

Ethnobotanical Studies of Sub-Himalayan Duars in West Bengal and Assam with particular reference to the Tribe Mech

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BY

Smt. Ajita Sarkar

UNDER THE SUPERVISION OF

Prof. A.P. Das



DEPARTMENT OF BOTANY
UNIVERSITY OF NORTH BENGAL
DARJEELING,
INDIA – 734013.

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Ajita Sarkar
[Ajita Sarkar]

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CHAPTER 1

INTRODUCTION

INTRODUCTION

The association of man with plants is an age-old process. Also the relationship between man and environment in general has never been static and is changing continuously. But this is not the case with tribal/aboriginal communities the world over. The life, culture and traditions of these communities have remained almost undisturbed and static for hundreds of years. The traditional communities in the world over have the wealth of accumulated knowledge and wisdom particularly about the biological resources around them. Often it is said that they are the living archaeological museums of ancient traditions and cultural heritage of a nation (Ghosh & Das 2004).

The Indian subcontinent is inhabited by over 53.8 million tribal people belonging to over 550 communities like *Santal, Munda, Oraon, Naga, Momp, Karbis, Saora, Sarasia, Irulus, Chenchus, Kharia, Baigas, Bando* etc. with some degenerated communities like *Ongae, Great Andamanies, Jarawa, Sentinelese, Shompen, Toda, Toto, Asur, Birhore, Lodha* etc. that come under 106 different linguistic groups and 227 subsidiary dialects (Rao 1994). They inhabit in varied geographical and climate zones of the 5000 forest villages in the country and are living in complete harmony with the nature. Tribals constitute about 7.5% of India's total population (Jain 1991, Pushpangadan 1994). They can utilize the biological resources without disturbing the delicate balance of the ecosystem. But this peaceful coexistence of the tribal society has been violently shaken in the recent past by the interference in their habitats by so called civilized outsiders. India is very rich for its 16 agro-climatic zones and its old heritage of ancient civilization with old and obsolete literatures like Vedas, Quaran, Puran, Sanhitas, Neghuntas, Nidans, Epics (*Ramayana, Mahabharata*), archeological remains and sacred groves and is an unused field for ethnobotanical studies in various aspects to get initial information on inter-disciplinary and intra-disciplinary subjects. However, this subject is newer to Indian science and recognized as a multidisciplinary study (Pal 2000).

In the pre-historic times people used plants quite intuitively for the fulfillment of basic needs. Such as food, clothing, shelter, tools and even for the cure of many of their bodily disorders. The history of medicinal plants is intimately connected with the history of plants.

Primitive man lived at the mercy of nature, in constant terror of diseases. The medicinal plants played a very important role from times immemorial among the illiterates to highly civilized men and women in the folklores, superstitions, traditions, various rituals, witchcraft and incantation connected with healing of diseases and also driving out the evil spirits which they believed to be the cause of the disease. Astonishingly, these magical rites seemed to help. The use of plants for curing various human ailments figured in ancient manuscripts such as *The Bible*, *The Rig-Veda*, *The Iliad* and *The Odyssey* and the History of Herodotus. Over 6000 years ago, the ancient Chinese were using drug plants. The Egyptians, Babylonians, Sumerians, Greeks and Romans, all developed their respective characteristic *Materia Medica*. In India, the ayurvedic system of medicine has been in use for over three thousand years. Charaka and Susruta, two of the earliest Indian authors had sufficient knowledge of the properties of the Indian medicinal plants. Their medical works the *Charaka Samhita* and the *Susruta Samhita* are esteemed even today as treasures of literature on indigenous medicine. This man-plant relationship can be classified into two groups viz. (a) abstract and (b) concrete (Pal 2007).

The abstract relationship includes faith in good and bad power of plants, taboos, sacred plants, worship, folklore and other aesthetic valuable plants. In literature similies and metaphor coming from plants and plant parts are also included within this realm. On the other hand, the concrete relationship includes mainly the materials used such as food, medicine, shelter, etc. In 1989, Jain categorized the *Abstract* and *Concrete* relationship between man and plants under four headings, viz. (i) Relationships useful both to man and plants, cover the realm of domestication of plants, agriculture, development of improved crop varieties, hybridization, creation of hardy, disease-resistant varieties, propagation, sustainable exploitation and conservation of wild plant resources. (ii) Relationships useful to man, harmful to plants, include the areas of the practice of monoculture forestry, silviculture, usage of minor forest produces, etc. (iii) Relationships useful to plants, harmful to man, include obnoxious weeds and the plants in pesticides. (iv) Relationships harmful both to man and plants, come under the purview of damage to environment, environmental pollution, deforestation, creation of waste lands by one way or the other, shifting cultivation, etc (Jain 2004).

1.1. Definition

The term “*Ethnobotany*” is derived from two Greek syllables *Othnikos* or *ethnos*, meaning nation or race, and *botanikos* or *botane*, meaning plant. The term “*Ethnobotany*” refers to the study of the relationship of botany with primitive human race. Dr. John W. Harshberger first coined the term in 1895, under the heading “... some new ideas” in *The Daily Evening Telegraph*,

Philadelphia. But in some details it was published in *Botanical Gazette* in 1896. Subsequent workers have defined and interpreted the subject. Jones (1941) defined the subject as the study of the interrelations of primitive man and plants. Faulks (1958) considered that Ethnobotany encompassed the entire realm of “Economic Botany”, including the modern use of plants. Later on, Jones (1952) revised his concept and considered that Ethnobotany is a unit of ecological studies with special reference to the interaction of man and the phytoworld. Schultes (1962) interpreted ethnobotany as the study of existing relationship between people of a primitive society and their plant environment. Ford in 1978, for the first time disapproved the use of the word ‘primitive’ before human. Vartak & Gadgil (1980) clearly stated that the ethnobotany is a branch of economic botany. Jain (1986) applied ethnobotany to total and direct relationship of plants with man. Manilal (1988) stated, “Ethnobotany denotes the entire realm of useful relationship between plant and man”. Ethnobotany is now regarded as distinct and independent subject in science.

1.2. Ethnobotany – A Multidisciplinary Science

It has been recognized as a multidisciplinary subject comprising many interesting and useful aspects of other subjects, like Botany, Anthropology, Sociology, Agriculture, Horticulture, History, Archeology, Medicines, Ecology, Geography, Linguistics, etc. A comprehensive study combining all the above disciplines could provide clue to the origin of cultivated plants, distribution of wild relatives, history, names, migration of human races, phonetics, etc. A French botanist, De Candolle (1886) and a Russian geneticist and agronomist, Vavilov (1926, 1951) took the aid of Ethnobotany to ascertain the center of origin of economic plants in the world.

1.3. Interdisciplinary Applications of Ethnobotany

Various inter-disciplinary aspects of Ethnobotany are ethnometeorology (the weather forecasting through plant behaviour), ethnocosmetics (traditional cosmetics), ethnodieteics (the study of food during sufferings and restrictions on consumption of edible plants in different seasons), ethnomusicology (related to plant used in instruments, referred to music), ethnotoxicology, ethnonarcotics (referred to plants used by ethnic groups for hallucination and narcotic purposes), ethnopharmacology (the pharmacology of ethnobotanical species), ethnoorthopedics (the study of traditional methods for healing of fractured bones and setting of dislocated joints), ethnoophthalmology (the study of plants used for curing eye diseases), ethnogynaecology (the traditional methods of treatment of female diseases), ethnopaediatrics (the study of plants used for diseases amongst children), and so on. The prefix “Ethno”, in general, is used to indicate inter-disciplinary and intra-disciplinary branches or areas of Ethnobotany (Pal 2000).

1.4. Sub-disciplines of Ethnobotany

Ethnobotany deals with the relationship of man with various subgroups of plant kingdom, like algae, fungi, bryophytes, pteridophytes, lichens, etc. are called subdisciplines of ethnobotany and have been termed as ethnoalgology, ethnomycology, ethnobryology, ethnopteridology, ethnolichenology, ethnotaxonomy, ethnopalaeobotany, etc. (Pal 2000). Different branches of ethnobotany also named from utilitarian points of view like ethnomedicine, ethnopharmacognosy, ethnoveterinary, etc.

1.5. Knowledge Generation

Knowledge comes from knowing and learning. And, to know means “to have in one’s mind or memory”. This generally comes through practice and experience. Practice can be a trial and error method and its result is the experience. So, tribal people, when settling in a new area they will then start generating a new series of knowledge (Goel 2007).

This they do using own perception and understanding with the nature. Thus, they acquire new knowledge and that they transfer to next generation for use and further refinement if necessary. The knowledge generating system is still a living tradition in many poor and developing countries, particularly in biodiversity rich third world nations. A study of such knowledge system of traditional communities about the plant world is the subject of ethnobotany. During past 100 years, the *Ethnic* as well as *Folklore Knowledge Based Systems* have expanded well and established closer linkages with many disciplines of knowledge with numerous aspects of socio-economic development of human race. Experience in the traditional as well as modern societies is ones personal acquirement. Experiences both in ethnic and folklore knowledge bases have been different from each other but sometimes go as overlapping.

1.6. Ethnic Knowledge

The term Ethnic concerns with the varieties of human races more specifically the tribals. Their tribal status is regulated by their customs or traditions or special rules and regulations. Ethnic knowledge is generally employed for innovations and practices of indigenous communities embodying ethnic life styles mainly nature dependent. One such important ethnic knowledge is the use of *Tricopus zeylanica* by the *Kani* tribe from the Agastyamalai hills in Western Ghats (Pushpangadan 2002, Pushpangadan *et al* 1997).

1.7. Folklore Knowledge

Folklore comprises of two words: *Folk* meaning people in general or of a specified class and the *Lore* means knowledge and both the words together depict traditional belief among people or

society as well as their study. In other words, *Folklore* is tradition based, collectively held, orally transmitted in a local dialect and an important source of cultural identity. Its forms include language, literature, music, dance, games, mythology, rituals, customs, handicrafts, architecture and arts (Seital 2001; Goel 2007).

1.8. Life of Early Men and the Use of Plant Resources

Evolution of early men started about 5 million years ago. These early men evolved from apes, which were tree dwellers, and they too lived in caves, as a result of overall interaction with their local environment, including plants and animals. This trend has continued to the present times where people obtain much of their basic needs, mainly the food and medicine from biological resources. As a result of such continuous association during the past several millennia, information on various aspects of natural resources has accumulated (Jain 1991).

It is now believed that humans in preceding millions of years have influenced the most pristine natural habitats in some way. The forcible intent and the concern of human society have been to fulfill their hunger. Since the time immemorial, to overcome this, people carried out experimentation, selection, domestication and the improvement in economically important plants and animals. For their survival, primitive man started to interlink natural impulse without disturbing the biological resources and continuously selected a large number of plants in first instance and then animals as his food items. During selection of foodstuff, man utilized his intuition and also observed the animals eating and behaving with plants. Every animal including man cannot remain alive without the help of natural resources (Shah 2002). In different regions of the world, aboriginal people have revealed the incredible uses of their natural resources around them.

Pre-historic man started cultivation nearly 12,000 years ago in forests. Most probably womenfolk in the vicinity of their dwellings initiated farming of plants, when men used to remain engaged in hunting and searching food inside the forests. During hunting and food gathering, primitive man observed and understood how plants generate seeds those grow into the seedlings (Arora 1995; Goel 2007).

1.9. Loss of Knowledge

The knowledge gathered by tribes and early men, were obtained through trial and error processes and evolved during practice of this knowledge for generations. Thousands of years ago, native people had great centers of learning due to the presence of oldest civilizations on this planet. Over a period of time, with decline of these civilizations and arrival of invaders, several of them

existing cultural practices including the teaching of information decline or were banned entirely. At that time, intergenerational transmission of information about useful plant species generated from written to oral traditions. Such patterns are prevalent among many ethnic societies all over the world. But they are generally hesitant to divulge or share indigenous knowledge with the outside world without persuasion. So, this knowledge may not be relayed properly to the younger generations.

On the other hand, cultural evolution is the most vital source of future development and the conservation of natural resources. Cultural systems are more dynamic than biological ones. In many parts of the world traditional conservation practices have weakened by cultural changes due to increased human needs. Some resources are being over exploited due to fast cultural and economic transformations (Laird 2002). With these modernizations, younger generations have little or no inclination towards their cultural heritage and exhibit ignorance and no interest in learning and continuing these systems.

1.10. Importance of Documenting Traditional Knowledge

Ethnobotany deals with the studies among the tribal and rural people for recording their unique knowledge about plant wealth. It has been recognized as a multidisciplinary study that plays a major role in the advancement of many aspects of scientific, sociological and historical studies. The wealth of knowledge is generally shifted orally from one generation to the other. Even today, lots of such knowledge remains undocumented those urgently require immediate attention, scientific evaluation and validation for the benefit of mankind (Goel 2004).

Over a period of time, ethnic people have acquired vast knowledge of activities and products related with plants and their uses. Some ethnobotanists are spending several years among the ethnic societies; they have opined that their knowledge about nature is far more than all our knowledge (Pushpangadan 2003). Interestingly Ethnobotany traces and unfolds diverse cultures among the ethnic societies. This rich heritage of knowledge and age old wisdom should be well documented for future use and conservation. In absence of proper care, this knowledge is bound to be lost, creating an unfulfilling damage to various aspects of conservation.

1.11. Need of Ethnobotanical Studies

During initial years, ethnobotany referred to the study of plants used by ethnic societies. However, its scope has widened constantly in the recent years. Currently it is employed to include the total relationship of plants and the people and is often encircled by rich biodiversity coupled

with ethnic diversity. Ethnobiological studies can help considerably the ethnic communities to define their requirements for natural resources more clearly (Jain 1981). Thus assisting them to advocate their cases for continual access to certain areas of land or habitats or for the provision of alternatives to wild gathering if required and also bring to light entirely new or little known uses of bio-resources. Ethnobotany represents best avenues for screening new economic plants for food, medicine, etc as well as for gene pool source for the development of agricultural and medicinal crops. For this purpose, a close collaboration is required among agriculturists, phytochemists, pharmacologists, nutritionists and ethnobotanists. This will not only lead to the discovery of new economic plants but also result in better understanding the relationship between primitive societies and modern science. However, the significance of Ethnobotany is multifaceted and multi-dimensional in nature. The following may be included under its coverage (Goel 2007):

- a) Man-plant interaction in human society.
- b) Historical understanding based on existing human culture.
- c) Genetic pool for resistant crops and for development of hybrid plant species.
- d) Scientific investigation of herbal practices exists among different ethnic communities and tribal groups to discover new medicinal plant species, new area of knowledge, treatment, therapies and drug development.
- e) Development of traditional technologies with scientific imputes for the benefit of artisan classes and for sustainable utilization of natural resources.

1.12. Organized Studies on Ethnobotany

1.12.1. Ethnobotanical Studies in the World: Ethnobotany beyond its ordinary realm of botany has great significance for other branches of science, like meteorology, cosmetics, dietetics, music, toxicology, narcotics, pharmacology, orthopedics, gynecology, pediatrics, ophthalmology, phytochemistry etc. Hence, it has received wonderful attention throughout the world. In USA, Ethnobotany has a rich history. Harvard University is a leading centre of ethnobotanical studies, while University of Michigan has established an ethnobotanical laboratory and many other universities of USA have included ethnobotany as a subject of study and research. Canada has instituted "Canadian Ethnobiology Service". It has become a major subject in Mexico, Brazil and other countries of South America. In 1987, the department of Ethnobotany has been established at the Kunming Institute of Botany, Academia Sinicia. Ethnobotany has also been introduced as a subject of study along with Economic Botany in the University of Murcia, Spain. The subject has received considerable importance in Ethiopia, Ghana, Uganda, Kenya, South Africa, West Indies, Indonesia, Australia, New Zealand etc. It is the thrust area of research in Bangladesh and Nepal.

In December 1994, an International Conference on Ethnobotany was held at Dhaka. The subject is receiving increasing attention in European countries as well, like UK, France, Denmark, Portugal and others (Pal 2000).

1.12.2. Ethnobotanical Studies in India: India with its diverse flora coupled with large number of aboriginal tribes, inhabiting different pockets in the country, offer immense scope to the Ethnobotanists. This wealthy inheritance of knowledge and age old wisdom of India might well be among the earliest in the world. From the period of '*Vedas*' *Rigveda* (2500 B.C. – 1600 B.C.), *Atharva veda* (1500 B.C. – 500 B.C.), *Kautilya's Arthashastra* (321 B.C. – 186 B.C.), *Vishnu Puran* (500 A.D.), *Agni Puran* (500 A.D. – 700 A.D.), *Vishnudharmottara Mahapurana* (500 A.D. – 700 A.D.), *Apstanga Smriti* (200 B.C. – 200 A.D.), *Brihat Samhita* (500 A.D.), *Upavanavinoda* (1120 A.D. – 1330 A.D.), etc, and with medieval literature in Sanskrit, Pali, Tamil, Persian and other regional languages, posses huge wealth of ethnobotanical information. Ascertaining of the botanical identity of large number of plants in ancient literature is one of the branches of investigation in ethnobotany. Starting from "*Vishalyakarani*" in Hindu epic Ramayana and "*Soma*" in Vedas, more than one and a half dozen of plants have been attributed with important medicinal properties (Pal 2000). Bodding (1925 – 1940) perhaps sowed the seed of field investigation in ethnobotany through his pioneering contribution on "*Studies in Santal Medicine and Folklore*". This was followed by an equally important contribution by late Prof. G.P. Majumdar (1938) through his publication – "Some Aspects of Indian culture (in plant perspective)". The Bulletin of Botanical Society of Bengal added the sub-title "Ethnobotanical studies in India" to it. Kirtikar & Basu (1933) stated, "Ethnobotany is virtually a new field of research in India". They further remarked that ethnobotany would become a more important subject when its study would progress to a point where results could be studied comparatively. De (1968) also supported Kirtikar & Basu's view and stated that ethnobotany was a new science in India. Since 1960, Dr. S.K. Jain from Botanical Survey of India started intensive field study among the tribals of Central India. He has instituted (i) one Ethnobotanical Institute, (ii) one Society of Ethnobotanists and (iii) one *Ethnobotany* journal, and these have, certainly promoted the subject at least in this country (Pal 2000).

Very little organized ethnobotanical work had been done in the country till about 20 years ago. Organized fieldwork and other studies in the subject were started in the Botanical Survey of India. Studies on ethnobotany were undertaken as an official program in the Economic Botany Section, since its very inception. Dr. E.K. Janaki Ammal initiated researches on ethnobotany in Botanical Survey of India. She studied subsistence food plants of certain tribals of south India.

The publications for this group in the early 1960s triggered the ethnobotanical activity in many other centers, particularly among botanists, anthropologists and medical practitioners, etc in India. During the last two decades similar work has now been initiated at various institutions such as National Botanical Research Institute (NBRI) at Lucknow, National Bureau of Plant Genetic Resources (NBPGR) at Delhi; Central Council for Research in Ayurveda and Siddha (CCRAS); Central Council for Research in Unani Medicine, (CCRUM); Central Council for Research in Homeopathy (CCRH) and Tropical Botanic Garden and Research Institute (TBGRI) at Thiruvananthapuram. In 1974 Dr. T.N. Khoshoo, the then Director of National Botanical Research Institute, proposed an "All India Co-ordinated research Project on Ethnobiology" (AICRPE) under "Man and Biosphere" program of the Department of Science and Technology, Government of India. It took some years to finalize the work program and the project came into operation from 1982. This project is in operation at NBRI, Lucknow, and four centers of Botanical Survey of India (Shillong, Howrah, Coimbatore and Port Blair) and some other institutions. Followed by special session on ethnobotany in Botanical conferences and the organization of a Seminar of "Plants in Folklore and Folklife" on the occasion of Xth International Congress of Anthropological and Ethnological Sciences, a Society of Ethnobotanists was established in India in 1981 and 1982, respectively. Several papers presented in these symposia and seminars have been compiled and edited by Dr. S.K. Jain under the title "Glimpses of Indian Ethnobotany" (1981). This indicates the increasing interest developed in various institutions in the country for ethnobotanical studies. Botany Departments of several Indian Universities now have also initiated ethnobotanical work. Another noteworthy aspect is the recognition of ethnobotany as an organized scientific discipline even for the doctoral and post-doctoral work by academic institutions in India.

Apart from several institutions and Universities, many scientists in different Regional circles of Botanical Survey of India have undertaken ethnobotanical studies in some areas of Andaman & Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Bihar, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal among the tribes. They have so far recorded about two thousand plants used as medicine, food, fodder, fiber, house building materials, musical instruments, fuel, oil, seeds, narcotics, beverage, in material culture and for magico-religious purposes. Some studies on plant used in veterinary medicines have also been made. Indian Institute of Ecology and Environment, New Delhi has proposed to make a herbarium of medicinal plants at New Delhi Administration.

1.13. Scope of Ethnobotanical Studies in North Bengal

North Bengal comprises of six districts of the Indian state of West Bengal and exhibits contrasting climate, hot and humid in plains and cold in the hills. The Himalayan portion that passes through the state lies in this region. Districts of North Bengal are bounded by various foreign countries viz. Nepal, Bhutan, Bangladesh and China. Thus, infiltration of different tribes has occurred at different times to this land since the time immemorial. They include *Lepcha*, *Rabha*, *Mech*, *Toto*, *Santal*, *Oraon*, *Baraik*, *Kharia* and others. These tribes have markedly different origins but now share common homeland, mainly Duars and Terai in North Bengal. Since, in course of time, they have become native or local to this area; they also share cordial relationship with local Bengalese inhabitants. With the passage of time, their tribal culture is being contaminated with Bengali culture. Thus, for proper conservation of traditional knowledge of these tribes, extensive and intrinsic studies about these communities are essential. Since this region is homeland of various tribes, selection of this study area is thought to be appropriate (Anonymous 2001a).

The facilities of civilization were only in their dreams and were surviving in very close harmony with the local resources, mainly plants. They arrived here with different habit, practice, knowledge and culture in their mind and then started using the local resources. This has resulted in the generation and accumulation of new knowledge within their societies. But, the overall causes or conditions are also prevailing in this region and threatening the continuation of the use of such knowledge among the younger generation. So, this is the prime time to prepare documents on their Ethnobotanical knowledge (Das *et al* 2007).

These may include the following areas:

1. Identification and documentation of ethnobotanical plants used by the tribal inhabitants of North Bengal
2. Inventorying of genetic resources of economic utility
3. To implicit planning and development of biodiversity conservation
4. Providing basic information i.e. distribution and status of floral species of North Bengal
5. To understand the demography of population, pattern of utilization of flora and their impact on the environment
6. Try to understand and recognize and evaluate plant related folklores and myths.

CHAPTER 2

THE *MECH* TRIBE

THE *MECH*TRIBE

2.1. Who are Tribes?

The word '*tribe*' was used by English speakers to refer to inhabitants with distinctive social, cultural and possibly physical characteristics and it occurs interchangeably with other words denoting some kind of collection of people (Dash Sharma 2006). The contrary meaning of '*tribe*' is separated from 'nation' emerged in the first half of the nineteenth century, when early anthropologists and sociologists connected it with the conception of 'primitive society' (Fried 1966, 1975).

An understanding of the concept of "indigenous and tribal peoples" is contained in Article 1 of the 1989 Convention concerning Indigenous and Tribal Peoples in Independent Countries, No. 169, which is adopted by the International Labour Organization. There is a lot of debate in the definition of "indigenous peoples". Noteworthy debate on the subject has been detained within the circumstance of the preparation of a Draft Declaration on the Rights of Indigenous Peoples (Stamatopoulou 1994) by the Working Group on Indigenous Populations since 1982. The working definition is: "Indigenous communities, peoples and nations are those which, having a historical continuity with pre-invasion and pre-colonial societies that developed on their territories, consider themselves distinct from other sectors of the societies now prevailing on those territories, or parts of them".

Risley (1891) defined the word '*tribe*' as "it is a collection of families or a group of families, bearing a common name which as a rule does not denote any specific occupation, generally claiming common descent from a mythical or historical ancestry, occasionally the name is derived from an animal but in some parts of the country, the tribe is held together only by the obligation of kinship, member speaking the same language and occupy a tract of the country."

2.2. Tribes/ Indigenous Peoples in India

The group of autochthonous people, popularly known as the Tribal people is particularly numerous in the Indian states. Officially recognized by the Indian government as 'Scheduled Tribes' in the Fifth Schedule of the Constitution of India, has often been categorized as being

indigenous (United Nations 2004; World Bank 2005). The Indian Government identifies those communities as scheduled tribes on the basis of community's "primitive traits, distinctive culture, shyness with the public at large, geographical isolation and social and economic backwardness" (Anonymous 2004), with substantial variations in each of these dimensions with respect to different scheduled tribe communities (Basu 2000). While 'Scheduled Tribes' is an administrative term adopted by the Government of India, the term '*Adivasi*' has become the popular term for India's indigenous or tribal peoples. '*Adivasi*' is a Sanskrit word meaning '*Original Inhabitants*'. Indian tribals are also called *Atavika* (forest dwellers, in Sanskrit texts). The term '*Adivasi*' is often used to describe the different communities those belong to scheduled tribes. Contrary to the official government position, this term reflects the widely recognized fact that the people are thought to be the earliest settlers and the original inhabitants of the Indian peninsula before the settlement of the Aryan Colonization (Thapar 1990). The distinct identity of *Adivasis* has many aspects: language, religion, a profound bond linking the individual to the community and to nature, minimal dependence on economic pattern, a tradition of community-level self-government and an egalitarian culture that rejects the rigid social hierarchy of the *Hindu* caste system (Anonymous 1999).

The Indian subcontinent is inhabited by over 84 million people belonging to 698 communities are identified as scheduled tribes (Anonymous 2004), constituting 8.2% of the total Indian population (Anonymous 2001b). According to a constitutional mandate (Anonymous 2004), formulated in 1950, scheduled tribes have been formally recognized as tribals in India. As a result, there exist clear governmental policies for confirmatory actions targeted towards scheduled tribes (Anonymous 1950) and their members are regularly enumerated in national surveys (Anonymous 2000) and censuses (Anonymous 2001b). As the 1950's formal recognition of scheduled tribes, the proportion of individuals of scheduled tribes in the total population has increased from 5.3% (1951) to 8.2% (2001) (Anonymous 2004).

The concentration of indigenous and tribal people varies substantially between the Indian states (Anonymous 2001b). In northeastern states, tribals constitute 65 % or more of the total population; in Chattisgarh, Jharkhand, Orissa, Madhya Pradesh, Gujarat and Rajasthan this proportion ranges between 13% and 32% of the state's population. There are smaller numbers of tribal people in south India, western India and in the union territories of Lakshadweep and the Andaman and Nicobar Islands. About 1% of the populations of Kerala and Tamil Nadu are tribal, whereas about 6% in Andhra Pradesh and Karnataka are members of tribes.

2.3. The Mech Tribe

The *Meches* or the *Bodos* (Boros) are regarded as the oldest settling Indo-Mongoloid tribe of Northeast India and that of the Northern part of West Bengal (Plate I, Figs. A – G). They are found in large numbers in Assam. During the time of the Ramayana and the Mahabharata and in other Hindu scriptures the present day *Meches* were known as *Danavas*, *Asuras*, *Kiratas* and *Mlechhas*. According to N.N. Vasu (1922) *Meches* and *Kiratas* belong to the *Asura* dynasty. Grierson (1909) maintained that, in the history of Assam the *Mlechhas* or the *Meches* ruled Pragjyotispur or Kamrupa for four thousand years and began to decline from the 11th century.

Burling (1959) has divided the *Proto Bodo* group (Fig. 2.1) into three sub-groups: (i) *Koch*, (ii) *Garo* and (iii) *Bodo proper*. According to Burling *Mech*, *Dimasa* and *Boro* belong to the “Bodo Proper Group”.

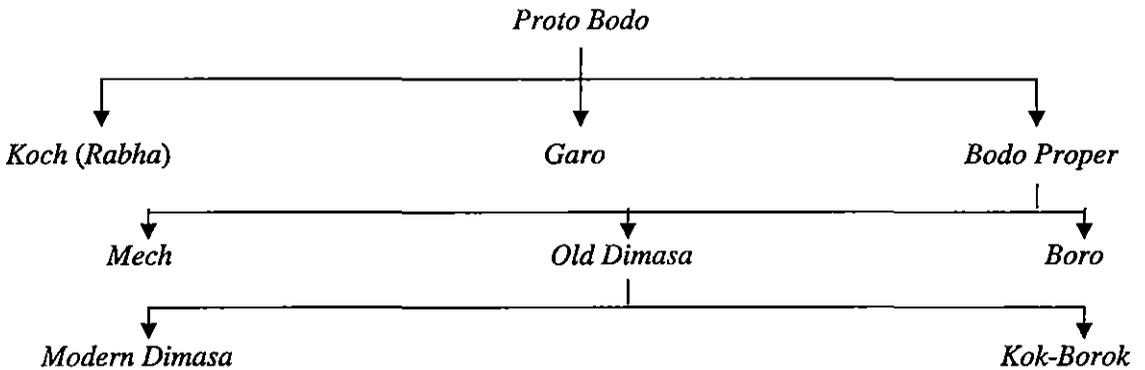


Figure 2.1. Classification of *Proto-Bodo* by Robbin Burling

Before the starting of caste *Hindu Assamese* ethnicity, the *Bodo* kingdoms were extended throughout the modern Assam. After dominating Gauda and Nodiya, the Turks under the leadership of Muhammad-bin-Bakhtiyar Khalji invaded Kamrupa with a view of conquering Tibet. In the same period Kamarupa was occupied by the *Koches*, the *Meches* and the *Tharus*. The author of *Tabaqat-i-Nasiri*, Minhaj-ud-din wrote that “In the different parts of those mountains which lie between Tibbat and the country of Lakhanawati are three races of people, one called *Kunch*, the second the *Mei (Meg)* and the third the *Tiharu* and all have Turk countenance.” The Mech King of Kamarupa resisted Muhammad-bin-Bakhtiyar Khalji. According to S.K. Chatterjee, the Turkish was resisted by the ruler of Kamarupa under the leadership of Lunar dynasty of Vallabha-deva, and fell into the hand of Bakhtiyar Khalji. He accepted the Muhammadan faith and was known as ‘Ali the Mech’. Historians are of the opinion

that 'Ali the Mech' was suspected to be Vallabha-deva who became the ruler of Gauda (Narjeenary 1985).

2.3.1. Etymology of 'Mech': There are three different opinions about the origin of the generic term 'Mech' as follows:

VIEW I: *Mlechha*>*Mech*: The word 'Mech' is simply a corruption of the Sanskrit word 'Mlechha' which means 'barbarian' or foreigners. The name *Mech* or *Mlechha* that 'Welsh' or barbarians was given to the *Bodos* of North Bengal by their *Bengali* neighbours (Basumata 2001).

VIEW II: *Mech*> *Mlechha*: According to Prof. Suniti Kumar Chatterjee (1951), due to progressive Sanskritisation of the various Pre-Aryan or non-Aryan people in their culture, their outlook and their ways of life, the 'Mech' might have been Sanskritised as 'Mlechha'.

VIEW III: The *Bodos* one of the Tibeto-Burman speaking Indo-Mongoloid Tribes migrated into India through Patkoi Hills between India and Burma and gradually spread themselves into the whole of modern Assam, North Bengal and parts of East Bengal or present Bangladesh. One part went along the river Bramhaputra and established themselves in the whole of modern Assam upto Goalpara and parts of the districts of Jalpaiguri and Coochbehar in West Bengal under the name of *Bodo*.

The third part went towards the west along the foot of the Himalayas upto river *Mechi* between India and Nepal and settled on the north bank of the said river as *Mech* or *Mechia*. So the *Bodos* who settled on the bank of the river *Mechi* were known as *Mech* (Sanyal 1973).

Binoy Khungar Bwisumuthiary in his article 'The Origin of the Bara' proposed that the appellation 'Mech' is the shortened version of Meshek, son of Japhet and grandson of Noah (Basumata 2001).

Another hypothetical proposition made by N.N. Vasu (1922) in his 'The Social History of Kamrup' in which we also get Biblical reference as to the origin of the 'Mech'. Vasu observes, in the Vedic Age the *Asuras* became separate from the Aryans and having crossed the borders of India settled in Persia or Turkey. They founded the kingdom of Asur or Assyria about 200 miles to northwest of Babylon and founded the Capital of Asur on the bank of Tigris. Their possessions extended from Asia Minor to Caucasus Mountain. In the Old Testament mention is made of a Royal Priest in the name of Melclu-Zedek. After his name 'Mekhi' came to denote king and priest in Syrian and Assyrian languages.

This is an ascending task to say which of the above propositions about the origin of appellation '*Mech*' is historically more acceptable. However Dr. Sunity Kumar Chatterjee's (1951) proposition that '*Mlechha*' is the Sanskritisation of *Mech* seems to be more acceptable on the following grounds:

- i. '*Mech*' is a *Bodo* word which means human being. '*Mech*' is formed of the root '*Me*' and '*ch*'. Here '*ch*' is the shortened form of '*shi*' or '*chi*' which means '*soul*' in *Bodo* language. So '*Mech*' means the being with soul i.e. human being.
- ii. Had the appellation '*Mech*' been derived from '*Mlechha*', there would have obviously been more than one *Mech* community at present in India because in Chapter 175 of *Adiparba* of *Mahabharata Pundras, Kiratas, Yavanas, Barbaras* etc all are included in the *Mlechha* race.
- iii. Both the propositions that the appellation '*Mech*' might have been the reduced edition of Biblical Characters '*Meshak*' and *Melchi-Zedek* do not seem to have historical footings but the propositions enhance the possibility of long settlement of *Mech* people in Babylon before their transmigration to India with the great Mongol group. The *Samhita* portion of the *Vedas* testifies this prospect.

Finally, we may say that the modern *Mech* entered India as '*Mech*' and were later Sanskritised as '*Mlechha*' (Chatterjee 1951).

2.3.2. Habitat and Distribution: The *Meches* are migrated into India through Patkoi Hills, which is situated between India and Myanmar and gradually spread themselves into the whole of modern Assam, North Bengal and parts of Bangladesh. It is probable that they marched towards three directions. One part went south along the river Brahmaputra and established themselves in the modern Assam up to Goalpara and in some parts of Jalpaiguri and Coochbehar districts of West Bengal.

The third part went towards the west along the foot of the Himalayas up to the river *Mechi* running between India and Nepal and settled on the north bank of the said river as *Mech* or *Mechia*. They crossed the river and established themselves in the deep forests of Darjeeling Terai and Baikunthapur of Jalpaiguri. Again they marched eastwards, crossed the Tista and spread in the Duars, Jalpaiguri. After that, they moved further east, crossed the river Sankosh and went towards Goalpara in Assam (Sanyal 1973).

2.3.3. Population Structure: According to some anthropologists, the *Meches* or the *Bodos* are the descendants of the great *Kachhari* tribe of North-East India and they have been living in Jalpaiguri district of West Bengal since 7th century together with their counterparts throughout Assam. It has been known from Census surveys that 90% of the *Meches* of West Bengal are the Jalpaiguri-*Meches*. A few members of the tribe however, are found in Siliguri sub-division of the district of Darjeeling and elsewhere. According to 1991 and 2001 Census report (Anonymous 1991a, 1991b, 2001c & 2001d), the total population of *Meches* or *Bodos* in Jalpaiguri district of West Bengal and Kokrajhar district in Assam against the total population and total tribal population of West Bengal and Assam are mentioned in Table 2.1:

Table 2.1. Population of *Meches* in Jalpaiguri district and West Bengal (Anonymous 1991a & 2001c)

Year	State/ District	Total Population	Total Tribal Population	Total Mech Population
1991	West Bengal	68077965 Male: 35510633 Female: 32567332	3809000	29904
	Jalpaiguri	2800543 Male: 1453194 Female: 1347349	589225	26987
2001	West Bengal	80176197 Male: 41465985 Female: 38710212	4406794	Not available
	Jalpaiguri	3401173 Male: 1751145 Female: 1650028	641688	Not available

Table 2.2. Population of *Bodos* in Kokrajhar district and Assam (Anonymous 1991b & 2001d)

Year	State/ District	Total Population	Total Tribal Population	Total Bodo (Mech) Population
1991	Assam	22414322	2874441 Male: 1461560 Female: 1412881	1267015 Male: 642443 Female: 624572
	Kokrajhar	808730	329461	318432
2001	Assam	26655528 Male: 13777037 Female: 12878491	3308570 Male: 1678117 Female: 1630453	1352771
	Kokrajhar	930404	313546	Not available

2.3.4. The Faith and Religion among the Meches: Before the access of Aryans and much latter of Britishers in North-East India *Meches* were worshippers of *Bathou* religion. Only after Aryan's influences few *Meches* were converted to different sects of *Hindu* religion. And after the annexation of earlier Assam and West Bengal by East India Company, some *Meches* were converted to Christianity. But, in general, *Meches* are still believers and worshippers of *Bathou* religion. *Meches* could have had its distinct language, culture, custom and tradition built on *Bathou* religion. *Bathou* religion is based on one God, *Bwrai Bathou*, who is almighty Supreme Being and creator.

About creation, believers in *Bathou* religion preaches that *Bwrai Bathou* created five matters – earth, water, air, heat (Sun) and universe. *Bwrai Bathou* created these matters first and latter other creation followed continuously. Who has created these matters, also created all living beings and plants including men through evolutionary process. Hence he is creator (*Swrjigiri*) and the *Meches* obey and worship Him for the well being of all creatures. These are the myths in *Bathou* religion. The *Bathou* worshippers could not leave their relation with the nature, because, they earn their livelihood from amongst the natural resources. Besides, along with *Bwrai Bathou* as others they perform different rites in the name of different Gods for their protection and prosperity. Generally before the performances of *Kherai* and *Garja*, they performed *Absha* and *Salami* Puja where everybody has to confess. Along with *Bwrai Bathou*, *Bathou* religion attaches special importance to purity or sacredness in personal as well as in social life (Suba 2000).

2.3.5. Economy and Education in Mech Society: Until the end of the twentieth century, the *Meches* practiced '*Jhum*' (*Hadang*) i.e. slash and burn method of cultivation. They were also found to earn livelihood through weaving, fishing, making bamboo articles etc. Now, they have transformed themselves from '*Jhum*' to settled agriculture (*Hal-wai-nai*) with the bullocks and the plough. Along with paddy cultivation, other cash crops like jute (*Corchorus capsularis* Linnaeus), mustard seeds (*Brassica nigra* Koch), areca nut (*Areca catechu* Linnaeus), arum [*Colocasia esculenta* (Linnaeus) Schott], various pulses and vegetables are also cultivated in large scale by the *Meches*. They are also known for their age-old cottage industry, *Eri-culture*. The *Mech* women are traditionally skilled in rearing of silkworms, spinning and weaving (Plate I, Fig. H). *Mech* family rear fowls, cows, pigs, ducks and goats. These constitute as source of income especially for the women. 18 DEC 2012

In 1880, Hodgson wrote that "the *Mech* have no education in the modern sense. Their language and numerals are complicated. They count up to seven". Gait in 1891 and Grierson in

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1909 wrote that “they can count up to ten and could make a small collection of their numerals” (Sanyal 1973). Now-a-days, the *Mech* people have received and are receiving modern education. Some of them have gained the highest degree of the University. At present, a good number of the *Meches* are found as government servants, teachers, doctors, nurses, drivers and businesspersons. Many have joined in military and Para-military forces. The *Meches* have shown a good deal of progress in the development of formal education among them in comparison with the other tribes. In West Bengal they have even initiated a movement and have asked the government for the introduction of *Bodo* language as the medium of instruction in primary schools.

2.3.6. Residence:

2.3.6.1. Homestead - Selection of Site: Having selected the new site, the head of the homestead goes there with a *Deusi*. Four wooden posts are drilled on the four border junctions of the proposed site. They are joined by jute strings forming a fence. The *Deusi* places two rice grain side by side on a leaf at night uttering incantations over them. It is covered with another leaf. This is done at the four corners of the proposed site. If in the next morning they are found unmolested they feel assured that there is no evil spirit on the spot and the house may be built. But now, this custom is rare.

2.3.6.2. House: A house is called ‘*Na*’ (Plate II, Figs. A – D); some pronounce it as ‘*No*’. A living hut is generally 18’-24’ long and 12’-8’ wide. The huts with mud plinths are erected so as to enclose a quadrangle or a nearly square yard. The huts are made of straw or jungle grass (*Vetiveria zizanioides*) supported by bamboo trellis (*Bambusa sp.*) or of strips of bamboo. The thatched roof resting on a bamboo (*Bambusa sp.*) or wooden (mainly *Shorea robusta*) framework, projects considerably beyond the walls. The walls are mud-plastered. There is one open space for door (*Duar*) and sometimes one or two small openings in the wall for window (*Janala*) but in most huts there is no window. Formerly an opening in the front wall was the door and the small space between the roof and the wall served as a window. A piece of jute cloth hung over the opening served the purpose of a door cover. Now reed or wooden door covers are used. All huts have mud floor raised about 2ft from the ground.

There is a separate cooking hut (*No-a-ghar*) and sleeping huts are separate. The northern hut (*Na-ma* i.e. house for the mother) is generally the bigger hut where resides the goddess *Mainou* (the goddess of wealth). At the north eastern corner of the yard there is a *Euphorbia royleana* plant enclosed in five layers of bamboo trellis. This is their Great God, ‘*Bathou*’. The cattle byre (Plate II, Fig. E – G) is a thatched lowly hut and is always built outside the inner yard.

At present well-to-do *Meches* have built wooden houses on wooden polls (*Shorea robusta*) about 7ft height from the ground, with wooden floor, wooden wall and corrugated iron or tiled roof. Brick floor has also been found in some houses. The cooking hut has a mud floor about 3ft high with thatched roof. In Assam, some families construct pucca or semi-pucca Assam type houses with C.I. sheet roofing. Every house has a well of its own. It was, previously, simply dug into the earth but now concrete ring wells are becoming popular. The well is called 'Doi-khur' (water dug-out). The Local Self-Government Department of the district and Village Anchals are establishing many concrete ring wells to supply drinking water to the villagers. Cast iron pipe wells there are but not favoured.

Some portion of homestead is covered with different plant species like *Artocarpus heterophyllus*, *Neolamarckia cadamba*, *Gmelina arborea*, *Lagerstroemia reginae*, *Callicarpa arborea*, *Bambusa spp.* etc. Each house is surrounded by a ditch and fence. The fence is usually made of split bamboo (*Bambusa nutans*) and trunk stripe of *Areca catechu*. Some plant species are used for fencing like *Jatropha curcas*, *Gliricidia sepium*, *Justicia adhatoda* etc.

2.3.7. Furniture: A moderately monied cultivator has a bamboo made bedstead (*Machang*). Some of them have wooden bedsteads (Plate II, Fig. H). A rich man has a wooden bedstead. They use modern chairs, tables and benches also. Moderately affluent families use low wooden seats for sitting.

2.3.8. Beddings: Bedding is called 'Iyem'. It is composed of a layer of jute sticks spread on the bedstead (*Changra*). This layer is called 'Chirin'. On this layer a jute mat is spread (*Phatusla*), on this a cotton cloth is spread (*Iyem-hi*). But many families use mattress, which is made with cotton of *Bombax ceiba* and *Gossypium arboreum*. They use pillow (*Gandu*), it is made with cotton pressed into a jute or cotton bag (*Iyem-shi-phung*). In winter they use a thick cloth to cover the body, this they call 'Modon-jum-nai-ni-hi'. They use woolen or cotton blankets (*Khumshi*) and also cotton 'Kantha' (*Khitab*).

2.3.9. Utensils: For cooking they use iron, brass or bell-metal utensils. Now aluminium or enameled pots are becoming popular. They use earthen vessels or bamboo cylinders (*Ha-chung*) carrying and storing water. For eating they use earthen or wooden or metal plate (*Thursi*). They use wooden mortar (Plate III, Fig. A) and husking tools, which is made with *Shorea robusta*, *Artocarpus heterophyllus*. For sieving and drying the grains or another things they use bamboo

made utensils. They make nice broom (*Hasib*) from *Vetiveria zizanioides* (*Gigab*) (Plate III, Fig. B). They make wide-mouthed baskets and also winnowing fans and sieving materials for keeping or cleaning grains (Plate III, Figs. C – E).

2.3.10. Lighting Implements: When going out they pierce a few fruits of *Ricinus communis* (*Eri*) and *Jatropha curcas* (*Enda*) in a bamboo sticks or jute sticks or some weeds use as a torch (*Banzar*). Kerosene lamps and electric torches are also available.

2.3.11. Dress: The women are spinning and weaving by their traditional homelooms. The loom they use is put inside a pit in the earth. The pit loom is called '*Chanchhali*'. Spinning is usually done with a spindle is called '*Takuri*' (Plate III, Fig. F).

The children put on a small piece of cloth called '*Nangti*' spun and woven by the ladies. When ten to twelve years old they wear a larger cloth '*Gamcha*' that turns between the legs and buttocks and hangs down to the knees from the loins. Young and old people also put on a '*Gamcha*' of a slightly bigger size (Plate III, Fig. G). During winter they use to wrap the body with a wrapper (*Modomni Gamscha*) of cotton or *Endi* spun and woven at home. The cotton is obtained from *Gossypium arboreum*. *Endi* is made from home raised worms fed on leaves of *Ricinus communis* (*Eri*). They also use a banian, a sort of coat, of cotton or *Endi*. The one without button but tied with two small threads of the same materials is called '*Bushta-bhoto*' or '*Bodo-bushta*'. The one with a row of buttons and eyes in front along the chest and abdomen was called '*Bandia*' or '*Bandia*'. A piece of hand woven cloth covered with flowery design is also used by *Mech* men around their neck, which is called as '*Arnai*'. An *arnai* is about 3 – 3.5 ft in length and 8 – 10 inch in breadth.

The women tie a cloth round the chest just below the armpit that hangs to the knees. It is called '*Dakhna-thinthai*' (when plain) and '*Dokhna-ashar*' (when ornamented). Yellow is the favourite colour of *Mech* women. Now-a-days a lot of changes have occurred in the dresses of *Meches*.

2.3.12. Foot Wear: Advanced *Meches* use leather shoes that they buy from the market. Sometimes they use wooden (mainly *Alstonia scholaris*) sole cover with a knob to pass between the great toe and the second finger. This they call '*Nak-thung*'.

2.3.13. Head Cover: The *Meches* use a headgear of fabricated bamboo strips and leaves of *Phrynium pubinerve* (*Laihu*), that protects the head and the back from the rain and the sun. It was called 'Ghum' (Plate III, Fig. H). It had no handle. It was simply put on the head. Many of the *Meches* have started using modern umbrellas but the men engaged in cultivation adhere to the old head-cover for convenience.

2.3.14. Fishing and Hunting: *Meches* are non-vegetarian and to fulfill their requirements of food, they are dependent on fishing and hunting.

I. Fishing (*Na-sangou-thamang-gou*):

Mech men and women, carry out fishing singly or in groups during all seasons. They use cast nets and different other bamboo-made indigenous fishing and trapping implements for this purpose. Fishing is also done by poisoning the water.

A. Fishing Equipments:

Jakhoi:

This is made from strips of *Bambusa nutans* (*Ooa*) and fibres of *Sterculia villosa*. They also enjoy a dance with this trap (Plate IV, Fig. A).

Burung:

This fishing trap is made from *Bambusa nutans* (Plate IV, Fig. B).

Tepai:

This trap catches mainly small fishes. It is made from *Bambusa nutans*. It is placed at streams (Plate IV, Fig. C).

Koka:

This is also a bamboo made fishing trap (Plate IV, Fig. D).

***Ze-ma* (Cast net):**

The cast net is called *zal-gedet*. It is used for catching fish in rivers, streams and ponds. The net is made of special twine thread and they are knitted this net using two bamboo made (*Bambusa nutans*) instruments, called *Kangkila* and *Chemper* (Plate IV, Fig. E). This net is to be tanned by the fruit juice of *Diospyros malabarica* (*Gab Bingfang*) for long lasting.

Khobai:

This is used for keeping fishes when fishing is done (Plate IV, Figs. F & G). This is also made from strips of *Bambusa nutans* and fibres of *Sterculia villosa*.

B. Fish Poisons:

Meches poison fish in water by some plant parts. Due to its poisonous effect, the eyes of fishes start burning. Hence, fish travel to the surface of water. In addition, on eating the plant parts, their speed is reduced and can pick up the affected fishes without much effort.

II. Hunting:

The *Meches* are very good hunters. Formerly bow and arrow were the only weapon (Plate IV, Fig. H) for hunting. Even now they adhere to it. *Bambusa nutans* (*Ooa*) is split into two. The split half is cut to the requisite length and thickness, and then it is rubbed lengthwise to smoothen edges. At the two ends, grooves are carved. This is called '*Zilit*' and the bowstring is '*Phanic*'. The arrow shaft is made of young culms of *Bambusa nutans*. This is called '*Bla*' or '*Thir*'. The arrow tip is made of a metal blade, this is called '*Singi-muri*'. Sometimes they poison the arrow tip with *Capsicum annum*. At first chillies are pounded and smeared on arrowhead and then burnt it on fire. They also use spear (*Zang*). The wooden handle of the spear is called '*Zang-ni-danthe*'.

Owing to stringent forest laws for preservation of animals and birds, they hunt in the fields and in small jungles.

2.3.15. Musical Instruments: This ethnic group has a large number of musical instruments.

Among those, the popular instruments are *Siphung*, *Kham*, *Khamwang*, *Serja*, *Jotha*, *Tharkha*, etc (Plate V, Fig. A). *Siphung* is a long bamboo-flute having five holes (Plate V, Fig. B). A long drum made by wood and skin of goat, is called *Kham* (Plate V, Fig. C). *Khamwang* is a pair of round metallic plate, hangs to each other by a jute rope. A violin-like instrument having a round body is known as *Serja* and *Jotha*, basin-like instrument of brass, beaten together in pair. *Tharkha*, for clapping it is used, made by bamboo split into two halves (Plate V, Fig. D).

2.3.16. Food-Habit: Rice is the staple food of the *Meches*. Now, many families are cultivating wheat (*Triticum aestivum* Linnaeus) but they are not used to take flour or atta. They also take maize, fish, meat, vegetables and milk. Normally they take boiled green vegetables and among them some are wild species. Some of which are useful for curing diseases. They also drink milk and use mustard oil for cooking food. Ghi is eaten; also dahi (curd). Corn is eaten both raw and cooked. Plantains, papaya, oranges and other fruits are eaten. *Sesamum indicum* Linnaeus (*Sibing Bigodh*) are grown round the cotton plant. The seed is crushed in the wooden mortar and mixed

with vegetable curry as a whet to the appetite. An alkaline salt (*Khardoi Bedai*) is made by burning twigs of *Vigna mungo* (*Sabai Gwchhwu*). The ash is collected in a pot. This is added to the curry.

They take meals thrice in a day – early morning meal (*Kham-go-zang*), midday meal (*Sanja-phu*) and evening meal (*Bi-ni-mi-kham*). Early morning meal consists of stale rice cooked at previous night with salt, chillies, onion etc. But wealthy families take hot rice. For mid day meal they take rice, vegetable curry, meat or fish. The evening meal is same as at midday. They are used to take the following meats: of pigs (*Oma Bidor*), of fowls (*Dau Bidor*), of ducks (*Hangsha Bidor*), of pigeons (*Pharau Bidor*), of goats, etc. The poultries and pigs are not only reared for household consumption but these also constitute as source of income especially for the women.

2.3.17. Games and Sports:

2.3.17.A. *Daubo Atheng Gele-nai*:

A group of children gather at a ground. Each player takes two hard branched bamboo poles. The players then walk with the support of that branched pole by the foot at some distance above the ground, just like the stilt. At that time the players sing the following song –
“*Daubo daubo/Gang rabo rabo/Gaungbou kani rath rath*” (“Oh crane, oh crane/White wings with open;/Let us with you to go/Take a pause, take a pause – be slow”).

2.3.17.B. *Gilathakuri-Kanni*: In this game, a hole is made on the ground. Each player has a seed of *Entada rheedii* (*Gilathakuri*) which they throw into the hole from some distance by twisting the fingers.

2.3.17.C. *Maklau-Manay*: One boy lies on the ground holding tightly one bamboo pole. The other boy holds his leg tightly. Thus about 5-6 boys form a line on the ground representing a sweet gourd ‘*Maklau*’ (*Cucurbita maxima*) creeper; their heads represent the sweet gourds. Another boy stands at a distance representing the thief. The thief runs along the line, observing carefully if the last boy has loosened the grip, then he suddenly pulls legs of the last boy. If the boy is separated, he becomes a companion of the thief. Thus, if the all boys excepting first boy can be brought out the thief wins. Otherwise he loses the game.

2.3.17.D. *Goy-Kanni*: In this game, six small holes are made side by side in a line on the ground. Two players stand at some distance with young fruits of *Areca catechu* (*Goy*) in hand. One player throws his fruits into the holes. Fruits fall into some and some remain empty. Then another player takes his chance. If he can throw into those holes where the other player had already put in his

fruits, the second player gets all the fruits of those holes. He also tries to put fruits into the empty holes. The first boy again takes his turn. Thus the player who wins the maximum number of fruits becomes the winner.

2.3.17.E. Dausi Gele-nai: About 5 – 8 children gather at a place. They run like a bird and sing “*Ada bola mailam daung/Jaung maun jaudang ji-joy*” (“Brother Kala has harvested the crops/So we are being feed, how fine?”)

2.3.18. Mech Language: The *Meches* refer their dialect as *Bodo*. This speech has been classified as a dialect of the Assam-Burmese group of language belonging to the Sino-Tibetan language family. They are not having their own script, although they were using Roman and Assamese scripts in the past. Recently *Bodo* has been transcribed into Devnagari script. In West Bengal, *Mech* literature is written in Bengali script (Bhattacharya 2004).

2.3.19. Culture

2.3.19.A. Music and Dance: *Meches* are traditionally fond of music and dance. Dance is known as *Mosanai* in their community. This community is very rich in culture and has varieties of folk dances like *Kherai* dance, *Bagurumba* dance and *Baishagu-methay* as their artistic wealth. These dances are related to marriage, religious matter, seasons, hunting, fishing etc. Accompaniments of the traditional musical instruments like *kham*, *siphung* and *jotha* make this dance more exquisite. Girls and boys perform this dance together, sometimes by the girls alone. Songs are related with these dances.

i. *Bagurumba*:

The *Meches* traditionally dance the *Bagurumba* (Plate V, Figs. E & F). It is a vital part of *Mech* culture and depicts the beauty of nature. It is usually performed during the spring season. This attractive folk dance resembles the movement of birds and butterflies. It is basically a female oriented dance, in which the female dancers clad in colorful attires gently move their feet alongwith outstretched hands while dancing in the tunes of the traditional instruments. This dance is accompanied by the *Bagurumba* song which goes like this

Bagurumba, Hai Bagurumba
Bagurumba, Hai aio Bagurumba
jat nonga bwla khun nonga bwla

thab brum homnanwi bamnanwi lagwmwn kha
hwi lwgw lagwmwn kha...

ii. Baishagu:

This is continued usually three days from the first day of *Baisakh* (mid-April), the Bengali New Year. The main God, *Bathou* is worshipped daily in every household during this festival. The boys and girls move from house to house with music and dance, raise donations and rice and on the last day, the dancing and singing party eats the offerings and some of the offerings are distributed to all the villages.

iii. Kherai Mosanai:

The *Kherai* dance is strictly restricted to the womenfolk. Men are allowed to play on various musical instruments, yet they have to maintain the respective distance within the precinct. The dance represents the activities and behaviours of the gods and goddesses. The dances are essential and inevitable part of the *Kherai* worship and they are exhibited in items serially and chronistically. The dances are initiated, guided and controlled by the *Doudini* who is the central figure of the dances.

iv. Nagur Nou:

It is a fishing dance (Plate V, Figs. G & H). It has a vital role in *Mech* society. It is usually held in the river or any other streamlets when fishing is done. This dance is performed by the both sexes with own hand made bamboo implements, *Jakhoi* (for trapping the fishes) and *Khobai* (for keeping the fish).

v. Dong-fang Badari:

Meches are heavily dependent upon forest. At the time of entering a forest to gather wood the male and female folks are performed this dance.

vi. Endi-lunai:

The *Meches* have a tradition of weaving. *Mech* women are traditionally expert in rearing of silkworms, spinning and weaving by their traditional home-looms. The *Endi-lunai* dance is performed for this purposes.

vii. Mai-jainou Mosanai:

At the commencement of the paddy sowing, this dance is performed.

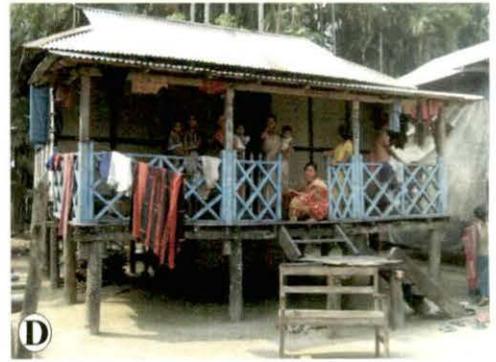
Besides the aforesaid dances, in the marriage ceremony some elderly ladies and girls dance *Mashanay* (peacock dance) in front of the *Bathou* (*Euphorbia royleana*) accompanied with bamboo flute, stringed instruments and small metal cymbals.

PLATE I



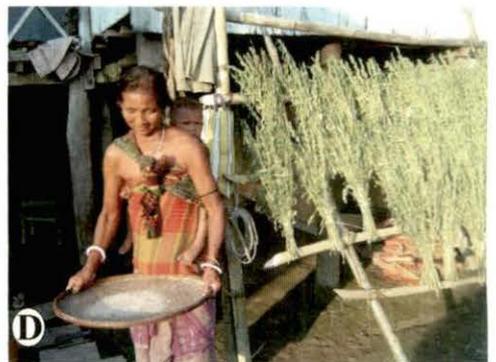
Figs. A. *Mech* family, B. Old man making ropes from jute, C. An old lady is working, D. An old man and his daughter removing covers from corns, E. A lady fashioned her with *Dokhna* (Traditional dress), F. Two *Mech* boys, G. A man is busy his *Ruya* (Axe), H. *Mech* women are spinning and weaving

PLATE II



Figs. A. D. Different types of *Na* (House), E. G. Pigeon nest box & cattle sheds, H. Bedstead

PLATE III



Figs. A. *Ooal*(Wooden mortar), B. *Hasib* (Broom), C. *Dhola* (grain keeping basket), D. The lady cleaning grains with *Chhongrai* (Winnowing fan), E. *Chhandrai* (Grain-siever), F. A lady spinning with a *Takuri* (Spindle), G. An old man with their traditional *Gamcha*, H. *Ghum* (Head-cover)

PLATE IV



Figs. A. *Jakhoi* (Fishing equipment), B. *Burung* (Fishing equipment), C. Fishing equipment *Tepai* is set for fishing, D. *Koka* (Fishing material), E. *Kangkila* & *Chemper* two equipments for knitting fishing net, F. *Khobai* the fish keeping basket, G. *Zilit* & *Bla* (Bow & arrow), H. A lady fishing with *Jakhoi* & *Khobai*

PLATE V



Figs. A. Musical Group, B. *Siphung* (Bamboo made flute), C. *Kham* (Musical instrument), D. *Jotha* (Brass-made instrument) & *Tharkha* (Bamboo-made clapping musical instrument), E. & F. *Bagurumba* dance, G. & H. *Nagur Nou* the fishing dance

CHAPTER 3

THE PROPOSED WORK

THE PROPOSED WORK

3.1. The Present Work

Over a period of time, ethnic people have acquired generous knowledge of activities and products related with plants and animals like gathering, hunting, growing and their many uses. Thousands of years ago, native people had great centers of learning due to the presence of oldest civilizations on this part of the planet. With turn down of these civilizations and arrival of invaders, several native cultural practices including the tradition of information declined or were excluded entirely (Pushpandagan 1994).

Traditionally ethnic communities worldwide are extremely knowledgeable about the huge uses of local plant and other natural resources with which they are closely related (Jain 2000a). Ethnic and the cultural diversity have helped in generating vast knowledge based systems about usage of their bio-resources (Goel 2004). Cultural evolution is the very important source of future development and the conservation of natural resources. In many parts of the World traditional conservation practices have weakened by cultural changes due to increased human needs and numbers by a shift to cash economics. Some resources are being over exploited due to fast cultural and economic transformations (Laird 2002).

The present study is basically a survey work aiming for the record of the traditional knowledge of the *Mech* people related to the use of plants. It is partly experimental as well as reflective in nature that was carried out spreading over a period of four years from 2004 to 2009. Like most of other tribal groups, *Mech* people also prefer to live near or inside the forests. They are maintaining this forest-dependent life-style since the time immemorial. The population structure of *Meches* is quite high. It was expected that the *Mech* society is a rich store house of ethnobotanical knowledge those they developed during their stay in the area with close interaction with the local biodiversity. But, the present *Mech* society is now adapting to the facilities of modern civilization very fast. This has endangered their long acquired and much useful traditional knowledge. The present work was undertaken with an aim to record endangered *Mech* traditional knowledge for future evaluation and any possible benefit for the civilized modern society. The wide range of information those included in different chapters were

gathered from numerous sources. The queries were gathered about the uses of plants of *Mech* people through field visits, observation, informal discussion and open-ended interview methods with the informants and knowledgeable persons of different age groups of both sexes.

Folklores including folksongs are present almost in every traditional society. *Mechs* are not the exception. Through these they not only express the joy and/or joyful feelings of their mind, they also express many of their activities, acquired knowledge. These are beautiful medium of teaching the people of the same and future generations and act long lasting repository of traditional knowledge. During the present dissertation collection of folklores was also in mind.

3.2. Different Aspects of Present Study

The generalized survey of uses of plants by *Mech* community included:

- (i) Edible plants
- (ii) Medicinal plants (for people and their pets)
- (iii) Fodder plants
- (iv) Dye yielding plants
- (v) Fibre yielding plants
- (vi) Aromatic plants
- (vii) Poisonous plants
- (viii) Plants used in house building, making tools and implements, musical instruments, etc.
- (ix) Religious and witch-craft plants
- (x) Ornamental and decorative plants
- (xi) Plants used in liquor preparation
- (xii) Plants related to Birth, Marriage and Death and other social ceremonies
- (xiii) Folklores, songs, etc.

In addition, their attitude towards the sacred groves, - patches of forests where vegetation is protected in the name of God or a deity and the folklore related plants also studied.

3.3. Importance of the Present Work

It is evidenced from the study that the *Mech* tribe of Duars of West Bengal and the lower part of Assam is the earliest settlers in these parts of the country and living there for over four hundred years using local and natural resources. So, it is expected that during this period of their stay in

Duars region and adjacent part of Assam, they have been successfully generating and accumulating considerable amount of knowledge on the usefulness of the plants of these regions. Their lifestyle and traditions depend upon the forests and their cultural pattern itself has considered using biodiversity in order to conserve it. They have deep concern for maintaining diversity in their surrounding environment and their general concern for the quality and sustainability of natural system.

Intergenerational transmission of information about useful plant species handed over to forthcoming generations in traditional communities by oral citation is still a living tradition. Such patterns are prevalent among many indigenous or ethnic cultures all over the world. But they are generally hesitant to reveal or share indigenous knowledge with the outside world. However, these are limited within families or tribes, which may not be even relayed properly to the younger generations. Moreover, with modernization, young generations have least interest or no inclination towards their cultural heritage and exhibit ignorance and no interest in learning and continuing these systems.

Thus, much of the valuable knowledge of the tribes is perishing with the loss of the elders of the family. In recent decades, this multidimensional effect on the culture and lifestyle of the *Mech* society and mingling with people of outside culture is causing severe threat to the maintenance of their accumulated knowledge. The exposure of *Mech* community with modern education, new lifestyle and impact of multi media has also caused reduction of some people who are direct beneficiaries through indigenous knowledge system and bioresources. Such new cultures are slowly spreading over the *Mech* villages.

Under this situation, it becomes extremely important to record their knowledge systems related particularly to the use and need of plants in their life immediately. This is a blow to the search of new resources of herbal drugs, edible plants and other aspects of plants including conservation. Such knowledge once lost cannot be restored and creates a void in multidisciplinary goals such as anthropology, culture, literature etc. of the *Mech* tradition.

CHAPTER 4

REVIEW OF LITERATURE

REVIEW OF LITERATURE

Life of humans is interlinked with plants from the time of his origin. The primitive man used plants quite intuitively for fulfilling of their basic needs, like food, shelter, clothing, and making different types of implements and even for the treatment of many diseases and discomforts. Pre-historic man lived at the mercy of nature, in constant terror of diseases. The medicinal plants played a vital role from time immemorial among the primitive society to civilized men and women in association with superstitions, strange rituals and incantation, healing of diseases and also repelling the influence of evil spirits. In all parts of the world the early civilization reveals a considerable number of drugs used in modern medicine were used even in ancient times.

4.1. Use of Plants in Ancient Ages

The use of plants for curing various ailments figured in ancient manuscripts such as The Bible, The Vedas, The Iliad and The Odyssey and the History of Herodotus. The Egyptians, Babylonians, Sumerians, Greeks, Romans and Chinese, all developed their respective *Materia Medica*. On the other side of the world, the Aztecs, Mayans and Incas also developed primitive medicines. Some of the ancient Egyptian text books '*papyri*' (1600 B.C.) indicate that the Egyptians had a complex *Materia Medica*. Hippocrates, Aristotle, Theophrastus, Pliny the Elder, Dioscorides and Galen, wrote extensively about medicinal herbs along with a description, giving their names, illustrations, their reputed healing properties and method of preparation of medicines. Hippocrates, the "*Father of Medicine*" firstly attempted a scientific explanation for diseases, which remains today in the Hippocratic Oath taken by the medical students. Theophrastus (370 B.C. – 285 B.C.), a noted philosopher and scientist of Greek era has been known to use some plants like *Daucus*, *Crataegus* and *Narcissus*, which is evident from his work "*De Cause Plantarum*", are still in use today (Theophrastus 1916). Nearly 15th centuries, Pedanius Dioscorids (100 A. D.) a Greek, was also a Roman Army physician reported 600 medicinal plants in his wonderful work "*De Materia Medica*". Galen (130 A. D. – 200 A. D.), a practitioner and teacher of pharmacy and medicine, published nearly 30 books on his tribute with prescriptions and formulas.

4.1.1. Development of Ayurvedic System: The earliest knowledge repository of Hindus, 'Rigveda' (4500 – 1600 B.C.) mentioned the use and preparation of medicinal plants. Later, various uses of plants alongwith medicinal properties are given in 'Atharvaveda', which was followed by 'Charak Samhita' (1000 – 800 B.C.), 'Sushruta Samhita' (800 – 700 B.C.) and Vagbhatta's 'Ashtang Hridaya'. Later on, Parashara provided detailed characteristics of drugs in 'Vriksha Ayurveda' (Mitra & Jain 1991). Sages in South India evolved the Siddha system, a branch of Ayurveda with advancement of selected medicinal plants.

4.1.2. Development of Unani System: The Unani system of medicine developed by Muslim physicians during Mohammedan rule and hypothetically it is a contemporary of Siddha system. The incredible advancement of Ayurveda system got a major set back after the invasions of Greeks, Scythians, Huns, Moghuls and Europeans which again get rejuvenated after the British came and introduced some medicinal plant in India and the tradition goes on.

4.2. The Global Scenario

In 1900, Barrows published an account of his ethnobotanical studies on Coanhilla Indians. Spruce (1908) reported the knowledge of using of rubber plants by the tribals in Andes and Amazon. Investigation of narcotic and stimulant plants of Haiti and Aztec region was done by Safford (1916, 1917). Schultes (1941, 1956, 1960, 1963, 1967, 1987, 1988, 1990, 1992, 1993, 1996) contributed on various aspects of ethnobotany including wild edibles, narcotic and psychoactive plants, hallucinogens and tribes of Amazon. *An Introduction to Ethnobotany*, a first book on ethnobotany was written by Faulks (1958), concluded the influence of man on vegetation, physical and psychological difficulties caused by vegetation etc. Bisset (1970) studied ethnobotany of African species of *Strychnos*. Ayensu & Coursey (1972) did ethnobotanical study on yams in West Africa. Ford (1978) published *The Nature and Status of Ethnobotany*, dealt with the concept and development of ethnobotany in systematically. Duke (1986) and Duke & Vasquez (1994) compiled two dictionaries, *Isthmian Ethnobotanical Dictionary* and *Amazonian Ethnobotanical Dictionary*. Bhat *et al* (1990) worked on the ethnobotany of Central Nigeria. Yang & Walters (1992) studied ethnobotany of the family Cucurbitaceae of China. Bhattarai (1992a, 1992b, 1993a, 1993b, 1994) vividly did ethnomedico-botanical work in different regions of Nepal. Gill & Nyawuame (1994) worked on the leguminous plants used as ethnomedicine in Nigeria. *Ethnobotany: A Methods Manual* written by Martin (1995) provided all potential methods and hypothesis testing, botany, ethnopharmacology, anthropology, ecology, economics,

linguistics, ethnobotanical conservation and community development. Schultes & Reis (1995) wrote outstandingly a book *Ethnobotany: Evolution of a Discipline*, contained general ethnobotany, socio-ethnobotany, historical ethnobotany, conservation, crop improvement, geography, ethno-pharmacology, ethno-mycology and archaeo-ethnobotany. Cotton in 1996 wrote a textbook entitled *Ethnobotany: Principles and Applications*.

Now-a-days, Ethnobotany became a popular subject of study with the realization that the world is loosing its age-old traditional knowledge very fast.

4.3. Status in India

During the recent four decades a considerable number of ethnobotanical works were published from different parts of India. Among those, Fuchs (1908) studied the Korkus of Vindhya Hills. Bodding (1927) worked on Santal medicines. Guha (1939) deliberately studied the ethnobotany of Garo tribe of Assam; Dastur (1951) worked on medicinal plants of India and Pakistan. Elwin (1955) worked on the sacred aspects of Indian tribes. Sengupta (1956) worked for nutritive value screening of tribal beverages. Gupta (1960) enumerated 101 useful and medicinal plants of Nainital in Kumaon Himalaya. Dr. S.K. Jain, former Director of Botanical Survey of India (1963a, 1963b) studied Madia tribe of Bastar region of Madhya Pradesh. Jain (1965a, 1967, 1971, 1987) also worked on plants, which are used for various other purposes. Janardhanan (1963) reported and enumerated the medicinal plants of Khed Taluka of Pune District with the use of plants and mode of administration. Gupta (1963) worked on tribals of Chotanagpur plateau. Jain & Tarafder (1963) investigated on indigenous plant remedies for snakebite among the tribals of central India. Jain (1964) reported wild edible plants of some tribes like Madia, Halba and Gond of Bastar of Madhya Pradesh. Jain & De (1964, 1966) observed ethnobotany among the tribals of Purulia. Jain (1965b) reported some wooden musical instruments used by the Gonds of Central India. Introductory analysis of 202 plant species for alkaloid, saponin and steroid estimation, was done by Maiti (1968). Kapoor *et al* (1969) also worked on Indian medicinal plants for saponins, alkaloids and flavonoids. Jain & Tarafder (1970) compiled a botanical index of Bodding's work. Pal & Banerjee (1971) investigated on some food plants used by the tribes of Andhra Pradesh and Orissa. Jain & Banerjee (1974) worked on ethnobotany of the genus *Coix*.

Vartak & Datar (1975) enumerated wild edible plants of Karnala Bird Sanctuary, in Maharashtra. Gadgil & Vartak (1976) worked together on sacred grooves of Western Ghats. Kapoor & Sarin (1977) worked on medicinal ferns of Jammu and Kashmir. Arora (1977, 1987) reported wild and cultivated plants like *Coix* and *Colocasia* of Eastern India are the useful source

of cultivars. Tiwari *et al* (1978, 1980) studied the medicinal folklore of indigenous tribes of Assam and Arunachal Pradesh. Bedi (1978) contributed on ethnobotany of Ratanmahal Hills of Gujarat, which is predominantly inhabited by Bhils. Roy (1978) worked on beverages from some tribal communities of India and screened their nutritional value. Jain & Dam (1979) did some ethnobotanical works in northeast India. Jain & Borthakur (1980) studied ethnobotany of the Mikirs of India. Kumar *et al* (1980) studied the ethnobotanical practices on Garo tribe of Meghalaya. Similarly, Maheshwari *et al* (1980) worked on ethnobotany of Tharus of Uttar Pradesh. Joshi *et al* (1980) investigated the folk medicine used by Dang tribe of Gujarat. Singh & Pande (1980) worked on the medicinal plants of some tribes of Eastern Rajasthan. Mudgal & Pal (1980) reported medicinal plants used by the tribes of Mayurbhanj of Orissa. Pal (1980, 1981) observed the veterinary medicinal plants used by tribes of West Bengal, Orissa and Bihar. Kamble & Pradhan (1980) reported medicinal plants of Korku tribe of Maharashtra.

Jain (1981) compiled a book, *Glimpses of Indian Ethnobotany*, it contains tribal uses of more than 1500 plants in different parts of India. Rao (1981) studied ethnobotany of Khasia and Garo tribes of Meghalaya. Ramchandran & Nair (1981) worked on the ethnobotany of Irulas of Tamil Nadu. Again Vartak & Gadgil (1981) surveyed some sacred grooves of Goa and Western Maharashtra. Shah *et al* (1981) did ethnobotanical notes on 133 plant species, belonging to 54 families of Saurashtra in Gujarat. Yonzone *et al* (1981) and Yonzone & Mandal (1982) worked on ethnobotany of Darjeeling area. Kamboj & Dhawan (1982) studied herbal remedies related to fertility used by native peoples of India. Tarafder (1983a, 1983b; 1984) recorded plants of some tribals for conception, abortion, pre- and postnatal complaints. Bhargava (1983) worked on ethnobotany of various tribes of Andaman and Nicobar Islands. Sen *et al* (1983) did ethnobotanical study of Kuchla (*Strychnos nux-vomica*). Bennet (1983, 1985) studied on ethnobotany in Sikkim. Two bibliographies published by Jain *et al* (1984) and Jain (2002) provide leads to regions and ethnic groups on which Ethnobotanists can work. Jain & Puri (1984) investigated 100 medicinal plants of Jausar-Bawar Hills of Uttar Pradesh. John (1984) reported 100 herbal drugs of Kani tribes of Kerala. Pushpangadan & Atal (1984) did ethno-medico-botanical investigation of 79 plant species, which are used by some tribes of Western Ghats of Kerala. Janaki Ammal & Prasad (1984) observed ethnobotanical uses of *Costus speciosus* among the Kanikkars of Tamil Nadu. Hemadri & Rao (1984) reported 17 plants used in the treatment of jaundice by the tribals of Dandakaranya. Bhujel *et al* (1984a, 1984b and 1984c) vividly surveyed for edible and poisonous plants of Darjeeling area. Baruah & Sharma (1984) worked on medicinal plants used by the Bodos of Assam.

Sharma & Vyas (1985) studied the medicinal significance of ferns used by the tribes of Rajasthan. Lal *et al* (1985) reported ethnobotanical uses of lichens of tribes of Madhya Pradesh. Jain and Borthakur (1986) did ethnobotanical work on Solanaceae family. Goel *et al* (1987) reported plants used for birth control of Santhals in Santhal Paraganas of Bihar. Badruzzaman *et al* (1988) investigated on 50 plant species used for skin diseases in Uttar Pradesh. Yadav and Bhamare (1989) surveyed Dhule forest of Maharashtra and reported ethnobotanically used plants of Bhil, Dhanka, Gamit, Kokna tribes of that area. Dagar (1989) enlisted 73 plants used by Nicobarese tribe of Car Nicobar. Nath and Bardoli (1989) recorded 50 plants used by the tribals of Tirap District of Arunachal Pradesh. Pal *et al* (1989) worked on insect repelling plants used by the tribals of Bihar. Saxena and Tripathi (1989, 1990) reported ethnomedicinal plants of Bundelkhand region. Mukherjee & Namhata (1990) studied on medicinal plants of tribals of Sundargarh district of Orissa.

Hembrom (1991) worked on tribal medicine related to polio, asthma, tuberculosis, epilepsy and cancer in Chotanagpur and Santhal Paraganas of Bihar. Bhattarai (1991) studied on the ethnobotany of Ladakh region. Enlisted in a *Dictionary of Indian Folkmedicine and Ethnobotany* by Jain (1991), which comprised 2532 plants belonging to 259 families and 1174 genera. Dagar & Chaghtai (1991) worked on Nicobarese plantlore in the treatment of domestic animals. Bhatt and Gaur (1992) did ethnobotanical work of *Raji* tribe of Pithoragarh district. Gaur *et al* (1992) reported various veterinary medicinal plants by *Gujjar, Marchha, Johari, Jada* tribes of Uttar Pradesh. Kulkarni and Kumbhojkar (1992a, 1992b & 1992c) worked on ethnobotany of *Mahadeo Koli* tribe of Western Maharashtra. Negi *et al* (1993) surveyed five districts of Garhwal region of Uttar Pradesh for ethnobotanical work. Khanna *et al* (1993) studied the *Kol, Tharu, Bayar* tribes of Uttar Pradesh. Oommachan and Masih (1993) worked on tribal regions of Madhya Pradesh and recorded 62 medicinal plants. Mao (1993) did ethnobotanical work on Mao Nagas of Manipur. Singh and Maheshwari (1994) observed ethnobotany of *Tharu* tribe from Nainital, Uttar Pradesh. Rajendra & Henry (1994) recorded useful plants of the Kadar tribes of Tamil Nadu. Gaur & Bhatt (1994) reported some pteridophytes used in folk life of Garhwal Himalaya. Rai and Upadhyay (1995) worked on ethnomedicinal plants of *Gond, Bhariya* tribes of Chhindwara district of Madhya Pradesh. Verma *et al* (1995) studied traditional phytotherapy of *Baiga* tribe of Madhya Pradesh. Jain *et al* (1995) worked on Indian and Amazonian tribes and compared the similar uses of some common plants, which are used by them. Hembrom (1995) published seven volumes on indigenous herbal remedies of some ethnic groups of Central India.

Saklani & Rao (1996) studied the role of Brahmakamal (*Saussurea obvallata*) in the culture of Garhwales. Rai *et al* (1996) recorded ten fungi used by the *Baiga* and *Bhuriya* tribes of Central India. Cyrilnayagam *et al* (1996) reported fish poisoning plants used by Nirgiri tribes. Bhujel *et al* (1984a, 1984b, 1984c) published on the useful plants of Darjeeling. Rai & Bhujel (1997, 1999, 2002, 2003 & 2007) did some ethnobotanical works including medicinal plants, their marketing, dye and gum yielding plants of Darjeeling Himalaya. Rai *et al* (1998) studied ethnobotany in some fringe area of Sikkim and Darjeeling Himalayas. Reddy *et al* (1998) worked on ethnoveterinary in Warangal District of Andhra Pradesh. A *Dictionary of Ethnoveterinary Plants of India* was published by Jain & Srivastava (1999), it contained brief accounts of 836 plants and their uses for animal diseases. Verma *et al* (1999) did ethnobotanical work on Santals of Bihar and compared with Boddington's work to show what loss has occurred in traditional knowledge. Jain (2000b) and Jain & Srivastava (2003) worked on Indian ethnoveterinary practices. Jain & Srivastava (2001) and Jain (2002) indicated data on several undocumented remote areas and ethnic groups in some critical reviews. Barooah & Borthakur (2003) studied on bamboos and its utilities in human life of Assam. Rai *et al* (2007) worked on ethnobotany related to birth, marriage and death in Darjeeling Himalaya. Dr. S.K. Jain may be treated as the father of ethnobotanical studies in India. Apart from his innumerable publication in ethnobotany, he has also established the "Society of Ethnobotanists" at Lucknow and initiated the journal "*Ethnobotany*". The Council of Scientific and Industrial Research (CSIR) in India started publishing two important journals those also facilitated the ethnobotanical studies in the Indian Sub-continent. These are *Indian Journal of Traditional Knowledge* and *Indian Journal of Natural Products Radiance*.

4.4. Development in North Bengal

For the northern part of West Bengal, including the hills of Darjiling and the rolling plains of Terai and Duars, study on ethnobotany is extremely important. This is not only due the existence of extremely rich biodiversity of the area but also the presence of a considerable number of ethnic communities living in the area. However, the initiation of such studies in this area is late. Biswas & Chopra (1956) published a detailed account of the Medicinal Plants of Darjiling and Sikkim. After that there were very few sporadic publications on the useful plants of Darjiling (Yonzon & Mandal 1982 and Yonzon *et al* 1981). Little later, after the establishment of a laboratory with taxonomy and biodiversity related activities in the University of North Bengal, ethnobotanical studies initiated in this part of the country in an organized manner. Not only a long series of research articles started appearing from this centre (Das & Chanda 1990; Rai & Bhujel 1997,

1999, 2002, 2007; Rai *et al* 1998; Ghosh & Das 2004, 2007a, b; Rai & Das 2004; Rai *et al* 2007; Chowdhury & Das 2007, 2009; Das *et al* 2007, 2010; Ghosh *et al* 2008; Sarkar & Das 2010; Sarkar *et al* 2010) a book, entitled “*Advances in Ethnobotany*” (Das & Pandey 2007) made the centre familiar. In addition, the newly established *East Himalayan Society for Spermatophyte Taxonomy* at the University of North Bengal also started publishing a new scientific journal “*Pleione*” in 2007, which is also publishing ethnobotanical research articles. *Pleione* is now became an important window for the publication of taxonomic and ethnobotanical researches from Eastern Himalayan and NE Indian parts of India.

CHAPTER 5

STUDY AREA

STUDY AREA

Historically, when Huien Tsang visited Assam, a major portion of today's Duars was a part of the Kingdom of Kamrupa, which then apparently stretched up to river Karatoya in the west. This land had often been included in the Kingdoms of Bhutan and Koch Behar. The name 'Duars' may have evolved from the word 'Doors' or passages. There were eighteen such passages which were used by the Bhutanese people to communicate with the southern fertile plains for their trade. Before the advent of the British rule, the Bhutanese separated Duars from the Kingdom of Koch Behar and controlled it. In 1964, after the Second Bhutan War, the British captured it under the command of Captain Hedayat Ali and divided it into two parts. The eastern part was merged with the Goalpara district of today's Assam and the western part was turned into a new district as Western Duars. But its duration was only for 1864 – 1868 and in 1869, when the Jalpaiguri district was formed, the Western Duars was merged with the Jalpaiguri.

In 1947, based on the extinguishing British rule in India, the state acceded on to the dominion of India. Later on, in 1949, it was merged with the Union of India.

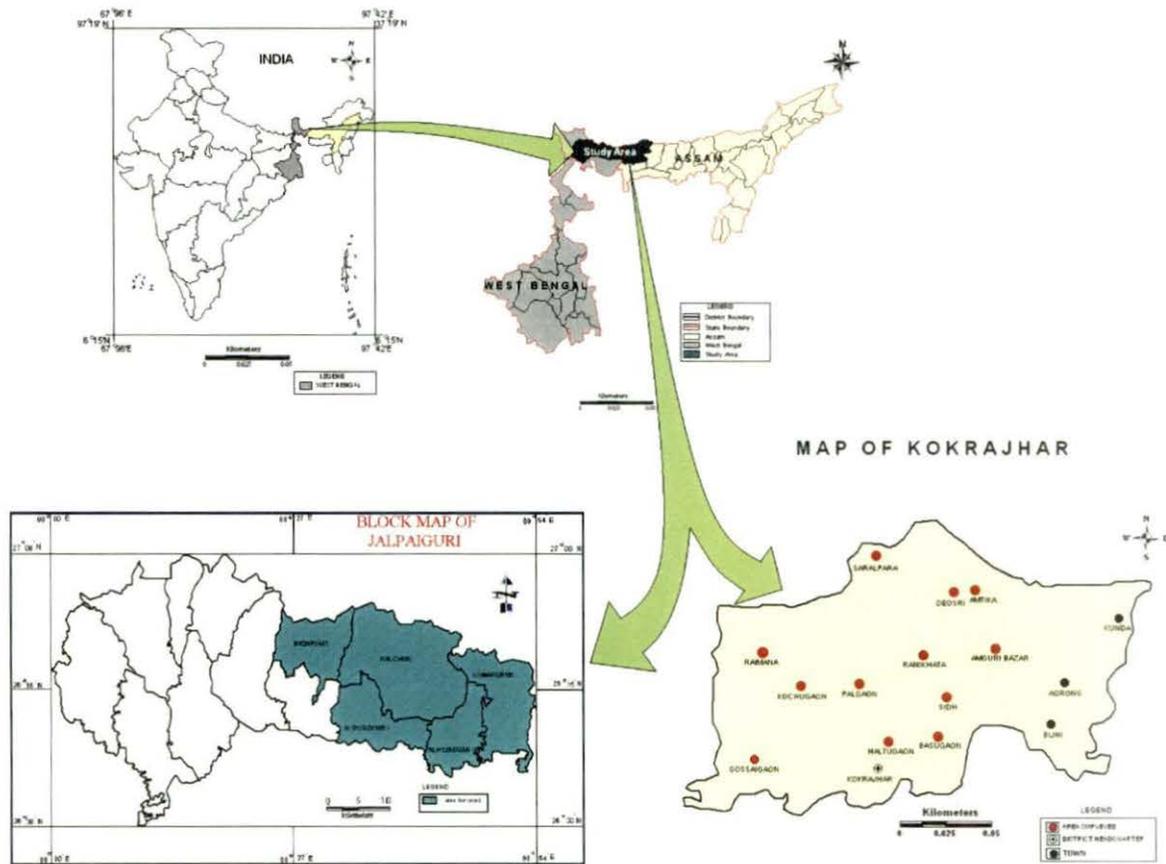
Originally Kokrajhar was a part of undivided Goalpara district. It was just a small village till 1956. In 1957, a new civil sub-division Kokrajhar was created by the northern part of Dhubri sub-division and some parts of Goalpara sub-division. This area consisted of five tracts of Eastern Duars, viz., Bijni, Sidli, Chirang, Ripu and Guma. Again, in 1983 the Kokrajhar sub-division was upgraded into Kokrajhar district.

5.1. Location

Duars is located in the border area of Northern Sector of the State of West Bengal. It is situated at the land of the lower Himalayas with its geographical diversity. It is surrounded by Darjiling and Bhutan in the North, Coochbehar and Bangladesh in the South, Assam in the East and the plain region of Darjiling district and small part of Bangladesh lies to the West. It is located between 26°16' N – 27° N latitudes and 88°4' E – 89°53' E longitudes. It has a total area of approximately 6227 sq km and stretched between the rivers Tista and Sankosh. Duars is the entrance to Bhutan (Jana 1997). [Map 5.1 & 5.2].

Kokrajhar is one of the 27 districts of Assam and at the same time this district is well known as the Gateway of northern India. It is located on the bank of the river Brahmaputra. Kokrajhar lies roughly

between 89°46'E – 90°38'E longitudes and 26°19'N – 26°54'N latitudes. The district is bounded by the Himalayan Kingdom of Bhutan on the north, by Dhubri district on the south, Bongaigaon district on the east and West Bengal on the west (Map 5.3). It is extended from the river Manas in the east to the Sankosh on the west (Anonymous 2002).



Map 5.1. Map of West Bengal and Assam in India, showing the study area
 (Source: Office of the District Magistrate, Jalpaiguri and Sub-Divisional Office, Gossaigaon)

5.2. Topography

Duars region is divided by the Sankosh river into the eastern and the western Duars consisting of an area of 6227 sq km. The major geographic features of this area are the numerous rivers and hill streams which intersect it in every direction, and large tracts of Sal forests, tall grasses and reeds, especially dense and luxuriant along the banks of the entire region, except for intervals of patches of ordinary cultivation, is covered with tea gardens and large patches of reserved forests.



Map 5.2. Sattelite image of the Duars region (marked with red lines). (Source: Google Earth)



Map 5.3. Sattelite image of Kokrajhar district (surveyed area marked with red lines). (Source: Google Earth)

There are innumerable streams and rivers flowing through these fertile plains from the mountains of Bhutan. In Assam the major rivers are Brahmaputra and Manas, and in northern West Bengal the major Tista besides many others like the Jaldhaka, Torsha, Sankosh, Diana, Karatoya, Raidak, Kaljani among others.

The soils are brought down by hilly rivers like the Tista, the Torsha, the Jaldhaka, and their tributaries which, bringing materials from a height of about 3048 m, have deposited them layer by layer to form the soil of this district. The greater part of the region is covered with alluvial soils, ranging from pure sand to clay, but it is mainly sandy loam. In the basin between the Jaldhaka and the Tista, however, the soil is composed of hard black clay. In the upland of the north of the Duars, the soil is ferruginous clay and is particularly well-suited to the growth of the tea plants. The Western Duars contain numerous old river beds which have been deserted by the stream. Near the hills they are composed of stones and boulders while lower down they contain gravel and in the plain they contain sand (Jana 1997).

The total area of Kokrajhar district is 3169.22 sq.km. The Kokrajhar district is situated in humid sub-tropical climate that is characteristic of the lower Brahmaputra Valley of Assam. There is high rainfall and humidity. The district also has the largest concentration of forest in the state, like Guma Range. The soil in the district is fertile and suitable for paddy cultivation (Anonymous 2002).

The water that flows along natural dongs and canals are the main source of irrigation of the agricultural fields. Rain water flow down from the hill tracts of Bhutan and along the foothills and reserve forests of the district. The Bhutan hills are also the source of a number of rivers that flow through the district and act as tributaries to the Brahmaputra. The rivers of the district that flow from north to south are the Laopani (Anonymous 2002).

The soil throughout the district is composed of sand and clay in varying proportion ranging from pure sand in the riverbed to soft clay in different parts. The rocks of this district are all sedimentary. In the southernmost part of district there are two small hills Dholmara N. C. Hills and Nadanggiri Hills, that are composed of metamorphic rocks (Anonymous 2002).

5.3. Climate

The seasons in study area, generally follows the course of other districts in the adjacent plain, but owing to its proximity to the hills, the rainfall is much heavier and the temperature is rarely excessive. November, December, January and February are the driest months though even in these months there is some amount of rain. However, temperature of the region fluctuates from 37.5° C during summer to about 6° C in

winter. In December, January and February it is colder, and from the end of March it begins to get warmer, and from May to September it is rather hot when there is monsoon rains.

Rainfall mainly occurs due to south-western monsoon wind and begins from the month of May and continues till the first quarter of October. In consequence of the heavy and wide-spread rainfall, the region never presents a dry appearance, and is always green and the growth of vegetation is most luxuriant. In May the average rainfall is about 339.7 mm and the rains are usually very heavy between June and September when the humidity becomes extremely high. Between June and September the mid-troposphere is dominated by a 'High' over the Sub-Himalayas and its adjacent lowlands (Jana 1997).

The following tables (Tables 5.1, 5.2, 5.3) and figures (Figures 5.1 & 5.2) show the weather data of the maximum and minimum temperature, rainfall, relative humidity and number of rainy days of the study area.

Table 5.1. Weather Data for the study area: A mean of ten years (2000 – 2009) as recorded at Central Tobacco Research Institute at Dinhat

Month	Temperature (°C)		Relative Humidity (in %)		Rainfall (in mm)	No. of Rainy Days
	Mean Max.	Mean Min.	06.32 hrs	13.32 hrs		
JANUARY	21.98	9.76	92.4	71.8	17.6	2
FEBRUARY	25.28	12	90.7	65.7	25.34	2.43
MARCH	29.44	15.6	88.8	63.6	45.17	4.6
APRIL	30.1	19.36	88.9	72.2	165.77	10.3
MAY	30.94	21.47	88.1	76.7	275.79	13.8
JUNE	31.66	23.4	91.6	81.1	645.06	18.1
JULY	31.35	24.66	90.4	82.4	567.2	16.2
AUGUST	31.01	24.85	90.9	80.6	448.56	14.9
SEPTEMBER	32.06	24.11	92.4	81.1	364.17	12.9
OCTOBER	30.89	21.28	91	77.2	205.03	6.4
NOVEMBER	28.01	16.11	90.6	72.4	9.1	2
DECEMBER	25	11.85	91.7	69.2	14.55	1

Table 5.2. Monthwise mean maximum and minimum temperature and rainfall during 2000 – 2009 in the study area

Month	Mean Maximum Temperature (°C)	Mean Minimum Temperature (°C)	Rainfall (mm)
JANUARY	22.98	9.76	17.6
FEBRUARY	25.28	12	25.34
MARCH	29.44	15.6	45.17
APRIL	30.1	19.36	165.77
MAY	30.94	21.47	275.79
JUNE	31.66	23.4	645.06
JULY	31.35	24.66	567.2
AUGUST	32.01	24.85	448.56
SEPTEMBER	32.06	24.11	364.17
OCTOBER	30.89	21.28	205.03
NOVEMBER	28.01	16.11	9.1
DECEMBER	25	11.85	14.55

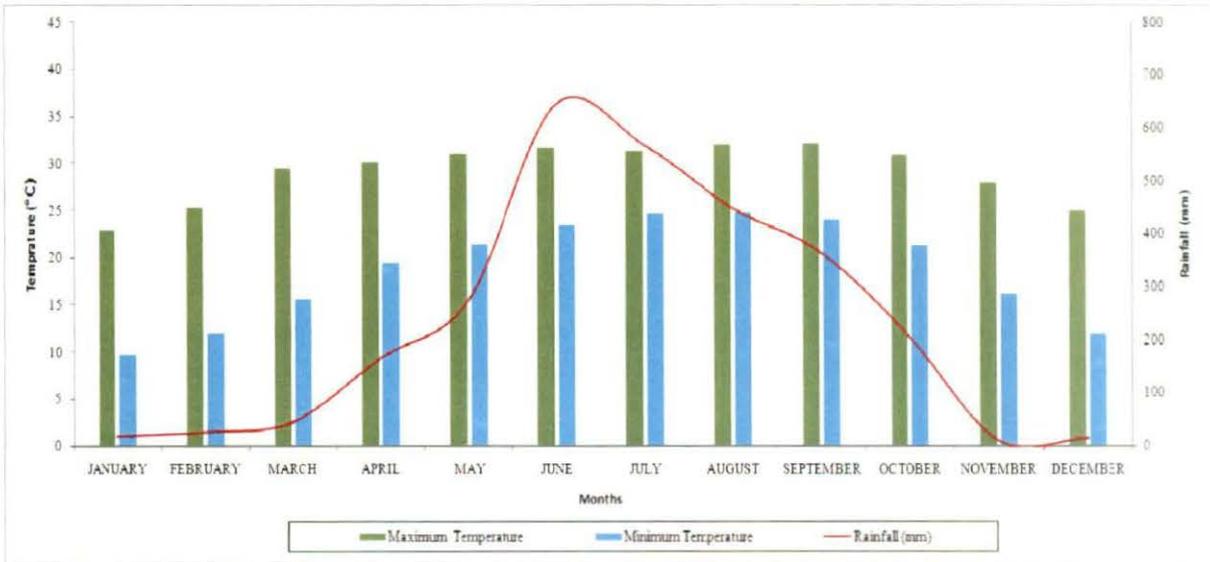


Figure 5.1. Graphical representation of yearly mean temperature and rainfall of the study area

Table 5.3. Month wise mean maximum and minimum relative humidity and number of rainy days during 2000 – 2009 in the study area

Month	Mean Relative Humidity (in %)		No. of Rainy Days
	Maximum (06.32 Hrs)	Minimum (13.32 Hrs)	
JANUARY	92.4	71.8	2
FEBRUARY	90.7	65.7	2.43
MARCH	88.8	63.6	4.6
APRIL	88.9	72.2	10.3
MAY	88.1	76.7	13.8
JUNE	91.6	81.1	18.1
JULY	90.4	82.4	16.2
AUGUST	90.9	80.6	14.9
SEPTEMBER	92.4	81.1	12.9
OCTOBER	91	77.2	6.4
NOVEMBER	90.6	72.4	2
DECEMBER	91.7	69.2	1

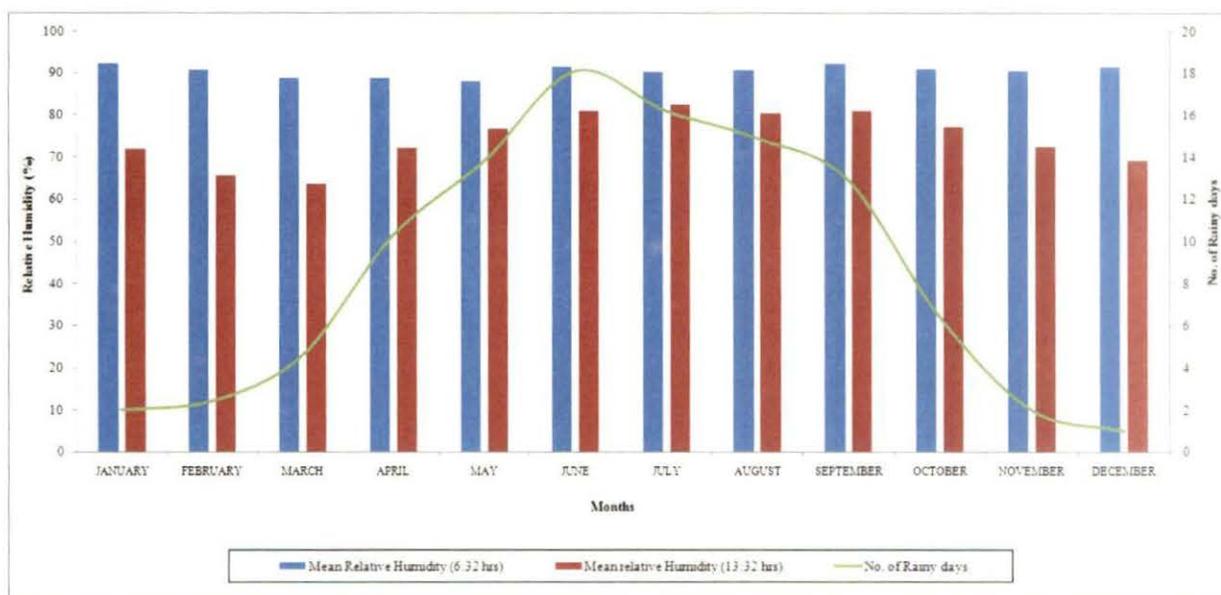


Figure 5.2. Graphical representation of yearly mean relative humidity and number of rainy days of the study area

5.4. Vegetation

Duars, the sub-Himalayan region of West Bengal and the adjacent part of Assam are very rich in its floristic diversity. The dense growth of diverse type of floristic elements here is primarily due to the local

physiography, climatic conditions as also courses off the turbulent tributaries of the study area and its soil texture. The forest and vegetation of this area is similar to the mixed plain forest of Darjiling and has various kinds of forest including Savannah type of grasslands. Famous two Wildlife Sanctuaries (Jaldapara Wildlife Sanctuary and Chapramari Wildlife Sanctuary) and two National Parks (Gorumara National Park and Buxa National Park) are situated in this region. After declaration of Buxa Duar as a tiger reserve in Jalpaiguri, the flora of North Bengal gained special attention to maintain the forest habitat for proper conservation. In 1965, Mukherjee worked on the vegetation of Jalpaiguri and prepared a sketch of forest types of Jalpaiguri and described its main floristic composition.

The main rivers of study area, Tista, Torsa, Jaldhaka, Kaljani, Raidak, Sankosh etc., all have the record of shifting their original streams. Due to shifting of the river-courses and anthropogenic activities vegetation in different parts of Duars often deviates from semi-deciduous to evergreen forests, the standard formation.

According to Champion and Seth (1968), the main forest-types of study area are:

I. **3C/C1b: Very Moist Bhabar Sal Forest:** *Shorea robusta* Roxburgh ex Gaertner f. with *Schima wallichii* (DC.) Korthals, *Dillenia pentagyna* Roxburgh, *Terminalia bellerica* (Gaertner) Roxburgh and evergreen undergrowth of *Amoora*, *Leea*, *Psilanthus* etc.

II. **3C/C3/2S: Secondary Euphorbiaceous Scrub:** Dense crop of *Macaranga denticulata* (Blume) Mueller succeeding tree less heavy savannah grass.

The vegetation of Duars is of following types:

- i. Sub-Himalayan Secondary Wet Mixed Forest
- ii. East Himalayan Moist Mixed Deciduous Forest
- iii. Low Alluvial Savannah Woodland
- iv. Eastern Wet Alluvial Grassland
- v. Khair-Sissu Forest.

Different workers (Mukherjee 1965; Banerjee 1993; Sikdar 1984 and Mohanta 2004) worked on vegetation of Duars. On the basis of composition and distribution of the major floristic elements Sikdar (1984) described vegetation of Duars in following five types:

A. Semi Evergreen Forest:

Alstonia scholaris R. Brown, *Bauhinia variegata* Linnaeus, *Castanopsis tribuloides* (Smith) A. DC., *Cinnamomum bejolghota* (Hamilton) Sweet, *Litsea salicifolia* (Nees) Hooker f., etc. are the general members of this forest type. This type of forests is restricted near rivers and dry streams. Other commonly

occurring species are *Mesua ferrea* Linnaeus, *Lepisanthes senegalensis* (Poiret) Leenhouts, *Osbeckia nepalensis* Hooker, *Mussaenda roxburghii* Hooker f., etc.

B. Moist Deciduous Forest:

This type of forest is described under moist tropical forest type and of Sub-Himalayan secondary wet mixed forest. This forest is mainly occupied by the species of *Elaeocarpus*, *Eugenia Dysoxylum*, *Litsea*, *Machilus*, climbers of Vitaceae, *Callicarpa arborea* Roxburgh, *Casearia vareca* Roxburgh, *Phlogacanthus thyrsiformis* (Hardwicke) Mabberley, *Maesa indica* (Roxburgh) A. DC., *Psilanthus benghalensis* (Schultes) Leroy, *Thunbergia grandiflora* Roxburgh, *Setaria palmifolia* (Koenig) Stapf, *Oplismenus compositus* (Linnaeus) P. Beauvois, etc.

C. Dry Deciduous Forest:

This kind of vegetation was recognized as East Himalayan moist deciduous forest by Champion & Seth (1968) and dominated by *Shorea robusta*. Apart from the *Shorea robusta* other members are *Lagerstroemia parviflora* Roxburgh, *Wrightia arborea* (Dennstedt) Mabberley, *Sterculia villosa* Roxb., *Mallotus phillippensis* (Lamarck) Mueller, *Bridelia spp.* etc. The undergrowth flora includes *Solanum indicum* Linnaeus, *Lepidagathis incurva* Buchanon-Hamilton ex D. Don, *Urena lobata* Linnaeus, *Eragrostis unioloides* (Retzius) Nees ex Steudel, *Lygodium flexuosum* (Linnaeus) Sw. etc.

D. Sal Forest:

Additional associates of these kinds of forests include *Lagerstroemia parviflora* Roxburgh, *Sterculia villosa* Roxburgh, *Terminalia bellirica* (Gaertner) Roxburgh, *Schima wallichii* (DC.) Korthals, etc. Besides those some shrubby species like *Psilanthus benghalensis* (Schultes) Leroy, *Asparagus racemosus* Willdenow, etc. and few grasses e.g. *Centotheca lappacea* (Linnaeus) Desvaux, *Microstegium ciliatum* (Trinius) A. Camus etc. are also found in these forests.

E. Grasslands:

These types of vegetation are found in the riverbanks and low-lying moist areas. Predominant grass species are *Saccharum spontaneum* Linnaeus, *Saccharum arundinaceum* Retzius, *Phragmites karka* (Retzius) Trinius ex Steudel, *Themeda villosa* (Poiret) A. Camus, *Themeda arundinacea* (Roxburgh) Ridley etc. Some common species of trees like *Bombax ceiba* Linnaeus, *Butea monosperma* Kuntze, *Bischofia javanica* Blume etc. are found in scattered condition. Sometimes grasslands are replaced by typical mixed deciduous forests.

In herb and shrub layers plants like *Scoparia dulcis* Linnaeus, *Acmella calva* (DC.) Jansen, *Tridax procumbens* Linnaeus, *Blumea lacera* (Burman f.) DC. among the herbs and *Melastoma malabathricum* Linnaeus, *Clerodendrum viscosum* Ventenat, *Buddleja asiatica* Loureiro etc in the shrub layer are found.

This region supports a large number of threatened species, like *Aristolochia tagala* Chamisso, *Calamus erectus* Roxburgh, *Costus speciosus* (Koenig ex Retzius) Smith, *Drosera burmanii* Vahl, *Gloriosa superba* Linnaeus, *Phrynium pubinerve* Blume etc.

However, Mohanta (2004) prepared a vegetation cover map using remote sensing and GIS and classified the vegetation of Duars as (i) Semi-evergreen forest, (ii) Sal mixed forest, (iii) Mixed Sal forest, (iv) Sub-tropical broad leaved hill forest, (v) Sal forest, (vi) Bamboo brakes, (vii) Riverine forest, (viii) Forest plantation, (ix) Teak plantation, (x) Degraded forest, (xi) Savannahs, (xii) Scrubs, (xiii) Grassland, (xiv) Agriculture land and (xv) Tea gardens.

CHAPTER 6

MATERIALS & METHODS

MATERIALS AND METHODS

The entire methodology for the present dissertation is primarily based on the interaction with the *Mech* people, pursuing them to share their traditional knowledge and analyzing the documented data scientifically. Traditional societies are, in general, very much conservative. There are strict social rules to control the leakage of their traditional knowledge (TK) outside the society and the punishment for doing so is quite stringent. Sometimes the collected TK needs proper verification as there is every possibility to get a fake data where the resource person tries to satisfy both, his own society and the outside receiver.

However, the entire methodology followed has been presented below in detail along with reference sources.

6.1. Ethnobotanical Studies

For the ethnobotanical survey the methods adopted by Schultes (1962); Jain (1981, 1987, 1991); Rai *et al* (1998); Rai & Bhujel (1999); Rai (2002) and some publications (Croom 1983; Alcorn 1984; and Rao & Hajra 1987) were followed. A questionnaire prepared on the model by Jain & Mudgal (1999) and Tag (2007). The extensive fieldwork spread over three years from 2004 to 2009 was carried out in different villages in the Duars of the Jalpaiguri district of West Bengal and Kokrajhar district of Assam.

The villages, which were vividly surveyed, are: Pashim Satali, Satali Nakadala, Mendabari, Dakshin Mendabari, Uttar Mendabari, Mantharam, Nimati, Chhekamari, Karjeepara, Baniapara, Mondalpara, Latabari, Dhalkar, Sibkata, Khoardanga, Ghoramara, Salkumar and Mahakalguri in West Bengal and Gossaigaon, Raimana, Kochugaon, Patgaon, Basugaon, Ranikhata, Amtika, Sidli, Amguri Bazar, Deosri, Saralpara and Haltugaon in Assam. The purpose of the study was the record of the traditional knowledge of the *Mech* people related to the use of plants. Enquiries were made on their daily life, food habit, occupation, health practices, medicines, trade, beliefs, rituals, ceremonies, traditions and customs using a pre-designed questionnaire.

6.1.1. Preparation of Questionnaire: The questionnaire has been provided in Annexure I & II.

6.1.2. Development of Contact with *Mech* People: The random demand of information from the people of traditional societies generally shows their antipathy and unwillingness to share their traditional knowledge (Train *et al* 1941) but with the sense of affection, sympathy and respect were extended to the informants to create the healthy atmosphere and better understanding. The *Mech* people in general, are all apparently seemed to be very friendly but maintained a deep secrecy about their traditional knowledge, especially concerning to herbal medicines. There is a belief, if too many people know about the medicines those will loose their efficacy. They also hesitate with a notion that their folk medicinal practices may be a matter of funny story for the outsiders. So, it is very important to establish a friendly relationship with these people. It is also helpful to participate in various ceremonies and festivals of their indigenous culture. However, they were ready to impart their indigenous knowledge, after visiting them for several times and convinced them that these information were collected only to record and preserve in written form for the future generation of the society and these will not be disclosed to the other medicinemen and also will not be used for personal benefit. Sometimes, the investigator had to take help from mediators mainly to resolve the language problem.

The communication with *Mech* people was not very difficult as because the author herself is an inhabitant of the Duars. Author personally knew few of them and had contacts with them. First of all author was to contact knowledgeable informants in the *Mech* villages or the medicine men called *Oja*. The *Mech* people apparently seemed to be very friendly. Almost all of them could speak and understand Bengali language and so direct conversation was possible without the help of interpreters in most of the cases. But sometimes interpreters were necessary, especially in Assam. The ladies also did not hesitate to speak to the author to express their own problems. Thus the author had all opportunity to know much about their family interactions; the visible behavior and traditions and the invisible thoughts of their mind.

During the field work some skills were adopted. First of all, proper contact was established with knowledgeable informants or medicine-men (*Oja*); they were then taken to the field mainly to recognize the plants they use. Another approach was to explain the purpose of the work to the Village Head or *Gaon-Burha* and educated persons of that area. Sometimes different

types of uses of plants were discussed with elderly persons and housewives. They provided different data using their local or vernacular plant names. Repeated queries were made to understand their knowledge, methods of diagnosis and treatment of diseases. Further information regarding the mode of intake and other conditions and combinations were also recorded. Data were collected on the specific part(s) of the plants, methods of processing and preparation of the drug and doses of administration of the prepared medicine. While in the field, a large number of information were enquired and recorded in pre-designed questionnaire, which was prepared following Jain & Mudgal (1999) and Tag (2007). Cross checking of collected knowledge in extremely important. This was done in the same or different village.

Staying with a family for some days and taking part in their regular domestic activities was also very much helpful not only to collect different TK in detail but also to understand the philosophy of uses of many plants in numerous instances.

6.1.3. Observing the Daily Life: Direct observation on the daily life in *Mech* society including food and traditional liquor preparations, process of making of instruments etc. helped to record the related plants much easily. Attending different customary rituals including funerals and other similar occasions on the uses of plants helped to understand the philosophy of the uses of different plants in *Mech* society. Observation on different places of religious interest or on Sacred Groves and recognition of plant related folklores and myths also were possible through such observation. The daily or weekly markets (*hats*) were also visited to study the marketability of wild or cultivated plants, vegetables and other plants products collected and/or produced in this area. Various plant materials were observed and in some cases brought for the conservation.

With the advent of modernization and through the contact of newer cultures, the *Mech* people have now adapted many broadly practiced manners and customs and now they become very hospitable and friendly to outsiders. For this, it was possible to stay as guest in quite a few *Mech* families and to receive invitation to attend many of their social or family-oriented celebrations and ceremonies. During the field work through the *Mech* villages, personal observations were noted down in the field note book on the daily life, agricultural practices, subsistence food, plant resource management, conservational practices/ attitudes and so on.

Men folk are generally familiar with local area, local plants and other resources. The *Gaon-burha*, elders and leading local intellectuals are also well acquainted with such knowledge as well and were interviewed. The ladies have absolute control over the household affairs and play a vital role in agro-ecosystem. So, they were also consulted mainly for the matters related to social affairs.

6.1.4. Edible Plants: Since time immemorial plants have been used as source of food, shelter, clothing, medicines, fiber, gum, resin, oil, etc. Several species of wild plants are used for edible purposes by tribals and other local people inhabiting in forest and remote areas. It is true that wild plants have been the primary source of man's basic needs. Many such species are most popular and now cultivated widely. Numerous workers including Jain (1964), Sahu (1996), Shukla *et al* (2001), Kar *et al* (2008), Takatemjen *et al* (2009) and Majumdar & Datta (2009) worked on wild edible plants in different corner of this country.

Sustenance of the *Mech* people, by and large, depends upon wild edible plants, including famine foods, which are collected daily from the forests and also from different other type of vegetation. Various parts of plants are used in the form of fruits, vegetables, pickles or other preparations. Aquatic animals like crabs, water snails, tadpoles, common prawns, different types of small fishes (available in local streams) etc. also form integral part of their rural foodstuffs.

Though majority of the vegetables sold in the markets constitute cultivated products but about one third of the vegetables account for wild edible plants.

Generally women folk collect edible plants from the vegetation. Children also some time take part in this work. But, for the collection of fruits from upper branches of tall trees are generally done by men. However, mostly women were consulted for this and they were requested to spot the plant in the vegetation and the voucher specimens were procured through this type of interaction only. Also, many plants were recognized after analyzing the already collected plants and through observation at the time of collection.

6.1.5. Preparing Food, Medicine and Traditional Liquor:

A. Food: During the surveys, data on household composition based on the method of preparation of food, medicine and traditional liquor available for use was documented. Knowledge of indigenous food is part of traditional knowledge which is largely transmitted through involvement of persons of households. The survey was conducted using a schedule to evaluate the information, availability and consumption pattern of edible plants. Informal discussions with inhabitants were held to enhance understanding and gather information about different preparations of edible plants as well as traditional cousins also. Female member from the household, who is responsible for food preparation, was engaged with the additional informants like males and children; those who assist in collection and processing of wild vegetables. With the help of informants, collection

of plant specimens, their local names, processing, ingredients and their quantity and preparation method were noted down.

B. Medicines: The information about the ethnomedicinal plants and their method of preparation was collected through rigorous surveys. The *Mech* people are in fact very friendly but maintained a deep privacy about their traditional medicines. However, after visiting them for several times to develop confidence and with the help of contact persons, finally they agreed to share their knowledge. The traditional healers (*Oja*) were interviewed about the medicinal plants, preparation method of medicines, quantity, mode of administration, etc. The midwives were also consulted for this purpose.

C. Veterinary Medicines: Ancient people closely observed the behavior of their domestic animals and the surrounding environment. Over centuries, through trial and error and keen observation, they acquired knowledge on remedial properties of plants against various diseases of animals. This knowledge about diseases and their treatments was transmitted by one generation to the next only verbally. Due to modernization, the traditional knowledge is vanishing rapidly day-by-day. In the present study, an attempt has been made to investigate and document this oral tradition that has accumulated over the ages. Records on ethnoveterinary recipes and plants used for treating animals are available from various parts of India (Jain & Srivastava 1999, 2003; Jain 2003).

The study area is rich in herbal wealth. *Mech* people usually practice agriculture for their economic needs. Most of the inhabitant depends largely on plant resources growing in their surroundings to gather their requirements including ethno-herbal therapy for ailing animals. Ethnoveterinary information was collected by interviewing local healers and experienced people. Collection of data and fieldwork was done according to Jain (1999). The information was cross-checked with different informants.

D. Liquor Preparation: Traditional liquor consumed by almost all the *Mech* people in the area and prepared in good quantity by some families in Duars. However, only a few people produce it for sale. The basic information were collected from expert producers of traditional country liquor i.e. *Rice Beer*. The entire process of the survey was divided into four parts (Jain 1991, 1995; Ghosh & Das 2004; Baruah *et al* 2010; Nath *et al* 2010): (i) Establishment of effective contacts, (ii) Recognition of basic ingredients and (iii) Observing the method of preparation starter mixture and (iv) Brewing the beer.

After developing confidence their TK related to the production of rice beer were observed, enquired and recorded. The useful plants were recognized and/or spotted by the practitioners and specimens were collected from the wild or planted sources and recorded the vernacular name of the plants, useful parts, purpose of use and amount used. The method of preparation of starter mixture, brewing and final fermentation process was also recorded. People from the *Mech* community engaged in the marketing of starter and beer were interviewed quite informally.

6.1.6. Documentation of Methods of Collecting Fodder Plants: In recent years, extensive concentration has been given to sustainable use and integrated management of fodder plants due to their nutritional value and importance for the conservation of land and water resources (Joshi 1991). The *Mech* people collect fodder from various habitats and bundles are carried back to their villages to feed the stock. The domestic stock animals obtain their food in two ways. For a part of the time, they are released or led out to graze in meadow and forest areas around the village, and in the afternoon or evening, while returned back and sheltered in stalls, they receive tree leaves/twigs and grasses, which has been collected for them during the day. Stall-feeding has the added significance that it provides a supply of manure, which can be used as a fertilizer for the crop field. The domestic animals, which are reared by the *Mech* people, are cows, goats and pigs.

Ethnobotanical information on fodder plants was gathered using various techniques, such as open interview and discussion with local informants. Information about the choice of fodder species and grading of the value of fodder species was obtained mainly from detailed examination of fodder bundles, which are poisonous or in some way unsuitable as fodder. The village people, especially the women folk have excellent knowledge about fodder species and their food value. They are able to identify them accurately in the field and have developed indigenous selection practices of fodder quality.

6.1.7. Collection of Plant Related Folklores and Myths: Several folklore especially songs, proverbs and tales which have been passed from one generation to the other have references to certain interesting properties or aspects of plants. These uses though not experienced in modern laboratories have proved to be correct because of long years of trial and error method (Rao 1989). The data of myth and folklore related plants have been obtained from the *Oja* (Priest), *Gaon Burha* (Village Heads), elderly people and leading local intellectuals through interactions.

6.2. Voucher Specimens

For all the plants used by the people of *Mech* tribe voucher specimens were collected. Plants were basically spotted by them either from their collected materials on in the field.

6.2.1. Herbarium Methodology: The voucher specimens were processed according to the method as suggested by Jain & Rao (1977). On the basis of information the plant specimens were collected from the wild or planted sources. Their common-names, uses, parts used, habitat, distribution pattern, habit and a brief but significant botanical description, flowering and fruiting, etc. were recorded in the field note book. Collected specimens were tagged, packed in airtight polythene bags and brought to the laboratory for further processing.

In the laboratory, the specimens were treated with formalin and pressed in blotting papers with heavy wooden press. Specimens were given changes every 24 hours for first three days and then in regular intervals till the plants were properly dried. Then specimens were poisoned by soaking those in the saturated solution of Mercuric Chloride in Rectified Spirit and then again dried under the blotters. After poisoning, specimens were mounted on herbarium sheets by pressing them with glue and then properly stitched with thread, whenever that was necessary. All the herbarium sheets were labeled properly and stored temporarily in a Herbarium Cabinet.

6.2.2. Identification of Specimens: Identification of collected specimens was done with the help of different literature including *Flora of Bhutan* (Grierson & Long 1983, 1987, 1991, 1994, 1999, 2001; Noltie 1994, 2000), *Flora of India* (Hajra *et al* 1995, 1997), *Flora of Eastern Himalaya* (Hara 1966, 1971), *An Enumeration of Flowering Plants of Nepal* (Hara *et al* 1978, 1979, 1982), *Ferns and Fern-Allies of Arunachal Pradesh* (Singh & Panigrahi 2005), *The Orchids of Bhutan* (Pearce & Cribb 2002), *Diversity and Distribution of Bamboos in Assam* (Barooah & Borthakur 2003) etc. Identification was also confirmed by matching specimens with the pre-identified and authenticated specimens available in NBU-Herbarium and at CAL.

6.2.3. Storing of Voucher Specimens: Specimens are primarily stored in steel cabinets in the Taxonomy & Environmental Biology Laboratory in the Department of Botany, North Bengal University. After finishing of the project work, the main set of the voucher specimens will be deposited in NBU-Herbarium and the duplicates will be deposited in CAL.

CHAPTER 7

RESULT

Result

The life of a man needs innumerable materials for his survival. All these materials they were collecting from nature in early days. But with development of science and technology man started using artificially made materials. But, in tribal life even today the importance of naturally produced materials are the main resources for survival. However, all recorded resources are grouped under some categories for better understanding as follows:

1. The Edible Plants
2. The Fodder Plants
3. The Medicinal Plants
4. Plants for House Building
5. Plants used as Fire Wood
6. The Religious Plants
7. The Ornamental & Decorative Plants
8. Plants in Folklores; etc.

The results of present survey among the *Meches* have been discussed under some separate sections:

- 7.1. Recorded Edible Plants
- 7.2. Recorded Fodder Plants
- 7.3. Recorded Plants for Domestic Uses
- 7.4. Recorded Medicinal Plants
- 7.5. Recorded Plants for Veterinary Medicines
- 7.6. Recorded Poisonous Plants
- 7.7. Preparation of *Jou*
- 7.8. Recorded Ornamental & Decorative Plants
- 7.9. Recorded Religious Plants
- 7.10. Plants Referred in Folklores
- 7.11. Plants Related to Birth Marriage & Death
- 7.12. Recorded plants for Festivals & Worship
- 7.13. Recorded Plants in Traditional Cuisine

7.1. Recorded Edible Plants

7.1.1. ENUMERATION OF RECORDED EDIBLE PLANTS

The present study documented the uses of 121 species of wild plants collected and eaten by *Mech* people. Such plants are enumerated below along with their vernacular names, edible parts, mode of consumption and reference to voucher specimens.

Acmella calva (DC.) Jansen [Asteraceae]

Vernacular Name: *Usumai* (Mech); Exscicattus: *Ajita & AP Das 118*.

Fried leaves are consumed as vegetable.

Aegle marmelos (Linnaeus) Correa [Rutaceae]

Vernacular Name: *Bel Bingfang* (Mech); Exscicattus: *Ajita & AP Das 042*.

Aromatic pulp is eaten as such or as a drink with sugar.

Alocasia macrorrhizos (Linnaeus) G. Don [Araceae]

Vernacular Name: *Mana Thadung* (Mech); Exscicattus: *Ajita & AP Das 322*.

Boiled tubers and petiole are eaten.

Alternanthera philoxeroides (Martius) Grisebach [Amaranthaceae]

Vernacular Name: *Chhetchi* (Mech); Exscicattus: *Ajita & AP Das 243*.

Leaves are consumed as vegetable.

Alternanthera paronichioides St. Hill [Amaranthaceae]

Vernacular Name: *Hagrani Moigong* (Mech); Exscicattus: *Ajita & AP Das 276, 430*.

Whole plants are cooked and eaten.

Alternanthera sessilis (Linnaeus) R. Brown ex DC. [Amaranthaceae]

Vernacular Name: *Nunni* (Mech); Exscicattus: *Ajita & AP Das 254, 300*.

Fried leaves are eaten.

Alpinia nigra (Gaertner) Burt [Zingiberaceae]

Vernacular Name: *Tharai* (Mech); Exscicattus: *Ajita & AP Das 047*.

Fried inner sheaths of pseudostem is eaten and used for the preparation of *Sabai Gwchhwu* [*Vigna mungo* (Linnaeus) Hepper] dal.

Amaranthus lividus Linnaeus [Amaranthaceae]

Vernacular Name: *Khudna* (Mech); Exscicattus: *Ajita & AP Das 274*.

Young shoots are cooked as vegetable.

Amaranthus spinosus Linnaeus [Amaranthaceae]

Vernacular Name: *Khudna* (Mech); Exscicattus: *Ajita & AP Das 103*.

Young shoots are cooked as vegetables.

Amaranthus viridis Linnaeus [Amaranthaceae]

Vernacular Name: *Khudna* (Mech); Exscicattus: *Ajita & AP Das 275*.

Young shoots are cooked as vegetables.

Amorphophallus bulbifer (Roxburgh) Blume [Araceae]

Vernacular Name: *Tha Thadung* (Mech); Exscicattus: *Ajita & AP Das 081*.

Boiled underground tuber is eaten and cooked in curries.

Annona reticulata Linnaeus [Anonaceae]

Vernacular Name: *Balam Fithai* (Mech); Exscicattus: *Ajita & AP Das 253*.

Ripe fruits are edible.

Ardisia solanacea Roxburgh [Myrsinaceae]

Vernacular Name: *Hagrani Fithai* (Mech); Exscicattus: *Ajita & AP Das 195*.

Ripe fruits are eaten raw.

Artocarpus chama Buchanan-Hamilton [Moraceae]

Vernacular Name: *Lator* (Mech); Exscicattus: *Ajita & AP Das 117*.

Ripe fruits are eaten.

Artocarpus heterophyllus Lamarck [Moraceae]

Vernacular Name: *Khanthal* (Mech); Exscicattus: *Ajita & AP Das 244*.

Ripe fruits are eaten and young fruits are cooked as vegetable.

Artocarpus lacucha Buchanan-Hamilton [Moraceae]

Vernacular Name: *Daao* (Mech); Exscicattus: *Ajita & AP Das 170*.

Ripe fruits are edible.

Azadirachta indica A. Jussieu [Meliaceae]

Vernacular Name: *Neem Bingfang* (Mech); Exscicattus: *Ajita & AP Das 038*.

Fried leaves are eaten.

Baccaurea ramiflora Loureiro [Euphorbiaceae] (Plate VI, Fig. A).

Vernacular Name: *Khusumai* (Mech); Exscicattus: *Ajita & AP Das 026*.

Ripe fruits are eaten.

Bacopa monnieri (Linnaeus) Pennell [Scrophulariaceae]

Vernacular Name: *Barami* (Mech); Exscicattus: *Ajita & AP Das 245*.

Fried whole plants are consumed as vegetable.

Bambusa nutans Wallich *ex* Munro [Poaceae]

Vernacular Name: *Ooa* (Mech); Exscicattus: *Ajita & AP Das 286*.

New grown part is cooked as vegetable and also used for making prickles.

Bauhinia purpurea Linnaeus [Caesalpiniaceae]

Vernacular Name: *Khainchon* (Mech); Exscicattus: *Ajita & AP Das 246*.

Fried flower buds are edible.

Bauhinia variegata Linnaeus [Caesalpiniaceae]

Vernacular Name: *Khainchon* (Mech); Exscicattus: *Ajita & AP Das 247*.

Fried flower buds are eaten.

Boerhavia coccinea Miller [Nyctaginaceae]

Vernacular Name: *Punarnova* (Mech); Exscicattus: *Ajita & AP Das 218*.

Fried leaves are edible.

Calamus erectus Roxburgh [Arecaceae]

Vernacular Name: *Raidong* (Mech); Exscicattus: *Ajita & AP Das 046*.

Ripe fruits are eaten raw and roasted tender leaf-sheath is edible.

Cannabis sativa Linnaeus [Cannabaceae]

Vernacular Name: *Ganja* (Mech); Exscicattus: *Ajita & AP Das 314*.

Raw leaves are edible.

Carica papaya Linnaeus [Caricaceae]

Vernacular Name: *Thul-mul* (Mech); Exscicattus: *Ajita & AP Das 475*.

Flowers are cooked in traditional curry (*Inghur Khari*).

Cassia occidentalis Linnaeus [Caesalpiniaceae]

Vernacular Name: *Sunda Bilai* (Mech); Exscicattus: *Ajita & AP Das 461*.

Young fried leaves are consumed as vegetable.

Centella asiatica (Linnaeus) Urban. [Apiaceae]

Vernacular Name: *Manimuni Gedet* (Mech); Exscicattus: *Ajita & AP Das 006*.

Whole plants are cooked as vegetable.

Chenopodium album Linnaeus [Chenopodiaceae]

Vernacular Name: *Bothhua* (Mech); Exscicattus: *Ajita & AP Das 298*.

Leaves are cooked as vegetables.

Cissus repens Lamarck [Vitaceae]

Vernacular Name: *Bindong* (Mech); Exscicattus: *Ajita & AP Das 208*.

Fried tender leaves are eaten.

Cissus simplex Blanco [Vitaceae]

Vernacular Name: *Daeiilarang* (Mech); Exscicattus: *Ajita & AP Das 248*.

Juice of inside-stem is drunk.

Citrullus lanatus (Thunberg) Matsumura & Nakai [Cucurbitaceae]

Vernacular Name: *Gumbri* (Mech); Exscicattus: *Ajita & AP Das 204*.

Ripe fruits are edible and young fruits are consumed as vegetable.

Citrus limon (Linnaeus) Osbeck [Rutaceae]

Vernacular Name: *Nareng* (Mech); Exscicattus: *Ajita & AP Das 073*.

Fruits are edible.

Coccinia grandis (Linnaeus) Voigt [Cucurbitaceae] (Plate VI, Fig. B).

Vernacular Name: *Kundri* (Mech); Exscicattus: *Ajita & AP Das 123*.

Young green fruits and leaves are cooked as vegetables.

Colocasia esculenta (Linnaeus) Schott [Araceae] (Plate VI, Fig. C).

Vernacular Name: *Thadung* (Mech); Exscicattus: *Ajita & AP Das 050*.

Young leaves, petioles, flowers and esculent roots are cooked as vegetables.

Commelina benghalensis Linnaeus [Commelinaceae] (Plate VI, Fig. D).

Vernacular Name: *Sanai Bibar* (Mech); Exscicattus: *Ajita & AP Das 319*.

Fried leaves are eaten.

Corchorus capsularis Linnaeus [Tiliaceae]

Vernacular Name: *Phatto* (Mech); Exscicattus: *Ajita & AP Das 349*.

Young and matured leaves are consumed as vegetable.

Costus speciosus (Koenig ex Retzius) Smith [Costaceae]

Vernacular Name: *Debgugri* (Mech); Exscicattus: *Ajita & AP Das 143*.

Leaf-sheath is cooked as vegetable.

Curcuma longa Linnaeus [Zingiberaceae]

Vernacular Name: *Haldi* (Mech); Exscicattus: *Ajita & AP Das 348*.

Rhizome is edible.

Deeringia amaranthoides (Lamarck) Merrill [Amaranthaceae]

Vernacular Name: *Maibet* (Mech); Exscicattus: *Ajita & AP Das 085*.

Young leafy shoots are cooked as vegetables.

Dillenia indica Linnaeus [Dilleniaceae]

Vernacular Name: *Thaidig* (Mech); Exscicattus: *Ajita & AP Das 022*.

Fruits are eaten raw and used for preparing pickles.

Dillenia pentagyna Roxburgh [Dilleniaceae]

Vernacular Name: *Rae Bingfang* (Mech); Exscicattus: *Ajita & AP Das 312*.

Ripe fruit are eaten raw.

Dioscorea bulbifera Linnaeus [Dioscoreaceae]

Vernacular Name: *Thaganda* (Mech); Exscicattus: *Ajita & AP Das 256*.

Boiled root-tuber is edible.

Dioscorea esculenta (Loureiro) Burkill [Dioscoreaceae]

Vernacular Name: *Thaganda* (Mech); Exscicattus: *Ajita & AP Das 257*.

Boiled root-tuber is eaten.

Dioscorea pentaphylla Linnaeus [Dioscoreaceae]

Vernacular Name: *Thaganda* (Mech); Exscicattus: *Ajita & AP Das 273*.

Boiled root-tuber is edible.

Dioscorea pubera Blume [Dioscoreaceae]

Vernacular Name: *Thaganda* (Mech); Exscicattus: *Ajita & AP Das 255*.

Boiled root-tuber is edible.

Diospyros malabarica (Desrousseaux) Kosteletsky [Ebenaceae]

Vernacular Name: *Gab Bingfang* (Mech); Exscicattus: *Ajita & AP Das 345*.

Ripe fruits are eaten.

Diplazium esculentum (Retzius) Swartz [Athyriaceae]

Vernacular Name: *Dingkhisa* (Mech); Exscicattus: *Ajita & AP Das 036*.

Tender fronds are cooked as vegetables.

Diplocyclos palmatus (Linnaeus) Juffrey [Cucurbitaceae]

Vernacular Name: *Gumbri* (Mech); Exscicattus: *Ajita & AP Das 163*.

Young fruits are cooked as vegetable.

Drymaria cordata (Linnaeus) Willdenow ex Roemer & Schultes [Caryophyllaceae] (Plate VI, Fig. E).

Vernacular Name: *Barmadaree* (Mech); Exscicattus: *Ajita & AP Das 146*.

Fried whole plants are edible.

Duchesnea indica (Andrews) Focke [Rosaceae] (Plate VI, Fig. F).

Vernacular Name: *Gorai Bidai* (Mech); Exscicattus: *Ajita & AP Das 134*.

Ripe fruits are edible.

Ehretia serrata Roxburgh [Ehretiaceae]

Vernacular Name: *Larlaria* (Mech); Exscicattus: *Ajita & AP Das 126*.

Ripe fruits are edible.

Eichhornia crassipes (Martius) Solms [Pontederiaceae] (Plate VI, Fig. G).

Vernacular Name: *Pana* (Mech); Exscicattus: *Ajita & AP Das 158*.

Fried flowers are edible.

Elaeocarpus floribundus Blume [Elaeocarpaceae]

Vernacular Name: *Jalpoi* (Mech); Exscicattus: *Ajita & AP Das 040*.

Fruits are eaten raw and used for the preparation of pickle.

Enydra fluctuans Loureiro [Asteraceae] (Plate VI, Fig. H).

Vernacular Name: *Hela* (Mech); Exscicattus: *Ajita & AP Das 431*.

Leaves and stalks are cooked as vegetables.

Euphorbia hirta Linnaeus [Euphorbiaceae]

Vernacular Name: *Dudhali* (Mech); Exscicattus: *Ajita & AP Das 311*.

Leaves are cooked as vegetables.

Ficus hispida Linnaeus f. [Moraceae] (Plate VII, Fig. A).
Vernacular Name: *Adumri*; Exscicattus: *Ajita & AP Das 028*.
Young fruits are cooked as vegetables. Ripe fruits are edible.

Flacourtia jangomas (Loureiro) Raeuschel [Flacourtiaceae]
Vernacular Name: *Dongkhur* (Mech); Exscicattus: *Ajita & AP Das 284*.
Ripe fruits are eaten raw.

Glinus oppositifolius (Linnaeus) A. DC. [Molluginaceae]
Vernacular Name: *Ghima Bilai* (Mech); Exscicattus: *Ajita & AP Das 186*.
Whole plants are cooked as vegetable.

Glycosmis pentaphylla (Retzius) DC. [Rutaceae]
Vernacular Name: *Motra* (Mech); Exscicattus: *Ajita & AP Das 236*.
Ripe fruits are eaten.

Gmelina arborea Roxburgh [Verbenaceae] (Plate VII, Fig. B).
Vernacular Name: *Gambri* (Mech); Exscicattus: *Ajita & AP Das 459*.
Flowers are fried and eaten.

Grewia asiatica Linnaeus [Tiliaceae] °
Vernacular Name: *Phalasa Fithai* (Mech); Exscicattus: *Ajita & AP Das 470*.
Ripe fruits are edible.

Grewia serrulata DC. [Tiliaceae]
Vernacular Name: *Hagrani Fithai* (Mech); Exscicattus: *Ajita & AP Das 168*.
Ripe fruits are eaten raw.

Helminthostachys zeylanica (Linnaeus) Hooker [Helminthostachyaceae] (Plate VII, Fig. C).
Vernacular Name: *Daudai Atheng* (Mech); Exscicattus: *Ajita & AP Das 216*.
Petioles and young tender leaves are cooked as vegetables.

Hibiscus sabdariffa Linnaeus [Malvaceae]
Vernacular Name: *Mistha Bingfang* (Mech); Exscicattus: *Ajita & AP Das 249*.
Calyx is eaten raw.

Houttuynia cordata Thunberg [Saururaceae] (Plate VII, Fig. D).
Vernacular Name: *Maisundri* (Mech); Exscicattus: *Ajita & AP Das 070*.
Young leaves are pounded with onion, green chilli and ginger and consumed as pickle.

Hygrophila auriculata (Schumacher) Heine [Acanthaceae] (Plate VII, Fig. E).
Vernacular Name: *Boikhara* (Mech); Exscicattus: *Ajita & AP Das 250*.
Young leaves are cooked as vegetables.

Ipomoea aquatica Forsskal [Convolvulaceae] (Plate VII, Fig. F).
Vernacular Name: *Khalmi* (Mech); Exscicattus: *Ajita & AP Das 079*.
Young shoots are cooked as vegetables.

Lagenaria siceraria (Molina) Standley [Cucurbitaceae]
Vernacular Name: *Kaila Khaka* (Mech); Exscicattus: *Ajita & AP Das 160*.
Fried young fruits are eaten.

Lasia spinosa (Linnaeus) Thwaites [Araceae] (Plate VII, Fig. G).
Vernacular Name: *Sibru* (Mech); Exscicattus: *Ajita & AP Das 113*.
Fried petioles are eaten.

Leucas indica (Linnaeus) R. Brown ex Vatke [Lamiaceae]
Vernacular Name: *Khansisa* (Mech); Exscicattus: *Ajita & AP Das 089*.
Young shoots are cooked as vegetables.

Lippia javanica (Burman f.) Sprengel [Verbenaceae]
Vernacular Name: *Anthai Bazab* (Mech); Exscicattus: *Ajita & AP Das 125*.
Young fried leaves are eaten and raw leaves are added in curry as aromatic.

Luffa aegyptica Miller [Cucurbitaceae]
Vernacular Name: *Falla* (Mech); Exscicattus: *Ajita & AP Das 412*.
Young green fruits are fried and eaten.

Manihot esculenta Crantz [Euphorbiaceae]
Vernacular Name: *Thasumbly* (Mech); Exscicattus: *Ajita & AP Das 084*.
Boiled roots are eaten.

Marsilea minuta Linnaeus [Marsileaceae] (Plate VII, Fig. H).
Vernacular Name: *Sususni* (Mech); Exscicattus: *Ajita & AP Das 190*.
Fried leaves are edible.

Melastoma malabathricum Linnaeus [Melastomataceae] (Plate VIII, Fig. A).
Vernacular Name: *Daukhiboi* (Mech); Exscicattus: *Ajita & AP Das 080*.
Ripe seed is edible.

Melia azedarach Linnaeus [Meliaceae]
Vernacular Name: *Neem Gadar* (Mech); Exscicattus: *Ajita & AP Das 027*.
Fried young leaves are eaten.

Mimusops elengi Linnaeus [Sapotaceae] (Plate VIII, Fig. B).
Vernacular Name: *Baikhul* (Mech); Exscicattus: *Ajita & AP Das 165*.
Ripe fruits are edible.

Momordica charantia Linnaeus [Cucurbitaceae]

Vernacular Name: *Udasi* (Mech); Exscicattus: *Ajita & AP Das 228*.

Young fruits and leaves are cooked as vegetables.

Momordica dioica Roxburgh ex Willdenow [Cucurbitaceae]

Vernacular Name: *Aamkhora* (Mech); Exscicattus: *Ajita & AP Das 235*.

Young fruits are cooked as vegetables.

Monochoria vaginalis (Burman f.) C. Presl. ex Kunth [Pontederiaceae]

Vernacular Name: *Pana* (Mech); Exscicattus: *Ajita & AP Das 468*.

Fried petioles are edible.

Moringa oleifera Lamarck [Moringaceae]

Vernacular Name: *Sajna* (Mech); Exscicattus: *Ajita & AP Das 041*.

Young green pods are cooked as vegetable and mature pods are cooked with dal. Young fried leaves are consumed as vegetable.

Morus australis Poiret [Moraceae]

Vernacular Name: *Thaikhong Chef* (Mech); Exscicattus: *Ajita & AP Das 457*.

Ripe fruits are edible.

Mukia maderaspatana (Linnaeus) M. J. Roemer [Cucurbitaceae]

Vernacular Name: *Kundri* (Mech); Exscicattus: *Ajita & AP Das 163*.

Young fruits are cooked as vegetable.

Murraya koenigii (Linnaeus) Sprengel [Rutaceae]

Vernacular Name: *Jafsri Bilai* (Mech); Exscicattus: *Ajita & AP Das 135*.

Ripe fruits are eaten by children.

Musa balbisiana Colla [Musaceae]

Vernacular Name: *Athia Thalith* (Mech); Exscicattus: *Ajita & AP Das 251*.

Young and matured fruits are consumed as vegetable and pseudostems are cooked with meat.

Mussaenda glabra Vahl [Rubiaceae]

Vernacular Name: *Kotmotia* (Mech); Exscicattus: *Ajita & AP Das 193*.

Young fried leaves are edible.

Mussaenda roxburghii Hooker f. [Rubiaceae]

Vernacular Name: *Kotmotia* (Mech); Exscicattus: *Ajita & AP Das 192*.

Young leaves are boiled in rice and eaten.

Neolamarckia cadamba (Roxburgh) J. Bosser [Rubiaceae]

Vernacular Name: *Khadam* (Mech); Exscicattus: *Ajita & AP Das 230*.

Ripe fruits are edible.

Nymphaea pubescens Willdenow [Nymphaeaceae]

Vernacular Name: *Daeii Bibar* (Mech); Exscicattus: *Ajita & AP Das 187*.

Fried petioles are edible.

Oldenlandia corymbosa Linnaeus [Rubiaceae]

Vernacular Name: *Hagrani Bilai* (Mech); Exscicattus: *Ajita & AP Das 233*.

Fried whole plants are eaten.

Oroxylum indicum (Linnaeus) Bentham ex Kurz [Bignoniaceae]

Vernacular Name: *Kharo Khandai* (Mech); Exscicattus: *Ajita & AP Das 044*.

Bitter flowers and tender shoots are soaked in hot water and fried in oil and eaten.

Oxalis corniculata Linnaeus [Oxalidaceae]

Vernacular Name: *Shimpli* (Mech); Exscicattus: *Ajita & AP Das 112*.

Raw leaves are crushed with green chilli and salt and consumed as prickle.

Oxalis corymbosa DC. [Oxalidaceae]

Vernacular Name: *Shimpli Gedet* (Mech); Exscicattus: *Ajita & AP Das 270*.

Bulbs are eaten raw.

Paederia foetida Linnaeus [Rubiaceae]

Vernacular Name: *Khipi Bindong* (Mech); Exscicattus: *Ajita & AP Das 364*.

Young fried leaves are edible.

Phlogacanthus thyriformis (Hardwicke) Mabberley [Acanthaceae]

Vernacular Name: *Chinchingri Khala* (Mech); Exscicattus: *Ajita & AP Das 082*.

Fried flowers are eaten.

Phyllanthus emblica Linnaeus [Euphorbiaceae]

Vernacular Name: *Amlakhi* (Mech); Exscicattus: *Ajita & AP Das 034*.

Fruits are eaten raw and also pickled.

Physalis divaricata D. Don [Solanaceae] (Plate VIII, Fig. C).

Vernacular Name: *Ganga Thopfa* (Mech); Exscicattus: *Ajita & AP Das 133*.

Ripe fruits are eaten.

Piper betle Linnaeus [Piperaceae]

Vernacular Name: *Phatai* (Mech); Exscicattus: *Ajita & AP Das 114*.

Leaves are eaten with the nut of *Areca catechu*.

Piper nigrum Linnaeus [Piperaceae]

Vernacular Name: *Banjut* (Mech); Exscicattus: *Ajita & AP Das 272*.

Dried fruit is eaten as condiment.

Piper sylvaticum Roxburgh [Piperaceae]

Vernacular Name: *Hagrani Phatai* (Mech); Exscicattus: *Ajita & AP Das 128*.

Leaves are eaten with the nut of *Areca catechu*.

Polycarpon prostratum (Forsskal) Ascherson & Schweinfurth [Caryophyllaceae] (Plate VIII, Fig. D).

Vernacular Name: *Hagrani Bilai* (Mech); Exscicattus: *Ajita & AP Das 261*.

Whole plants are eaten.

Polygonum plebeium R. Brown [Polygonaceae].

Vernacular Name: *Daunasi* (Mech); Exscicattus: *Ajita & AP Das 119*.

Whole plants are cooked as vegetables.

Portulaca oleracea Linnaeus [Portulacaceae] (Plate VIII, Fig. E).

Vernacular Name: *Hangsaramai* (Mech); Exscicattus: *Ajita & AP Das 456*.

Whole plants are cooked as vegetables.

Premna bengalensis Clarke [Verbenaceae]

Vernacular Name: *Babol* (Mech); Exscicattus: *Ajita & AP Das 271*.

Fried young leaves are eaten.

Solanum anguivi Lamarck [Solanaceae]

Vernacular Name: *Khunthai* (Mech); Exscicattus: *Ajita & AP Das 161*.

Both young and matured fried fruits are edible.

Solanum nigrum Linnaeus [Solanaceae] (Plate VIII, Fig. F).

Vernacular Name: *Moisung* (Mech); Exscicattus: *Ajita & AP Das 122*.

Ripe fruits and fried leaves are eaten.

Solanum torvum Swartz [Solanaceae] (Plate VIII, Fig. G).

Vernacular Name: *Khunthai Raja* (Mech); Exscicattus: *Ajita & AP Das 450*.

Young and mature fried fruits are edible.

Spondias pinnata (Linnaeus f.) Kurz [Anacardiaceae]

Vernacular Name: *Thaischchip* (Mech); Exscicattus: *Ajita & AP Das 226*.

Ripe fruits are eaten.

Stellaria wallichiana Bentham ex Haines [Caryophyllaceae]

Vernacular Name: *Daubibu* (Mech); Exscicattus: *Ajita & AP Das 299*.

Fried whole plants are eaten.

Sterculia villosa Roxburgh [Sterculiaceae]

Vernacular Name: *Odlā* (Mech); Exscicattus: *Ajita & AP Das 045*.

Fried seeds are eaten.

Syzygium cumini (Linnaeus) Skeels [Myrtaceae]

Vernacular Name: *Jham* (Mech); Exscicattus: *Ajita & AP Das 023*.

Ripe fruits are edible.

Tamarindus indica Linnaeus [Caesalpiniaceae]

Vernacular Name: *Titli* (Mech); Exscicattus: *Ajita & AP Das 025*.

Ripe fruits are eaten raw and used for preparing pickles.

Terminalia bellirica (Gaertner) Roxburgh [Combretaceae]

Vernacular Name: *Bhaora* (Mech); Exscicattus: *Ajita & AP Das 024*.

Embryo is eaten raw.

Trapa natans Linnaeus var. *bispinosa* (Roxburgh) Makino [Trapaceae]

Vernacular Name: *Daie Fithai* (Mech); Exscicattus: *Ajita & AP Das 185*.

Fruits are edible.

Typhonium trilobatum (Linnaeus) Schott [Araceae] (Plate VIII, Fig. H).

Vernacular Name: *Thadung* (Mech); Exscicattus: *Ajita & AP Das 157*.

Young leaves are pounded with green chilli and salt and eaten as pickle.

Vitex negundo Linnaeus [Verbenaceae]

Vernacular Name: *Nisindou* (Mech); Exscicattus: *Ajita & AP Das 182*.

Fried young leaves are edible.

Xanthosoma brasiliense (Desfontaines) Engler [Araceae]

Vernacular Name: *Dudhali Thadung* (Mech); Exscicattus: *Ajita & AP Das 051*.

Fried petiole is eaten.

Zehneria japonica (Thunberg) H.Y. Liu [Cucurbitaceae]

Vernacular Name: *Hagrani Phatol* (Mech); Exscicattus: *Ajita & AP Das 422*.

Young fried fruits are eaten.

Zingiber officinale Roscoe [Zingiberaceae]

Vernacular Name: *Adi* (Mech); Exscicattus: *Ajita & AP Das 252*.

Rhizome is edible.

Zizyphus mauritiana Lamarck [Rhamnaceae]

Vernacular Name: *Boi* (Mech); Exscicattus: *Ajita & AP Das 150*.

Ripe fruits are eaten.

7.1.2. DISCUSSION

Plants are eaten mainly in two ways, cooked or uncooked. While plants are eaten cooked then those are generally referred as 'vegetable'. On the other hand, there is no such overall terminology for those which are eaten uncooked.

7.1.2.1. Vegetables

As much as 81 species of plants are used as vegetable and are eaten after cooking.

A. Leafy Vegetable: Only leaves of these plants are used as vegetable in their different stages of maturity. A high number of 45 species (covering 40 genera and 29 families) are recognized under this category.

i. Very young leaves: *Diplazium esculentum* and *Helminthostachys zeylanica*.

ii. Young leaves: *Amaranthus lividus*, *Amaranthus spinosus*, *Amaranthus viridis*, *Cassia occidentalis*, *Cissus repens*, *Colocasia esculenta*, *Deeringia amaranthoides*, *Hygrophila auriculata*, *Ipomoea aquatica*, *Leucas indica*, *Lippia javanica*, *Melia azedarach*, *Moringa oleifera*, *Mussaenda glabra*, *Mussaenda roxburghii*, *Oroxylum indicum*, *Paederia foetida*, *Premna bengalensis*, *Typhonium trilobatum*, *Vitex negundo*.

iii. Young & mature leaves: *Acmella calva*, *Alternanthera philoxeroides*, *Alternanthera paronichioides*, *Alternanthera sessilis*, *Azadirachta indica*, *Bacopa monnieri*, *Boerhavia coccinea*, *Centella asiatica*, *Chenopodium album*, *Coccinia grandis*, *Commelina benghalensis*, *Corchorus capsularis*, *Drymaria cordata*, *Enhydra fluctuans*, *Euphorbia hirta*, *Glinus oppositifolius*, *Marsilea minuta*, *Momordica charantia*, *Oldenlandia corymbosa*, *Polycarpon prostratum*, *Polygonum plebeium*, *Portulaca oleracea*, *Solanum nigrum*, *Stellaria wallichiana*.

B. Petiole Vegetable: In some plants entire leaf is not eaten. In plants like *Alocasia macrorrhizos*, *Colocasia esculenta*, *Lasia spinosa*, *Nymphaea pubescens*, *Helminthostachys zeylanica*, *Monochoria vaginalis* and *Xanthosoma brasiliense* only the petiole is collected for cooking. Six angiospermic species (of 6 genera and 3 families) and one pteridophyte (*Helminthostachys zeylanica*) are recognized for this category.

C. Leaf-Sheath/ Pseudostem as vegetable: In a pseudostem inner sheaths are generally soft and Mech people use those at least of four species from 4 genera in 4 families. These are *Musa balbisiana*, *Costus speciosus*, *Alpinia nigra* and *Calamus erectus*. Out of these only first species is under cultivation and the populations of last two are decreasing quickly.

D. Root-tuber vegetable: Large fleshy root-stocks of different species of *Dioscorea* is one preferred food in numerous communities specially in the tropics. During four of its species (*D. bulbifera*, *D. esculenta*, *D. pentaphylla* and *D. pubera*) were recorded to consume by Meches. *Amorphophallus bulbifer* (Araceae) is also available in local forests and is also a favored vegetable. In addition, one exotic plant of Euphorbiaceae, *Manihot esculenta*, is also largely consumed by them.

E. Rhizome vegetable: In addition to root-tubers, 2 species of aroids *Alocasia macrorrhizos* and *Colocasia esculenta*, are also much favoured food. These two are semi-cultivated plants.

F. Flower/ Inflorescence vegetable: Flowers of seven dicotyledonous (*Bauhinia purpurea*, *Bauhinia variegata*, *Carica papaya*, *Gmelina arborea*, *Moringa oleifera*, *Oroxylum indicum* and *Phlogacanthus thyriformis*) and three monocotyledonous (*Colocasia esculenta*, *Eichhornia crassipes* and *Musa balbisiana*) plants (from 8 genera and 8 families) are use as vegetable in *Mech* kitchens. Apart from *Eichhornia crassipes* and *Musa balbisiana*, the flowering period of seven other plants are quite restricted and of different availability status.

G. Fruit vegetable: Fruits of these plants are eaten only after cooking. 15 species of plants covering 13 genera and 5 families are recognized for this category. Like leaves, fruits are also used in different stages of maturity. However, there are some personal preferences too.

i. Young fruits: *Artocarpus heterophyllus*, *Citrullus lanatus*, *Coccinia grandis*, *Diplocyclos palmatus*, *Ficus hispida*, *Lagenaria siceraria*, *Luffa aegyptica*, *Momordica charantia*, *Momordica dioica*, *Mukia maderaspatana*, *Zehneria japonica*.

ii. Young & matured fruits: *Moringa oleifera*, *Musa balbisiana*, *Solanum anguivi*, *Solanum torvum*.

H. Seed vegetable: The seeds of *Odal* (*Sterculia villosa*) is also used for different types of preparations.

I. Spices & Condiments: Rhizomes of *Curcuma longa* and *Zingiber officinale* and the fruits of *Piper nigrum* are regularly used as spices and condiments.

J. Aromatic plants: Leaves of *Lippia javanica* are used for their aroma. Raw matured leaves are added with meat curry.

K. Pickle: Young primary shoot of *Bambusa nutans*, acrescent calyx of *Dillenia indica* and the fruits of *Elaeocarpus floribundus*, *Zizyphus mauritiana*, *Phyllanthus emblica* and *Spondias pinnata* are commonly used by *Meches* for the preparation of pickles.

7.1.2.2. Eaten Raw: There are many plants or plant parts those are eaten raw by the *Mech* people.

A. Fruits: Green and/or ripe fruits of 34 species covering 30 genera and 23 families are recorded to eat by *Mech* people without cooking. Such plants can be grouped as follows: *Aegle marmelos*, *Annona reticulata*, *Ardisia solanacea*, *Artocarpus chama*, *Artocarpus heterophyllus*, *Artocarpus lacucha*,

Baccaurea ramiflora, *Calamus erectus*, *Citrullus lanatus*, *Citrus limon*, *Dillenia indica*, *Dillenia pentagyna*, *Diospyros malabarica*, *Duchesnea indica*, *Ehretia serrata*, *Elaeocarpus floribundus*, *Ficus hispida*, *Flacourtia jangomas*, *Glycosmis pentaphylla*, *Grewia asiatica*, *Grewia serrulata*, *Mimusops elengi*, *Morus australis*, *Murraya koenigii*, *Musa balbisiana*, *Neolamarckia cadamba*, *Phyllanthus emblica*, *Physalis divaricata*, *Solanum nigrum*, *Spondias pinnata*, *Syzygium cumini*, *Tamarindus indica*, *Trapa natans*, *Zizyphus mauritiana*.

B. Leaves: Leaves of five species of 4 genera and 4 families (*Cannabis sativa*, *Hottuynia cordata*, *Oxalis corniculata*, *Piper betle* and *Piper sylvaticum*) are eaten raw. While leaves of *Hottuynia cordata* and *Oxalis corniculata* are made into 'chatni' (deserts) and taken along with other food; the leaves of *Piper betle* and *P. sylvaticum* are used as masticator. However, the leaves of *Cannabis sativa* is hallucinogenic.

C. Bulb: The underground bulbs of *Oxalis corymbosa* are eaten raw by children.

D. Seed: Seeds of *Melastoma malabathricum* are chewed aggressively by children. This also stains their teeth deep-purple.

E. Embryo: Embryos of *Terminalia bellirica* are collected by breaking the seeds and eaten raw. It tastes like the same of *Terminalia catappa*.

F. Calyx: The persistent calyx of *Hibiscus sabdariffa* is crescent, succulent and sour. It is made into pickles, cooked into tasty sour curry and also eaten raw.

G. Sap of stem: While moving inside the forests during dry season they cut the thick lianas stem of *Cissus simplex* that yields some amount watery sap which helps them to quench their thirst.

7.1.2.3. Classifications of Edible Parts: All parts of all plants are not edible. And, that is clear from the above discussion. Man has recognized edible part of different plants through trial and error method. It is true for the *Mech* community too. Following is an account of edible parts for different plants eaten by them.

A. Whole plants/ Leafy shoots: *Acmella calva*, *Alternanthera philoxeroides*, *Alternanthera paronichioides*, *Alternanthera sessilis*, *Amaranthus lividus*, *Amaranthus spinosus*, *Amaranthus viridis*, *Boerhavia coccinea*, *Bacopa monnieri*, *Centella asiatica*, *Chenopodium album*, *Commelina benghalensis*, *Deeringia amaranthoides*, *Drymaria cordata*, *Enhydra fluctuans*, *Glinus oppositifolius*, *Ipomoea*

aquatica, Leucas indica, Oldenlandia corymbosa, Oroxylum indicum, Polycarpon prostratum, Polygonum plebeium, Portulaca oleracea, Stellaria wallichiana [24 species, 20 genera, 15 families]

B. Leaves: 25 species, 23 genera, 17 families. *Azadirachta indica, Cannabis sativa, Cassia occidentalis, Cissus repens, Coccinia grandis, Colocasia esculenta, Corchorus capsularis, Diplazium esculentum, Euphorbia hirta, Helminthostachys zeylanica, Houlttuynia cordata, Hygrophila auriculata, Lippia javanica, Marsilea minuta, Melia azedarach, Momordica charantia, Moringa oleifera, Mussaenda glabra, Mussaenda roxburghii, Oxalis corniculata, Paederia foetida, Piper betle, Piper sylvaticum, Premna bengalensis, Solanum nigrum, Typhonium trilobatum, Vitex negundo.*

C. Fruits: 45 species, 38 genera, 24 families [*Aegle marmelos, Annona reticulata, Ardisia solanacea, Artocarpus chama, Artocarpus heterophylla, Artocarpus lacucha, Baccaurea ramiflora, Calamus erectus, Citrullus lanatus, Citrus limon, Coccinia grandis, Dillenia indica, Dillenia pentagyna, Diospyros malabarica, Diplocyclos palmatus, Duchesnea indica, Ehretia serrata, Elaeocarpus floribundus, Ficus hispida, Flacourtia jangomas, Glycosmis pentaphylla, Grewia asiatica, Grewia serrulata, Lagenaria siceraria, Luffa aegyptica, Mimusops elengi, Momordica charantia, Momordica dioica, Moringa oleifera, Morus australis, Mukia maderaspatana, Murraya koenigii, Musa balbisiana, Neolamarckia cadamba, Phyllanthus emblica, Physalis divaricata, Solanum anguivi, Solanum nigrum, Solanum torvum, Spondias pinnata, Syzygium cumini, Tamarindus indica, Trapa natans, Zehneria japonica, Zizyphus mauritiana*].

D. Flowers/Calyx/Inflorescence: 11 species, 10 genera, 10 families [*Bauhinia purpurea, Bauhinia variegata, Carica papaya, Colocasia esculenta, Eichhornia crassipes, Gmelina arborea, Hibiscus sabdariffa, Moringa oleifera, Oroxylum indicum, Phlogacanthus thyriformis* and *Musa balbisiana*].

E. Seeds: 2 species, 2 genera, 2 families [*Melastoma malabathricum, Sterculia villosa*].

F. Embryos: *Terminalia bellirica*

G. Sap of stem: *Cissus simplex*

7.1.2.4. Classification of Habit Groups: The vegetation in this region is mainly forested. There are plants of all habit groups grow in such vegetations. Analysis of habit groups shows that there is wide diversity of habits.

A. Trees: 34 species, 29 genera, 23 families [*Aegle marmelos*, *Annona reticulata*, *Artocarpus chama*, *Artocarpus heterophyllus*, *Artocarpus lacucha*, *Azadirachta indica*, *Baccaurea ramiflora*, *Bambusa nutans*, *Bauhinia purpurea*, *Bauhinia variegata*, *Dillenia indica*, *Dillenia pentagyna*, *Diospyros malabarica*, *Ehretia serrata*, *Elaeocarpus floribundus*, *Ficus hispida*, *Flacourtia jangomas*, *Gmelina arborea*, *Grewia asiatica*, *Grewia serrulata*, *Melia azedarach*, *Mimusops elengi*, *Moringa oleifera*, *Morus australis*, *Neolamarckia cadamba*, *Oroxylum indicum*, *Phyllanthus emblica*, *Premna bengalensis*, *Spondias pinnata*, *Sterculia villosa*, *Syzygium cumini*, *Tamarindus indica*, *Terminalia bellirica*, *Zizyphus mauritiana*].

B. Shrub: 19 species, 17 genera, 14 families [*Ardisia solanacea*, *Calamus erectus*, *Cannabis sativa*, *Carica papaya*, *Cassia occidentalis*, *Citrus limon*, *Deeringia amaranthoides*, *Glycosmis pentaphylla*, *Hibiscus sabdariffa*, *Lippia javanica*, *Manihot esculenta*, *Melastoma malabathricum*, *Murraya koenigii*, *Mussaenda glabra*, *Mussaenda roxburghii*, *Phlogacanthus thyrsoformis*, *Solanum anguivi*, *Solanum torvum*, *Vitex negundo*].

C. Herb: 46 species, 41 genera, 28 families [*Acmella calva*, *Alocasia macrorrhizos*, *Alpinia nigra*, *Alternanthera philoxeroides*, *Alternanthera paronichioides*, *Alternanthera sessilis*, *Amaranthus lividus*, *Amaranthus spinosus*, *Amaranthus viridis*, *Amorphophallus bulbifer*, *Bacopa monnieri*, *Boerhavia coccinea*, *Centella asiatica*, *Chenopodium album*, *Colocasia esculenta*, *Commelina benghalensis*, *Corchorus capsularis*, *Costus speciosus*, *Curcuma longa*, *Drymaria cordata*, *Duchesnea indica*, *Eichhornia crassipes*, *Enhydra fluctuans*, *Euphorbia hirta*, *Glinus oppositifolius*, *Houttuynia cordata*, *Hygrophila auriculata*, *Ipomoea aquatica*, *Lasia spinosa*, *Leucas indica*, *Monochoria vaginalis*, *Musa balbisiana*, *Nymphaea pubescens*, *Oldenlandia corymbosa*, *Oxalis corniculata*, *Oxalis corymbosa*, *Physalis divaricata*, *Polycarpon prostratum*, *Polygonum plebeium*, *Portulaca oleracea*, *Solanum nigrum*, *Stellaria wallichiana*, *Trapa natans*, *Typhonium trilobatum*, *Xanthosoma brasiliense*, *Zingiber officinale*].

D. Climber: 19 species, 12 genera, 5 families [*Cissus repens*, *Cissus simplex*, *Citrullus lanatus*, *Coccinia grandis*, *Dioscorea bulbifera*, *Dioscorea esculenta*, *Dioscorea pentaphylla*, *Dioscorea pubera*, *Diplocyclos palmatus*, *Lagenaria siceraria*, *Luffa aegyptica*, *Momordica charantia*, *Momordica dioica*, *Mukia maderaspatana*, *Paederia foetida*, *Piper betle*, *Piper nigrum*, *Piper sylvaticum*, *Zehneria japonica*].

E. Geophytes: Also there are geophytic plants. Those are *Alocasia macrorrhizos*, *Alpinia nigra*, *Amorphophallus bulbifer*, *Colocasia esculenta*, *Costus speciosus*, *Curcuma longa*, *Lasia spinosa*, *Musa balbisiana*, *Nymphaea pubescens*, *Oxalis corymbosa*, *Trapa natans*, *Typhonium trilobatum*, *Xanthosoma brasiliense* and *Zingiber officinale*

F. Pteridophyte: 3species, 3 genera, 3 families [*Diplazium esculentum*, *Helminthostachys zeylanica*, *Marsilea minuta*].

7.1.2.5. Marketability of Edible Plants:

If the demand for a plant is high in the society and if it becomes difficult for many people to collect from the vegetation, in that case some other people will try to put it on sale in the market. 35 species, 31 genera, 24 families. *Aegle marmelos*, *Alocasia macrorrhizos*, *Amaranthus spinosus*, *Amorphophallus bulbifer*, *Annona reticulata*, *Artocarpus heterophyllus*, *Azadirachta indica*, *Centella asiatica*, *Chenopodium album*, *Citrus limon*, *Coccinia grandis*, *Colocasia esculenta*, *Corchorus capsularis*, *Curcuma longa*, *Dillenia indica*, *Dioscorea bulbifera*, *Dioscorea esculenta*, *Dioscorea pentaphylla*, *Dioscorea pubera*, *Diplazium esculentum*, *Ficus hispida*, *Gmelina arborea*, *Hygrophila auriculata*, *Ipomoea aquatic*, *Luffa aegyptica*, *Manihot esculenta*, *Momordica charantia*, *Moringa oleifera*, *Musa balbisiana*, *Nymphaea pubescens*, *Phyllanthus emblica*, *Piper betle*, *Piper nigrum*, *Syzygium cumini*, *Tamarindus indica*, *Trapa natans*, *Typhonium trilobatum*, *Zingiber officinale*, *Zizyphus mauritiana*.

The above account reflects that *Meches* living in forest-villages or in fringe areas need not to go the market for the purchase of majority of cultivated plants. Again, slowly, some of these plants are preferred by urban people.

PLATE VI



Figs. A. *Baccaurea ramiflora*, B. *Coccinia grandis*,
C. *Colocasia esculenta*, D. *Commelina benghalensis*,
E. *Drymaria cordata*, F. *Duchesnea indica*,
G. *Eichhornia crassipes*, H. *Enhydra fluctuans*

PLATE VII



Figs. A. *Ficus hispida*, B. *Gmelina arborea*,
C. *Helminthostachys zeylanica*, D. *Houttuynia cordata*,
E. *Hygrophila auriculata*, F. *Ipomoea aquatica*,
G. *Lasia spinosa*, H. *Marsilea minuta*

PLATE VIII



Figs. A. *Melastoma malabathricum*, B. *Mimusops elengi*,
C. *Physalis divaricata*, D. *Polycarpon prostratum*,
E. *Portulaca oleracea*, F. *Solanum nigrum*,
G. *Solanum torvum*, H. *Typhonium trilobatum*

7.2. Recorded Fodder Plants

7.2.1. ENUMERATION OF RECORDED FODDER PLANTS

A total of 61 species of plants covering 52 genera from 28 families have been recorded to use as fodder for their domestic cows, buffalos and goats. But, when these animals are allowed to graze openly outside then they consume much larger number of plants. However, through the screening of their collected fodder in different seasons following plants have been recognized.

Achyranthes bidentata Blume [Amaranthaceae]

Vernacular Name: *Aran-dandali Bilai* (Mech); Exscicattus: *Ajita & AP Das 416, 426.*

Leafy shoots are fodder for cows.

Acmella calva (DC.) Jansen [Asteraceae]

Vernacular Name: *Usumai* (Mech); Exscicattus: *Ajita & AP Das 313.*

Whole plant is eaten by pigs.

Aegle marmelos (Linnaeus) Correa [Rutaceae]

Vernacular Name: *Bel Bingfang* (Mech); Exscicattus: *Ajita & AP Das 042.*

Leaves are used as cattle feed.

Alocasia macrorrhizos (Linnaeus) G. Don [Araceae]

Vernacular Name: *Mana Thadung* (Mech); Exscicattus: *Ajita & AP Das 322.*

Whole plant and rhizomes are eaten by pigs.

Alstonia scholaris (Linnaeus) R. Brown [Apocynaceae]

Vernacular Name: *Sithaona* (Mech); Exscicattus: *Ajita & AP Das 417.*

Leaves are cattle-feed.

Alternanthera sessilis (Linnaeus) R. Brown ex DC. [Amaranthaceae]

Vernacular Name: *Nunni* (Mech); Exscicattus: *Ajita & AP Das 300.*

Whole plant is cattle-fodder.

Amaranthus lividus Linnaeus [Amaranthaceae]

Vernacular Name: *Khudna* (Mech); Exscicattus: *Ajita & AP Das 274.*

Whole plant is used as cattle fodder.

Amaranthus spinosus Linnaeus [Amaranthaceae]

Vernacular Name: *Khudna* (Mech); Exscicattus: *Ajita & AP Das 429.*

Shoots are good source of fodder for the cow.

Amaranthus viridis Linnaeus [Amaranthaceae]

Vernacular Name: *Khudna* (Mech); Exscicattus: *Ajita & AP Das 275, 428.*

Whole plant is eaten by cattle.

Amorphophallus bulbifer (Roxburgh) Blume [Araceae]

Vernacular Name: *Tha Thadung* (Mech); Exscicattus: *Ajita & AP Das 081.*

Whole plant is used as fodder for pig.

Annona reticulata Linnaeus [Annonaceae]

Vernacular Name: *Balam Fithai* (Mech); Exscicattus: *Ajita & AP Das 253.*

Shoots and ripe fruits are eaten by cattle.

Artocarpus heterophyllus Lamarck [Moraceae]

Vernacular Name: *Khanthal* (Mech); Exscicattus: *Ajita & AP Das 285.*

Leaves are eaten by cows and goats; ripe fruits are eaten by cows.

Artocarpus lacucha Buchanon-Hamilton [Moraceae]

Vernacular Name: *Daoa* (Mech); Exscicattus: *Ajita & AP Das 170.*

Leaves and fruits are used as fodder.

Axonopus compressus (Swartz) P. Beauvois [Poaceae]

Vernacular Name: *Chhepti Gangse* (Mech); Exscicattus: *Ajita & AP Das 240.*

Whole plant is used as fodder for cows.

Baccaurea ramiflora Loureiro [Euphorbiaceae]

Vernacular Name: *Khusumai* (Mech); Exscicattus: *Ajita & AP Das 026.*

Leaves are eaten by cows and goats.

Bambusa nutans Wallich *ex* Munro [Poaceae]

Vernacular Name: *Ooa* (Mech); Exscicattus: *Ajita & AP Das 286.*

Leaves are used as fodder.

Bambusa balcooa Roxburgh [Poaceae]

Vernacular Name: *Ooa* (Mech); Exscicattus: *Ajita & AP Das 287.*

Leaves are eaten by goats and cows.

Bidens pilosa Linnaeus [Asteraceae]

Vernacular Name: *Guphut Bibar* (Mech); Exscicattus: *Ajita & AP Das 304.*

Whole plants are eaten by pigs.

Boerhavia coccinea Miller [Nyctaginaceae]

Vernacular Name: *Punarnova* (Mech); Exscicattus: *Ajita & AP Das 218.*

Whole plant is fodder.

Chenopodium album Linnaeus [Chenopodiaceae]

Vernacular Name: *Bothhua* (Mech); Exscicattus: *Ajita & AP Das 298*.

Whole plant is cattle-fodder.

Colocasia esculenta (Linnaeus) Schott [Araceae]

Vernacular Name: *Thadung* (Mech); Exscicattus: *Ajita & AP Das 050*.

Whole plants are eaten by pigs.

Commelina benghalensis Linnaeus [Commelinaceae]

Vernacular Name: *Sanai Bibar* (Mech); Exscicattus: *Ajita & AP Das 319*.

Whole plant is cattle fodder.

Cynodon dactylon (Linnaeus) Persoon [Poaceae]

Vernacular Name: *Duba Gang-se* (Mech); Exscicattus: *Ajita & AP Das 288*.

Whole plant is used as fodder.

Cyperus pilosus Vahl [Cyperaceae]

Vernacular Name: *Gang-se* (Mech); Exscicattus: *Ajita & AP Das 341*.

Whole plant is used as cattle feed.

Cyperus rotundus Linnaeus [Cyperaceae]

Vernacular Name: *Mutha Gang-se* (Mech); Exscicattus: *Ajita & AP Das 075*.

Whole plant is fodder.

Digitaria ciliaris (Retzius) Koeler [Poaceae]

Vernacular Name: *Gang-se* (Mech); Exscicattus: *Ajita & AP Das 284*.

Whole plant is used as fodder.

Dillenia indica Linnaeus [Dilleniaceae]

Vernacular Name: *Thaidig* (Mech); Exscicattus: *Ajita & AP Das 022*.

Leaves are eaten by goats.

Dillenia pentagyna Roxburgh [Dilleniaceae]

Vernacular Name: *Rae Bingfang* (Mech); Exscicattus: *Ajita & AP Das 312*.

Leaves are cattle feed.

Diospyros malabarica (Desrousseaux) Kosteletsky [Ebenaceae]

Vernacular Name: *Gab Bingfang* (Mech); Exscicattus: *Ajita & AP Das 345*.

Tender shoots are fodder for goats.

Drymaria cordata (Linnaeus) Willdenow ex Roemer & Schultes [Caryophyllaceae]

Vernacular Name: *Barmadaree* (Mech); Exscicattus: *Ajita & AP Das 146*.

Whole plant is cattle-feed.

Eichhornia crassipes (Martius) Solms [Pontederiaceae].

Vernacular Name: *Pana* (Mech); Exscicattus: *Ajita & AP Das 158*.

Leaves are eaten by cow.

Elaeocarpus floribundus Blume [Elaeocarpaceae]

Vernacular Name: *Jalpoi* (Mech); Exscicattus: *Ajita & AP Das 040*.

Leaves are eaten by cows.

Enydra fluctuans Loureiro [Asteraceae]

Vernacular Name: *Hela* (Mech); Exscicattus: *Ajita & AP Das 431*.

Whole plant is used as fodder.

Eragrostis unioloides (Retzius) Nees ex Steudel [Poaceae]

Vernacular Name: *Gang-se* (Mech); Exscicattus: *Ajita & AP Das 421*.

Whole plant is used as fodder.

Euphorbia hirta Linnaeus [Euphorbiaceae]

Vernacular Name: *Dudhali* (Mech); Exscicattus: *Ajita & AP Das 311*.

Shoots are cattle-feed.

Ficus benghalensis Linnaeus [Moraceae]

Vernacular Name: *Bhot* (Mech); Exscicattus: *Ajita & AP Das 336*.

Leaves are used as cattle feed.

Ficus hispida Linnaeus f. [Moraceae]

Vernacular Name: *Adumri* (Mech); Exscicattus: *Ajita & AP Das 028*.

Leaves are eaten by cows and goats; fruits are much liked by pigs.

Ficus religiosa Linnaeus [Moraceae]

Vernacular Name: *Asar* (Mech); Exscicattus: *Ajita & AP Das 282*.

Leaves are good fodder.

Gmelina arborea Roxburgh [Verbenaceae]

Vernacular Name: *Gambri* (Mech); Exscicattus: *Ajita & AP Das 359*.

Leaves and fruits are eaten by cows.

Imperata cylindrica (Linnaeus) Raeuschel [Poaceae]

Vernacular Name: *Thurmus* (Mech); Exscicattus: *Ajita & AP Das 281*.

Whole plant is used as fodder for cows.

Ipomoea aquatica Forsskål [Convolvulaceae]

Vernacular Name: *Khalmi* (Mech); Exscicattus: *Ajita & A.P. Das 360*.

Whole plant is fodder for cows.

Kyllinga nemoralis (J.R. & G. Forster) Dandy ex Hutchinson & Dalziel [Cyperaceae]

Vernacular Name: *Gang-se* (Mech); Exscicattus: *Ajita & AP Das 342*.

Whole plant is eaten by cows and pigs.

Macaranga denticulata (Blume) Mueller [Euphorbiaceae]

Vernacular Name: *Laigajaou* (Mech); Exscicattus: *Ajita & AP Das 144*.

Leaves are used as fodder.

Mangifera indica Linnaeus [Anacardiaceae]

Vernacular Name: *Khaizou* (Mech); Exscicattus: *Ajita & AP Das 280*.

Leaves are cattle-feed.

Melia azedarach Linnaeus [Meliaceae]

Vernacular Name: *Neem Gadar* (Mech); Exscicattus: *Ajita & AP Das 303*.

Leaves and fruits are eaten by goats.

Mikania micrantha Kunth [Asteraceae]

Vernacular Name: *Rakkhasi Bindong* (Mech); Exscicattus: *Ajita & AP Das 035*.

Whole plant is fodder.

Moringa oleifera Lamarck [Moringaceae]

Vernacular Name: *Sajna* (Mech); Exscicattus: *Ajita & AP Das 041*.

Leaves are fodder.

Musa balbisiana Colla [Musaceae]

Vernacular Name: *Athia Thalit* (Mech); Exscicattus: *Ajita & AP Das 251*.

Leaves, fruits and pseudostems are eaten by cows and goats.

Neolamarckia cadamba (Roxburgh) Bossier [Rubiaceae]

Vernacular Name: *Khadam* (Mech); Exscicattus: *Ajita & AP Das 441*.

Leaves and fruits are used as fodder for cattle.

Oplismenus burmannii (Retzius) P. Beauvois [Poaceae]

Vernacular Name: *Gang-se* (Mech); Exscicattus: *Ajita & AP Das 242*.

Shoots are used as fodder.

Oplismenus compositus (Linnaeus) P. Beauvois [Poaceae]

Vernacular Name: *Gang-se* (Mech); Exscicattus: *Ajita & AP Das 418*.

Shoots are eaten by cows and goats.

Oroxylum indicum (Linnaeus) Bentham ex Kurz [Bignoniaceae]

Vernacular Name: *Kharo Khandai* (Mech); Exscicattus: *Ajita & AP Das 279*.

Leaves are eaten by cattle.

Persicaria chinensis (Linnaeus) H. Gross [Polygonaceae]

Vernacular Name: *Futkol* (Mech); Exscicattus: *Ajita & AP Das 278*.

Whole plant is used as fodder for cows.

Saccharum spontaneum Linnaeus [Poaceae]

Vernacular Name: *Gigab* (Mech); Exscicattus: *Ajita & AP Das 420*.

Leaves are cattle-feed.

Setaria palmifolia (Koenig) Stapf [Poaceae]

Vernacular Name: *Gang-se* (Mech); Exscicattus: *Ajita & AP Das 339*.

Whole plant is fodder.

Spermacocce latifolia Aublet [Rubiaceae]

Vernacular Name: *Hagrani Bilai* (Mech); Exscicattus: *Ajita & AP Das 340*.

Whole plant is used as fodder.

Streblus asper Loureiro [Moraceae]

Vernacular Name: *Seora Bingfang* (Mech); Exscicattus: *Ajita & AP Das 277*.

Leaves are used as fodder for goats.

Syzygium cumini (Linnaeus) Skeels [Myrtaceae]

Vernacular Name: *Jham* (Mech); Exscicattus: *Ajita & AP Das 023*.

Leaves are eaten by cattle.

Toona ciliata M. Roemer [Meliaceae]

Vernacular Name: *Tuni* (Mech); Exscicattus: *Ajita & AP Das 142*.

Leaves are fodder for cattle.

Typhonium trilobatum (Linnaeus) Schott [Araceae]

Vernacular Name: *Thadung* (Mech); Exscicattus: *Ajita & AP Das 365*.

Whole plants are eaten by pigs.

Xanthosoma brasiliense (Desfontaines) Engler [Araceae]

Vernacular Name: *Dudhali Thadung* (Mech); Exscicattus: *Ajita & AP Das 051*.

Whole plants are eaten by pigs.

7.2.2. DISCUSSION

Plants of diverse taxonomic and habit groups are used as fodder by *Meches* for their different domesticated herbivores.

7.2.2.1. Habit Groups: Out of the recorded 61 species, 25 are trees, 29 herbs including grasses and 1 species is climber (*Mikania micrantha*). Trees are *Aegle marmelos*, *Alstonia scholaris*, *Annona reticulata*,

Artocarpus heterophylla, *Artocarpus lacucha*, *Baccaurea ramiflora*, *Bambusa nutans*, *Bambusa balcooa*, *Dillenia indica*, *Dillenia pentagyna*, *Diospyros malabarica*, *Elaeocarpus floribundus*, *Ficus benghalensis*, *Ficus hispida*, *Ficus religiosa*, *Gmelina arborea*, *Macaranga denticulata*, *Mangifera indica*, *Melia azedarach*, *Moringa oleifera*, *Neolamarckia cadamba*, *Oroxylum indicum*, *Streblus asper*, *Syzygium cumini*, *Toona ciliata* belonging to 16 families and herbs are *Achyranthes bidentata*, *Acmella calva*, *Alternanthera sessilis*, *Amaranthus lividus*, *Amaranthus spinosus*, *Amaranthus viridis*, *Axonopus compressus*, *Bidens pilosa*, *Boerhavia coccinea*, *Chenopodium album*, *Commelina benghalensis*, *Cynodon dactylon*, *Cyperus pilosus*, *Cyperus rotundus*, *Digitaria ciliaris*, *Drymaria cordata*, *Eichhornia crassipes*, *Enydra fluctuans*, *Eragrostis unioides*, *Euphorbia hirta*, *Imperata cylindrica*, *Ipomoea aquatica*, *Kyllinga nemoralis*, *Oplismenus burmannii*, *Oplismenus compositus*, *Persicaria chinensis*, *Saccharum spontaneum*, *Setaria palmifolia*, *Spermacoce latifolia*, under 14 families. Geophytes are 6 species belonging to 2 families i.e. *Alocasia macrorrhizos*, *Amorphophallus bulbifer*, *Colocasia esculenta*, *Musa balbisiana*, *Typhonium trilobatum*, *Xanthosoma brasiliense*.

7.2.2.2. Fodder Part of Plants: Only leaves are used as fodder from 27 plant species like *Aegle marmelos*, *Alstonia scholaris*, *Anona reticulata*, *Artocarpus heterophylla*, *Artocarpus lacucha*, *Baccaurea ramiflora*, *Bambusa nutans*, *Bambusa balcooa*, *Eichhornia crassipes*, *Elaeocarpus floribundus*, *Dillenia indica*, *Dillenia pentagyna*, *Ficus benghalensis*, *Ficus hispida*, *Ficus religiosa*, *Gmelina arborea*, *Macaranga denticulata*, *Mangifera indica*, *Melia azedarach*, *Moringa oleifera*, *Musa balbisiana*, *Neolamarckia cadamba*, *Oroxylum indicum*, *Saccharum spontaneum*, *Streblus asper*, *Syzygium cumini*, *Toona ciliata*. 28 species used as whole plant i.e. *Acmella calva*, *Alocasia macrorrhizos*, *Alternanthera sessilis*, *Amaranthus lividus*, *Amaranthus viridis*, *Amorphophallus bulbifer*, *Axonopus compressus*, *Bidens pilosa*, *Boerhavia coccinea*, *Chenopodium album*, *Colocasia esculenta*, *Commelina benghalensis*, *Cynodon dactylon*, *Cyperus pilosus*, *Cyperus rotundus*, *Digitaria ciliaris*, *Drymaria cordata*, *Enydra fluctuans*, *Eragrostis unioides*, *Imperata cylindrica*, *Ipomoea aquatica*, *Kyllinga nemoralis*, *Mikania micrantha*, *Persicaria chinensis*, *Setaria palmifolia*, *Spermacoce latifolia*, *Typhonium trilobatum*, *Xanthosoma brasiliense*. Leafy shoots of 7 species like *Achyranthes bidentata*, *Amaranthus spinosus*, *Annona reticulata*, *Diospyros malabarica*, *Euphorbia hirta*, *Oplismenus burmannii*, *Oplismenus compositus* are collected as fodder for cattle. Ripe and unripe fruits of *Annona reticulata*, *Artocarpus heterophylla*, *Artocarpus lacucha*, *Ficus hispida*, *Gmelina arborea*, *Melia azedarach*, *Musa balbisiana*, *Neolamarckia cadamba* are collected for cows and pigs. Pseudostems of *Musa balbisiana* are also collected for cows. Along with such plants common grasses and sedges are also collected as fodder.

7.2.3. Conclusion

It is difficult to say that the list presented here is the complete list of fodder on which domestic animals generally brows. In fact, cows, buffaloes and goats brows on innumerable number of plants including cultivated ones when they are released for grazing during day-time. But, the presented list has been prepared from the fodder collected by people as supplementary food when animals are at home.

7.3. Recorded Plants for Domestic Uses

7.3.1. ENUMERATION OF RECORDED PLANTS FOR DOMESTIC USES

We need a wide array of materials for our survival. After oxygen, water and food, next important materials may include shelter/ house, dress, weapons for hunting and safety, equipments for fishing, de-husking of food-grains etc. All these are basic requirements for survival and human societies living in any corner of the planet need materials for such purposes.

People of *Mech* community is not the exception and during the present survey numerous such uses of plants has been recorded those may be grouped as 'Domestic Uses'. This chapter does not include plants used for religious, medicinal, edible, fodder, poisonous and decorative plants. However, plants of Domestic Uses are enumerated below along with their local names and uses.

Alangium chinense (Loureiro) Harms [Alangiaceae]

Vernacular Name: *Ban* (Mech); Exscicattus: *Ajita & AP Das 422*.

The wood is used as fuel.

Alstonia scholaris R. Brown [Apocynaceae]

Vernacular Name: *Sithaona* (Mech); Exscicattus: *Ajita & AP Das 030*.

The wood is used for making wooden sandal (*Nakthung*) and musical instrument (*Dotara*).

Barringtonia acutangula (Linnaeus) Gaertner [Lecythidaceae]

Vernacular Name: *Hijol Bingfang* (Mech); Exscicattus: *Ajita & AP Das 265*.

Children play with its fruits.

Bambusa nutans Wallich ex Munro [Poaceae]

Vernacular Name: *Ooa* (Mech); Exscicattus: *Ajita & AP Das 012*.

Bamboo is used for making house, various fishing equipments, grain-sieving (*Chhandrai*), winnowing utensils (*Chhongrai*), water-storing cylinder, hunting equipments, musical instruments, playing sticks (*Phatka*) (Plate IX, Fig. A), etc.

Bambusa balcooa Roxburgh [Poaceae]

Vernacular Name: *Ooa* (Mech); Exscicattus: *Ajita & AP Das 439*.

Bamboo is used for making poles, thatching of roof, tool handles etc.

Bombax ceiba Linnaeus [Bombacaceae]

Vernacular Name: *Simul* (Mech); Exscicattus: *Ajita & AP Das 099*.

Floss is used for making pillow (*Gandu*).

Callicarpa arborea Roxburgh [Verbenaceae]

Vernacular Name: *Dhouli* (Mech); Exscicattus: *Ajita & AP Das 020*.

The wood is used for making furniture (*Ijeng Ila*).

Casearia graveolens Dalziel [Flacourtiaceae]

Vernacular Name: *Guti Fithai* (Mech); Exscicattus: *Ajita & AP Das 469*.

Children play with ripe fruits.

Cassia fistula Linnaeus [Caesalpiniaceae]

Vernacular Name: *Dindong* (Mech); Exscicattus: *Ajita & AP Das 413*.

Fruits are burnt and the ash is used for washing utensils.

Chukrasia tabularis A. Jussieu [Meliaceae]

Vernacular Name: *Chikrasi* (Mech); Exscicattus: *Ajita & AP Das 306*.

Timber is used for making house building materials.

Corchorus capsularis Linnaeus [Tiliaceae]

Vernacular Name: *Phatto* (Mech); Exscicattus: *Ajita & AP Das 258*.

Fiber is used for making rope (*Doudung*) (Plate IX, Fig. B) and jute stick (*Phatto-sheer-kha*) is used for thatching roof.

Dalbergia sissoo Roxburgh ex DC. [Fabaceae]

Vernacular Name: *Khuzrab* (Mech); Exscicattus: *Ajita & AP Das 032*.

The timber is used for making furniture (*Ijeng ila*), door (*Duar*) and window (*Janala*) frames.

Deeringia amaranthoides (Lamarck) Merrill [Amaranthaceae]

Vernacular Name: *Maibet* (Mech); Exscicattus: *Ajita & AP Das 427*.

A deep violet dye is extracted from its ripe fruits.

Diospyros malabarica (Desrousseaux) Kosteletsky [Ebenaceae]

Vernacular Name: *Gab Bingfang* (Mech); Exscicattus: *Ajita & AP Das 345*.

Fruit juice is used for tanning fishing nets.

Gmelina arborea Roxburgh [Verbenaceae]

Vernacular Name: *Gambri* (Mech); Exscicattus: *Ajita & AP Das 359*.

The wood is used for making furniture (*Ijeng ila*).

Gossypium arboreum Linnaeus [Malvaceae]

Vernacular Name: *Kshun Phang* (Mech); Exscicattus: *Ajita & AP Das 458*.

Cotton-lints, obtained from its capsules is used for making mattress (*Thousok*) and traditional dresses.

Jatropha curcas Linnaeus [Euphorbiaceae]

Vernacular Name: *Enda* (Mech); Exscicattus: *Ajita & AP Das 138*.

Endosperm is used for lightening purposes.

Lagerstroemia hirsuta (Lamarck) Willdenow [Lythraceae]

Vernacular Name: *Jharul* (Mech); Exscicattus: *Ajita & AP Das 259*.

The timber is used for making house building materials such as poles and planks etc. The wood is used as fuel wood.

Lannea coromandelica (Houttuyn) Merrill [Anacardiaceae]

Vernacular Name: *Giga* (Mech); Exscicattus: *Ajita & AP Das 260*.

Gum oozing out from bas is used as adhesive.

Litsea monopetala (Roxburgh) Persoon [Lauraceae]

Vernacular Name: *Ban* (Mech); Exscicattus: *Ajita & AP Das 191*.

Trunk produces fuel wood.

Luffa aegyptiaca Miller [Cucurbitaceae]

Vernacular Name: *Falla* (Mech); Exscicattus: *Ajita & AP Das 412*.

The fibrous mesocarp is used as bath sponge (Plate IX, Fig. C).

Macaranga denticulata (Blume) Mueller [Euphorbiaceae]

Vernacular Name: *Laigajaou* (Mech); Exscicattus: *Ajita & AP Das 144*.

The wood is used as fuel. Leaves are used for packing meat, fish etc.

Michelia champaca Linnaeus [Magnoliaceae]

Vernacular Name: *Champ* (Mech); Exscicattus: *Ajita & AP Das 031*.

Trunk produces good quality timber for making furniture and fire-wood (Plate IX, Fig. D).

Mikania micrantha Kunth [Asteraceae]

Vernacular Name: *Rakkhasi Bindong* (Mech); Exscicattus: *Ajita & AP Das 432*.

The stem is used as cordage.

Pericampylus glaucas (Lamarck) Merrill [Menispermaceae]

Vernacular Name: *Nalithapa* (Mech); Exscicattus: *Ajita & AP Das 264*.

The stem is used as rope.

Phrynium pubinerve Blume [Marantaceae]

Vernacular Name: *Laihu* (Mech); Exscicattus: *Ajita & AP Das 067*.

Leaf used for making head-cover known as *Ghum*.

Ricinus communis Linnaeus [Euphorbiaceae]

Vernacular Name: *Eri* (Mech); Exscicattus: *Ajita & AP Das 102*.

Few fruits are pierced in a bamboo stick and used it as a torch (*Khati-sukhani*) on burning.

Saccharum spontaneum Linnaeus [Poaceae]

Vernacular Name: *Gigab* (Mech); Exscicattus: *Ajita & AP Das 048*.

Whole dry plant is used for thatching roof (*Ukhum*). Leaves are used for making commercially viable good quality ropes (Plate IX, Fig. E).

Sapindus rarak DC. [Sapindaceae]

Vernacular Name: *Riha Bingfang* (Mech); Exscicattus: *Ajita & AP Das 100*.

Fruits are soaked in water and then used as detergent and shampoo.

Sida acuta Burman f. [Malvaceae]

Vernacular Name: *Bamonmara* (Mech); Exscicattus: *Ajita & AP Das 065*.

Stem is used as cordage and dry whole plant is used as broom.

Shorea robusta Roxburgh ex Gaertner f. [Dipterocarpaceae]

Vernacular Name: *Sal-dom-phang* (Mech); Exscicattus: *Ajita & AP Das 029*.

The soft wood and branches are used as fuel and the heart wood is for making houses, furniture, grain-husking instrument (*Dhiki*) (Plate IX, Fig. F), wooden mortar (*Ooal*), wooden plough (*Nangal*) (Plate IX, Fig. G) etc.

Sterculia villosa Roxburgh [Sterculiaceae]

Vernacular Name: *Odlā* (Mech); Exscicattus: *Ajita & AP Das 435*.

The bark is used as cordage.

Tectona grandis Linnaeus f. [Verbenaceae]

Vernacular Name: *Seghun Bingfang* (Mech); Exscicattus: *Ajita & AP Das 097*.

Trunk produce excellent quality wood for making furniture (*Ijeng ila*) and loom (*Chancheli*); leaves are used for packing. (Plate IX, Fig. H).

Tephrosia candida DC. [Fabaceae]

Vernacular Name: *Bhogla* (Mech); Exscicattus: *Ajita & AP Das 083*.

Dry leaves are fertilizing substance (manure) and stems are used as fuel.

Tetrastigma bracteolatum (Wallich) Planchon [Vitaceae]

Vernacular Name: *Benda Bindong* (Mech); Exscicattus: *Ajita & AP Das 194*.

The stem is used as cordage.

Toona ciliata M. Roemer [Meliaceae]

Vernacular Name: *Tuni* (Mech); Exscicattus: *Ajita & AP Das 142*.

The wood is used for making quality furniture.

Trema orientalis (Linnaeus) Blume [Ulmaceae]

Vernacular Name: *Ban* (Mech); Exscicattus: *Ajita & AP Das 462*.

The wood is used as fuel.

Trewia nudiflora Linnaeus [Euphorbiaceae]

Vernacular Name: *Pitali* (Mech); Exscicattus: *Ajita & AP Das 141*.

The wood is used as fuel.

Vetiveria zizanioides Nash [Poaceae]

Vernacular Name: *Birna* (Mech); Exscicattus: *Ajita & AP Das 049*.

Leaves are used for making broom (*Hasib*).

7.3.2. DISCUSSION

To meet up the needs of their innumerable domestic purposes they collect a large number of plants from their nearby vegetation. This chapter does not deal with the edible or fodder plants as those are very important groups and are presented separately.

7.3.2.1. Habit Groups: The present survey recorded a total of 39 species of angiospermic plants, covering 38 genera and 28 families used different domestic works by the people of *Mech* community living in Duars of West Bengal.

The habit-group distribution of recorded plants of different domestic uses has been analyzed in Table 7.3.1.

Table 7.3.1. Habit group distribution of the plants of domestic uses.

Habit-group	Taxa		
	Family	Genus	Species
Tree	19	23	24
Shrub	4	5	5
Herb	4	5	5
Climber	4	5	5
Total recorded species:			39

It is quite interesting to note that in the category of 'Domestic Plants' out of a total of 39 species recorded 24, i.e. 61.5 % are trees. Number of climbers used here is also comparatively higher and, on the other hand, proportion of herbs is quite less.

7.3.2.2. Types of Domestic Uses: As it has already discussed, we need different plants for different purpose related to our survival. Those types may be recognized as:

- i. **Fuel:** At least for cooking their food they need quite a good amount of fuel. In general, most of the dry plants with sap wood are used for this purpose. Though most of the dry herbs, shrubs and climbers are used as fuel but they prefer the tree trunk and branches with sap-wood or soft wood. At least nine species, coming from 9 genera of 8 families are preferred by them. These are *Alangium chinense*, *Lagerstroemia hirsuta*, *Litsea monopetala*, *Macaranga denticulata*, *Michelia champaca*, *Shorea robusta*, *Tephrosia candida*, *Trema orientalis* and *Trewia nudiflora*.
- ii. **House-building materials:** House building materials include poles, wall materials and thatch. For this 8 species (in 7 genera from 6 families) have been listed, namely *Bambusa*

nutans, *Bambusa balcooa*, *Chukrassia tabularis*, *Corchorus capsularis*, *Dalbergia sissoo*, *Lagerstroemia hirsuta*, *Saccharum spontaneum* and *Shorea robusta*.

- iii. **Wood for furniture:** Timber from only few selected trees is suitable for making furniture. Mechs in Duars generally use 7 species (from 7 genera and 5 families) for this. These are *Callicarpa arborea*, *Dalbergia sissoo*, *Gmelina arborea*, *Michelia champaca*, *Shorea robusta*, *Tectona grandis* and *Toona ciliata*.
- iv. **Stuffing materials:** The floss from *Bombax ceiba* and cotton from *Gossypium arboretum* are used for stuffing mattresses and pillows and for making their traditional dresses. Of these, while the first plant is wild and abundant in this region, the second one is generally grown near the houses. *Gossypium arboretum* is not in cultivation in this area.
- v. **Packing/ Packaging materials:** Generally the large leaves of *Macaranga denticulata* and *Tectona grandis* are used as packing materials.
- vi. **Cordage/Rope:** While the slender and flexible stems of some climbing plants like *Mikania micrantha*, *Pericampylus glaucas* and *Tetrastigma bracteolatum* are used directly as ropes, they extract fibers from the stem of *Corchorus capsularis*, *Sida acuta* and *Sterculia villosa* and twist to produce ropes.
- vii. **Adhesive:** Gum exudes from the bark of *Lannea coromandelica* is used as adhesive.
- viii. **Bath sponge:** The fibrous mesocarp of *Luffa aegyptiaca*, after drying, is widely used as bath-sponge. This is also having good demand in the market for the same purpose.
- ix. **Broom:** Entire whole plant of *Sida acuta* after drying and removing leaves and the stiff dried leaves of *Vetiveria zizanioides* are used as broom by most of the tribal communities in the area. Brooms made from *Vetiveria zizanioides* is also marketed in good amount.
- x. **Detergent/Shampoo:** Fruits of *Sapindus rarak* is well known as a high quality washing agent and is often used as shampoo since long. It is also having quite high demand in the market. The plant grows wild in the Duars.
- xi. **Dye:** Ripe fruits of the amaranthoid climber *Deeringia amaranthoides* is used to extract a red color to dye cloth and for other purposes.
- xii. **Tools handles:** The bases of old bamboos (*Bambusa balcooa*) produce excellent and much durable tool-handles.

- xiii. **Grain processing equipment:** For sieving, winnowing, storing baskets *Bambusa nutans* is used widely. This bamboo is also used as water-storing cylinder.
- xiv. **Fishing & hunting equipments:** For making different types of fishing and hunting equipments they produce branches and main stem of *Bambusa nutans*.
- xv. **Hat/ Umbrella:** Large and leathery leaves of *Phrynium pubinerve* is used for making hats and umbrella especially for cultivation during monsoon.
- xvi. **Illumination:** The endosperm is taken out from the large seeds of *Jatropha curcas* and *Ricinus communis*, dry under the sun. On burning it produce beautiful white light. However, *Jatropha* and castor oils are extracted from seeds and are generally used for lighting lamps.
- xvii. **Manure:** High quality green-manure is produced by decomposing the leafy young branches of *Tephrosia candida*.
- xviii. **Musical instruments:** The timber of *Alstonia scholaris* is used for musical instrument (*Dotara*). The stem of *Bambusa nutans* is also used for making playing sticks for drums.
- xix. **Tanning:** The juice from the young fruits of *Diospyros malabarica* contain high amount of tannin which they used to tan their fishing nets
- xx. **Washing detergent:** Ash produced on burning the fruits of *Cassia fistula* is used for washing utensils.
- xxi. **Wooden sandal:** Wood of *Alstonia scholaris* is used for making wooden-sandals which is referred as *Nakthung*.
- xxii. **Sports goods:** Different types of sports items like *phatka* and *guti* are manufactured from the stem of *Bambusa nutans*, *Barringtonia acutangula* and *Casearia graveolens*.

It is difficult to prepare a final list of domestic uses. But, above discussion has covered the major areas and the majority of the plants they use. Different types of uses of plants have been summarized numerically in Table 7.3.2.

Table 7.3.2. Numerical summery of the uses of plants for different types of domestic requirements

Uses	Taxa		
	Family	Genus	Species
Fuel	8	9	9
House Building	6	7	8

Furniture making	5	7	7
Stuffing material	2	2	2
Packing	2	2	2
Cordage/ Rope	6	6	6
Adhesive	1	1	1
Bath sponge	1	1	1
Broom	2	2	2
Detergent/ Shampoo	1	1	1
Dye	1	1	1
Tools handle	1	1	1
Grain processing equipments	1	1	1
Fishing & hunting equipments	1	1	1
Hat/ Umbrella	1	1	1
Illumination	1	2	2
Manure	1	1	1
Musical instruments	2	2	2
Tanning	1	1	1
Washing utensil	1	1	1
Wooden sandal	1	1	1
Sports goods	3	3	3

From the above discussion one can be attracted to the uses of bamboos in their daily activities. Quite a few species of bamboos are growing in Duars and all those are used by the people of *Mech* community for one or more purposes. Probably, 'bamboo' is the most important plant in the life of *Mech* people after *Oryza sativa*.

7.3.2.3. Marketability of these Plants: During field studies it is noticed that timber and bamboo play a vital role in the economy of *Mech* people. They make various types of bamboo-made containers, fishing traps (*Jakhoi*, *Burung*, *Koka*, *Tepai*), fish keeping container (*Khobai*), sieves (*Chhandrai*), winnowing-fan (*Chhongrai*), wooden mortar (*Ooal*), broom (*Hasib*) etc. and sell them in local markets. In addition, they also collect and sale some amount of fire-wood in local market. The commercial importance of the numerous plants they use in their every-day life are with much market value. But, as per rule of the land, they are not permitted to collect the desired quality and quantity of such plants for marketing.

PLATE IX



Figs. A. *Phatka* (Bamboo made playing stick), B. *Doudung* (Rope) made from the fibre of *Corchorus capsularis*, C. Dry fruit of *Luffa aegyptica* (*Falla*), D. *Michelia champaca* (Timber-wood), E. Whole plant of *Saccharum spontaneum* used as rope, F. *Dhiki* (Husking tool), G. *Nangal* (Wooden plough), H. Leaves of *Tectona grandis* used for packing

7.4. Recorded Medicinal Plants

People of *Mech* community use a large number of plants to treat the diseases they suffer. While in some cases a single plant is used as medicine, and for many other cases they use a definite formulation using more than one species of plants. Most of the required plants they collect from the vegetation around them, few they grow near their residence and few others they procure from other sources including market. The method of preparation of medicines are of different type and the mode of application are generally in the form of tablet, extract, paste or just touch.

The result of the present survey for the ethnomedicinal plants are presented here in two separate categories:

- I. Plants used in solitary, and
- II. Plants used in definite formulations.

7.4.1. Plants Used in Solitary

A good number of plants are used solitarily against numerous diseases or discomforts. Those plants are recorded below along with their vernacular names and the methods of preparation and administration of drugs.

7.4.1.1. ENUMERATION OF PLANTS USED IN SOLITARY

Acmella calva (DC.) R.K. Jansen [Asteraceae] (Plate X, Fig. A).

Vernacular Name: *Usumai* (Mech); Exscicattus: *Ajita & AP Das 118*.

- Leaves are boiled in water with black pepper and one cup of juice is given in the morning for curing body ache.
- Leaves are cooked with fish and given to women daily after childbirth. It strengthens the weak mother.

Acorus calamus Linnaeus [Acoraceae]

Vernacular Name: *Buchi* (Mech); Exscicattus: *Ajita & AP Das 140*.

2 gm of rhizome is pounded and massaged on scalp. After sometime they wash the hairs with water for removal of lice.

Aegle marmelos (Linnaeus) Correa [Rutaceae]

Vernacular Name: *Bel Bingfang* (Mech); Exscicattus: *Ajita & AP Das 437*.

One 2.5 cm long piece of root is tied to the hair to concentrate mind.

Ageratum conyzoides Linnaeus [Asteraceae] (Plate X, Fig. B).

Vernacular Name: *Hagrani Tulutsi* (Mech); Exscicattus: *Ajita & AP Das 183*.

Sufficient leaves are crushed and applied immediately after cut until bleeding stops.

Alstonia scholaris (Linnaeus) R. Brown [Apocynaceae]

Vernacular Name: *Sithaona* (Mech); Exscicattus: *Ajita & AP Das 433*.

Inner stem part is pounded and applied over the chest once in a day in breathing problem till cure.

Amaranthus spinosus Linnaeus [Amaranthaceae]

Vernacular Name: *Khudna* (Mech); Exscicattus: *Ajita & AP Das 434*.

Leaves are pounded and applied on boil for early maturation.

Ambroma augusta (Linnaeus) Linnaeus f. [Sterculiaceae] (Plate X, Fig. C).

Vernacular Name: *Ulat Khambal* (Mech); Exscicattus: *Ajita & AP Das 320*.

About 200 ml juice of root-bark is taken in empty stomach daily in 5 days for dysmenorrhoea.

Andrographis paniculata (Burman f.) Nees [Acanthaceae] (Plate X, Fig. D).

Vernacular Name: *Khalamegh* (Mech); Exscicattus: *Ajita & AP Das 328*.

Dried stem parts put in water overnight. Next morning one cup of the yellowish color water is given internally in empty stomach for small worms (vermifuge).

Argemone mexicana Linnaeus [Papavaraceae] (Plate X, Fig. E).

Vernacular Name: *Khata Bilai* (Mech); Exscicattus: *Ajita & AP Das 283*.

Ten leaves are boiled in 50gms mustard oil (*Thao*) and applied on the itching area twice daily.

Argyreia roxburghii Choisy [Convolvulaceae] (Plate X, Fig. F).

Vernacular Name: *Dudhali Bindong* (Mech); Exscicattus: *Ajita & AP Das 063*.

In constipation, 150-200 gms roots are pounded and boiled in sufficient water. After that ½ cup decoction is given in the morning and another ½ cup decoction in the evening.

Artemisia indica Willdenow [Asteraceae]

Vernacular Name: *Nadaona* (Mech); Exscicattus: *Ajita & AP Das 347*.

Leaf extract is massaged on body to check body-itching.

Azadirachta indica A. Jussieu [Meliaceae]

Vernacular Name: *Neem Bingfang* (Mech); Exscicattus: *Ajita & AP Das 438*.

About 10 leaves are soaked in one-bucket of water and taken a bath with this water to cure itching.

Bambusa balcooa Roxburgh [Poaceae]

Vernacular Name: *Ooa* (Mech); Exscicattus: *Ajita & AP Das 021*.

Five leaves and 1 gm new grown stem part of bamboo, 5 gms fragrant spices (small and big cardamom, cinnamon and cloves) are pounded and boiled in 1 lit water and half cup of decoction is given thrice daily in empty stomach in pneumonia.

Bambusa nutans Wallich ex Munro [Poaceae]

Vernacular Name: *Ooa* (Mech); Exscicattus: *Ajita & AP Das 286*.

About 10-12 leaves are boiled in sufficient water. Juice is given to the patient thrice daily in measles.

Boerhavia coccinea Miller [Nyctaginaceae] (Plate X, Fig. G).

Vernacular Name: *Punornova* (Mech); Exscicattus: *Ajita & AP Das 446*.

- In insect bite, leaves are crushed and the infusion is applied on bitten site.
- 30 ml leaf decoction is taken before sleeping in case of insomnia.

Bombax ceiba Linnaeus [Bombacaceae]

Vernacular Name: *Simul* (Mech); Exscicattus: *Ajita & AP Das 443*.

Thorns are crushed and the paste is applied externally on the face to remove pimples.

Breynia retusa (Dennstedt) Alston [Euphorbiaceae]

Vernacular Name: *Okhen* (Mech); Exscicattus: *Ajita & AP Das 091*.

In mastalgia (breast pain after delivery), 15 gms roots are pounded and simultaneously 20 gms leaves are boiled in water. Root juice is applied on breast twice or thrice daily. Boiled leaf juice is given to the mother once in a day.

Calotropis gigantea (Linnaeus) W.T. Aiton [Asclepiadaceae]

Vernacular Name: *Aganda* (Mech); Exscicattus: *Ajita & AP Das 039*.

Astringent juice of leaves is useful for curing ringworm.

Careya arborea Roxburgh [Lecythidaceae] (Plate X, Fig. H).

Vernacular Name: *Khoom Bingfang* (Mech); Exscicattus: *Ajita & AP Das 440*.

100gms. pounded stem bark is soaked in 250 gms. water for about twelve hours and the decoction is given in the morning and evening in empty stomach in diarrhea.

Cassia alata Linnaeus [Caesalpiniaceae] (Plate XI, Fig. A).

Vernacular Name: *Dad Bingfang* (Mech); Exscicattus: *Ajita & AP Das 229*.

Leaves are crushed and applied on ringworms.

Cassia tora Linnaeus [Caesalpiniaceae] (Plate XI, Fig. B).

Vernacular Name: *Shinchum* (Mech); Exscicattus: *Ajita & AP Das 200, 447*.

- Two pieces of roots are crushed and added with one cup of water. This liquid mix is taken twice in a day in influenza.
- Root is pulled out in one breath in early morning and a piece of root of about 2 cm length is hung with a thread to treat periodic fever (fever which occurs at regular intervals).

Citrus limon (Linnaeus) Osbeck [Rutaceae]

Vernacular Name: *Nareng* (Mech); Exscicattus: *Ajita & AP Das 101*.

Juice of one fruit is mixed with one glass of water. It is taken as antiemetic.

Cissus quadrangularis Linnaeus [Vitaceae]

Vernacular Name: *Harjhor Bindong* (Mech); Exscicattus: *Ajita & AP Das 379*.

Whole plant is pounded and smeared on bone fractured area and plastered with bamboo splint.

Colocasia esculenta (Linnaeus) Schott [Araceae]

Vernacular Name: *Thadung* (Mech); Exscicattus: *Ajita & AP Das 338*.

- It is used to itch the ear with the petiole to get relieve from ear itchiness.
- One gram rhizome and one pinch potash-alum (phatkiri) are pounded and boiled in ½ cup coconut oil and applied thrice daily in gum wound. During treatment it is advised not to take any sour food and fish

Corchorus capsularis Linnaeus [Tiliaceae]

Vernacular Name: *Phatto* (Mech); Exscicattus: *Ajita & AP Das 349*.

3 tablespoon leaf juice and 1 tablespoon mustard oil are mixed and applied on eruption caused by cater pillars.

Costus speciosus (Koenig) J.E. Smith [Costaceae]

Vernacular Name: *Debgugri* (Mech); Exscicattus: *Ajita & AP Das 317*.

In case of leucorrhoea (white discharge), half-cup of rhizome extract and two pinches of sugar candy (*misri*) are mixed and given orally in empty stomach once in a day for one week.

Crassocephalum crepidioides (Benth) S. Moore [Asteraceae]

Vernacular Name: *Jenthai* (Mech); Exscicattus: *Ajita & AP Das 145*.

Leaves are pounded and the paste is applied on cut and continued till cure.

Curcuma aeruginosa Roxburgh [Zingiberaceae] (Plate XI, Fig. C).

Vernacular Name: *Gocham Haldu* (Mech); Exscicattus: *Ajita & AP Das 370*.

When fall under evil influence, 10 gms rhizome is crushed and given to the attacked person. This may be considered as a magico-religious treatment.

Curcuma longa Linnaeus [Zingiberaceae] (Plate XI, Fig. D).

Vernacular Name: *Haldi* (Mech); Exscicattus: *Ajita & AP Das 348*.

A small part of flower is tied to the hair of the expectant mother at the time of delivery to induce labour pain. Simultaneously, some part of flower is ground and given orally to her.

Cuscuta reflexa Roxburgh [Cuscutaceae]

Vernacular Name: *Sona Bindong* (Mech); Exscicattus: *Ajita & AP Das 380*.

Whole plant is crushed and applied externally on psoriasis affected area of the body.

Cynodon dactylon (Linnaeus) Persoon [Poaceae]

Vernacular Name: *Duba Gang-se* (Mech); Exscicattus: *Ajita & AP Das 054, 215*.

- Leafy twigs are crushed and half-cup of decoction is given to the patient of anaemia daily till cure.
- In case of brittle nail, whole plant is crushed and applied on affected nail.

Cyperus rotundus Linnaeus [Cyperaceae]

Vernacular Name: *Mutha Gang-se* (Mech); Exscicattus: *Ajita & AP Das 075*.

Three tubers are pounded and given in constipation twice daily for two days.

Datura metel Linnaeus [Solanaceae]

Vernacular Name: *Dotra* (Mech); Exscicattus: *Ajita & AP Das 074, 449.*

2 – 3 crushed seeds are boiled in ½ cup of mustard oil. This medicated oil is massaged on patient's body to cure the rheumatic pain.

- In case of mad dog-bite, 6 seeds are cracked and eaten on first day; 2 seeds on second day and 1 seed on the third day.
- After making a hole in the fruit, the whitlow-affected finger is entered into the fruit and keeps it till cure.

Eclipta prostrata (Linnaeus) Linnaeus [Asteraceae] (Plate XI, Fig. E).

Vernacular Name: *Kalkhasri* (Mech); Exscicattus: *Ajita & AP Das 104.*

1 gm leaves are soaked in one glass of water overnight. The infusion is taken in the morning in empty stomach in lochia (excessive bleeding after delivery).

Euphorbia hirta Linnaeus [Euphorbiaceae] (Plate XI, Fig. F).

Vernacular Name: *Dudhali* (Mech); Exscicattus: *Ajita & AP Das 337.*

Sufficient leaves are boiled in sufficient water and taken once in a day with boiled rice for improving lactation.

Glycosmis pentaphylla (Retzius) DC. [Rutaceae]

Vernacular Name: *Motra* (Mech); Exscicattus: *Ajita & AP Das 448.*

Half-cup of leaf juice is taken as vermifuge in empty stomach in the morning daily till cure.

Gmelina arborea Roxburgh [Verbenaceae]

Vernacular Name: *Gambri* (Mech); Exscicattus: *Ajita & AP Das 359.*

In pharyngitis ripe fruits are eaten raw daily.

Hibiscus rosa-sinensis Linnaeus [Malvaceae] (Plate XI, Fig. G).

Vernacular Name: *Panchhomukhi Jhova* (Mech); Exscicattus: *Ajita & AP Das 225.*

In metrorrhagia (irregular menstrual cycle), three flowers are pounded and the decoction is given in empty stomach for 4 – 5 days before menstrual cycle.

Ipomoea aquatica Forsskål [Convolvulaceae]

Vernacular Name: *Khalmi* (Mech); Exscicattus: *Ajita & AP Das 079.*

A necklace is prepared from small pieces of stem and the necklace is stuck round the head of the jaundice-patient.

Jatropha curcas Linnaeus [Euphorbiaceae]

Vernacular Name: *Enda* (Mech); Exscicattus: *Ajita & AP Das 361.*

- Inner part of stem is crushed and boiled in water. The decoction is applied thrice daily for two days in toothache.
- Latex from stem is dropped onto a sugar-cake (*Batasa*) and given such three sugar-cakes once in a day for 2-3 days in empty stomach in blood dysentery.

Leucas indica (Linnaeus) R. Brown ex Vatke [Lamiaceae] (Plate XI, Fig. H).

Vernacular Name: *Khansisa* (Mech); Exscicattus: *Ajita & AP Das 089, 305.*

- Young leaves are pounded and taken into a cotton-cloth. 5 drops of juice is dropped into the nostrils twice daily till cure.
- In case of body swelling, 20 – 25 leaves are pounded and slight salt is added with it and the paste is applied on swelling for 2 – 3 days.
- One spoon of crushed leaf is mixed with one glass of water and gurgled with this twice daily in sore throat.
- 12 leaves are pounded and squeezed; the extract is mixed with 4-5 drops mustard oil and applied on itching areas with the hen feather.

Mangifera indica Linnaeus [Anacardiaceae]

Vernacular Name: *Khaizou* (Mech); Exscicattus: *Ajita & AP Das 414*.

Stem-bark is crushed and 4-5 spoon-full of juice is mixed with 1 cup of milk and given in the morning in empty stomach in jaundice.

Melastoma malabathricum Linnaeus [Melastomataceae]

Vernacular Name: *Daukhiboi* (Mech); Exscicattus: *Ajita & AP Das 445*.

About 70 gms of dried roots are boiled in 100 gm black Sesamum oil. This medicated oil is used once in a week for dyeing hair.

Mimosa pudica Linnaeus [Mimosaceae]

Vernacular Name: *Sumukhchi* (Mech); Exscicattus: *Ajita & AP Das 059*.

Root is pulled out in one breath is stuck to the lock of hair of the expectant mother at the time of delivery to induce labor-pain. Immediately after delivery, the root piece is removed.

Momordica dioica Roxburgh ex Willdenow [Cucurbitaceae]

Vernacular Name: *Aamkhora* (Mech); Exscicattus: *Ajita & AP Das 235*.

Half root-tuber is crushed and massaged the affected part of the body in rheumatic pain.

Moringa oleifera Lamarck [Moringaceae]

Vernacular Name: *Sojno Bingfang* (Mech); Exscicattus: *Ajita & AP Das 041*.

About a 1.5 cm long root piece is kept into the eye corner of the affected side to relieve hemichrania.

Morus australis Poirer [Moraceae]

Vernacular Name: *Thaikhong Chef* (Mech); Exscicattus: *Ajita & AP Das 167, 234*.

- About a 1.2 cm long root-piece of mulberry plant is wrapped with 1 cm long root piece of *Mimosa pudica* in a cloth and hung with a thread around the neck to treat jaundice.
- Juice obtained from 100 – 150 gm leaf, is mixed with 1 cup of curd and given to the patient of jaundice once in a day till cure.

Musa balbisiana Colla [Musaceae]

Vernacular Name: *Atia Thalit* (Mech); Exscicattus: *Ajita & AP Das 251, 239*.

- One raw fruit is pounded and taken once in a day for one week in menorrhagia.
- In kidney-stone formation, one-cup of root juice is mixed with one-tablespoon sugar candy and given to the patient 4 – 5 times daily till the stones are cleared.
- Acute burnt patient is made to lie down on banana-leaf to prevent burning sensation.

Neanotis hirsute (Linnaeus f.) Lewis [Rubiaceae]

Vernacular Name: *Khaskhasi Bilai* (Mech); Exscicattus: *Ajita & AP Das 207*.

Leaf extract is given internally in ear to treat ear sore.

Neolamarchia cadamba (Roxburgh) J. Bosser [Rubiaceae]

Vernacular Name: *Khadam* (Mech); Exscicattus: *Ajita & AP Das 043*.

- One leaf is slightly roasted and then boiled in sufficient amount of water; half-cup juice is then given orally twice daily till the cure of asthma.
- In hydrocele, scrotum is wrapped with a fresh leaf and changed the leaf daily till cure.

Ocimum tenuiflorum Linnaeus [Lamiaceae]

Vernacular Name: *Tulutsi* (Mech); Exscicattus: *Ajita & AP Das 008*.

- A leaf is kept below the pillow before sleeping to prevent bad dream and to have a sound sleep.
- Sufficient leaf juice is applied on itching areas caused by the contact of the poisonous hairs of caterpillars.
- 3 table-spoon of leaf juice and 1 pinch of common salt is mixed together and applied externally on lentigo affected area of the body.

Oxalis corniculata Linnaeus [Oxalidaceae]

Vernacular Name: *Shimpli* (Mech); Exscicattus: *Ajita & AP Das 343*.

Leaves are pounded and applied on tongue twice daily for curing tongue-sore.

Paederia foetida Linnaeus [Rubiaceae]

Vernacular Name: *Khipi Bindong* (Mech); Exscicattus: *Ajita & AP Das 364*.

Raw leaves are pounded and given to the patient with hot rice twice daily to check amoebic dysentery.

Peperomia pellucida (Linnaeus) Kunth [Piperaceae]

Vernacular Name: *Luchhi Bilai* (Mech); Exscicattus: *Ajita & AP Das 451*.

In scorpion bite, some leaves are grounded and the infusion is applied on bitten area.

Phlogacanthus thyrsoformis (Hardwicke) Mabberley [Acanthaceae]

Vernacular Name: *Chinchingri Khala* (Mech); Exscicattus: *Ajita & AP Das 082*.

- 5 – 6 leaves are boiled in sufficient water and filtered. The filtrate is given to the patient for checking whooping cough; for children, 2-3 tablespoons in a day and for adults one cup in a day.
- In malarial fever, 2 leaves are roasted and taken orally once daily till cure.

Phrynium pubinerve Blume [Marantaceae]

Vernacular Name: *Laihu* (Mech); Exscicattus: *Ajita & AP Das 474*.

Children suffering from malnutrition is made to lay down on the leaf for one month. Simultaneously during the treatment, a small part of skull of *Macaca mullatta* Zimmermann (monkey) is tied with a string and hung around the neck of the child.

Pogostemon amaranthoides Benthham [Lamiaceae]

Vernacular Name: *Hagra Bingfang* (Mech); Exscicattus: *Ajita & AP Das 147*.

Leaves are pounded and applied on wound till cure.

Plumbago zeylanica Linnaeus [Plumbaginaceae]

Vernacular Name: *Emao* (Mech); Exscicattus: *Ajita & AP Das 368*.

- A small piece of root is wrapped in a cloth and tied to the waist to prevent dropsy.
- 20 gms roots are crushed and the obtained juice is taken orally as abortifacient.

Ricinus communis Linnaeus [Euphorbiaceae]

Vernacular Name: *Eri* (Mech); Exscicattus: *Ajita & AP Das 367*.

A necklace prepared from its fruits is hung around the neck to prevent goiter.

Scoparia dulcis Linnaeus [Scrophulariaceae]

Vernacular Name: *Rakhep* (Mech); Exscicattus: *Ajita & AP Das 344*.

Roots are pounded and half-cup of its extract is added with one glass of water. One such glass of water is given twice daily as diuretic till curing.

Sida cordifolia Linnaeus [Malvaceae]

Vernacular Name: *Bamonmara* (Mech); Exscicattus: *Ajita & AP Das 336*.

- Half-cup root juice and half tablespoon sugar candy are mixed together and taken orally once in a day till curing jaundice.
- A small piece of root is tied to the hair of the new mother just after delivery to expel the placenta.

Solanum torvum Swartz [Solanaceae]

Vernacular Name: *Khunthai Raja* (Mech); Exscicattus: *Ajita & AP Das 450*.

Fruits are boiled in water and the boiled fruits are taken against bilious once in a day till cure.

Solanum viarum Clarke [Solanaceae]

Vernacular Name: *Kata Fithai* (Mech); Exscicattus: *Ajita & AP Das 205*.

In case of whitlow of finger, made a hole in the fruit and entered the finger into the fruit and kept it till cure.

Stephania japonica (Thunberg) Miers [Menispermaceae]

Vernacular Name: *Chhantala* (Mech); Exscicattus: *Ajita & AP Das 139*.

Aquatic decoction of its leaves is prepared and legs are massaged with the decoction at night to check jaundice.

Streblus asper Loureiro [Moraceae]

Vernacular Name: *Seora Bingfang* (Mech); Exscicattus: *Ajita & AP Das 149*.

Dry leaves are powdered and 1 spoon-full of leaf-powder is mixed with 1 glass of hot water and taken twice a day in rheumatic pain.

Terminalia arjuna (Roxburgh ex DC.) Wight & Arnott [Combretaceae]

Vernacular Name: *Harjun* (Mech); Exscicattus: *Ajita & AP Das 098*.

In heart diseases, 10 gms of stem-bark is boiled with 3 cups of water till it reduces to 1 cup and given orally once in a day.

Terminalia bellirica (Gaertner) Roxburgh [Combretaceae]

Vernacular Name: *Bhaora* (Mech); Exscicattus: *Ajita & AP Das 024*.

Stem-bark is crushed and 1 table-spoon is taken orally in empty stomach once in a day in dyspepsia.

Terminalia chebula (Gaertner) Retzius [Combretaceae]

Vernacular Name: *Shilikhya* (Mech); Exscicattus: *Ajita & AP Das 037*.

3-4 fruits are soaked in one glass of water for overnight and next morning it is taken in empty stomach to remove constipation.

Typhonium trilobatum (Linnaeus) Schott [Araceae]

Vernacular Name: *Thadung* (Mech); Exscicattus: *Ajita & AP Das 157*.

In anorexia (loss of appetite), sufficient leaves and garlic are pounded and consumed. It also increases the taste of tongue.

Vitex negundo Linnaeus [Verbenaceae]

Vernacular Name: *Nisindou* (Mech); Exscicattus: *Ajita & AP Das 182*.

Fried leaves are eaten to prevent rheumatic pain.

Zea mays Linnaeus [Poaceae]

Vernacular Name: *Dumba* (Mech); Exscicattus: *Ajita & AP Das 374*.

Five table-spoons full of corn powder is added with one glass of water and taken in dipsomnia.

Zizyphus mauritiana Lamarck [Rhamnaceae]

Vernacular Name: *Boi* (Mech); Exscicattus: *Ajita & AP Das 238*.

A leaf is being touched to the styte affected eye and then kept in straw-roof; the process is continued for 7 days, each day with a new leaf.

7.4.1.2. ANALYSIS OF RESULT

Medicinal Plants are also referred as Herbal Plants. But, this does not mean that medicinal plants are mostly herbaceous. In fact plants of medicinal use are belonging to almost all habit groups. At the same time, they also belong to very wide taxonomic groups.

7.4.1.2.1. Habit Groups: The present investigation revealed the uses of 74 species of plants belonging to 66 genera and 45 families to cure at least 64 types of human diseases. considering their habit groups, there are 17 species of trees e.g. *Aegle marmelos*, *Alstonia scholaris*, *Azadirachta indica*, *Bambusa balcooa*, *Bambusa nutans*, *Bombax ceiba*, *Careya arborea*, *Gmelina arborea*, *Mangifera indica*, *Moringa oleifera*, *Morus australis*, *Neolamarckia cadamba*, *Streblus asper*, *Terminalia arjuna*, *Terminalia bellirica*, *Terminalia chebula*, *Zizyphus mauritiana* from 13 families; 16 species shrubs like *Ambroma augusta*, *Artemisia indica*, *Breynia retusa*, *Calotropis gigantea*, *Cassia alata*, *Citrus limon*, *Datura metel*, *Glycosmis pentaphylla*, *Hibiscus rosa-sinensis*, *Jatropha curcas*, *Melastoma malabathricum*, *Phlogacanthus thyrsoformis*, *Plumbago zeylanica*, *Ricinus communis*, *Solanum torvum*, *Vitex negundo*

from 12 families; 26 species of herbs e.g. *Acmella calva*, *Ageratum conyzoides*, *Amaranthus spinosus*, *Andrographis paniculata*, *Argemone mexicana*, *Boerhavia coccinea*, *Cassia tora*, *Corchorus capsularis*, *Crassocephalum crepidioides*, *Cynodon dactylon*, *Cyperus rotundus*, *Eclipta prostrata*, *Euphorbia hirta*, *Ipomoea aquatica*, *Leucas indica*, *Mimosa pudica*, *Neanotis hirsuta*, *Ocimum tenuiflorum*, *Oxalis corniculata*, *Peperomia pellucida*, *Phrynium pubinerve*, *Pogostemon amaranthoides*, *Scoparia dulcis*, *Sida cordifolia*, *Solanum viarum*, *Zea mays* from 19 families; geophytes are 7 species belonging to 5 families i.e. *Acorus calamus*, *Colocasia esculenta*, *Costus speciosus*, *Curcuma aeruginosa*, *Curcuma longa*, *Musa balbisiana*, *Typhonium trilobatum* and 6 species climbers belonging to 6 families (e.g. *Argyreia roxburghii*, *Cissus quadrangularis*, *Cuscuta reflexa*, *Momordica dioica*, *Paederia foetida* and *Stephania japonica*).

7.4.1.2.2. Useful plant parts: Different parts of medicinal plant species were used by the *Mech* as medicine. For curing ailments, the use of aboveground plant parts was higher than the underground plant parts. Of the aboveground plant parts, leaf was used in majority of cases (34 species) e.g. *Acmella calva*, *Ageratum conyzoides*, *Amaranthus spinosus*, *Argemone mexicana*, *Artemisia indica*, *Azadirachta indica*, *Bambusa balcooa*, *Bambusa nutans*, *Boerhavia coccinea*, *Breynia retusa*, *Calotropis gigantea*, *Cassia alata*, *Corchorus capsularis*, *Crassocephalum crepidioides*, *Eclipta prostrata*, *Euphorbia hirta*, *Glycosmis pentaphylla*, *Leucas indica*, *Morus australis*, *Musa balbisiana*, *Neanotis hirsuta*, *Neolamarckia cadamba*, *Ocimum tenuiflorum*, *Oxalis corniculata*, *Paederia foetida*, *Peperomia pellucida*, *Phlogacanthus thyriformis*, *Phrynium pubinerve*, *Pogostemon amaranthoides*, *Stephania japonica*, *Streblus asper*, *Typhonium trilobatum*, *Vitex negundo* and *Zizyphus mauritiana* from 23 families, followed by fruits (9 species from 7 families) like *Citrus limon*, *Datura metel*, *Gmelina arborea*, *Musa balbisiana*, *Ricinus communis*, *Solanum torvum*, *Solanum viarum*, *Terminalia chebula* and *Zea mays*; stems (5 species from 5 families) e.g. *Alstonia scholaris*, *Andrographis paniculata*, *Bambusa balcooa*, *Ipomoea aquatica* and *Jatropha curcas*; stem bark 4 species belonging to 3 families (*Careya arborea*, *Mangifera indica*, *Terminalia arjuna* and *Terminalia bellirica*); whole plants 3 species from 3 families (e.g. *Cissus quadrangularis*, *Cuscuta reflexa* and *Cynodon dactylon*); flowers 2 species (*Curcuma longa* and *Hibiscus rosa-sinensis*); prickles of *Bombax ceiba* and seeds of *Datura metel*. Petiole of *Colocasia esculenta* is also used as medicine.

Different underground plant parts such as roots (12 species from 12 families), namely *Aegle marmelos*, *Argyreia roxburghii*, *Breynia retusa*, *Cassia tora*, *Melastoma malabathricum*, *Mimosa pudica*, *Moringa oleifera*, *Morus australis*, *Musa balbisiana*, *Plumbago zeylanica*, *Scoparia dulcis*, *Sida cordifolia* and root-bark of *Ambroma augusta*; rhizome (4 species from 4 families) like *Colocasia*

esculenta, *Costus speciosus*, *Curcuma aeruginosa* and *Curcuma longa*; root-tubers of *Cyperus rotundus*, *Momordica dioica* were also used by the *Mech* people as a source of curing ailments.

7.4.1.2.3. Diseases treated: A critical assessment of the wide range of diseases they treat those include, on one hand, common diseases like cold & cough, constipation, pneumonia, dysentery, fever, insect bite, jaundice, skin diseases etc.

7.4.1.2.4. Magico-religious practices: The tribals have much faith in magico-religious beliefs and *Ojas* use such techniques along with their physical methods as these acts like psychological treatments. In numerous instances, *Ojas* chant mantras when they deliver plant parts to the patients or treating a patient.

These remedies have been fairly well accepted by a majority of the *Mech*. There is a variation in the method like tying to different parts of the body, laying down the patient on plant parts and use like a necklace. Sometimes it is noticed that along with the plant parts, animal part like skull of *Macaca mullatta* is found to be useful.

To concentrate mind, usefulness of *Aegle marmelos* root is believed that a patient gets total relief from mental stress. Root of *Cassia tora* is used for periodic fever; in that case it is advised the root is pulled out in one breath in early morning. Crushed rhizome *Curcuma aeruginosa* is given orally to the patient when she/he is fallen under evil spirit. The necklace, made by the stem of *Ipomoea aquatica* is used for jaundice. In case of delivery to induce labour pain, the use of flower of *Curcuma longa* and root of *Mimosa pudica* are believed that this treatment make safe delivery. The woman acting as midwife of the *Mech* community is performed this act. Immediately after delivery, the placenta is said to be dangerous among the *Meches*. They believe that it should be removed within 2 – 10 minutes otherwise when it takes longer time it will go to heart and it can be life threatening for the mother. Therefore, to ease the labor or to expel the placenta, *Meches* give the root piece of *Sida cordifolia* to the laboring women. A necklace prepared from the fruits of *Ricinus communis* is used to prevent goiter. In case of stye, the usefulness of leaf of *Zizyphus mauritiana* is quite unique and appears to be effective. However, it is also possible that the leaf has no role in recovering the disease and the natural recovery takes just seven days.

7.4.2. Plants Used in Definite Formulations

The use of individual plants for the treatment of diseases has already been discussed. But to treat most of the diseases *Mech* medicine practitioners generally use more than one plant together in definite formulations for the preparation of drugs. Here in this section, only such formulations have been presented. However, recorded formulations have been clubbed together under different groups like Gastro-intestinal diseases, Hepatic diseases, Circulatory diseases, Gynaecological problems, Eye Diseases, etc.

7.4.2.1. GASTRO-INTESTINAL DISEASES

I. Bacillary Dysentery:

FORMULA 1:

Ingredients: (i) *Musa balbisiana* Colla [Ajita & AP Das 329], (ii) *Cynodon dactylon* (Linnaeus) Persoon [Ajita & AP Das 330] and (iii) *Centella asiatica* (Linnaeus) Urban [Ajita & AP Das 331].

Mech Names: (i) *Athia Thalith*, (ii) *Duba-gangse* and (iii) *Manimuni Gedet*.

Preparation: Equal quantities of roots of *Musa balbisiana*, whole part of *Cynodon dactylon* and *Centella asiatica* are crushed and mixed with sufficient cold water and filtered.

Dose: One cup of extract is given at an interval of one hour.

FORMULA 2:

Ingredients: (i) *Eleutherine bulbosa* (Miller) Urban [Ajita & AP Das 069], (ii) *Houttuynia cordata* Thunberg [Ajita & AP Das 070], (iii) *Mentha spicata* Linnaeus [Ajita & AP Das 071], (iv) *Psidium guajava* Linnaeus [Ajita & AP Das 072] and (v) *Citrus limon* (Linnaeus) Osbeck [Ajita & AP Das 073].

Mech Names: (i) *Hagrani Sabrum*, (ii) *Maisundri*, (iii) *Madam-nai Bilai*, (iv) *Thamb* and (v) *Nareng*.

Preparation: One bulb of *Eleutherine bulbosa*, 5 leaves of *Houttuynia cordata* and *Mentha spicata*, 5 tender leaves of *Psidium guajava* and 2 leaves of *Citrus limon* are pounded together and made a paste.

Dose: Three tablespoonfuls for adult and one tablespoonful for children, once daily.

II. Stomachache:

Ingredients: (i) *Acorus calamus* Linnaeus [Ajita & AP Das 356], (ii) *Zingiber officinale* Roscoe [Ajita & AP Das 359] and (iii) *Curcuma aeruginosa* Roxburgh [Ajita & AP Das 370].

Mech Names: (i) *Buchi*, (ii) *Adi* and (iii) *Gocham Haldu*.

Preparation: 1 gm rhizome of *Acorus calamus*, 0.5 gm rhizome of *Zingiber officinale* and 1 gm of *Curcuma aeruginosa* are pounded and mixed with one cup of water.

Dose: Given to the patient thrice daily till cure.

7.4.2.2. HEPATIC DISEASES

I. Liver Disorder:

Ingredients: (i) *Saccharum spontaneum* Linnaeus [Ajita & AP Das 375], (ii) *Zizyphus mauritiana* Lamarck [Ajita & AP Das 376], (iii) *Citrus limon* (Linnaeus) Osbeck [Ajita & AP Das 377] and (iv) *Justicia adhatoda* Linnaeus [Ajita & AP Das 378].

Mech Names: (i) *Gigab*, (ii) *Boi*, (iii) *Nareng* and (iv) *Chinchiri*.

Preparation: 2 gm root of *Saccharum spontaneum*, 10 prickles of *Zizyphus mauritiana*, 10 thorns of *Citrus limon* and 3 leaves of *Justicia adhatoda* are pounded and made into pills and dried.

Dose: Pills are taken thrice daily with water.

II. Jaundice:

FORMULA 1:

Ingredients: (i) *Stephania glabra* (Roxburgh) Miers [Ajita & AP Das 001], (ii) *Argyreia roxburghii* Choisy [Ajita & AP Das 002]

Mech Names: (i) *Dibauli Bidat* and (ii) *Dudhali Bindong*

Preparation: 10 – 15 gm tuber of *Stephania glabra* and 5 leaves of *Argyreia roxburghii* are pounded and made into small pills and dried.

Dose: The pills are taken thrice daily with water.

FORMULA 2:

Ingredients: (i) *Natsiatum herpeticum* Buchanan-Hamilton ex Arnott [Ajita & AP Das 062], (ii) *Stephania glabra* (Roxburgh) Miers [Ajita & AP Das 070] and (iii) *Argyreia roxburghii* Choisy [Ajita & AP Das 063].

Mech Names: (i) *Dokha Khamflai*, (ii) *Dibauli Bidat* and (iii) *Dudhali Bindong*

Preparation: 1 branch each of *Natsiatum herpeticum* and *Argyreia roxburghii* and 1 branch with tuber of *Stephania glabra* are twisted together and made it like a garland and is hung round the patient's neck.

Dose: Use it for 7 days and change it again, till recovery.

FORMULA 3:

Ingredient: (i) *Oroxylum indicum* (Linnaeus) Kurz [*Ajita & AP Das* 044], (ii) Hen's egg and (iii) Common salt

Mech Name: (i) *Kharo Khandai*, (ii) *Dau Bidoi* and (iii) *Shong-khoi*.

Preparation: 2 tablespoonful juice of stem bark, 1 hen's egg and 1 pinch common salt are blended and fried the mixture like an omelet. The omelet is divided into 3 equal pieces.

Dose: These 3 pieces are given orally thrice daily for 3 days. During the treatment the patients are advised not to take fish and meat

FORMULA 4:

Ingredients: *Plumbago zeylanica* Linnaeus [*Ajita & AP Das* 231] and *Solanum tuberosum* Linnaeus [*Ajita & AP Das* 232].

Mech Names: (i) *Emao* and (ii) *Thablati*.

Preparation: Making a hole in a potato and ½ inch (±1.2 cm) root of *Plumbago zeylanica* is inserted into the potato and roasted and peeled off the potato

Dose: Given orally once in a day for 3 days.

7.4.2.3. CIRCULATORY DISEASES

I. Piles:

FORMULA 1:

Ingredients: (i) *Albizia procera* (Roxburgh) Bentham [*Ajita & AP Das* 223] and (ii) *Careya arborea* Roxburgh [*Ajita & AP Das* 224].

Mech Names: (i) *Gapht Siris* and (ii) *Khoom Bingfang*.

Preparation: Equal quantities of bark of *Albizzia procera* and *Careya arborea* are pounded together

Dose: Half a cup of extract is given orally for 4 – 5 days daily.

FORMULA 2:

Ingredients: (i) *Dillenia pentagyna* Roxburgh [*Ajita & AP Das* 362] and (ii) *Bischofia javanica* Blume [*Ajita & AP Das* 363].

Mech Names: (i) *Rae Bingfang* and (ii) *Thaichho*.

Preparation: 100 gm barks of *Dillenia pentagyna* and 100 gm barks of *Bischofia javanica* are boiled in 1 lit. water and reduced this water into 250 ml.

Dose: Given ½ cup twice daily till cure.

7.4.2.4. GYNAECOLOGICAL PROBLEMS

I. Puerperal Disease:

Ingredients: (i) *Croton roxburghii* Balakrisnan [Ajita & AP Das 171], (ii) *Artemisia indica* Willdenow [Ajita & AP Das 172], (iii) *Citrus limon* (Linnaeus) Osbeck [Ajita & AP Das 173], (iv) *Hypericum japonicum* Murray [Ajita & AP Das 174], (v) *Desmodium triflorum* (Linnaeus) DC. [Ajita & AP Das 175], (vi) *Solanum anguivi* Lamarck [Ajita & AP Das 176], (vii) *Centella asiatica* (Linnaeus) Urban [Ajita & AP Das 177], (viii) *Hydrocotyle sibthorpioides* Lamarck [Ajita & AP Das 178], (ix) *Acorus calamus* Linnaeus [Ajita & AP Das 179] and (x) *Curcuma aromatica* Salisbury [Ajita & AP Das 180].

Mech Names: (i) *Chhikho Domphang*, (ii) *Nadaona*, (iii) *Nareng*, (iv) *Sona Bingfang*, (v) *Chimpli Gochhang*, (vi) *Khunthai*, (vii) *Manimuni Gedet*, (viii) *Manimuni Galei*, (ix) *Buchi* and (x) *Khaslot*.

Preparation: 5 gm bark of *Croton roxburghii*, 5 gm bark of *Citrus limon*, 25 gm whole plants of *Hypericum japonicum*, 5 gm whole plants of *Desmodium triflorum*, 5 gm roots of *Solanum anguivi*, 25 gm leaves of *Centella asiatica* and *Hydrocotyle sibthorpioides* and small and large cardamom are pounded together and boiled in 1 bottle rice beer and then sieved.

Dose: Half-bottle is given to the patient daily for one week.

After one week

Preparation: 10 gm rhizome of *Acorus calamus*, 10 gm rhizome of *Curcuma aromatica* and 5 gm leaves of *Artemisia indica* are pounded with sufficient water and sieved.

Dose: 20 ml infusion is given thrice daily.

II. Menorrhagia:

FORMULA 1:

Ingredients: (i) *Alpinia nigra* (Gaertner) Burt [Ajita & AP Das 315], (ii) *Entada rheedii* Sprengel [Ajita & AP Das 316], (iii) *Costus speciosus* (Koenig ex Retzius) Smith [Ajita & AP Das 317] and (iv) *Spondias pinnata* (Linnaeus f.) Kurz [Ajita & AP Das 318].

Mech Names: (i) *Tharai*, (ii) *Gilathakuri*, (iii) *Debgugri* and (iv) *Thaiscchip*.

Preparation: Rhizomes of *Alpinia nigra* and *Costus speciosus*, seeds of *Entada scandens* and stem bark of *Spondias pinnata* are taken in equal quantity, crushed and mixed with 500 ml water. Divide this water in four parts.

Dose: Each part is given separately in one day.

FORMULA 2:

Ingredients: (i) *Nymphaea pubescens* Willdenow [Ajita & AP Das 220], (ii) *Imperata cylindrica* (Linnaeus) Raeuschel [Ajita & AP Das 221] and (iii) *Butea monosperma* (Lamarck) Taubert [Ajita & AP Das 222].

Mech Names: (i) *Daeii Bibar*, (ii) *Thurmus* and (iii) *Phalas Bibar*.

Preparation: One young leaf of *Nymphaea pubescens*, 3 – 4 roots of *Imperata cylindrica* and 4 – 5 tender shoots of *Butea monosperma* are pounded and made extract.

Dose: Three teaspoonfuls of extract is given daily for 5 – 6 days; may be continued for 20 – 25 days if required.

III. Dysmenorrhoea:

Ingredients: (i) *Zingiber purpureum* Roscoe [Ajita & AP Das 199], (ii) *Stephania glabra* (Roxburgh) Miers [Ajita & AP Das 201], (iii) *Morinda angustifolia* Roxburgh [Ajita & AP Das 202] and (iv) *Artemisia indica* Willdenow [Ajita & AP Das 203].

Mech Names: i) *Bura Usud*, (ii) *Dibauli Bidat*, (iii) *Achhou Gakha* and (iv) *Nadaona*.

Preparation: 50 gm rhizome of *Zingiber purpureum*, 10-15gm tuber piece of *Stephania glabra*, 5 leaves of *Morinda angustifolia* and 5 twigs of *Artemisia indica* are pounded and soaked in 500gm water for half an hour.

Dose: Half-cup liquid is given thrice daily. It is advised to avoid taking any fish or sour food during the treatment.

IV. Infertility:

Ingredients: (i) *Hibiscus rosa-sinensis* Linnaeus [Ajita & AP Das 214], (ii) *Cynodon dactylon* (Linnaeus) Persoon [Ajita & AP Das 215] and (iii) Sundried rice grains (*Oryza sativa* Linnaeus).

Mech Names: (i) *Panchamukhi Jhova*, (ii) *Duba-gangse* and (iii) *Alua Mairong*.

Preparation: Equal quantities of whole plant of *Cynodon dactylon* and sundried rice dust are mixed and fried.

Dose: Fried mix is taken 2 - 3 days in a week. Simultaneously, three pounded flowers of *Hibiscus rosa-sinensis* are taken 3 - 4 days before menses and continuing 4 - 5 days in empty stomach.

7.4.2.5. RESPIRATORY DISEASES

I. Asthma:

Ingredients: (i) *Crinum amoenum* Roxburgh [Ajita & AP Das 076], (ii) Hen's egg.

Mech Names: (i) *Mosoi Sabrum* and (ii) *Dau Bidoi*.

Preparation: About ¼th of a mature bulb of *Crinum amoenum* is chopped and mixed with one blended hen's egg and then fried to prepare an omelet. This omelet and boiled sunned rice are given to the patient of asthma.

Dose: It is said that the single dose causes vomiting after 5 minutes and cures the disease on the next day.

II. Bronchitis:

Ingredients: (i) *Justicia adhatoda* Linnaeus [Ajita & AP Das 334] & (ii) *Tinospora cordifolia* (Willdenow) Hooker f. & Thomson [Ajita & AP Das 335].

Mech Names: (i) *Chinchiri* and (ii) *Gultai*.

Preparation: 10 -12 leaves of *Justicia adhatoda* and 5 - 6 inches stem of *Tinospora cordifolia* are boiled in sufficient water and filtered.

Dose: Half cup of filtrate is given thrice daily till cure.

III. Common Cough & Cold:

Ingredients: (i) *Pupalia lappacea* (Linnaeus) A. Jussieu [Ajita & AP Das 351] & (ii) *Musa balbisiana* Colla [Ajita & AP Das 352]

Mech Names: (i) *Samultha* and (ii) *Athia Thalith*

Preparation: 100 gm whole plant of *Pupalia lappacea* and 100 gm dried flowers of *Musa balbisiana* are roasted and added in 250 ml of water

Dose: Half-cup juice is given thrice daily.

IV. Common Cough:

Ingredients: (i) *Ocimum tenuiflorum* Linnaeus [301] and (ii) *Zingiber officinale* Roscoe [302].

Mech Names: (i) *Tulutsi* and (ii) *Adi*.

Preparation: Juice of 10 – 12 leaves of *Ocimum tenuiflorum* and a few drop of rhizome extract of *Zingiber officinale* are mixed with 1 tablespoonful of honey.

Dose: 2 tablespoonfuls of mixture is given orally once daily.

V. Pneumonia:

FORMULA 1:

Ingredients: (i) *Solanum torvum* Swartz [*Ajita & AP Das* 003], (ii) *Drymaria cordata* (Linnaeus) Willdenow ex Roemer & Schultes [*Ajita & AP Das* 004], (iii) *Hypericum japonicum* Murray [*Ajita & AP Das* 005], (iv) *Centella asiatica* (Linnaeus) Urban [*Ajita & AP Das* 006], (v) *Hydrocotyle sibthorpioides* Lamarck [*Ajita & AP Das* 007] and small & big cardamom, cinnamon bark, black pepper, nutmeg.

Mech Names: (i) *Khunthai Raja*, (ii) *Barmadaree*, (iii) *Sona Bingfang*, (iv) *Manimuni Gedet*, (v) *Manimuni Galei*.

Preparation: Three to four grams root of *Solanum torvum* and five leafy shoots *Drymaria cordata*, *Hypericum japonicum*, *Centella asiatica* and *Hydrocotyle sibthorpioides* and 5 – 6 gms fragrant spices are pounded together, made into small pills and dried.

Dose: One pill is given thrice daily with water.

FORMULA 2:

Ingredients: (i) *Centella asiatica* (Linnaeus) Urban [*Ajita & AP Das* 053], (ii) *Hydrocotyle sibthorpioides* Lamarck. [*Ajita & AP Das* 054], (iii) *Bambusa nutans* Wallich ex Munro [*Ajita & AP Das* 055], (iv) *Hypericum japonicum* Murray [*Ajita & AP Das* 056], (v) *Scoparia dulcis* Linnaeus [*Ajita & AP Das* 057], (vii) *Phyllanthus amarus* Schumacher & Thonning [*Ajita & AP Das* 058], (viii) *Mimosa pudica* Linnaeus [*Ajita & AP Das* 059], (ix) *Clerodendrum serratum* (Linnaeus) Moon [*Ajita & AP Das* 060], (x) *Desmodium*

triflorum (Linnaeus) DC. [Ajita & AP Das 061], big & small cardamom, cinnamon and black pepper.

Mech Names: (i) *Manimuni Gedet*, (ii) *Manimuni Galei*, (iii) *Ooa*, (iv) *Sona Bingfang*, (v) *Rakhep*, (vi) *Banamlai*, (vii) *Sumukhchi*, (viii) *Holupang* and (ix) *Chimpli Gochhang*.

Preparation: 25 gm whole plants of *Centella asiatica* and *Hydrocotyle sibthorpioides*, 5 whole plants of *Hypericum japonicum*, *Phyllanthus amarus* and *Desmodium triflorum*, 50 gm young shoots of *Bambusa nutans*, 25 gm leaves of *Scoparia dulcis*, 5 roots of *Mimosa pudica*, 10 gm bark of *Clerodendrum serratum* and 5 gm fragrant spices are pounded together and boiled in 1 lit. of water.

Dose: Half-cup of decoction is given to the patients 2-3 times a day. 2-3 tablespoons generally prescribed to the children.

FORMULA 3:

Ingredients: (i) *Piper longum* Linnaeus [Ajita & AP Das 106], (ii) *Zingiber officinale* Roscoe [Ajita & AP Das 107], (iii) *Hypericum japonicum* Murray [Ajita & AP Das 108], (iv) *Centella asiatica* (Linnaeus) Urban [Ajita & AP Das 109], (v) *Hydrocotyle sibthorpioides* Lamarck [Ajita & AP Das 110], (vi) *Lippia javanica* (Burman f.) Sprengel [Ajita & AP Das 111], (vii) *Oxalis corniculata* Linnaeus [Ajita & AP Das 112], (viii) *Lasia spinosa* (Linnaeus) Thwaites [Ajita & AP Das 113] and fragrant spices.

Mech Names: (i) *Pipli*, (ii) *Adi*, (iii) *Sona Bingfang*, (iv) *Manimuni Gedet*, (v) *Manimuni Galei*, (vi) *Anthai Bazeb*, (vii) *Shimpli* & (viii) *Sibru*.

Preparation: 2 gm fruits of *Piper longum*, 2 gm dry rhizome of *Zingiber officinale*, 4 – 5 gm whole plants of *Hypericum japonicum*, 4 – 5 gm whole plants of *Centella asiatica* and *Hydrocotyle sibthorpioides*, 4 – 5 gm leaves of *Oxalis corniculata*, 5 – 6 leaves of *Lippia javanica*, 5 gm stem of *Lasia spinosa* and 5 gm fragrant spices are boiled in water for half an hour and sieved the infusion.

Dose: Half-cup of infusion is taken thrice daily.

FORMULA 4:

Ingredients: (i) *Rotala rotundifolia* (Buchanan - Hamilton) Koehne [Ajita & AP Das 086], (ii) *Murdannia nudiflora* (Linnaeus) Brenan [Ajita & AP Das 087], (iii) *Lindernia anagallis* (Burman f.) Pennell [Ajita & AP Das 088], (iv) *Mecardonia procumbens* (Miller) Small [Ajita & AP Das 090], (v) *Leucas indica* (Linnaeus) R. Brown ex Vatke [Ajita & AP Das 089] and (vi) *Scoparia dulcis* Linnaeus [Ajita & AP Das 091].

Mech Names: (i) *Gozah Bibar*, (ii) *Lalnak Bibar*, (iii) *Gaphtnak Bibar*, (iv) *Gauda Bibar*, (v) *Khansisa* & (vi) *Rakhep*.

Preparation: Whole plants of *Rotala rotundifolia*, *Murdannia nudiflora*, *Lindernia anagallis*, *Mecardonia procumbens*, roots of *Leucas indica* and leaves of *Scoparia dulcis*, all together 50 gm are taken and pounded and boiled in sufficient water.

Dose: One-tablespoonful of decoction is given 2 – 3 times daily.

FORMULA 5:

Ingredients: (i) *Piper attenuatum* Buchanan-Hamilton ex Miquel [*Ajita & AP Das* 127], (ii) *Piper sylvaticum* Roxburgh [*Ajita & AP Das* 128], (iii) *Zanthoxylum rhetsa* (Roxburgh) DC. [*Ajita & AP Das* 129], (iv) *Centella asiatica* (Linnaeus) Urban [*Ajita & AP Das* 130], (v) *Hydrocotyle sibthorpioides* Lamarck [*Ajita & AP Das* 131], (vi) *Leucas indica* (Linnaeus) R. Brown ex Vatke [*Ajita & AP Das* 132] and fragrant spices.

Mech Names: (i) *Galthou Phatai*, (ii) *Hagrani Phatai*, (iii) *Jabreng*, (iv) *Manimuni Gedet*, (v) *Manimuni Galei*, (vi) *Khansisa*.

Preparation: Three leaves of *Piper attenuatum*, four leaves of *Piper sylvaticum*, five shoots of *Centella asiatica* and *Hydrocotyle sibthorpioides*, 2 gm bark of *Zanthoxylum rhetsa* and five shoots of *Leucas indica* and 5 gm fragrant spices are pounded together, made into small pills and dried.

Dose: One pill is given twice or thrice daily with water.

FORMULA 6:

Ingredients: (i) *Smilax ovalifolia* Roxburgh [*Ajita & AP Das* 151], (ii) *Centella asiatica* (Linnaeus) Urban [*Ajita & AP Das* 152], (iii) *Hydrocotyle sibthorpioides* Lamarck [*Ajita & AP Das* 153], (iv) *Leucas indica* (Linnaeus) R. Brown ex Vatke [*Ajita & AP Das* 154] and (v) *Bambusa nutans* Wallich ex Munro [*Ajita & AP Das* 155].

Mech Names: (i) *Kaijomai*, (ii) *Manimuni Gedet*, (iii) *Manimuni Galei*, (iv) *Khansisa* and (v) *Ooa*.

Preparation: Two leaves of *Smilax ovalifolia*, 5 gm whole plants of *Centella asiatica* and *Hydrocotyle sibthorpioides*, 2 gm root of *Leucas indica* and 2 gm new grown part of *Bambusa nutans* and clove, cinnamon, cardamom 5 gm are pounded and boiled in 3 glasses of water.

Dose: One glass of decoction is given thrice daily.

7.4.2.6. SKIN DISEASES

I. Abscess:

Ingredients: (i) *Pericampylus glaucas* (Lamarck) Merrill [Ajita & AP Das 077], (ii) *Clerodendrum serratum* (Linnaeus) Moon [Ajita & AP Das 078], (iii) *Tetraodon cutcutia* Hamilton (fish) and (iv) Mustard oil.

Mech Names: (i) *Nalithapa*, (ii) *Holupang*, (iii) *Tepa Naya-na* and (iv) *Thao*.

Preparation: 5 – 6 dry leaves of *Pericampylus glaucas*, 5 – 6 gm dry roots of *Clerodendrum serratum* and one dry *Tetraodon cutcutia* are crushed and boiled in 100 gm of mustard oil and sieved and applied.

Dose: Applied locally twice daily for 3 – 4 days. Also, advised to avoid banana, sour fruit, and pumpkin (*Cucurbita maxima* fruits) and *Vigna mungo* pulses.

II. Bed Sore:

Ingredients: (i) *Costus speciosus* (Koenig ex Retzius) Smith [Ajita & AP Das 353], (ii) *Helicteres isora* Linnaeus [Ajita & AP Das 350] and (iii) *Stephania glabra* (Roxburgh) Miers [Ajita & AP Das 354].

Mech Names: (i) *Debgugri*, (ii) *Bismoura* and (iii) *Dibauli Bidat*.

Preparation: 5 gm rhizome of *Costus speciosus*, 1 fruit of *Helicteres isora* and 5 gm tuber of *Stephania glabra* are crushed together and made into a paste.

Dose: Applied on sore twice daily for one week.

III. Blister:

Ingredients: (i) *Momordica charantia* Linnaeus [Ajita & AP Das 096], (ii) *Polygonum plebeium* Roxburgh [Ajita & AP Das 119] and (iii) Coconut oil

Mech Names: (i) *Udasi*, (ii) *Daunasi* and (iii) *Narel-thao*.

Preparation: 4 – 5 leaves of *Momordica charantia*, 2 – 3 whole plants of *Polygonum plebeium* are crushed and boiled in 100 gm coconut oil. It is then cooled down and stored in a bottle.

Dose: The oil is applied locally with hen's feather thrice daily.

IV. Boils:

Ingredients: (i) *Sida acuta* Burman f. [Ajita & AP Das 065] and (ii) *Curcuma aromatica* Salisbury [Ajita & AP Das 066] and (iii) Coconut oil.

Mech Names: (i) *Bamonmara*, (ii) *Khaslat* and (iii) *Narel-thao*.

Preparation: Leaves of *Sida acuta* and rhizome of *Curcuma aromatica* are taken in equal quantity and pounded and boiled in sufficient coconut oil.

Dose: This medicated oil is applied on boil at night.

V. Dermatitis:

Ingredients: (i) *Derris polystachya* Benthham [Ajita & AP Das 453], (ii) *Entada rheedii* Sprengel [Ajita & AP Das 454], (iii) *Stephania glabra* (Roxburgh) Miers [Ajita & AP Das 455] and (iv) Mustard oil

Mech Names: (i) *Dibauli Bidat*, (ii) *Gilathakuri*, (iii) *Rhu* and (iv) *Thao*.

Preparation: 5 gm roots of *Derris polystachya*, 5 gm dry seeds of *Entada scandens* and 5 gm dry tuber of *Stephania glabra* are crushed and boiled in 100 gm mustard oil and sieved and applied on sore

Dose: Twice daily for 3-4 days.

VI. Gangrene:

Ingredients: (i) *Stephania glabra* (Roxburgh) Miers [Ajita & AP Das 354], (ii) *Eclipta prostrata* (Linnaeus) Linnaeus [Ajita & AP Das 371], (iii) *Justicia gendarussa* Linnaeus f. [Ajita & AP Das 372], (iv) *Chelone mydas* Linn. (turtle) and (v) Mustard oil.

Mech Names: (i) *Dibauli Bidat*, (ii) *Kalkhasri*, (iii) *Jatrasi*, (iv) *Khau-cham* and (v) *Thao*.

Preparation: 10 gm dry shoot of *Eclipta prostrata*, 10 gm dry leaf of *Justicia gendarussa*, 5 gm dry tuber of *Stephania glabra* and dusted carapace of *Chelone mydas* are powdered and boiled in 100 gm of mustard oil and sieved.

Dose: Applied locally twice daily.

VII. Leprosy:

Ingredients: (i) *Stephania glabra* (Roxburgh) Miers [Ajita & AP Das 354], (ii) *Hypericum japonicum* Murray [Ajita & AP Das 355], (iii) *Acorus calamus* Linnaeus [Ajita & AP Das 356], (iv) *Terminalia chebula* (Gaertner) Retzius [Ajita & AP Das 357], (v) *Ocimum tenuiflorum* Linnaeus [Ajita & AP Das 358], (vi) *Zingiber officinale* Roscoe [Ajita & AP Das 360] (vii) Rice dust and (viii) Fragrant spices.

Mech Name: (i) *Dibauli Bidat*, (ii) *Sona Bingfang*, (iii) *Buchi*, (iv) *Shilikhya*, (v) *Tulutsi*, (vi) *Adi*.

Preparation: 250 gm tuber of *Stephania glabra*, 10 gm leaves of *Hypericum japonicum*, 50 gm rhizome of *Acorus calamus*, 5 seeds of *Terminalia chebula*, 10 gm leaf of *Ocimum*

tenuiflorum, 100 gm rhizome of *Zingiber officinale*, 250 gm rice dust and 10 gm fragrant spices are dried and pounded together.

Dose: Three-teaspoonful dust mixed to one-cup of water and given thrice daily, continuing for one month.

VIII. Scabies:

Ingredients: (i) *Eclipta prostrata* (Linnaeus) Linnaeus [Ajita & AP Das 371], (ii) *Justicia gendarussa* Linnaeus f. [Ajita & AP Das 372] (iii) *Kaempferia rotunda* Linnaeus [Ajita & AP Das 373], and (iv) Mustard oil.

Mech Names: (i) *Kalkhasri*, (ii) *Jatrasi*, (iii) *Agniswar*, and (iv) *Thao*.

Preparation: 5 gm rhizome of *Kaempferia rotunda*, 10 gm dry leaves of *Eclipta prostrata* and *Justicia gendarussa* are pounded and boiled in 100 gm of mustard oil and sieved.

Dose: Applied on scabies thrice daily.

7.4.2.7. OPHTHALMIC DISEASES

I. Cataract:

Ingredients: (i) *Polygonum plebeium* R. Brown [Ajita & AP Das 119], (ii) *Centella asiatica* (Linnaeus) Urban [Ajita & AP Das 120], (iii) *Hydrocotyle sibthorpioides* Lamarck [Ajita & AP Das 121].

Mech Names: (i) *Daunasi*, (ii) *Manimuni Gedet*, (iii) *Manimuni Galei*.

Preparation: Equal quantities of Tender shoots of *Polygonum plebeium*, leaves of *Centella asiatica* and *Hydrocotyle sibthorpioides* are crushed together and strained.

Dose: The filtrate is put into the eyes thrice daily for three days.

7.4.2.8. DENTAL PROBLEMS

I. Pyorrhea:

Ingredients: (i) *Leucas indica* (Linnaeus) R. Brown ex Vatke [Ajita & AP Das 476], (ii) *Centella asiatica* (Linnaeus) Urban [Ajita & AP Das 477] and (iii) *Hydrocotyle sibthorpioides* Lamarck [Ajita & AP Das 478] and (iv) *Zingiber officinale* Roscoe [Ajita & AP Das 479].

Mech Names: (i) *Khansisa*, (ii) *Manimuni Gedet*, (iii) *Manimuni Galei* and (iv) *Adi*.

Preparation: Equal quantities of leaves of *Leucas indica*, *Centella asiatica*, *Hydrocotyle sibthorpioides* and *Zingiber officinale* are crushed and put the paste in between the affected teeth.

Dose: 4-5 times daily and allowed to adhere for 10-20 minutes.

7.4.2.9. STINGS & BITES

I. Snake bite:

Ingredients: (i) *Centella asiatica* (Linnaeus) Urban [Ajita & AP Das 308], (ii) *Hydrocotyle sibthorpioides* Lamarck [Ajita & AP Das 309] and (iii) *Ocimum tenuiflorum* Linnaeus [Ajita & AP Das 310].

Mech Names: (i) *Manimuni Gedet*, (ii) *Manimuni Galei* and (iii) *Tulutsi*.

Preparation: Equal quantities of leaves of *Ocimum tenuiflorum*, *Centella asiatica* and *Hydrocotyle sibthorpioides* are pounded together without water

Dose: The paste is repeatedly applied externally on wounds caused by snakebite. After sometimes the color of paste is changed and then, again applied, till the poison is taken out.

7.4.2.10. ORTHOPAEDIC

I. Sprain:

Ingredients: (i) *Datura metel* Linnaeus [Ajita & AP Das 325], (ii) *Ocimum tenuiflorum* Linnaeus [Ajita & AP Das 326] and (iii) *Cynodon dactylon* (Linnaeus) Persoon [Ajita & AP Das 327].

Mech Names: (i) *Dotra*, (ii) *Tulutsi* and (iii) *Duba-gangse*.

Preparation: Seeds of one fruit of *Datura metel*, two shoots of *Ocimum tenuiflorum* and one handful whole plant of *Cynodon dactylon* are pounded together and made into a paste.

Dose: The paste is applied on the affected area once in a day.

7.4.2.11. EAR-NOSE-THROAT

I. Epistaxis:

Ingredients: (i) *Centella asiatica* (Linnaeus) Urban [Ajita & AP Das 331], (ii) *Hydrocotyle sibthorpioides* Lamarck [Ajita & AP Das 332] and (iii) *Leucas indica* (Linnaeus) R. Brown ex Vatke [Ajita & AP Das 333].

Mech Names: (i) *Khansisa*, (ii) *Manimuni Gedet* and (iii) *Manimuni Galei*.

Preparation: Equal quantities of leaves of *Leucas indica*, *Centella asiatica* and *Hydrocotyle sibthorpioides* are crushed and squeezed

Dose: Five drops of juice is dropped into the nostrils twice daily.

7.4.2.12. PSYCHIATRY

I. Insanity (Mental Disease):

Ingredients: (i) *Corchorus capsularis* Linnaeus [*Ajita & AP Das* 423] and (ii) *Pericampylus glaucas* (Lamarck) Merrill [*Ajita & AP Das* 424] and (iii) *Stephania glabra* (Roxburgh) Miers [*Ajita & AP Das* 425].

Mech Names: (i) *Phatto*, (ii) *Nalithapa* and (iii) *Dibauli Bidat*.

Preparation: 1 gm seed of *Corchorus capsularis*, 7 – 8 leaves of *Pericampylus glaucas* and 6 gm tuber of *Stephania glabra* are boiled in sufficient water. After that the boiled things are pounded and cooled, and then mixed with ½ cup of coconut oil.

Dose: This oil is applied on scalp twice daily till cure.

7.4.2.13. RENAL DISEASES

I. Disuria:

Ingredients: (i) *Acampe papillosa* (Lindley) Lindley [*Ajita & AP Das* 019] and (ii) *Kalanchoe pinnata* (Lamarck) Persoon [*Ajita & AP Das* 018].

Mech Names: (i) *Mauji lanjai* and (ii) *Oatkhambra*.

Preparation: One leaf of *Acampe papillosa* and one leaf *Kalanchoe pinnata* are pounded together.

Dose: The ointment is smeared on the lower abdomen twice daily, continuing for 2 – 3 days.

7.4.2.14. NEUROLOGICAL PROBLEMS

I. Hemisrania:

Ingredients: (i) *Eclipta prostrata* (Linnaeus) Linnaeus [*Ajita & AP Das* 104] and (ii) *Musa balbisiana* Colla [*Ajita & AP Das* 105]

Mech Names: (i) *Kalkhasri* and (ii) *Athia Thalith*.

Preparation: Five whole plants of *Eclipta prostrata* and half unripe fruit (banana) of *Musa balbisiana* are pounded together

Dose: The paste is smeared on forehead twice daily.

7.4.2.15. MAGICO-RELIGIOUS

I. Evil Spirit:

FORMULA 1:

Ingredients: (i) *Chromolaena odoratum* (Linnaeus) King & Robinson [Ajita & AP Das 093], (ii) *Xanthium indicum* Koenig ex Roxburgh [Ajita & AP Das 094], (iii) *Drymaria cordata* (Linnaeus) Willdenow ex Roemer & Schultes [Ajita & AP Das 095] and (iv) Coconut oil.

Mech Names: (i) *Germani Bingfang*, (ii) *Okhra*, (iii) *Barmadaree* and (iv) *Narel-thao*.

Preparation: Equal quantities of twigs of *Chromolaena odoratum* and *Xanthium strumarium* and whole plant of *Drymaria cordata* are pounded together and heated with sufficient coconut oil.

Dose: Sometimes people suffer due to evil spirits, and then this medicated oil is applied externally on the body.

FORMULA 2:

Ingredients: (i) *Acorus calamus* Linnaeus [Ajita & AP Das 323] and (ii) *Murraya koenigii* (Linnaeus) Sprengel [Ajita & AP Das 324].

Mech Name: (i) *Buchi* and (ii) *Jafsri Bilai*.

Preparation: 2 gm rhizome of *Acorus calamus* and 15 leaves of *Murraya koenigii* are pounded together and kept it for fermentation for one day.

Dose: Smear on body once in a day till cure.

7.4.2.16. ANALYSIS OF OBSERVATION

7.4.2.16.1. Taxonomic and Habit Groups: A total of 83 species of plants belonging to 76 genera and 49 families are recorded here used in 31 types of diseases. Out of these 12 species are trees [*Psidium guajava*, *Zizyphus mauritiana*, *Oroxylum indicum*, *Albizia procera*, *Careya arborea*, *Dillenia pentagyna*, *Bischofia javanica*, *Spondias pinnata*, *Butea monosperma*, *Zanthoxylum rhetsa*, *Derris polystachya*, *Terminalia chebula*], 19 species of shrubs [*Citrus limon*, *Justicia adhatoda*, *Plumbago zeylanica*, *Croton roxburghii*, *Artemisia indica*, *Solanum anguivi*, *Morinda angustifolia*, *Hibiscus rosa-sinensis*, *Ocimum tenuiflorum*, *Solanum torvum*, *Clerodendrum serratum*, *Lippia javanica*, *Helicteres isora*, *Sida acuta*, *Justicia gendarussa*, *Datura metel*, *Kalanchoe pinnata*, *Chromolaena odoratum*, *Murraya koenigii*], 27 species of herbs [*Cynodon dactylon*, *Centella asiatica*, *Houttuynia cordata*, *Mentha spicata*, *Saccharum spontaneum*, *Hypericum japonicum*, *Desmodium triflorum*, *Hydrocotyle sibthorpioides*, *Imperata cylindrica*, *Oryza sativa*, *Pupalia lappacea*, *Drymaria cordata*, *Bambusa nutans*, *Scoparia dulcis*,

Phyllanthus amarus, *Mimosa pudica*, *Oxalis corniculata*, *Rotala rotundifolia*, *Murdannia nudiflora*, *Lindernia anagallis*, *Macaronesia procumbens*, *Leucas indica*, *Polygonum plebeium*, *Eclipta prostrata*, *Corchorus capsularis*, *Xanthium indicum*, *Nymphaea pubescens*], 11 species of climbers [*Stephania glabra*, *Argyreia roxburghii*, *Natsiatum herpeticum*, *Entada rheedii*, *Tinospora cordifolia*, *Piper longum*, *Piper attenuatum*, *Piper sylvaticum*, *Smilax ovalifolia*, *Pericampylus glaucas*, *Momordica charantia*], 13 species of geophytes i.e. *Musa balbisiana*, *Eleutherine bulbosa*, *Acorus calamus*, *Zingiber officinale*, *Curcuma aeruginosa*, *Solanum tuberosum*, *Curcuma aromatica*, *Alpinia nigra*, *Costus speciosus*, *Zingiber purpureum*, *Crinum amoenum*, *Lasia spinosa*, *Kaempferia rotunda*, and just 1 species of epiphyte [*Acampe papillosa*].

Apart from these 83 species of plants, some other materials are also used as ingredients. Of these common salt, mustard oil (*Brassica nigra*) and coconut oil (*Cocos nucifera*) are medicinal ingredients and some spices like small & big cardamom [*Elettaria cardamom* & *Amomum subulatum*], cinnamon bark (*Cinnamomum zeylanicum*), black pepper (*Piper nigrum*) and nutmeg (*Myristica fragrans*) are also used sometime to improve the acceptability of the prepared medicine by the patient.

At least three animal parts are also reported to use as ingredients, these are (i) Hen's egg, (ii) *Tetraodon cutcutia* (fish) and *Chelone mydas* (turtle).

7.4.2.16.2. Efficacy of Drugs: For the treatment of as much as 31 types of diseases a great variety of at least 43 formulations are recorded by *Mech* traditional healers. The efficacy of these medicines were also studied and the result has been presented in Table 7.4.1.

Table 7.4.1. Efficacy Status of the Recorded Formulations

Diseases		Total No. of patients	Fully cured	Partly cured	Not cured
GASTRO-INTESTINAL DISEASES					
<i>Bacillary Dysentery</i>	Formula 1	5	5	0	0
	Formula 2	5	3	2	0
<i>Stomachache</i>		4	4	0	0
TOTAL		14	12	2	0
HEPATIC DISEASES					
Jaundice	Formula 1	7	5	2	0
	Formula 2	10	7	3	0
	Formula 3	6	3	2	1
	Formula 4	6	2	3	1

<i>Liver Disorder</i>		5	2	1	2
TOTAL		34	19	11	4
CIRCULATORY SYSTEM DISORDER					
<i>Piles</i>	Formula 1	6	2	1	3
	Formula 2	4	3	0	1
TOTAL		10	5	1	4
GYNAECOLOGICAL DISEASES					
<i>Puerperal Disease</i>		5	3	2	0
<i>Menorrhagia</i>	Formula 1	7	3	1	3
	Formula 2	5	2	1	2
<i>Dysmenorrhoea</i>		6	5	1	0
<i>Infertility</i>		2	2	0	0
TOTAL		25	15	5	5
RESPIRATORY DISEASES					
<i>Asthma</i>		4	1	2	1
<i>Bronchitis</i>		5	2	2	1
<i>Common Cold & Cough</i>		8	5	2	1
<i>Common Cough</i>		5	3	2	0
<i>Pneumonia</i>	Formula 1	6	3	3	0
	Formula 3	5	2	2	1
	Formula 4	4	2	1	1
	Formula 5	3	2	1	0
	Formula 6	5	1	2	2
TOTAL		45	21	17	7
SKIN DISEASES					
<i>Abscess</i>		7	4	3	0
<i>Bed Sore</i>		2	2	0	0
<i>Blister</i>		8	5	3	0
<i>Boil</i>		6	3	2	1
<i>Dermatitis</i>		5	2	3	0
<i>Gangrene</i>		3	2	0	1
<i>Leprosy</i>		2	0	1	1
<i>Scabies</i>		5	3	2	0
TOTAL		38	21	14	3
OPHTHALMIC DISEASES					
<i>Cataract</i>		7	4	2	1
DENTAL PROBLEMS					
<i>Pyorrhoea</i>		5	2	2	1
STINGS & BITES					
<i>Snake Bite</i>		3	3	0	0
ORTHOPAEDIC					
<i>Sprain</i>		5	5	0	0
EAR-NOSE-THROAT (ENT) DISEASE					
<i>Epistaxis</i>		6	4	1	1
PSYCHIATRY					
<i>Insanity</i>		2	1	0	1
RENAL DISEASES					
<i>Disuria</i>		4	1	2	1
NEUROLOGICAL PROBLEMS					

Hemicrania		10	9	1	0
MAGICO-RELIGIOUS					
Evil Spirit	Formula 1	3	2	1	0
	Formula 2	4	1	2	1
TOTAL		7	3	3	1
GRAND TOTAL		215	125	61	29

The analysis of the efficacy table shows that the drugs prepared and administered by *Mech* traditional healers are of very high quality. Out of the 43 formulations, only in a few [Piles Formula 1; Pneumonia Formula 6; Insanity and Disurea] the results of treatments are not satisfied. Otherwise 39 other formulations worked satisfactorily. As a whole, out of 215 patients responded 125 (i.e. 58.14 %) were fully cured. Another 61 patients (i.e. 28.37 %) were partially cured and only 29 patients (i.e. 13.49 %) expressed their dissatisfaction on the result of the treatment.

7.4.3. DISCUSSION

The analysis of the results of survey for the plants used as medicine either in solitary or in combination with other plants and additives lead to the record of 74 species of plants used as solitary and 83 species in combinations. The medicines were almost purely made of plant materials. Only in few cases other non-plant materials has been used. Common salt is the only non-organic materials used in these medicines. Other non-plant materials are Hen's egg, one species of fish and the carapace of turtle.

The medicines are made of different parts of the recorded plants. These include root, bulb, tuber, rhizome, stem, leafy shoot, leaf, flower, fruit, seed, resin, etc almost all parts of plants were used. This no doubt reflects their high research ability. The power of observation of *Mech* traditional healers appeared to be very high. They are nicely using the rich flora of Duars for this purpose.

The medicines they prepare are used afresh in most of the cases. However, in some cases, they prepare tablets or powders. But they never preserve any medicine for a longer period. Plants they use are mostly in freshly collected condition (Plate XII, Fig. A). The paste, the extract or decoction, inhalation, touch, etc – so many forms or methods of treatment are practiced by these healers (Plate XII, Figs. B – H). Their power of identification of plants in the vegetation is also extremely high. They can recognize the repeatedly collected from different habitat. They do not add any preservative and rarely use additive to improve taste and/or aroma.

For the treatment of any disease, the first requirement is the diagnosis of the disease. The power of diagnosis of *Mech* traditional healers also appears to be quite high and that has been reflected in the rate of recovery.

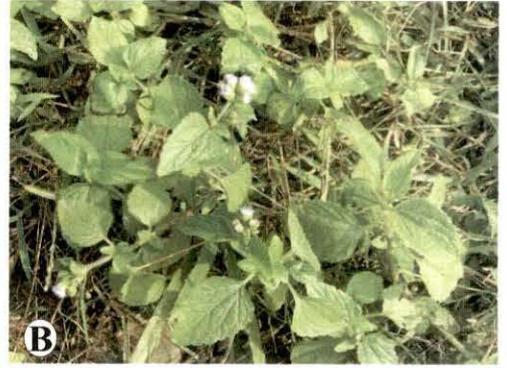
Many of the plants they use are well known for their traditional values. A quick scan through *The Wealth of India* (Anonymous 1976) or any other account on Indian Medicinal Plants (Kirtikar & Basu 1933) will reveal that a good proportion of *Mech* medicinal plants are established ones for their medicinal properties. Species like *Psidium guajava*, *Terminalia chebula*, *Justicia Adhatoda*, *Artemisia indica*, *Ocimum tenuiflorum*, *Centella asiatica*, *Acorus calamus*, *Zingiber officinale*, *Curcuma aeruginosa*, *Alpinia nigra*, *Costus speciosus*, *Phyllanthus amarus*, *Eclipta prostrate*, *Kaempferia rotunda*, *Tinospora cordifolia*, *Piper longum*, *Aegle marmelos*, *Alstonia scholaris*, *Azadirachta indica*, *Terminalia arjuna*, *Terminalia bellirica*, *Ambroma augusta*, *Calotropis gigantea*, *Cassia alata*, *Citrus limon*, *Ricinus communis*, *Vitex negundo*, *Andrographis paniculata*, *Boerhavia coccinea*, *Curcuma longa*, etc are all well established plants and are used in *Mech* traditional medicines.

In addition, there are many other plants those are also used by many other traditional groups and their medicines are also working quite effectively (Rai & Bhujel 1999; Rai 2002; Rai & Das 2004; Chowdhury & Das 2007; Dutta 2007).

7.4.4. Conclusion

Although these herbal remedies are incomparable to the modern medicines but the efficacy rate at least in *Mech* people is quite high. It is also possible that level of immunity against different diseases is very high as their life style is mostly nature dependent and that is why these simple medicines become so effective. At the same time, it is also important to test the efficacy of these plants scientifically in modern laboratories.

PLATE X



Figs. A. *Acmella calva*, B. *Ageratum conyzoides*, C. *Ambroma augusta*, D. *Andrographis paniculata*, E. *Argemone mexicana*, F. *Argyreia roxburghii*, G. *Boerhavia coccinea*, H. *Careya arborea*

PLATE XI



Figs. A. *Cassia alata*, B. *Cassia tora*,
C. *Curcuma aeruginosa*, D. *Curcuma longa*,
E. *Eclipta prostrata*, F. *Euphorbia hirta*,
G. *Hibiscus rosa-sinensis*, H. *Leucas indica*

PLATE XII



Figs. A. Collection of herbal medicines, B. D. Preparation medicine, E. H. Prepared pills, extract, decoction etc.

7.5. Recorded Plants for Veterinary Medicine

7.5.1. ENUMERATION OF PLANTS OF VETERINARY MEDICINE

Main domesticated animals in *Mech* villages are cows, goats, buffaloes, pigs, cats, dogs and fowls. As for man, these animals also suffer from different diseases and they are also treated by *Ojas* using mostly plant materials. A close scrutiny of the plants they use for the treatment of their different pets has revealed the identity of 29 species of plants covering 28 genera from 21 families and is enumerated below.

Alstonia scholaris R. Brown [Apocynaceae]

Vernacular Name: *Sithaona* (Mech); Exscicattus: *Ajita & AP Das 030*.

100 gm dry bark powder is mixed with food and given to the pigs, cows and goats. It acts as a vermicide.

Amaranthus spinosus Linnaeus [Amaranthaceae]

Vernacular Name: *Khudna* (Mech); Exscicattus: *Ajita & AP Das 103*.

Leafy shoots are fed to cows and buffaloes to enhance lactation.

Amorphophallus bulbifer (Roxburgh) Blume [Araceae]

Vernacular Name: *Tha Thadung* (Mech); Exscicattus: *Ajita & AP Das 081*.

Tuber is cut into thin slices and smeared with little amount of salt and rubbed on tongue of cow for curing sore on tongue.

Annona reticulata Linnaeus [Annonaceae]

Vernacular Name: *Balam Fithai* (Mech); Exscicattus: *Ajita & AP Das 415*.

Leaf paste is rubbed on body of cattle for removing lice.

Azadirachta indica A. Jussieu [Meliaceae]

Vernacular Name: *Neem Bilai* (Mech); Exscicattus: *Ajita & AP Das 038*.

The body of cattle is washed with leaf decoction once in a day for 3 days in skin diseases.

Bambusa nutans Wallich ex Munro [Poaceae]

Vernacular Name: *Ooa* (Mech); Exscicattus: *Ajita & AP Das 286*.

2 – 3 kg raw leaves are fed to the cows against dysentery.

Cannabis sativa Linnaeus [Cannabaceae]

Vernacular Name: *Ganja* (Mech); Exscicattus: *Ajita & AP Das 460*.

Huge amount of fresh shoots are kept in the fowl shed in time incubation for removing/ repelling insects from the place.

Centella asiatica (Linnaeus) Urban [Apiaceae]

Vernacular Name: *Manimuni Gedet* (Mech); Exscicattus: *Ajita & AP Das 290*.

In case of drowsiness and white stool in hen, equal quantities of leaves *Centella asiatica*, *Hydrocotyle sibthorpioides* and dry fish are pounded together and mixed with boiled rice and given to the hen once in a day.

Colocasia esculenta (Linnaeus) Schott [Araceae]

Vernacular Name: *Thadung* (Mech); Exscicattus: *Ajita & AP Das 050*.

Leaves and petioles are chopped and boiled in sufficient water and fed to the pigs twice a day for 7 days to induce fertility.

Corchorus capsularis Linnaeus [Tiliaceae]

Vernacular Name: *Phatto*; Exscicattus: *Ajita & AP Das 294*.

50gm dry leaves are soaked in 250 ml of water overnight and then strained; this water is then given orally to the goats in equal intervals (4 times in a day) for worms.

Crinum amoenum Roxburgh [Amaryllidaceae]

Vernacular Name: *Mosoi Sabrum* (Mech); Exscicattus: *Ajita & AP Das 76, 465*.

- In asthma of cows, about 1/3 roasted bulb is given to the cows with their food once in a day
- One bulb of *Crinum amoenum* and same quantity of tuber of *Amorphophallus bulbifer* are pounded and half of the paste is given orally to the cows in swelling of neck and the remaining part of paste is smeared on neck till cure
- One bulb is crushed and fed to the cow once in a day to prevent flatulence of stomach.

Curcuma longa Linnaeus [Zingiberaceae]

Vernacular Name: *Haldi* (Mech); Exscicattus: *Ajita & AP Das 466*.

10 gm rhizome is pounded and mixed with 1 tablespoon of lime and applied on body of fowls to cure body sore.

Cynodon dactylon (Linnaeus) Persoon [Poaceae]

Vernacular Name: *Duba Gang-se* (Mech); Exscicattus: *Ajita & AP Das 288*.

In body-sore of cattle, 25 gms of whole plant of *Cynodon dactylon* and 25 gm rhizome of *Curcuma longa* are pounded. The paste is smeared on infected area and tied the area with a cotton-rag and changed it every day continuously till cure.

Dryopteris filix-mas (Linnaeus) Schott [Dryopteridaceae]

Vernacular Name: *Saldaokhumai* (Mech); Exscicattus: *Ajita & AP Das 289*.

In incubation time of hens, fronds are kept around the hen for repelling insects.

Euphorbia hirta Linnaeus [Euphorbiaceae]

Vernacular Name: *Dudhali* (Mech); Exscicattus: *Ajita & AP Das 174*.

Leaves are fed to milking cows for improving lactation.

Euphorbia royleana Boissier [Euphorbiaceae]

Vernacular Name: *Sijou* (Mech); Exscicattus: *Ajita & AP Das 295*.

Latex is applied externally on the skin at the side of the affected eye(s) to cure ophthalmic cows.

Hibiscus sabdariffa Linnaeus [Malvaceae]

Vernacular Name: *Mistha Bingfang* (Mech); Exscicattus: *Ajita & AP Das 249*.

10 – 12 leaves are boiled in 1 bowl of boiled rice water and given orally to the cows twice daily for 4 – 5 days in dysentery.

Hydrocotyle sibthorpioides Lamarck [Apiaceae]

Vernacular Name: *Manimuni Galei* (Mech); Exscicattus: *Ajita & AP Das 291*.

Equal quantities of leaves of *Hydrocotyle sibthorpioides*, *Centella asiatica*, cinnamon and cardamom are pounded and heated and fed to the cow at morning and in the evening in pneumonia.

Jatropha curcas Linnaeus [Euphorbiaceae]

Vernacular Name: *Enda* (Mech); Exscicattus: *Ajita & AP Das 293*.

- Extract of stem bark is applied on the body of cows and buffaloes to cure skin sores.
- 5 – 6 drops of latex is dropped on to eyes of cows thrice daily in ophthalmia.

Justicia adhatoda Linnaeus [Acanthaceae]

Vernacular Name: *Chinchiri* (Mech); Exscicattus: *Ajita & AP Das 404*.

About 4 – 5 leaves are pounded and given to the cows twice daily to cure pneumonia.

Mimosa pudica Linnaeus [Mimosaceae]

Vernacular Name: *Sumukhchi* (Mech); Exscicattus: *Ajita & AP Das 059*.

Shoots are crushed and the extract is applied on wounds of cows thrice a day till cure.

Musa balbisiana Colla [Musaceae]

Vernacular Name: *Athia Thalith* (Mech); Exscicattus: *Ajita & AP Das 251*.

- Pseudostem is cut into small pieces and given to the cattle to prevent heatstroke.
- Three ripen fruits are peeled off and squeezed in 900 ml of water and fed to the cows thrice daily to check dysentery.

Nyctanthes arbor-tristis Linnaeus [Verbenaceae]

Vernacular Name: *Sephali Bibar* (Mech); Exscicattus: *Ajita & AP Das 292*.

Three tablespoons leaf extract is mixed with food and fed to the hens to cure fever.

Oryza sativa Linnaeus [Poaceae]

Vernacular Name: *Mairong* (Mech); Exscicattus: *Ajita & AP Das 296*.

Boiled rice water is sprayed in the fowl shed in incubation period for removing insects.

Paederia foetida Linnaeus [Rubiaceae]

Vernacular Name: *Khipi Bindong* (Mech); Exscicattus: *Ajita & AP Das 467*.

In case of flatulence of stomach of cows, few creepers are twisted and hung around the neck of the animal.

Pericampylus glaucas (Lamarck) Merrill [Menispermaceae]

Vernacular Name: *Nalithapa* (Mech); Exscicattus: *Ajita & AP Das 077*.

In case of hyper salivation of cows, 10 – 15 leaves are boiled in a bowl of water and the extract is given to the cows once in a day for 3 – 4 days.

Persicaria hydropiper (Linnaeus) Spach [Polygonaceae]

Vernacular Name: *Hatitika* (Mech); Exscicattus: *Ajita & AP Das 266*.

400 gm of leaves are rubbed on the body of cattle for removing lice.

Piper betle Linnaeus [Piperaceae]

Vernacular Name: *Phatai* (Mech); Exscicattus: *Ajita & AP Das 114*.

Three leaves and 50 gm of jaggery are crushed and fed to the cows thrice daily in stomachache.

Zingiber officinale Roxburgh [Zingiberaceae]

Vernacular Name: *Adi* (Mech); Exscicattus: *Ajita & AP Das 252*.

In indigestion of cows, 50 gm zinger rhizome, 25 gm ajowan and 25 gm black salt are pounded together and fed to the cows once in a day.

7.5.2. ANALYSIS OF PLANTS USED IN VETERINARY MEDICINES

The *Meches* have rich and unique traditional knowledge about the use of natural resources, particularly the biological resources available in their surroundings for the treatment of ailments of their domestic animals. According to the present study, the plant species are used traditionally against 23 types of animal diseases as vermicide, lactation enhancer, fertility inducer, repellent for body-lice and other insects, and against sore of tongue, skin diseases, dysentery, drowsiness and white stool, worms, asthma, swelling of neck, flatulence of stomach, body sore, ophthalmia, pneumonia, wounds, heatstroke, fever, hyper salivation, stomachache and indigestion. The efficacy of the methods of treatment appears to be quite satisfactory.

1. Diseases they treat: Out of 23 types of ailments of pets recorded to treat by the *Mech Ojas*, there are 2 formulations used as vermicide, using two species of plants, *Alstonia scholaris* and *Corchorus capsularis*. Accordingly, two each for lactation, repelling body-lice, dysentery, repelling insects, flatulence of stomach, body sore, ophthalmia, pneumonia and one each for sore of tongue sore, skin disease, drowsiness and white stool, fertility inducer, asthma, swelling of neck, wounds, heatstroke, fever, hyper salivation, stomachache and indigestion have been recorded.

2. Habit groups: The total number of plants used in veterinary purposes can be categorized in the following ways considering their habit groups: four tree species (*Alstonia scholaris*, *Annona reticulata*, *Azadirachta indica*, *Bambusa nutans*,) belonging four families i.e. Apocynaceae, Annonaceae, Meliaceae and Poaceae; four species of shrubs like *Euphorbia royleana*, *Jatropha curcas*, *Justicia adhatoda*, *Nyctanthes arbor-tristis* under three families, Euphorbiaceae, Acanthaceae and Verbenaceae; 18 species of herbs i.e. *Amaranthus spinosus*, *Amorphophallus bulbifer*, *Cannabis sativa*, *Centella asiatica*, *Colocasia esculenta*, *Corchorus capsularis*, *Crinum amoenum*, *Curcuma longa*, *Cynodon dactylon*,

Dryopteris filix-mas, *Euphorbia hirta*, *Hibiscus sabdariffa*, *Hydrocotyle sibthorpioides*, *Mimosa pudica*, *Musa balbisiana*, *Oryza sativa*, *Persicaria hydropiper*, *Zingiber officinale* belonging 12 families, Amaranthaceae, Cannabaceae, Araceae, Poaceae, Apiaceae, Tiliaceae, Amaryllidaceae, Zingiberaceae, Dryopteridaceae, Euphorbiaceae, Mimosaceae, Musaceae, Polygonaceae and 3 species climbers (*Paederia foetida*, *Pericampylus glaucas* and *Piper betle*) under 3 families, Rubiaceae, Menispermaceae and Piperaceae.

3. Plant parts used: An analysis of available data on the plants used as veterinary medicines have shown that leaves of 16 species (*Annona reticulata*, *Azadirachta indica*, *Bambusa nutans*, *Centella asiatica*, *Colocasia esculenta*, *Corchorus capsularis*, *Dryopteris filix-mas*, *Euphorbia hirta*, *Euphorbia royleana*, *Hibiscus sabdariffa*, *Hydrocotyle sibthorpioides*, *Justicia adhatoda*, *Nyctanthes arbor-tristis*, *Pericampylus glaucas*, *Persicaria hydropiper*, *Piper betle*) used are belonging to 14 families; rhizomes or corms of 3 species like *Amorphophallus bulbifer*, *Curcuma longa*, *Zingiber officinale* under 2 families; shoots of 3 species (*Amaranthus spinosus*, *Cannabis sativa*, *Mimosa pudica*) of 3 families; stem-barks of *Alstonia scholaris* and *Jatropha curcas*; petiole of *Colocasia esculenta*; bulb of *Crinum amoenum*; whole plant *Cynodon dactylon*; pseudostem and fruits of *Musa balbisiana*; twining shoot of *Paederia foetida* and grains of *Oryza sativa* are used.

4. Conclusion: People of *Mech* community keep many domestic animals. And, their traditional plant based medicines keeps these animals quite healthy. This clearly indicates the efficacy of such herbal medicines. The list of recorded plants also includes a good number of well-known medicinal plants. However, the other recorded plants can be the subject of modern research leading to the development of more effective and safer medicines.

7.6. Recorded Poisonous Plants

7.6.1. INTRODUCTION

Sometimes we also need to use some harmful materials. We manufacture lethal weapons not only to hunt for our food we also use those to save us from the enemies. In traditional societies, in addition to their comparatively much less dangerous weapons, they also use many plants for their different levels of toxicity and can be used as poison, which may be harmful or not to the human. However, for suicide activities people also need to use extremely poisonous plants.

The situation is not different in the *Mech* society too! During the ethnobotanical survey among the *Meches* the uses of some such poisonous plants also have been recorded. Those plants are enumerated below along with their local names, voucher specimens and mode of use as poison.

7.6.2. ENUMERATION OF PLANTS RECORDED FOR VETERINARY MEDICINES

Alstonia scholaris R. Brown [Apocynaceae]

Vernacular Name: *Sithaona* (Mech); Exsicattus: *Ajita & AP Das 030*.

About 30 kg of crushed stem-bark is mixed with the water in a small pond (*Hakhor*) for stupefying fishes.

Capsicum annuum Linnaeus [Solanaceae]

Vernacular Name: *Banzut* (Mech); Exsicattus: *Ajita & AP Das 184*.

Pounded fruit is used for poisoning arrow.

Careya arborea Roxburgh [Lecythidaceae]

Vernacular Name: *Khoom Bingfang* (Mech); Exsicattus: *Ajita & AP Das 463*.

Root and stem-barks are crushed in sufficient quantity (approx 5 – 6 kg) and mixed with pond water for stupefying fishes.

Costus speciosus (Koenig ex Retzius) Smith [Costaceae]

Vernacular Name: *Debgugri* (Mech); Exsicattus: *Ajita & AP Das 382*.

Sufficient quantity (approx 2 – 3 kg) of crushed rhizome is mixed with shallow water bodies (size 2 × 2 m) to stupefy fishes.

Datura metel Linnaeus [Solanaceae]

Vernacular Name: *Dotra* (Mech); Exsicattus: *Ajita & AP Das 074*.

Juice of ± 5 fruits and one cup of leaf-juice can create madness in people.

Derris polystachya Bentham [Fabaceae]

Vernacular Name: *Rhu* (Mech); Exscicattus: *Ajita & AP Das 472*.

1 kg stem-bark is crushed and mixed with stagnant water of forest streams (1 × 1 m) for stupefying fishes.

Diospyros malabarica (Desrousseaux) Kosteletsky [Ebenaceae]

Vernacular Name: *Gab* (Mech); Exscicattus: *Ajita & AP Das 345*.

Boiled fruits are used for trapping birds.

Fagerlindia fasciculata (Roxburgh) Tirvengadam [Rubiaceae]

Vernacular Name: *Maina* (Mech); Exscicattus: *Ajita & AP Das 169*.

12 – 15 kg of fruits are pounded and mixed in pond water for killing fishes.

Moringa oleifera Lamarck [Moringaceae]

Vernacular Name: *Sajna* (Mech); Exscicattus: *Ajita & AP Das 041*.

About 30 gm root extract is toxic for human health.

Murraya koenigii (Linnaeus) Sprengel [Rutaceae]

Vernacular Name: *Jafsri Bilai* (Mech); Exscicattus: *Ajita & AP Das 381*.

Aquous leaf extract is sprayed around homestead for repelling snakes.

Persicaria hydropiper (Linnaeus) Spach [Polygonaceae]

Vernacular Name: *Hatitika* (Mech); Exscicattus: *Ajita & AP Das 124*.

About 3 kg whole plants are crushed and mixed with pond water for stupefying fishes.

Plumbago zeylanica Linnaeus [Plumbaginaceae]

Vernacular Name: *Emao* (Mech); Exscicattus: *Ajita & AP Das 015*.

About 40 gm root extract is poisonous for human health.

Thevetia peruviana (Persoon) Schumann [Apocynaceae]

Vernacular Name: *Kholke Bibar* (Mech); Exscicattus: *Ajita & AP Das 464*.

Consumption of just 2 fruits is enough to develop harmful effects for human beings. It creates madness and can even cause death.

7.6.3. ANALYSIS OF RECORDED FOR VETERINARY MEDICINES

During the field survey, 13 species of poisonous plants belonging to 11 families were recorded. Such plants are harmful for human health and for other animals. Though the main occupation of *Mech* people is agriculture, fishing is an alternate source of income. They collect fish for food and also for sale in nearby markets. For stupefying and/or killing fishes either entire plants or certain part of plants as fish poison. Fishing is done by erecting a temporary wall with mud and stones or by diverting the water current they arrest the water for some smaller area in rivers/ streams/ ponds. The plants or plant parts are crushed and mix with the water. The fish poison makes the fish float in a stupefied state where they are captured

easily. Besides these, some plants are also used for hunting and bird trapping purposes. Even for committing suicide they use some plant parts.

7.6.3.1. Habit Groups: Out of the recorded species 6 belonging to 6 families are trees, like *Alstonia scholaris*, *Careya arborea*, *Derris polystachya*, *Diospyros malabarica*, *Fagerlindia fasciculata* and *Moringa oleifera*. Also, there are 5 species of shrubs from 4 families namely *Capsicum annum*, *Datura metel*, *Murraya koenigii* and *Plumbago zeylanica*, *Thevetia peruviana* and 2 species of herbs (*Costus speciosus* and *Persicaria hydropiper*) are also documented.

7.6.3.2. Useful Plant Parts: Leaves and fruits of *Datura metel*, root of *Moringa oleifera* and *Plumbago zeylanica* and fruits of *Thevetia peruviana* are poisonous for human health. Stem barks of *Alstonia scholaris*, *Careya arborea*, *Derris polystachya*; fruits of *Fagerlindia fasciculata*; roots of *Careya arborea*; rhizome of *Costus speciosus* and whole plant of *Persicaria hydropiper* are used for stupefying fishes. Boiled fruits of *Diospyros malabarica* are used as bird-trapping purposes. To drive out snakes, leaves of *Murraya koenigii* are very useful in *Mech* villages.

7.6.3.3. Conclusion: If a plant is poisonous then certainly there is one or more toxic chemical(s). In most of the cases, we know, these chemicals are also of medicinal importance. This is also reflected in the list of plants recorded here as all the recorded 13 species are recognized as medicinal plants too!

7.7. Preparation of *Jou* [Rice Beer]

7.7.1. INTRODUCTION

Jou is the elixir of life in the *Mech* society. It is a kind of Rice Beer and is prepared by most of the traditional communities at least in the Indian subcontinent (Ghosh & Das 2004). Duars can be regarded as the native place of several tribes such as *Mech*, *Rabha*, *Toto*, *Garo*, *Oraon*, *Munda* etc. The practice of consuming homemade liquor is immensely popular among them. Although the plant ingredients of the liquor made by different tribes vary widely but their starting material i.e. boiled rice (*Oryza sativa* Linnaeus of Poaceae) and the process of preparation remains same. This “Country Liquor” is popularly termed as *Jou* (by *Mech*), *Iu* (by *Toto*), *Chukor Muchi* (by *Rabha*), *Jhara* (by *Oraon*), *Haria* (by *Santal*) and *Badde* (by *Munda*).

The plant materials that have been incorporated in the preparation of starter mixture of rice beer have tremendous ethnomedicinal values in tribal communities (Jain 1991). A good number of people from these tribal communities are engaged in the preparation and marketing of rice beer. Not only that, use of these plants and the rice beer itself is related to different socio-cultural and religious occasions of tribes. They consume this beer in most of their social programs like marriage ceremony, celebration of childbirth etc.

Even today, most of the people of these tribal communities believe that they remain healthy by drinking rice beer regularly. Unfortunately, younger generations are more inclined towards the distilled products of rice beer that is with higher percentage of ethanol but without having the quality of its plant ingredients.

7.7.2. Ingredients:

Following is the list of materials used for making *Jou* by the people of *Mech* community:

1. *Plumbago zeylanica* Linnaeus; Plumbaginaceae (*Emao*) [Ajita & AP Das 015]: It is used for fermentation.
2. *Scoparia dulcis* Linnaeus; Scrophulariaceae (*Rakhep*) [Ajita & AP Das 014]: It produces sweetness.
3. *Clerodendrum viscosum* Ventenat; Verbenaceae (*Lakhna*) [Ajita & AP Das 016]: It produces slight bitter taste.
4. *Artocarpus heterophyllus* Lamarck; Moraceae (*Kanthal*) [Ajita & AP Das 017]: It increases sweetness.

5. *Dryopteris filix-mas* (Linnaeus) Schott; Dryopteridaceae (*Saldaokhumai*) [Ajita & AP Das 013]: It develops bitter taste.
6. *Oryza sativa* Linnaeus; Poaceae (*Mairong*) [Ajita & AP Das 296]: This is the main ingredient.

7.7.3. Preparation:

Preparation of Rice Beer has two distinct steps (i) Preparation of Starter Mixture and (ii) Fermentation of boiled rice (Ghosh & Das 2004).

7.7.3.1. Preparation of Starter Mixture: 1 kg of broken grains of *Oryza sativa*, 250 gm roots and shoots of *Plumbago zeylanica*, 100 gm shoots of *Scoparia dulcis*, 100 gm tender leaves of *Clerodendrum viscosum* and 50 gm tender leaves of *Artocarpus heterophyllus* and 10 gm young fronds of *Dryopteris filix-mas* are pounded together in a wooden mortar and made into powder. The powder are strained through a sieve and made into a paste with little water. The dough is then flattened into round discoid breads. These are kept within straw, covered with a jute rug. There the ferment grows in the breads for two days and the breads develop a dense mantle of white fungal hyphae. After two to three days the breads are brought out and dried hard under the direct sun. These breads are the *Emao*, the starter mixture. (Plate XIII, Figs. A – D).

7.7.3.2. Fermentation of Boiled Rice: For rice beer preparation, 2 kg rice is boiled with an amount of water that will dry up when the boiling will be over i.e. nothing is to be decanted. Boiled rice is spread on a bamboo plate to cool down and for little more drying. 200 gm of starter bread is powdered and then mixed with the boiled rice. The whole things are placed in a big metal container for fermentation. In winter the mix is kept for 7 – 8 days and in summer it becomes ready in 4 – 5 days. After the proper fermentation some amount of liquor is come out from the mix and the liquid is now strained. This liquor is *Jou*, the Rice Beer. (Plate XIII, Figs. E – H).

7.7.3.3. Differences: The materials and the methods followed by *Meches* is not exactly similar with that the methodology recorded by Ghosh & Das (2004) among the *Oraons* living in Duars. *Oraons* use some core plants those are must for the preparation of starter mixture. In addition to those they use some other modifier plants to develop a particular color or aroma or taste or for long time storage. In comparison to that *Meches* use much lesser number of plants and except the grains of *Oryza sativa* no other plant can be regarded as the core plant. *Oraons* always keep few pieces of dry chili and charcoal with materials from the stage of collection of raw herbage materials upto the final fermentation stage. They believe, this keeps away evil spirits which may interfere with the quality of the produces. However, it may be *Jou* or *Jhara*, the rice beer is much favorite for the people of both the communities.

PLATE XIII



Figs A. Grinding of plant materials, B. Sieving the powder, C. The prepared starters, D. Dried starter, E. Grinding starter added to the boiled rice, F. Placing the mixed rice in a container for fermentation, G. After fermentation the prepared liquor, H. Straining the liquid

7.8. Recorded Ornamental & Decorative Plants

7.8.1. ENUMERATION OF ORNAMENTAL AND DECORATIVE PLANTS

Generally the campus of a *Mech* household is neatly maintained. Each house of *Mech* is surrounded by a fence and almost all the families have their lands, some of which is used as garden. According to survey, 18 plants species covering 17 genera from 15 families are recorded which are used for garden decoration and ornamentation purposes. These are enumerated below.

Areca catechu Linnaeus [Arecaceae]

Vernacular Name: *Goy* (Mech); Exscicattus: *Ajita & AP Das 346*.

Trunk stripe is used for fencing purposes.

Bambusa nutans Wallich ex Munro [Poaceae]

Vernacular Name: *Ooa* (Mech); Exscicattus: *Ajita & AP Das 012*.

Bamboo split is used as fence (*Tati*).

Cassia fistula Linnaeus [Caesalpinaceae]

Vernacular Name: *Dindong* (Mech); Exscicattus: *Ajita & AP Das 413*.

Deciduous ornamental small tree with beautiful foliage and flowers.

Catharanthus roseus (Linnaeus) G. Don [Apocynaceae]

Vernacular Name: *Nayantara* (Mech); Exscicattus: *Ajita & AP Das 188*.

Plant is grown in gardens

Costus speciosus (Koenig ex Retzius) Smith [Costaceae]

Vernacular Name: *Debgugri* (Mech); Exscicattus: *Ajita & AP Das 143*.

For ornamentation this plant is grown.

Crinum amoenum Roxburgh [Amaryllidaceae]

Vernacular Name: *Mosoi Sabrum* (Mech); Exscicattus: *Ajita & AP Das 076*.

Plants are grown for gardening purposes.

Gliricidia sepium (Jacquin) Walpers [Fabaceae]

Vernacular Name: *Benda Bimfang* (Mech); Exscicattus: *Ajita & AP Das 400*.

Planted along the fencing for its beautiful leaves and flowers.

Hibiscus rosa-sinensis Linnaeus [Malvaceae]

Vernacular Name: *Java* (Mech); Exscicattus: *Ajita & AP Das 397, 405*.

Grown in gardens for its beautiful flowers.

Ixora coccinea Linnaeus [Rubiaceae]

Vernacular Name: *Rangan Bibar* (Mech); Exscicattus: *Ajita & AP Das 137*.

Grown in gardens for its beautiful flowers.

Jatropha curcas Linnaeus [Euphorbiaceae]

Vernacular Name: *Enda* (Mech); Exscicattus: *Ajita & AP Das 406*.

Grown along the fencing (*Tati*).

Justicia adhatoda Linnaeus [Acanthaceae]

Vernacular Name: *Chinchiri* (Mech); Exscicattus: *Ajita & AP Das 404*.

Grown along the fences for its beautiful foliage and flowers.

Justicia gendarussa Linnaeus f. [Acanthaceae]

Vernacular Name: *Jatrashi* (Mech); Exscicattus: *Ajita & AP Das 403*.

Grown along the fences for its beautiful foliage and flowers.

Kalanchoe pinnata (Lamarck) Persoon [Crassulaceae]

Vernacular Name: *Oatkhambra* (Mech); Exscicattus: *Ajita & AP Das 411*.

Grown in gardens for its beautiful succulent leaves and flowers.

Malvaviscus arboreus Cavan [Malvaceae]

Vernacular Name: *Banjut Java* (Mech); Exscicattus: *Ajita & AP Das 401*.

Grown in gardens for its beautiful flowers.

Mirabilis jalapa Linnaeus [Nyctaginaceae]

Vernacular Name: *Mana-bai -ni Bibar* (Mech); Exscicattus: *Ajita & AP Das 398*.

Grown in gardens for its beautiful flowers.

Polyalthia longifolia (Sonnerat) Thwaites [Annonaceae]

Vernacular Name: *Debbaru* (Mech); Exscicattus: *Ajita & AP Das 136*.

Leaves are used for decoration.

Sansevieria trifasciata Prain [Dracaenaceae]

Vernacular Name: *Jibou Bilai* (Mech); Exscicattus: *Ajita & AP Das 452*.

Succulent ornamental herb.

Thevetia peruviana (Persoon) Schumann [Apocynaceae]

Vernacular Name: *Kholke Bibar* (Mech); Exscicattus: *Ajita & AP Das 395*.

For its beautiful leaves and flowers; generally grown near the religious sites.

7.8.2. ANALYSIS OF RECORDED DECORATIVE AND ORNAMENTAL PLANTS

Out of 18 species four are trees (*Areca catechu*, *Bambusa nutans*, *Cassia fistula*, *Polyalthia longifolia*) from 4 families; 10 species are shrubs (*Catharanthus roseus*, *Gliricidia sepium*, *Hibiscus rosa-sinensis*,

Ixora coccinea, *Jatropha curcas*, *Justicia adhatoda*, *Justicia gendarussa*, *Kalanchoe pinnata*, *Malvaviscus arboreus* and *Thevetia peruviana* belonging 7 families and 2 species of herbs i.e. *Mirabilis jalapa* and *Sansevieria trifasciata* from 2 families and 2 species of geophytes e.g. *Costus speciosus* and *Crinum amoenum* belonging to 2 families are documented.

For fencing the house campus, *Areca catechu*, *Bambusa nutans*, *Gliricidia sepium*, *Jatropha curcas*, *Justicia adhatoda*, *Justicia gendarussa* etc. are grown. Twigs of *Polyalthia longifolia* are used for decoration in ceremonies. Some plants like *Cassia fistula*, *Catharanthus roseus*, *Costus speciosus*, *Crinum amoenum*, *Hibiscus rosa-sinensis*, *Ixora coccinea*, *Kalanchoe pinnata*, *Malvaviscus arboreus*, *Mirabilis jalapa*, *Sansevieria trifasciata* and *Thevetia peruviana* are grown in garden for their beautiful flowers, leaves and foliage.

Again, it can also be realized that only except three (*Costus speciosus*, *Crinum amoenum* and *Cassia fistula*) of the recorded 18 species all are grown with purpose. And, of these at least ten species (*Catharanthus roseus*, *Gliricidia sepium*, *Hibiscus rosa-sinensis*, *Jatropha curcas*, *Justicia gendarussa*, *Kalanchoe pinnata*, *Malvaviscus arboreus*, *Mirabilis jalapa*, *Sansevieria trifasciata* and *Thevetia peruviana*) are exotics. There are numerous other beautiful plants in the surrounding forests but they do not use those for decoration. From this habit appears that they have selected these plants mostly by observing the local Bengali community who uses quite a large number of plant species for this purpose.

7.9. Religious Plants

7.9.1. ENUMERATION OF RECORDED RELIGIOUS PLANTS

People of *Mech* community are the followers of *Bathou* religion. Their place of worship is of two types:

(i) Every house has its own *No-ma-no* (= temple); and (ii) for the community there is *Thansali*. At both the places they grow at least one plant of *Euphorbia royleana* (*Sijou*) and some plants of *Justicia gendarussa* (*Jatrashi*) are also grown near by. In addition to these two plants they use some other plants too for different religious purposes and are enumerated bellow:

Aegle marmelos (Linnaeus) Correa [Rutaceae]

Vernacular Name: *Bel Bilai* (Mech); Exscicattus: *Ajita & AP Das 042*.

Leaves are use in different religious ceremonies.

Areca catechu Linnaeus [Arecaceae]

Vernacular Name: *Goy* (Mech); Exscicattus: *Ajita & AP Das 346*.

Nuts are used for different religious purposes.

Bambusa nutans Wallich *ex* Munro [Poaceae]

Vernacular Name: *Ooa* (Mech); Exscicattus: *Ajita & AP Das 012*.

In different religious ceremonies bamboo is used.

Bambusa tulda Roxburgh [Poaceae]

Vernacular Name: *Jati Ooa* (Mech); Exscicattus: *Ajita & AP Das 383*.

Bamboo is used in *Kherai Sibinai*.

Bombax ceiba Linnaeus [Bombacaceae]

Vernacular Name: *Simul* (Mech); Exscicattus: *Ajita & AP Das 099*.

Floss is used in various ceremonies.

Calamus erectus Roxburgh [Arecaceae]

Vernacular Name: *Raidong* (Mech); Exscicattus: *Ajita & AP Das 384*.

Whole plant is useful in *Kherai Phunai*.

Catharanthus roseus (Linnaeus) G. Don [Apocynaceae]

Vernacular Name: *Nayantara* (Mech); Exscicattus: *Ajita & AP Das 188*.

For worshipping deities flowers are used.

Cicer arietinum Linnaeus [Fabaceae]

Vernacular Name: *But* (Mech); Exscicattus: *Ajita & AP Das 399*.

Seed is offered to the deities during worship.

Clerodendrum viscosum Venttenat [Verbenaceae]

Vernacular Name: *Lakhna* (Mech); Exscicattus: *Ajita & AP Das 386*.

Leaves are used in *Kherai Phunai*.

Corchorus capsularis Linnaeus [Tiliaceae]

Vernacular Name: *Phatto* (Mech); Exscicattus: *Ajita & AP Das 387*.

Jute stick is used in different ceremonies.

Cucumis sativus Linnaeus [Cucurbitaceae]

Vernacular Name: *Gumbri* (Mech); Exscicattus: *Ajita & AP Das 388*.

Fruit is offered to the deities during worship.

Cynodon dactylon (Linnaeus) Persoon [Poaceae]

Vernacular Name: *Duba-gangse* (Mech); Exscicattus: *Ajita & AP Das 054*.

Twigs are useful for different religious ceremonies.

Euphorbia royleana Boissier [Euphorbiaceae]

Vernacular Name: *Sijou* (Mech); Exscicattus: *Ajita & AP Das 010*.

Sijou is the symbol that implies *Bwrai Bathou*, the main God.

Gliricidia sepium (Jacquin) Walpers [Fabaceae]

Vernacular Name: *Benda Bimfang* (Mech); Exscicattus: *Ajita & AP Das 400*.

Two bundles containing rice beer and offerings suspended on two sides (*Ban-dingdong*) of a rod made from the branch of this plant and is carried by a porter in *Gami Madai-phunai* (Worship of Village God).

Gmelina arborea Roxburgh [Verbenaceae]

Vernacular Name: *Gambri* (Mech); Exscicattus: *Ajita & AP Das 389*.

Stools made of its timber are useful in *Kherai Phunai*.

Hibiscus rosa-sinensis Linnaeus [Malvaceae]

Vernacular Name: *Java* (Mech); Exscicattus: *Ajita & AP Das 397, 405*.

Flowers are used for worshipping of deities.

Justicia gendarussa Linnaeus f. [Acanthaceae]

Vernacular Name: *Jatrashi* (Mech); Exscicattus: *Ajita & AP Das 011*.

For worshipping *Bathou* God, shoots are used for making sanctified water.

Malvaviscus arboreus Cavan [Malvaceae]

Vernacular Name: *Banjut Java* (Mech); Exscicattus: *Ajita & AP Das 396*.

Flowers are used in religious ceremonies.

Mirabilis jalapa Linnaeus [Nyctaginaceae]

Vernacular Name: *Mana-bai -ni Bibar* (Mech); Exscicattus: *Ajita & AP Das 398*.

Flowers are used for worshipping deities.

Musa balbisiana Colla [Musaceae]

Vernacular Name: *Athia Thalith* (Mech); Exscicattus: *Ajita & AP Das 408*.

Leaves, leaf sheaths, pseudostem and fruits are used in different rituals. Whole plant and pseudostem are also used for ceremonial decorations.

Ocimum tenuiflorum Linnaeus [Lamiaceae]

Vernacular Name: *Tuhutsi* (Mech); Exscicattus: *Ajita & AP Das 013*.

Leaves are used for worshiping of deities.

Oryza sativa Linnaeus [Poaceae]

Vernacular Name: *Mairong* (Mech); Exscicattus: *Ajita & AP Das 409*.

Paddy- grains, with and without husk, are used in most of the religious ceremonies.

Phragmites karka (Retzius) Trinius ex Steudel [Poaceae]

Vernacular Name: *Khangkhla* (Mech); Exscicattus: *Ajita & AP Das 390*.

Whole plant is necessary in *Kherai Phunai*.

Piper betle Linnaeus [Piperaceae]

Vernacular Name: *Phatai* (Mech); Exscicattus: *Ajita & AP Das 159*.

Leaves are used in marriage and death ceremonies and also for offerings.

Premna bengalensis C.B. Clarke [Verbenaceae]

Vernacular Name: *Babol* (Mech); Exscicattus: *Ajita & AP Das 271*.

Whole plant is being worshipped as *Hagra Madai* (Forest God).

Psilanthus bengalensis (Schultes) Leroy [Rubiaceae]

Vernacular Name: *Hagrani Bibar* (Mech); Exscicattus: *Ajita & AP Das 385*.

Flowers are used for worshipping.

Saccharum spontaneum Linnaeus [Poaceae]

Vernacular Name: *Gigab* (Mech); Exscicattus: *Ajita & AP Das 048*.

For worshipping *Bathou* whole plant is used.

Shorea robusta Roxburgh ex Gaertner f. [Dipterocarpaceae]

Vernacular Name: *Sal-dom-phang* (Mech); Exscicattus: *Ajita & AP Das 391*.

The resin obtained from the bark is used as incense in religious ceremonies.

Tabernaemontana divaricata (Linnaeus) Roemer & Schultes [Apocynaceae]

Vernacular Name: *Gapht Bibar* (Mech); Exscicattus: *Ajita & AP Das 392*.

Flowers are used in many religious ceremonies.

Tagetes patula Linnaeus [Asteraceae]

Vernacular Name: *Genda* (Mech); Exscicattus: *Ajita & AP Das 410*.

Flowers are used for worshipping of deities.

Thevetia peruviana (Persoon) Schumann [Apocynaceae]

Vernacular Name: *Kholke Bibar* (Mech); Exscicattus: *Ajita & AP Das 395*.

Flower is used for worshipping deities.

Vigna mungo (Linnaeus) Hepper [Fabaceae]

Vernacular Name: *Sabai Gwchhwu* (Mech); Exscicattus: *Ajita & AP Das 393*.

Seeds are the offerings for *Maigaijennaini Sibinai* (paddy sowing ceremony).

7.9.2. ANALYSIS OF RECORDED RELIGIOUS PLANTS

The present survey recorded a total of 32 species of angiospermic plants, covering 31 genera and 19 families used as religious plants by the people of *Mech* community.

The habit-group distribution of recorded religious plants has been analyzed in Table 7.9.1.

Table 7.9.1. Habit group distribution of religious plants.

Habit-group	Taxa		
	Family	Genus	Species
Tree	8	9	9
Shrub	8	10	10
Herb	5	9	9
Climber	3	3	3
Geophyte	1	1	1
Total recorded species:			32

As far as I have realized, *Euphorbia royleana*, is the most religious plant for the believers of *Bathou* religion. They generally grow one plant of *Euphorbia royleana* in one corner of their premises where they warship their God.

The plants recorded here as religious plants includes *Aegle marmelos*, which is not only one important medicinal plant, it is also treated as religious by different communities in the Indian subcontinent. In addition, flowers of the plants like *Tagetes patula*, *Tabernaemontana divaricata*, *Malvaviscus arboreus*, *Hibiscus rosa-sinensis*, *Catharanthus roseus* and *Thevetia peruviana* are used to please the deity by wide array of people. Also, the fruits, shoot and/ or leaves of the plants like *Cynodon dactylon*, *Ocimum tenuiflorum*, *Areca catechu*, *Piper betle*, *Vigna mungo* and *Oryza sativa* are also used for warship. However, plants like *Musa balbisiana*, *Cicer arietinum*, *Shorea robusta* and *Bambusa spp.* are also used in different religious acts by different sections of people in the subcontinent. Remaining

plants recorded here are probably coming here probably due to their easy availability in the local vegetation. It is interesting to note the use of *Justicia gendarussa* is one introduced garden plant and is now become an important plant in the religious activities of *Mech* people.

Again, plants like *Mirabilis jalapa*, *Tagetes patula*, *Thevetia peruviana*, *Hibiscus rosa-sinensis*, *Gliricidia sepium*, *Corchorus capsularis*, *Catharanthus roseus* and *Areca catechu* are not local plants and are introduced here mostly from other phytogeographical regions. It is also interesting to note that most of these plants, especially *Tagetes patula*, *Thevetia peruviana*, *Mirabilis jalapa*, *Hibiscus rosa-sinensis*, *Catharanthus roseus* and *Areca catechu* are widely used for pleasing deities in the indian subcontinent. However, the list of recorded plants does not include any RET plant.

7.10. Plants Related to Birth, Marriage & Death

There are three major incidents in the life of a man. These are (i) Birth, (ii) Marriage and (iii) Death. Birth related to the appearance, marriage to the maturity including the initiation of reproductive life and, finally, life is completed through the death. Traditional societies use many plants during all three incidents of life and majority of these are ritualistic (Rai *et al* 2007).

7.10.1. BIRTH

Birth of a child is very important for the society in any continuity in any part of the world. It is, therefore, is also considered as very important incident in different ethnic communities. Every ethnic group has its own way of celebrating or performing rituals of the childbirth and it is true with the *Mech* community too! The *Mech* people have divided the phase of the childbirth or the ritual associated with it into the following phases:

- a. Pregnancy
- b. Delivery
- c. Cutting of the umbilical cord
- d. Removal of placenta
- e. First bath of the newborn
- f. First bath of mother after delivery
- g. Felicitating the older women of the village who were present during the birth
- h. Naming the child
- i. Head shaving

7.10.1.1. Pregnancy

During pregnancy the woman is not allowed to go out alone on Tuesday and Saturday, these days are looked upon as inauspicious. However, there is no other restriction. On the third day of every bright fortnight of the moon, the woman must bathe in the afternoon, put on a washed clean cloth, take some sun dried rice, *Duba-gangse* (*Cynodon dactylon*), a few *Tulutsi* (*Ocimum tenuiflorum*) leaves and some water in her hands and sprinkle those around every hut and on the yard from the *Bathou* (*Euphorbia royleana*) plant up to the hut of the *Mainou* (The goddess of wealth). This

ritual is called '*Doi-gothar-satno*'. This must continue up to the day of the delivery. It is believed that this custom will ward off all evil spirits and make a safe delivery.

7.10.1.2. Delivery

Generally after 9 months and 10 days or 280 days woman gives birth to the baby. *Mech* people use the technique of holding the wooden mortar (*Ooal*) during the labor, following which birth is given.

After the delivery the unconscious child is brought to consciousness by making the noise of the beating plates or plough. Immediately after the delivery the starter (rice ball, which is used to make traditional rice beer) is given to the mother. The *Mech* people believe that this will avoid the weakness and other reactions in mother's body. In olden days the people used to cut an egg on top of the rice ball, this ritual is still maintained in many interior villages. By doing this, they believe that if the egg is cut into two halves the labor time will be shorter, of the egg is cut into 1/3 then delivery time will be longer. In *Mech* language it is called "*Khira fornai*" (taking oath).

In the *Mech* culture it is believed that when the child is born with umbilical cord tied on the neck he/she is believed to be from previous Brahman caste. It is believed that he/she will be vegetarian when he/she grows older. When the newborn is born on Tuesday or Saturday it is believed that whatever curse he says to others it will be notorious or the curse he gives to others it will be materialized. To overcome this child is made to lick the soil. When the child is born from the feet it is said to be *Uta Nadi*. They believe that when the field is irrigated from the washed water of their feet, this water is said to have insecticidal property.

7.10.1.3. Cutting of the Umbilical Cord

Before cutting the umbilical cord, the newborn's mouth is cleaned from the secretions of the uterus as this is believed to cause cough and asthma. After the cleaning is completed the umbilical cord is cut. First it is cut with the help of sharp edged slip of green bamboo (*Bambusa nutans*) skin (*Ooa-shothing*) by pulling upward and cut end of the cord is tied with a cotton or jute or *Muga* silk thread (*Phun-dung*). It is not boiled but simply washed with cold water. Some dried earth or ash made by burning straw is sprinkled on the cut surface as an antiseptic. The woman acting as midwife of the community will perform this act. Bamboo knife is used as it is thought to be antiseptic. Now-a-days most of the delivery is done in the hospital but still in remote villages the labor is done at the home. After this, the midwife takes some *Duba-gangse* and *Tulutsi* leaves and puts those in a pot of water. She sprinkles this holy water on all persons in

the room and on all sides of the room. After the sprinkling of water the women are purified. After the delivery the amniotic sac is buried.

7.10.1.4. Removal of Placenta

The placenta after delivery is believed to be dangerous among the *Meches*. They believe that it should be removed within 2 – 10 minutes otherwise, when it takes longer time it will go to heart and it can be life threatening to the woman in labor. That is why there is a saying among *Meches*, “Male dies in hunting or by the enemy and the women dies in pregnancy or in the labor”.

Therefore, to ease the labor or to extricate the placenta, *Meches* give certain herbal mix to the laboring woman. The mix contains three fallen leaves of *Ocimum tenuiflorum* (*Tulutsi*) and three flowers of *Musa balbisiana* (*Athia Thalith*) are added to a bowel of especially collected water. They put a sphere on the straw roof of a hut. Then some amount of water is poured on it. When the water roll down from the roof of the hut they collect it in a bowel and the *Tulutsi* leaves and *Athia Thalith* flowers are the added to that. This water is then given to the laboring woman. Apart from this the hair of the laboring women is put in her mouth; this is believed to help to extricate the placenta.

After the delivery the mother is given new *Dokhna* (cloth) and she is made to sit on the straw so that the heel of her feet will not touch the vagina as because it is believed that this may cause the disease called ‘*Hauwala*’ (development of infection lesions in vagina). After the birth there is a ritual of feeding rice to the mother.

7.10.1.5. First Bath of the Newborn

After cutting of the umbilical cord there is a ritual of giving bath to the newborn. First the water is taken in the pot in which *Tulutsi* leaves are put along with the Herbal Medicine (10 twigs of *Cynodon dactylon* and 2 cm rhizome of *Curcuma longa* are crushed) and with this water baby takes its first bath.

7.10.1.6. Laying the Child on Winnower

There is a ritual among the *Meches* of laying the child on the winnower for sleep made up of Bamboo (generally of *Bambusa tulda*), so as to avoid septic form the cutting of umbilical cord besides the bark of Bamboo acts as coagulant of blood and it also heals the wound. This proves the scientific attitude of the *Mech* people. Besides, the *Mech* people believe that keeping some

materials beside the baby like nettle, winnower, the Bamboo made fish anchor etc the midwife can't do anything wrong.

7.10.1.7. Bath of the Mother after Giving Birth

After delivering the child there is the ritual of giving bath to the mother in river or in the dug-well. While taking her for the bath, the older woman of the community carries simul-floss (*Bombax ceiba*), sickle, rice (*Oryza sativa*), one pair nuts of *Areca catechu* (*Goy*), one pair of leaves of *Piper betle* (*Phatai*), leaves of *Musa balbisiana* (*Athia Thalith*), leaves of *Ocimum tenuiflorum*, thread etc. On bank of the river a dome is made with the sand. On the sickle a thread is tied and above it three pieces of cotton are tied and it is buried in the soil.

On top of the dome a banana leaf is kept, on which betel-nut, little amount of rice is kept and prayer is done to the River. There is the spiritual reason for keeping 3 cotton pieces on the top; which represent geologically heaven, universe and hell respectively.

Finally, water with Basil leaves is poured in the dome and offer *Namaskar*. Then the bathing is done and the mother is given new *Dokhna* (cloth) after which she returns to her home.

7.10.1.8. Putting the Child in Own Caste

After giving bath to both, mother and the child, there is the ritual of putting both of them in their own caste or community (Plate XIV, Fig. A). During this ritual a Banana leaf is taken in which a pair of betel-nuts along with some rice is also taken. Into this a little basil water is put and if the child is a boy a cock or if a girl then a hen is sacrificed in the name of their ancestors.

After that a curry is made up with the sacrificed fowl and some plants like *Xanthosoma brasiliense* (*Dudhali Thadung*) or *Euphorbia hirta* (*Dudhali*) and given to the mother. On the second day the same plant is used to make meal of *Cherenga* fish (*Channa punctatus* Bloch). This will help to increase milk production in the lactating mother. Here the *Mech* people used the plant as herbal medicine.

7.10.1.9. Felicitating the Older Woman of the Community

Among the *Meches* there is a ritual of felicitating the old lady who was present during the childbirth. In *Mech* language this is called *Burai-buraikhau*. The meaning of which is felicitating the old woman. This is a very important and necessary way of purification, without this that home is said to be impure. Until such purification the prayer is not done in that home.

7.10.1.10. Naming the Child

During the above-mentioned ritual an old lady (any person related to the family) gives name to the child. The *Meches* do not follow the *Hindu* way of naming. They name the child in accordance to his/her character, colour of the skin, crying, smiling, tall or dwarfness, thinness, day of birth etc. e.g., the child who often cries: *gabakho-gabakheli*, dwarf: *haytha*, like wise *Khanda-khandi*, *langa-langi*, *budbar-budhabari* etc. But in today's scenario naming is done by seeing the horoscope.

7.10.1.11. Head Shaving

This important ritual is done for the boys only. When the child becomes 4 or 5 years old this ritual is then performed.

This ritual is not synonymous with the *Hindu* ritual. Among the *Hindus* the *Brahmins* does everything of this ritual, but among the *Meches* boys's maternal uncle (*Mama*) does everything.

On the first day of the ritual boy's parents buy new cloths, scissors, comb and mirror. On the next day of ritual uncle cuts the boy's hair by scissors, sometimes he cuts the hair completely or in other cases, after the initial cutting, a barber performs the rest of the job. After this, maternal uncle (*Mama*) gives new cloth, plate and pitcher and if possible a cow is also given to his nephew. After the ritual is over there is the convention of offering feast to the neighbors and people of his community who are invited for the ritual and this culminates the entire process.

7.10.1.12. List of Plants Used during the Process

Cynodon dactylon (Linnaeus) Persoon [Poaceae]

Ocimum tenuiflorum Linnaeus [Lamiaceae] (Plate XIV, Fig. B)

Euphorbia royleana Boissier [Euphorbiaceae]

Musa balbisiana Colla [Musaceae]

Bambusa tulda Roxburgh [Poaceae]

Bambusa nutans Wallich ex Munro [Poaceae]

Bombax ceiba Linnaeus [Bombacaceae]

Oryza sativa Linnaeus [Poaceae]

Areca catechu Linnaeus [Arecaceae]

Piper betle Linnaeus [Piperaceae]

7.10.2. MARRIAGE (*Haba*)

The second important stage of life is marriage. In *Mech* society the boys generally get married at the age of 25 – 26 and the girls marries at around 20 or 21. By marriage the couple is in now entering into the reproductive stage of their lives. It is one social event through which the society accepted a newly formed family before which they were unrelated.

The entire event of marriage can be divided into five stages –

- (i) *Bangkon Hanai* (Proposal)
- (ii) *No-nay-nay* (Observing groom's house)
- (iii) *Ban Hanai* or *Akhtam Ganhani* (Engagement)
- (iv) *Haba* (Marriage Ceremony) and
- (v) *Ankham Jahanai* (Eight days ceremony).

7.10.2.1. *Bangkon Hanai* (Proposal)

Bangkon is of two types. Proposal of marriage is considered after obtaining verbal consent from both the girl and boy's family through the matchmaker, called *Bari-khitao*. The matchmaker with guardian of the boy or some co-villagers visits the house of prospective bride. A plot of land at the outer courtyard of the bride's house where the *Bathou* (*Euphorbia royleana*) has been grown is now cleaned and smeared with cow dung emulsion. One rupee coin, one pair leaves of *Piper betle* (*Phatai*), one pair nut of *Areca catechu* (*Goy*) and some flowers are bundled with leaf of *Musa balbisiana* (*Athia Thalith*) and are kept in front of the *Euphorbia royleana*.

Another *Bangkon* is – without taking the help of a matchmaker the guardians of the groom go the prospective bride's house as guest and any metal ring is hung on the northern wall of house secretly. After departing of groom's family, the guardians of bride understand the purpose of guest's coming.

If the bride's family is not inclined to accept the proposal, they return the token coin. If the coin is not returned, the marriage must take place and the elders will have it done.

7.10.2.2. *No-nay-nay* (Observing groom's house)

Next custom is *No-nay-nay*. Mother of bride or guardian and co-villagers go to the groom's house for observing the groom's family and house. The guardians of the groom welcome them, offer good food and supply plenty of *Jou* (Rice beer) to drink. Before departing from the groom's house, a custom is done, called *Rupa-hase-nai*. The final proposal is accepted through this

custom. In this custom one or two coins, sun dried rice, *Duba-gangse* (*Cynodon dactylon*), flowers etc. are bundled with plantain leaf and keep it in front of *Euphorbia royleana* as a symbol.

7.10.2.3. *Ban Hanai* or *Akhtam Ganhani* (Engagement)

For fixing the final date of the marriage, the father of the boy with his friends, *Bari-khitao* (matchmaker) go to the girl's house with areca nuts, betel leaves and rice beer. On this day the elders of the village of the bride also accompany. A discussion regarding the bride price (dowry) and other expenses of the marriage follows. It is a long drawn process, the *Bari-khitaos* of both sides move from one party to another to for an amicable settlement. When it is finally settled, the father of the boy blesses the girl put paddy, rice and twigs of *Cynodon dactylon* on her head. Hence the marriage day is finally fixed.

7.10.2.4. *Haba* (Marriage Ceremony)

The process of *Haba* includes the following –

7.10.2.4.1. Invitation: A few days before the marriage, the ladies of the groom's family visit the houses of co-villagers and their relatives with a trayful of betel leaves and areca nuts. To each family they give two leaves and two nuts as token of invitation to the marriage. Invitation from the bride's house is made in the same way. All the members of each family are thus invited.

7.10.2.4.2. Ritual: Marriage ceremony may be completed in the bride's house or in the groom's house. In case of groom's house, on the fixed day the groom's villagers come to the village of bride along with *Bairathis* (a few ladies of the bride's house and a few of the groom's house together form the *Bairathis*, they are entrusted with the rituals of the marriage) for ceremonial march of the bride to the groom's house. They are received formally. Certain social obligations and religious formalities are observed. The bride comes out from the house accompanying the bride's party to the village of the bridegroom. After leaving father's home, the bride's party marches to the village of bridegroom. At the entrance of the groom's house the *Barlangfas* and *Bairathis* dance to receive bride. Before entry into the courtyard of the bridegroom's house, the mother of the groom or any elder women relative welcome the bride by washing the feet of bride and take her into the hut of *Mainao* (Goddess) as the future Laxmi of the house is about to come.

On the other hand, if the groom comes to the bride's house, the groom with a party goes to the bride's house with areca nuts, betel leaves, two pitchers containing rice beer and sun dried

rice suspended on two sides (*Ban-dingdong*) of a rod (which is made of split-bamboo, especially *Bambusa tulda*) and carried by a porter. The party is welcomed by showering sun-dried rice over them. They are led into the house, given betel leaves and areca nuts and rice beer.

7.10.2.4.3. Marriage Site: A plot of land at the outer courtyard of the house where the *Bathou* (*Euphorbia royleana*) is situated is cleaned and smeared with cow dung emulsion. This is the marriage site (Plate XIV, Fig. C). Two *Bairathis* receive the bride and groom with carrying *Sailon* (a wickerwork of split *Bambusa nutans* culms) (Plate XIV, Fig. D), a tray containing a few lamps, areca nuts, betel leaves, sun-dried rice and unripe banana. They move five times anticlockwise round the *Bathou* while the *Bairathis* shower sun-dried rice over them. After moving, the bride and the groom sit in front of the *Bathou* on a *Khamflai* (flat wooden stool) at a short distance from the priest (Plate XIV, Fig. E). Then the priest starts chanting *Mantra*.

During and after the marriage some elderly ladies and girls dance *Mashanay* (peacock dance) in front of the *Bathou* (*Euphorbia royleana*) accompanied with bamboo flute, stringed instruments and small metal cymbals till all are called for dinner.

7.10.2.4.4. After the Marriage: If the marriage is held on the bride's home, the bride after arriving at the groom's house is led into the northern hut (*No-ma-no*) to rest. Two bamboo made pitchers full of water (*Doi-hachung*) are kept at the gate of the northern hut. The bride while entering the hut topples the pitchers with her left leg. Then the bride enters the room of the hut. The bridegroom takes his seat on the verandah of the northern hut with his friends.

The groom hides with him a small bundle (*Gay-thao*) containing five betel leaves and five areca nuts. The *Bairathis* snatch away the bundle from the groom and chew the contents. The bride is then taken out of the hut and both stand in front of the *Euphorbia royleana*. The priest (*Oja*) utters incantations. After the *Oja* has finished, the groom salutes the *Euphorbia royleana* and then the bride salutes by bending her head to the ground. The bride is again led into the northern hut. Now, the marriage feast begins. After the feast both the bride and groom are seated at the middle of the inner yard. The groom's parents and then others bless the couple and offer gifts. The formal marriage is thus completed.

7.10.2.4.5. Daujurun Khutnay (Rice distribution ceremony): Next day, a special curry (*Ondla*) of the powdered rice without any spice is cooked by the bride. This is mixed with all foods. The

elders and the relatives are invited. She distributes some food to all the invitees. And, thus she is admitted into the society.

7.10.2.4.6. Ankham Jahanai (Eight days ceremony): On the eighth day after marriage the bride and the groom go to the bride's house. There is no special ceremony attached to this.

7.10.2.5. Botany of the Marriage Ceremony

Through the entire process of marriage following plants and plant-parts are used –

- i. *Areca catechu* Linnaeus [Arecaceae]: stones from the fruits
- ii. *Bambusa nutans* Wallich ex Munro [Poaceae]: culm (Plate XIV, Fig. F)
- iii. *Bambusa tulda* Roxburgh [Poaceae]: culm
- iv. *Cynodon dactylon* (Linnaeus) Persoon [Poaceae]: twigs
- v. *Euphorbia royleana* Boissier [Euphorbiaceae]: one grown plant
- vi. *Musa balbisiana* Colla [Musaceae]: leaves
- vii. *Oryza sativa* Linnaeus [Poaceae]: grains (with and without husk)
- viii. *Piper betle* Linnaeus [Piperaceae]: leaves

Apart from these the generous supply of *Jou* is also very important which a fermented plant product is entirely. The preparation of *Jou* has been discussed in a separate chapter and quite a few plants are used for its preparation.

However, out of the directly used seven species of plants most important is *Euphorbia royleana* as the bridegroom takes oath considering the plant as God or the deity. Next to it there are two plants of equal importance, *Areca catechu* and *Piper betle*. The betel-nut and betel-leaves are of much religious and social importance. The combination of these two speaks so many things including 'invitation', 'blessings', 'acceptance' etc. Rice grains (with and without husk) and the twigs of *Cynodon dactylon* are of religious importance and are used mainly for blessings. Split bamboo is used mainly for making different types of baskets for carrying different types of article at different stages of the entire event.

Out of these seven plants *Areca catechu*, *Bambusa tulda*, *Musa balbisiana*, *Oryza sativa* and *Piper betle* are important useful plants and all cultivated widely and commercially extremely important. So, it is natural that such important plants will occupy some important positions in social customs. In addition, *Cynodon dactylon* and *Euphorbia royleana* are also important as both of those are important medicinal plants in Mech traditional system of medicines.

7.10.3. DEATH

The life of a man starts with the fusion of two gametes in mother's womb and ends with his death. While birth is a welcome event of life, the death is a sad event when we need to loose one person from our family or, in other words, from our society. When we can predict the tentative date of birth, it may not be possible to predict any such death in most of the cases.

7.10.3.1. Announcement of Death

Death is announced when the *Oja* declares that the soul has left the body. When the *Oja* is far away and cannot be called immediately, the stoppage of breathing signifies the death.

After death, body is taken out of the house a woman sprinkles the emulsion of fresh cow dung at the place of the yard where the body was placed before carrying and along the probable path in which the corpse will be carried away with the idea to prevent the spirit of the dead to come back home following that way. The body is kept on a bamboo made, *Chirin*, with head directed to south and face and feet to the north. It is their belief that by keeping so the spirit from the dead person will see the *Kailas* Hill of the Himalayas and the legs will carry him straight to that hill. The body is kept covered with a white cloth (*Hisha-lu*) and flowers (Plate XIV, Fig. G).

After this, the relatives of the dead person are given a few drops of 'Holy Water' to the mouth of the body to purify the soul. Leaves of *Ocimum tenuiflorum* and *Justicia gendarussa* are put in water, this water is called 'Holy Water'.

Four close relatives of the dead carry the body by a *Bathi* (the projecting bamboo polls that rest on the shoulders of the poll bearers are called *Bathu* or *Bathi*).

7.10.3.2. Disposal of the dead

It is the customary of the *Mech* society to bury the dead bodies. Lately, some of the *Mech* have started burning their dead relatives.

7.10.3.3. Cremation

A pyre (*Khogan-oat*) is made with wood, mainly *Shorea robusta*. A *Oja* (priest) utters mantras (incantation) and one of the sons, takes a burning torch (*Banzar*) made of dry bamboos or of fibre free *Corchorus capsularis* stems and moves round the pyre three times (*Wat-shauno*) touching the mouth of the dead with the fire of the (*Khogan-shauno*) each time and then the pyre is lit (*Banzar-shauno*) from below. After burning is finished the ashes are cleaned and the place is

washed with water (*Gothai-dugarna*) and a small mound is made with soil where the body was burnt.

7.10.3.4. Burial

A grave is dug matching the length of the deceased. Some straws form the bed on which the dead body is laid. The body is covered with a white sheet and then slowly put into the grave with head directed to the south. After this the body is slowly covered with soil.

After the cremation or burial, the team comes back home and take a purifying bath. After taking bath, they are chewed leaves of *Imperata cylindrica* (*Thurmus*), *Ocimum tenuiflorum* (*Tulutsi*) etc. and touch fire and iron.

7.10.3.5. Unclean Period (Mourning Period)

Unclean period lasts for 7 – 11 days according to the custom of the particular family. In this period, the son offers food to the deceased before taking his own meals. A small mound is made with soil at the southern corner of the yard of the house of the dead. Everyday, before taking the meals, a part of the food is placed on the mound and also a pot of drinking water for the departed person to eat and drink. The *Mech* believe that the deceased can eat and drink like the living.

7.10.3.6. Sradh (Last Rights Ceremony)

On the day of the *Sradh*, the relatives are called. Some food is offered to the deceased on that day. A large bamboo basket with some cooked food and rice beer is placed in a clean plot. Another small bamboo basket is used for the purpose of the dead's seat. The son goes to the living room of the dead with that small basket, calls him or her and says, "today, we have here for you, you take the seat and let us go to the cremation or burial ground. There, we will offer you all drinks and foods." After saying that, five or more invitees and the sons of the deceased go to the cremation or burial ground. After reaching the spot, the relatives put foods at the place where the body was burnt or on the grave and call the dead by his or her name. Saying so all come back from the cremation or burial ground and a *Mech* barber shaves the head of the son. Then all relatives and others are taken a purifying bath and chewed leaves of *Imperata cylindrica*, *Ocimum tenuiflorum* or *Cynodon dactylon*, sun dried rice etc. and touched fire and a piece of iron. Thus, with this the unclean or the mourning period is over. Then the invitees then enjoy the funeral feast.

7.10.3.7. Botanical Notes

Not much plants are used during different events related to last phase of a person in the *Mech* society. The plants recorded are listed below:

- i. *Bambusa tulda* Roxburgh [Poaceae]: culms
- ii. *Corchorus capsularis* Linnaeus [Tiliaceae]: fiber free xylem sticks
- iii. *Cynodon dactylon* (Linnaeus) Persoon [Poaceae]: twigs
- iv. *Imperata cylindrica* (Linnaeus) Raeuschel [Poaceae]: leaves
- v. *Justicia gendarussa* Linnaeus f. [Acanthaceae]: leaves (Plate XIV, Fig. H)
- vi. *Ocimum tenuiflorum* Linnaeus [Lamiaceae]: leaves
- vii. *Oryza sativa* Linnaeus [Poaceae]: straw, grains
- viii. *Shorea robusta* Roxburgh ex Gaertner f. [Dipterocarpaceae]: wood

Apart from these they use some locally available flowers for showing respect to the deceased. Of the recorded plants uses of *Bambusa tulda*, *Corchorus capsularis* and *Shorea robusta* are used for burning the dead-body. Straw of *Oryza sativa* is used for making the bed in grave. So, the uses of these four plants are related to the final delivery of the body. However, the bamboo culms are also used for carrying the body.

On the other hand, twigs of *Cynodon dactylon* and the leaves of *Justicia gendarussa*, *Ocimum tenuiflorum* and *Imperata cylindrica* are used as religious purifiers. The food the offer to the deceased is mainly the boiled rice.

7.10.4. Discussion

When summing up, we find Mech people use all together at least 14 species of plants religiously in three most important phases of their life, namely Birth, Marriage and Death. These plants and their useful parts in different occasions have been presented in Table 7.10.1.

Table 7.10.1. Plants and plant-parts used by *Meches* during Birth, Marriage and Death

Plants	Family	Birth	Marriage	Death
<i>Areca catechu</i> Linnaeus	Areaceae	Stones from the fruits	Stones from the fruits	—
<i>Bambusa nutans</i> Wallich ex Munro	Poaceae	Culms	Culms	Culms
<i>Bambusa tulda</i> Roxburgh	Poaceae	Culms	Culms	—
<i>Bombax ceiba</i> Linnaeus	Bombacaceae	Floss	—	—

<i>Corchorus capsularis</i> Linnaeus	Tiliaceae	—	—	
<i>Cynodon dactylon</i> (Linnaeus) Persoon	Poaceae	Twigs	Twigs	Twigs
<i>Euphorbia royleana</i> Boissier	Euphorbiaceae	Grown plant	Grown plant	—
<i>Imperata cylindrica</i> (Linnaeus) Rauschel	Poaceae	—	—	Leaves
<i>Justicia gendarussa</i> Linnaeus f.	Euphorbiaceae	—	—	Leaves
<i>Musa balbisiana</i> Colla	Musaceae	Leaves	Leaves	—
<i>Ocimum tenuiflorum</i> Linnaeus	Lamiaceae	Leaves	—	Leaves
<i>Oryza sativa</i> Linnaeus	Poaceae	Grains	Grains	Straw, grains
<i>Piper betle</i> Linnaeus	Piperaceae	Leaves	Leaves	—
<i>Shorea robusta</i> Roxburgh ex Gaertner f.	Dipterocarpaceae	—	—	Wood

This implies that Birth, Marriage and Death are given much importance in the *Mech* society. And, that is the reason why they are using only the important plants to make these events safe and for a better future.

PLATE XIV



Figs. A. Birth related ritual, B. *Ocimum tenuiflorum*, C. Marriage site, D. *Sailon* (Bamboo-made tray), E. Bride & groom with priest, F. *Bambusa nutans*, G. Dead body covered with white cloth and flowers, H. *Justicia gendarussa*

7.11. Recorded Plants for Festivals & Worship

7.11.1. INTRODUCTION

Festivals are the integral events of social life. In traditional societies festivals are generally associated with some religious occasions. After oxygen and water, food is the most important material for survival. For the *Meches* in Duars and Kokrajhar there are no dearth of good air and fresh water as there are very wide forest cover and innumerable rivers and streams passing through the region after originating from different corners of the great Himalayas. So, food is the material without which man can't survive but food will not come to you plate of its own. Either it is to be collected from the vegetation or you need to grow it in your plots for cultivation. If the cultivation is proper that will produce good amount of better quality of food otherwise the farmer need no to be dissatisfied! So, it is expected that one or more important festivals of the society should be associated with the cultivation and/or harvesting of crops.

The *Mech* word *Phunai* is referred to *Devine Worship*. It is equivalent to *Puja* in Sanskrit derived languages (Bengali, Assamese, Oriya, Hindi, etc.).

A number of festivals are observed or organized by *Meches* in different times of the year. The ethnobotany of such festivals is discussed below.

7.11.2. MECH FESTIVALS

Different important *Mech* festivals include *Bathou Phunai*, *Kherai Phunai*, *Gagja Phunai*, *Baishagu*, *Lakhee Phunai*, *Hagra Madai*, *Gami Madai Phunai*, *Manasha Phunai*, *Maigaijennaini Sibinai*, *Mai jatraijennaini Sibinai*, and *Bakhrwi Sibinai*. These festivals or worships and the ethnobotany involved in those are discussed below.

7.11.2.1. *Kherai Phunai*:

The *Kherai Phunai* is regarded as a national festival of the *Meches*. It is a symbol of hope and desires which ancestors. The *Mech* kings also were believed to have been depending on the '*Kherai Phunai*' for their success in battle.

Kherai Phunai is believed to be the greatest religious festival of the *Meches*. They perform this puja on some specific occasions. The *Kherai* is of four kinds, (i) the *Darsan Kherai*, (ii) the *Umrao Kherai*, (iii) the *Phalo Kherai* and (iv) the *Nowaoni Kherai* (Domestic *Kherai*).

(i) Preparation of the *Kherai Phunai*:

The *Meches* have no temple or a fixed shrine of worship. They select any suitable place when they have to worship their gods and goddesses. An altar is prepared by the intending worshippers. The altar is long one and divided into three parts. It started from the south and ends in the northern end. Generally the grazing field is selected for making an altar for the *Kherai* puja. In the first of the altar a piece of cloth is hung up above the ground, it indicates the formless (Nirakar) existence of the *Obanlaoree* (the God). In the middle part of the *Bathou* is symbolized by the planted *Sijou* (*Euphorbia royleana* Boissier). The *Sijou* is surrounded by a round fence of the small bamboo (*Bambusa nutans* Wallich ex Munro) strips folded with five fastenings symbolizing the religious and spiritual principles grouped in five. Under the *Euphorbia royleana* and *Alari batti* (a sacred earthen lamp) is lighted. Five pairs nuts of *Areca catechu* Linnaeus (*Goy*) and leaves of *Piper betle* Linnaeus (*Phatai*), green fruits of *Musa balbisiana* Colla (*Athia Thalith*) and other sacred things are put on the plantain leaflets (*Musa balbisiana*) placed under the *Euphorbia royleana*. A pot filled with pure water is also installed there and top branches of *Jatrashi* (*Justicia gendarussa* Linnaeus f.) and *Tulutsi* (*Ocimum tenuiflorum* Linnaeus) are kept in the pot for sprinkling the holy water from within the pot on the altar. As a symbol of creation an egg and as a symbol of truth a piece of stone is kept in front of the *Bathou*. From the middle part of the altar to the northern section some rows of *Khangkhla* [*Phragmites karka* (Retzius) Trinius ex Steudel] are planted leading to the northern end where *Mainao*, the goddess of wealth or of crops is installed. The northern part of the altar symbolizes the beautiful and prosperous 'Mother Earth'. Two holy persons, a *Dauri* and *Doudini*, remain as the holy custodians of puja under the guidance of the *Oja* (a medicine man) and they perform all the religious rites. The surroundings of the entire altar are kept pure by burning aromatic articles like 'dhub stick', 'dhuna' and 'chandan'. The puja continues for three days and nights. In earlier days the puja lasted for seven days and nights.

(ii) Significance of the Altar for *Kherai Phunai*:

The whole length wise altar of the *Kherai* puja, has its significance, it is believed that the altar symbolizes a holy road from the Heaven down to the earth, or from the earth to the heaven, the

ideal of the philosophy indicates a holy link between the god of the heaven and the human beings of the earth.

A piece of cotton yarn which is tied on the post of bamboo with green leaves (*Bambusa nutans*) is believed to signify the unending principle or the law of creation of the creator. Thus the whole preparation of the altar of the *Kherai* puja bears significance.

(iii) Essential Materials for the *Phunai*:

In order to perform *Kherai* puja some essential material must be collected by the villagers. The materials are, -

1. *Euphorbia royleana* Boissier (*Sijou*): one whole plant
2. *Ocimum tenuiflorum* Linnaeus (*Tulutsi*): one whole plant
3. *Bambusa nutans* Wallich ex Munro (*Ooa*): three entire bamboos
4. *Bambusa tulda* Roxburgh (*Ooa*): four entire bamboos
5. *Oryza sativa* Linnaeus (*Mairong*): husked grain and grain-dust
6. *Phragmites karka* (Retzius) Trinius ex Steudel (*Khangkhla*): eighteen pairs
7. *Clerodendrum viscosum* Ventenat (*Lakhna*): eighteen pairs of leaves
8. *Cynodon dactylon* (Linnaeus) Persoon (*Duba Gang-se*): 9 leafy twigs
9. *Musa balbisiana* Colla (*Athia Thalith*): one plantain leaves and banana fruits
10. *Areca catechu* Linnaeus (*Goy*): five pairs of nuts
11. *Piper betle* Linnaeus (*Phatai*): five pairs of leaves
12. *Calamus erectus* Roxburgh (*Raidong*): one stick
13. *Gmelina arborea* Roxburgh (*Gambri*): a low stool made of its timber
14. *Dillenia indica* Linnaeus: included in the oath
15. *Jou* (Rice Beer) [many plants are used in its preparation]
16. Mustard oil
17. *Gossypium arboreum* Linnaeus (*Kshun Phang*): floss
18. *Guphur aowa khundung* (white rayon)
19. *Dhuna* (resin of *Shorea robusta* Roxburgh ex Gaertner f.)
20. Incense sticks (aromatic stick)
21. *Sindur* (vermilion).
22. A gold ring
23. A pair of of *Lotha* (a small vessel made of brass)
24. *Jewari* (earthen lamps), etc.

(iv) Essential Musical Instruments for the *Kherai Phunai*:

The following musical instruments are also essential during the '*Kherai*' –

1. *Kham* (drum) – one pair,
2. *Jotha* (cymbal) – one pair,
3. *Siphung* (a long flute of bamboo) – one pair,
4. *Thungri* (sword) – one or one pair and
5. *Dahal* or *dhal* (shield) – one or one pair.

(v) Sacrifice during *Kherai Phunai*:

The *Mech* worshippers sacrifice birds and animals in the name of Gods and Goddesses during the *Kherai*. Cocks, the goats and the pigs are generally selected for sacrifices to the God-in-chief, '*Bura Bathou*' and other God and Goddesses during the *Kherai Phunai*. Along with the sacrifice the worshippers also offer *Jou* (Rice Beer) to the Gods and Goddesses. The worshippers believe that the God-in-chief *Bura Bathou* and the other remain satisfied while they are offered *Jou* (Rice Beer) during the puja. Pigeons are also essential to be sacrificed during the *Kherai*.

It is observed that the Chief god of the *Meches* '*Bura Bathou*' is identified as the Aryan God '*Siva*', '*Mahadeva*'.

(vi) Role of the *Oja* or the Medicine Man during the *Kherai Phunai*:

The role of *Oja* is of great importance during the *Kherai*. Like *Doudini* he plays a great role during the *Kherai Phunai*. He instructs the worshippers and other co-workers of the puja like *Doudini* or *Githal* to help *Doudini* in performing the *Kherai* smoothly. The villagers are obliged to follow his advices when they arrange a *Kherai* or 'formulas' in such a way that the gods and goddesses become pleased easily.

(vii) The Prayer or the Oath: (in *Mech*):

"*Oi phiguri, Anangachay binangochy, nong ondo nongni ogian Boro phichaphorkhou ondo nongo; Oi chorzigiri nongo; nongno phothango, nongna loy zahoyo, nongnikhuroi dersin laocin roabo goilia; Oi, thaigirnikhonga khongba, sijauni sira siriba, siphungni gudunga dungba, bathouni bandoa bandoba, boro boraini rawa phongba; Bima phipha guru binikhaino Bathou pathinanoi Sijau gainanoi, gaca gainanoi, kham, zotha, Siphung lananoi nong piphakhou onchayo, ondo apha piphaguru ondo; ondor chingao gogloichonanoi thanai Boro phichaphorkhou ondo nong, oi piphaguru, khomsiniphray bokhonanoi chrangao langdo zongkhu, chorgoniphray bor charcrinanoi hordo nongo zong phichaphorno.*

English rendering of the above formula is likely as follows: “O God, our father, protect your ignorant children, you are the Creator, preserver and destroyer, all in one you are peerless; that the ‘ou fruit (*Dillenia indica* Linnaeus) has five rive rinds, the *Sijou* (*Euphorbia royleana*) has five ridges, the *Siphung* (a long bamboo flute) has five holes, the *Bathou* has five knots (of bamboo strips) and the *Boro Borai* (the elder persons) have five moral preachings; we plant the *Sijou* on the altar and light the flame of oil and worship you, whilst drums, flutes and cymbals play; oh father be merciful, have mercy on your *Mech* sons, steeped in darkness of ignorance, light us father, from darkness, lift us to light, from Heaven father, shower on us.”

During the *Kherai*, the *Oja* offers prayer to the gods and goddesses through *Doudini*.

At the time of enchanting the formula the *Oja* is found at half-sitting position without using any tool or mate, while the *Douris* also follow his position. This half-sitting position is called *Jaslang Jonai* in *Mech*.

7.11.2.2. *Garja Phunai*:

The *Garja Phunai* is another important ceremony of the *Meches*. The real or proper meaning of the word *Garja* is not yet found clearly. Some like to give the meaning of the word *Garja* as ‘God’. But, the gods are called in *Mech Modai*. Again some define the meaning of the word as way of making ones free from danger. It may be probable that the *Garja* word itself bears the meaning of expulsion; (*Garja* or *garjani* or *garnai* means expulsion or discharging anything in *Mech*) and during the *Garja* puja some evil gods are expelled or discharged from the area of a village. This system of *Garja* puja, where the evil gods are expelled is called *Bhasani* or *Bhasainai* (floating away in the river or a stream). The *Mech* word *Bhasani* means to float away in the river or stream. It is also to be noted that all the gods and goddesses are not expelled from a certain village or area by performing the *Garja Phunai*.

The *Meches* perform the *Garja Phunai* to purify themselves and the village after any seasonal festival. They believe that at the annual festivals the participants of the village become impure to free mixing with each other, merry-making, walking, drinking rice-beer from one’s house to another’s house. So, in order to purify themselves they perform the *Garja* puja at the village.

If some epidemic appears in a family or in the village then the villagers perform the *Garja* puja to protect themselves from the evils.

The *Mech* villagers use to examine the village whether it is all right or not. There is a procedure to examine the village as well as the villagers. The procedure is very easy. One night ahead of the proposed *Garja* puja in the evening the altar of the *Garja* puja is made clean after washing it with holy water. A piece of the *Musa balbisiana* Colla is placed on the altar and a pair of *Tulutsi* leaves (*Ocimum tenuiflorum* Linnaeus), nine grains of rice (*Oryza sativa* Linnaeus) are placed together on the plantain leaf and then covered the articles with a bamboo (*Bambusa nutans* Wallich ex Munro) basket. Next day, early in the morning the articles are examined. If the articles are found all right, it is believed that the village or the villagers are all right and free from danger. But, if the articles are found scattered or some of them are missing, then it is believed that the village and the villagers are not all right. The villagers suspect some persons to be involved in some illegal or immoral activities. The guilty persons are compelled to apologize before the gods of the '*Garja Phunai*'.

The *Meches* believe that the flood also carries diseases from one place to another. So, in order to keep the village free from diseases they perform '*Garja Phunai*' and let the diseases or the evils floating away from the village.

(i) Preparation of the *Garja Phunai*:

a. *Salami*: The pre-*Garja* arrangement is called *Salami*. It is performed one day ahead of the *Garja* puja. The *Douri* of the *Garja* puja cuts a chicken and offers it to the *Bura Bathou*, and then he purifies every house of the village sprinkling holy water, which is kept ready in a pot or lotha (*Lota*). In the night the villagers have to remain pure and neat for the puja to be solemnized the next day.

b. *Garja Sali*: A lonely place of the grazing field, which is covered with jungle, is selected for the *Garja* puja and the place of the puja is called *Garja Sali*. They regard the bank of the river as the most suitable place for the *Garja* puja.

They clean the plot where the altar of the puja is to be made. A few small huts, which are called *Dera* in *Mech*, are built by the villagers. Rice beer prepared by the villagers is kept in the camp house of the puja. Some grains of rice, a pair of new *Dokhna* (a garment for the female *Meches*) and ornaments are kept inside the temporary camp at night. It is peculiar that nobody dares to enter into the camp and steal the materials offered to the gods and goddesses. The camp house is kept unguarded for the night. This is called *Salami*. The next day morning the villagers clean their houses all the utensils, cloths, etc and get ready for the puja. A pair of Areca nuts

(*Areca catechu* Linnaeus) and a pair of Betel leaves (*Piper betle* Linnaeus) on a small plantain leaf are placed inside the small hut.

(ii) Offerings and sacrifices to the gods during the *Garja Phunai*:

For the puja, a cock, a hen and a chick are sacrificed. Three pigeons are set free in the air. Besides sacrifices, for god, a pair of areca nuts and betel leaves, and a pair of banana fruits are essential.

(iii) Materials required for *Garja Phunai*:

1. *Areca catechu* Linnaeus: nuts
2. *Musa balbisiana* Colla: leaves & fruits
3. *Ocimum tenuiflorum* Linnaeus: leaves
4. *Bambusa nutans* Wallich ex Munro: culms
5. *Oryza sativa* Linnaeus: grains & straw
6. *Piper betle* Linnaeus: leaves
7. *Lotha*: an utensil
8. *Dokhna*: one type of Mech traditional dress for females
9. Ornaments

7.11.2.3. *Baishagu*:

The festival of *Baishagu* is generally celebrated by *Meches* during mid-April. It is in fact the most cherished festival of the *Mech* tribe. The *Mech* tribe celebrates this festival in the season of spring at the advent of the New Year. This festival is devoted to Lord Shiva or *Bathou* as he is worshipped during this festival with utmost devotion and offerings of chicken and rice beer are made. During this festival they sing and dance surrounding *Bathou* (the *Euphorbia royleana* plant).

The only plant product used is *Jou* – the rice beer. In addition, *Euphorbia royleana* is the only other plant involved in this festival.

7.11.2.4. *Laakhee Phunai* (The *Lakhee* Worship)

(i) Source of the Title: The *Meches* called the things '*Lakhee*' which are much beneficial to them. Paddy crop is very important as rice is their staple food. They specially grow '*Amon*' cultivars of paddy belonging to *indica* variety of *Oryza sativa*. They arrange '*Lakhee Puja*' at the

time of crop ripening and harvesting. One or more than one families is normally arranged this *Phunai* or puja.

(ii) Period: The *Amon* paddy is harvested during *Agrahayana* (November – December) or *Pous* (December – January) by the *Meches*. So the *Lakhee* Puja is performed during these months every year.

(iii) Motive: The *Meches* think that it is necessary to get the permission for harvesting paddy from '*Mainao Burui*' – the goddess of the paddy-crops. The pious *Meches* belief that without Her permission, collecting *Amon* crop is a sin.

(iv) God and Goddess: The Goddess '*Mainao Burui*' who is the wife of God '*Bathou Brai*' is the main adoring figure in this puja. The other associated god and goddess, who are also worshipped along with '*Mainao Burui*' are *Hailong* or *Maither Brai*, *Basmussi*, *Dibaulee*, *Sanjanbralee*, *Khaila*, *Aablakhungoor*, *Chang Brai*, *Chang Burui* etc. But these names vary in different regions.

(v) Ingredients of Worship: Banana (*Musa balbisiana*), incense (dhup), earthen lamps, mustard oil, handmade-thread, flowers, betel leaf (*Piper betle*), betel nut (*Areca catechu*), plantain leaf, *Tulutsi* leaves (*Ocimum tenuiflorum*) etc. And, for the immolation (if practiced) generally pigeon, hen, duck etc. are used.

(vi) Procedure: The location for this puja is chosen normally outside of the house. The place can be a field or the open yard. First the selected spot is cleaned. A small hut is built at the spot to the north-east. It is called '*Dera*'. On the day of worship the bundle of ripens *Amon* paddy is planted alongwith roots on the altar in the hut. Another altar is built to the north-south corner of the '*Dera*'. Here the *Meches* offer their prayer to the associated god and goddess. The *Dera* and the altars are decorated with colorful flowers.

Inside the *Dera* they worship only to '*Mainao Burui*' and to the others at the altar located outside.

They place the offerings to the deities like *Bathou Brai*, *Chang Brai*, *Chang Burui*, *Basmussi*, *Dibaulee*, *Khaila*, *Sanjanbralee*, *Aablakhungur* and *Hailong Brai* respectively starting from the north. The priest of the *Meches* helps to arrange the offering. '*Panthol*' the assistant of

the priest also helps him in arrangement. After placing the offering to the deity, the priest sits on knees and heels toward the east. Then he scatters the droplets of water by *Tulutsi (Ocimum tenuiflorum)* leaf on him and others for self-purification.

Now the priest sits in front of the altar of '*Mainou Burui*' and starts incantation, the eulogy of the goddess. Then he appeals for permitting the devotees to harvest the crop. Thus the eulogies or praises the '*Bathou Brai*' and other associate god-goddess. Next to the incantation he cuts the crop-stalks that were planted on the altar. In the *Baroari* worship (when a number of families involve in the worship) the respected elder village-woman who specially wears new '*Dokhna*', the traditional dress of *Meches* ladies, and cuts the crop-stalk with a new sickle. Then the priest arranges the ingredients of the puja in a new winnowing-platter made of bamboo (*Bambusa sp.*). In the case of *Baroari* puja the elder lady dressed with '*Dokhna*' way of her home. The priest again scatters the droplets of water by the *Tulutsi (Ocimum tenuiflorum)* leaf on the way to make the path sacred. The lady follows the priest dancing to the music. Then both the lady and the priest enter into the '*No-ma-no*'. Here the priest ties the cutting stalks of crop and hangs them from the fence or on the wall. The priest carries on incantation while sets the crop-stalks up on the wall. This time he recites the eulogy of setting the crop-stalks. The puja is over after setting of the crop-stalks.

(vii) The Eulogy of the Adoration (Incantation):

Om, hrim, khlim phodosa

Oh the kind mother '*Mainao*',

Please do favour to hear me

Hear me please.

Today in this sacred moment

We all the innocent children of You

We recall You,

We offer our pranam (respect) to You.

It is known by You, that the time of harvesting the new crops has come now.

Our ripen crops are in the field,

The birds, insects, and the pest are spoiling them,

So our kind mother, we offer our respect to get the permission for reaping.

Today in this holy moment we have offered fruits, flowers and earthen lamp at

Your altar

Our great, kind mother, accept these all, please!

Please forgive all our mistakes and favour us.

The Music (Songs):

How nice is today!

How nice! how beautiful!

In the joy of the New Year and the joy for harvesting

We can't stay inside the room

Our great mother 'Mainao' we recall you and become over ----- today.

How kind You, our mother!

Your blessing saves us

We all are alive due to You

For You, to You.

7.11.2.5. Bathou Religion and the Nature of Worship:

Bathou religion is one of the oldest religions of world. It is propagated and worshipped largely by *Meches* from the ancient age prior to spread of Aryan settlement in India. Only after Aryan's influences few *Meches* were converted to different sects of Hindu religion and after the annexation of earlier Assam by East India Company some *Meches* were converted to Christianity. *Meches* could have had its distinct language, culture, customs and traditions built on *Bathou* religion.

Bathou religion is based on one God, *Bwrai Bathou*, who is almighty Supreme Being and creator.

About creation *Bathou* religion preaches that *Bwrai Bathou* created five matters – earth, water, air, heat (Sun) and universe (*Ha, Dwi, Bar* or *Arw okhrang*). Who has created these matters, he has also created all living beings and plants including men through evolutionary process! Hence he is the creator (*Swrjigiri*) and *Meches* obey and worship *Bwrai Bathou* for the well being of all creatures. There are no other myths in *Bathou* religion. The main hymn of *Bathou* religion is:

Sijou siri siriba

Chifung gudunga gudumba

Taigir sing bwiraini

Raoa fongba

Subungni asara asarba

Bathouni bandwba.

The basic concept of *Bathou* religion is expressed through this verse. The meaning of this verse is deep and wide ranging whereby believers in *Bathou* religion are instructed to abide by the spirit of this verse to make life worthwhile.

Five ribs of *Euphorbia royleana* (*Sijou*) represent the virtues of earth, water, air, heat and universe, which are inevitable for the existence of plants and creatures.

The holes of flute used by *Meches* are of five, which represent nose, ear, mouth, urinary hole and anus. All these are basic organs of human or other animals and require care to enjoy a healthy life.

Mwning sing's five words are *Awng, hring, khling fwd, se* which imply earth, water, air, heat and universe without which plants and living being cannot live.

So, also *Asharba* and *Bandwba* indicate rites observed at the time of conceive, birth, marriage, old age and death. *Ashar* and *bandwba* imply duties and responsibilities attached to every cycle of period of life to make life meaningful.

The method of worshipping of *Bathou* religion is simple. An altar (*Bathou*) is constructed by 18 pairs of bamboo (*Khami*). The *Euphorbia royleana* (*Sijou*) is planted in the middle (Plate XV, Fig. A). *Ocimum tenuiflorum* (*Tulutsi*) and *Justicia gendarussa* (*Jatrashi*) are also planted near by *Sijou*. These are taken as the symbol of peace and prosperity and protection from all evils. *Sijou* is the symbol that implies supreme soul, *Bwrai Bathou*. In the time of worship pure water (*Dwi Shanthi*) is sprinkled at the altar with *Duba-gangse* (*Cynodon dactylon*) and *Tulutsi* (*Ocimum tenuiflorum*) and a pair of betel nuts (*Areca catechu*) and leaves (*Piper betle*) are offered on the plantain (*Musa balbisiana*) leaves. An *alari* (lamp) is lighted to pray before *Bwrai Bathou*.

Bwrai Bathou religion attaches special importance to purity or sacredness in personal as well as social life. Nurturing of purity of thought, non-envy and co-operation are the essence of *Bathou* religion. And exceptionally dirt of impurity could not have access to *Mech* society to create chaos. They had peaceful social life under the tenet of *Bathou* religion and its preaching. They were co-operative among each other and maintained the sanctity of purity or cleanness of life strictly, so that chaos and disturbances do not mar (damage) social well being. The practice of high and low caste prejudices and untouchability never get a place in *Bathou* religion.

7.11.2.6. *Hagra Madai*:

Before entering the forest for the collection of fuel wood or cutting timber, *Meches* perform 'Hagra Madai Phunai'. It is held in the Bengali month *Pous* (December – January). It is the worship of the Goddess of the forest and essentially the worship of the Tree God. A spot in front of a big tree of *Premna bengalensis* (*Babol*) smeared with fresh cow-dung emulsion and dried clean. Flowers, Banana, Sundried rice, a hen are offered and burning of incense. (Plate XV, Fig. B).

7.11.2.7. *Gami Madai-Phunai* (Worship of Village God):

In the month of *Baisak* (April – May) the *Mech* people perform 'Gami Phunai'. Here they worship all gods at a time, e.g. *Bathou*; *Mainou*; other several gods e.g. *Arang*, *Khoila*, *Manashu*, *Sanjan*, *Brali*, *Bagha* and *Baghi* (Plate XV, Fig. C); all river gods and goddesses. The idols of deities are made with bamboo sticks (*Bambusa nutans* Wallich *ex* Munro) and different colored flags are tied to the top of each stick (Plate XV, Fig. D). A lump of earth called 'Thansali' representing the Mother earth, is also worshipped. This 'Thansali' is a combination of *Mahakal*, *Mainou*, *Kali*, *Tista-Buri* and *Bisahari*. A *Oja* performs the *Phunai* invoking the well-being of all villagers.

Piper betle Linnaeus (*Phatai*), *Areca catechu* Linnaeus (*Goy*), rice beer (*Jou*), ripe fruits of *Musa balbisiana* Colla (*Athia Thalith*) and de-husked grains of *Oryza sativa* Linnaeus (*Alua Mairong*) are offered and incense sticks are burnt. Leaves of *Ocimum tenuiflorum* Linnaeus (*Tulutsi*) and twigs of *Cynodon dactylon* (Linnaeus) Persoon (*Duba-ganse*) are used. Hens, cocks, pigeons and ducks are sacrificed as offerings (Plate XV, Fig. E). The birds are killed by one stroke. Blood and heads of the birds are given to the gods and goddesses (Plate XV, Fig. F). Rice beer and blood are given in a bowl made of plantain-leaf. A bit of liver is cooked with rice, pseudostem of *Musa balbisiana* and offered to the gods and goddesses (Plate XV, Fig. G). After that, two persons go outside the village with offerings and rice beer suspended on a rod made from the branch of *Gliricidia sepium* (Jacquin) Walpers (*Benda Bimfang*) (Plate XV, Fig. H) and kept that on a place. The village people believe that these offerings are for the evil Gods.

7.11.2.8. *Manasha Phunai*:

In the month of *Asar* (June – July) 'Manasha Phunai' is held. *Manasha* is the goddess of snakes. Two ripe fruits of *Musa balbisiana* Colla (*Athia Thalith*), milk and beautiful flowers are offered to the god and incense sticks are burnt. All offerings are placed on a plantain leaf. The offerings are taken on hand by the Grand Lady of the house (*Grazoh*) and also the other members of the

family, made a procession. They go to the river and the offerings are immersed in water (Plate XVI, Fig. A & B).

7.11.2.9. Maigaijennaini Sibinai (Paddy Sowing):

At the beginning of the paddy sowing, on the first day the Grand Lady (*Grazoh*) of the family, takes a bath in the morning, put on clean cloth, and then go to the field. The land is ploughed and prepared for the sowing beforehand. A plantain tree (*Musa balbisiana* Colla) is planted over there and worshipped by offering the seeds of *Vigna mungo* (Linnaeus) Hepper (*Sabai gwchhwu*), flowers, two stones of *Areca catechu* Linnaeus (*Goy*), two leaves of *Piper betle* Linnaeus (*Phatai*), ripe fruits of *Musa balbisiana* Colla (*Athia Thalith*) and fruits of *Cucumis sativus* Linnaeus (*Gumbri*) (Plate XVI, Fig. C). After worshipping, the lady is sown seeds or plant seedlings for few lines facing east, to the rising sun and then followed by others. (Plate XVI, Fig. D – E).

7.11.2.10. Maijatraijennaini Sibinai (Harvesting):

On the first day of harvesting the Grand Lady (*Grazoh*) is takes a bath in the morning, put on clean cloth, go to the field, cut a few sheaves, put them on a bamboo plate, carried them home and hung them from the roof of the *Mainou*'s hut (Plate XVI, Fig. F). These will remain there as a sign of good fortune. After this, regular cutting of the crop is begun by others.

7.11.2.11. Bakh'rwi Sibinai (New Rice-eating):

At the beginning of the paddy husking, the Grand Lady (*Grazoh*) of the house, takes a bath in the morning, put on clean cloth and then go to the granary. She performs *Phunai* invoking comfort and welfare for all family members and offer ripe fruits of *Musa balbisiana* Colla (*Athia Thalith*), beautiful flowers and burn incense sticks. The lady takes permission from the *Mainou* to start the paddy husking process (Plate XVI, Fig. G & H). After that, regular husking process is begun and eating of newly harvested rice is started in that family.

7.11.3. ANALYSIS OF PHUNAI ETHNOBOTANY

A total of eleven festivals or *Phunai* (Devine Worship) have been observed and analysed. It has been observed that in all the eleven events one or more plants are involved.

It is found that in all the religious festivals the main intention of the *Mech* people is the social cleanliness and begging grace of the God for their prosperity. Through the *Kherai Phunai* they connect the God through their imaginary way, which may not be scientifically feasible, but

for this every family take up cleaning operations that is important for any society. Though there is every possibility to misuse of verdict of the Puja, but in religious mind generally such things do not occur.

During *Garja Phunai* also, main part of the festival is the cleaning operations. The house, the utensils, cloths, etc. – everything are to be cleaned. But, there is one strong point of misuse of this festival. If the *Salami* found disturbed next morning the *Mech* people decide that there are one or more uncleaned people in the village. But, through the *Phunai* activity there is no scientific methodology for detection of the uncleaned people.

However, for both the *Phunais* a number of plants are used. And, most of these plants are either edible or medicinal or of much economic or social importance. Plants like *Oryza sativa*, *Musa balbisiana*, *Areca catechu* and *Piper betle* provide edible products for survival. Again, the plants like *Euphorbia royleana*, *Ocimum tenuiflorum*, *Clerodendrum viscosum* and *Cynodon dactylon* are well known medicinal plants. Other plants [*Bambusa nutans*, *Bambusa tulda*, *Calamus erectus*, *Gmelina arborea*, *Gossypium herbaceum*, *Phragmites karka*, *Shorea robusta*] used in *Kherai Puja*. In addition in the prayer for the Puja the mention of *Dillenia indica* fruit appears to be quite important. This is also one edible fruit.

Similarly in *Garja Puja* too a number of plants [*Musa balbisiana*, *Ocimum tenuiflorum*, *Oryza sativa*, *Bambusa nutans*, *Areca catechu* and *Piper betle*] are used. And, all these plants are economically very much important.

It can now be observed that in both the festivals *Mech* people do not use any plant that is otherwise not useful for them. *Mech* society does not observe much religious festivals. Apart from these two naming and marriage are two more occasions which might be referred as festivals. And, in all cases, plant or plant materials used by them are mostly useful ones for their society. This is the clear reflection of their intention to please the deity with something useful.

This is true for other festivals and *Phunais* too. But, further analysis also shows that the ethnobotany of all these festivals is not much broader. And, almost no other new plant added to the list of plants discussed above for the remaining *Phunais*.

PLATE XV



Figs. A. *Bwrai Bathou* (*Sijou*) *Euphorbia royleana*, B. *Hagra Madai* (*Premna bengalensis*), C. Idol of *Bagha & Baghi* (God & Goddess), D. Bamboo made idols worshipped during *Gami Madai-Phunai*, E. Bird sacrificed during *Gami Madai-Phunai*, F. Blood of bird offered to the God, G. Offering is cooked, H. Offerings for evil God

PLATE XVI



Figs. A. & B. Offerings for *Manasha* God, C. Before paddy sowing *Mech* women are busy with their *Maigaijennaini Sibinai* (Paddy sowing ritual), D. & E. After completion of ritual ceremonies starting their paddy sowing, F. *Mainou* (Main Goddess) hut, G. & H. *Bakhrwi Sibinai* (Occasion of getting new paddy from granary)

7.12. Plants Referred in Folklores

7.12.1. INTRODUCTION

Folklores are present almost in all societies. But with the advancement of social structure including its tremendous complexity most of such societies are loosing their folklore very fast. On the other hand traditional societies maintain folklores as their social and cultural treasures. The highly traditional *Mech* people maintain their folklores with much love and respect. Folklores can be found in many forms, like (i) Songs, (ii) Poems, (iii) Puzzles, (iv) Stories, (v) Dances and (vi) Dramas.

During the present survey a large number of folklores of different kinds were recorded. Folklores involving plants were selected and are presented in this section of the report.

Selected folklores are of two types (i) Poems and (ii) Puzzles and are presented below.

7.12.2. PLANTS IN *MECH* POEMS

Poems, songs and dances are the basic elements of cultural activities of any society. A number of poems were collected during the present survey in the *Mech* society. Some are descriptive, mainly of natural beauties. As for the following (Poem No. 1):

Poem No.1:

*“Daubo daubo
Gang rabo rabo
Gaungbou kani rath rath”*

[Oh crane, oh crane
White wings with open;
Let us with you to go
Take a pause, take a pause – be slow.]

Here the beauty of a flying crane with its spreading wings in the background of open blue sky has been described. The sky is endless and, the viewer is surprised to think how far the crane

will move!! He thought, if he can accompany the crane then he can also move away to far away places and can enjoy the beauty of the earth. If the crane stop once for him he will certainly accompany the crane.

This poem is not reflecting any of their traditional knowledge but, certainly, reflecting their way of thinking in a philosophical mind.

Though the ladies collect most of the edible plants and firewood from the forest, males generally take up the toiling job of cultivation. If the men in the family do not cultivate then they will not get enough crop for their survival. And, that has been reflected in the following sonnet (Poem No. 2):

Poem No. 2:

*“Ada bola mailam daung
Jaung maun jaudang ji-joy”*

[Brother Kala has harvested the crops
So we are being feed
How fine?]

The work distribution in *Mech* society is well defined. The duty of food preparation, i.e. cooking is done by the ladies. And, no doubt, elder ladies are better experts in the preparation of different tasty items. But, when all the required items are available for cooking then also it may not be possible for the lady to cook if the fire can not be put on in their traditional oven. Again, to put the oven on fire, firewood is to be put in the oven and that wood should be collected from the forest by the man in the family. On the other hand for procuring wood he needs an axe which is made by an iron-smith, how he will make the axe if there is no fire? So, fire is the basic source of energy without which the present day human society can not survive. The following poem (Poem No. 3) nicely depicted this interrelationship in a beautiful manner including the importance of tamed fire.

Poem No. 3.

*“Burai naung manau ankham chhongakhoi
Burai naung manau hagra chhinnal khoi
Ruthalou goiya
Ruthaloung manaung goiya
Kamalau angkhau banaya khoi
Kamar naung mauna banaya khoi*

Angar nau dhoya.”

[Why the old-lady does not cook rice?
Why you, not ‘the old-lady’ cook rice?
Why the old-lad does not cut wood?
Why you not ‘the old-lad’ cut some wood?
Why then the ironmonger does not make the axe?
Why you not ironmonger make that?
It is for having no fire.]

Ants and other insects quite often affect their crops. To save their crops from flies and ants regular monitoring and care of plants are required. Generally younger family members [who can not work with plough or spade] do this type of work. If they neglect their work then, certainly, crops will be damaged. This is a regular phenomenon and that has been reflected in the Poem no. 4.

Poem No. 4.

*“Jio jio bongbrama
Thamphoi dadranga
Gaumaung mani jalang baay
Geethang mani galang baay
Maukhra balanda
Suh suh suh
Aagoi jwaraiya undu.”*

[The ants suck the ripen beans
And are being sucked by the flies.
All the ripen beans are finished
Only the unripen are missed.
Hash! Hash-a, sha-a---
Sleep, sleep oh sweet brother,
and you little, my darling sister.]

Tharai (*Alpinia nigra* of Zingiberaceae) is one wild plant. The inner soft part of pseudostem is edible and its edible part is also sold in the market. In the habitat *Tharai* produce thick clumps. In a clump if new sucurs do not develop then how edible parts will be collected!

Old plants, at or after flowering, are not suitable for consumption. So, people needs new plants in clumps. This wish or desire has been expressed in the Poem no. 5.

Poem No. 5.

*“Tharai rhu rhu tharai ba
Tharai-ni – fisa jokhay ba.
Aaphaya thang daung hathayao
Gusla fen laynau
Aayiya-thang daung aabaunao
Maibra sithao layela
Sai, sai, sai –
Aagoi jwabo naung dagab sai.”*

[In the *Tharai*'s clump, five *Tharai* are there
Tharai has kids of five pair
Father has gone to the 'Haat'
He will sure bring dresses
Mother is in the grandpa's home
For the Borni-cake.
So, stop, stop, stop and why
My little sister you then cry?]

Mech villages are located in or on the margin of forests. They generally live in small cottages. Very recently they are using corrugated metal or asbestos sheets to thatch their houses but, earlier, some local species of plants including *Saccharum spontaneum* and *Imperata cylindrica* were used for this purpose. There was every possibility that such thatched roofs would develop leakage and water will enter in the house moistening their belongings. And, during the rain it becomes difficult to come of the houses as paths or roads were all muddy and weedy. But, during monsoon, it is expected that there will be enough rain to help their cultivation. So, when rains remain off, they try to enjoy such moments in an environment developed with well grown lush green vegetation sprinkled with flowers of different colors and shades. Those enjoyable moments has been picked up in the following poem (Poem no. 6):

Poem No. 6.

“Kaltang kultang jwi dau aang

Mai gai khangbla nang gol jhangkra
Jou laung naini bauthaur chofoibla
Gauja, gaumu, gauthang rathoigang baidi baidi
Aagar akhaio aang.
Aarou baidi baidi
Roung hananoi bibar erkhangnau aang
Tang khaultang jwi daou aang
Bauthaur chofoibla.”

I weave cloths tow-twang-toon
 When the rain is gone.
 When it will over- the sowing;
 Will drink haria, after the reeping.
 And red, green with the yellow –
 So many flowers and leaves I'll draw.
 I weave cloths tow-twang-toon
 When the rain is gone.

The 7th poem noted below express the happiness in a satisfied family or society. When their granaries are full, their pets are happy with abundant food and the climate is so shooting for leading the comfortable life. Like many other societies people in the *Mech* society to express their thanks and confidence on God. They arrange worshipping at the sit of mother *Mainou*.

Poem No. 7.

“Lamaio mauji thwabaio
Chhoima thwabaio
Aabau thwabaio manshi.
Dabri bariyao maushou gangsau jwao
Baurama gangsau jwao
Jwae aamaya mai gundoini aaphar
Gograsing bao thaou dao.
Hangshau pabaou
Ama – barma
Bakhri singaou thao baidi maigong faigong
No-ma – naomaou thao baidi baida

*Janai naungnai aarounwa khonaou
Haou mainou buroini ganti.”*

[On the path, there moves the cat
The dog moves and the men walk
The cows graze in the field
Also the goats and pigs eat
In the coops there are hens-ducks and goats;
And the granary is stored with rice and grains.
The greens are at the nook of the house
And kitchen is full with edible-goods,
Where mother *Mainou* sits, is our goddess.]

7.12.2.1. ANALYSIS OF PLANTS USED IN *MECH* POEMS

Like most of the traditional societies, the people in the *Mech* society also are culture loving. The selected seven poems presented here are mostly showing their relationship with their habitat, which is generally forested and full of useful materials to use as food, fodder, house building materials, medicines, making instruments for hunting and recreational activities.

Only the first poem is too much philosophical but the remaining six poems are expressing their relation with the surrounding environment and with frequent reference with different types of plants. The plants they refer are mainly useful for them. Their difficult life style, natural enemies, joy from successful cultivation, etc are all become background subjects of their poems.

7.12.3. PLANTS IN *MECH* PUZZLES

Recreation is a basic intuition of most of the animals (and plants). Man has developed innumerable methods of recreation and plants are used in majority of cases in some form or other. Tribal traditional modes of recreation include songs, dances, music, puzzles, games and sports. A large number of puzzles were collected covering different aspects. Here, some of the puzzles involving plants or plant materials are presented below:

Puzzle No. 1:

*Moukhou dailele
No-injur konayao
Ma jirath bilai?*

[*English*: What is there in the nook?]

Finlu (Answer): *Jou* (rice beer).

Puzzle No. 2:

Abo dadura mejem bhara

Ma jirath bilai?

[*English*: Who is that old fat man with rough skin?]

Finlu (Answer): *Lichu* (*Litchi chinensis* of Sapindaceae).

Puzzle No. 3:

Shibro-bro abo bigur

Singao hai dong bidoi bur

Ma jirath bilai?

[*English*: Who is the old man has juice inside and dry skin at out?]

Finlu (Answer): *Jambura* [*Citrus maxima* of Rutaceae].

Puzzle No. 4:

Bimaya gaom thayo fisaya

Uraee lango

Ma jirath bilai?

[*English*: Not lie it is true, son take a fly but mother stays at bellow.]

Finlu (Answer): *Zilith aaro shimmuri* (bow and arrow made of bamboo).

Puzzle No. 5:

Hwani chhayao bifang

Bifangni chhayao fithai

Fithaini chhayao bifang bilai

Ma jirath bilai?

[*English*: There is fruit in the tree and tree on the fruit above the soil, now you solve the riddle.]

Finlu (Answer): *Anarousa* [*Ananas comosus* of Bromeliaceae].

Puzzle No. 6:

Futhja mati chitlayaou

Daoukhi choulayaou

Ma jirath bilai?

[**English:** Name the keen that at the down, excreta is licked in the yard by it?]

Finlu (Answer): – *Hasib* (broom-sticks made of different plant parts).

Puzzle No. 7:

Megon gaiyee, ateng gaiyee, begong moun cheyaolou

Birath gidir deini meider badi moudoum

Ma jirath bilai?

[**English:** No eyes, no legs

Only stands on bones

Looks like hippopotamus; have you ever seen?]

Finlu (Answer): – *Mai jigwabni punji* (heap of straw of *Oryza sativa* of Poaceae).

Puzzle No. 8:

Gang gounang janji jeng greb kanai rung bang

Hwathay riji riji jido lari

Chour chikhoula moun

Ma jirath bilai?

[**English:** She has a thin waist and curly hair

With glittering teeth of sixteen pair

And the body is covered with feathers.

Who are the sweet daughters, guess!]

Finlu (Answer):– *Dubba* (*Zea mays* of Poaceae).

Puzzle No. 9:

Durung doung cheyaounou golee bungjachhe moushou

Ma jirath bilai?

[**English:** The shed is full of cattle which are tied by a rope in a row, - what is that do you know?]

Finlu (Answer): *Kalkou, Kombra* (bottle gourd, pumpkin; *Cucurbita maxima* of Cucurbitaceae).

Puzzle No. 10:

Fisakhou labra Bimaya biji shuhorou

Ma jirath bilai?

[**English:** Take the baby, the mother will give a strike heavy – what is it?]

Finlu (Answer): *Boi (Zizyphus mauritiana* of Rhamnaceae).

Puzzle No. 11:

Nu-naibla habar

Deiblanou aanoyou burblayou

Ma jirath bilai?

[**English:** It looks strange on, the king is unable to put its crown on – what is it?]

Finlu (Answer): – *Khoma Bilai (Dendrocide sinuata* of Urticaceae).

Puzzle No. 12:

Rajani topi

Rajaouni gannao haya

Ma jirath bilai?

[**English:** It is shame on, the King is unable to put its crown on – what is it?]

Finlu (Answer): *Chou Bilai* (head cover; *Phrynium pubinerve* of Marantaceae).

Puzzle No. 13:

Rada gaiyee bingfang

Ma jirath bilai?

[**English:** Name the plant that has no roots.]

Finlu (Answer): *Badamani* (mosses).

Puzzle No. 14:

Jaba janalei khinou rounga

Ma jirath bilai?

[**English:** Who can't evacuate after eat or swallow?]

Finlu (Answer): *Gandu* (pillow filled with floss from *Bombax ceiba* of Bombacaceae).

7.12.4. ANALYSIS OF PLANTS USED IN MECH PUZZLES

It is natural that while composing a puzzle the author will target a material that will be available in his/ her surrounding and are generally useful or interesting. Out of the 14 puzzles presented here at least six puzzles (Nos. 2, 3, 5, 8, 9 & 10) are indicating one species of edible plant for each. Those are *Litchi chinensis*, *Citrus maxima*, *Ananas comosus*, *Zea mays*, *Cucurbita maxima* and *Zizyphus mauritiana*. In addition, for the first puzzle the answer is *Jou*, for the preparation of

which quite a few plants are used and that is the elixir of their life. *Jou* is one important ingredient in their life style including religious festivals.

The answer for the Puzzle No.4 is 'bow & arrow'. *Mech* people live in forest villages where they need survive from the attack of many wild animals. In Duars, animals like leopard, bison, different types of wild cats, elephants, snakes, etc. quite often pose danger for them. At the same time for the collection of food male people enters the forests for hunting edible animals (especially when hunting was permitted). So, bow & arrow are very important weapon for them.

Answers for Puzzle Nos. 7, 12 and 14 are referring to very important materials. Paddy straw is now only used for thatching their cottages, it is also the most important stock fodder for their cattle. - - *Phrynium pubinerve* is very common in marshy habitat. Large broad and durable leaf-lamina of this plant is used for making temporary umbrella during rains, specially when while working paddy fields. - - And, for sleeping like any people they also need one pillow. *Bombax ceiba* is a very common plant in the area and the local people collect huge quantity of floss from these plants which is not only sufficient for stuffing their own pillows and mattresses, the excess amount is also having good demand in the market. So, it is natural that the pillow and/or simul-floss will take place in their cultural practices.

The 13th puzzle is framed on mosses. These are minute rootless plants but with hairy rhizoids. It is interesting that through their analytical observation they realized that mosses are rootless plants. This observation is scientifically true and highlights the strong analytical power of observation of *Mech* people.

At last, the Puzzle no. 11. For their survival *Mech* people, both males and females, need to move in the forest for long time. The strongly irritating indumentum of *Dendrocnide sinuata* gives them trouble quite frequently as this shrub is abundant in Duars forests. This is a powerful plant but will never be accepted as King as the plant is not acceptable as a lovable plant.

7.13. Recorded Plants in Traditional Cuisine

7.13.1. TRADITIONAL CUISINE

Every society has their own tradition in culture and taste. This also always reflects in the taste of their prepared food. This community-special taste develops certainly from the recipe that includes ingredients and mode of preparation or cooking. This is also true for the *Mech* community. During survey six *Mech*-specific preparations have been recorded from their kitchen. These six preparations are presented below including their ingredients and method of preparation.

I. *Inghur Khari:*

Ingredients: 12 – 15 leaves of *Momordica charantia*, 12 – 15 flowers of *Carica papaya*, 250 g broken rice grains, one chopped onion, turmeric powder, green chili and salt to taste.

Method:

Heat mustard oil in a deep vessel. Put onion, green chili. When they crackle, add broken rice grains and cook till they turn light brown. Add turmeric powder and salt and cook for few more minutes. Add the *Carica papaya* flowers and leaves of *Momordica charantia* and cook well. Add sufficient water and cook till the rice grains are soft. It tastes slightly bitter.

II. *Narzi:*

Ingredients: One cup dry leaf powder of *Corchorus capsularis*, 2 tablespoons *Khardoi Bedai*, one chopped onion and salt.

Method:

Boil ½ litre of water with chopped onion. Put leaf powder and salt. Let it cook till the gravy is thick. Pork or small fishes also can be added to *Narzi*. It forms a bitter but tasty gravy.

III. *Ondla:*

Ingredients: 200 g rice powder, 20 g chopped onion, 3 green chilies, turmeric powder and salt to taste.

Method:

Boil ½ litre of water in a vessel. Add chili and onion. When they turn soft, add rice dust, turmeric powder and salt and cook it. Add *Khardoi Bedai* and cook well. Chicken or pork can be added to it. It tastes like normal pulses preparation.

IV. Saonai:

Ingredients: Tender leaf-sheath of *Calamus erectus*, mustard oil, green chili and salt.

Method:

Leaf-sheaths are cut into pieces (about 8 cm long) and bound them together in a bundle and roasted and the peeled off the roasted bark of leaf-sheath. The soft parts are mashed. Mustard oil, green chili and salt are added to this and mix well.

V. Sobai:

Ingredients: 6 – 7 spadices of *Colocasia esculenta*, 2 chopped onions, green chili, mustard oil, turmeric powder and salt.

Method:

Cut spadices into small pieces and boil and then mashed in water. Then it is kept aside. Onion, green chili, turmeric powder and salt are cooked in heated mustard oil till they turn brown. Now add the boiled spadix along with water and cook for a few minutes. It tastes like pulses preparation.

VI. Maibra Sithao:

Ingredients: Powdered partially water-soaked rice grains and young leaf of *Musa balbisiana*

Method:

Leaven the rice powder. After that, cakes are made out of this, rolled in banana leaf and then steamed.

7.13.2. ANALYSIS OF PLANTS IN MECH KITCHENS

As most of the traditional societies in this area are now in regular touch with the modern society, they have mostly adopted Bengali-type food preparation. Even then, they maintained some of their traditional preparations. They collect most of the main ingredients from the local vegetation and other ingredients like onion, mustard oil, salt etc are collected from the local market.

Freshly collected young seedlings of *Corchorus capsularis* is generally used as a green vegetable. But, Mech people store its leaves in sun-dried condition and use the same round the year. Some plant parts like the flowers of *Carica papaya*, leaves of *Momordica charantia*, leaf-

sheaths of *Calamus erectus* and the spadices of *Colocasia esculenta* are not regular vegetables and are not generally used in modern kitchens. But these are all locally available in abundance and *Mech* people developed their own traditional recipe for using these vegetable materials.

The people in *Mech* community highly prefer their traditional food and they feel these foods are very tasty. In marriage ceremony *Ondla* is one very important cuisine. The nutrient value or quality of these *Mech* traditional foods is yet to be studied. However, some of these preparations can be popularize through little modification.

CHAPTER 8

ENUMERATION OF ETHNOBOTANICAL PLANTS

Enumeration of Ethnobotanical Plants

Ethnobotanical studies have been conducted among the *Meches* living in Duars of West Bengal and in the adjacent part of Assam covering almost all areas in *Mech* life style. While in one hand edible and medicinal plants are of prime importance for survival were recorded in detail, plants used in traditional festivals or worships or plants narrated in traditional folklores – all were recorded and analysed. The present enumeration listed all plants those were recorded in all the different sections of present study.

8.1. DELIMITATION AND CLASSIFICATION

The present ethnobotanical survey among the *Mech* community has recorded the uses of at least 271 species of plants covering 93 families of Pteridophytes and Angiosperms (Magnoliophyta). For the delimitation of families Hutchinson (1973) has been followed in general and for the classification or arrangement of angiospermic families Cronquist (1981) has been followed exclusively. For the arrangement of Pteridophytic families the classification as adopted by Singh & Panigrahi (2005) has been consulted.

8.2. PRESENTATION OF FLORA

In the following enumeration of the collected flora in relation with the ethnobotanical survey among the *Meches*, all the major taxa of Plant Kingdom is presented following Cronquist's (1981) system of classification. But, the minor taxa (i.e. genus, species and variety) are presented alphabetically.

The placement of different recorded major taxa is shown below:

PTERIDOPHYTA [after Singh & Panigrahi 2005]

Athyriaceae

Dryopteridaceae

Helminthostachyaceae

Marsileaceae

MAGNOLIOPHYTA [Angiosperms] [after Cronquist 1981; Hutchinson 1973]

Division: MAGNOLIOPHYTA

Class: MAGNOLIOPSIDA

Subclass I: Magnoliidae

Order: Magnoliales

Family: Magnoliaceae

Family: Annonaceae

Order: Laurales

Family: Lauraceae

Order: Piperales

Family: Saururaceae

Family: Piperaceae

Order: Nymphaeales

Family: Nymphaeaceae

Order: Ranunculales

Family: Menispermaceae

Order: Papaverales

Family: Papaveraceae

Subclass II: Hamamelidae

Order: Urticales

Family: Ulmaceae

Family: Cannabaceae

Family: Moraceae

Family: Urticaceae

Subclass III: Caryophyllidae

Order: Caryophyllales

Family: Nyctaginaceae

Family: Aizoaceae

Family: Chenopodiaceae

Family: Amaranthaceae

Family: Portulacaceae

Family: Caryophyllaceae

Order: Polygonales

Family: Polygonaceae

Order: Plumbaginales

Family: Plumbaginaceae

Subclass IV: Dilleniidae

Order: Dilleniales

- Family: Dilleniaceae
- Order: Theales
 - Family: Dipterocarpaceae
 - Family: Hypericaceae
- Order: Malvales
 - Family: Elaeocarpaceae
 - Family: Tiliaceae
 - Family: Sterculiaceae
 - Family: Bombacaceae
 - Family: Malvaceae
- Order: Lecythidales
 - Family: Lecythidaceae
- Order: Violales
 - Family: Flacourtiaceae
 - Family: Caricaceae
 - Family: Cucurbitaceae
- Order: Capparales
 - Family: Moringaceae
- Order: Ebenales
 - Family: Sapotaceae
 - Family: Ebenaceae
- Order: Primulales
 - Family: Myrsinaceae

Subclass V: Rosidae

- Order: Rosales
 - Family: Crassulaceae
 - Family: Rosaceae
- Order: Fabales
 - Family: Mimosaceae
 - Family: Caesalpinaceae
 - Family: Fabaceae
- Order: Myrtales
 - Family: Lythraceae
 - Family: Trapaceae
 - Family: Myrtaceae
 - Family: Melastomataceae
 - Family: Combretaceae
- Order: Cornales
 - Family: Alangiaceae
- Order: Celastrales
 - Family: Icacinaceae
- Order: Euphorbiales
 - Family: Euphorbiaceae

Family: Bischofiaceae

Order: Rhamnales

Family: Rhamnaceae

Family: Vitaceae

Order: Sapindales

Family: Sapindaceae

Family: Anacardiaceae

Family: Meliaceae

Family: Rutaceae

Order: Geraniales

Family: Oxalidaceae

Order: Apiales

Family: Apiaceae

Subclass VI: Asteridae

Order: Gentianales

Family: Apocynaceae

Family: Asclepiadaceae

Order: Solanales

Family: Solanaceae

Family: Convolvulaceae

Family: Cuscutaceae

Order: Lamiales

Family: Ehretiaceae

Family: Verbenaceae

Family: Lamiaceae

Order: Scrophulariales

Family: Scrophulariaceae

Family: Acanthaceae

Family: Bignoniaceae

Order: Rubiales

Family: Rubiaceae

Order: Asterales

Family: Asteraceae

Class: LILIOPSIDA

Subclass II: Arecidae

Order: Arecales

Family: Arecaceae

Order: Arales

Family: Araceae

Family: Acoraceae

Subclass III: Commelinidae

Order: Commelinales

Family: Commelinaceae

Order: Cyperales

Family: Cyperaceae

Family: Poaceae

Subclass IV: Zingiberidae

Order: Bromeliales

Family: Bromeliaceae

Order: Zingiberales

Family: Musaceae

Family: Zingiberaceae

Family: Costaceae

Family: Marantaceae

Subclass V: Liliidae

Order: Liliales

Family: Pontederiaceae

Family: Amaryllidaceae

Family: Iridaceae

Family: Dracaenaceae

Family: Smilacaceae

Family: Dioscoreaceae

Order: Orchidales

Family: Orchidaceae

8.3. DETAILED ENUMERATION

Recorded ethnobotanical plants have been presented as discussed earlier. For each plant there will be a (i) Correct name, (ii) Basionym – if essential, (iii) Common synonym – if any, (iv) Proper author citation, (v) Protologue reference, (vi) Reference to record in published local floras, (vii) Vernacular name, (viii) A brief description, (ix) Flowering & Fruiting period, (x) Reference to Voucher Specimen – *Exsiccatiae*, and (xi) Local and general distribution.

In the enumeration following literatures have been cited in abbreviated form:

Flora of Bhutan	FB
An Enumeration of the Flowering Plants of Nepal	EFPN
Flora of Eastern Himalaya	FEH
Flora of India	FI
Flora of British India	FBI
Bengal Plants	Bengal Pl

8.3.1. PTERIDOPHYTA

ATHYRIACEAE Alston

DIPLAZIUM Swartz

Diplazium esculentum (Retzius) Swartz in Schrader, J. Bot. 1801 (1): 312. 1803 ; Handb. Ferns Brit. Ind. 192. 1883; Ferns Fern-All. Arun. Prad. I: 161. 2005. *Hemionitis esculenta* Retz., Obs. Bot. 4: 38. 1791.

Vernacular Name: Dingkhsa (Mech).

Marshy or sometimes terrestrial herbs; rhizome erect, stipes tufted sparsely scaly at base, glabrous above, purplish band on stipes and rachis; lamina deltoid, acuminate, truncate, bipinnate; pinnae narrowly deltoid; sori linear, all along the veins.

Fertile: July – February.

Exsiccatus: Pashim Satali, *Ajita & AP Das 036*, dated 01.09.2004.

Local Distribution: Throughout the study area

General Distribution: India (Arunachal Pradesh, Assam, Meghalaya, Tripura, Western Ghats), Bangladesh, China and Malaya.

DRYOPTERIDACEAE Herter

DRYOPTERIS Adanson

Dryopteris filix-mas (Linnaeus) Schott, Gen. Fil. Ad. pl. 9. 1834. *Polypodium filix-mas* Linnaeus, Sp. Pl. 1090. 1753.

Vernacular Name: Saldakhumoi (Mech).

Rhizome erect, paleaceous. Fronds tufted, lanceolate, bipinnate at base, bipinnatisect upwards. Stipes paleaceous, grooved. Lamina 30 cm long, pinnae subopposite; pinnules pinnatifid, veins pinnate. Sori round, median, entire, brown.

Fertile: July – February.

Exsiccatus: Paschim Satali, *Ajita & AP Das 013*, dated 21.08.2004; Nimati, *Ajita & AP Das 289*, dated 05.03.2008.

Local Distribution: Throughout the study area.

General Distribution: India, China.

HELMINTHOSTACHYACEAE Ching

HELMINTHOSTACHYS Kaulfuss

Helminthostachys zeylanica (Linnaeus) Hooker, Gen. Pl. 476. 1842; FEH 1: 453. 1966; FI 1: 133. 2004. *Osmunda zeylanica* Linnaeus, Sp. Pl. 2: 1063. 1753.

Vernacular Name: Daudai Atheng (Mech).

Perennial, stout horizontal root stock with thick fleshy roots. Rhizome thick, fleshy, creeping. Fronds tripartite with erect fertile spike. Lamina sessile, palmately divided with three major oblong-lanceolate division, margin entire or crenate. Veins free, pinnate, parallel. Spores trilet.

Fertile: November – February.

Exsiccatus: Mantharam, *Ajita & AP Das 216*, dated 14.06.2007.

Local Distribution: Mantharam, Nimati and Paschim Satali.

General Distribution: India (Eastern, South, Central and Western), Sri Lanka, China, Indo-China, Taiwan, Malesia, Malay Islands.

MARSILEACEAE Mirbel

MARSILEA Linnaeus

Marsilea minuta Linnaeus, Mant. 308. 1771; Sledge, Bot. J. Linn. Soc. 84: 22. 1982; Manickam & Irudayaraj, Pterid. Fl. Western Ghats 342. Pl. 187. 1992.

Vernacular Name: *Sususni* (Mech).

Aquatic pteridophytes with creeping rhizome, roots borne usually on nodes, stipes scattered, usually green, leaves four, sessile arranged at the tip of the stipe in cloud leaf model. Sporocarp borne at the nodes in alternate clusters.

Fertile: January – April.

Exciccatus: Nimati, *Ajita & AP Das 190*, dated 07.03.2006.

Local Distribution: In Nimati.

General Distribution: India, Africa, Trinidad and Brazil.

8.3.2. MAGNOLIOPHYTA [Angiosperms]

8.3.2.1. MAGNOLIOPSIDA

MAGNOLIACEAE A. Jussieu

MICHELIA Linnaeus

Michelia champaca Linnaeus, Sp. Pl. 1: 536. 1753; FBI 1: 42. 1872; FB 1(2): 236. 1984; FI 1: 175. 1993.
Michelia rheedii Wight, Illus. 1: 14. 1840.

Vernacular Name: *Champa* (Mech).

Trees. Leaf blade elliptic or ovate, base broadly cuneate, apex long acuminate to subcaudate. Flowers fragrant. Fruits 7 – 15 cm; mature carpels obovoid-ellipsoid, tuberculate. Seeds 2 – 4 per carpel, rugose.

Flowers & Fruits: June – October.

Exsiccatus: Paschim Satali, *Ajita & AP Das 031*, dated 29.08.2004.

Local Distribution: Paschim Satali, Nimati, Dakshin Mendabari and Gossaigaon.

General Distribution: Tropical and sub-tropical parts of the world.

ANNONACEAE A. Jussieu

ANNONA Linnaeus

Annona reticulata Linnaeus, Sp. Pl. 1: 573. 1753; FBI 1: 78. 1872; FB 1(2): 244. 1984; FI 1: 207. 1993.

Vernacular Name: *Balam Fithai* (Mech).

Trees, 4 – 10 m. Leaves oblong-lanceolate, entire, acuminate, base rounded, glabrous. Flowers in axillary or terminal cymes, 2 – 3. Sepals 3, broadly ovate. Petals 6, 3 in inner whorl; outer ones narrowly oblong. Carpels many; style oblong; stigma entire. Fruits ovoid.

Flowers & Fruits: May – January.

Exsiccatus: Nimati, *Ajita & AP Das 253*, dated 02.01.2008; Paschim Satali, *Ajita & AP Das 415*, dated 15.11.2008.

Local Distribution: Nimati, Paschim Satali, Ghoramara, Bamonpara and Kochugaon.

General Distribution: Native of Central America and naturalized in India.

POLYALTHIA Blume

Polyalthia longifolia (Sonnerat) Thwaites, Enum. 398. 1864; FBI 1: 62. 1872; FI 1: 274. 1993; FB 1(2): 244. 1984. *Uvaria longifolia* Sonnerat, Voy. Indes 2: 233.t. 131. 1782.

Vernacular Name: *Debdaru* (Mech).

Evergreen tree. Lamina narrowly lanceolate, repand, membranous, acuminate, base acute, glabrous, shining above, pellucid-dotted. Flowers in dense axillary cymose fascicle; outer tepals small, orbicular, inner tepals linear to narrowly lanceolate, yellowish green. Berries globose, stalked; seeds shining.

Flowers & Fruits: March – September.

Exsiccatus: Paschim Satali, *Ajita & AP Das 136*, dated 08.02.2005.

Local Distribution: Nimati, Paschim Satali and Salkumar.

General Distribution: Native of Sri Lanka; common in eastern Asiatic countries.

LAURACEAE A. Jussieu

LITSEA Lamarck (*nom. cons.*)

Litsea monopetala (Roxburgh) Persoon, Syn. Pl. 2: 4. 1807; EFPN 3: 185. 1982; FB 1(2): 276. 1984.
Tetranthera monopetala Roxburgh, Pl. Coromandel 2: 26.t. 1798.

Vernacular Name: **Ban Bingfang** (Mech).

Evergreen trees, up to 18 m. Leaf blade broadly obovate to ovate-oblong, pinninerved, base rounded to acute, apex obtuse. Umbels clustered on shortest branchlets. Perianth yellow-white, lanceolate. Fruits long ovoid.

Flowers & Fruits: November – July.

Exsiccatus: Nimati, **Ajita & AP Das 191**, dated 22.04.2006.

Local Distribution: Nimati and Dakshin Latabari.

General Distribution: Bhutan, Cambodia, India, Laos, Malaysia, Myanmar, Nepal, Pakistan, Thailand, Vietnam.

SAURURACEAE A. Richard

HOUTTUYNIA Thunberg

Houttuynia cordata Thunberg, Vet. Akad. Stockh. Handl. 4: 149. t. 5. 1783; FBI 5: 78. 1886; EFPN 3: 182. 1982; FB 1(2): 341. 1984.

Vernacular Name: **Maisundri** (Mech).

Perennial, prostrate. Leaves broadly ovate, acute or shortly acuminate, cordate; stipules oblong. Flowers spikes 1 – 3 cm; basal bracts white, oblong or obovate. Fruits capsules.

Flowers & Fruits: June – December.

Exsiccatus: Chhekamari, **Ajita & AP Das 070**, dated 10.10.2004.

Local Distribution: Chhekamari and Nimati.

General Distribution: Himalaya, Khasia Hills, Thailand, China and Japan.

PIPERACEAE C.A. Agardh

PEPEROMIA Ruiz et Pavon

Peperomia pellucida (Linnaeus) Kunth, Nov. Gen. Sp. 1: 64. 1816; FB 1(2): 345. 1984. *Piper pellucidum* Linnaeus, Sp. Pl. 1: 30. 1753.

Vernacular Name: **Luchhi Bilai** (Mech).

Herbs annual, fleshy. Stems erect or ascending, branched, glabrous. Leaf blade broadly ovate, base cordate, apex acute or obtuse. Anthers subglobose. Ovary ellipsoid; stigmas pubescent.

Flowers & Fruits: April – July.

Exsiccatus: Nimati, **Ajita & AP Das 451**, dated 01.03.2009.

Local Distribution: Throughout the study area.

General Distribution: Tropical and sub-tropical parts of the world.

PIPER Linnaeus

Piper attenuatum Buchanan-Hamilton ex Miquel, Syst. Piperac. 306. 1843; FBI 5: 92. 1886; FB 1(2): 347. 1984.

Vernacular Name: Galthou Phatai (Mech).

Glabrous climbers. Leaf blade ovate-orbicular to ovate, membranous, glandular, base rounded to subcordate, usually truncate, apex cuspidate; reaching leaf apex. Flowers monoecious. Spikes leaf-opposed. Male spikes slender; apex rounded, margin free. Ovaries ovoid, distinct. Drupes drying black, ovoid-globose.

Flowers & Fruits: October – December.

Exsiccatu: Latabari, *Ajita & AP Das 127*, dated 03.02.2005.

Local Distribution: In Latabari.

General Distribution: India, Bhutan, Tropical and sub-tropical parts of the world.

Piper betle Linnaeus, Sp. Pl. 1: 28. 1753; FBI 5: 85. 1886; Bengal Pl. 2: 893. 1903.

Vernacular Name: Phatai (Mech).

Climbers dioecious. Stems rooted at nodes, slightly woody. Petiole very finely powdery pubescent; leaf-blade ovate to ovate-oblong, acuminate, cordate to rounded, symmetric, veins 7, usually opposite, others basal; reticulate veins conspicuous. Spikes leaf-opposed. Drupes fused to form terete, fleshy, reddish, compound fruit.

Flowers & Fruits: May – July.

Exsiccatu: Nimati, *Ajita & AP Das 159*, dated 01.11.2005.

Local Distribution: Cultivated.

General Distribution: Widely cultivated; India, S.E. to S.W. China, Indonesia, Malaysia, Philippines, Sri Lanka, Vietnam, Africa.

Piper longum Linnaeus, Sp. Pl. 29. 1753; FBI 5: 83. 1886; FEH 2: 14. 1971; EFPN 3: 183. 1982; FB 1(2): 348. 1984.

Vernacular Name: Pipli (Mech).

Climbing shrub. Leaves membranous, subacute or bluntly acuminate, base deeply cordate-auriculate, symmetric. Male spikes slender and female spikes cylindrical.

Flowers & Fruits: September – January.

Exsiccatu: Dakshin Mendabari, *Ajita & AP Das 106*, dated 11.11.2004.

Local Distribution: In Dakshin Mendabari.

General Distribution: India, Bangladesh, Bhutan, Malaysia, Nepal, Sri Lanka.

Piper nigrum Linnaeus, Sp. Pl. 28. 1753; FBI 5: 90. 1887.

Vernacular Name: Banjut (Mech).

Slender climbers, rooting at nodes. Leaves petloid coriaceous, broadly ovate oblong, base orbicular, rounded, oblique. Spikes robust, Flowers dioecious. Fruits globose, sessile, black when ripe.

Flowers & Fruits: January – April.

Exsiccatu: Paschim Satali, *Ajita & AP Das 272*, dated 13.02.2008.

Local Distribution: Chhekamari and Paschim Satali.

General Distribution: Tropical.

Piper sylvaticum Roxburgh, Fl. Ind. 1: 156. 1832; FBI 5: 84. 1886; FB 1(2): 348. 1984.

Vernacular Name: **Hagrani Phatai** (Mech).

Climbers herbaceous, dioecious. Stolons present. Leaf blade usually ovate, base cordate, symmetric, apex acuminate. Spikes leaf-opposed. Male spikes slender. Female spikes erect, very finely powdery pubescent. Ovary globose, distinct. Drupes globose.

Flowers & Fruits: August – September.

Exsicattus: Mantharam, **Ajita & AP Das 114**, dated 13.11.2004; Latabari, **Ajita & AP Das 128**, dated 03.02.2005.

Local Distribution: Latabari, Mantharam and Paschim Satali.

General Distribution: Tropical and sub-tropical parts of the world.

NYMPHAECHEAE Salisbury

NYMPHAEA Linnaeus

Nymphaea pubescens Willdenow, Sp. Pl. 2: 1154. 1799; FI 1: 431. 1993.

Vernacular Name: **Daeii Bibar** (Mech).

Large aquatic herbs. Rootstock creeping, attached to the substratum. Leaves quite entire, sometime sinuate, toothed. Flowers rose, white or variously coloured; floating on by long radical spaces; sepals obtuse, ribbed; petals acute or tapering at both the ends.

Flowers & Fruits: September – January.

Exsicattus: Nimati, **Ajita & AP Das 187**, dated 07.03.2006; Chhekamari, **Ajita & AP Das 220**, dated 26.08.2007.

Local Distribution: Nimati.

General Distribution: India, Bangladesh, Malaysia, Africa, Java, Philippines and Hungary.

MENISPERMACEAE A. Jussieu

PERICAMPYLUS Miers

Pericampylus glaucus (Lamarck) Merrill, Interpr. Rumph. Herb. Amboin. 219. 1917; FB 1(2): 336. 1984; FI 1: 330. 1993. *Menispermum glaucum* Lamarck, Encycl. Meth. 4: 100. 1797.

Vernacular Name: **Nalithapa** (Mech).

Base with a woody tuber. Lamina triangular-ovate to triangular-oblong, base subtruncate to cordate, rarely broadly cuneate, margin crenate or subentire, apex obtuse or rounded, rarely mucronate, apiculate. Inflorescences corymbose cymes. Drupes red or purple.

Flowers & Fruits: April – October.

Exsicattus: Chhekamari, **Ajita & AP Das 077**, dated 03.10.2004; Nimati, **Ajita & AP Das 264**, dated 22.01.2008; Ghoramara, **Ajita & AP Das 424**, dated 25.11.2008.

Local Distribution: Chhekamari, Ghoramara and Nimati.

General Distribution: India (Eastern Himalaya, Assam), Myanmar, China, Thailand, Taiwan, Japan, Malaysia.

STEPHANIA Loureiro

Stephania glabra (Roxburgh) Miers, Contrib. Bot. 3: 217. 1817; FB 1(2): 336. 1984; FI 1: 334. 1993. *Cissampelos glabra* Roxburgh, Fl. Ind. 3: 840. 1832. *Stephania rotunda* sensu FBI p.p. Loureiro; FB 1(2): 336. 1984.

Vernacular Name: *Dibauli Bidat* (Mech).

Rootstock often tuberous, ovate or suborbicular, acute or subacute, base rounded, glabrous. Inflorescence usually axillary; peduncles umbels slender in male, generally stouter in female. Fruits suborbicular, reddish on ripening.

Flowers & Fruits: April – July

Exsiccatus: Paschim Satali, *Ajita & AP Das 001*, dated 04.07.2004; Baniapara, *Ajita & AP Das 064*, dated 01.10.2004; Uttar Mendabari, *Ajita & AP Das 201*, dated 14.05.2006; Chhekamari, *Ajita & AP Das 354*, dated 10.07.2008; Ghoramara, *Ajita & AP Das 425*, dated 25.11.2008; Chhekamari, *Ajita & AP Das 455*, dated 15.03.2009.

Local Distribution: Baniapara, Chhekamari, Ghoramara, Paschim Satali, Uttar Mendabari and Patgaon.

General Distribution: Arunachal Pradesh, Assam, Manipur, Nagaland, Tropical Himalayas, Western Peninsula.

Stephania japonica (Thunbergh) Miers in Ann. Mag. Nat. Hist. ser. 3, 18: 14. 1866; FBI 1: 103. 1872; FB 1(2): 337. 1984; FI 1: 335. 1993; *Menispermum japonicum* Thunbergh ex J.A. Murray, Syst. Veg., ed. 14: 892. 1784.

Vernacular Name: *Chhantala* (Mech).

Slender twiner. Lamina deltoid, acuminate, rounded, entire, sparsely pubescent beneath. Umbels axillary; male flowers sessile in dense capitates clusters, sepals oblanceolate, petal obovate; female flowers similar. Fruits suborbicular, red on ripening.

Flowers & Fruits: May – December.

Exsiccatus: Sibkata, *Ajita & AP Das 139*, dated 01.03.2005.

Local Distribution: Sibkata.

General Distribution: Tropical to temperate regions of Asia and Africa.

TINOSPORA Miers

Tinospora cordifolia (Willdenow) Hooker f. & Thomson, Fl. Ind. 184. 1855; FBI 1: 97. 1872; FB 1(2): 335. 1984; FI 1: 347. 1993. *Menispermum cordifolium* Willdenow, Sp. Pl. 4: 826. 1806.

Vernacular Name: *Gultai* (Mech).

Large twiner. Leaves broadly ovate, abruptly acuminate, base cordate, glandular domatia in veins axils on lower surface, otherwise glabrous. Male flowers in few-flowered clusters, female flowers borne singly along axis. Outer sepals ovate in male, inner elliptic; petals obovate. Female flowers with sepals and petals similar to male; staminodes linear, carpels ellipsoid. Drupes red.

Flowers & Fruits: January – May.

Exsiccatus: Dakshin Mendabari, *Ajita & AP Das 335*, dated 30.05.2008.

Local Distribution: Dakshin Mendabari and Haltugaon.

General Distribution: India, Sri Lanka, Bangladesh and Myanmar.

PAPAVERACEAE A. Jussieu

ARGEMONE Linnaeus

Argemone mexicana Linnaeus, Sp. Pl. 1: 508. 1753; FBI 1:117. 1872; FB 1(2): 402. 1984.

Vernacular Name: Khata Bibar (Mech)

A prickly glabrous annual herbs, branched. Leaves alternate, lamina elliptic-oblong, pinnatifid, sinuate-lobulated; variegated green and white, dentate, prickly on the margin, midrib and the veins beneath. Sepals with an acute, terete horn below the apex, very sparsely prickly outside, concave, imbricate caduceus; petals narrowed below, bright yellow, imbricate; stamens indefinite.

Flowers & Fruits: February – May.

Exsicattus: Nimati, *Ajita & AP Das283*, dated 17.02.2008.

Local Distribution: Throughout the study area.

General Distribution: India and warmer countries.

ULMACEAE Mirbel

TREMA Loureiro

Trema orientalis (Linnaeus) Blume, Mus. Bot. Lugd. Bot. 2: 58. 1856; FBI 5: 484. 1888; FEH 1: 52. 1966; EFPN 3: 207. 1982; FB 1(1): 86. 1983. *Celtis orientalis* Linnaeus, Sp. Pl. 2: 1044. 1753.

Vernacular Name: Ban (Mech).

Small trees, semideciduous; bark silver-grey. Lamina ovate-lanceolate, closely serrate, acuminate, cordate, scabrous above, silvery white beneath; stipules deciduous. Flowers in axillary cymes. Drupes black, ovoid.

Flowers & Fruits: March – October.

Exsicattus: Nimati, *Ajita & AP Das 462*, dated 20.04.2009.

Local Distribution: Throughout the study area.

General Distribution: Tropical Africa, Himalaya, India, Sri Lanka, W. and S. China and Australia.

CANNABACEAE Lindley

CANNABIS Linnaeus

Cannabis sativa Linnaeus, Sp. Pl. ed. 1. 1827. 1753; FBI 5: 487. 1888; FEH 1: 53. 1966; FB 1(1): 134. 1983.

Vernacular Name: Ganja (Mech).

Shrubs. Leaves with 5 – 9 leaflets; leaflets lanceolate, narrowly acuminate, base attenuate, margins serrate, pubescent beneath. Male panicles 2 – 5 cm long; perianth segments elliptic. Female spikes 2 – 3 cm. Achenes ovoid, pale brown, reticulate.

Flowers & Fruits: June – August.

Exscicattus: Nimati, *Ajita & AP Das 314*, dated 17.04.2008; Nimati, *Ajita & AP Das 460*, dated 20.04.2009.

Local Distribution: Throughout the study area.

General Distribution: Native to Central Asia and naturalized in temperate and tropical world.

MORACEAE Link

ARTOCARPUS Forster

Artocarpus heterophyllus Lamarck, Encyl. Meth. B. 3: 209. 1789; EFPN 3: 208. 1982; FB 1(1): 100. 1983.

Vernacular Name: *Khanthal* (Mech).

Trees. Leaves ovate to elliptic, base cuneate, glabrous; stipules broadly ovate. Male heads club-shaped. Syncarps oblong, surface rough with sharp perianth points formed from the tips of elongated sterile female flowers which surround the achenes, latter enclosed by sweet fleshy perianths.

Flowers & Fruits: February – July.

Exscicattus: Paschim Satali, *Ajita & AP Das 017*, dated 21.08.2004; Nimati, *Ajita & AP Das 244*, dated 06.01.2008; Nimati, *Ajita & AP Das 285*, dated 01.03.2008.

Local Distribution: Throughout the study area.

General Distribution: Native of S.W. India.

Artocarpus chama Buchanan-Hamilton, Mem. Wern. Nat. Hist. Soc. 5: 331. 1826; FB 1(1): 100. 1983.

Artocarpus chaplasha Roxburgh, Fl. Ind. 3: 525. 1832; FBI 5: 543. 1888.

Vernacular Name: *Lator* (Mech).

Trees. Leaves spirally arranged; blade elliptic, oblong, or ovate, base broadly cuneate to rounded. Inflorescences axillary, solitary. Male inflorescences ellipsoid. Female inflorescences globose to ellipsoid. Fruiting syncarp yellow when young. Infructescence ellipsoid.

Flowers & Fruits: June – December.

Exscicattus: Mantharam, *Ajita & AP Das 117*, dated 13.11.2004.

Local Distribution: Mantharam.

General Distribution: Tropical and sub-tropical parts of the world.

Artocarpus lacucha Buchanan- Hamilton in Mem. Wern. Soc. 5: 333, 1826; EFPN 3: 209. 1979; FB 1(1): 100. 1983. *Artocarpus lakoocha* Roxburgh, Fl. Ind. 3: 524. 1832.

Vernacular Name: *Daoo* (Mech).

Trees, up to 40 m, shoots brownish hispid. Leaves elliptic obovate, glabrous and rather glossy above; stipules lateral. Leaves of young plants are shallowly pinnatifid. Infructescence subglobose, 3 – 8 cm, brownish yellow with irregular lobed and smooth.

Flowers & Fruits: February – June.

Exscicattus: Nimati, *Ajita & AP Das 170*, dated 12.11.2005.

Local Distribution: Ghoramara and Nimati.

General Distribution: India, Sri Lanka, Myanmar, Malaysia.

FICUS Linnaeus

Ficus benghalensis Linnaeus, Sp. Pl. 1059. 1753; FBI 5: 499. 1888; EFPN 3: 209. 1982; FB 1(1): 97. 1983.

Vernacular Name: Bhot (Mech).

Wide branching trees to 30 m with numerous aerial roots from branches forming additional props, often epiphytic. Leaves ovate, obtuse or bluntly apiculate, base rounded or subcordate; stipules ovate-lanceolate. Figs subglobose, solitary or in axillary pairs, sessile.

Flowers & Fruits: January – December.

Exsiccatius: Nimati, *Ajita & AP Das 336*, dated 04.06.2008.

Local Distribution: In Duars.

General Distribution: India, Bangladesh, Nepal, Bhutan, Pakistan.

Ficus hispida Linnaeus f., Suppl. 442.1781; FBI 5: 522.1888; EFPN 3: 210. 1982; FB 1(1): 89. 1983.

Vernacular Name: Adumri (Mech).

Trees. Leaves opposite, coriaceous, elliptic, acute, base truncate, hirsute beneath, margins serrulate, veins 7 pairs. Figs many, short racemes in axillary position, globose, subsessile, hirsute; apical scales rounded, prominent.

Flowers & Fruits: Throughout the year.

Exsiccatius: Paschim Satali, *Ajita & AP Das 028*, dated 29.08.2004.

Local Distribution: In Duars.

General Distribution: India, Nepal, Sri Lanka, S. China, Indo-China, Malaysia and Australia.

Ficus religiosa Linnaeus, Sp. Pl. 1059. 1753; FBI 5: 513. 1888; Bernardi in Candollea 18: 270. 1963; FEH 1: 54. 1966; EFPN 3: 211. 1982; FB 1(1): 94. 1983.

Vernacular Name: Asar (Mech).

Tree to 20 m. Leaves more abruptly and longer caudate-acuminate, margins sinuate; petioles slender. Figs smaller, purplish when ripe.

Flowers & Fruits: April – September.

Exsiccatius: Nimati, *Ajita & AP Das 282*, dated 17.02.2008.

Local Distribution: Chhekamari, Latabari, Nimati and Mendabari.

General Distribution: India, Sri Lanka, Bangladesh, Myanmar, Malaysia and China.

MORUS Linnaeus

Morus australis Poirlet in Lamarck, Ency. 4:380.1797; EFPN 3: 212. 1982; FB 1(1): 101. 1983. *Morus indica* auct. non L.: Hook.f., FBI 5:492. 1888.

Vernacular Name: Thaixhong Chhef (Mech).

Small trees. Leaves ovate, caudate-acuminate, base cordate, margin serrate, some leaves deeply 3 – lobed minutely strigose above and pubescent beneath. Flowers appearing with young leaves. Male spikes 2 cm. Female spikes shorter; tepals ovate, succulent in fruit.

Flowers & Fruits: February – May.

Exscicattus: Uttar Mendabari, *Ajita & AP Das 009*, dated 01.08.2004; Ghoramara, *Ajita & AP Das 167*, dated 10.11.2005; Nimati, *Ajita & AP Das 234*, dated 05.12.2007; Dakshin Mendabari, *Ajita & AP Das 457*, dated 08.04.2009.

Local Distribution: Dakshin Mendabari, Ghoramara, Nimati, Uttar Mendabari and Salkumar.

General Distribution: Himalaya (Kumaun to Bhutan), Assam, India, Myanmar, W. China.

STREBLUS Loureiro

Streblus asper Loureiro, Fl. Cochinch. 615. 1790; FBI 5: 489. 1888; FEH 1: 55. 1966; 1967; EFPN 3: 212. 1982; FB 1(1): 102. 1983.

Vernacular Name: *Seora Bingfang* (Mech).

Unarmed evergreen shrub or trees, shoots pubescent at first. Leaves elliptic – obovate, acute, base cuneate, margins sinuate or weakly serrate, scabrid, sessile or petiolate.

Flowers & Fruits: March – December.

Exscicattus: Paschim Satali, *Ajita & AP Das 149*, dated 20.10.2005; Paschim Satali, *Ajita & AP Das 277*, dated 13.02.2008.

Local Distribution: Dhalkar, Ghoramara, Mendabari, Nimati, Paschim Satali, Sibkata, Kokrajhar and Raimana.

General Distribution: Himalaya (Kumaun to Nepal), India, Sri Lanka, S. China, Indo-China and Malaysia.

URTICACEAE A. Jussieu

DENDROCNIDE Miquel

Dendrocnide sinuata (Blume) Chew in Gard. Bull. Singap. 21: 206. 1955 & 25:36. 1969; FB 1(1): 111. 1983. *Urtica sinuata* Blume, Bijdr. 505. 1825.

Vernacular Name: *Khoma Bilai* (Mech).

Tall shrubs. Lamina elliptic or ovate, entire or crenate-sinuate, acute – acuminate, cordate or rounded, sparsely stinging hairy beneath. Flowers greenish; ovary apically beaked.

Flowers & Fruits: May – September.

Exscicattus: Paschim Satali, *Ajita & AP Das 471*, dated 15.05.2009.

Local Distribution: In Duars.

General Distribution: Subtropical Himalaya, India, Sri Lanka, Myanmar, Malaysia.

NYCTAGINACEAE A. Jussieu

BOERHAVIA Linnaeus

Boerhavia coccinea Miller, Gard. Dict., ed. 8. n. 4. 1768; FB 1(2): 194. 1984.

Vernacular Name: *Punarnova* (Mech).

Perennial herb, stems up to 50 cm, diffuse. Leaves opposite, ovate elliptic to broadly ovate, subacute, base cordate, subglabrous, petiole 2 cm. Cymes 3 – 5 flowered, bract minute. Perianth campanulate, purple, fruits 3 mm.

Flowers & Fruits: April – August.

Exsiccatuus: Paschim Satali, *Ajita & AP Das 218*, dated 20.07.2007; Latabari, *Ajita & AP Das 446*, dated 20.01.2009.

Local Distribution: Latabari, Nimati, Ghoramara and Paschim Satali.

General Distribution: Native of tropical America; pantropical.

MIRABILIS Linnaeus

Mirabilis jalapa Linnaeus, Sp. Pl. 177. 1753; EFPN 3: 167. 1982; FB 1(2): 192. 1984.

Vernacular Name: *Mana-bai -ni Bibar* (Mech).

Robust herb. Leaves triangular-ovate, acuminate, base truncate glabrous or sparsely pubescent. Flowers red or white; corolla trumpet-shaped.

Flowers & Fruits: April – November.

Exsiccatuus: Paschim Satali, *Ajita & AP Das 398*, dated 15.10.2008.

Local Distribution: Cultivated.

General Distribution: Native of tropical America; seminaturalised.

AIZOACEAE Rudolphi

GLINUS Linnaeus

Glinus oppositifolius (Linnaeus) A. DC., Bull. Herb. Boiss. 2, 1: 552. 1901. *Mollugo oppositifolia* Linnaeus, Sp. Pl. 89. 1753. *Molluga spergula* Linnaeus, Syst. ed. 10: 881. 1759; FBI 2: 662. 1879.

Vernacular Name: *Ghima Bilai* (Mech).

Prostrate, annual herbs; stem slender, glabrous. Leaves oblanceolate or elliptic-obovate, entire. Flowers in axillary, 2 - 9; tepals 5, white; stamens 5; ovary 3 locular. Capsules oblong; seeds reddish, reniform.

Flowers & Fruits: January – December.

Exsiccatuus: Nimati, *Ajita & AP Das 186*, dated 07.03.2006.

Local Distribution: Chhekamari, Dhalkar, Nimati and Paschim Satali.

General Distribution: Pantropical.

CHENOPODIACEAE Ventenat

CHENOPODIUM Linnaeus

Chenopodium album Linnaeus, Sp. Pl. 219. 1753; FBI 5: 3. 1886; FB 1(2): 217. 1984.

Vernacular Name: *Bothhua* (Mech).

Herbaceous, upto 80 cm. Leaves ovate-deltoid, acute, base cuneate, margin entire, sometimes weakly 3 – lobed. Flower- clusters dense, sessile, slender panicles. Flower bisexual; stamens 5. Seeds black.

Flowers & Fruits: February – June.

Exsicattus: Nimati, *Ajita & AP Das 298*, dated 12.03.2008.

Local Distribution: Throughout the study area.

General Distribution: Tropical America and common in tropics.

AMARANTHACEAE A. Jussieu

ACHYRANTHES Linnaeus

Achyranthes bidentata Blume, Bijdr. 545. 1825; FBI 4: 730. 1885; EFPN 3: 168. 1982; FB 1(2): 227. 1984.

Vernacular Name: *Aran-dandali Bilai* (Mech).

Erect biennial herb; branches long, slender, pubescent. Leaves petiolate opposite, ovate – elliptic, acute, pubescent. Flowers bisexual; tepals ovate-lanceolate, greenish, rigid, persistent.

Flowers & Fruits: August – February.

Exsicattus: Paschim Satali, *Ajita & AP Das 416*, dated 15.11.2008; Ghoramara, *Ajita & AP Das 426*, 25.11.2008.

Local Distribution: Throughout the study area.

General Distribution: Tropical Africa, India, Sri Lanka, China, Malaysia, New Guinea.

ALTERNANTHERA Forsskal

Alternanthea philoxeroides (Martius) Grisebach in Abh. Koen. Ges. Wiss. Goett. Phys. Cl. 24: 36.1825. *Buchozia philoxeroides* Martius, Beitr. Amarantac. 107. 1825 & in Nova Acta Leop. 13: 315.1826.

Vernacular Name: *Chhetchi* (Mech).

Fleshy, prostrate, marshy annual herbs; stem fistular, base creeping; rooting at nodes; internodes long. Lamina linear – oblong or obovate, spatulate, narrowed down into base, entire. Flowers in axillary, solitary, globose pendunculate heads, corolla white; bracts deltoid, ovate; bracteoles ovate, acuminate. Urlicles compressed.

Flowers & Fruits: September – February.

Exsicattus: Nimati, *Ajita & AP Das 243*, dated 06.01.2008.

Local Distribution: Throughout Duars.

General Distribution: Himalayas, India, Myanmar, Indo –China, S. China.

Alternanthera paronychioides St. Hill, Voy. Bres. 2: 439. 1833.

Vernacular Name: *Hagrani Moigong* (Mech).

Prostrate, creeping herbs with profusely branched stems; rooting at nodes. Lamina opposite, oblanceolate-elliptic to spatulate, entire, acute, base narrowed, hairy. Flower in axillary heads; tepals white, pilose on back, 3-nerved.

Flowers & Fruits: January – December.

Exsicattus: Paschim Satali, *Ajita & AP Das 276*, dated 13.02.2008; Ghoramara, *Ajita & AP Das 430*, dated 15.12.2008.

Local Distribution: Paschim Satali, Uttar Mendabari, Dhalkar.

General Distribution: India, a native of tropical America; naturalized in tropics.

Alternanthera sessilis (Linnaeus) R. Brown ex DC., Cat. Hort. Monsp. 4:77. 1813; FBI 4: 731.1885; FB 1(2): 228. 1984. *Gomphrena sessilis* Linnaeus, Sp. Pl. 225. 1753.

Vernacular Name: *Nunni* (Mech).

Prostrate herb, rooting at nodes, often perennial. Leaves elliptic, acute, attenuate at base, sessile, glabrous. Flower clusters sessile, globose, white; tepals all similar. Stamens 5, 3 bearing anthers, basal cup very short, pseudostaminodes minute. Capsules rounded.

Flowers & Fruits: March – August.

Exsiccatuus: Dakshin Mendabari *Ajita & AP Das 254*, dated 10.01.2008; Nimati, *Ajita & AP Das 300*, dated 12.03.2008.

Local Distribution: Throughout the study area.

General Distribution: Himalayas, India, Sri Lanka, Myanmar, Indo –China, S. China and probably pantropic.

AMARANTHUS Linnaeus

Amaranthus lividus Linnaeus, Sp. Pl. 1: 990. 1753; FB 1(2): 224. 1984. *Amaranthus blitum* Linnaeus, Sp. Pl. 1: 990. 1753; FBI 4: 721. 1885.

Vernacular Name: *Khudna* (Mech).

Prostrate or semi erect annual herbs. Leaves broadly ovate, obtuse. Flowers in clusters densely aggregated in to slender spikes. Flowers unisexual, mostly female with a few males above; stamens 3; stigma 3. Capsules distinctly exceeding perianth.

Flowers & Fruits: April – August.

Exsiccatuus: Paschim Satali, *Ajita & AP Das 274*, dated 13.02.2008.

Local Distribution: Throughout the study area.

General Distribution: Himalayas, India, Myanmar, Indo – China, S. China.

Amaranthus spinosus Linnaeus, Sp. Pl. 991.1753; FBI 4:718.1885; FB 1(2): 225. 1984.

Vernacular Name: *Khudna* (Mech).

Erect annual herbs. Leaves ovate-elliptic, acute; axillary spines paired. Flowers in clusters densely aggregated in to slender spikes. Flowers unisexual, mostly female with a few males above; stamens 3; stigma 3, minute; Capsules circumscissile.

Flowers & Fruits: May – September.

Exsiccatuus: Paschim Satali, *Ajita & AP Das 103*, dated 13.11.2004; Baniapara, *Ajita & AP Das 429*, dated 10.12.2008; Sibkata, *Ajita & AP Das 434*, dated 20.12.2008.

Local Distribution: Throughout the study area.

General Distribution: Pantropical.

Amaranthus viridis Linnaeus, Sp. Pl. 2: 1405. 176; FBI 4: 720. 1885; FB 1(2): 224. 1984.

Vernacular Name: *Khudna* (Mech).

Erect annual herbs. Leaves broadly ovate, obtuse. Flowers in clusters densely aggregated in to slender spikes. Flowers unisexual, mostly female with a few males above.

Flowers & Fruits: April – June.

Exsciccattus: Paschim Satali, *Ajita & AP Das 275*, dated 13.02.2008; Baniapara, *Ajita & AP Das 428*, dated 10.12.2008.

Local Distribution: Throughout the area.

General Distribution: Pantropical.

DEERINGIA R. Brown

Deeringia amaranthoides (Lamarck) Merrill, Interpr. Rumph. Herb. Amboin. 211. 1917; FEH 1: 78. 1966; EFPN 3:169.1982; FB 1(2): 221. 1984. *Achyranthes amaranthoides* Lamarck, Encycl. Meth. B. 1: 548. 1785.

Vernacular Name: *Maibet* (Mech).

Climbers. Leaves opposite, ovate, acuminate, base rounded, puberulous beneath. Spikes 10 – 20 cm; flowers bisexual. Perianth segments 5, concave. Stamens 5, anthers 2 – celled. Ovaries subglobose, stigmas 3, linear. Berries subglobose, red.

Flowers & Fruits: August – February.

Exsciccattus: Paschim Satali, *Ajita & AP Das 085*, dated 05.10.2004; Baniapara, *Ajita & AP Das 427*, 10.12.2008.

Local Distribution: In Duars.

General Distribution: India, China, Australia.

PUPALIA Adanson *mut.* A. Jussieu

Pupalia lappacea (Linnaeus) A. Jussieu in Ann. Mus. Hist. Nat. Paris 2: 132. 1803 ; FBI 4 : 724. 1885. *Achyranthes lappacea* Linnaeus, Sp. Pl. 204. 1753.

Vernacular Name: *Samultha* (Mech).

Straggling tomentose plant. Leaves opposite, petiole short, ovate, entire. Flowers green.

Flowers & Fruits: September – January.

Exsciccattus: Dakshin Mendabari, *Ajita & AP Das 351*, dated 10.07.2008.

Local Distribution: Throughout the study area.

General Distribution: Tropical parts of India, Nepal, Sri Lanka, South Africa and Philippines.

PORTULACACEAE A. Jussieu

PORTULACA Linnaeus

Portulaca oleracea Linnaeus, Sp. Pl. 1: 445. 1753; FBI 1: 246. 1874; FEH 1: 79. 1966; FB 1(2): 196. 1984; FI 3: 4. 1993.

Vernacular Name: *Hangsaramai* (Mech).

Prostrate succulent, glabrous herbs, swollen at nodes. Leaves cuneiform, fleshy, Stipule hairy. Flowers sessile, in cluster, yellow; stamens 5 – 12; ovaries ovoid, unilocular. Capsules ovoid, many seeded.

Flowers & Fruits: July – October.

Exsciccattus: Paschim Satali, *Ajita & AP Das 456*, dated 30.03.2009.

Local Distribution: Throughout the study area.

General Distribution: Pantropical.

CARYOPHYLLACEAE A. Jussieu

DRYMARIA Schultes

Drymaria cordata (Linnaeus) Willdenow ex Roemer & Schultes, Syst. Veg. 5: 406.1819; FBI 1:244.1874; FB 1(2): 215.1984. *Holosteum cordatum* Linnaeus, Sp. Pl. 88. 1753. *Drymaria diandra* Blume, Bijdr. 62. 1825; FI 2:533. 1993.

Vernacular Name: Barmadaree (Mech).

Stems elongate, rooting at nodes. Leaves broadly ovate or suborbicular, acute or obtuse, mucronate, base rounded, glabrous; stipules lacerate into 1 – 2 mm filaments. Flowers broadest above middle. Sepals elliptic – ovate, 3-veined, inflexed, glandular-papillose on veins. Petals white. Seeds finely tuberculate.

Flowers & Fruits: May – July.

Exsiccatuus: Paschim Satali, *Ajita & AP Das 004*, dated 04.07.2004; Baniapara, *Ajita & AP Das 095*, dated 09.10.2004; Paschim Satali, *Ajita & AP Das 146*, dated 01.10.2005;

Local Distribution: Throughout the study area.

General Distribution: India; Tropical and Subtropical Asia, Formosa, W. & S. China, Oceania, Hawaii.

POLYCARPON Linnaeus

Polycarpon prostratum (Forsskål) Ascherson & Schwein-furth in Ascherson, Oesterr. Bot. Z. 39: 128. 1889; FI 2: 553. 1993; FB 1(2): 216. 1984. *Alsine prostrata* Forsskål, Fl. Aegypt.-Arab. 207. 1775.

Vernacular Name: Hagrani Bilai (Mech).

Annual herbs. Stems prostrate or ascending. Leaf blade obovate to spatulate, glabrous, base attenuate, apex acute. Cymes often axillary. Pedicels short. Sepals lanceolate. Petals oblong, entire. Capsules ovoid.

Flowers & Fruits: February – June.

Exsiccatuus: Dakshin Mendabari, *Ajita & AP Das 261*, dated 18.01.2008.

Local Distribution: Throughout the study area.

General Distribution: Tropical regions of Asia and Africa.

STELLARIA Linnaeus

Stellaria wallichiana Bentham ex Haines in Bull. Misc. Inf. Kew 1920: 66. 1920; FI 2: 591. 1993.

Vernacular Name: Daubibu (Mech).

Decumbent or prostrate, annual herbs. Lamina flat, entire, simple. Inflorescence cymose. Flower actinomorphic; corolla white, bisexual; sepals 5, petals 5, stamens hypogynous. Fruits capsule; seeds compressed, embryo annular.

Flowers & Fruits: January – May.

Exsiccatuus: Nimati, *Ajita & AP Das 299*, dated 12.03.2008.

Local Distribution: In Duars.

General Distribution: Himalayas, India, Myanmar, Indo-China, S. China.

POLYGONACEAE A. Jussieu

PERSICARIA Linnaeus

Persicaria chinensis (Linnaeus) H. Gross, Bot. Jahrb. 49: 269. 1913; EFPN 3: 175. 1982; FB 1(1): 163. 1983. *Polygonum chinense* Linnaeus, Sp. Pl. 1: 363. 1753.

Vernacular Name: Futkol (Mech).

Perennial herbs. Rhizomes stout. Stems erect. Leaf blade ovate to elliptic-lanceolate, base truncate to broadly cordate, margin entire, apex shortly acuminate, glabrous, apex oblique. Inflorescence terminal or axillary. Perianth white or pinkish; tepals ovate, accrescent in fruit, becoming blue-black, fleshy. Achenes black, broadly ovoid, trigonous.

Flowers & Fruits: July – December.

Exsiccatu: Ghoramara, *Ajita & AP Das 217*, dated 14.06.2007; Paschim Satali, *Ajita & AP Das 278*, dated 13.02.2008.

Local Distribution: Throughout the study area.

General Distribution: Bhutan, India, Indonesia, Japan, Malaysia, Myanmar, Nepal, Philippines, Sikkim, Thailand, Vietnam.

Persicaria hydropiper (Linnaeus) Spach, Hist. Veg. 10: 536. 1841; FEH 2: 23. 1971; FB 1(1):162. 1983.

Polygonum hydropiper Linnaeus, Sp. Pl. 1: 361. 1753; FBI 5: 39. 1886.

Vernacular Name: Hatitika (Mech).

Erect or decumbent, bushy, glabrous, marshy herbs. Lamina sub sessile, oblong-lanceolate, glabrous, stipule glabrous with short ciliate. Racemes filiform, decurved, perianth glandular, pink.

Flowers & Fruits: May – December.

Exsiccatu: Nimati, *Ajita & AP Das 124*, dated 02.02.2005; Dakshin Mendabari, *Ajita & AP Das 266*, dated: 24.01.2008.

Local Distribution: Throughout the study area.

General Distribution: India (Plains and wet places), Europe and N. Africa.

POLYGONUM Linnaeus

Polygonum plebeium R. Brown, Prodr. 420. 1810; FBI 5: 27. 1886; FB 1(1): 170. 1983.

Vernacular Name: Daunasi (Mech).

Annual, prostrate, diffusely branched herbs. Stem grooved. Lamina sub sessile, ovate-lanceolate. Stipules hyaline, short, lacerate with fimbriate nerve. Perianth white or pink; petiole short. Nuts rhomboid, trigonous, shining.

Flowers & Fruits: January – May.

Exsiccatu: Nimati, *Ajita & AP Das 119*, dated 02.02.2005; Latabari, *Ajita & AP Das 267*, 25.01.2008.

Local Distribution: Latabari, Mantharam and Nimati.

General Distribution: India (Tropical part), Tropical and Sub Tropical Asia, Africa and Australia.

PLUMBAGINACEAE A. Jussieu

PLUMBAGO Linnaeus

Plumbago zeylanica Linnaeus, Sp. Pl. 1: 151. 1753; FBI 3: 480. 1882; FEH 249. 1966; EFPN 3: 61. 1982; FB 2(2): 570. 1999.

Vernacular Name: Emao (Mech).

Scrambling bushy shrubs. Leaves ovate, acute, margins entire, base attenuate, glabrous. Petioles narrowly winged above, broadly auriculate at base. Racemes many-flowered, glandular. Corolla white. Capsules ellipsoid.

Flowers & Fruits: September – February.

Exsicattus: Paschim Satali, *Ajita & AP Das 015*, dated 21.08.2004; Nimati, *Ajita & AP Das 231*, dated 05.12.2007; Paschim Satali, *Ajita & AP Das 368*, dated 13.07.2008.

Local Distribution: Latabari, Nimati, Dakshin Mendabari, Paschim Satali and Salkumar.

General Distribution: Pantropical.

DILLENACEAE Salisbury

DILLENIA Linnaeus

Dillenia indica Linnaeus, Sp. Pl. 1: 535. 1753; FBI 1: 36. 1872; FI 1: 155. 1993; FB 1(2): 355. 1984.

Vernacular Name: Thaidig (Mech).

Tree; trunk straight, branches spreading. Leaves fascicled at the end of the branches, lamina oblong, dentate, acute-acuminate, base attenuate, glabrous above, strigose mainly on nerves beneath. Flowers solitary, pendulous; sepals 5, orbicular; petals 5, white, obovate. Fruits enclosed in succulent sepals, yellowish green.

Flowers & Fruits: May – February.

Exsicattus: Paschim Satali, *Ajita & AP Das 022*, dated 29.08.2004.

Local Distribution: Throughout the study area.

General Distribution: Tropical and sub-tropical regions of Asia.

Dillenia pentagyna Roxburgh, Pl. Corom. 1: 21. t. 20. 1795; FBI 1: 38. 1872; FI 1: 156. 1993; FB 1(2): 355. 1984.

Vernacular Name: Rae Bingsfang (Mech).

Trees, deciduous. Leaves simple, alternate, obovate, obtuse, base cuneate, margin serrate; exstipulate. Flowers actinomorphic, bisexual. Sepals 5, imbricate, persistent. Petals free, imbricate, deciduous. Stamens in 2 series, the outer numerous. Carpels 5, oblong. Pseudocarps orange on ripening.

Flowers & Fruits: March – April.

Exsicattus: Nimati, *Ajita & AP Das 312*, dated 17.04.2008; Sibkata, *Ajita & AP Das 362*, dated 12.07.2008.

Local Distribution: Nimati, Paschim Satali and Sibkata.

General Distribution: India, Myanmar, China, Vietnam, Thailand, Java, Celebes and Lesser Sunda Islands.

DIPTEROCARPACEAE Blume

SHOREA Roxburgh

Shorea robusta Roxburgh ex Gaertner f., Suppl. Carp. 3: 48.t. 186. 1805; FBI 1: 306. 1874; FB 1(2): 361. 1984.

Vernacular Name: *Sal-dom-phang* (Mech).

Trees. Stipules fugacious, lanceolate; leaf blade ovate to oblong, thinly leathery, midvein prominent abaxially and conspicuous adaxially, glabrous, base obtuse to cordate, apex acuminate. Flowers subsessile, minute. Fruit sepals unequal, spatulate.

Flowers & Fruits: February– July.

Exsiccatus: Paschim Satali, *Ajita & AP Das 029*, dated 29.08.2004; Gossaigaon, *Ajita & AP Das 391*, dated 20.08.2008.

Local Distribution: Ghoramara, Mendabari, Nimati and Paschim Satali.

General Distribution: Tropical and sub-tropical parts of the world.

HYPERICACEAE A. Jussieu

HYPERICUM Linnaeus

Hypericum japonicum Murray, Syst. Veg. ed. 14: 702. 1784; FBI 1: 256.1874; EFPN 2: 62. 1979; FI 3: 69. 1993; FB 1(2): 376. 1984.

Vernacular Name: *Sona Bingsfang* (Mech).

Suberect or diffuse, sometimes prostrate herb, stems quadrangular, branches dichotomous. Leaves sessile, lamina elliptic-ovate or oblanceolate, obtuse or rounded, cordate. Flowers in terminal dichotomous often broad cymes; sepals elliptic-obovate, acute or sub obtuse; petals yellow. Capsules ovoid.

Flowers: Almost throughout the year; **Fruits:** November – February.

Exsiccatus: Paschim Satali, *Ajita & AP Das 005*, dated 04.07.2004; Dakshin Mendabari, *Ajita & AP Das 056*, dated 01.10.2004; Dakshin Mendabari, *Ajita & AP Das 108*, dated 11.11.2004; Uttar Mendabari, *Ajita & AP Das 174*, dated 13.11.2005; Chhekamari, *Ajita & AP Das 355*, dated 10.07.2008.

Local Distribution: Throughout the study area.

General Distribution: India (chiefly in Himalayas), Sri Lanka, Nepal, Bhutan, Bangladesh, Myanmar, China, Taiwan, Vietnam.

ELAEOCARPACEAE DC.

ELAEOCARPUS Linnaeus

Elaeocarpus floribundus Blume, Bijdr. 120. 1825; FBI 1: 401. 1874; FB 2(1): 170. 1991. *Elaeocarpus rigidus* Ridley in J. Asiat. Soc. Str. Settl. 54:28, 1910. *Elaeocarpus ramsoii* Kunth in Feddes Repert. 44: 131. 1938.

Vernacular Name: *Jalpoi* (Mech).

Trees upto 20 m high. Lamina ovate to elliptic-ovate, acute to acuminate, base cuneate or rounded, glabrous, glandular-punctate beneath. Racemes 20 – 25-flowered. Sepals lanceolate, glabrescent or thinly appressed hairy. Petals white, obtriangular, hairy on margins only. Ovaries 3-celled. Fruits ellipsoid-obovoid.

Flowers & Fruits: March – December.

Exscicattus: Paschim Satali, *Ajita & AP Das 040*, dated 05.09.2004.

Local Distribution: Mantharam, Nimati, Paschim Satali, Salkumar and Sibkata.

General Distribution: India, Bangladesh, Bhutan, Myanmar, Malaysia and Indonesia.

TILIACEAE A. Jussieu

CORCHORUS Linnaeus

Corchorus capsularis Linnaeus, Sp. Pl. 1: 529. 1753; FBI 1: 397. 1874; EFPN 2: 71. 1979; FB 2(1): 172. 1991.

Vernacular Name: *Phatto* (Mech).

Tall herbs. Petiole puberulent; leaf blade ovate-lanceolate, base rounded, margin coarsely serrate, apex acuminate. Flowers solitary or several arranged in cymes, axillary. Capsules globose, obtusely angled.

Flowers & Fruits: March – June.

Exscicattus: Dakshin Mendabari, *Ajita & AP Das 258*, dated 18.01.2008; Ghoramara, *Ajita & AP Das 294*, dated 10.03.2008; Nimati, *Ajita & AP Das 349*, dated 02.07.2008; Gossaigaon, *Ajita & AP Das 387*, dated 20.08.2008; Ghoramara, *Ajita & AP Das 423*, dated 25.11.2008.

Local Distribution: Locally cultivated.

General Distribution: Tropical and sub-tropical parts of the world.

GREWIA Linnaeus

Grewia asiatica Linnaeus, Mant. Pl. 122. 1767; FBI 1: 386. 1874, excl. var. *vestita*; FI 3: 494. 1993; FB 2(1): 177. 1991.

Vernacular Name: *Phalasa Fithai* (Mech).

Small trees. Leaves broadly ovate or suborbicular, obliquely cordate or rounded at base, acute or acuminate at apex, scabrous above, tomentose beneath. Flowers in axillary, umbellate cymes, oblong-obovoid, ribbed, tomentose. Sepals oblong – lanceolate or oblanceolate, tomentose. Petals yellow, obtuse. Drupes subglobose, red or purple.

Flowers & Fruits: November – September.

Exscicattus: Paschim Satali, *Ajita & AP Das 470*, dated 15.05.2009.

Local Distribution: Nimati and Paschim Satali.

General Distribution: India, Bangladesh and Sri Lanka.

Grewia serrulata DC., Prodr. 1: 510. 1824; FI 3: 509. 1993; FB 2(1): 178. 1991.

Vernacular Name: *Hagrani Fithai* (Mech).

Small climbing trees. Branchlets densely brown stellate. Petiole densely yellow stellate; leaf blade ovate to ovate-oblong, leathery, stellate, base rounded, margin densely serrulate, apex acute. Cymes solitary in leaf axils. Drupes 4 lobed, drupelets coarsely hairy to stellate tomentose.

Flowers & Fruits: June – December.

Exscicattus: Nimati, *Ajita & AP Das 168*, dated 12.11.2005.

Local Distribution: Nimati.

General Distribution: Cambodia, India, Indonesia (Java), Laos, Malaysia, Myanmar, Thailand, Vietnam.

STERCULIACEAE Ventenat

AMBROMA Linnaeus f.

Ambroma augusta Linnaeus f., Suppl. Pl. 341. 1782; FB 2(1): 206. 1991.

Vernacular Name: Ulat Khambal (Mech).

Shrubs. Leaves ovate-suborbicular unlobed or shallowly 3 – 5 lobed, margins distantly serrulate, petiole long. Flowers pendent, purplish brown. Capsule obovoid, 5 winged.

Flowers & Fruits: June – January.

Exsiccatu: Chhekamari, *Ajita & AP Das 320*, dated 27.04.2008.

Local Distribution: Chhekamari and Dakshin Mendabari.

General Distribution: India, Nepal, Bhutan, China, Malaysia.

HELICTERES Linnaeus

Helicteres isora Linnaeus, Sp. Pl. 963. 1753; FBI 1: 365. 1874; FI 3: 426. 1993.

Vernacular Name: Bismoura (Mech).

Shrubs, stellately tomentose. Lamina oblong – obovate, crenate-serrate, acute-acuminate, base cordate stellately pubescent beneath. Flowers in axillary peduncles; calyx oblique stellate; petals red, reflexing. Fruits ribbed, spirally twisted, grayish.

Flowers & Fruits: April – January.

Exsiccatu: Chhekamari, *Ajita & AP Das 350*, dated 10.07.2008.

General Distribution: India, Sri Lanka, Java, North Australia.

STERCULIA Linnaeus

Sterculia villosa Roxburgh, Fl. Ind., ed. 1832, 3: 153. 1832; FBI 1: 355. 1874; FB 2(1): 199. 1991.

Vernacular Name: Odlā (Mech).

Trees. Leaves simple; stipules lanceolate, base broadly cordate, central lobe broadly ovate, apex caudate. Inflorescence subterminal on branchlets. Calyx yellow, campanulate; style curved downward, ovary globose. Follicles narrowly ellipsoid.

Flowers & Fruits: February – October.

Exsiccatu: Paschim Satali, *Ajita & AP Das 045*, dated 15.09.2004; Sibkata, *Ajita & AP Das 435*, dated 20.12.2008.

Local Distribution: Paschim Satali and Sibkata.

General Distribution: Tropical and sub-tropical parts of the world.

BOMBACACEAE Kunth

BOMBAX Linnaeus

Bombax ceiba Linnaeus, Sp. Pl. 1: 511. 1753; FI 3: 398. 1993; FB 2(1): 195. 1991.

Vernacular Name: Simul Bingfang (Mech).

Trees. Stipules minute; blades oblong to oblong-lanceolate. Flowers solitary, terminal. Calyx cup-shaped, green. Petals usually red, thick. Stamens shortly united at base. Style 4 – 6 mm. Capsules ellipsoid. Seeds many, obovate, smooth.

Flowers & Fruits: March – April.

Exsicattus: Uttar Mendabari, *Ajita & AP Das 099*, dated 05.11.2004; Nimati, *Ajita & AP Das 443*, dated 03.01.2009.

Local Distribution: Uttar Mendabari, Nimati and Sibkata.

General Distribution: Tropical and sub-tropical parts of the world.

MALVACEAE A. Jussieu

GOSSYPIUM Linnaeus

Gossypium arboreum Linnaeus, Sp. Pl. 693. 1753; FBI 1: 347. 1874; FB 2(1): 186. 1991.

Vernacular Name: *Kshun Phang* (Mech).

Shrubs. Lamina ovate-orbicular, base cordate, 3, 5 or 7 lobed; stipules linear – lanceolate. Flowers solitary, axillary; calyx copular, 5 – dentate; corolla light yellow with dark purple centre. Seeds 5 – 11 per locule with white floss.

Flowers & Fruits: October – May.

Exsicattus: Ghoramara, *Ajita & AP Das 458*, dated 15.04.2009.

Local Distribution: Ghoramara and Khoardanga.

General Distribution: Tropical and sub-tropical parts of the world.

HIBISCUS Linnaeus

Hibiscus rosa-sinensis Linnaeus, Sp. Pl. 694. 1753; FBI 1: 334. 1874; FEH 1: 204. 1966; EFPN 2: 67. 1979; FI 3: 391. 1993; FB 2(1): 182. 1991.

Vernacular Name: *Java, Panchhomukhi Jhova* (Mech).

Perennial, erect, glabrous shrubs. Leaves ovate to ovate-lanceolate; regularly serrate, acute, base rounded. Flowers solitary, axillary. Epicalyx segments 5 – 10, lanceolate. Calyx campanulate. Petals obovate, red.

Flowers & Fruits: Throughout the year.

Exsicattus: Chhekamari, *Ajita & AP Das 214*, dated 01.01.2007; Chhekamari, *Ajita & AP Das 225*, dated 26.08.2007; Paschim Satali, *Ajita & AP Das 397*, dated 05.09.2008; Mondalpara, *Ajita & AP Das 405*, dated 28.10.2008.

Local Distribution: Throughout Duars.

General Distribution: India: Tropical India; possibly Eastern African origin. Widely cultivated throughout the tropics and subtropics.

Hibiscus sabdariffa Linnaeus, Sp. Pl. 695. 1753; FBI 1: 340. 1874; FEH 1: 204. 1966; EFPN 2: 67. 1979; FI 3: 391. 1993; FB 2(1): 182. 1991.

Vernacular Name: *Mistha Bingfang* (Mech).

Annual. Leaves polymorphic, palmately 3 – 5 lobed, lobes lanceolate, ovate or oblong. Flowers solitary, axillary or in raceme by reduction of the upper leaves. Calyx cup-shaped, fleshy after flowering. Petals yellow with purple base. Staminial column shorter than petals.

Flowers & Fruits: October – January.

Exscicattus: Nimati, *Ajita & AP Das 249*, dated 10.01.2008.

Local Distribution: Cultivated in Latabari, Nimati and Paschim Satali.

General Distribution: India: tropical India; cultivated in the tropics.

MALVAVISCUS Adanson

Malvaviscus arboreus Cavanilles, Diss. 3: 13, t. 48. f. 1. 1787; FEH 1: 205. 1966; EFPN 2: 68. 1979; FI 3: 393. 1993; FB 2(1): 194. 1991. *Hibiscus malvaviscus* Linnaeus, Sp. Pl. 694. 1753.

Vernacular Name: *Banjut Java* (Mech).

Erect, perennial shrubs. Leaves ovate to broadly ovate, acute, base rounded or cordate, margin serrate, thinly pubescent. Epicalyx segments 5 – 10, linear-oblong. Petals scarlet.

Flowers & Fruits: Throughout the year.

Exscicattus: Paschim Satali, *Ajita & AP Das 396*, dated 05.09.2008; Mondalpara, *Ajita & AP Das 401*, dated 28.10.2008.

Local Distribution: Cultivated.

General Distribution: Cultivated throughout in India; Native in tropical America.

SIDA Linnaeus

Sida acuta Burman f., Fl. Ind. 147. 1768; FI 3: 281. 1993; FB 2(1): 192. 1991. *Sida carpinifolia sensu* Masters in FBI 1: 323. 1874 (*non* L.f. 1781).

Vernacular Name: *Bamonmara* (Mech).

Erect under shrubs, branched throughout, shoots thinly stellate-pubescent becoming glabrous. Leaves narrowly lanceolate to lanceolate, acute, base cuneate, rarely rounded, margin serrate, glabrescent, stipules of each pair unequal, filiform to linear-lanceolate. Flowers axillary, solitary or 2 – 5 flowered. Petals yellow, obovate.

Flowers & Fruits: September – May.

Exscicattus: Baniapara, *Ajita & AP Das 065*, dated 01.10.2004.

Local Distribution: Throughout the study area.

General Distribution: Pantropical.

Sida cordifolia Linnaeus, Sp. Pl. 684. 1753; FBI 1: 324. 1874; FEH 1: 205. 1966; EFPN 2: 68. 1979; FB 2(1): 192. 1991; FI 3: 285. 1993.

Vernacular Name: *Bamonmara* (Mech).

Erect, under shrubs. Leaves ovate to oblong or orbicular; crenate serrate; obtuse or acute; shallowly cordate at base. Flowers axillary, solitary or 2 – 5 in clusters. Corolla yellow or cream yellow, petals obliquely obovate, truncate at apex; ciliate at base. Staminal column simple hairy or glabrous.

Flowers & Fruits: Throughout the year.

Exscicattus: Paschim Satali, *Ajita & AP Das 336*, dated 13.07.2008.

Local Distribution: Throughout the study area.

General Distribution: India (throughout the dry waste places); pantropical.

LECYTHIDACEAE Poiteau

BARRINGTONIA J.R. & G. Forst., *nom. cons.*

Barringtonia acutangula (Linnaeus) Gaertner, Fruct. 2: 97. 1791; FBI 2: 508. 1879. *Eugenia acutangula* Linnaeus, Sp. Pl. 471. 1753.

Vernacular Name: Hijol Bingfang (Mech).

Trees. Leaves alternate; lamina obovate or oblanceolate, obscurely denticulate, rounded, obtuse or acute, base cuneate. Racemes long, drooping, many-flowered. Sepals 4, oblong, connate below; petals 4, elliptic, obtuse, pink. Fruits 4 – angled, 1 – seeded.

Flowers & Fruits: May – December.

Exsicattus: Nimati, *Ajita & AP Das 265*, dated 22.01.2008.

Local Distribution: Nimati.

General Distribution: India, Sri Lanka, Myanmar, Bangladesh, Australia.

CAREYA Roxburgh, *nom.cons.*

Careya arborea Roxburgh, Pl. Corom. 3: 14, t.218. 1819; FBI 2:511. 1879; FB 2(1): 290. 1991.

Vernacular Name: Khoom Bingfang (Mech).

Deciduous trees; fibrous bark. Leaves clustered towards apex of branchlets; lamina obovate, crenate-denticulate to entire, shortly acuminate, base cuneate. Flowers sessile, in terminal cymes; calyx campanulate, lobes 4; petals 4, white. Berries globose, green, many-seeded.

Flowers & Fruits: April – July.

Exsicattus: Chhekamari, *Ajita & AP Das 224*, dated 26.08.2007; Paschim Satali, *Ajita & AP Das 440*, dated 30.12.2008.

Local Distribution: Chhekamari and Paschim Satali.

General Distribution: India, Sri Lanka, Bangladesh, Pakistan.

FLACOURTIACEAE DC.

CASEARIA Jacquin

Casearia graveolens Dalzell in Hooker, Kew J. 4: 107. 1852; FBI 2: 592. 1879; EFPN 2: 48. 1979; FI 2: 394. 1993; FB 2(1): 220. 1991.

Vernacular Name: Guti Fithai (Mech).

Shrub or tree. Leaves broadly elliptic, usually shortly acuminate, base usually truncate, margin obscurely crenate-serrate. Flowers green; pedicels glabrous above articulation near base. Calyx hairy or glabrous above, lobes deflexed. Fruit trigonous – ellipsoid, fleshy but firm, orange.

Flowers & fruits: March – July.

Exsicattus: Nimati, *Ajita & AP Das 469*, dated 11.05.2009.

Local Distribution: Latabari, Nimati, Paschim Satali and Sibkata.

General Distribution: India, Nepal, Bhutan, Bangladesh, China, Thailand.

FLACOURTIA Heritier

Flacourtia jangomas (Loureiro) Raeuschel, Nom. Bot. ed. 3: 290. 1797; EFPN 2: 49. 1979; FI 2: 405. 1993; FB 2(1): 219. 1991. *Flacourtia jangomas* Loureiro, Fl. Cochinch. 2: 634. 1790. *Flacourtia cataphracta* Roxburgh ex Willdenow, Sp. Pl. 4: 830. 1806; FBI 1: 193. 1872.

Vernacular Name: Dongkhur (Mech).

Trees, deciduous. Leaves ovate to ovate-lanceolate, cuneate to rounded, obtusely acuminate at apex, glabrous above, minutely puberulent along midrib beneath. Flowers greenish white; sepals subequal, broadly ovate. In male flowers stamens numerous; filaments glabrous. In female ovary flask-shaped to subglobose. Berries subglobose, dark red when ripe.

Flowers & Fruits: March – October.

Exsicattus: Nimati, *Ajita & AP Das 284*, dated 01.03.2008.

Local Distribution: Nimati.

General Distribution: India; widely cultivated in S.E. Asia and E. Africa.

CARICACEAE Dumitriu

CARICA Linnaeus

Carica papaya Linnaeus, Sp. Pl. 1036. 1753; FBI 2: 599. 1879; FB 2(1): 236. 1991.

Vernacular Name: Thul-mul (Mech).

Shurbs. Leaves ovate or orbicular in outline, deeply palmately divided into 7 – 9 sharp tooth, pinnatifid lobes. Flowers fragrant; panicles 30 – 40 cm, lobes spreading. Female flowers on peduncles; petals lanceolate. Fruit yellow when ripe, ellipsoid or narrowly obovoid, flesh thick, orange. Seeds ellipsoid, black, wrinkled.

Flowers & Fruits: January – December.

Exsicattus: Nimati, *Ajita & AP Das 475*, dated 24.05.2009.

Local Distribution: Cultivated in study area.

General Distribution: A native of West Indies; widely cultivated in warmer areas.

CUCURBITACEAE A. Jussieu

CITRULLUS Schrader (*nom.cons.*)

Citrullus lanatus (Thunberg) Matsumura & Nakai in Cat. Sem. Spor. Hort. Bot. Univ. Imp. Tokyo 30: no. 854. 1916; EFPN 2: 177. 1979. *Momordica lanata* Thunberg, Prodr. Fl. Cap. 13. 1800.

Vernacular Name: Gumbri (Mech).

Annual climbers. Stem and branches villous. Tendrils puberulent, 2 – fid. Petiole densely pubescent; leaf blade triangulate – ovate, white – green, both surfaces hispid, 3 – partite, apex acute to acuminate, base cordate. Flowers monoecious, solitary. Fruits globose to oblong, smooth. Seeds numerous, ovate.

Flowers & Fruits: April – October.

Exsicattus: Paschim Satali, *Ajita & AP Das 204*, dated 11.06.2006.

Local Distribution: Paschim Satali.

General Distribution: Native to S Africa; cultivated in all warmer areas of the world; Tropical and subtropical parts of the world.

COCCINIA Wight & Arnott

Coccinia grandis (Linnaeus) Voigt, Hort. Suburb. Calcutt. 59. 1845; EFPN 2: 177. 1979. *Bryonia grandis* Linnaeus, Mant. Pl. 126. 1767.

Vernacular Name: Kundri (Mech).

Climbing herbs. Tendrils filiform, glabrous, simple. Leaf blade broadly cordate, apex obtuse, base with several glands. Flowers dioecious, solitary. Fruits fusiform. Seeds yellow.

Flowers & Fruits: January – December.

Exsiccatus: Nimati, *Ajita & AP Das 123*, dated 02.02.2005.

Local Distribution: Chhekamari, Latabari, Mantharam, Nimati, Paschim Satali and Sibkata.

General Distribution: Tropical and sub-tropical parts of the world.

CUCUMIS Linnaeus

Cucumis sativus Linnaeus, Sp. Pl. 1012. 1753; FBI 2: 620. 1879; FEH 322. 1966; EFPN 2: 178. 1979; FB 2(1): 259. 1991.

Vernacular Name: **Gumbri** (Mech).

Climbers; stems angular; tendrils slender, simple. Leaf blade ovate-cordate, membranous, margin 3 – 5 - angular or lobed; lobes triangular, apex acute or acuminate. Male flowers fasciculate; pedicle filiform, pubescent; calyx tube campanulate; corolla yellow – white. Female flowers solitary or fascicled; pedicles pubescent; ovary fusiform.

Flowers & Fruits: March – September.

Exsiccatus: Gossaigaon, *Ajita & AP Das 388*, dated 20.08.2008.

Local Distribution: Cultivated.

General Distribution: Cultivated in all tropical and temperate countries.

CUCURBITA Linnaeus

Cucurbita maxima Duchesne, Essai Hist. Nat. Courges. 7: 12. 1786; EFPN 2: 178. 1979.

Vernacular Name: **Kalkou, Kombra, Maklau** (Mech).

Climbers. Stem robust, white setose. Petiole 15 – 20 cm, densely setose. Male blade reniform or orbicular – reniform, both surfaces setose. Male pedicel puberulent; calx tube campanulate; segments linear – lanceolate, densely white setose; corolla tubular; segments reflexed, ovate-orbicular, margin rugose, apex obtuse; stamens 3; filaments connivent. Ovary ovoid. Seeds compressed.

Flowers & Fruits: April – November.

Exsiccatus: Paschim Satali, *Ajita & AP Das 481*, dated 28.05.2009.

Local Distribution: Cultivated in study area.

General Distribution: Native to S. America; cultivated in tropical and temperate regions.

DIPLOCYCLOS (Endlicher) Post & Kuntze

Diplocyclos palmatus (Linnaeus) Jeffrey in Kew Bull. 15: 352. 1962 ; FB 2(1): 255. 1991. *Bryonia palmata* Linnaeus, Sp. Pl. 1012. 1753, excl. syn. *Bryonia laciniosa* Linnaeus, Sp. Pl. 1013. 1753.

Vernacular Name: **Gumbri** (Mech).

Tuberous monoecious climbing herbs; stems slender, tendrils 2 – fid. Lamina deeply plamately 5 – lobed, denticulate or undulate, upper surface scabrous, lower smooth. In male flowers corolla campanulate, greenish-yellow, shortly papillose. Female flowers fasciculate, ovary globose. Fruits spherical, green; seeds grey.

Flowers & Fruits: April – December.

Exsiccatus: Nimati, *Ajita & AP Das 163*, dated 08.11.2005.

Local Distribution: Nimati.

General Distribution: Tropical and sub-tropical parts of India, Sri Lanka, Myanmar, Bangladesh, Pakistan, Malaysia, China, Africa, Australia.

LUFFA Miller

Luffa aegyptiaca Miller, Gard. Dict. ed. 8, 4: 500. 1785; FBI 2: 614. 1879; FB 2(1): 256. 1991.

Vernacular Name: *Falla* (Mech).

Climbers with glabrous stems; tendrils trifid. Lamina palmately 5 – lobed. Male and female flowers often in same axil. In male flowers calyx-tube short; corolla yellow. In female flowers ovary cylindrical. Fruits ellipsoid – cylindrical, smooth; seeds black, ellipsoid.

Flowers & Fruits: June – December.

Exsiccatu: Nimati, *Ajita & AP Das 412*, dated 05.11.2008.

Local Distribution: Throughout the study area.

General Distribution: Tropics of the Old World; cultivated in warm countries.

MOMORDICA Linnaeus

Momordica charantia Linnaeus, Sp. Pl. ed. 1: 1009. 1753; FBI 2: 616.1879; FB 2(1): 252. 1991.

Vernacular Name: *Udasi* (Mech).

Annual scandent. Leaf blade ovate-reniform, membranous, margin crenate or irregularly lobed, apex obtuse or acute, sinus semicircular, nerves palmate. Flowers monoecious. Fruits fusiform or cylindrical. Seeds numerous, oblong.

Flowers & Fruits: May – October.

Exsiccatu: Latabari, *Ajita & AP Das 096*, dated 11.10.2004; Nimati, *Ajita & AP Das 228*, dated 10.09.2007.

Local Distribution: Latabari, Mendabari, Nimati, Paschim Satali and Sibkata.

General Distribution: Tropical and sub-tropical parts of the world.

Momordica dioica Roxburgh ex Willdenow, Sp. Pl. 4:605. 1805; FB 2(1): 254. 1991.

Vernacular Name: *Aamkhora* (Mech).

Scandent. Leaf blade membranous, ovate-cordate or broadly ovate – cordate. Tendrils filiform, simple. Flowers dioecious, solitary, pedicel filiform. Fruit-pedicel slender, glabrous, fruit ovoid. Seeds gray or yellow – brown.

Flowers & Fruits: June – November.

Exsiccatu: Nimati, *Ajita & AP Das 235*, dated 05.12.2007.

Local Distribution: Nimati.

General Distribution: Tropical and sub-tropical parts of the world.

MUKIA Arnott

Mukia maderaspatana (Linnaeus) M. J. Roemer, Syn. Mon. 2: 47. 1846; FB 2(1): 258. 1991. *Cucumis maderaspatana* Linnaeus, Sp. Pl. 1012. 1753.

Vernacular Name: *Kundri* (Mech).

Annual scandent. Leaf blade somewhat rigid, ovate or ovate – cordate. Tendrils moderately robust, simple. Flowers monoecious. Fruiting pedicels extremely short; fruit dark red, globose, smooth. Seeds ovate.

Flowers & Fruits: August – December.

Exsicattus: Nimati, *Ajita & AP Das 163*, dated 08.11.2005.

Local Distribution: Nimati.

General Distribution: Tropical and sub-tropical parts of the world.

ZEHNERIA Endlicher

Zehneria japonica (Thunberg) H.Y. Liu, Bull. Nation. Mus. Nat. Sci. (Taiwan) 1: 40. 1989; FB 2(1): 257. 1991. *Bryonia japonica* Thunberg, Fl. Jap. 325. 1784.

Vernacular Name: *Hagrani Phatol* (Mech).

Scandent. Leaf blade membranous, broadly ovate, apex acute or short-acuminate. Tendrils filiform, simple. Flowers monoecious. Fruits globose, red when ripe. Seeds ovate-oblong, compressed, smooth, marginate.

Flowers & Fruits: April – November.

Exsicattus: Nimati, *Ajita & AP Das 422*, dated 20.11.2008.

Local Distribution: In Nimati.

General Distribution: Tropical and sub-tropical parts of the world.

MORINGACEAE Dumitriu

MORINGA Adanson

Moringa oleifera Lamarck, Encycl. 1: 398. 1785; FB 1(2): 445. 1984.

Vernacular Name: *Sojno Bingfang* (Mech).

Trees. Leaves petiolate, 3 – pinnate; leaflets ovate, elliptic. Inflorescence a widely spreading panicle, bracteate. Flowers white to cream, fragrant. Ovary hairy. Capsule 3 – valved, dehiscent. Seeds subglobose, 3 – angled.

Flowers & Fruits: June – December.

Exsicattus: Paschim Satali, *Ajita & AP Das 041*, dated 05.09.2004.

Local Distribution: Latabari, Mahakalguri, Mendabari, Mondalpara, Nimati and Paschim Satali.

General Distribution: Tropical and sub-tropical parts of the world.

SAPOTACEAE A. Jussieu

MIMUSOPS Linnaeus

Mimusops elengi Linnaeus, Sp. Pl. 349. 1753; FBI 3: 548. 1882; FB 2(2): 573. 1999.

Vernacular Name: *Baikhul* (Mech).

Trees, branchlets glabrous. Lamina elliptic, ovate – lanceolate, acute-acuminate, base cuneate, midrib prominent beneath. Flowers axillary, solitary or clustered; scented. Sepals tomentose, triangular. Corolla white. Berries elliptic, fleshy, 1 – seeded.

Flowers & Fruits: April – November.

Exscicattus: Ghoramara, *Ajita & AP Das 165*, dated 10.11.2005.

Local Distribution: In Ghoramara.

General Distribution: Pantropical.

EBENACEAE Gurke

DIOSPYROS Linnaeus

Diospyros malabarica (Desrousseaux) Kosteletsky, *Allg. Med. Pharm. Fl.* 3: 1099. 1834; *FB 2(2)*: 576. 1999. *Garcinia malabarica* Desrousseaux in *Lam., Ency.* 3: 701. 1792. *Diospyros embryopteris* Persoon, *Syn.* 2: 624. 1807; *FBI 3*: 556. 1882.

Vernacular Name: *Gab Bingfang* (Mech).

Trees; branchlets glabrous. Leaves coriaceous, oblong, acute-obtuse, base rounded, reticulate above; petiole stout. Flowers unisexual, fragrant, white; males in umbellate cymes, females solitary; calyx accrescent. Fruits globose, reddish, yellow when ripe.

Flowers & Fruits: May – July.

Exscicattus: Mendabari, *Ajita & AP Das*, dated 30.06.2008.

Local Distribution: Mendabari.

General Distribution: India, Sri Lanka, Thailand.

MYRSINACEAE R. Brown

ARDISIA Swartz., *nom. cons.*

Ardisia solanacea Roxburgh, *Pl. Coromandel 1*: 27. 1795; *FB 2(2)*: 514. 1999.

Vernacular Name: *Hagrani Fithai* (Mech).

Shrubs, glabrous. Leaf blade elliptic to oblanceolate, papery, base cuneate, margin subrevolute, entire, apex acute. Inflorescences at bases of new shoots, paniculate with racemose. Flowers leathery, pink. Sepals broadly ovate to reniform, ciliate, apex rounded. Petals nearly free; lobes broadly ovate, margin entire, hyaline, apex obtuse or acute. Fruits purplish red or blackish, densely black punctate.

Flowers & Fruits: February – November.

Exscicattus: Nimati, *Ajita & AP Das 195*, dated 22.04.2006.

Local Distribution: Nimati.

General Distribution: India, Nepal, Singapore, Sri Lanka, cultivated in Hawaii.

CRASSULACEAE DC.

KALANCHOE Adanson

Kalanchoe pinnata (Lamarck) Persoon, *Syn.* 446. 1805. *FB 1(3)*: 473. 1987. *Cotyledon pinnata* Lamarck, *Dict.* 2: 141. 1786.

Vernacular Name: *Oatkhambra* (Mech).

Stems 0.3 – 2 m, somewhat woody at base. Leaves thickly fleshy, simple or 3 – 5 foliate, leaves or leaflets ovate-oblong, obtuse, base rounded, margins crenately serrate, glaucous beneath. Flowers pendulous, reddish.

Flowers & Fruits: December – March.

Exsiccatus: Paschim Satali, *Ajita & AP Das 018*, dated 21.08.2004; Nimati, *Ajita & AP Das 411*, dated 05.11.2008.

Local Distribution: Nimati, Mendabari, Mondalpara and Paschim Satali.

General Distribution: Native of Africa and naturalized throughout the tropics.

ROSACEAE A. Jussieu

DUCHESNEA Small

Duchesnea indica (Andrews) Focke in Engler & Prantl, Nat. Pflanzenfam. 3(3): 33. 1888; FB 1(3): 579. 1987. *Fragaria indica* Andrews, Bot. Rep. 7: t. 479, 1807; FBI 2: 343. 1878.

Vernacular Name: *Gorai Bidai* (Mech).

Herbs perennial. Stipules narrowly ovate; leaflets petiolulate, obovate to rhombic-oblong, margin obtusely serrate, apex rounded. Flowers 1 – 2.5 cm in diam. Carpels numerous, free. Aggregate fruit ripening red. Achenes shining when fresh, ovoid.

Flowers & Fruits: June – October.

Exsiccatus: Nimati, *Ajita & AP Das 134*, dated 05.02.2005.

Local Distribution: Mondalpara and Nimati.

General Distribution: Tropical and sub-tropical parts of the world.

MIMOSACEAE R. Brown

ALBIZIA Durazzini

Albizia procera (Roxburgh) Bentham, London J. Bot. 3: 89. 1844; FEH 1: 136. 1966; EFPN 2: 104. 1979. FB 1(3): 645. 1987. *Mimosa procera* Roxburgh, Pl. Coromandel 2: 12. 1799.

Vernacular Name: *Gaphit Siris* (Mech).

Trees. Leaf rachise with a large oval gland near base and with one or more smaller ones at base of upper pinnae. Leaflets ovate – elliptic, 4 – 12 pairs, obtuse or emarginate, base rounded, dark green above, pale beneath. Panicles elongated, much branched, heads 12-20-flowered; calyx glabrous. Pods thinly coriaceous, 5 – 10 – seeded.

Flowers & Fruits: May – February.

Exsiccatus: Chhekamari, *Ajita & AP Das 223*, dated 26.08.2007.

Local Distribution: Chhekamari and Nimati.

General Distribution: South Asia and SE Asia.

ENTADA Adanson

Entada rheedii Sprengel, Syst. Veg. 2: 325. 1825; FB 1(3): 638. 1987. *Mimosa entada* Linnaeus, Sp. Pl. 1: 518. 1753.

Vernacular Name: *Gilathakuri* (Mech).

Leaves 12 – 25 cm; pinnae 2 pairs; leaflets obtuse or subacute, base rounded, glabrous, stipules subulate. Flowers bisexual; calyx pubescent. Petals elliptic, yellowish. Pods oblong; seeds suborbicular or ovoid.

Flowers & Fruits: March – June.

Exsicattus: Sibkata, *Ajita & AP Das 316*, dated 25.04.2008; Chhekamari, *Ajita & AP Das 454*, dated 15.03.2009.

Local Distribution: Chhekamari and Sibkata.

General Distribution: Tropical Asia; E. Africa, Australia, Indian Ocean islands.

MIMOSA Linnaeus

Mimosa pudica Linnaeus, Sp. Pl. 1: 518. 1753; FEH 1: 159. 1966; FB 1(3): 639. 1987.

Vernacular Name: *Sunukhchi* (Mech).

Spreading undershrub, highly sensitive, branches prickly. Leaves sensitive, leaflets 11 – 19 pairs, pinnae 4, digitate, narrowly oblong acute. Flowers pink or white. Pods prickly along sutures.

Flowers & Fruits: May – October.

Exsicattus: Baniapara, *Ajita & AP Das 059*, dated 01.10.2004.

Local Distribution: Throughout the study area.

General Distribution: Pantropical.

CAESALPINIACEAE R. Brown

BAUHINIA Linnaeus

Bauhinia purpurea Linnaeus, Sp. Pl. 375. 1753; FBI 2: 284. 1878; FB 1(3): 633. 1987.

Vernacular Name: *Khainchon* (Mech).

Small tree. Lamina broadly elliptic, obcordate, lobes subacute or obtuse, base truncate or cordate. Racemes 10-12 flowered, axillary or terminal. Calyx spatulate. Petals pink or purple. Pods linear oblong; seeds ellipsoid.

Flowers & Fruits: January – December.

Exsicattus: Chhekamari, *Ajita & AP Das 246*, dated 08.01.2008.

Local Distribution: Chhekamari.

General Distribution: Tropical Himalayas and South West China.

Bauhinia variegata Linnaeus, Sp. Pl. ed. 1: 375. 1753; FBI 2: 284. 1978; FEH 3: 57. 1975; FB 1(3): 634. 1987.

Vernacular Name: *Khainchon* (Mech).

Deciduous tree. Leaves broadly ovate, cordate, lobes obtuse. Flowers subsessile, fragrant, appearing with leaves; petals elliptic, white. Pods linear oblong.

Flowers & Fruits: February – December.

Exsicattus: Chhekamari, *Ajita & AP Das 247*, dated 08.01.2008.

Local Distribution: Chhekamari and Nimati.

General Distribution: India (Himalaya), Myanmar, China.

CASSIA Linnaeus

Cassia alata Linnaeus, Sp. Pl. 378. 1753; FBI 2: 264. 1878; FB 1(3): 629. 1987.

Vernacular Name: Dad Bingfang (Mech).

Shrubs. Leaves 30 – 60 cm; leaflets 8 – 12 pairs, oblong or obovate, obtuse, mucronate, base rounded, glabrous; stipules triangular. Racemes 40 – 60 cm, bracts orange. Petals oblong or obovate, yellow. Pods 4 – angled.

Flowers & Fruits: August – October.

Exsicattus: Dakshin Mendabari, *Ajita & AP Das 229*, dated 01.10.2007.

Local Distribution: Throughout the study area.

General Distribution: Pantropical.

Cassia fistula Linnaeus, Sp. Pl. 377. 1753; FBI 2: 261. 1878; FB 1(3): 628. 1987.

Vernacular Name: Dindong (Mech).

Trees to 20 m, deciduous. Leaves 15 – 40 cm, leaflets 3 – 4 pairs, ovate, acute, base rounded, glabrous; stipules deltoid. Racemes axillary, pendent. Petals obovate, yellow. Pods terete, woody, indehiscent, black. Seeds brown, ovate, glossy.

Flowers & Fruits: January – December.

Exsicattus: Karjeepera, *Ajita & AP Das 413*, dated 08.11.2008.

Local Distribution: Chhekamari, Karjeepera, Mantharam and Salkumar.

General Distribution: India, Nepal, Bhutan, China, Malaysia, Malaya Islands, Myanmar, Africa.

Cassia occidentalis Linnaeus, Sp. Pl. 377. 1753; FBI 2: 262. 1878; FB 1(3): 631. 1987.

Vernacular Name: Sunda Bilai (Mech).

Annuals, undershrubs. Leaves to 15 – 20 cm; leaflets 3 – 5 pairs, ovate or lanceolate, acuminate, base rounded, glandular pubescent beneath, petiole with a globose gland. Corymbs axillary. Petals yellow, obovate. Pods linear, compressed.

Flowers & Fruits: July – December.

Exsicattus: Nimati, *Ajita & AP Das 461*, dated 20.04.2009.

Local Distribution: Throughout the study area.

General Distribution: India, Nepal, Bhutan, Tropical America.

Cassia tora Linnaeus, Sp. Pl. 376. 1753; FBI 2: 263. 1878; FB 1(3): 632. 1987.

Vernacular Name: Shinchum (Mech).

Annuals. Stipules linear. Leaflets 3 pairs, 2 glands between lowermost leaflet pair; obovate. Flowers yellow; sepals obtuse; petals veined, obovate. Pods slender.

Flowers & Fruits: July – December.

Exsicattus: Dakshin Mendabari, *Ajita & AP Das 200*, dated 14.05.2006; Latabari, *Ajita & AP Das 447*, dated 20.01.2009.

Local Distribution: Throughout the study area.

General Distribution: Pantropical.

TAMARINDUS Linnaeus

Tamarindus indica Linnaeus, Sp. Pl. 1: 34. 1753; FBI 2: 273. 1878; FB 1(3): 636. 1987.

Vernacular Name: *Titli* (Mech).

Trees. Leaflets oblong, small, glabrous, base obliquely rounded, apex rounded. Flowers few, yellowish tinged with purplish red stripes. Petals obovate, subequal to calyx lobes, margin repand, curled. Ovaries slightly incurved, terete. Pods brownish, straight or arcuate.

Flowers & Fruits: May – December.

Exsicattus: Paschim Satali, *Ajita & AP Das 025*, dated 29.08.2004.

Local Distribution: Chhekamari, Nimati and Paschim Satali.

General Distribution: Tropical and sub-tropical parts of the world.

FABACEAE Lindley

BUTEA Roxburgh

Butea monosperma (Lamarck) Taubert in Pfamilien. 3(3): 366. 1894; FB 1(3): 688. 1987. *Erythrina monosperma* Lamarck, Ency. 1: 391. 1783.

Vernacular Name: *Phalas Bibar* (Mech).

Trees. Leaves coriaceous, leaflets ovate or rhombic, obtuse or emarginated, base cuneate. Flowers orange red, dense racemes forming terminal panicles.

Flowers & Fruits: February – April.

Exsicattus: Chhekamari, *Ajita & AP Das 222*, dated 26.08.2007.

Local Distribution: Chhekamari and Ghoramara.

General Distribution: India, Nepal, Bhutan, Sri Lanka, S.E. Asia, Malaysia.

CICER Linnaeus

Cicer arietinum Linnaeus, Sp. Pl. 2: 738. 1753; FB 1(3): 727. 1987.

Vernacular Name: *But* (Mech).

Stems branched from base. Leaves 3 – 7 cm, leaflets ovate-elliptic, base cuneate, stipules ovate. Peduncles erect and deflexed. Petals purplish, wings spathulate. Pods ellipsoid, pubescent; seeds angularly ovoid or globose, white or brown.

Flowers & Fruits: April – July.

Exsicattus: Paschim Satali, *Ajita & AP Das 399*, dated 15.10.2008.

Local Distribution: Cultivated in study area.

General Distribution: Widely cultivated elsewhere.

DALBERGIA Linnaeus f. *nom. cons.*

Dalbergia sissoo Roxburgh ex de Candolle, Prodr. 2: 416. 1825; FB 1(3): 652. 1987.

Vernacular Name: *Khuzrab* (Mech).

Trees. Leaves lanceolate; leaflets suborbicular, occasionally rhombic – obovate, apex rounded, shortly caudate. Panicles axillary. Flowers nearly sessile. Corolla yellowish white. Ovary oblong, pubescent. Pod pale brown when dry, linear – oblong.

Flowers & Fruits: March – November.

Exsiccatus: Paschim Satali, *Ajita & AP Das 032*, dated 29.08.2004.

Local Distribution: Throughout the study area.

General Distribution: Tropical and sub-tropical parts of the world.

DERRIS Loureiro

Derris polystachya Bentham, J. Proc. Linn. Soc., Bot. 4(Suppl.): 114. 1860; FB 1(3): 656. 1987.

Vernacular Name: *Rhu* (Mech).

Branchlets brown puberulous at first. Leaflets coriaceous, elliptic or obovate, base rounded or cuneate, glabrous above, sparsely puberulous along veins beneath. Flowers red or pink. Pods asymmetrically oblong – elliptic, acuminate; 1 – 2 – seeded.

Flowers & Fruits: August – September.

Exsiccatus: Chhekamari, *Ajita & AP Das 453*, dated 15.03.2009; Mantharam, *Ajita & AP Das 472*, dated 20.05.2009.

Local Distribution: Chhekamari and Mantharam.

General Distribution: Subtropical.

DESMODIUM Desvaux (*nom. cons.*)

Desmodium triflorum (Linnaeus) DC., Prodr. 2: 334. 1825; FBI 2: 173. 1876; FB 1(3): 673. 1987.

Hedysarum triflorum Linnaeus, Sp. Pl. 749. 1753.

Vernacular Name: *Chimpli Gochhang* (Mech).

Annual, prostrate, diffuse herbs. Leaves 3 foliate; leaflets ovate, emarginated, base broadly cuneate. Racemes 2 – 5 flowered at leaf axils; corolla purplish. Pods oblong, undulate along lower suture, 2 – 5 segments.

Flowers & Fruits: January – December.

Exsiccatus: Dakshin Mendabari, *Ajita & AP Das 061*, dated 01.10.2004; Uttar Mendabari, *Ajita & AP Das 175*, dated 13.11.2005.

Local Distribution: Throughout the study area.

General Distribution: India, Nepal, Bhutan, China, S.E. Asia, Australia, America, Africa.

GLIRICIDIA Humboldt, Bonpland & Kunth

Gliricidia sepium (Jacquin) Kunth ex Walpers, Report. 1: 679. 1842; FB 1(3): 660. 1987. *Robinia sepium* Jacquin, Enum. Syst. Pl. 28. 1760.

Vernacular Name: *Benda Bimfang* (Mech).

Small trees or shrubs. Leaves 15 – 25 cm, leaflets oblong-ovate, bluntly acute, base rounded often oblique. Flowers pinkish to white. Pods on basals stalks.

Flowers & Fruits: February – April.

Exsiccatus: Paschim Satali, *Ajita & AP Das 400*, dated 15.10.2008.

Local Distribution: Chhekamari, Nimati, Paschim Satali and Salkumar.

General Distribution: Native of South America.

TEPHROSIA Persoon

Tephrosia candida DC., Prodr. 2: 249. 1825; FB 1(3): 659. 1987.

Vernacular Name: *Bhogla* (Mech).

Perennial. Leaflets blades oblong. Pseudoracemes terminal or lateral. Calyx teeth equal. Corolla white. Ovary tomentose, with numerous ovules. Legume linear, straight, brown tomentose.

Flowers & Fruits: October – December

Exsiccatu: Baniapara, *Ajita & AP Das 083*, dated 04.10.2004.

Local Distribution: Baniapara and Paschim Satali.

General Distribution: Tropical and sub-tropical parts of the world.

VIGNA G. Savi

Vigna mungo (Linnaeus) Hepper in Kew Bulletin 11: 128. 1956; FB 1(3): 701. 1987. *Phaseolus mungo* Linnaeus, Mantissa Plantarum 1. 1767.

Vernacular Name: *Sabai Gwchhwu* (Mech).

Straggling annual; stems erect. Leaflets ovate, shortly acuminate, base rounded or cuneate, margin entire or undulate; stipules medifixed ovate – elliptic. Flowers 5 – 15 terminally clustered on racemes. Pods shortly brown pubescent; seeds blackish.

Flowers & Fruits: May – September.

Exsiccatu: Paschim Satali, *Ajita & AP Das 393*, dated 05.09.2008.

Local Distribution: Cultivated.

General Distribution: India, Cambodia, Indonesia, Laos, Sri Lanka, Thailand, Vietnam, Africa; widely cultivated in tropical and subtropical regions.

LYTHRACEAE Jaume St. Hilaire

LAGERSTROEMIA Linnaeus

Lagerstroemia hirsuta (Lamarck) Willdenow, Sp. Pl. 2: 1178. 1799; FB 2(1): 276. 1991. *Adambe hirsuta* Lamarck, Encycl. 1: 39. 1783.

Vernacular Name: *Jharul* (Mech).

Trees with smoothy branchlets. Leaves thinly coriaceous, elliptic – oblong, base rounded, glabrous. Flowers purple in terminal panicles. Capsules woody, subglobose.

Flowers & Fruits: May – September.

Exsiccatu: Dakshin Mendabari, *Ajita & AP Das 259*, dated 18.01.2008.

Local Distribution: Throughout Duars.

General Distribution: India, Nepal, Bhutan, Myanmar, Thailand.

ROOTALA Linnaeus

Rotala rotundifolia (Buchanan-Hamilton) Koehne, Bot. Jahrb. 1: 175. 1881; Islam, Fl. Majuli 137. 1990; Bora & Kumar, Flor. Div. Ass. 158. 2003. *Ammannia rotundifolia* Buchanan-Hamilton in Don Prodr. 220. 1825; FBI. 2: 566. 1828; Beng. Pl. 1: 500. 1903.

Vernacular Name: *Gozak Bibar* (Mech).

Extensively creeping and rooting herbs with red stem. Lamina sessile, orbicular or broadly elliptic-rounded. Flowers pinkish sessile, closely packed in terminal simple or panicle spikes; calyx tube campanulate, petals 4, pink coloured. Capsules 4 – valved ellipsoid; seeds elliptic peltate.

Flowers & Fruits: November – April.

Exsicattus: Baniapara, *Ajita & AP Das 086*, dated 09.10.2004.

Local Distribution: Throughout the study area.

General Distribution: India and China.

TRAPACEAE Dumortier

TRAPA Linnaeus

Trapa natans Linnaeus var. *bispinosa* (Roxburgh) Makino in Inuma, Sumoku-Dzusetu ed. 3, 1: 137. 1907; Prain, Beng. Pl.1: 508. 1903; *Trapa bispinosa* Roxburgh, Pl. Cor. 3: t. 234. 1815; FBI 2: 590. 1879.

Vernacular Name: *Daiee Fithai* (Mech).

Aquatic floating herbs. Floating leaves in rosettes, rhomboid, crowded in the upper part of stem; submerged ones dissected. Flowers in solitary axillary; calyx lanceolate, acute; corolla white; pubescent; stamens 4. Fruits angled nuts, 2 spiny horned.

Flowers & Fruits: September – January.

Exsicattus: Nimati, *Ajita & AP Das 185*, dated 07.03.2006.

Local Distribution: In Nimati.

General Distribution: Throughout India, Nepal, China, Malaysia, Philippines and Sri Lanka.

MYRTACEAE A. Jussieu

PSIDIUM Linnaeus

Psidium guajava Linnaeus, Sp. Pl. 470. 1753; FBI 2: 468. 1878; FB 2(1): 287. 1991.

Vernacular Name: *Thamb* (Mech).

Small trees, erect; branchlets pubescent; bark brownish. Leaves oblong-elliptic, acute, base rounded, pubescence beneath, lateral veins parallel, prominent beneath. Flowers white. Fruits globose, ovoid – pyriform, yellowish when ripe; seeds numerous.

Flowers & Fruits: Throughout the year.

Exsicattus: Chhekamari, *Ajita & AP Das 072*, dated 03.10.2004.

Local Distribution: Commonly cultivated.

General Distribution: Native of tropical America, naturalized and cultivated in India.

SYZYGIUM Gaertner

Syzygium cumini (Linnaeus) Skeels in U.S. Dept. Agric. Bur. Pl. Ind. Bull. 248. 25. 1912; FB 2(1): 284. 1991. *Myrtus cumini* Linnaeus, Sp. Pl. 471. 1753.

Vernacular Name: *Jham* (Mech).

Trees. Leaves coriaceous, elliptic, cuneate. Cymes borne in axils of older and fallen leaves, many-flowered. Flowers sessile. Calyx funnel-shaped, tapering into stalk-like base, lobes shallow, persistent. Petals creamy. Fruit obliquely obovoid-crimson, becoming black when ripe.

Flowers & Fruits: June – December.

Exsiccatus: Paschim Satali, *Ajita & AP Das 023*, dated 29.08.2004.

Local Distribution: In study area.

General Distribution: India (tropical and subtropical regions), Sri Lanka, Malaya and Australia.

MELASTOMACEAE A. Jussieu

MELASTOMA Linnaeus

Melastoma malabathricum Linnaeus, Sp. Pl. 390. 1753 ('*malabathrica*'); FBI 2: 523. 1879; FEH 1: 221. 1966; EFPN 2: 170. 1979; FB 2(1): 296. 1991.

Vernacular Name: *Daukhiboi* (Mech).

Bushy shrubs. Stems densely appressed hairy. Leaves elliptic to lanceolate-elliptic, acute or shortly acuminate, base rounded, cuneate, veins 5; upper surface with rows of white cells at base of very short hairs. Calyx tube densely covered with appressed, fimbriate-margined, scale like hairs; lobes triangular – oblong. Petals mauve to rose – purple.

Flowers & Fruits: January – December.

Exsiccatus: Chhekamari, *Ajita & AP Das 080*, dated 03.10.2004; Mendabari, *Ajita & AP Das 445*, dated 10.01.2009.

Local Distribution: Chhekamari, Mendabari and Paschim Satali.

General Distribution: Tropical Himalayas, India, China, Sri Lanka, Myanmar, Malaysia and Australia.

COMBRETACEAE R. Brown

TERMINALIA Linnaeus, *nom. cons.*

Terminalia arjuna (Roxburgh ex DC.) Wight & Arnott, Prodr. 314. 1834. *Pentaptera arjuna* Roxburgh (Hort. Beng. 34.1814, *nom. nud.*) ex DC., Prodr. 3: 14. 1828.

Vernacular Name: *Harjun* (Mech).

Trees, trunk buttressed. Bark greenish-white. Leaves sub-opposite or alternate; lamina elliptic – oblong. Flowers in pendulous axillary or terminal panicles of spikes, pale-yellow. Drupes ovoid or obovoid – oblong, woody, 5 – winged.

Flowers & Fruits: May – April.

Exsiccatus: Paschim Satali, *Ajita & AP Das 098*, dated 13.10.2004.

Local Distribution: Nimati and Paschim Satali.

General Distribution: India, Bangladesh, Sri Lanka.

Terminalia bellirica (Gaertner) Roxburgh, Pl. Coromandel 2: 54. 1805; FBI 2: 445. 1878; FB 2(1): 304. 1991. *Myrobalanus bellirica* Gaertner, Fruct. Sem. Pl. 2: 90. 1791.

Vernacular Name: Bhaora (Mech).

Trees. Leaves spiraled, crowded into pseudowhorls at apices of branchlets. Inflorescences axillary, simple spikes. Calyx tube distally shallowly cupular. Stamens 10. Fruits shortly stipitate, subglobose to broadly ellipsoid.

Flowers & Fruits: March – August.

Exsiccatus: Paschim Satali, *Ajita & AP Das 024*, dated 29.08.2004.

Local Distribution: Mendabari, Paschim Satali and Salkumar.

General Distribution: Tropical and sub-tropical parts of the world.

Terminalia chebula Retzius, *Observ. Bot.* 5: 31. 1789; *FBI* 2: 446. 1878; *FEH* 1: 220. 1966; *FB* 2(1): 304. 1991.

Vernacular Name: Shilikhya (Mech).

Trees. Leaves alternate or subopposite; leaf blade elliptic. Inflorescences axillary or terminal, simple spikes. Flowers slightly fragrant, bisexual. Calyx tube distally cupular. Stamens 10. Fruits not stipitate, blackish brown when ripe, ovoid.

Flowers & Fruits: May – December.

Exsiccatus: Paschim Satali, *Ajita & AP Das 037*, dated 01.09.2004; Chhekamari, *Ajita & AP Das 357*, dated 10.07.2008.

Local Distribution: Chhekamari, Nimati and Paschim Satali.

General Distribution: Tropical and sub-tropical parts of the world.

ALANGIACEAE DC.

ALANGIUM Lamarck

Alangium chinense (Loureiro) Harms in *Ber. Deuts. Bot. Ges.* 15: 24. 1897; *FB* 2(1): 332. 1991. *Stylidium chinense* Loureiro, *Fl. Cochinch.* 1: 221. 1790. *Marlea begoniaefolia* Roxburgh, *Cor. Pl.* 3: 80t. 203. 1819; *FBI* 2: 743. 1879.

Vernacular Name: Ban (Mech).

Small trees. Leaves alternate; pubescent, ovate – suborbicular or broadly subquadrate, margin entire to angular lobed, tip long acuminate, base oblique, truncate or deeply cordate, glabrous above. Flowers white, inflorescence axillary. Fruits ovoid, dark purple when ripe, glabrous.

Flowers & Fruits: March – October.

Exsiccatus: Nimati, *Ajita & AP Das 442*, dated 03.01.2009.

Local Distribution: Ghoramara and Nimati.

General Distribution: Tropical Africa, Nepal, Bhutan, Myanmar, Malaysia.

ICACINACEAE Miers

NATSIATUM Arnott

Natsiatum herpeticum Buchanan-Hamilton ex Arnott, *Edinburgh New Philos. J.* 16: 314. 1834; *FBI* 1: 595. 1875; *FEH* 1: 191. 1966; *EFPN* 2: 87. 1979; *FB* 2(1): 135. 1991.

Vernacular Name: Dokha Khamflai (Mech).

Young branches yellow – brown strigose; old branches conspicuously lenticellate. Petiole slender; leaf blade cordate – ovate, apex acute. Flowers yellow – green. Sepals lanceolate, petals narrowly lanceolate. Drupes yellow – green, becoming black with age.

Flowers & Fruits: November – April.

Exsicattus: Baniapara, *Ajita & AP Das 062*, dated 01.10.2004.

Local Distribution: Baniapara and Paschim Satali.

General Distribution: Tropical and sub-tropical parts of the world.

EUPHORBIACEAE A. Jussieu

BACCAUREA Loureiro

Baccaurea ramiflora Loureiro, Fl. Cochinch. 2: 661. 1790; FB 1(3): 788. 1987. *Baccaurea sapida* (Roxburgh) Muell. –Arg. in DC., Prodr. 15, 2: 459. 1866; FBI 5: 371. 1887; FEH 174. 1966. *Pierardia sapida* Roxburgh, Fl. Ind. 2: 254. 1832.

Vernacular Name: Khusumai (Mech).

Evergreen trees. Petiole glabrous; lamina obovate-oblong, oblanceolate, shortly acuminate to acute, entire or shallowly repand, base cuneate. Flowers small, dioecious, apetalous. Male inflorescences densely papillose. Capsules ovoid.

Flowers & Fruits: May– October.

Exsicattus: Paschim Satali, *Ajita & AP Das 026*, dated 29.08.2004.

Local Distribution: Paschim Satali.

General Distribution: Tropical and sub-tropical parts of the world.

BREYNIA J. R. & J. G. A. Forster, *nom. cons.*

Breynia retusa (Dennstedt) Alston, Ann. Roy. Bot. Gard. (Peradeniya) 11: 204. 1929; FB 1(3): 782. 1987. *Phyllanthus retusus* Dennstedt, Schlüssel Hortus Malab. Register 1: 15; Register 2: 24; Register 3: 31. 1818.

Vernacular Name: Okhen (Mech).

Erect shrubs. Stipules small; lamina elliptic to slightly obovate, rounded to subacute, mucronulate, base obtuse to rounded. Flowers solitary or rarely 2 in axillary clusters. Fruiting pedicel 2 – 6 mm; capsules globose, exocarp fleshy, tardily dehiscent.

Flowers & Fruits: March – August.

Exsicattus: Baniapara, *Ajita & AP Das 091*, dated 09.10.2004.

Local Distribution: Baniapara and Satali Nakadala.

General Distribution: Tropical and sub-tropical parts of the world.

CROTON Linnaeus

Croton roxburgii Balakrishnan, Bull. Sur. Ind. 3: 39. 1961; FB 1(3): 792. 1987.

Vernacular Name: Chhikho Domphang (Mech).

Scandent shrubs. Lamina ovate, papery, obscurely serrulate, acute, sometimes caudate-acuminate. Inflorescence terminal. Male flowers densely stellate-hairy; petals oblong. Female flowers densely stellate-hairy; petals oblong, smaller than sepals; ovary densely hispid; styles bifid, linear. Fruits globose.

Flowers & Fruits: May – October.

Exsiccatus: Uttar Mendabari, *Ajita & AP Das 171*, dated 13.11.2005.

Local Distribution: Nimati and Uttar Mendabari.

General Distribution: Bangladesh, Bhutan, Brunei, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Thailand, Singapore, Sri Lanka, Vietnam; N Australia.

EUPHORBIA Linnaeus

Euphorbia hirta Linnaeus, Sp. Pl. 454. 1753; FB 1(3): 766. 1987.

Vernacular Name: *Dudhali* (Mech).

Erect or decumbent annual. Leaves opposite, shortly petiolate; lamina elliptic oblong, oblique, dentate or serrulate, acute. Cyathia in sub-sessile or pedunculate globose heads.

Flowers & Fruits: January – December.

Exsiccatus: Ghoramara, *Ajita & AP Das 311*, dated 15.04.2008; Nimati, *Ajita & AP Das 337*, dated 04.06.2008; Paschim Satali, *Ajita & AP Das 407*, dated 02.11.2008.

Local Distribution: Throughout the study area.

General Distribution: Pantropical.

Euphorbia royleana Boissier, DC. Prodr. 15 (2): 83. 1862; FBI 5: 257. 1887; EFPN 3: 196. 1982; FB 1(3): 761. 1987.

Succulent, erect cactus-like shrub. Older stems terete, woody; branches whorled, erect, 5 – angled., angles broad with short stipular spines. Leaves borne at branch tips, membranous, obovate, obtuse and apiculate, attenuate at base, glabrous, entire, subsessile. Cymes subsessile, condensed, each composed of 1 – 4 cyathia with broad, rounded marginal appendages and glands.

Flowers & Fruits: April – May.

Exsiccatus: Paschim Satali, *Ajita & AP Das 010*, dated 03.08.2004; Dakshin Mendabari, *Ajita & AP Das 295*, dated 11.03.2008.

Local Distribution: Cultivated.

General Distribution: Himalaya (Kumaun to Nepal).

JATROPHA Linnaeus

Jatropha curcas Linnaeus, Sp. Pl. ed. 1: 1006.1753; FBI 5:383.1887; FB 1(3): 790. 1987.

Vernacular Name: *Enda* (Mech).

Erect, bushy, raddish, undershrubs. Leaves alternate, palmately lobed, cordate at base; petiole, stipules glandular hairy. Flower in cyme; bracts lanceolate. Sepals with glandular hairs, persistent; corolla purplish red; stamens basally connete. Capsules oblong, 3 – lobed.

Flowers & Fruits: June – December.

Exsiccatus: Paschim Satali, *Ajita & AP Das 138*, dated 08.02.2005; Uttar Mendabari, *Ajita & AP Das 293*, dated 08.03.2008; Paschim Satali, *Ajita & AP Das 361*, dated 11.07.2008; Mondalpara, *Ajita & AP Das 406*, dated 28.10.2008.

Local Distribution: Throughout the study area.

General Distribution: Tropical and sub-tropical parts of the world.

MACARANGA Thonning

Macaranga denticulata Mueller-Argoviensis in DC., Prodr. 15: 2. 1000. 1866; FB 1(3): 804. 1987.

Vernacular Name: *Laigajaou* (Mech).

Trees with rusty pubescent branches. Leaves alternate, broadly ovate, acute-acuminate, veins palmately 5 – 7 at base, glabrous above, densely gland-dotted beneath. Capsules tomentose with persistent styles.

Flowers & Fruits: October – February.

Exsiccatus: Paschim Satali, *Ajita & AP Das 144*, dated 01.10.2005.

Local Distribution: Ghoramara, Mondalpara, Nimati, Paschim Satali and Salkumar.

General Distribution: Himalayas (Kumaun to Sikkim).

MANIHOT Miller

Manihot esculenta Crantz, Inst. Rei Herb. 1: 167. 1766; FB 1(3): 795. 1987. *Jatropha manihot* Linnaeus, Sp. Pl. 2: 1007. 1753.

Vernacular Name: *Thasumbly* (Mech).

Shrubs; root tubers cylindric. Lamina lobes elliptic – oblanceolate, acuminate, pale beneath, swollen at base. Male sepals yellowish green; female sepals 7 – 9 mm.

Flowers & Fruits: September – December.

Exsiccatus: Baniapara, *Ajita & AP Das 084*, dated 04.10.2004.

Local Distribution: Cultivated in study area.

General Distribution: Native of South America; cultivated throughout the tropics.

PHYLLANTHUS Linnaeus

Phyllanthus amarus Schumacher & Thonning, Kongl. Danske Vidensk. Selsk. Skr. 4: 195. 1829; EFPN 3: 198. 1982. *Phyllanthus niruri auct. non* Linnaeus, FBI 5: 298. 1887; FEH 181. 1966.

Vernacular Name: *Banamlai* (Mech).

Tall, erect, stems simple or branched, glabrous herbs. Leaves petiolate, elliptic – oblong, entire, minutely apiculate, base obtuse. Flowers axillary. Seeds triangular.

Flowers & Fruits: July – January.

Exsiccatus: Dakshin Mendabari, *Ajita & AP Das 058*, dated 01.10.2004.

Local Distribution: Throughout the study area.

General Distribution: Pantropical.

Phyllanthus emblica Linnaeus, Sp. Pl. 2: 982. 1753; FBI 5: 289. 1887; FB 1(3): 772. 1987. *Emblica officinalis* Gaertner, Fruct. 122-123, Pl. 108, f. 2. 1790.

Vernacular Name: *Amlakkhi* (Mech).

Trees, monoecious, deciduous. Leafy shoots angular, at start of growing season often with poorly developed leaves and densely flowered. Leaves distichous; leaf blade oblong, mucronate or retuse at tip. Fruit a drupe, globose, exocarp fleshy.

Flowers & Fruits: April – September.

Exsiccatus: Paschim Satali, *Ajita & AP Das 034*, dated 01.09.2004.

Local Distribution: Few in study area.

General Distribution: Tropical and sub-tropical parts of the world.

RICINUS Linnaeus

Ricinus communis Linnaeus, Sp. Pl. 2: 1007. 1753; FBI 5: 457. 1887; FB 1(3): 808. 1987.

Vernacular Name: Eri (Mech).

Tall perennial, erect, fleshy, glabrous shrubs. Lamina simple, palmately 7 – 9 lobed. Inflorescence terminal raceme with lower female and upper male flower. Male flower with bract, actinomorphic, parienth-5; stamens-5; female flower with 5-perianth, carpel-3. Fruits schizocarpic with 3 one seeded cocci.

Flowers & Fruits: January – December.

Exsicattus: Paschim Satali, *Ajita & AP Das 102*, dated 13.11.2004; Nimati, *Ajita & AP Das 263*, dated 05.02.2008; Paschim Satali, *Ajita & AP Das 367*, dated 13.07.2008.

Local Distribution: Throughout the study area.

General Distribution: India and Africa.

TREWIA Linnaeus

Trewia nudiflora Linnaeus, Sp. Pl. 2: 1193. 1753; FBI 5: 423. 1887; EFPN 3: 199. 1982; FB 1(3): 799. 1987.

Vernacular Name: Pitali (Mech).

Trees. Stipules lanceolate; leaf blade ovate or oblong – ovate, apex acuminate. Male inflorescences densely villous. Female flowers: pedicel 1 – 9 mm; ovary tomentulose; styles often 3. Drupe globose.

Flowers & Fruits: January – December.

Exsicattus: Sibkata, *Ajita & AP Das 141*, dated 01.03.2005.

Local Distribution: Throughout the study area.

General Distribution: India, Sri Lanka to Thailand, Malaysia, Indonesia.

BISCHOFIACEAE (Mueller Argoviensis) Airy Shaw

BISCHOFIA Blume

Bischofia javanica Blume, Bijdr. 1168. 1826; FB 2(1): 130. 1991.

Vernacular Name: Thaichho (Mech).

Trees. Leaves palmately 3(–5)-foliolate; stipules membranous, lanceolate; leaflet blades ovate, elliptic, obovate, or elliptic-ovate; apex acute or caudate-acuminate. Plants dioecious. Inflorescence axillary, paniculate. Fruits globose or subglobose, brownish.

Flowers & Fruits: April – October.

Exsicattus: Sibkata, *Ajita & AP Das 363*, dated 12.07.2008.

Local Distribution: Paschim Satali and Sibkata.

General Distribution: Tropical and sub-tropical parts of the world.

RHAMNACEAE A. Jussieu

ZIZYPHUS Miller

Zizyphus mauritiana Lamarck, Encycl. 3: 319. 1789; FI 5: 233. 2000; FB 2(1): 138. 1991. *Zizyphus jujuba* (Linnaeus) Gaertner, Fruct. 1: 203. 1788 (*non* Miller, 1768); FBI 1: 632. 1875. *Rhamnus jujuba* Linnaeus, Sp. Pl. 194. 1753.

Vernacular Name: Boi (Mech).

Trees. Stipular spines 2, one oblique and hooklike recurved; leaf blade ovate or oblong-elliptic, margin serrulate, apex rounded, or acute. Flowers green-yellow, axillary dichotomous cymes. Ovary globose, glabrous. Drupe turning black at maturity; mesocarp corky; endocarp thick.

Flowers & Fruits: August – December.

Exsiccatus: Paschim Satali, *Ajita & AP Das 150*, dated 20.10.2005; Nimati, *Ajita & AP Das 238*, dated 05.12.2007; Latabari, *Ajita & AP Das 376*, dated 01.08.2008.

Local Distribution: Throughout the study area.

General Distribution: Tropical and sub-tropical parts of the world.

VITACEAE A. Jussieu

CISSUS Linnaeus

Cissus simplex Blanco, Fl. Filip. 72. 1837; FB 2(1): 159. 1991. *Cissus adnata* Roxburgh, Fl. Ind. 1: 423. 1820.

Vernacular Name: Daeiibindong (Mech).

Woody stems; branchlets terete with longitudinal ridges; tendrils bifurcate. Leaves simple; stipules ovate – elliptic, apex obtuse; leaf blade cordate – oval, base cordate. Inflorescence umbelliform, leaf-opposed. Calyx undulately lobed; petals oval. Ovary sparsely pilose. Berry 1 – seeded.

Flowers & Fruits: June – September.

Exsiccatus: Nimati, *Ajita & AP Das 248*, dated 10.01.2008.

Local Distribution: Nimati.

General Distribution: India, Cambodia, Laos, Myanmar, Nepal, Thailand, Vietnam.

Cissus quadrangularis Linnaeus, Syst. Nat. ed. 12(2): 124. 1767 & Mant. Pl. 39. 1767; FI 5: 288. 2000.

Vernacular Name: Harjhor Bindong (Mech).

Ramblers; branches quadrangular with angles usually winged, succulent; tendrils stout, simple. Leaves ovate to reniform, sometimes 3 – 7 – lobed, acute-obtuse at apex, truncate-cordate at base, subentire – denticulate at margins, glabrous; stipules broadly ovate, obtuse. Flowers glabrous; petals ovate-oblong. Berries obovoid or globose, apiculate, 1 – 2 – seeded. Seeds obovoid.

Flowers & Fruits: June – January.

Exsiccatus: Latabari, *Ajita & AP Das 379*, dated 01.08.2008.

Local Distribution: Khoardanga, Latabari and Salkumar.

General Distribution: India, Africa, Sri Lanka, Bangladesh, Myanmar, Indo-China, Indonesia and Philippines.

Cissus repens Lamarck, Encycl. 1: 31. 1783; FB 2(1): 159. 1991.

Vernacular Name: Bindong (Mech).

Herbaceous. Branchlets terete, with longitudinal ridges, glabrous; tendrils bifurcate. Leaves simple; leaf blade oval, glabrous, base cordate, apex acuminate. Flowers in terminal or leaf-opposed umbels. Petals triangular ovate. Berries 1 – seeded. Seed surface smooth, with sparse ribs.

Flowers & Fruits: July – May.

Exsiccatus: Nimati, *Ajita & AP Das 208*, dated 17.10.2006.

Local Distribution: Nimati.

General Distribution: India, Bhutan, Cambodia, Laos, Malaysia, Nepal, Philippines, Thailand, Vietnam, Australia, Tropical and sub-tropical parts of the world.

TETRASTIGMA Planchon

Tetrastigma bracteolatum (Wallich) Planchon in DC., Monogr. Phan. 5: 428. 1887; FI 5: 310. 2000; FB 2(1): 154. 1991. *Vitis bracteolatum* Wallich in Roxburgh, Fl. Ind. 2: 483. 1824; FBI 1: 654. 1875.

Vernacular Name: **Benda Bindong** (Mech).

Large climbers with puberulous stem; tendrils simple. Leaves trifoliolate; stipules caduceous. Leaflets membranous, ovate or elliptic, acuminate, rounded. Flowers in lax puberulous cymes.

Flowers & Fruits: June – December.

Exsiccatu: Nimati, *Ajita & AP Das 194*, dated 22.04.2006.

Local Distribution: Mantharam, Nimati, Paschim Satali and Sibkata.

General Distribution: Himalaya.

SAPINDACEAE A. Jussieu

LITCHI Sonnerat

Litchi chinensis Sonnerat, Voy. Indes Orient. 3: 255. 1782; FB 2(1): 72. 1991.

Vernacular Name: **Lichu** (Mech).

Tree to 30 m. Leaflets coriaceous, elliptic – lanceolate, sharply acuminate, base obliquely cuneate, lateral veins inconspicuous. Panicles pubescent. Calyx greenish-white. Fruit globose; pericarp dry and brittle when ripe, warted; aril whitish, fleshy.

Flowers & Fruits: February – July.

Exsiccatu: Paschim Satali, *Ajita & AP Das 480*, dated 28.05.2009.

Local Distribution: Cultivated in study area.

General Distribution: S.E. Asia; widely cultivated in subtropical regions.

SAPINDAS Linnaeus

Sapindus rarak DC., Prodr. 1: 608. 1824; FB 2(1): 70. 1991.

Vernacular Name: **Ritha Bingfang** (Mech).

Trees. Leaves odd- or even-pinnate, rachis pubescent. Leaflets 6 – 9 pairs, elliptic-lanceolate, acuminate, oblique at base, pubescent on midrib beneath. Panicles axillary, terminal. Flowers white; sepals ovate. Fruits fleshy, globose.

Flowers & Fruits: May – November.

Exsiccatu: Uttar Mendabari, *Ajita & AP Das 100*, dated 05.11.2004.

Local Distribution: Ghoramara and Uttar Mendabari.

General Distribution: India, Bhutan, Myanmar, China, Malaya, Java and Sri Lanka.

ANACARDIACEAE Lindley

LANNEA A. Richard *nom. cons.*

Lannea coromandelica (Houttuyn) Merrill in J. Arnold Arb. 19: 353. 1939; FB 2(1): 61. 1991. *Dialium coromandelicum* Houttuyn, Nat. Hist. Ser. 2(2): 39. t.5. f.2. 1774. *Odina wodier* Roxburgh, Fl. Ind. 2: 293. 1832; FBI 2: 29. 1876.

Vernacular Name: Giga (Mech).

Deciduous trees, younger branches stellately pubescent, bark whitish-grey. Leaves imparipinnate; leaflets usually 7 pairs, ovate, entire, acuminate, base cuneate. Flowers unisexual, tetramerous; petals yellow, elliptic; sepals rounded. Drupes ovaoid – obovoid, red in maturity.

Flowers & Fruits: January – May.

Exsiccatu: Dakshin Mendabari, *Ajita & AP Das 260*, dated 18.01.2008.

Local Distribution: Dakshin Mendabari, Dhalkar, Mendabari, Nimati, Paschim Satali and Salkumar.

General Distribution: India, S. Asia, Indo-Malaysia.

MANGIFERA Linnaeus

Mangifera indica Linnaeus, Sp. Pl. 1: 200. 1753; FBI 2: 13. 1876; FB 2(1): 59. 1991; FI 5: 466. 2000.

Vernacular Name: Khaijou (Mech).

Trees. Leaves elliptic or lanceolate, acuminate, base cuneate, glabrous. Panicles terminal, pubescent. Drupes variable in shape, ovoid-oblong, weakly compressed, yellowish when ripe.

Flowers & Fruits: February – June.

Exsiccatu: Nimati, *Ajita & AP Das 280*, dated 17.02.2008; Paschim Satali, *Ajita & AP Das 414*, dated 15.11.2008.

Local Distribution: Throughout the study area.

General Distribution: India, Nepal, Bangladesh, Myanmar and Malaysia.

SPONDIAS Linnaeus

Spondias pinnata (Linnaeus f.) Kurz, Prelim. Rep. Forest Pegu, App. A, 44; App. B, 42. 1875; FB 2(1): 60. 1991. *Mangifera pinnata* Linnaeus f., Suppl. Pl. 156. 1782.

Vernacular Name: Thaiscchip (Mech).

Deciduous trees. Petiole and rachis glabrous; imparipinnately compound with 5 – 11 opposite leaflets; leaflet glabrous on both sides. Inflorescence paniculate, terminal. Flower sessile or subsessile, white, glabrous. Ovary subglobose. Drupes ellipsoid to elliptic-ovoid.

Flowers & Fruits: April – September.

Exsiccatu: Chhekamari, *Ajita & AP Das 226*, dated 26.08.2007; Sibkata, *Ajita & AP Das 318*, dated 25.04.2008.

Local Distribution: Chhekamari and Sibkata.

General Distribution: Tropical and sub-tropical parts of the world.

MELIACEAE A. Jussieu

AZADIRACHTA A. Jussieu

Azadirachta indica A. Jussieu in Mem. Mus. Hist. Nat. 19: 221.t.13.f. 5. 1830; FI 4: 478. 1997; FB 2(1): 32. 1991.

Vernacular Name: Neem Bingfang (Mech).

Trees. Leaves 15 – 30 cm; leaflets 5 – 9 pairs, ovate-lanceolate, acuminate, cuneate, serrate. Thyrses axillary; flowers white. Petals oblanceolate. Drupes ovoid, 1 – seeded.

Flowers & Fruits: January – December.

Exsiccatus: Paschim Satali, *Ajita & AP Das 038*, dated 01.09.2004; Mondalpara, *Ajita & AP Das 438*, dated 25.12.2008.

Local Distribution: Ghoramara, Mondalpara, Nimati and Paschim Satali.

General Distribution: Native of Myanmar; growing in S. E. Asia.

CHUKRASSIA A. Jussieu

Chukrassia tabularis A. Jussieu, Mem. Mus. Hist. Nat. 19: 251. t. 22. 1830; 9. 1869; FBI 1: 568. 1875; FB 2(1): 39. 1991; FI 4: 481. 1997.

Vernacular Name: Chikrasi (Mech).

Trees. Leaflets ovate or oblong, acuminate, pubescent. Panicles terminal. Flowers yellow. Capsules ovoid – ellipsoid.

Flowers & Fruits: May – March.

Exsiccatus: Nimati, *Ajita & AP Das 306*, dated 16.03.2008.

Local Distribution: In study area.

General Distribution: India, Nepal, Bhutan, Bangladesh, Myanmar and Sri Lanka.

MELIA Linnaeus

Melia azedarach Linnaeus, Sp. Pl. 1: 384. 1753; FBI 1: 544. 1875; FB 2(1): 30. 1991; FI 4: 494. 1997.

Vernacular Name: Neem Gadar (Mech).

Trees. Leaves odd-pinnate; leaflets opposite; leaflet blades ovate, elliptic, margin crenate or sometimes entire, apex shortly acuminate. Flowers fragrant. Drupes globose to ellipsoid, endocarp ligneous. Seed ellipsoid.

Flowers & Fruits: March – December.

Exsiccatus: Paschim Satali, *Ajita & AP Das 027*, dated 29.08.2004; Khoardanga, *Ajita & AP Das 305*, dated 15.03.2008.

Local Distribution: Khoardanga, Latabari, Nimati, Paschim Satali and Sibkata.

General Distribution: Tropical and sub-tropical parts of the world.

TOONA (Endlicher) Roemer

Toona ciliata M. Roemer, Fam. Nat. Syn. Monogr. 1: 139. 1846; FB 2(1): 38. 1991. *Cedrela toon* Roxburgh ex Rottler, Ges. Naturf. Freunde Berlin Neue Schriften 4: 198. 1803; FBI 1: 568. 1875.

Vernacular Name: Tuni (Mech).

Trees. Leaves pilose; leaflets glabrescent; leaflet blades lanceolate to ovate-lanceolate, base usually asymmetric, margin entire. Inflorescences pendent. Flowers sweetly scented. Seeds winged at both ends; wings unequal, apex narrowly obtuse.

Flowers & Fruits: January – November.

Exsicattus: Uttar Dhalkar, *Ajita & AP Das 142*, dated 01.03.2005.

Local Distribution: Uttar Dhalkar, Nimati and Mahakalguri.

General Distribution: Tropical and sub-tropical parts of the world.

RUTACEAE A. Jussieu

AEGLE Correa *ex* Koenig, *nom. cons.*

Aegle marmelos (Linnaeus) Correa in Trans. Linn. Soc. London 5:223.1800; FBI 1:516.1875; FB 2(1): 10. 1991. *Crateva marmelos* Linnaeus, Sp. Pl. 444.1753. FI 4: 264. 1997.

Vernacular Name: **Bel Bingfang** (Mech).

Trees; shoots dimorphic, some spineless others bearing straight spines. Lamina ovate – elliptic, crenate, bluntly acuminate, base cuneate, glabrous or sparsely pubescent; petioles unwinged. Calyx cup-shaped. Petals elliptic oblong, white. Fruits ellipsoid or broadly ovoid.

Flowers & Fruits: March – December.

Exsicattus: Paschim Satali, *Ajita & AP Das 042*, dated 01.09.2004; Mondalpara, *Ajita & AP Das 437*, dated 25.12.2008.

Local Distribution: Mondalpara, Nimati, Paschim Satali, Sibkata and Mendabari.

General Distribution: India, Myanmar and Sri Lanka.

CITRUS Linnaeus

Citrus limon (Linnaeus) Osbeck, Reis Ostindien China, 250. 1765; FB 2(1): 22. 1991. *Citrus medica* Linnaeus var. *limon* Linnaeus, Sp. Pl. 2: 782. 1753.

Vernacular Name: **Nareng** (Mech).

Shrubs. Branches spiny. Leaf blade ovate to elliptic, margin conspicuously crenulate, apex usually mucronate. Flowers solitary. Calyx cup-shaped. Petals purplish, inside white. Ovary subcylindric or barrel-shaped. Fruit yellow, ellipsoid to ovoid.

Flowers & Fruits: April – May.

Exsicattus: Chhekamari, *Ajita & AP Das 073*, dated 10.10.2004; Dakshin Mendabari, *Ajita & AP Das 101*, dated 13.11.2004; Latabari, *Ajita & AP Das 377*, dated 01.08.2008.

Local Distribution: Chhekamari, Dakshin Mendabari, Latabari, Paschim Satali and Nimati.

General Distribution: Tropical and sub-tropical parts of the world.

Citrus maxima (Burman) Merrill, Interpr. Herb. Amboin. 296.1917; FB 2(1): 21. 1991. *Aurantium maximum* Burman in Rumphius & Burman, Herb. Amboin. Auctuar. 7: Index [16]. 1755.

Vernacular Name: **Jambura** (Mech).

Trees; twigs spiny. Leaves obtuse, base rounded, margin obscurely crenate, pubescent along midrib beneath; petiole broadly winged. Flowers solitary or in axillary clusters. Petals white, oblong. Ovary subglobose, sharply delimited from deciduous style. Fruit globose or subpyriform; peel yellow, thick.
Flowers & Fruits: April – December.

Exsiccatus: Paschim Satali, *Ajita & AP Das 482*, dated 28.05.2009.

Local Distribution: Cultivated in study area.

General Distribution: Cultivated.

GLYCOSMIS Correa

Glycosmis pentaphylla (Retzius) DC., Prodr. 1: 538. 1924; FB 2(1): 15. 1991. *Limonia pentaphylla* Retzius, Observ. Bot. 5: 24. 1789.

Vernacular Name: *Motra* (Mech).

Trees. Leaves (3 or) 5 – foliolate; leaflet blades oblong, papery, base cuneate, margin serrate, apex mucronate. Inflorescences axillary or terminal, paniculate. Flowers globose in bud. Sepals broadly ovate. Petals white or pale yellow. Fruit reddish, subglobose.

Flowers & Fruits: July – March.

Exsiccatus: Nimati, *Ajita & AP Das 236*, dated 05.12.2007; Latabari, *Ajita & AP Das 448*, dated 20.01.2009.

Local Distribution: Latabari, Nimati and Salkumar.

General Distribution: Tropical and sub-tropical parts of the world.

MURRAYA Linnaeus

Murraya koenigii (Linnaeus) Sprengel, Syst. Veg. 2: 315. 1825; FBI 1: 503. 1875; FEH 3: 75. 1975; BFPN 2: 82. 1979; FB 2(1): 17. 1991. *Bergera koenigii* Linnaeus, Mant. Pl. 2: 555, 563. 1771.

Vernacular Name: *Jafsri Bilai* (Mech).

Shrubs. Leaves 17 – 31-foliolate; lamina ovate, entire, base obtuse to rounded and oblique. Inflorescences terminal, many flowered. Flowers 5 – merous, ellipsoid in bud. Sepals ovate. Petals white. Fruits bluish black, ovoid to oblong.

Flowers & Fruits: March– August.

Exsiccatus: Nimati, *Ajita & AP Das 135*, dated 06.02.2005; Mondalpara, *Ajita & AP Das 324*, dated 10.05.2008; Nimati, *Ajita & AP Das 381*, dated 10.08.2008.

Local Distribution: In Duars.

General Distribution: Tropical and sub-tropical parts of the world.

ZANTHOXYLUM Linnaeus

Zanthoxylum rhetsa (Roxburgh) DC., Prodr. 1:728.1824; FBI 1:495.1875; FI 4: 387. 1997; FB 2(1): 13.1991. *Fagara rhetsa* Roxburgh, Fl.Ind. 1:438.1820.

Vernacular Name: *Jabreng* (Mech).

Erect deciduous trees; main stem armed with 2 – 4 cm spines with broad bases. Leaves appearing with flowers, crowded at branch ends, odd-pinnate; leaflets 4 – 15 pairs, ovate, acuminate, base asymmetrically rounded, entire to remotely crenate with glands at the base of teeth. In male flowers calyx 4 – lobed; petals 4, oblong; stamens 4. In female calyx and petals as in male flowers; staminodes absent; carpel solitary.

Flowers & Fruits: March – November.

Exsicattus: Latabari, *Ajita & AP Das 129*, dated 03.02.2005.

Local Distribution: Latabari.

General Distribution: India, Bangladesh, Bhutan, Myanmar, Sri Lanka, Thailand, S. Vietnam, Malay Peninsula, Java, Philippines, Celebes, Moluccas & Papua.

OXALIDACEAE R. brown

OXALIS Linnaeus

Oxalis corniculata Linnaeus, Sp. Pl. 1: 435. 1753; FBI 1: 436. 1874; FEH 1: 168. 1966; EFPN 2: 77. 1979; FB 1(3): 742. 1987.

Vernacular Name: *Shimpli* (Mech).

Annuals, creeping. Rootstock a slender taproot. Leaves alternate; leaflet blades obcordate. Inflorescences umbellate; peduncle usually slightly longer than petioles. Sepals oblonglanceolate. Petals bright yellow, oblong – obovate. Capsules long cylindrical.

Flowers & Fruits: February – October.

Exsicattus: Dakshin Mendabari, *Ajita & AP Das 112*, dated 13.11.2004; Mendabari, *Ajita & AP Das 343*, dated 15.06.2008.

Local Distribution: Throughout the study area.

General Distribution: Tropical and sub-tropical parts of the world.

Oxalis corymbosa DC., Prodr. 1: 696. 1824; FB 1(3): 743. 1987.

Vernacular Name: *Shimpli Gedet* (Mech).

Perennials, stemless, pubescent. Leaves basal; leaflet blades obcordate. Inflorescences corymbose cymes, irregularly branched; bracts lanceolate, membranous. Sepals lanceolate. Petals purplish pink with darker veins. Ovaries pubescent.

Flowers & Fruits: March – December.

Exsicattus: Latabari, *Ajita & AP Das 270*, dated 25.01.2008.

Local Distribution: Throughout the study area.

General Distribution: Tropical and sub-tropical parts of the world.

APIACEAE Lindley, *nom. alt*

CENTELLA Linnaeus

Centella asiatica (Linnaeus) Urban in Martius, Fl. Brasil 11:287, t. 78, f.1.1879; FEH 1:229. 1966; EFPN 2:188. 1979; FB 2(2): 446.1999. *Hydrocotyle asiatica* Linnaeus, Sp. Pl. ed. 1(1): 234. 1753; FBI 2:669. 1979.

Vernacular Name: *Manimuni Gedet* (Mech).

Creeping herbs; stems usually rooting at nodes. Lamina suborbicular or reniform, unlobed or very shallowly lobed, crenate-dentate, base cordate, glabrous or sparsely pubescent on both surface; Umbels 1

– 10, clusters at nodes, each 2 – 4 -flowered; peduncles usually short; bracts ovate. Flowers pinkish to deep red. Mericarps ellipsoid.

Flowers & Fruits: April – August.

Exsiccatus: Paschim Satali, *Ajita & AP Das 006*, dated 04.07.2004; Dakshin Mendabari, *Ajita & AP Das 053*, dated 01.10.2004; Dakshin Mendabari, *Ajita & AP Das 109*, dated 11.11.2004; Latabari, *Ajita & AP Das 120*, dated 02.02.2005; Latabari, *Ajita & AP Das 130*, dated 03.02.2005; Mendabari, *Ajita & AP Das 152*, dated 28.10.2005; Uttar Mendabari, *Ajita & AP Das 177*, dated 13.11.2005; Uttar Mendabari, *Ajita & AP Das 290*, dated 08.03.2008; Dhalkar, *Ajita & AP Das 308*, dated 02.04.2008; Latabari, *Ajita & AP Das 331*, dated 20.05.2008; Dhalkar, *Ajita & AP Das 477*, dated 26.05.2009.

Local Distribution: Throughout the study area.

General Distribution: Tropical and sub-tropical parts of the world.

HYDROCOTYLE Linnaeus

Hydrocotyle sibthorpioides Lamarck, Encycl. Meith. 3:153. 1789; FEH 1:230.1966; EFPN 2:187. 1979; FB 2(2): 444.1999. *Hydrocotyle rotundifolia* Roxburgh ex DC., Prodr. 4:64. 1830; FBI 2:668. 1879.

Vernacular Name: *Manimuni Galei* (Mech).

Plants strongly aromatic. Stem weak, slender. Leaf blade reniform-rounded, base cordate, entire or shallowly 5 – 7 -lobed, lobes rounded. Umbel solitary at the nodes with 5 – 8 -flowered. Petals greenish white. Fruits broadly globose.

Flowers & Fruits: April – September.

Exsiccatus: Paschim Satali, Nimati, *Ajita & AP Das 007*, dated 04.07.2004; Dakshin Mendabari, *Ajita & AP Das 052*, dated 01.10.2004; Dakshin Mendabari, *Ajita & AP Das 110*, dated 11.11.2004; Latabari, *Ajita & AP Das 121*, dated 02.02.2005; Latabari, *Ajita & AP Das 131*, dated 03.02.2005; Mendabari, *Ajita & AP Das 153*, dated 28.10.2005; Uttar Mendabari, *Ajita & AP Das 178*, dated 13.11.2005; Uttar Mendabari, *Ajita & AP Das 291*, dated 08.03.2008; Dhalkar, *Ajita & AP Das 309*, dated 02.04.2008; Latabari, *Ajita & AP Das 332*, dated 20.05.2008; Dhalkar, *Ajita & AP Das 478*, dated 26.05.2009.

Local Distribution: Throughout the study area.

General Distribution: S.E. Asia, Australia.

APOCYNACEAE A. Jussieu

ALSTONIA R. Brown, *nom. cons*

Alstonia scholaris (Linnaeus) R. Brown, Mem. Wern. Nat. Hist. Soc. 1: 76. 1811; FBI 3: 642. 1882; FB 2(2): 672. 1999. *Echites scholaris* Linnaeus, Mant. Pl. 1: 53. 1767.

Vernacular Name: *Sithaona* (Mech).

Trees to 40 m tall, glabrous. Bark gray; branchlets copiously lenticellate. Leaves in whorls of 3 – 10; leaf blade narrowly obovate to very narrowly spatulate. Cymes dense, pubescent. Corolla white. Ovaries distinct, pubescent. Follicles distinct, linear.

Flowers & Fruits: June – December.

Exscicattus: Paschim Satali, *Ajita & AP Das 030*, dated 29.08.2004; Paschim Satali, *Ajita & AP Das 417*, dated 15.11.2008; Sibkata, *Ajita & AP Das 433*, dated 20.12.2008.

Local Distribution: Paschim Satali, Sibkata and Mendabari.

General Distribution: Tropical and sub-tropical parts of the world.

CATHARANTHUS G. Don

Catharanthus roseus (Linnaeus) G. Don, Gen. Hist. 4: 95. 1837; FB 2(2): 670. 1999. *Vinca rosea* Linnaeus, Syst. ed. 10: 944. 1759; FBI 3: 640. 1882.

Vernacular Name: *Nayantara* (Mech).

Erect undershrub. Lamina glabrous, elliptic – obovate, obtuse-mucronate, cuneate. Corolla lobes white, pink, purple, obovate. Fruits striate; seeds oblong.

Flowers & Fruits: January – December.

Exscicattus: Nimati, *Ajita & AP Das 188*, dated 07.03.2006.

Local Distribution: Cultivated.

General Distribution: A native of South America, naturalized in the tropics.

TABERNAMONTANA Linnaeus

Tabernamontana divaricata (Linnaeus) R. Brown in R & S. Syst. 4: 427. 1819; FEH 1: 259. 1966; FB 2(2): 675. 1999. *Nerium divaricatum* Linnaeus, Sp. Pl. 209. 1753.

Vernacular Name: *Gapht Bibar* (Mech).

Shrubs, dichotomously branched. Lamina ovate – lanceolate, oblong – lanceolate, acuminate, base cuneate, greenish, glossy. Flowers fragrant. Folicles 2 – 4.5 cm long, divaricata, yellowish, seeds red-arillate.

Flowers & Fruits: April – November.

Exscicattus: Paschim Satali, *Ajita & AP Das 392*, dated 05.09.2008.

Local Distribution: Throughout the study area.

General Distribution: Native of Tropical Asia, naturalized in India.

THEVETIA Linnaeus

Thevetia peruviana (Persoon) Schumann, Nat. Pflanzenfam. 4(2): 159. 1895; FB 2(2): 667. 1999. *Cerbera peruviana* Persoon, Syn. Pl. 1: 267. 1805.

Vernacular Name: *Kholke Bibar* (Mech).

Shrubs. Leaves coriaceous, linear to linear-lanceolate, apex narrowly acuminate, base attenuate. Flowers yellow, fragrant, solitary in upper leaf axils. Calyx lobes oblanceolate. Fruit transversely ellipsoid with transverse distal ridge. Seeds globose, 4 per fruit, glabrous, unwinged.

Flowers & Fruits: April – June.

Exscicattus: Paschim Satali, *Ajita & AP Das 395*, dated 05.09.2008; Paschim Satali, *Ajita & AP Das 464*, dated 01.05.2009.

Local Distribution: In Duars.

General Distribution: Native to Central and South America.

ASCLEPIACEAE R. Brown

CALOTROPIS R. Brown

Calotropis gigantea (Linnaeus) W.T. Aiton, Hortus Kew. ed. 2, 2: 78. 1811; FBI 4: 17. 1883; FEH 1: 260. 1966; EFPN 3: 85. 1982; FB 2(2): 700. 1999. *Asclepias gigantea* Linnaeus, Sp. Pl. 1: 214. 1753.

Vernacular Name: Aganda (Mech).

Shrubs. Leaf blade obovate-oblong, base cordate, apex obtuse, cottony tomentose when young. Cymes umbel-like, with fine woolly hairs. Flower buds cylindric. Corolla usually purplish or white; spreading or reflexed, margin revolute. Corona shorter than gynostegium. Follicles obliquely elliptic.

Flowers & Fruits: Throughout the year.

Exsicattus: Paschim Satali, *Ajita & AP Das 039*, dated 01.09.2004.

Local Distribution: Mendabari, Nimati and Paschim Satali.

General Distribution: Tropical and sub-tropical parts of the world.

SOLANACEAE A. Jussieu

CAPSICUM Linnaeus

Capsicum annum Linnaeus, Sp. Pl. 1: 188. 1753; FB 2(3): 1046. 2001.

Vernacular Name: Banzut (Mech).

Herbs or under-shrubs. Leaves solitary or paired; lamina oblong-ovate, entire, glabrescent, base narrowed. Flowers solitary. Calyx cup-shaped, undulate. Corolla white. Berries mostly red, variously shaped.

Flowers & Fruits: May – November.

Exsicattus: Nimati, *Ajita & AP Das 184*, dated 07.03.2006.

Local Distribution: In study area.

General Distribution: Tropical and sub-tropical parts of the world.

DATURA Linnaeus

Datura metel Linnaeus, Sp. Pl. 1: 179. 1753; FBI 4: 243. 1883; FEH 1: 283. 1966; EFPN 3: 109. 1982; FB 2(3): 1067. 2001.

Vernacular Name: Dotra (Mech).

Erect branched annual undershrubs, sometimes woody at base. Leaves petiolate, lamina ovate to rhomboid or elliptic, base cuneate, dentate. Flowers solitary, axillary, erect. corolla whitish or purplish. Capsule ovoid, pericarp very sharply spiny. Seed black, slightly reniform.

Flower & Fruits: August – April.

Exsicattus: Chhekamari, *Ajita & AP Das 074*, dated 03.10.2004; Chhekamari, *Ajita & AP Das 325*, dated 12.05.2008; Khoardanga, *Ajita & AP Das 449*, dated 01.02.2009.

Local Distribution: Chhekamari, Khoardanga, Nimati and Paschim Satali.

General Distribution: Temperate region of world.

PHYSALIS Linnaeus

Physalis divaricata D. Don, Prodr. Fl. Nepal. 97. 1825; FBI 4: 238. 1883; FB 2(3): 1045. 2001.

Vernacular Name: Ganga Thopfa (Mech).

Erect or decumbent, annual herbs. Lamina ovate, acute sinuate-toothed or tubulate, acuminate. Flowers yellow, solitary, on long slender deflexed pedicels; corolla often with small spot at the base within. Berries completely enclosed within the enlarged membranous 5 – 10 ribbed calyx; seeds discoid or reniform.

Flower & Fruits: April – January.

Exsicattus: Nimati, *Ajita & AP Das 133*, dated 05.02.2005.

Local Distribution: Throughout the study area.

General Distribution: Pantropical.

SOLANUM Linnaeus

Solanum anguivi Lamarck, Encycl. 2: 23. 1793; Hawkes in Bot. J. Linn. Soc. 76: 290. 1978; FB 2(3): 1056. 2001.

Vernacular Name: *Khunthai* (Mech).

Spiny shrubs; stem prickles short, sparsely stellate towards base. Leaves ovate or oblong-ovate, repand or lobed, acute, base unequally truncate. Inflorescence an extra-axillary cyme of 4 – 15 flowers all of which are bisexual. Calyx cup-shaped, densely stellate-pubescent. Corolla densely stellate-tomentose outside, more sparsely stellate-pubescent inside. Berry globose, orange.

Flowers & Fruits: April – January.

Exsicattus: Nimati, *Ajita & AP Das 161*, dated 08.11.2005; Uttar Mendabari, *Ajita & AP Das 176*, dated 13.11.2005.

Local Distribution: Ghoramara, Nimati, Mantharam, Paschim Satali and Uttar Mendabari.

General Distribution: Indian subcontinent and Tropical Africa.

Solanum nigrum Linnaeus, Sp. Pl. 1: 183. 1783; FBI 4: 229. 1883; FEH 1: 284. 1966; FB 2(3): 1052. 2001.

Vernacular Name: *Moisung* (Mech).

Weak, branched erect herbs or under shrubs. Leaves ovate – oblong, toothed lobed. Flowers in axillary drooping cymes; corolla white; staminal filament hairy at base. Berries globose.

Flower & Fruits: November – March.

Exsicattus: Nimati, *Ajita & AP Das 122*, dated 02.02.2005.

Local Distribution: Throughout the study area.

General Distribution: India, Tropical Africa, S. E. Asia, Australia and America.

Solanum torvum Swartz, Prodr. 47. 1788; FBI 4: 234. 1883; FEH 1: 284. 1966; FB 2(3): 1055. 2001.

Vernacular Name: *Khunthai Raja* (Mech).

Sparingly armed shrubs, branches densely stellate-pubescent when young, prickles few, usually confined to stems. Leaves ovate with deeply 2 – 3 sinuate, lobes acute. Inflorescence a dense, pedunculate, extra-axillary, branched; corolla white; anther yellow. Berries green turning bright yellow and finally orange, glabrous; seeds pale olive, almost smooth.

Flower & Fruits: November – March

Exsicattus: Paschim Satali, *Ajita & AP Das 003*, dated 04.07.2004; Mendabari, *Ajita & AP Das 450*, dated 01.02.2009.

Local Distribution: Throughout the study area.

General Distribution: Tropical India, China, Malaya, Philippines and Tropical America.

Solanum tuberosum Linnaeus, Sp. Pl. 185. 1753; EFPN 3: 112. 1982; FB 2(3): 1055. 2001.

Vernacular Name: *Thablati* (Mech).

Tuberous perennial; stems erect, branched. Leaves imparipinnate; leaflets 3 – 5 pairs. Inflorescence terminal, few-flowered paniculate cyme; calyx campanulatepubescent; lobes ovate. Corolla white, pendent.

Flower & Fruits: June – October.

Exsicattus: Nimati, *Ajita & AP Das 232*, dated 05.12.2007; Dakshin Mendabari, *Ajita & AP Das 297*, dated 11.03.2008.

Local Distribution: Cultivated.

General Distribution: Native to South America; widely cultivated.

Solanum viarum Dunal in A. de Candolle, Prodr. 13(1): 240. 1852; FB 2(3): 1057. 2001.

Vernacular Name: *Kata Fithai* (Mech).

Herbs, armed. Stems and branches terete. Leaves unequal paired; armed with erect, leaf blade broadly ovate, sessile. Inflorescences extra-axillary. Flowers andromonoecious. Corolla white or green. Ovaries puberulent. Berries pale yellow.

Flowers & Fruits: June – October.

Exsicattus: Paschim Satali, *Ajita & AP Das 205*, dated 11.06.2006.

Local Distribution: Throughout Duars.

General Distribution: Tropical and sub-tropical parts of the world.

CONVOLVULACEAE A. Jussieu

ARGYREIA Loureiro

Argyrea roxburghii Choisy in Mem. S. Phys. Hist. Nat. Geneve 6: 419. 1834; FBI 4: 185. 1883; FEH 1:207. 1966; EFPN 3: 105. 1982; FB 2(2): 841. 1999.

Vernacular Name: *Dudhali Bindong* (Mech).

Climbers. Stems terete, villous. Leaf blade broadly ovate to circular. Inflorescences cymose. Sepals unequal. Corolla red-purple, funnel form. Ovary glabrous. Berry enclosed by enlarged calyx, dark purple, ovoid-globose.

Flowers & Fruits: February – October.

Exsicattus: Paschim Satali, *Ajita & AP Das 002*, dated 04.07.2004; Baniapara, *Ajita & AP Das 063*, dated 01.10.2004.

Local Distribution: Throughout the study area.

General Distribution: Tropical and sub-tropical parts of the world.

IPOMOEIA Linnaeus

Ipomoea aquatica Forsskal, Fl. Aegypt. Arab. 44. 1775; FBI 4: 210. 1883; EFPN 3: 106. 1982. *Ipomoea reptants* Poirlet in Lamarck, Suppl. 3: 460. 1814.

Vernacular Name: Khalmi (Mech).

Aquatic trailing herbs; rooting at nodes; stem hollow. Lamina usually hastate, ovate-oblong, acute to acuminate. Flowers solitary or in few flowered peduncled cymes; Sepals ovate-oblong; corolla pale purple. Capsules ovoid, globose.

Flowers & Fruits: August – February.

Exsiccatus: Chhekamari, *Ajita & AP Das 079*, dated 03.10.2004; Paschim Satali, *Ajita & AP Das 360*, dated 11.07.2008.

Local Distribution: Chhekamari, Nimati, Ghoramara and Paschim Satali.

General Distribution: Throughout the India; Tropical Asia, Australia and Africa.

CUSCUTACEAE Dumitriu

CUSCUTA Linnaeus

Cuscuta reflexa Roxburgh, Pl. Corom. 2: 3, t. 104. 1798; FBI 4: 225. 1883; FB 2(2): 863. 1999.

Vernacular Name: Sona Bindong (Mech).

Stem branched, reddish. Flowers sweetly scented in a short lax raceme, creamy white.

Flowers & Fruits: February – October.

Exsiccatus: Latabari, *Ajita & AP Das 380*, dated 01.08.2008.

Local Distribution: Latabari and Nimati.

General Distribution: India, Sri Lanka, Malaysia.

EHRETIACEAE Lindley

EHRETIA P. Br.

Ehretia serrata Roxburgh, Fl. Ind. 2: 340. 1824; FB 2(2): 875. 1999. *Ehretia acuminata* R. Brown, Prodr. 147. 1810.

Vernacular Name: Larlaria (Mech).

Trees, up to 15 m. Leaves shortly petiolate, lamina elliptic-oblong, serrulate, acuminate, base cuneate, glabrous above. Inflorescence a terminal, ovate. Flowers sessile in ovoid subracemose glomerules. Calyx cup-like; corolla white, Drupes subglobose.

Flowers & Fruits: March – August.

Exsiccatus: Nimati, *Ajita & AP Das 126*, dated 02.02.2005.

Local Distribution: Nimati.

General Distribution: Bhutan, Japan, Nepal, Vietnam.

VERBENACEAE Jaume St. Hilaire

CALLICARPA Linnaeus

Callicarpa arborea Roxburgh *ex* Clarke in FBI 4: 567. 1885; FEH 1: 268. 1966; EFPN 3: 145. 1982; FB 2(2): 919. 1999.

Vernacular Name: Dhouli (Mech).

Trees; branchlets closely yellowish stellate tomentose. Leaves opposite, ovate – elliptic, entire, acuminate, base cuneate, glabrous above, stellate tomentose beneath. Cymes axillary with purple-mauve flowers. Drupes globose, black or purple when ripe.

Flowers & Fruits: April – November.

Exsicattus: Paschim Satali, *Ajita & AP Das 020*, dated 29.08.2004.

Local Distribution: Ghoramara and Paschim Satali.

General Distribution: Himalaya (Kumaon-Bhutan), India, Myanmar, Malaysia, S. China.

CLERODENDRUM Linnaeus

Clerodendrum serratum (Linnaeus) Moon, Cat. Ceylon Pl. 46. 1824; EFPN 3: 146. 1982; FB 2(2): 933. 1999. *Volkameria serrata* Linnaeus, Mant. Pl. 90. 1767.

Vernacular Name: Holupang (Mech).

Shrubs; branchlets quadrangular. Leaves membranous, opposite, obovate or elliptic, acute or apiculate, base attenuate, margins shallowly to coarsely, distantly serrate, glabrous or puberulous on veins. Bracts leafy, pubescent. Calyx cup-shaped, puberulous. Corolla bilabiate, creamy or white, with blue or purple lip. Drupes 2 – 4 -lobed.

Flowers & Fruits: July – February.

Exsicattus: Dakshin Mendabari, *Ajita & AP Das 060*, dated 01.10.2004; Chhekamari, *Ajita & AP Das 078*, dated 03.10.2004.

Local Distribution: Chhekamari and Dakshin Mendabari.

General Distribution: India, Sri Lanka, Bangladesh, Myanmar.

Clerodendrum viscosum Ventenat, Jard. Malamina 1: 25. 1803; FB 2(2): 934. 1999. *Clerodendrum infortunatum* Loureiro, Fl. Cochinch. ed. 1, 2: 387. 1790; FBI 4: 594. 1885.

Vernacular Name: Lakhna (Mech).

Shrub or subshrub; stems quadrangular. Lamina ovate, subentire-serrate, dentate, acute or acuminate, base sub-truncate or rounded. Panicles pyramidal, corymbose, terminal bracteates. Flowers scented, pink tinged white. Drupes hidden in red persistent calyx, black.

Flowers & Fruits: February – August.

Exsicattus: Paschim Satali, *Ajita & AP Das 016*, dated 21.08.2004; Gossaigaon, *Ajita & AP Das 386*, dated 20.08.2008.

Local Distribution: Throughout the study area.

General Distribution: Indo – Malaysia.

GMELINA Linnaeus

Gmelina arborea Roxburgh, Pl. Corom. 3: 4. t. 246. 1815; FBI 4: 581. 1885; FEH 2: 113. 1971; EFPN 3: 147. 1982; FB 2(2): 928. 1999.

Vernacular Name: Gambri (Mech).

Deciduous tree with stout, glabrous branchlets. Leaves simple, ovate-triangular, acuminate, base truncate or cordate, margin entire, glabrous above, densely minutely white scaly beneath. Flowers in terminal corymbose panicles, yellow. Drupes ovoid with persistent calyx, fleshy.

Flowers & Fruits: February – June.

Exsiccatus: Paschim Satali, *Ajita & AP Das 359*, dated 11.07.2008; Gossaigaon, *Ajita & AP Das 389*, dated 20.08.2008; Karjeepra, *Ajita & AP Das 459*, dated 16.04.2009.

Local Distribution: Chhekamari, Karjeepra, Khoardanga, Nimati, Uttar Mendabari, Paschim Satali, Basugaon and Kochugaon.

General Distribution: Himalaya (Nepal to Bhutan), India, Sri Lanka and Philippines.

LIPPIA Linnaeus

Lippia javanica (Burman f.) Sprengel, Syst. 2: 752. 1825; FB 2(2): 916. 1999. *Verbena javanica* Burman f., Fl. Ind. 12. t. 6, f. 2. 1768. *Lippia geminata* Humboldt, Bonpland & Kunth, Nov. Gen. Sp. 2: 266. 1818; FBI 4: 563. 1885.

Vernacular Name: *Anthai Bazab* (Mech).

Small pubescent shrubs; branches slender erect or sub-erect. Leaves opposite, lamina ovate, elliptic ovate or elliptic oblong, acute, finely crenate-serrate, truncate to cuneate at base. Heads axillary, bracts pubescent, lower ones broad, higher ones becoming smaller and narrower. Fruits globose.

Flower & Fruits: January – August.

Exsiccatus: Dakshin Mendabari, *Ajita & AP Das 111*, dated 13.11.2004; Nimati, *Ajita & AP Das 125*, dated 02.02.2005.

Local Distribution: Dakshin Mendabari and Nimati.

General Distribution: Pantropical.

NYCTANTHES Linnaeus

Nyctanthes arbor-tristis Linnaeus, Sp. Pl. 6. 1753; FBI 3: 603. 1882; FB 2(2): 937. 1999.

Vernacular Name: *Sephali Bibar* (Mech).

Shrubs; branches quadrangular. Leaves rigid, ovate, acuminate, base rounded or cuneate, margin entire or coarsely serrate, scabrid-hairy above, appressed pubescent on veins beneath. Flowers fragrant, sessile; corolla tube orange; lobes white. Capsule elliptic or suborbicular, 2 – lobed.

Flowers & Fruits: September – January.

Exsiccatus: Uttar Mendabari, *Ajita & AP Das 292*, dated 08.03.2008.

Local Distribution: Cultivated in study area.

General Distribution: India, cultivated in tropical area.

TECTONA Linnaeus f.

Tectona grandis Linnaeus f., Suppl. 151. 1781; FBI 4: 570. 1885; FB 2(2): 921. 1999.

Vernacular Name: *Seghun Bingfang* (Mech).

Deciduous trees; branchlets quadrangular, finely matted with whitish stellate hairs. Leaves opposite, broadly ovate, elliptic or obovate, acute or obtuse, base attenuate, smooth or scabrid above; petiole 1 – 3 cm. Panicles large, long and broad, stellate tomentose. Calyx tube and tomentose outside. Corolla white, with short tube and rounded lobes. Drupes depressed globose, and thickly hirsute.

Flowers & Fruits: May – January.

Exscicattus: Paschim Satali, *Ajita & AP Das 097*, dated 13.10.2004.

Local Distribution: Throughout the study area.

General Distribution: Indo- Malaysia.

VITEX Linnaeus

Vitex negundo Linnaeus, Sp. Pl. 638. 1753; FBI 4: 583. 1885; FEH 1: 270. 1966; FB 2(2): 926. 1999.

Vernacular Name: *Nisindou* (Mech).

Shrub with suberect branches. Leaves digitately 3 – 5 foliate; leaflets ovate – lanceolate, entire, crenulate acute or acuminate, glaucous beneath. Flowers purplish blue. Drupe obscurely ribbed and glandular.

Flower & Fruits: April – October.

Exscicattus: Nimati, *Ajita & AP Das 182*, dated 07.03.2006.

Local Distribution: Nimati, Latabari, Ghoramara and Paschim Satali.

General Distribution: India, Himalaya, Sri Lanka, Afganistan, China, Myanmar, Malaysia.

LAMIACEAE Lindley, *nom. alt.*

[LABIATAE A. Jussieu, *nom. cons.*]

LEUCAS R. Brown

Leucas indica (Linnaeus) R. Brown ex Vatke in Oesterr. Bot. Zeits. 25: 95. 1875; FB 2(2): 963. 1999.

Leonurus indicus Linnaeus, Syst. ed 10: 1101. 1760.

Vernacular Name: *Khansisa* (Mech).

Erect, much branched herbs. Stem quadriangular. Leaves opposite, linear – lanceolate, entire. Inflorescence verticillaster. Corolla bilabiate, white; stamens didynamous, carcerules black.

Flowers & Fruits: August – February.

Exscicattus: Baniapara, *Ajita & AP Das 089*, dated 09.10.2004; Latabari, *Ajita & AP Das 132*, dated 03.02.2005; Mendabari, *Ajita & AP Das 154*, dated 28.10.2008; Nimati, *Ajita & AP Das 305*, dated 16.03.2008; Dhalkar, *Ajita & AP Das 307*, dated 02.04.2008; Latabari, *Ajita & AP Das 333*, dated 20.05.2008; Dhalkar, *Ajita & AP Das 476*, dated 26.05.2009.

Local Distribution: Throughout the study area.

General Distribution: India, Bangladesh, Sri Lanka, Myanmar, Malaya, China, Nepal, Temperate Asia and Australia.

MENTHA Linnaeus

Mentha spicata Linnaeus, Sp. Pl. 576. 1753; FB 2(2): 978. 1999.

Vernacular Name: *Madam-nai Bilai* (Mech).

Clump-forming herb. Leaves oblong – elliptic to oblong – lanceolate, distantly serrate, acute. Corolla white. Nutlets smooth or reticulate.

Flowers & Fruits: August – October.

Exscicattus: Chhekamari, *Ajita & AP Das 071*, dated 03.10.2004.

Local Distribution: Chhekamari.

General Distribution: Europe, Afghanistan, W. Pakistan, Himalaya (Kashmir to Nepal), Tibet, N. America, widely cultivated.

OCIMUM Linnaeus

Ocimum tenuiflorum Linnaeus, Sp. Pl. 2: 597. 1753; FB 2(2): 1002. 1999.

Vernacular Name: *Tulutsi* (Mech).

Erect, strongly aromatic herbs. Stem 4 – angled. Lamina ovate-lanceolate, entire, hairy. Flowers in whorls; corolla whitish-pink, bilabiate, stamens 4. Nutlets 4, black.

Flowers & Fruits: April – August.

Exsicattus: Paschim Satali, *Ajita & AP Das 008*, dated 01.08.2004; Khoardanga, *Ajita & AP Das 301*, dated 14.03.2008; Dhalkar, *Ajita & AP Das 310*, dated 02.04.2008; Chhekamari, *Ajita & AP Das 326*, dated 12.05.2008; Chhekamari, *Ajita & AP Das 358*, dated 10.07.2008.

Local Distribution: Throughout the study area.

General Distribution: India, warmer parts of Asia, Africa and America.

POGOSTEMON Desfontaines

Pogostemon amaranthoides Benthham in DC., Prodr. 12: 153. 1848; FBI 4: 634. 1885; FEH 280. 1966; FB 2(2): 985. 1999.

Vernacular Name: *Hagra Bingfang* (Mech).

Herbs; stems erect or sprawling, pubescent – tomentose in young. Leaves ovate – lanceolate, acute – acuminate, base cuneate-attenuate, numerous glands on lower surface. Cayx obovoid; corolla white. Nutlets trigonous.

Flowers & Fruits: September – October.

Exsicattus: Paschim Satali, *Ajita & AP Das 147*, dated 20.10.2005.

Local Distribution: Throughout the study area.

General Distribution: Himalaya (Kumaun to Bhutan), Assam.

SCROPHULARIACEAE A. Jussieu

BACOPA Aublet

Bacopa monnieri (Linnaeus) Pennell, Proc. Acad. Nat. Sci. Philadelphia 98: 96. 1946; FB 2(3): 1113. 2001. *Lysinachia monniero* Linnaeus, Cent. Pl. II. t. 9.1756.

Vernacular Name: *Barami* (Mech).

Amphibious, procumbent annual herbs, stem glabrous, floating and roots originated from nodes. Leaves smelling of camphor, opposite, lamina sessile, ovate – elliptic or linear – lanceolate. Flowers in axillary cymes or racemes, or solitary – axillary. Penicel, bracteolate, linear – oblong. Calyx usually 4 – 6 mm; corolla white or mauve, villose within; all filaments glabrous; Capsules ovoid, 3 – 4 mm.

Flowers & Fruits: September – February.

Exsicattus: Chhekamari, *Ajita & AP Das 245*, dated 08.01.2008.

Local Distribution: Chhekamari.

General Distribution: India, tropical & warm-temperate part of world, Australia.

LINDERNIA Allioni

Lindernia anagallis (Burman f.) Pennell in J. Arn. Arbor. 24: 252. 1943; EFPN 3: 116. 1982; FB 2(3): 1123. 2001. *Ruellia anagallis* Burman f., Fl. Ind. 135. 1768; FBI 4: 285. 1884.

Vernacular Name: Gaphtnak Bibar (Mech).

Annual, stem creeping rooting at lower node, ascending, branched herbs. Leaves sub sessile or shortly petiolate, linear – lanceolate, ovate, entire. Flowers solitary, axillary; calyx deeply 5 lobed; corolla white to pale purple. Capsule cylindrical, acuminate, glabrous.

Flowers & Fruits: January – February.

Exsicattus: Baniapara, *Ajita & AP Das 088*, dated 09.10.2004.

Local Distribution: Throughout the study area.

General Distribution: India, Sri Lanka, Malaya, Indonesia, Siam, China, Philippines Islands and Java.

MECARDONIA Ruiz & Pavon

Mecardonia procumbens (Miller) Small, Fl. South-east U.S. 1065, 1338. 1903; FB 2(3): 1114. 2001.

Erinus procumbens Miller, Gaed. Dict. Ed. 8, Ni.6. 1768.

Vernacular Name: Gauda Bibar (Mech).

Prostrate. Leaves ovate, serrate in upper part. Pedicels erecto-patent. Corolla yellow; tube pubescent. Capsules ovoid or ellipsoid; seeds ellipsoid.

Flowers & Fruits: June – December.

Exsicattus: Baniapara, *Ajita & AP Das 090*, dated 09.10.2004.

Local Distribution: Throughout the study area.

General Distribution: Native of America and naturalized in India.

SCOPARIA Linnaeus

Scoparia dulcis Linnaeus, Sp. Pl. ed. 1, 116. 1753; FBI 4: 289. 1884; FEH 1:290. 1966; EFPN 3:126. 1982.

Vernacular Name: Rakhep (Mech).

Branched annual herb, stem erect; semi woody. Leaves sessile, opposite, sometimes terrately whorled; lamina elliptic or rhomboid, margin serrate, punctate, Flowers axillary, white calyx 3 – nerved, segments imbricate in bud; corolla white filament base woody. Capsule globose, septisidal; seeds obovoid, angular.

Flowers & Fruits: June – December.

Exsicattus: Paschim Satali, *Ajita & AP Das 014*, dated 21.08.2004; Dakshin Mendabari, *Ajita & AP Das 057*, dated 01.10.2004; Baniapara, *Ajita & AP Das 091*, dated 09.10.2004; Mendabari, *Ajita & AP Das 344*, dated 30.06.2008.

Local Distribution: Throughout the study area.

General Distribution: Tropical India; America, commonly naturalised in tropical Asia.

ACANTHACEAE A. Jussieu

ANDROGRAPHIS Wallich ex C.G.D. Nees

Andrographis paniculata (N.L. Burman) Nees in Wallich, Pl. Asiat. Rar. 3: 116. 1832. *Justicia paniculata* N.L. Burman, Fl. Indica 9. 1768.

Vernacular Name: *Khalamegh* (Mech).

Herbs. Leaves ovate – oblong to oblong – lanceolate, slightly obtuse. Racemes terminal or axillary; peduncle leaves smaller than those on branches. Corolla white. Capsules compressed with a canal at middle.

Flowers & Fruits: June – December.

Exsiccatu: Chhekamari, *Ajita & AP Das 328*, dated 12.05.2008.

Local Distribution: Chhekamari.

General Distribution: Tropical and sub-tropical parts of the world.

HYGROPHILA R. Brown

Hygrophila auriculata (Schumacher) Heine, Kew Bull. 16(2): 172. 1962; FB 2(3): 1252. 2001. *Barleria auriculata* Schumacher in Schumacher & Thonn., Beskr. Guin. Pl. 285. 1827. *Hygrophila spinosa* Anderson in Thwerts, Enum. Pl. Zeyl. 225. 1860 & J. Lin. Soc. (Bot) 7: 22. 1864; FBI 4: 408. 1884.

Vernacular Name: *Boikhara* (Mech).

Spiny erect, marshy, hispid herbs. Lamina sessile, oblong-lanceolate or oblanceolate with several long, sharp prominent reddish yellow axillary spines. Flowers bright bluish purple, showy. Capsules linear oblong.

Flowers & Fruits: March – August.

Exsiccatu: Nimati, *Ajita & AP Das 250*, dated 10.01.2008.

Local Distribution: Nimati.

General Distribution: Tropical regions of Asia, Africa and America.

JUSTICIA Linnaeus

Justicia adhatoda Linnaeus, Sp. Pl. 1: 15. 1753, FB 2(3): 1287. 2001. *Adhatoda vasica* Nees in Pl. As. Rar., 3: 103. 1832; FBI 4: 540. 1885.

Vernacular Name: *Chinchiri* (Mech).

Shrubs. Branches cylindric, gray, lenticellate; leaf blade oblong – lanceolate, lanceolate, ovate, or elliptic ovate, base broadly cuneate, margin entire, apex acuminate to sometimes caudate. Spike ovoid to elongate. Corolla white with purplish striate or pink. Capsule subwoody.

Flowers & Fruits: June – December.

Exsiccatu: Dakshin Mendabari, *Ajita & AP Das 334*, dated 30.05.2008; Latabari, *Ajita & AP Das 378*, dated 01.08.2008; Mondalpara, *Ajita & AP Das 404*, dated 28.10.2008.

Local Distribution: Throughout Duars and Kokrajhar.

General Distribution: Tropical and sub-tropical parts of the world.

Justicia gendarussa Burman f., Fl. Ind. 10. 1768; FBI 4: 532. 1885; FB 2(3): 1287. 2001. *Gendarussa vulgaris* Nees in Wallich, Pl. As. Rar. 3: 104. 1832.

Vernacular Name: *Jatrashli* (Mech).

Shrubs. Branches dark brown, glabrous; lamina lanceolate or narrowly elliptic, tapering to obtuse apex, attenuate, glabrous, purplish. Spikes terminal and axillary, corolla white with purple streaks, glabrous. Flowers in clusters along rachis with leafy bracts.

Flowers & Fruits: October – May.

Exsiccatus: Paschim Satali, *Ajita & AP Das 011*, dated 03.08.2004; Chhekamari, *Ajita & AP Das 372*, dated 15.07.2008; Mondalpara, *Ajita & AP Das 403*, dated 28.10.2008.

Local Distribution: Chhekamari, Ghoramara, Mondalpara, Nimati and Paschim Satali.

General Distribution: India, Nepal, Bhutan, Thailand, Myanmar.

PHLOGACANTHUS Nees

Phlogacanthus thyrsoiflorus (Hardwicke) Mabberley in Bot. Hist. Hortus Malabaricus 83. 1980; FBI 4: 512. 1884; FEH 1: 303. 1966; EFPN 3:143.1982; FB 2(3): 1284. 1991. *Justicia thyrsoiformis* Hardwicke in Asiat. Res. 6: 349. 1799.

Vernacular Name: *Chinchingri Khala* (Mech).

Shrubs. Stems erect, glabrous. Leaves often crowded near branch tips, elliptic, shortly acuminate at both ends, glabrous. Flowers in a dense, uninterrupted terminal thyse. Bracts linear, pubescent. Calyx pubescent, lobes linear. Corolla orange – brown. Capsule narrowly clavate, 2 – 4 cm.

Flowers & Fruits: January – March.

Exsiccatus: Chhekamari, *Ajita & AP Das 082*, dated 12.10.2004; Mondalpara, *Ajita & AP Das 436*, dated 25.12.2008.

Local Distribution: Chhekamari and Mondalpara.

General Distribution: India, Bhutan, Nepal.

BIGNONIACEAE A. Jussieu

OROXYLUM Ventenat

Oroxylum indicum (Linnaeus) Bentham ex Kurz, Forest Fl. Burma 2: 237. 1877; FB 2(3): 1241. 2001. *Bignonia indica* Linnaeus, Sp. Pl. 2: 625. 1753.

Vernacular Name: *Kharo Khandai* (Mech).

Trees. Leaves pinnately compound, borne nearly at stem apex; leaflets triangular-ovate. Flowers usually open at night, with foul smell. Calyx purple, campanulate. Corolla purple – red. Disc large. Capsules woody. Seeds rounded, including papery wing.

Flowers & Fruits: September – December.

Exsiccatus: Paschim Satali, *Ajita & AP Das 044*, dated 15.09.2004; Paschim Satali, *Ajita & AP Das 279*, dated 16.02.2008.

Local Distribution: In Duars.

General Distribution: Tropical and sub-tropical parts of the world.

RUBIACEAE A. Jussieu

FAGERLINDIA Tirvengadam

Fagerlindia fasciculata (Roxburgh) Tirvengadam, Nordic J. Bot. 3(4): 458. 1983; FB 2(2): 787. 1999.
Posoqueria fasciculata Roxburgh, Fl. Ind. 2: 568. 1824.

Vernacular Name: *Maina* (Mech).

Trees. Leaves ovate – oblong, truncate-attenuate at base, hairs on midrib beneath. Stipules caduceous. Flowers fragrant; calyx hairy outside, glabrous inside; corolla white. Fruit purplish.

Flowers & Fruits: March – May.

Exsiccatus: Nimati, *Ajita & AP Das 169*, dated 12.11.2005.

Local Distribution: In Duars.

General Distribution: Himalaya (Nepal to Bhutan), Khasia.

IXORA Linnaeus

Ixora coccinea Linnaeus, Sp. Pl. 1: 110. 1753; FB 2(2): 798. 1999.

Vernacular Name: *Rangan Bibar* (Mech).

Shrubs; stems glabrous, bark greyish. Leaves sessile, elliptic or obovate, acute, obtuse or rounded, base cordate or rounded. Inflorescence compact, few-flowered. Corolla crimson or yellow. Fruits wide.

Flowers & Fruits: Throughout the year.

Exsiccatus: Paschim Satali, *Ajita & AP Das 137*, dated 08.02.2005.

Local Distribution: Cultivated.

General Distribution: Widely cultivated throughout the tropic World.

MORINDA Linnaeus

Morinda angustifolia Roxburgh, Pl. Coromandel tab. 287. 1819; FBI 3: 156. 1880; FB 2(2): 804. 1999.

Vernacular Name: *Achhou Gakha* (Mech).

Erect shrubs. Leaves opposite, or opposite an inflorescence; oblong, elliptic, margin entire, acuminate at apex. Capitulum opposite a top leaf, many-flowered. Flowers sessile. Corolla white. Drupecetum baccate, white or black at maturity.

Flowers & Fruits: March – June.

Exsiccatus: Uttar Mendabari, *Ajita & AP Das 202*, dated 14.05.2006.

Local Distribution: Nimati and Uttar Mendabari.

General Distribution: Tropical and sub-tropical parts of the world.

MUSSAENDA Linnaeus

Mussaenda glabra Vahl, Symb. Bot. 3: 38. 1794; FBI 3: 90. 1880; FEH 312. 1966; EFPN 2: 204. 1979; FB 2(2): 783. 1999.

Vernacular Name: *Kotmotia* (Mech).

Branched scrambling shrub; stems brownish. Leaves petiolate, oblong – elliptic, acute at both ends, veins adpressed pubescent; stipules narrowly triangular. Inflorescence a lax, repeatedly trichotomous, terminal corymb. Calyx lobes triangular, tapering from base, sparsely pilose. Berries globose, glabrous.

Flowers & Fruits: June – November.

Exsiccatus: Nimati, *Ajita & AP Das 193*, dated 22.04.2006.

Local Distribution: In study area.

General Distribution: Himalaya (Nepal, Sikkim), Burma, China, Indo-China, Malaysia.

Mussaenda roxburghii Hooker f., FBI 3:87. 1880; FEH 1: 312. 1966; FB 2(2): 782. 1999.

Vernacular Name: Kotmotia (Mech).

Shrub; stems glabrous or pilose. Leaves petiolate, elliptic, rarely ovate or oblong acuminate at both ends. Flowers densely covered with long silky hairs in a dense terminal heads.

Flowers & Fruits: June – October.

Exsicattus: Nimati, *Ajita & AP Das 192*, dated 22.04.2006.

Local Distribution: Nimati, Paschim Satali and Sibkata.

General Distribution: Eastern Himalaya, Bangladesh, Myanmar.

NEANOTIS W.H. Lewis

Neanotis hirsuta (Linnaeus f.) Lewis in Ann. Missouri Bot. Gard. 53: 38. 1966; FB 2(2): 768. 1999.

Oldenlandia hirsuta Linnaeus f. Suppl. 127. 1781.

Vernacular Name: Khaskhasi Bilai (Mech).

Herbs; stem slender. Leaf blade ovate to elliptic, acute, base decurrent to petiole, both surfaces hairy; stipule membranous, base connate. Inflorescence terminal or axillary. Flowers white or pale purple. Calyx tube tubulate. Corolla funnellform; lobes broadly lanceolate, acute, shorter than tube. Capsules compressed globose, apex flat. Seeds minutely foveolate.

Flowers & Fruits: July – October.

Exsicattus: Nimati, *Ajita & AP Das 207*, dated 17.10.2006.

Local Distribution: Nimati.

General Distribution: India, Vietnam, Laos, Cambodia, Japan, Korea.

NEOLAMARCKIA Boissier

Neolamarckia cadamba (Roxburgh) J. Bosser in Bull. Mus. Nation. Hist. Nat. 4e ser., B. Adansonia 6: 247. 1984; FB 2(2): 739. 1999. *Nanctea cadamba* Roxburgh, Fl. Ind. ed. Carey, 2: 121. 1824.

Vernacular Name: Khadam (Mech).

Deciduous large trees. Lamina elliptic or oblong – elliptic, apex acute, base rounded or truncate. Flowering heads solitary. Calyx glabrous. Corolla yellowish white. Fruits yellowish green at maturity.

Flowers & Fruits: June – November.

Exsicattus: Paschim Satali, *Ajita & AP Das 043*, dated 05.09.2004; Dakshin Mendabari, *Ajita & AP Das 230*, dated 01.10.2007; Paschim Satali, *Ajita & AP Das 441*, dated 30.12.2008.

Local Distribution: Paschim Satali, Nimati, Ghoramara, Uttar Dhalkar and Dakshin Mendabari.

General Distribution: Tropical and sub-tropical parts of the world.

OLDENLANDIA Linnaeus

Oldenlandia corymbosa Linnaeus, Sp. Pl. ed. 1(1): 119. 1753; FBI 3: 64. 1880; FEH 1: 309. 1966; FB 2(2): 766.1999.

Vernacular Name: Hagrani Bilai (Mech).

Annual diffuse, prostrate herbs; stem 4 angled, slender, branched. Leaves opposite, sessile, linear to elliptic-lanceolate, entire, acuminate with false petiole. Flowers white.

Flowers & Fruits: January – December.

Exscicattus: Nimati, *Ajita & AP Das 233*, dated 05.12.2007.

Local Distribution: Chhekamari, Ghoramara, Mendabari and Nimati.

General Distribution: India, Sri Lanka, Tropical Asia, Africa, America.

PAEDERIA Linnaeus

Paederia foetida Linnaeus, Mant. Pl. 1: 52. 1767; Fl. Ind. 2:517. 1824; FBI 3:195. 1881; FEH 1:314. 1966; EFPN 2:206. 1979; FB 2 (2): 812. 1991.

Vernacular Name: *Khipi Bindong* (Mech).

Climbers. Leaves hairy beneath in vein axils, ovate, acuminate, truncate at base. Inflorescence densely pubescent or leafy to apex. Flowers subsessile. Calyx lobes triangular. Corolla outside reddish or purplish beneath whitish pubescence; lobes ovate with broad undulate margin. Fruits globose.

Flowers & Fruits: July – January.

Exscicattus: Paschim Satali, *Ajita & AP Das 364*, dated 13.07.2008.

Local Distribution: Mendabari, Nimati, Paschim Satali and Sibkata.

General Distribution: Himalaya, C. and E. India-China, Malaysia.

PSILANTHUS Hooker f.

Psilanthus bengalensis (Schultes) Leroy, FB 2(2): 803. 1999. *Coffea bengalensis* Schultes, Fl. Ind. 1: 540. 1820; FBI 3: 153. 1880; FEH 1: 308. 1966.

Vernacular Name: *Hagrani Bibar* (Mech).

Deciduous shrubs; branches spreading. Lamina elliptic, oblong – lanceolate to ovate-lanceolate, caudate-acuminate, base rounded to acute, nerves hairy beneath. Flowers white. Drupes ovoid or subglobose, black when ripe. Seeds grooved.

Flowers & Fruits: February – November.

Exscicattus: Gossaigaon, *Ajita & AP Das 385*, dated 20.08.2008.

Local Distribution: Throughout the study area.

General Distribution: Subtropical Himalaya, Bangladesh, Myanmar.

SPERMACOCE Linnaeus

Spermacoce latifolia Aublet, Hist. Pl. Guiane 1: 55, t. 19/1. 1775; FB 2(2): 817. 1999.

Vernacular Name: *Hagrani Bilai* (Mech).

Diffuse herbs. Leaf blade elliptic or ovate – oblong, apex acute or obtuse, base broadly cuneate, margin wavy. Flowers in axillary clusters within sheath of stipule, sessile. Fruit a capsule, ellipsoid. Seeds sub-ellipsoid, both ends obtuse.

Flowers & Fruits: May – June.

Exscicattus: Sibkata, *Ajita & AP Das 340*, dated 10.06.2008.

Local Distribution: Throughout the study area.

General Distribution: Tropical and sub-tropical parts of the world.

ASTERACEAE Dumitriu, *nom. alt.*

[COMPOSITAE Giseke, *nom. cons.*]

ACMELLA Richard

Acmella calva (DC.) Jansen, Syst. Bot. Monogr. 8: 41. 1985; FB 2(3): 1605. 2001. *Spilanthes calva* DC. in Wight, Contr. Bot. Ind. 19. 1834; FEH 2: 141. 1971; EFPN 3: 45. 1982; FI 12: 409. 1995. *Spilanthes acmella* var. *calva* (DC.) Clarke, Comp. Ind. 138. 1876; FBI 3: 307. 1881.

Vernacular Name: Usumai (Mech).

Decumbent profusely branched. Leaves opposite; lamina ovate, acute, serrate, 3 – nerved. Capitula discoid, 5 – 8 mm diameter, yellow. Involucral bracts 2 – serrate, ovoid. Receptacles conical. Rays uniserrate, yellowish. Pappus absent.

Flowers & Fruits: July – November.

Exsicattus: Nimati, *Ajita & AP Das 118*, dated 02.02.2005; Nimati, *Ajita & AP Das 313*, dated 17.04.2008.

Local Distribution: Throughout the study area.

General Distribution: India (Darjeeling, Sikkim, Assam), Nepal, Sri Lanka, China, Myanmar, Indonesia, Malaysia.

AGERATUM Linnaeus

Ageratum conyzoides Linnaeus, Sp. Pl. 2: 839. 1753; FBI 3: 243. 1881; FEH 1: 330. 1966; FI 12: 348. 1995; FB 2(3): 1627. 2001.

Vernacular Name: Hagrani Tulutsi (Mech).

Annual herbs. Stems and branches reddish green. Leaves elliptic to oblong, oblong, base obtuse to broadly cuneate, margin crenate – serrate, apex acute. Capitula small. Corollas glabrous; limb purplish. Achenes black.

Flowers & Fruits: June – December.

Exsicattus: Nimati, *Ajita & AP Das 183*, dated 07.03.2006.

Local Distribution: Throughout the study area.

General Distribution: Native to tropical America; widespread weed throughout Africa, India, Malay Peninsula, Myanmar, Nepal, and the South China Sea islands.

ARTIMISIA Linnaeus

Artemisia indica Willdenow, Sp. Pl. 3: 1846. 1803; EFPN 3: 12. 1982; FI 12: 27. 1995; FB 2(3): 1559. 2001.

Vernacular Name: Nadaona (Mech).

Perennial shrubs, up to 150 cm. Leaves shortly petiolate. Lowermost leaves ovate to oblong – ovate. Middle cauline leaves ovate to ovate – elliptic; lobules deeply serrate, acute or acuminate apically. Upper most leaves pinnatifid. Capitula in broad or midbroad paniculate inflorescences, ovoid. Achenes oblong or obovoid.

Flowers & Fruits: August – October.

Exsicattus: Uttar Mendabari, *Ajita & AP Das 172*, dated 13.11.2005; Uttar Mendabari, *Ajita & AP Das 203*, dated 14.05.2006; Mendabari, *Ajita & AP Das 347*, dated 30.06.2008.

Local Distribution: Uttar Mendabari and Mendabari.

General Distribution: E, S & S.E. Asia, North America including Central America, Oceania.

BIDENS Linnaeus

Bidens pilosa Linnaeus, Sp. Pl. ed. 1: 832. 1753; FBI 3: 309. 1881; FEH 1: 333. 1966; EFPN 3: 15. 1982; FI 12: 372. 1995; FB 2(3): 1619. 2001.

Vernacular Name: Guphut Bibar (Mech).

Annual erect glabrous. Leaves opposite; lamina 3 – lobed, leaflets ovate, toothed, acute. Peduncles stout. Involucral bracts scarious margined. Achenes linear, black.

Flowers & Fruits: June – March.

Exsicattus: Khoardanga, *Ajita & AP Das 304*, dated 15.03.2008.

Local Distribution: Khoardanga.

General Distribution: Pantropical.

CHROMOLAENA DC.

Chromolaena odoratum (Linnaeus) King & Robinson in *Phytologia* 20: 204. 1970; FB 2(3): 1628. 2001.

Eupatorium odoratum Linnaeus, *Syst. Nat. ed. 10*: 1205. 1759; FBI 3: 244. 1881; FI 12. 354. 1995; FB

Vernacular Name: *Germani Bingfang* (Mech).

Erect aromatic, shrubs. Leaves opposite; lamina entire, ovate – lanceolate, serrate, puberulose beneath. Flower white, in terminal corymbose heads. Involucral bracts ovate – lanceolate. Achenes ribbed, base narrowed. Pappus 5, white.

Flowers & Fruits: Throughout the year.

Exsicattus: Baniapara, *Ajita & AP Das 093*, dated 09.10.2007.

Local Distribution: In Baniapara, Paschim Satali, Nimati and Mendabari.

General Distribution: Native to America; naturalized in tropical countries.

CRASSOCEPHALUM Moench

Crassocephalum crepidioides (Bentham) S. Moore in *J. Bot.* 1:211.1912; EFPN 3: 22. 1982; FI 13: 201. 1995; FB 2(3): 1597. 2001. *Gynura crepidioides* Bentham in *Hook. f., Fl. Niger.* 438.1849.

Vernacular Name: *Jenthai* (Mech).

Erect herbs, branches hairy. Leaves elliptic or oblanceolate; lamina ovate, dentate, acute. Inflorescences terminal; capitula few, oblong. Pappus white.

Flowers & Fruits: April – December.

Exsicattus: Paschim Satali, *Ajita & AP Das 145*, dated 01.10.2005.

Local Distribution: Throughout Duars.

General Distribution: India, Sri Lanka, China, Africa and Madagascar.

ECLIPTA Linnaeus *nom. cons.*

Eclipta prostrata (Linnaeus) Linnaeus, *Mant. Pl.* 2: 286. 1771; FI 12: 381. 1995; FB 2(3): 1623. 2001.

Verbesina prostrata Linnaeus, *Sp. Pl.* 2: 902. 1753. *Eclipta alba* (Linnaeus) Hasskarl, *Pl. Jav. Rav.* 528. 1848; FBI 3: 304. 1881. *Verbesina alba* Linnaeus, *Sp. Pl.* 2: 902.1753.

Vernacular Name: *Kalkhasri* (Mech).

Erect or prostrate, rough, diffuse annual herbs. Stems often rooting from the nodes. Leaves opposite, lamina elliptic. Flower-heads small, white, heterogamous, almost sessile. Cypsela laterally winged on the margins, compressed. Pappus obsolete.

Flowers & Fruits: Throughout the year.

Exsicattus: Paschim Satali, *Ajita & AP Das 104*, dated 10.11.2004; Chhekamari, *Ajita & AP Das 371*, dated 15.07.2008.

Local Distribution: Paschim Satali, Chhekamari, Sibkata, Mendabari and Dhalkar.

General Distribution: Pantropical.

ENYDRA Loureiro

Enydra fluctuans Loureiro, Fl. Cochinch. 511. 1790; FBI 3: 304. 1881; FI 12: 384. 1995; FB 2(3): 1614. 2001.

Vernacular Name: Hela (Mech).

Profusely branched, aquatic herbs, puberulent. Leaves opposite, lamina oblong or linear-oblong, distinctly dentate, acute. Heads terminal or axillary, heterogamous, pale yellowish green. Achenes black, glabrous.

Flowers & Fruits: January – April.

Exsicattus: Ghoramara, *Ajita & AP Das 431*, dated 15.12.2008.

Local Distribution: Throughout the study area.

General Distribution: Tropical regions of Asia and Africa.

MIKANIA Willdenow

Mikania micrantha Kunth in Humboldt, Bonpland & Kunth, Nov. Gen. Sp. 4: 134. 1820; FI 12: 357. 1995; FB 2(3): 1625. 2001.

Vernacular Name: Rakhkhasi Bindong (Mech).

Extensive climbers, branches hairy. Lamina triangular – ovate, acute or acuminate, cordate, pubescent. Capitula numerous in dense compound corymbs. Phyllaries oblong, acute or shortly acuminate; corolla greenish white. Cypsela ribbed, glandular; pappus longer than achenes.

Flowers & Fruits: June – December.

Exsicattus: Paschim Satali, *Ajita & AP Das 035*, dated 01.09.2004; Ghoramara, *Ajita & AP Das 432*, dated 15.12.2008.

Local Distribution: Throughout the study area.

General Distribution: India, Tropical America. Nepal, Myanmar, Malaysia, China, Philippines, Taiwan and Tropical Africa.

TAGETES Linnaeus

Tagetes patula Linnaeus, Sp. Pl. 887. 1753; FI 13: 329. 1995; FB 2(3): 1602. 2001.

Vernacular Name: Genda Bibar (Mech).

Shrubs. Leaves 3 – 8 cm; leaflets 3 – 6 pairs. Peduncles slender with leaves obsolete. Involucres 7 – 12mm in diameter. Ray corolla tube 8 – 9 mm; ligule orange or yellow.

Flowers & Fruits: September – December.

Exsicattus: Paschim Satali, *Ajita & AP Das 410*, dated 02.11.2008.

Local Distribution: Cultivated in gardens.

General Distribution: Native of Mexico; widely cultivated in many parts of the world.

XANTHIUM Linnaeus

Xanthium indicum Koenig ex Roxburgh, FI 3: 601. 1832; FI 2: 427. 1995; FB 2(3): 1620. 2001.

Vernacular Name: Okra (Mech).

Scabrous, erect, annual herbs; stem terete, stout. Lamina broadly ovate or sub-orbicular, irregularly toothed. Capitula unisexual, monoecious, globose, axillary or terminal. Cypsela 2, oblong ovoid. Pappus 0.

Flowers & Fruits: August – April.

Exsicattus: Baniapara, *Ajita & AP Das 094*, dated 09.10.2004.

Local Distribution: Duars.

General Distribution: Pantropical.

8.3.2.2. LILIOPSIDA

[MONOCOTYLEDONS]

ARECACEAE Schultz-Schultzenst. (*nom. alt.*) [PALMAE A. Jussieu, *nom. cons.*]

ARECA Linnaeus

Areca catechu Linnaeus, Sp. Pl. 1189. 1753; Fl of Sikkim 1: 180. 1996; FB 3(1): 430. 1994.

Vernacular Name: *Goy* (Mech).

Trunk green when young, distant annual scars. Leaves pinnate; leaflets narrow. In male flowers calyx minute; corolla lobes lanceolate, ribbed. In female calyx lobed to base, oblong – ovate, imbricate; corolla lobes small. Fruits orange when ripe, large, mesocarp fibrous; nuts ellipsoid.

Flowers & Fruits: April – June.

Excicattus: Mendabari, *Ajita & AP Das 346*, dated 30.06.2008; Paschim Satali, *Ajita & AP Das 473*, dated 21.05.2009.

Local Distribution: Cultivated.

General Distribution: Widely cultivated throughout tropical Asia.

CALAMUS Linnaeus

Calamus erectus Roxburgh, Fl. Indica 3: 774. 1832; FBI 6: 438. 1892; FB 3(1): 419. 1994.

Vernacular Name: *Raidong* (Mech).

Shrubs. Branch tufted. Sheaths wide, spiny on upper side, eflagellate. Leaves upto 5 m long with 35 leaflets on each side of sub-opposite, linear-lanceolate. Inflorescence pendent, branched, covered with brown felt. Fruit ellipsoid.

Flowers & Fruits: November – August.

Excicattus: Dhalkar, *Ajita & AP Das 046*, dated 17.09.2004; Gossaigaon, *Ajita & AP Das 384*, dated 20.08.2008.

Local Distribution: Dhalkar, Khoardanga, Nimati and Sibkata.

General Distribution: Eastern Himalaya, Bangladesh.

ARACEAE A. Jussieu

ALOCASIA (Schott) G. Don

Alocasia macrorrhizos (Linnaeus) G. Don in Sweet, Hort. Brit. ed. 3: 631. 1839; FB 3(1): 139. 1994.

Arum macrorrhizon Linnaeus, Sp. Pl. 965. 1753.

Vernacular Name: *Mana Thadung* (Mech).

Rootstock stout. Leaves ovate, large, undulate, obtuse-rounded, bright green. Spathes yellowish green. Fertile male inflorescence white; females yellow.

Flowers & Fruits: April – September.

Excicattus: Mondalpara, *Ajita & AP Das 322*, dated 10.05.2008.

Local Distribution: Mondalpara, Nimati, Paschim Satali and Salkumar.

General Distribution: India, Bangladesh, Nepal, Sri Lanka, S.E. Asia to Pacific.

AMORPHOPHALLUS Blume ex Decn. (*nom. cons.*)

Amorphophallus bulbifer (Roxburgh) Blume in Rumphia 1: 148. 1835; FBI 6: 515. 1893; FEH 1: 394. 1966; FB 3(1): 133. 1994. *Arum bulbiferum* Roxburgh, Fl. Ind. 3: 516. 1832.

Vernacular Name: *Tha Thadung* (Mech).

Tuber subglobose. Cataphylls brown, membranous. Leaf divided into more numerous leaflets; bulbils developed at primary or secondary divisions; leaflets acuminate. Spathe ovate, subacute, margins overlapping basally. Spadix subacute, pink, sometimes whitish.

Flowers & Fruits: April – July.

Exsicattus: Chhekamari, *Ajita & AP Das 081*, dated 03.10.2004.

Local Distribution: Chhekamari.

General Distribution: Tropical.

COLOCASIA Schott

Colocasia esculenta (Linnaeus) Schott in Schott & Endlicher, Melet. Bot. 18. 1832; EFPN 1: 91. 1978; FB 3(1): 136. 1994. *Arum esculentum* Linnaeus, Sp. Pl. 965. 1753.

Vernacular Name: *Thadung* (Mech).

Rhizome tuberous. Leaf blade oblong – ovate to suborbicular, base shallowly cordate, dull, glaucous. Petiole green. Spathe blade narrowly lanceolate, acuminate, yellow.

Flowers & Fruits: June – December.

Exsicattus: Paschim Satali, *Ajita & AP Das 050*, dated 19.09.2004; Nimati, *Ajita & AP Das 338*, dated 04.06.2008.

Local Distribution: Throughout the study area.

General Distribution: Himalaya, India, Bangladesh, Sri Lanka.

LASIA Loureiro

Lasia spinosa (Linnaeus) Thwaites, Enum. 336. 1864 ; FB 3(1) : 129. 1994. *Dracontium spinosum* Linnaeus, Sp. Pl. 967. 1753.

Vernacular Name: *Sibru* (Mech).

Leaves simple or with blades, lobes pinnatisect into narrow segments, apex and lobes cuspidate, blade lanceolate; petioles spongy. Spathe slender, twisted above, dark crimson on outside, apex slight twisted. Spadix pale crimson. Tepals oblong, apex triangular-hooded, keeled. Ovary ovoid.

Flowers & Fruits: November – April.

Exsicattus: Dakshin Mendabari, *Ajita & AP Das 113*, dated 13.11.2004.

Local Distribution: Dakshin Mendabari and Mantharam.

General Distribution: India, Bangladesh, Sri Lanka, China, Myanmar.

TYPHONIUM Schott

Typhonium trilobatum (Linnaeus) Schott in Wien. Zeitschr. 3: 72. 1829; FBI 6: 509. 1893; FB 3(1): 139. 1994. *Arum trilobatum* Linnaeus, Sp. Pl. 965. 1753.

Vernacular Name: Thadung (Mech).

Rhizome globose. Lamina hastately 3 – lobed, middle lobe ovate-elliptic, acuminate. Spathe pinkish green at base and dark red above. Spadix exerted with a long barren, linear-cylindric appendage. Female flowers at base, male flowers above sterile zone.

Flowers & Fruits: April – September.

Exsicattus: Nimati, *Ajita & AP Das 157*, dated 01.11.2005; Paschim Satali, *Ajita & AP Das 365*, dated 13.07.2008.

Local Distribution: Mendabari, Nimati and Paschim Satali.

General Distribution: India, Myanmar, Sri Lanka, Nepal, Thailand, Malaysia.

XANTHOSOMA Schott

Xanthosoma brasiliense (Desfontaines) Engler, Engler Pflanzenr. Arac.-Colocas. 58. 1920; FB 3(1): 139. 1994. *Caladium brasiliense* Desfontaines, Tabl. Ecole Bot., ed. 3: 386. 1829.

Vernacular Name: Dudhali Thadung (Mech).

Stemless; leaf blades hastate, vein conspicuous; petiole to 40 cm.

Flowers & Fruits: September – December

Exsicattus: Paschim Satali, *Ajita & AP Das 051*, dated 19.09.2004.

Local Distribution: In Duars.

General Distribution: Native to tropical America; widely cultivated.

ACORACEAE Martinov

ACORUS Linnaeus

Acorus calamus Linnaeus, Sp. Pl. 324. 1753; FBI 6: 555. 1893; FB 3(1): 158. 1994.

Vernacular Name: Buchi (Mech).

Perennial marshland herbs, erect; rhizome prostrate. Lamina linear, asymmetric, acute, midrib conspicuous. Panicle trigonous; spadix greenish. Ovary hexagonal cylindrical with spongy apex.

Flowers & Fruits: April – July.

Exsicattus: Sibkata, *Ajita & AP Das 140*, dated 01.03.2005; Uttar Mendabari, *Ajita & AP Das 179*, dated 08.02.2006; Mondalpara, *Ajita & AP Das 323*, dated 10.05.2008; Chhekamari, *Ajita & AP Das 356*, dated 10.07.2008.

Local Distribution: Chhekamari, Nimati, Mondalpara, Sibkata and Uttar Mendabari.

General Distribution: India, Asia, Europe and North America.

COMMELINACEAE R. Brown

COMMELINA Linnaeus

Commelina benghalensis Linnaeus, Sp. Pl. 41. 1753; FBI 6: 370. 1892; FB 3(1): 238. 1994.

Vernacular Name: Sanai Bibar (Mech).

Herbs; underground stem with white, fertile cleistogamous flowers. Lamina ovate, entire, acute. Spathe 1 – 3 in axils. Chasmogamous flowers blue. Capsules 5 – seeded.

Flowers & Fruits: July – August.

Exsicattus: Chhekamari, *Ajita & AP Das 319*, dated 27.04.2008.

Local Distribution: Chhekamari, Mendabari, Nimati, Paschim Satali and Sibkata.

General Distribution: Himalaya, India, Africa, China, Malaysia.

MURDANNIA Royle, *nom. cons.*

Murdannia nudiflora (Linnaeus) Brenan in Kew Bull. 7: 189. 1952; FB 3(1): 229. 1994. *Commelina nudiflora* Linnaeus, Sp. Pl. 41. 1753.

Vernacular Name: *Lalnak Bibar* (Mech).

Annual, decumbent herbs; rooting from the lower nodes. Leaves glabrous, linear or linear – lanceolate. Inflorescence scorpioid cyme. Capsules brown, 2 – seeded.

Flowers & Fruits: July – October.

Exsicattus: Baniapara, *Ajita & AP Das 087*, dated 09.10.2004.

Local Distribution: In Baniapara.

General Distribution: Pantropical.

CYPERACEAE A. Jussieu

CYPERUS Linnaeus

Cyperus pilosus Vahl, Enum. 2: 354. 1805; FBI 6: 609. 1893; FB 3(1): 315. 1994.

Vernacular Name: *Gang-se* (Mech).

Perennial; rhizomes stoloniferous. Leaves 10 mm wide. Spike pilose; spikelets linear-lanceolate, 10 – 12 flowered. Glumes ovate. Stamens 3; achene ovate-elliptic, black.

Flowers & Fruits: July – November.

Exsicattus: Sibkata, *Ajita & AP Das 341*, dated 10.06.2008.

Local Distribution: Throughout Duars.

General Distribution: India, Nepal, Bhutan, China, Japan, Malaysia, Tropical Africa.

Cyperus rotundus Linnaeus, Sp. Pl. 45. 1753; FBI 6:598. 1893; FB 3(1): 316. 1994.

Vernacular Name: *Mutha Gang-se* (Mech).

Perennial sedges; rhizome slender, elongate, bearing hard, ovoid, black, fragrant tubers. Stem trigonous. Leaves shorter or longer than the stem, acuminate. Umbel simple or compound. Spikelets linear-lanceolate, many-flowered reddish-brown; glumes ovate to elliptic, imbricate, obtuse or obtuse or apiculate.

Flowers & Fruits: July – December.

Exsicattus: Chhekamari, *Ajita & AP Das 075*, dated 03.10.2004.

Local Distribution: Throughout the study area.

General Distribution: Throughout India; warm countries.

KYLLINGA Rottboell (*nom. cons.*)

Kyllinga nemoralis (J.R. & G. Forster) Dandy ex Hutchinson & Dalziel, Fl. W. Trop. Afr. 2: 487. 1936; FB 3(1): 325. 1994. *Thryocephalon nemorale* J.R. & G. Forster, Char. Gen. Pl. 130. 1776.

Vernacular Name: *Gang-se* (Mech).

Rhizome slender. Stems slender. Leaves linear – lanceolate. Achenes obovoid, yellowish-brown.

Flowers & Fruits: Throughout the year.

Exsiccatu: Mendabari, *Ajita & AP Das 342*, dated 15.06.2008.

Local Distribution: Throughout the study area.

General Distribution: Pantropical.

POACEAE Branhart, *nom. alt.*

AXONOPUS Beauverd

Axonopus compressus (Swartz) P. Beauvois, Ess. Agrost. 12:154. 167. 1812; FB 3(2): 717. 2000. *Milium compressus* Swartz, Prodr. Veg. Ind. Occ. 24. 1788.

Vernacular Name: *Chhepti Gang-se* (Mech).

Perennial ascending tufted grass, culms slender, compressed. Leaves oblong, linear – lanceolate; sheath keeled; ligules thin, fimbriate. Inflorescence racemose. Upper glumes elliptic – lanceolate, hairy on side. Lemma ovate, acute.

Flowers & Fruits: August – December.

Exsiccatu: Chhekamari, *Ajita & AP Das 240*, dated 08.12.2007.

Local Distribution: Throughout the study area.

General Distribution: India (Arunachal Pradesh, Assam, North India, Andaman & Nicobar Islands), America, Brazil, Mexico and Myanmar.

BAMBUSA Stapleton

Bambusa balcooa Roxburgh, Hort. Beng. 25. 1814; Fl. Ind. 2: 196. 1832; FBI 7: 39. 1896; FB 3(2): 488. 2000.

Vernacular Name: *Ooa* (Mech).

Culms up to 25 m, to 16 cm in diameter, green when young, pale grayish-green on maturity; wall thick at base; nodes swollen with whitish ring above, hairy below; lower internodes 10 – 12 cm and upper internodes upto 45 cm long. Lamina oblong – lanceolate, rounded or sub-cordate at the base, glabrous above; leaf-sheaths with dense, brown hairs. Mature spikelets flattened.

Flowers & Fruits: June – December.

Exsiccatu: Paschim Satali, *Ajita & AP Das 021*, dated 29.08.2004; Nimati, *Ajita & AP Das 287*, dated 01.03.2008; Paschim Satali, *Ajita & AP Das 439*, dated 30.12.2008.

Local Distribution: In study area.

General Distribution: Bangladesh, India and Indonesia.

Bambusa nutans Wallich ex Munro, Trans. Linn. Soc. 26(1): 92. 1868; FBI 7: 387. 1896; FB 3(2): 490. 2000.

Vernacular Name: Ooa (Mech).

Culms 5 – 7 cm in diameter, internodes 40 – 46 cm, initially white powdery; wall thick; nodes flat. Culm sheaths deciduous, convex, thickly leathery, apex asymmetrically triangular. Lamina broadly linear to linear – lanceolate. Spikelets linear to linear – lanceolate. Anthers purplish red, apex obtuse or emarginate. Ovary obovate to ovate – ellipsoid.

Flowers & Fruits: June – December.

Exsicattus: Dhalkar, *Ajita & AP Das 012*, dated 07.08.2004; Dakshin Mendabari, *Ajita & AP Das 055*, dated 01.10.2004; Mendabari, *Ajita & AP Das 155*, dated 28.10.2005; Nimati, *Ajita & AP Das 286*, dated 01.03.2008.

Local Distribution: Throughout the study area.

General Distribution: Bangladesh, Nepal, Bhutan, India, Myanmar.

Bambusa tulda Roxburgh, Fl. Ind., ed. 1832, 2: 193. 1832; FB 3(2): 491. 2000.

Vernacular Name: Ooa (Mech).

Culms up to 14 m, 7 – 8 cm in diameter, internodes 30 – 35 cm, initially white powdery, wall very thick; nodes with rings of gray-white silky hairs below and above sheath scar, apex subtruncate; auricles unequal, shortly fimbriate; blade erect, slightly asymmetrical, broadly triangular, apex acutely acuminate. Lamina broadly linear or linear – lanceolate, densely villous, glabrous.

Flowers & Fruits: June – December.

Exsicattus: Gossaigaon, *Ajita & AP Das 383*, dated 20.08.2008.

Local Distribution: Ghoramara and Khoardanga.

General Distribution: Bangladesh, Nepal, Bhutan, India, Thailand, Vietnam.

CYNODON Richard

Cynodon dactylon (Linnaeus) Persoon, Syn. Pl. 1:85. 1805; FBI 7: 288. 1896; FB 3(2): 678. 2000.

Panicum dactylon Linnaeus, Sp. Pl. 58. 1753.

Vernacular Name: Duba Gang-se (Mech).

Perennial prostrate or creeping grass; rooting at nodes. Leaves linear-lanceolate or ovate – lanceolate, hairy; sheath ciliate on margin; ligule membranous. Inflorescence a panicle. Spikelets pedicelled, 2 flowered. Lower florets sterile; upper bisexual, glumes 3 – 5 nerved.

Flowers & Fruits: March – September.

Exsicattus: Dakshin Mendabari, *Ajita & AP Das 054*, dated 01.10.2004; Chhekamari, *Ajita & AP Das 215*, dated 01.01.2007; Nimati, *Ajita & AP Das 288*, dated 01.03.2008; Chhekamari, *Ajita & AP Das 327*, dated 12.05.2008; Latabari, *Ajita & AP Das 330*, dated 20.05.2008.

Local Distribution: In Duars.

General Distribution: India and S. E. Asia.

DIGITARIA Haller

Digitaria ciliaris (Retzius) Koeler, Descr. Gram. 27. 1802; FB 3(2): 728. 2000. *Panicum ciliare* Retzius, Obs. Bot 4:16. 1786.

Vernacular Name: Gang-se (Mech).

Erect or decumbent, annual grass. Lamina linear – lanceolate, glabrous, ligule truncate. Racemes 2 – 9, sub digitate. Spikelets in pairs, oblong, acute, awnless. Stamens 3. Caryopsis 0.2 cm long.

Flowers & Fruits: May – December.

Exsicattus: Chhekamari, *Ajita & AP Das 241*, dated 08.12.2007.

Local Distribution: In Duars.

General Distribution: Pantropical.

ERAGROSTIS Beauverd

Eragrostis unioloides (Retzius) Nees ex Steudel, Syn. Pl. Glum. 1: 264. 1854; FB 3(2): 663. 2000. *Poa unioloides* Retzius, Obs. Bot. 5: 19. 1789.

Vernacular Name: *Gang-se* (Mech).

Annual, erect, tufted grass. Leaves flat, sheath striate. Spikelets ovate – oblong, obtuse, pinkish-white. Caryopsis pointed.

Flowers & Fruits: August – March.

Exsicattus: Nimati, *Ajita & AP Das 421*, dated 20.11.2008.

Local Distribution: Throughout the study area.

General Distribution: India, Sri Lanka, Myanmar, S.E. Asia.

IMPERATA Cirillo

Imperata cylindrica (Linnaeus) Raeuschel, Nom. Bot. 3:10. 1797; FB 3(2): 770. 2000. *Lagurus cylindricus* Linnaeus, Syst. Nat. ed. 10. 2:878. 1759.

Vernacular Name: *Thurmus* (Mech).

Perennial, tufted, erect, long grass. Rootstock hard, creeping. Leaves linear – lanceolate, scabrid margin; ligule membranous. Inflorescence compact panicle. Spikelets lanceolate, silky hairy. Stamen 2. Stigmas 2. Caryopsis oblong.

Flowers & Fruits: February – May.

Exsicattus: Chhekamari, *Ajita & AP Das 221*, dated 26.08.2007; Nimati, *Ajita & AP Das 281*, dated 17.02.2008.

Local Distribution: Chhekamari, Nimati, Paschim Satali and Dhalkar.

General Distribution: India, Asia, Australia, S. E. Africa.

OPLISMENUS P. Beauvois

Oplismenus burmannii (Retzius) P. Beauvois, Ess. Agrost. 54:168 -169. 1812; FBI 7:68. 1896; FB 3(2): 686. 2000. *Panicum burmannii* Retzius, Obs. Bot. 3: 10. 1783.

Vernacular Name: *Gang-se* (Mech).

Annual, prostrate grass; rooting at nodes. Leaves ovate – elliptic lanceolate, pubescent; sheath compressed, ciliate. Inflorescence a panicle 4 – 7 racemes. Spikelets elliptic-lanceolate. Caryopsis convex.

Flowers & Fruits: August - December.

Exsicattus: Chhekamari, *Ajita & AP Das 242*, dated 08.12.2007; Paschim Satali, *Ajita & AP Das 419*, dated 15.11. 2008.

Local Distribution: Throughout Duars.

General Distribution: India (Plains), Bangladesh, China, Japan and Sri Lanka.

Oplismenus compositus (Linnaeus) P. Beauvois, Ess. Agrost. 54: 168. 1812; FB 3(2): 684. 2000.
Panicum compositum Linnaeus, Sp. Pl. 57. 1753.

Vernacular Name: *Gang-se* (Mech).

Herbs. Leaf blades lanceolate, acuminate. Inflorescence 12 – 23 cm; racemes 5 – 10; spikelets 3 – 4 mm.

Flowers & Fruits: August – December.

Excicattus: Paschim Satali, *Ajita & AP Das 418*, dated 15.11.2008.

Local Distribution: Throughout Duars.

General Distribution: Tropical.

ORYZA Linnaeus

Oryza sativa Linnaeus, Sp. Pl. 1:333. 1753; FBI 7:92. 1893; FB 3(2): 516. 2000.

Vernacular Name: *Mairong* (Mech).

Cultivated annual, tufted. Culms erect, rooting at lower submerged nodes. Leaf sheaths inflated below, upper sheaths tight, glabrous, auricles falcate, ciliate; glabrous, smooth or scabrid on both sides, margins scabrid, apex acuminate. Panicles loosely contracted, nodding at maturity; branches 1 – 3 at lowest node, axils bearded or glabrous. Spikelets oblong to oblong – lanceolate, persistent. Caryopsis ovate or elliptic to cylindrical.

Flowers & Fruits: June – December.

Excicattus: Dakshin Mendabari, *Ajita & AP Das 296*, dated 11.03.2008; Paschim Satali, *Ajita & AP Das 409*, dated 02.11.2008.

Local Distribution: In Duars and Assam.

General Distribution: India (Northern part, Andaman & Nicobar Islands, West Bengal), China, Tropical and Temperate America.

PHRAGMITES Adanson

Phragmites karka (Retzius) Trinius ex Steudel, Nomencl. Bot. ed. 2(1): 144. 1840; FEH 2: 145. 1971; FB 3(2): 647. 2000. *Arundo karka* Retzius, Observ. Bot. 4: 21. 1786.

Vernacular Name: *Khangklila* (Mech).

Culms stout. Leaf blades glabrous, lateral, basal tufts of hairs at junction with ligule; sheaths glabrous. Inflorescence broadly cylindric, branches fascicled, overlapping, ascending, silky hairy at base.

Flowers & Fruits: September – October.

Excicattus: Gossaigaon, *Ajita & AP Das 390*, dated 20.08.2008.

Local Distribution: In study area.

General Distribution: India, Bhutan, Malaysia, Japan, N. Australia.

SACCHARUM Linnaeus

Saccharum spontaneum Linnaeus, Mant. Alt. 183. 1771; FBI 7:118. 1896; FB 3(2): 764. 2000.

Vernacular Name: *Gigab* (Mech).

Perennial, long grass. Culms high, erect; rhizomes thick, extensive. Leaves linear, acuminate, scabrid on margins; sheaths hairy at throat; ligule hairy. Inflorescence a lax panicle, silky hairy. Spikelets long, lanceolate. Caryopsis narrowly lanceolate.

Flowers & Fruits: September – December.

Exsicattus: Dakshin Mendabari, *Ajita & AP Das 048*, dated 18.09.2004; Latabari, *Ajita & AP Das 375*, dated 01.08.2008; Nimati, *Ajita & AP Das 420*, dated 20.11.2008.

Local Distribution: Dakshin Mendabari, Latabari, Nimati, Paschim Satali and Salkumarhat.

General Distribution: India, Sri Lanka, E. Australia and S. Europe.

SETARIA Beauverd

Setaria palmifolia (Koenig) Stapf, J. Lin. Soc. Bot. 42: 186. 1914; FEH 1: 376. 1966; FB 3(2): 723. 2000.

Panicum palmaefolium Koenig, Naturf. 22: 208. 1788.

Vernacular Name: *Gang-se* (Mech).

Perennial, root-stock woody. Lamina linear-lanceolate, acuminate, glabrous or sparsely hairy, sheath margin ciliate. Panicles spreading, loose. Spikelets solitary, bristle single.

Flowers & Fruits: May – February.

Exsicattus: Sibkata, *Ajita & AP Das 339*, dated 10.06.2008.

Local Distribution: Throughout the study area.

General Distribution: Tropics of Old World.

VETIVERIA Thouars ex Virey

Vetiveria zizanioides (Linnaeus) Nash in Small, Fl. South-East U.S. 67. 1903; FB 3(2): 790. 2000.

Phalaris zizanioides Linnaeus, Mant 2: 183. 1771.

Vernacular Name: *Birna* (Mech).

Perennial, strong densely tufted. Culms long, erect; root-stock rhizomatous. Leaves scabrid on margins; sheath glabrous. Inflorescence a contracted panicle. Spikelets paired, lanceolate. Caryopsis linear from middle.

Flowers & Fruits: August – November.

Exsicattus: Uttar Mendabari, *Ajita & AP Das 049*, dated 18.09.2004.

Local Distribution: Dhalkar, Nimati, Paschim Satali and Uttar Mendabari.

General Distribution: India, Myanmar, Sri Lanka, Java and tropical Africa.

ZEA Linnaeus

Zea mays Linnaeus, Sp. Pl. 971. 1753; FBI 7: 102. 1896; FB 3(2): 834. 2000.

Vernacular Name: *Dubba* (Mech).

Annual, stout culms. Leaves auricled at base, scattered hairy above with ciliate margins; sheaths hairy. Female inflorescence transversely oblong, concave, truncate – ciliate. Male flowers in panicle.

Flowers & Fruits: July – September.

Exsicattus: Chhekamari, *Ajita & AP Das 374*, dated 15.07.2008.

Local Distribution: Cultivated in study area.

General Distribution: Originating in America; widely cultivated elsewhere.

BROMELIACEAE A. Jussieu

ANANAS Miller

Ananas comosus (Linnaeus) Merrill, Interpr. Rumph., Herb. Amboin. 133. 1917 ; FB 3(1) : 172. 1994.
Bromelia ananas Linnaeus, Sp. Pl. 285. 1753.

Vernacular Name: Anarousa (Mech).

Leaves strap-shaped, sharply spinose-serrate, leathery. Scape short, stout. Spike void, many-flowered. Bracts reddish, triangular, leathery, serrate. Sepals broadly ovate, coriaceous, orange-tipped. Petals oblong – lanceolate, purple. Ripe fruit (syncarp) orange, ovoid – ellipsoid.

Flowers & Fruits: July – September.

Exsicattus: Paschim Satali, *Ajita & AP Das 483*, dated 03.07.2009.

Local Distribution: Cultivated in study area.in warm countries.

General Distribution: Native to S. America; widely cultivated.

MUSACEAE A. Jussieu

MUSA Linnaeus

Musa balbisiana Colla, Mem. Gen. Musa. 56. 1820; Kew Bull. 1948: 14. 1948; FEH 3: 136. 1975; EFPN 1: 63. 1978; FB 3(1): 180. 1994. *Musa sapientum* Linnaeus, Syst. 1303. 1759; FBI 6: 262. 1892.

Vernacular Name: Athia Thalith (Mech).

Pseudostems upto 5 m high. Lamina oblong, entire, petiole spongy. Spikes solitary, pendulous. Flowers numerous. Berries yellow when ripe.

Flowers & Fruits: December – May.

Exsicattus: Paschim Satali, *Ajita & AP Das 105*, dated 10.11.2004; Nimati, *Ajita & AP Das 251*, dated 10.01.2008; Latabari, *Ajita & AP Das 329*, dated 20.05.2008; Chhekamari, *Ajita & AP Das 352*, dated 10.07.2008; Paschim Satali, *Ajita & AP Das 408*, dated 02.11.2008.

Local Distribution: Cultivated in study area.

General Distribution: Pantropical.

ZINGIBERACEAE Lindley

ALPINIA Roxburgh

Alpinia nigra (Gaertner) Burt, Notes Roy. Bot. Gard. Edinburgh 35(2): 213. 1977; FB 3(1): 205. 1994.

Zingiber nigrum Gaertner, Fruct. Sem. Pl. 1: 35. 1788.

Vernacular Name: Tharai (Mech).

Pseudostems to 3 m. Leaves lanceolate, acuminate, sessile or very shortly petiolate. Inflorescence with some lateral branches in lower part, rather lax with remote cincinni, each subtending a cincinnus of 3 – 4 greenish-white flowers. Lip pink, clawed. Fruit black.

Flowers & Fruits: July – October.

Exsicattus: Dhalkar, *Ajita & AP Das 047*, dated 17.09.2004; Sibkata, *Ajita & AP Das 315*, dated 25.04.2008.

Local Distribution: Ghoramara, Dhalkar, Paschhim Satali and Sibkata.

General Distribution: India, Bhutan, Sri Lanka, Thailand.

CURCUMA Linnaeus

Curcuma aeruginosa Roxburgh, *Asiat. Res.* 11: 335. 1810; *Fl. Ind.* 1: 27. 1820; Zingiberaceae & Costaceae of S. India 132. 2006; *Curcuma caesia* Roxburgh, *Asiat. Res.* 11: 334. 1810.

Vernacular Name: Gocham Haldu (Mech).

Rhizome large, blue in centre, aromatic. Leaves distichous, petiole as long as lamina; lamina oblong – lanceolate, tip acute, base acuminate, glabrous, purple or reddish-brown patch along the sides on the distal half of the mid rib on upper side only. Inflorescence lateral, 25 – 30 cm long; coma bracts large, pink; fertile bracts green with pink tip; each bract subtends a cincinnus of 8 – 10 flowers. Calyx truncate; corolla pink, lobes unequal, concave.

Flowers & Fruits: April – September.

Exsicattus: Chhekamari, *Ajita & AP Das 370*, dated 10.07.2008.

Local Distribution: In Chhekamari.

General Distribution: Native of Myanmar.

Curcuma aromatica Salisbury, *Parad. Lond.* 2: t, 96. 1807; *FBI* 6: 210. 1890; *FB* 3(1): 192. 1994.

Vernacular Name: Khaslat (Mech).

Perennial herbs, rhizomes whitish, aromatic. Lamina broadly lanceolate, acuminate, pubescent beneath; petiole winged. Lower bracts green, upper pink-tipped; coma bracts pinkish-white. Flowers whitish, pink tinged, lip yellow.

Flowers & Fruits: May – September.

Exsicattus: Baniapara, *Ajita & AP Das 066*, dated 01.10.2004; Uttar Mendabari, *Ajita & AP Das 180*, dated 13.11.2005.

Local Distribution: Baniapara, Chhekamari and Uttar Mendabari.

General Distribution: India, Nepal, Myanmar, Bangladesh, Sri Lanka, Java.

Curcuma longa Linnaeus, *Sp. Pl.* 1: 2. 1753; *FBI* 6: 214. 1890; *Fl. Sikkim* 1: 125. 1996.

Vernacular Name: Haldi (Mech).

Herbs; rhizomes tuberous, branches elongated, aromatic, yellow-deep orange. Coma bracts pinkish white. Flowers creamy white.

Flowers & Fruits: June – October.

Exsicattus: Nimati, *Ajita & AP Das 348*, dated 02.07.2008.

Local Distribution: Mendabari, Nimati, Paschim Satali and Sibkata.

General Distribution: Cultivated throughout the tropics.

KAEMPFERIA Linnaeus

Kaempferia rotunda Linnaeus, *Sp. Pl.* 3. 1753; *FBI* 6: 222. 1890; *FB* 3(1): 198. 1994.

Vernacular Name: Agniswar (Mech).

Herbs, aromatic rhizome. Leaves oblong, acuminate, purple beneath, light green above. Spikes sessile. Bracts purplish white. Calyx purplish dotted; corolla white; lip bilobed, red.

Flowers & Fruits: March – May.

Exsicattus: Chhekamari, *Ajita & AP Das 373*, dated 15.07.2008.

Local Distribution: Chhekamari.

General Distribution: India, Malesia and Thailand.

ZINGIBER Boehmer

Zingiber purpureum Roscoe, Trans. Linn. Soc. London 8: 348. 1807; FB 3(1): 188. 1994. *Zingiber cassumunar* Roxburgh, Asiat. Res. 11: 347.t.5. 1810; Fl. Ind. 1: 48. 1820; FBI 6: 248. 1892.

Vernacular Name: *Bura Usud* (Mech).

Rhizome perennial, fleshy, aromatic, yellow inside. Leaves subsessile; ligule short, bilobed, pubescent; lamina linear-lanceolate, tip acute, base slight rounded. Inflorescence borne separately from the leafy shoot; spike ovate, deep red. Calyx white, membranous. Capsules ovoid; seed purple.

Flowers & Fruits: June – August.

Excicattus: Uttar Mendabari, *Ajita & AP Das 199*, dated 14.05.2006.

Local Distribution: Uttar Mendabari.

General Distribution: Native of India; Malay Penninsula and Sri Lanka.

Zingiber officinale Roscoe in Trans. Linn. Soc. 8: 348. 1807; FBI 6: 248. 1892; FB 3(1): 188. 1994.

Vernacular Name: *Adi* (Mech).

Herbs with aromatic rhizome, pale yellow inside. Leaves linear – lanceolate. Lip blackish purple.

Flowers & Fruits: September – October.

Excicattus: Dakshin Mendabari, *Ajita & AP Das 107*, dated 11.11.2004; Nimati, *Ajita & AP Das 252*, dated 10.01.2008; Khoardanga, *Ajita & AP Das 302*, dated 14.03.2008; Chhekamari, *Ajita & AP Das 369*, dated 10.07.2008; Dhalkar, *Ajita & AP Das 479*, dated 26.05.2009.

Local Distribution: Cultivated throughout the study area.

General Distribution: Cultivated in tropical countries throughout the World.

COSTACEAE (K. Schumann) Nakai

COSTUS Linnaeus

Costus speciosus (Koenig ex Retzius) Smith, Trans. Linn. Soc. Lond. 1: 249. 1800; FBI 6: 249. 1892; FB 3(1): 210. 1994. *Banksea speciosa* Koenig ex Retzius, Obs. Bot. 3: 75. 1783.

Vernacular Name: *Debgugri* (Mech).

Perennial herbs; stems unbranched, glabrous. Leaves sub-sessile, spirally arranged; lamina oblanceolate or oblong, entire, acuminate, sheathing at base, glabrous above, hairy beneath. Flowers in terminal bracteate spikes; bracts ovate, red; calyx red. Capsules globose or ovoid, dehiscent.

Flowers & Fruits: July – December.

Excicattus: Ghoramara, *Ajita & AP Das 143*, dated 01.08.2005; Sibkata, *Ajita & AP Das 317*, dated 25.04.2008; Chhekamari, *Ajita & AP Das 353*, dated 10.07.2008; Nimati, *Ajita & AP Das 382*, dated 10.08.2008.

Local Distribution: Chhekamari, Ghoramara, Nimati, Paschim Satali and Sibkata.

Local Distribution: India, Bangladesh, Sri Lanka, Myanmar, Malay Islands.

MARANTACEAE Petersen

PHRYNIUM Willdenow

Phrynium pubinerve Blume, Enum. Pl. Javae 1: 38. 1827; FB 3(1): 214. 1994.

Vernacular Name: Laihu (Mech).

Rhizome thick. Lamina oblong – elliptic, shortly cuspidate; flowers pinkish or blue-veined in condensed terminal spike. Prophylls reddish-brown, broadly oblong.

Flowers & Fruits: June – September.

Exsicattus: Baniapara, *Ajita & AP Das 067*, dated 01.10.2004; Ghoramara, *Ajita & AP Das 474*, dated 22.05.2009.

Local Distribution: Baniapara, Ghoramara and Paschim Satali.

General Distribution: Eastern Himalaya.

PONTEDERIACEAE Kunth

EICHHORNIA Kunth

Eichhornia crassipes (Martius) Solms in DC. Mon. Phan. 4: 527. 1832; Subramanym, Aquat. Angiosp. 70. 1962; FB 3(1): 175. 1994. *Pontederia crassipes* Martius Nov. Gen. Pl. 9.t. 4. 1823.

Vernacular Name: Pana (Mech).

Aquatic floating herbs. Leaves radical, rhomboid or ovate; petioles spongy, flaccid. Flowers pale violate. Perianth zygomorphic, odd petal with eye-mark. Stamens unequal, 6; filaments hairy.

Flowers & Fruits: September – January.

Exsicattus: Nimati, *Ajita & AP Das 158*, dated 01.11.2005.

Local Distribution: Nimati and Paschim Satali.

General Distribution: Native to Brazil; pantropical.

MONOCHORIA Presler

Monochoria vaginalis (Burman f.) C. Presl. ex Kunth, Enum. 4: 134. 1834; FBI 6: 363. 1892; FB 3(1): 174. 1994. *Pontederia vaginalis* Burman f., Fl. Ind. 80. 1768.

Vernacular Name: Pana (Mech).

Aquatic annual herbs. Leaves in basal rosette or shortly decumbent stem. Lamina lanceolate – ovate, acuminate, petiole exceeding scape. Inflorescence sub-umbellate racemose. Flowers pedicellate; tepals blue. Capsules oblong.

Flowers & Fruits: September – May.

Exsicattus: Nimati, *Ajita & AP Das 468*, dated 11.05.2009.

Local Distribution: Nimati.

General Distribution: India, Sri Lanka, Bangladesh, Malay Island, China, Japan and tropical Africa.

AMARYLLIDACEAE J. St. Hilaire

CRINUM Linnaeus

Crinum amoenum Roxburgh, Fl. Ind. 2: 127. 1832; FBI 6: 282. 1892; FB 3(1): 83. 1994.

Vernacular Name: Mosoi Sabrum (Mech).

Perennial. Bulb subglobose. Leaves spreading, ensiform acute, margins narrow membranous. Umbels on long solid, purplish scape with 3 – 10 white; flowers fragrant; perianth white; anthers versatile. Capsules subglobose.

Flowers & Fruits: June – August.

Exsiccatu: Chhekamari, *Ajita & AP Das 076*, dated 03.10.2004; Paschim Satali, *Ajita & AP Das 465*, dated 01.05.2009.

Local Distribution: Chhekamari, Nimati, Mendabari and Paschim Satali.

General Distribution: India, Sri Lanka, Java, Malaya.

IRIDACEAE A. Jussieu

ELEUTHERINE Herbert

Eleutherine bulbosa (Miller) Urban, Repert. Spec. Nov. Regni Veg. 15: 305. 1918; FB 3(1): 120. 1994.

Sisyrinchium bulbosum Miller, Gard. Dict., ed. 8: 3. 1768.

Vernacular Name: Hagrani Sabrum (Mech).

Bulb ovoid with many layers of brittle, red-brown tunics. Leaves lanceolate. Flower stem 22 – 30 cm; perianth lobes obovate.

Flowers & Fruits: April – August.

Exsiccatu: Chhekamari, *Ajita & AP Das 069*, dated 03.10.2004.

Local Distribution: Chhekamari.

General Distribution: Native of S. America, widely grown in tropical countries.

DRACAENACEAE Salisbury

SANSEVIERIA Thunberg

Sansevieria trifasciata Prain, Bengal Pl. 2: 1054. 1903; FB 3(1): 63. 1994.

Vernacular Name: Jibou Bilai (Mech).

Leaves erect in rosette, linear – lanceolate, flat, channeled towards base, acute, coriaceous, margins cream-coloured, central area mottled in shades of green.

Flowers & Fruits: June – November.

Exsiccatu: Chhekamari, *Ajita & AP Das 452*, dated 15.03.2009.

Local Distribution: Chhekamari, Mondalpara and Nimati.

General Distribution: Native to tropical W. Africa; widely cultivated.

SMILACACEAE Ventenat

SMILAX Linnaeus

Smilax ovalifolia Roxburgh, Fl. 3: 794. 1832; FEH 1: 417. 1966; FB 3(1): 30. 1994. *Smilax zeylanica* Linnaeus, Sp. Pl. 1029. 1753; FBI 6: 309. 1892; FEH 3: 135. 1975.

Vernacular Name: Kaijomai (Mech).

Shrubby climbers. Branchlets striated, glabrous, prickly. Tendrils simple, glabrous. Lamina ovate – elliptic, entire, acute, cuneate. In female umbels peduncles stout; receptacle globose. Receptacles in male umbels globose with brown bracteoles, flower buds oblong. Berries red when ripen.

Flowers & Fruits: March – December.

Exsicattus: Mendabari, *Ajita & AP Das 151*, dated 28.10.2005.

Local Distribution: Mendabari.

General Distribution: Tropical Himalaya, India, Bangladesh, Myanmar etc.

DIOSCOREACEAE R. Brown

DIOSCOREA Linnaeus

Dioscorea bulbifera Linnaeus, Sp. Pl. ed. 1: 1033. 1753; FEH 1: 419. 1966; FB 3(1): 9. 1994. *Dioscorea sativa* Thunberg, Fl. Jap. 151. 1784; *non* L. (1753); FBI 6: 295. 1892.

Vernacular Name: Thaganda (Mech).

Tubers globose, yellow. Stem twining to left, glabrous, angled. Bulbils common in leaf-axils. Leaves alternate; lamina shallowly cordate; petiole narrowly margined. Spikes in fascicles, axillary; flowers whitish. Capsules oblong – elliptic; seeds winged.

Flowers & Fruits: June – February.

Exsicattus: Paschim Satali, *Ajita & AP Das 256*, dated 12.01.2008.

Local Distribution: Mendabari, Uttar Mendabari, Nimati, Paschim Satali and Sibkata.

General Distribution: A native of Old World; India, Nepal, Sri Lanka.

Dioscorea esculenta (Loureiro) Burkill in Gard. Bull. Singap. 1: 396. 1917; FB 3(1): 8. 1994. *Onchus esculentus* Loureiro, Fl. Coch. 194. 1790.

Vernacular Name: Thaganda (Mech).

Twining to left with large unequal tubers; stems prickly. Lamina simple, reniform or orbicular, acuminate or cuspidate, base cordate, 5 – 7 -veined. Male spikes erect, sessile or shortly pedicellate; bracteoles very broad. Female racemes short. Capsules obcordate; seeds broadly winged.

Flowers & Fruits: September – January.

Exsicattus: Paschim Satali, *Ajita & AP Das 257*, dated 12.01.2008.

Local Distribution: In study area.

General Distribution: Cultivated in tropical Asia.

Dioscorea pentaphylla Linnaeus, Sp. Pl. 1032. 1753; FBI 6: 289. 1892; FEH 1: 420. 1966; FB 3(1): 10. 1994.

Vernacular Name: Thaganda (Mech).

Twining to the left; stems prickly, hairy in young parts. Tubers ovoid-globose. Leaves 3 – 5 foliolate; leaflets elliptic – oblanceolate, acute, glabrous. Male flowers greenish in axillary racemes forming panicles; female flowers in slender elongated racemes. Capsules oblong, glabrous.

Flowers & Fruits: September – February.

Exsiccatus: Paschim Satali, *Ajita & AP Das 273*, dated 13.02.2008.

Local Distribution: Dakshin Mendabari, Nimati and Paschim Satali.

General Distribution: India, Myanmar, Bangladesh, Sri Lanka, Malaya and tropical Africa.

Dioscorea pubera Blume, Enum. Pl. Javae 1: 21. 1827; FB 3(1): 14. 1994. *Dioscorea anguinea* Roxburgh, Fl. Ind. 3: 803. 1832; FBI 6: 293. 1892.

Vernacular Name: *Thaganda* (Mech).

Tubers 1 or 2, narrowly cylindrical, rootlets few, flesh lemon yellow. Plant shortly pubescent. Stem twining to right, lacking prickles; bulbils sometimes produced. Leaves alternate-subopposite, ovate, cuspidate to shortly caudate, base shallowly cordate, margins cartilaginous, persistently pubescent beneath.

Flowers & Fruits: August – January.

Exsiccatus: Paschim Satali, *Ajita & AP Das 255*, dated 12.01.2008.

Local Distribution: Nimati and Paschim Satali.

General Distribution: Himalayas, India, Myanmar, Sumatra, Java.

ORCHIDACEAE A. Jussieu

ACAMPE Lindley

Acampe papillosa (Lindley) Lindley, Fol. Orchid. 2. 1853; Fl. of Sikkim 1: 24. 1996; FB 3(3): 491. 2002.

Saccolabium papillosum Lindley in Bot. Reg. t. 1552. 1841; FBI 6: 63. 1890.

Vernacular Name: *Mauji Lanjai* (Mech).

Epiphytes; roots arising from nodes, long. Stem elongate, covered with leaf-sheaths. Leaves coriaceous, oblong, rounded, obliquely notched, sessile. Flowers yellow with brown base.

Flowers & Fruits: October – December.

Exsiccatus: Paschim Satali, *Ajita & AP Das 019*, dated 21.08.2004.

Local Distribution: Paschim Satali.

General Distribution: N.W. Himalaya, E. Himalaya, Nepal, Bhutan, Bangladesh, Myanmar, Thailand, Laos and Vietnam.

CHAPTER 9

GENERAL DISCUSSION

General Discussion

The ethnobotanical survey among the tribe *Mech* living the Duars region of West Bengal and in the adjacent part of Assam was conducted during 2004 – 2009 following standard methodology as suggested by Jain (1964, 1965b, 1967, 1987, 1995), Ghosh (2006), Tag (2007) and others. The survey covered wide aspects of *Mech* traditional life style and recorded the plants scientifically and all the voucher specimens will be deposited at NBU-Herbarium with a duplicate set to the CAL.

9.1. Taxonomic and Habit Group Classifications

The present ethnobotanical survey has recorded the uses of a total of 271 species of plants covering 223 genera and 93 families of which only four species are pteridophytic. Of the 267 species of Magnoliophyta, 215 are belonging to Magnoliopsida and 52 are under Liliopsida (Table 9.1).

Table 9.1. Numerical distribution of recorded taxa

Taxa	Family	Genus	Species
Pteridophyta	4	4	4
Magnoliophyta	89	119	267
Magnoliopsida	71	177	215
Liliopsida	18	42	52
TOTAL:	93	223	271

Analysis of the habit groups for the recorded plants showed the usefulness of different forms of plants as shown in Table 9.2.

Table 9.2. Habit group representation of recorded species of ethnobotanical plants

Habit	Family	Genus	Species
Trees	37	62	73
Shrubs	22	46	52
Climbers	13	24	35
Herbs	41	82	90
Geophytes	9	17	20
Epiphyte	1	1	1
TOTAL:			271

9.2. Areas Covered

To understand the *Mech* ethnobotany in a better way, different aspects of their life style has been observed from different angles like:

- i. Food
- ii. Fodder
- iii. Medicine
- iv. Other domestic needs
- v. Socio-religious
- vi. Socio-cultural
- vii. Birth-Marriage & Death, etc.

The collected 271 species are used in various ways. There are many species those are used in various manners and were recorded under different categories of uses. Such utilitarian grouping of the recorded *Mech* ethnobotanical plants has been presented in Table 9.3.

Table 9.3. Utility based classification of recorded *Mech* ethnobotanical plants

Category of uses	Taxa used		
	Family	Genera	Species
Edible	61	101	121
Fodder plants	28	52	61
Domestic uses	28	38	39
Medicinal Plants used in solitary	45	66	74
Medicinal Plants in formulae	49	76	83
Veterinary medicinal	21	28	29
Poisonous plants	11	13	13
Preparation of <i>Jou</i>	6	6	6
Ornamental & Decorative plants	15	17	18
Religious plants	19	31	32
Folklore related plants	8	11	11

9.2.1. Edible Plants: At least 121 species (covering 101 genera and 61 families) of plants are collected from the local habitat are collected by the people of *Mech* community to use as their own food. These include three species of pteridophytes - *Diplazium esculentum*, *Helminthostachys zeylanica* and *Marsilea minuta*. Considering the edible parts, it is found that almost all parts of different plants are edible. Some plants like *Colocasia* spp. rhizome, petiole and inflorescence are prepared in different manner for consumption. They consume even the inflorescence of *Eichhornia crassipes*, for which there was no previous record. Some of the plants they prefer to eat are abundant in the region and are quite tasty. Some

such plants like *Amaranthus lividus*, *Amaranthus spinosus*, *Amaranthus viridis*, *Alternanthera sessilis*, *Deeringia amaranthoides*, *Coccinia grandis*, *Bacopa monnieri*, *Centella asiatica*, *Chenopodium album*, *Commelina benghalensis*, *Drymaria diandra*, *Enydra fluctuans*, *Glinus oppositifolius*, *Ipomoea aquatica*, *Leucas indica*, *Oldenlandia corymbosa*, *Oroxylum indicum*, *Polycarpon prostratum*, *Polygonum plebeium*, *Portulaca oleracea*, etc. Fruits of some plants like *Coccinia grandis*, *Dillenia indica*, *Dillenia pentagyna*, *Diospyros malabarica*, *Diplocyclos palmatus*, *Duchesnea indica*, *Ehretia serrata*, *Elaeocarpus floribundus*, *Ficus hispida*, *Flacourtia jangomas*, etc are quite common and are also preferred ones. These trees are quite frequently available in the forests of Duars region. Quite often most of these fruits are also marketed. Some of these plants are also edible in developed societies. So, the plants they consume are of mostly agreeable qualities and their availability in different types of vegetation is quite good. At the same time, edible parts of different recorded species are available in different seasons of the year to meet up the food-requirement of the people in remote *Mech* villages.

Just the collection of edible plant parts is not enough. They need to cook their food. They are having their own style of cooking mostly using local ingredients. Six such *Mech* preparations recorded here along with their detailed recipes and methods of preparation. Whatever may be the taste, they like their traditional preparations. And, *Ondla* is must in marriage ceremonies which can be both vegetarian and non-vegetarian preparations. In non-vegetarian *Ondla* they add pork or chicken. This rice-powder based preparation is quite tasty and can be tried outside the *Mech* community too! But, now-a-days, they are quickly learning the Bengali type preparations endangering their own cuisines.

9.2.2. Fodder Plants: Though cow is the most important domestic animal in the *Mech* society, but a number of other animals are regularly reared by them. These include buffalo, goat, pig, fowls, ducks, dogs, and cats. They need to collect fodder from the vegetation for three animals mainly, cows, buffalos and goats. Analysis of the collected fodder led to the record of a total of 61 species of plants covering 52 genera from 28 families. These are all angiospermic plants. Except paddy-straw, they never store any fodder for future use. Most of these plants are growing in wild in their adjacent vegetation and every day they spend some time for the collection of fresh fodder. Interestingly, though climbers are abundant in the local vegetation but only one species (*Mikania micrantha*) of climber have been recorded from the collected fodders. Again, out of the remaining 60, 25 are trees and 35 are herbs. Number of trees is quite high and some plants like *Aegle marmelos*, *Alstonia scholaris*, *Diospyros malabarica*, *Elaeocarpus floribundus*, *Gmelina arborea*, *Neolamarckia cadamba*, *Oroxylum indicum* and *Toona ciliata* are generally not used as fodder by other communities in the region. Probably the easy availability of these plants tempted the *Mech* people to test these plants.

While grazing openly, these animals are probably browsing a much larger number plants. Specially, most of species of the grasses are liked by these animals. But, while a *Mech* is collecting fodders in the vegetation he/she look after only one point, i.e. they avoid those plants which may cause harm to the animals. Generally they do not grow any plant purposely for producing fodders but use many plants for this purpose those were originally planted for some other purpose. This include plants like *Melia azedarach*, *Moringa oleifera*, *Syzygium cumini*, *Toona ciliata*, *Aegle marmelos*, *Artocarpus heterophyllus*, *Bambusa nutans*, *Bambusa balcooa*, *Elaeocarpus floribundus*, *Gmelina arborea*, etc.

The animals they rear are found to remain quite healthy and that speaks for the successful selection of their fodder plants.

9.2.3. Plants for Domestic Uses: Apart from food many other materials are essential for survival. And, that may be long list. Provisions for accommodation, clothing, fibres, aromatic substances, dye, gums & resins, fishing & hunting equipments, musical equipments, etc are clubbed together here under this Domestic uses'. 39 species of angiospermic plants, covering 38 genera and 28 families have been recorded for this purpose. At least 22 areas have been recognized those are satisfied with these 39 species of plants. Fire-wood and materials for the construction of houses are the most important areas. It is a regular picture that the long-cues of fire-wood collectors are coming out of the forest in the afternoon. Under the present situation, may be, the entire collection is not for one's domestic use and, in such cases, they sale out the excess collection. For the construction of their houses, they prefer to collect the secondary or tertiary branches of *Shorea robusta*. Sometimes, the main trunk is also collected. The Table 7.2 has provided the numerical summary of the collected species for such uses. Different types of bamboos are available in these forests. All these bamboos are useful to the and mostly in multipurpose manner. House construction, fishing & hunting equipments, baskets, chicken & duck stores, water bottles, fencing, musical instruments, tools-handles, grain processing equipments, etc – in all cases bamboos are useful. For use as any kind of post or supporting structures bamboos find useful. Leaves, sheaths and semi-rotten bamboo stems are also use as fuel in village earthen stoves.

9.2.4. Medicinal Plants: Like people of any other community, *Meches* also suffer from numerous diseases. There are their own traditional healers mostly practicing herbal medicines, and *Mech* people even from developed villages prefer to be treated by them. These *Mech* healers are referred as *Ojas* in their society.

After analysis of all the documented *Mech*-medicine formulations, those are divided into two basic groups:

- (i) Medicines made of one species of plant, and

- (ii) Medicines prepared with definite formulations using more than one species of plants, rarely few non-plant materials are also used in such formulations.

A total of 130 species of medicinal plants has been recorded here to use by *Mech Ojas*. Out of these 74 species are used solitarily in some medicines. However, in numerous cases a species has been used in both the types of medicines. In most of the cases the formulations are completely fixed and with no replacements.

9.2.4.1. Comparison with Recognized Medicinal Plants: Recorded *Mech* medicinal plants were matched with one standard *Encyclopaedia of Indian Medicinal Plants* (Khare 2004) and the result has been presented in Table 9.4 below:

Table 9.4. Comparison of *Mech* Medicinal Plants with the plants recorded in an encyclopaedia (Khare 2004).

Plants	Recorded uses in <i>Encyclopaedia of Indian Medicinal Plants</i> (Khare 2004)
<i>Acampe papillosa</i>	Not recorded
<i>Acmella calva</i>	Not recorded
<i>Acorus calamus</i>	Purgative, appetizer, haemorrhage, fever, urinary, skin diseases, promoting intellect and longevity, epilepsy, insanity, asthma, consumption, menorrhagia, pastular eruptions, impotency and also a cardiac tonic, intestinal catarrh, indigestion, colic pain, dysentery; in vaginal discharges and other urinogenital diseases; also for purifying breast milk; cleansing and sterilizing wounds
<i>Aegle marmelos</i>	Diarrhoea, migraine, internal abscesses and for reducing obesity, appetizer, laxatives, checks vomiting, colitis, restorative tonic for women
<i>Ageratum conyzoides</i>	Not recorded
<i>Albizia procera</i>	Not recorded
<i>Alpinia nigra</i>	Not recorded
<i>Alstonia scholaris</i>	Skin diseases, oedema, urinary diseases, fever, malignant ulcers, leprosy and other virulent skin diseases, anal fistula, polyurea, chronic cough, purgative, infected wounds
<i>Amaranthus spinosus</i>	Used in toxic conditions, intoxication, internal haemorrhage, diuretic, laxative, antitoxic; in curing drowsiness due to poison, alcoholism or vitiated blood; checks bleeding.
<i>Ambroma augusta</i>	Dysmenorrhoea, emmenagogue, amenorrhoea
<i>Andrographis paniculata</i>	Used in sluggish liver; dyspepsia, griping, irregular bowels; loss of appetite, flatulence and diarrhea, especially of children; also in convalescence after fevers and general debility
<i>Argemone mexicana</i>	Externally used in skin and venereal diseases, purgative and cured intoxication, parasitic infection, itching, vitiated cough, constipation, poisoning and obstinate skin diseases, paralysis and abdominal swellings, ringworms
<i>Argyreia roxburghii</i>	Not recorded
<i>Artemisia indica</i>	Not recorded
<i>Azadirachta indica</i>	Internally used in virulent skin diseases, erysipelas, leprosy, urinary discharges, chronic fevers, poisoning, ascites, internal parasites, malignant ulcers, internal tumours, piles, oedema, jaundice; blood purifiers and antiperiodic; stomachic; purgative, emollient and anthelmintic, rheumatic swellings, hemiplegia, paralysis and other nervous disorders
<i>Bambusa balcooa</i>	Not recorded

<i>Bambusa nutans</i>	Not recorded
<i>Bischofia javanica</i>	Not recorded
<i>Butea monosperma</i>	In constipation, colic, dysuria, skin diseases, menstrual disorders, seminal weakness, obesity, piles, urinary calculi, urinary discharges, malfunctioning of the liver, dysentery, internal abscesses, abdominal glands, non-healing ulcers, leprosy, catarrh, cold and cough, sore throat, sexual debility; used as antitoxic, antiseptic, styptic, astringent, emmenagogue, diuretic, aphrodisiac; for treating laxicity of vagina, intestinal worms
<i>Boerhavia coccinea</i>	Oedema, haemorrhage, anaemia, biliousness, diseases of the nervous system, in heart diseases, piles, abscesses and rheumatic affections, enlargement of spleen, urinary diseases, skin diseases, respiratory diseases and fever, revitalizing and rejuvenating tonic, used in treatment of chronic alcoholism, dropsy, laxative, diuretic, stimulant to the urinogenital system, asthma, jaundice, ascites, urethritis
<i>Bombax ceiba</i>	Not recorded
<i>Breynia retusa</i>	Not recorded
<i>Calotropis gigantea</i>	Used for malignant skin diseases, piles, boils, ulcers, scabies, eczema, enlarged glands and leprosy, emesis and purgation, scrotal enlargement, elephantiasis, hydrocele, dysentery, cholera
<i>Careya arborea</i>	Not recorded
<i>Cassia alata</i>	Used in skin diseases like herpes, blotch, eczema, mycosis and for treating syphilis and gonorrhoea, leprosy; purgative, in stomatitis, bronchitis, asthma; internally used as an anthelmintic; ringworm
<i>Cassia tora</i>	Not recorded
<i>Centella asiatica</i>	It is age-sustainer and brain tonic; used for rejuvenation, pectoral lesions, ulcers and intestinal affections, vigour and longevity, chronic skin diseases, cough, fever, urinary disorders, anaemia, dermatosis, insanity, schizophrenia, epilepsy and convulsions, venereal diseases, eczema, psoriasis, festering sores; acts as astringent, nerve tonic; improving receptive and retentive capacity of mind
<i>Chromolaena odoratum</i>	Not recorded
<i>Cissus quadrangularis</i>	In cases of dislocation of joints and bone fractures; in leucorrhoea and metrorrhagia
<i>Citrus limon</i>	Carminative, digestive, antitoxic, cures parasitic infection, halitosis, cough, asthma, nausea, constipation, colic pain, hiccup; in gastritis; ringworm; in sluggish liver, dyspepsia
<i>Clerodendrum serratum</i>	Cough, fevers, hard cutaneous eruptions, catarrh, asthma, dyspepsia, colic pain, parasitic worms, piles, skin diseases, goiter, cervical adenitis, scrotal enlargement, inguinal hernia, dyspnoea; antitoxic, antiseptic, astringent, styptic
<i>Colocasia esculenta</i>	Not recorded
<i>Corchorus capsularis</i>	Not recorded
<i>Costus speciosus</i>	Not recorded
<i>Crassocephalum crepidioides</i>	Not recorded
<i>Crinum amoenum</i>	Not recorded
<i>Croton roxburghii</i>	Not recorded
<i>Curcuma aeruginosa</i>	Anaemia, oedema, parasitic infections, skin diseases including leprosy, ulcer, diseases of the eye, and cervical adenitis; used as carminative and galactagogue and for treating fevers; used as stimulant; on sprains and bruises; as cosmetic
<i>Curcuma aromatica</i>	In piles, inflammatory affections, vitiation of blood, cough, bronchitis, asthma, sprains, bruises; acts as internal antitoxic and antiseptic agent
<i>Curcuma longa</i>	In liver disorders, urinary affections, dermatosis, toxicosis, piles, bronchial asthma, senility, impaired vision; oedema, anaemia, skin diseases, leprosy, malignant ulcers, haemoptysis, seminal and urinary disorders, urethral and vaginal discharges; digestive and in chronic dysentery; purifier and promoter breast milk; ointment for ringworm; stomachic, tonic, blood-purifier, inflamed joints, common cold; used in bone fracture
<i>Cuscuta reflexa</i>	Used in liver problems and gallbladder; also as stomachic and anthelmintic; used for intestinal worms, in sluggish liver, jaundice, constipation, pain in uterus and bladder; blood purifier

<i>Cynodon dactylon</i>	Used for intrinsic haemorrhage, bleeding piles, wounds and for erysipelas and skin diseases like scabies, eczema, ringworm and urticaria; checks vomiting; for inducing menstruation; used as styptic; in ulcers
<i>Cyperus rotundus</i>	Diarrhoea, dysentery, ingestion; uterine and vaginal diseases; fever, hepatitis, flatulence of the stomach, palpitation and debility
<i>Datura metel</i>	Ointment for sinusitis; in insanity; eczema and ringworm, boils and eruptions; in chronic coryza; in hyperacidity, vomiting, burning sensation in the chest; in alopecia, falling hair and cutaneous affections of the scalp; used as hypnotic for averting premature ejaculation
<i>Derris polystachya</i>	Not recorded
<i>Desmodium triflorum</i>	Not recorded
<i>Dillenia pentagyna</i>	Not recorded
<i>Drymaria cordata</i>	Not recorded
<i>Eclipta prostrata</i>	Asthma, cough, bronchitis, rheumatism, senility; used as detoxifying, deobstruent and antiseptic, anaemia, splenic and liver enlargements, catarrhal jaundice, hyperacidity, gastritis, dysentery, skin affections; prescribed for anointing the head, for hair growth and for giving natural colour to grey hair
<i>Eleutherine bulbosa</i>	Not recorded
<i>Entada rheedii</i>	Not recorded
<i>Euphorbia hirta</i>	Not recorded
<i>Glycosmis pentaphylla</i>	Not recorded
<i>Gmelina arborea</i>	In stiffness of the back, facial paralysis; diarrhoea, bilious fever, haemoptysis, breathing trouble, asthma and for promoting adhesion of fractured bones; urticaria; applied on underdeveloped or sagging breasts; high fever, rheumatic affections, urinary tract infections, anuria, dysuria; on gout
<i>Helicteres isora</i>	It is antibilious, astringent, blood-purifier; used in diarrhea, dysentery, biliousness
<i>Hibiscus rosa-sinensis</i>	Contraceptive, leucorrhoea and other gynaecological disorders; amenorrhoea; for retarding premature greying of hair, controlling excessive uterine bleeding; used as refrigerant and vitaliser in palpitation, cough, fever, burning sensation in the body; venereal diseases
<i>Houttuynia cordata</i>	Not recorded
<i>Hydrocotyle sibthorpioides</i>	Not recorded
<i>Hypericum japonicum</i>	Not recorded
<i>Imperata cylindrica</i>	Galactagogue; used in retention of urine, dysuria, calculi, haemoptysis, diseases of reproductive system; for reducing obesity; acts as restorative, laxative
<i>Ipomoea aquatica</i>	Not recorded
<i>Jatropha curcas</i>	To stop bleeding or haemorrhage from wounds; also for treating scabies, eczema, ringworm; in rheumatism, piles, styptic, purgative
<i>Justicia adhatoda</i>	In pulmonary consumption, fever, malarial fever, cough, dyspepsia, anorexia, haemoptysis, oedema, anaemia, asthma, bronchitis
<i>Justicia gendarussa</i>	Not recorded
<i>Kaempferia rotunda</i>	Not recorded
<i>Kalanchoe pinata</i>	In ulcerative colitis, haemorrhagic dysentery, bleeding piles, metrorrhagia, styptic, small pox, cough and cold; used as astringent, antiseptic
<i>Lasia spinosa</i>	Not recorded
<i>Leucas indica</i>	Eye diseases, jaundice; used as blood purifier in psoriasis, scabies, chronic skin eruptions, malarial fever, rheumatism, antipyretic, in swellings, cough
<i>Lindernia anagallis</i>	Not recorded
<i>Lippia javanica</i>	Not recorded
<i>Mangifera indica</i>	Act as cardiac tonic, promotes complexion, semen, increases digestive power, cures urinary diseases and disorders caused by vitiated blood; cures vomiting and diarrhea, burning sensation in the chest due to acidity; in obesity, haemoptysis and vaginal discharges; in enlargement of spleen; in treatment of dandruff
<i>Macardonia procumbens</i>	Not recorded

<i>Melastoma malabathricum</i>	Not recorded
<i>Mentha spicata</i>	Used in flatulence, stomachache, dyspepsia, nausea, vomiting, cholera, diarrhea, cardalgia, catarrh, migraine, indigestion, chronic fevers
<i>Mimosa pudica</i>	In haemothermia, piles, diarrhea, persistent dysentery, diseases of female genital tract
<i>Momordica charantia</i>	Used in haemothermia, cough, fever, hiccup, urinary diseases, skin diseases, gout, measles, small pox, eruptions, diabetes, diseases of liver and spleen, rheumatism, jaundice, piles, leprosy; acts as emetic, purgative
<i>Momordica dioica</i>	Not recorded
<i>Morinda angustifolia</i>	Not recorded
<i>Moringa oleifera</i>	Oedema, anosmia, asthma, fainting, chronic skin eruptions, painful piles; in migraine, abdominal swelling, dropsy, for reducing obesity; boils, scrofula and leprotic wounds; abscesses; in gout, obesity, headache, eye diseases, and as a digestive stimulant; in catarrhal affections, cough, influenza, enlargement of spleen and liver, intestinal worms; articular pains, debility, neurological disorders and skin diseases, calculous affections, hiccup, rheumatism, gout, lumbago; used for reducing glandular swellings
<i>Morus australis</i>	Not recorded
<i>Murdannia nudiflora</i>	Not recorded
<i>Murraya koenigii</i>	Not recorded
<i>Musa balbisiana</i>	Not recorded
<i>Natsiatum herpeticum</i>	Not recorded
<i>Neanotis hirsuta</i>	Not recorded
<i>Neolamarchia cadamba</i>	It is adipogenous, retentive and inspissant to semen, aphrodisiac and cure affections of female genital tract, urinary disorders, anaemia and skin diseases; used as sedative, antitoxic, antiseptic, astringent, and in haemoptysis; in gastric irritability of children; galactagogue, blood purifier and as an expectorant; used for gargling in aphthous stomatitis due to their astringent properties; febrifuge and anti-diuretic; diarrhea, dysentery with bleeding, leucorrhoea, spermatorrhoea
<i>Nymphaea pubescens</i>	Not recorded
<i>Ocimum tenuiflorum</i>	Fever, splenic affections, toxicosis and skin eruptions; also for catarrh, cough, asthma and dyspepsia; for alleviating anorexia, parasitic infections, rhinitis, cough, cold, digestive, cures dysurea, vitiation of blood, urticaria, chronic skin diseases, piles, parasitic infections, vomiting, earache, conjunctivitis, post-parturition pain, chest diseases; pharynx, bronchial and lung infections; for expelling intestinal worms, cleansing wounds, conjunctivitis, malarial fever; in disorders of the genitourinary system; antipyretic, diaphoretic in fevers; in boils, mosquito bites, myiosis and ozoena
<i>Oroxylum indicum</i>	For dysentery, diarrhea, abdominal diseases, rheumatism, diseases of ear, nose and throat (ENT), high fever, partial paralysis, diabetes, dysuria, non-healing ulcers, gynaecological disorders, bone fracture, falling of hair and baldness, enlarged spleen, headache; acts as an antiseptic, antitoxic, astringent, styptic, stomachic, purgative
<i>Oxalis corniculata</i>	In piles, mesenteric disorders; for diarrhea, prolapsed of rectum, insanity, in dyspepsia and tympanitis, fevers with biliousness
<i>Paederia foetida</i>	In rheumatism, flatulence of abdomen, piles, inflammation of spleen, liver pain; applied to the abdomen in case of retention of urine
<i>Peperomia pellucida</i>	Not recorded
<i>Pericampylus glaucus</i>	Not recorded
<i>Phlogacanthus thyriformis</i>	Not recorded
<i>Piper attenuatum</i>	Not recorded
<i>Piper sylvaticum</i>	Not recorded
<i>Phrynium pubinerve</i>	Not recorded
<i>Phyllanthus amarus</i>	In jaundice, menometrorrhagia, haematuria, diarrhea, urinary disorders, chronic dysentery, ulcers, sores, swellings; used as deobstruent, diuretic, cooling and astringent
<i>Piper longum</i>	For cough, dyspnoea, diarrhea, diseases of mouth, malarial fever, arthritis, gout,

	asthma, chronic bronchitis, allergy, muscular atrophy, urinary disorders, anorexia, abdominal obstructions, tympanitis, contraception, intestinal disorders, enlarged liver and spleen, dyspepsia, stomachache, constipation, polyuria, dysuria, flatulence, throat infections
<i>Pogostemon amaranthoides</i>	Not recorded
<i>Polygonum plebeium</i>	Not recorded
<i>Plumbago zeylanica</i>	For intestinal catarrh, indigestion, colic, internal abscesses, jaundice, intestinal parasites, piles, urinary calculi, polyuria, spermaturia, vaginal discharges, deficient lactation, virulent skin diseases, poisoning; in diarrhea, dysentery, cough, throat related diseases, oedema, swellings of stomach and intestines; used for sprue, indigestion, colic and loss of appetite, acts as carminative and expectorant
<i>Psidium guajava</i>	Not recorded
<i>Pupalia lappacea</i>	Not recorded
<i>Ricinus communis</i>	Prescribed for misperistalsis, constipated bowels, diarrhea with blood and mucus; in rheumatism, inflammatory and irritable conditions of intestines, inflammatory diseases of rectum and urinogenital tract, lumbago, sciatica, plurodynia; for promoting conception, improving lactation, fevers, mental diseases; for hepatitis and splenitis
<i>Rotala rotundifolia</i>	Not recorded
<i>Scoparia dulcis</i>	Not recorded
<i>Sida acuta</i>	Not recorded
<i>Sida cordifolia</i>	In urinary diseases, splenic disorders, for rejuvenation and promoting fertility; rheumatism, gout, hemiplegia, neurological affections, muscular atrophy, torticollis, goiter, intrinsic haemorrhage, meno-metrorrhagia; prescribed as rejuvenating and nervine tonic; for loss of vitality; for facial paralysis and sciatica, alleviating erysipelas, diarrhoea
<i>Smilax ovalifolia</i>	Not recorded
<i>Solanum anguivi</i>	For toxicosis, pain, oedema of vagina, diarrhea, cough, piles, promoting conception, alopecia, haemothermia, bronchitis, chronic febrile conditions, headache, fever, anorexia, tympanitis, convulsions
<i>Solanum torvum</i>	Not recorded
<i>Solanum tuberosum</i>	Not recorded
<i>Solanum viarum</i>	Bronchial asthma, tympanitis, misperistalsis, piles, dysuria, and for rejuvenation, cough, hoarseness of voice, indigestion, anorexia, abdominal pain, fever; for suppression and retention of urine, promoting fertility and impregnation; acts as blood-purifier, antiseptic, antiperiodic, anti-inflammatory, cardiac tonic, restorative
<i>Spondias pinnata</i>	Not recorded
<i>Stephania glabra</i>	Not recorded
<i>Stephania japonica</i>	Not recorded
<i>Streblus asper</i>	Not recorded
<i>Terminalia arjuna</i>	For cardiac disorders, diarrhea, intrinsic haemorrhage, piles, ulcers; in freckles, vaginal discharges, migraine, internal abscesses, obesity, haemoptysis, jaundice, urinary calculi, chronic skin diseases; hair dye
<i>Terminalia bellirica</i>	Cough, irregular fever, cardiac affections, gradual loss of vision, deficient lactation, urinary diseases, chronic skin diseases; used as purgative; for preventing premature balding and dyeing hair; dyspnoea and asthma; in rheumatism, oedema, piles, sore throat, bronchitis
<i>Terminalia chebula</i>	Used for indigestion, oedema, dermatosis, urinary diseases, uterine and vaginal disorders, irregular fevers, hysteric convulsions, epileptic fits, tympanitis, vomiting, colic, sprue syndrome, jaundice, splenic disorders; acts as over-all tonic, blood-purifier, galactagogue, purgative, constipative, promoter of eyesight, dentifrice for bleeding gums; for treating cough, asthma, hiccup, throat affections, impaired voice, conjunctivitis
<i>Tinospora cordifolia</i>	Used for jaundice, splenomegaly, irregular fever, polyuria, diabetes, acid gastritis, gout, rhumatic affections, skin diseases, cough; acts as rejuvenating tonic,

	antiperiodic, antipyretic, anti-inflammatory agent
<i>Typhonium trilobatum</i>	Not recorded
<i>Vitex negundo</i>	Used for neuralgic pain of supraclavical region, sinus, fistula, scabies, catarrh, cough, asthma, rhinitis, cervical adenitis, splenic enlargement, cleansing of ulcers, venereal sores, spermatorrhoea, chronic ulcers and skin diseases; in rheumatism, gonorrhoeal epididymitis and orchitis, headache, dysentery, liver complaints; for removing foetid discharge from wounds and ulcers, promoting virility; used as febrifugal, expectorant and diuretic, dyspepsia
<i>Xanthium indicum</i>	Not recorded
<i>Zanthoxylum rhetsa</i>	Not recorded
<i>Zea mays</i>	Used for anuria, cystitis, metrorrhagia, bleeding piles, cough
<i>Zingiber cassumunar</i>	Not recorded
<i>Zingiber officinale</i>	It is used for oedema, piles, abdominal diseases, coryza, bronchial asthma, jaundice, influenza, fever, internal obstructions and congestions, polyuria, cough, dropsy, chronic heart diseases, stimulating appetite, congestion of nasal passage and sinus, rheumatism, sciatica, lumbago, nausea, vomiting, retching, dyspepsia; in liver and spleen diseases; acts as antinarcotic, snuff for headache, cardiac tonic, nervine tonic
<i>Zizyphus mauritiana</i>	For loss of voice, giddiness, piles, bilious and rheumatic affections, anuria; as purgative, warm enema, diuretic, stomachic and laxative; in haemoptysis, menstrual and other vaginal disorders, obesity, gluttonous appetite, leucorrhoea, vomiting, diarrhoea, dysentery, gingivitis

As per the present comparison it is now noted that out of the 130 species of plants used by *Mech Ojas* in their medicines 72 are not recorded in the *Encyclopedia of Indian Medicinal Plants* (Kirtikar & Basu 1933). However, when compared with some other books on medicinal plants covering this part of the country including Das & Mandal (2003), Das *et al* (2006, 2008), Gurung (2002), Sharma & Sharma (2010) and Jha *et al* (2008) it can be realized that some of these 72 species are also with important medicinal importance. Even after that 24 species recorded during the present survey appears to be new use record as traditional Medicinal Plants. These plants are: *Acampe papillosa*, *Albizia procera*, *Bambusa balcooa*, *Bambusa nutans*, *Bischofia javanica*, *Bombax ceiba*, *Breynia retusa*, *Derris polystachya*, *Hydrocotyle sibthorpioides*, *Lindernia anagallis*, *Lippia javanica*, *Macardonia procumbens*, *Murdannia nudiflora*, *Nymphaea pubescens*, *Peperomia pellucida*, *Piper attenuatum*, *Piper sylvaticum*, *Phrynium pubinerve*, *Pogostemon amaranthoides*, *Polygonum plebeium*, *Pupalia lappacea*, *Rotala rotundifolia*, *Spondias pinnata* and *Zingiber cassumunar*.

9.2.5. Plants for Veterinary Medicines: *Mech* people keeps so many types of types of domesticated animals like cows, buffalos, goats, sheep, fowls, ducks, pigs, dogs and cats. Like their masters, these animals too suffer from different types of diseases. And, the *Mech Ojas* have definite prescriptions for curing their ailments. The present survey has recorded the uses of 29 species of plants covering 28 genera from 21 families to tackle different veterinary problems. These include the problems they face regularly like helminth infestation, improper lactation, exoparasites, dysentery, flatulence, pneumonia, etc. As much as 23 types of diseases they treat and the formulations are quite simple. Most of the plants used for the treatment of their animals are also used for the treatment of man, i.e. these are mostly known medicinal

plants. These include important medicinal plants like *Alstonia scholaris*, *Azadirachta indica*, *Justicia adhatoda*, *Nyctanthes arbor-tristis*, *Cannabis sativa*, *Centella asiatica*, *Curcuma longa*, *Cynodon dactylon*, *Euphorbia hirta*, *Zingiber officinale*, *Paederia foetida* etc. For the preparation of medicines they use different plant parts like leaf, stem, rhizome, root, bark, fruit, flower, etc in the form of extracts, pastes, etc for treatment. Very rarely they use jaggery or black salt or table salt to prepare or to effective administration of medicines. The main success of any type of treatment depends on the rate of success in curing diseases with least or no side effects. The animals they maintain appear quite healthy and that reflects the success of their veterinary formulations.

9.2.6. Poisonous Plants: A plant becomes poisonous when it produce and store some chemicals those can create adverse effect on the body of one or more other organisms. Sometimes we need to use poisonous plants. Some cases like killing stupefying of fishes, poisoning arrows, repelling snakes and insects, creating madness or even killing people! Thirteen species (covering 11 families) have been recognised under this section and they use majority of the poisonous plants for stupefying fishes as they need to catch good amount of fishes from the local streams, rivers and other type of wetlands not only for their personal consumption but also for marketing. Interestingly, plants recorded under this section are all recognized medicinal plants.

9.2.7. Preparation of Jou: *Jou*, the traditional Rice Beer produced by *Meches* is a part and parcel of their life style. Most of the traditional societies produce such type of drink. It is not a mere alcoholic drink but they use it as 'food'. Just with *Jou* they can spend whole day or even days together. The comparison of the method of Rice Beer preparation by some other tribal communities shows that there are many differences in the herbal ingredients of starter mixture. Otherwise, the methods of preparation of starter mixture and the method of fermenting of boiled rice are almost similar. If the *Jou/ Haria/ Jhara* preparation can be standarise and the level of their food-values can be maintained properly, rice beer also can be marketed as a health drink with no side effect as similar drink *Fenny* is marketed in Goa.

9.2.8. Plants used in Decoration, Religious acts and in Festivals: Mostly beautiful plants are used for decoration during different occasions including foliage and flowering plants. Decoration is the basic need for festivals and for divine worships. In traditional societies most of the festivals are in connection with some religious acts and that is true for the *Meches* too! They organize these events round the year. And, in remote villages food is the most important limiting factor. They can harvest good crop only when the cultivation was proper. So, it is natural that worships and festivals will remain associated with the beginning of the cultivation and harvesting of crops. It is natural that *Laakhee Phunai* will be the most

important worship cum festival for them as through this they seek and get (as traditionally they believe) the permission to harvest the crop they produced in their croplands.

Basically they follow their own *Bathou* Religion. *Bathou* or the Lord Shiva is the creator but they also offer divine worship to many other Gods and Goddesses. And, for all these they use a good number of plants in different stages of worship and/or festival. A scrutiny of the plants used shows that some plants like *Euphorbia royleana*, *Ocimum tenuiflorum*, *Cynodon dactylon*, *Justicia gendarussa*, *Areca catechu*, *Piper betle*, *Musa balbisiana* and *Oryza sativa* are the most important religious and festival oriented plants in *Mech* society. *Euphorbia royleana* is the representative of *Bathou* and is planted on a platform like elevated place and is worshiped regularly. They do not worship any artificial structure like a doll or stone, instead the worship plants. Probably that brings them nearer to nature and induces love for nature in their mind. The prayer they perform before the God is very simple requesting Him for helping them to get enough food and to keep them healthy. If the people of a society remain healthy and get enough food from surrounding vegetation and/or from their cropland then they can maintain an independent life style. They consume good amount of *Jou* during all these festivals.

Birth, marriage and death are three very important stages of our life. Birth and marriage are welcome occasions and death is a loss. However, in all these three stages they use a number of plants in different manner. During pregnancy an aseptic condition need to be maintained and the same is also important at the time of giving birth and the first few days of child's life in open environment. Use of plants like *Ocimum tenuiflorum* and *Cynodon dactylon* etc are the indications that they feel to keep things clean and free from infections. Marriage is one joyful occasion but it formally initiates the reproductive phase of one boy and a girl. So, this is treated as a ceremony and in its ceremonial part some religious plants are in use. After the death of a person in a family, the bereaved living members do not feel comfortable and become susceptible. Under such condition, they need to take care of their own health as well as the health of the departed soul. *Mech* people believe in the existence of the soul and a soul never dies but change the body. For some time, before entering into the next new body, the soul remains free. So, after the death of a person they need to think for a number of persons. The dead, his family members and his departed soul. However, during all these life-stage related social programs they use quite a few plants like *Cynodon dactylon*, *Ocimum tenuiflorum*, *Euphorbia royleana*, *Musa balbisiana*, *Bambusa tulda*, *Bambusa nutans*, *Bombax ceiba*, *Oryza sativa*, *Areca catechu* and *Piper betleoides* for birth; *Areca catechu*, *Bambusa nutans*, *Bambusa tulda*, *Cynodon dactylon*, *Euphorbia royleana*, *Musa balbisiana*, *Oryza sativa* and *Piper betle* for marriages and during death *Bambusa tulda*, *Corchorus capsularis*, *Cynodon dactylon*, *Imperata cylindrica*, *Justicia gendarussa*, *Ocimum tenuiflorum*, *Oryza sativa* and *Shorea robusta*.

May be the total number of plants are not so high but a total of 14 species [*Areca catechu*, *Bambusa nutans*, *Bambusa tulda*, *Bombax ceiba*, *Corchorus capsularis*, *Cynodon dactylon*, *Euphorbia*

royleana, *Imperata cylindrica*, *Justicia gendarussa*, *Musa balbisiana*, *Ocimum tenuiflorum*, *Oryza sativa*, *Piper betle* and *Shorea robusta*] of plants they use. All these plants are either religious or are economically important.

9.2.9. Plants in Folklores: Folklores speak a lot about a community. In one hand it bears information regarding the origin and migration and on the other hand the great events, likings, dislikings and culture of the community. The collected folklore, mainly poems and puzzles were analyzed for information in regard to uses of plants from different angles. A total of seven poems and 14 puzzles were analysed.

The selected seven poems mostly showed their relationship with the habitat, which is generally forested and full of useful materials to use as food, fodder, house building materials, medicines, making instruments for hunting and recreational activities. These have reflected their lifestyle which is too much dependent on their surrounding vegetation, their cultivation, enemies and the habitat structure or, in other words, the environment in total.

Six out of 14 puzzles presented here are involving their food-plants [*Litchi chinensis*, *Citrus maxima*, *Ananas comosus*, *Zea mays*, *Cucurbita maxima* and *Zizyphus mauritiana*] and for one puzzle the answer is *Jou* – the elixir of their life. Another puzzle indicates the ‘bow & arrow’. *Mech* people live in forest villages where they need survive from the attack of numerous species of wild animals. Many such animals like leopard, bison, elephant, different types of snake, wildcats etc regularly visit their villages. So, for their safety and also for hunting the edible animals bow & arrow are the most important equipments. Similarly, other puzzles also indicating important objects like heap of straw, umbrella made of *Phrynium pubinerve* leaves, pillow stuffed with *Bombax ceiba* floss collected from local vegetation, the rootless mosses and the stinging plant *Dendrocnide sinuata*. They have realised that the mosses are rootless and that has expressed their power of observation.

9.3. New and Additional Records of Ethnic uses of Plants

During the present survey the ethnic uses of 271 species of plants has been recorded. A comparison with the *Dictionary of Indian Folk Medicine and Ethnobotany* (Jain 1991) and *Dictionary of Ethnoveterinary Plants of India* (Jain 1999) shows the new use records for the following plants:

Acampe papillosa, *Alangium chinense*, *Alternanthera paronichioides*, *Argyreia roxburghii*, *Artemisia indica*, *Axonopus compressus*, *Derris polystachya*, *Digitaria ciliaris*, *Eleutherine bulbosa*, *Eragrostis unioloides*, *Gliricidia sepium*, *Grewia serrulata*, *Kyllinga nemoralis*, *Lagerstroemia hirsuta*, *Macaranga denticulate*, *Malvaviscus arboreus*, *Mecardonia procumbens*, *Oplismenus burmannii*, *Oplismenus compositus*, *Persicaria chinensis*, *Pogostemon amaranthoides*, *Premna bengalensis*, *Pupalia*

lappacea, *Sansevieria trifasciata*, *Setaria palmifolia*, *Spermacoce latifolia*, *Stellaria wallichiana*, *Tetrastigma bracteolatum*, *Xanthosoma brasiliense*, *Zehneria japonica* and *Zingiber cassumunar*.

In addition to these, there are some other plants those are recorded earlier for some ethnobotanical uses but during the present survey newer type of their uses have been recorded. Following plants are coming under this category (new type of uses are given within parenthesis):

Acmella calva (edible, fodder); *Aegle marmelos* (fodder); *Alocasia macrorrhizos* (fodder); *Alpinia nigra* (medicinal), *Alstonia scholaris* (fodder, musical instruments, wooden sandal, fish poison), *Alternanthera sessilis* (fodder), *Amaranthus lividus* (fodder), *Amaranthus spinosus* (veterinary, fodder), *Amaranthus viridis* (fodder), *Amorphophallus bulbifer* (veterinary, fodder), *Annona reticulata* (veterinary, fodder), *Areca catechu* (fencing), *Artocarpus heterophylla* (fodder), *Artocarpus lacucha* (fodder), *Baccaurea ramiflora* (fodder), *Bambusa nutans* (medicinal, veterinary, edible, fodder, religious ceremony, fencing), *Boerhavia coccinea* (fodder), *Calamus erectus* (religious ceremony), *Cannabis sativa* (veterinary), *Centella asiatica* (veterinary), *Chenopodium album* (fodder), *Clerodendrum viscosum* (ingredient in rice beer), *Colocasia esculenta* (fodder, veterinary), *Commelina benghalensis* (fodder), *Corchorus capsularis* (veterinary, thatch, religious ceremony), *Costus speciosus* (ornamental, fish poison), *Crinum amoenum* (veterinary, gardening), *Curcuma longa* (veterinary), *Cynodon dactylon* (veterinary, fodder), *Cyperus rotundus* (fodder), *Datura metel* (poisonous for human health), *Dillenia indica* (fodder), *Dillenia pentagyna* (fodder), *Diospyros malabarica* (fodder, tanning fishing nets, trapping birds), *Drymaria cordata* (edible, fodder), *Elaeocarpus floribundus* (fodder), *Enydra fluctuans* (fodder), *Euphorbia hirta* (fodder), *Ficus hispida* (fodder), *Gmelina arborea* (fodder, religious ceremony), *Hibiscus sabdariffa* (veterinary), *Imperata cylindrica* (fodder, religious), *Ipomoea aquatica* (fodder), *Jatropha curcas* (veterinary, fencing), *Justicia adhatoda* (veterinary), *Justicia gendarussa*, (religious), *Kalanchoe pinnata* (decoration), *Lippia javanica* (edible), *Luffa aegyptica* (bath sponge), *Mangifera indica* (fodder), *Melastoma malabathricum* (hair dye), *Mirabilis jalapa* (divine offering), *Murraya koenigii* (snake repellent), *Musa balbisiana* (edible, medicinal, veterinary, fodder, offering, ceremonial decoration), *Neolamarchia cadamba* (fodder), *Nymphaea pubescens* (medicinal), *Oroxylum indicum* (fodder), *Oryza sativa* (veterinary), *Paederia foetida* (veterinary), *Pericampylus glaucas* (medicinal, veterinary), *Persicaria hydropiper* (veterinary), *Phrynium pubinerve* (medicinal), *Piper betle* (veterinary), *Plumbago zeylanica* (poisonous for human health), *Psilanthus bengalensis* (divine offering), *Rotala rotundifolia* (medicinal), *Saccharum spontaneum* (fodder, religious ceremony), *Tephrosia candida* (manure, fuel), *Thevetia peruviana* (divine offering, poisonous), *Typhonium trilobatum* (medicinal, fodder), *Vetiveria zizanioides* (broom), *Vigna mungo* (religious ceremony), *Vitex negundo* (edible), *Zingiber officinale* (edible, veterinary), *Achyranthes bidentata* (fodder), *Ambroma augusta* (medicinal), *Bambusa tulda* (religious), *Barringtonia acutangula* (fruits used for playing), *Bidens pilosa* (fodder), *Bischofia javanica*

(medicinal), *Callicarpa arborea* (furniture, Poison arrow head), *Catharanthus roseus* (religious purpose, gardening), *Casearia graveolens* (fruits used for playing), *Cassia fistula* (burnt fruit ash used for washing utensils), *Cicer arietinum* (religious ceremony), *Deeringia amaranthoides* (edible, deep violet dye), *Diplocyclos palmatus* (edible), *Eichhornia crassipes* (edible, fodder), *Euphorbia royleana* (veterinary, sacred), *Ficus benghalensis* (fodder), *Ficus religiosa* (fodder), *Gossypium arboreum* (cotton used for making mattress and traditional dress), *Hydrocotyle sibthorpioides* (medicinal, veterinary), *Litsea monopetala* (fuel wood), *Mentha spicata* (medicinal), *Michelia champaca* (timber, fire wood), *Mikania micrantha* (fodder, cordage), *Monochoria vaginalis* (edible), *Nyctanthes arbor-tristis* (veterinary), *Oldenlandia corymbosa* (edible), *Piper nigrum* (edible), *Pogostemon amaranthoides* (medicinal), *Toona ciliata* (fodder, furniture), *Trema orientalis* (fuel) and *Trewia nudiflora* (fuel).

So, the present survey has recorded new 31 ethnobotanical plants, i.e. the ethnic uses of those plants were earlier unknown to the scientists. In addition, another set of 104 species of plants were also recorded with their newer ethnic uses.

9.4. Future of *Mech* Traditional Knowledge

Through in the present discussion attempts have been made to establish the originality and the importance of *Mech* Traditional Knowledge on the uses of their local plants. But the structures of human settlements are changing very rapidly. Forest cover is decreasing at an alarming rate, present set of country's forest related rules are prohibiting tribal people to collect many of their forest-based daily requirements. Extension of road net-works, easily approachable markets of processed goods, Government Hospitals with modern treatment facilities, television programs, cinemas, establishment of schools almost in all villages etc are changing their life style very fast.

Yes, *Mech* people too should enjoy all these facilities of modern society and need to be strong in their economy. Government's initiatives or programs to uplift the quality of life style of most of the traditional societies, including *Meches*, are appreciable. Now, numerous *Mech* boys and girls are coming out to participate in University oriented education systems. They are now opting for numerous good professions and becoming Physicians, Advocates, Teachers, Administrators etc. And, the coming generations in *Mech* societies will, no doubt, move equally with the people of any developed community in their area. Quite a few *Mech* students are now pursuing their post-graduate studies in the University of North Bengal itself. But, all these changes are endangering their Traditional Knowledge which they have developed during their existence with the natural environment for thousands of years.

Unless conserved properly, the planet's human society will lose some important knowledge generated by *Meches* living in Duars of West Bengal and Assam.

9.5. Conservation of *Mech* Traditional Knowledge

It is not possible to ask the *Mech* people to continue their survival completely in their traditional manner. The elderly people and the people in remote villages like to practice ethnobotanical means even today. But, in developed areas and especially the present generation of enthusiastic young boys and girls like to see the world and to enjoy all facilities of modern civilization. They will hardly follow any traditional methodology.

Keeping this important point in mind, the immediate first and the basic requirement for the conservation of *Mech* Traditional Knowledge (TK) is the detailed survey in all their settlements mainly in Duars and Assam. It is true that now they are distributed outside this area but that migration is linked with their working or earning facilities and is living in comparatively developed locations. So, the steps for the conservation of TK are:

- i. Survey & Documentation (written and photographic)
- ii. Careful selection of TK for potential future uses
- iii. Assessment in modern laboratory conditions
- iv. Processed into agreeable structure for distribution in modern societies.

The traditional people do not like to share their knowledge with the outsiders. Initiative need to be taken for their realization and proper recognition and financial assistance need to be extended for them as they are the owner of such TKs. The TBGRI or Pushpangadan Model (Pushpangadan 2003) can help in such negotiations.

9.6. Some Important Areas in *Mech* Traditional Knowledge

Traditional Knowledge potential for exploitation can be found in different types of uses. Edible and medicinal properties are more important. Some such areas may be:

- i. *Jow/ Haria/ Jhara* preparation may be standardised, produced in bulk and can be marketed
- ii. Some potential non-conventional edible plants may be selected for basic improvement, including the estimation of food values, and can be introduced into the cultivation leading to their marketing. Some such selected plants may be *Alternanthera philoxeroides*, *Alternanthera sessilis*, *Amaranthus viridis*, *Baccaurea ramiflora*, *Costus speciosus*, *Dillenia pentagyna*, *Diplazium esculentum*, *Enydra fluctuans*, *Flacourtia jangomas*, *Glinus oppositifolius*, *Helminthostachys zeylanica*, *Houttuynia cordata*, *Hygrophila auriculata*, *Marsilea minuta*, *Mussaenda roxburghii*, *Oroxylum indicum*, *Phlogacanthus thyriformis*, *Piper sylvaticum*, *Polygonum plebeium*, *Solanum anguivi*, *Solanum torvum*, *Stellaria wallichiana*, *Typhonium trilobatum*, etc. Again, some of these plants already brought to the

urban or even metropolitan (e.g. Kolkata) markets in low quantity. But, there are good demands which can not be satisfied from the collection in natural vegetation only. Plants like *Typhonium trilobatum*, *Polygonum plebeium*, *Marsilea minuta*, *Hygrophila auriculata*, *Glinus oppositifolius*, *Enydra fluctuans*, *Diplazium esculentum* and *Alternanthera philoxeroides* are sold in different Kolkata markets.

- iii. Some of the *Mech* cuisines may be tested and some improvement may be made in the recipe and can be popularized. *Ondla* may be first *Mech* FAST FOOD that can be tested for this purpose.
- iv. Most of the formulated *Mech* medicines work quite effectively. Scientific evaluation of many such formulations may lead to the discovery of some quite effective drugs to replace some synthetic ones.

CHAPTER 10

CONCLUSION

Conclusion

Mech is one well known tribe mostly living in the Duars region of West Bengal and in the Kokrajhar district of Assam. In some areas of Assam they are also referred as *Bodo*. People of this primitive tribe love to live in forest villages or in localities quite nearer to forests. They are living in Duars, the present study area, for much longer than 400 years and were leading completely forest dependent life style. Recently they have learnt to cultivate some common crops like paddy, corn, jute, potato, etc but they prefer to consume their traditional vegetable those are available in local vegetations in abundance. Their previous population structure and the available natural resources were in good proportion and the forests were providing them enough food and other resources for their survival. But, the recent depletion in forest and other types of natural vegetations and, on the other hand, increase of *Mech* population is forcing them now to depend on sources outside the forests.

This forest-dependent life style helped them to recognize numerous useful plants to satisfy their different needs for proper survival.

The edible plants they selected are quite useful and many of those plants might be agreeable for people living in other areas. If investigated properly then many of their wild edible plants can be used widely and can be marketed. In addition, *Jou*, the rice beer they prepare also can be improved and its marketability can be tested. *Meches* also have their own special cuisines prepared using their own recipe and a few of those can be acceptable by others. Their most important preparation, *Ondla* (veg & non-veg), that is a must during their marriage ceremonies, can be marketed with little improvised taste.

Selection of fodder plants is also important as they maintain a good number and variety of livestock. Some of the selected species can be grown in fallow-lands to improve the fodder supply in villages located little away from nearby forests. If the livestock with *Mech* families remain healthy with their selected fodders, then, certainly those fodders will keep the livestock healthy maintained by other communities elsewhere. However, the nutritive status of their preferred fodders needs to be verified.

Mech traditional healers, *Ojas*, are quite conversant with the diseases they and their domestic animals suffer. They have developed a wide variety of drugs to use against those diseases, using mostly locally available plant materials and rarely with animal or inorganic materials. Their medicines are quite effective as the people remain healthy using these medicines only. Unless the situation is quite worse they will not visit a hospital, which is generally located far away from their settlements. Their single-plant medicines

and formulated drugs – all are quite effective and the practice level of *Mech Ojas* is quite good. During the survey, majority of the sufferers expressed their satisfaction about the improvement from their sufferings. For the treatment of some diseases they are having more than one formulated drugs used by different *Ojas*. However, in their method of treatment there is no use of any antibiotic like material and the plant extracts or pastes or tablets etc are working nicely. It is now important to verify these medicines scientifically to find out if any lead is available for the development of new drugs for their application over wider areas. - - The story is also same for the veterinary medicines practiced by them.

Meches are believers in *Bathou* religion. They worship a number of Gods and Goddesses. They organize a number of festivals round the year. Their worships related to get permission to start cultivation and to harvest the produced crops are very important. They also arrange *Phunai* to praise their deity to keep the society clean and healthy. The ethnobotany of their festivals and *Phunais* shows that they try to please their Gods and Goddesses using plants those are somehow valuable for them. Crops and other edible plants, medicinal plants, etc are commonly used for such purposes.

For survival we need to construct our houses. *Meches* construct houses of very simple design with thatched roof. Whatever may be the structure, they need construction materials. Main trunk or primary old branches of different trees are collected from forests for main poles and for thatching leaves of some grasses are the important materials. Not only for housing, have they also used plant materials for many other purposes for survival including the construction of hunting and fishing equipments, storage vessels, etc of their daily use. They also use some poisonous plants mainly to stupefy fishes and poison the arrows for hunting.

The cultural aptitude of *Meches* is quite high. They can frame dances, and can compose songs, poems and puzzles. In all these, references to plants are quite common.

The record 31 new ethnically useful plants and the additional new uses of 104 species of plants are probably making the results of the survey significant.

In fact, for the *Mech* society, the traditionally acquired knowledge on the uses of plants is quite high. Many of their Traditional Knowledge appears to be beneficial for the human society as a whole. But, the *Mech* society is changing rapidly through the adoption of the facilities of modernization in the outer world. This is endangering the huge stock of *Mech* Traditional Knowledge, which needs to be surveyed and documented immediately so that, in future, those can be scientifically evaluated and can be used for the betterment of the entire human society.

CHAPTER 11

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ANNEXURE – I

Questionnaire for Collecting Information on Plants Used by *Mech* Tribe Duars of West Bengal and Assam (Jain & Mudgal 1999)

Place (State, Dist., Block, Village):

Date:

Tribe:

Informer's Name:

Age (Years):

Sex: Male / Female

I. **TIMBER**

1. **Tools**

(i) Tools for agriculture

- a. Ploughing
- b. Harvesting
- c. Sieves
- d. Winnowing
- e. Storing

(ii) Tools for hunting

- a. Arrows
- b. Bow
- c. Traps

(iii) Tools for weaving

(iv) Tools for spinning

(v) Tools for fishing

2. **House Building**

(i) Walls

(ii) Windows

(iii) Roof

(iv) Doors

(v) Thatching

(vi) Fencing

3. **Utensils used for cooking and eating**

(i) Boiling

(ii) Frying

(iii) Storing cooked food

(iv) Serving

(v) Dishes

(vi) Utensil for water

4. **Furnitures**

- (i) Any stool
- (ii) Any rack
- (iii) Cots

5. **Other minor articles**

- (i) Combs
- (ii) Tobacco pipes
- (iii) Musical instruments

II. **FOOD**

Botanical Name

Vernacular Name

How Consumed

Source (cultivated/wild)

1. **Normal diet**

- (i) Cereals
- (ii) Pulses
- (iii) Vegetables
- (iv) Oils & Fats
- (v) Fruits
- (vi) Condiments
- (vii) Milk
- (viii) Egg, Fish etc.

2. **Special diet**

- (i) For sick
- (ii) For expectant mothers
- (iii) For nursing mothers
- (iv) For guests
- (v) On festivals and ceremonies

3. **Any foods offered to deities**

- (i) On festivals
- (ii) Distributed as Prasad of Gods

III. **PLANTS USED IN MEDICINE**

Botanical Name

Vernacular Name

Parts Used

Formulations

1. **Diseases**

- (i) Abortifacients
- (ii) Anthelmintic
- (iii) Antiasthmatic
- (iv) Antibilious
- (v) Antidiabetic
- (vi) Antidysenteric
- (vii) Antilithic
- (viii) Antiperiodic
- (ix) Antiseptic
- (x) Antispasmodic
- (xi) Aphrodisiac
- (xii) Astringent
- (xiii) Carminative
- (xiv) Demulcent
- (xv) Diuretic
- (xvi) Emetic
- (xvii) Eye drops
- (xviii) Febrifuge
- (xix) Galactagogue
- (xx) Gargles
- (xxi) Hairdye
- (xxii) Purgative
- (xxiii) Sedative
- (xxiv) Skin diseases
- (xxv) Stomachic (digestive, appetising)
- (xxvi) Tonic
- (xxvii) Veneral diseases

IV. **DYES & TANS**

1. Dyes for cloths
2. Dyes for timber articles
3. Tans for any articles
4. Misc. uses

V. **LIGHTENING & FUEL**

1. Firewood
2. Oils

VI. **DETERGENTS**

VII. AROMATICS

1. For foods
2. For body
3. For worship
4. As incense

VIII. GUMS & RESINS

1. For paints
2. As gum
3. As incense
4. In food
5. In medicine

IX. BEVERAGES

- (i) As narcotic and drug
- (ii) As diet
- (iii) How prepared
- (iv) Connection with any ritual

X. FIBRES

- (i) For dresses
- (ii) For mattresses
- (iii) For cordage

XI. PLANTS USED AS POISON

XII. ORNAMENTALS

XIII. ANY OTHER UTILIZATION OF PLANTS

ANNEXURE – II

Questionnaire for Ethnobotanical Investigation of Traditional Medicine Used by Tribe *Mech* in Duars of West Bengal and Assam (Jain & Mudgal 1999)

Name of Village (Block):
Name of Herbal Practitioners/Occupation:
Age (Years):
Sex (Male/Female):

Date:

1. BOTANICAL INVESTIGATION

- (i) Source of plant
- (ii) Numbering
- (iii) Vernacular name
- (iv) Plant collected from cultivated or wild state
- (v) Preliminary classification (Order, Family)
- (vi) Specimen for herbarium

2. PHARMACOLOGICAL INVESTIGATION

(i) How did the *Mech* acquired the ethnomedicinal knowledge?

- a. By read the scripture
- b. Learn through traditional folklores
- c. Through self training/intuitive perception:
- d. Any other methods they told

(ii) Gathering of the plant

- a. Season (time of year & time of day)
- b. Conditions
- c. Parts used
- d. Storage

(iii) Drug

- a. Treatment of the plant for preparing drug
- b. Appearance of the drug

(iv) Dosage (preparation technique)

- a. Natural drug
- b. Crushed drug

- c. Extract (infusion/decoction)
- d. Powder
- e. Juice
- f. Filtrates
- g. Pastes
- h. Pills
- i. Other preparations

(v) Method of use

- a. Internal (Chewing, Inhalation, Other routes)
- b. External (Poultice, Ointment, Baths, Touch therapy)

3. ANY OTHER INFORMATION OR OBSERVATIONS

4. IDENTIFICATION OF THE PLANT (Order, Family, Genus, Species, Variety)

ANNEXURE – III

Mech Terminology Used in the Present Work

Quite a good number of *Mech* terminologies have been used throughout the present work. It is now an attempt to translate these terminologies as realized from discussion with different people including the *Mech* students now pursuing different courses of studies at the University of North Bengal. These terminologies and the English equivalents are presented below:

<i>Akhtam Ganhani</i>	Engagement for marriage
<i>Alari Batti</i>	A sacred earthen lamp
<i>Ankham Jahanai</i>	Eight day's ceremony after marriage
<i>Arnai</i>	Scarf used by men
<i>Bairathis</i>	A group of people from both bride's and groom's house are entrusted marriage rituals
<i>Ban-dingdong</i>	Two earthen pitchers containing rice beer and sun dried rice hung on two sides bamboo-rod
<i>Ban Hanai</i>	Engagement for marriage
<i>Bandia</i>	Coat with a row of buttons
<i>Bangkon Hanai</i>	Marriage proposal
<i>Banzar</i>	Torch
<i>Banzar-shauno</i>	Apply fire to the mouth of a corpse at the time cremation
<i>Bari-khitao</i>	Matchmaker
<i>Bathi</i>	Projecting bamboo polls that rest on the shoulders of the poll bearers
<i>Bathou</i>	Great God
<i>Bi-ni-mi-kham</i>	Evening meal
<i>Bla</i>	Arrow
<i>Bodo-bushta</i>	A sort of coat with two small threads
<i>Burai-buraikhau</i>	Felicitation the old lady who is present during the childbirth
<i>Burung</i>	Bamboo made fishing trap
<i>Bushta-bhoto</i>	A sort of coat with two small threads
<i>Bwrai Bathou</i>	God
<i>Chanchhali</i>	Traditional handloom

<i>Changra</i>	Bedstead with a layer of jute-stick
<i>Chemper</i>	A bamboo made instrument, used to knit fishing net
<i>Chirin</i>	Bamboo made scaffold
<i>Dau Bidor</i>	Flesh of fowls
<i>Daujurun Khutnay</i>	Rice distribution ceremony
<i>Deusi</i>	Priest
<i>Dhiki</i>	Wooden manual husking instrument
<i>Doi-gothar-satno</i>	One of the customs during pregnancy
<i>Doi Hachung</i>	Bamboo cylinders, used for carrying and storing water
<i>Doi-khur</i>	Watering place or well
<i>Dokhna</i>	Traditional dress of women
<i>Dokhna-thinthai</i>	Traditional dress of women when plain
<i>Dokhna-ashar</i>	Traditional dress of women when it is ornamented
<i>Duar</i>	Door
<i>Finlu</i>	Puzzle
<i>Gamcha</i>	Cloth for men
<i>Gandu</i>	Pillow
<i>Gaon-burha</i>	Village head-man
<i>Gay-thao</i>	A small bundle containing five betel leaves and five areca nuts, used in marriage ceremony
<i>Ghum</i>	Headgear made with bamboo strips and leaves of <i>Phrynium pubinerve</i>
<i>Gothai-dugarna</i>	After burning clean and wash the cremation place
<i>Haba</i>	Marriage ceremony
<i>Hadang</i>	<i>Jhum</i> cultivation
<i>Hakhor</i>	Small pond
<i>Hal-wai-nai</i>	Agriculture
<i>Hangsha Bidor</i>	Flesh of ducks
<i>Hasib</i>	Broom
<i>Hauwala</i>	A kind of vaginal disease
<i>Hisha-lu</i>	White sheet
<i>Iyem</i>	Bedding
<i>Iyem-hi</i>	Cotton bed-sheet
<i>Iyem-shi-phung</i>	Pillow is made with cotton pressed jute or cotton bag, it is called <i>Iyem-shi-phung</i>
<i>Janala</i>	Window

<i>Jakhoi</i>	Fishing trap
<i>Kangkila</i>	A bamboo made instrument, used to knit fishing net
<i>Khamflai</i>	Flat wooden stool
<i>Kham-go-zang</i>	Early morning meal
<i>Khardo Bedai</i>	Alkaline salt
<i>Khira Fornai</i>	Taking oath
<i>Khitab</i>	Quilt made of piecemeal cloth
<i>Khobai</i>	For keeping fish it is used
<i>Khogan-oat</i>	Pyre for burning dead bodies
<i>Khumshi</i>	Woolen or cotton blanket
<i>Koka</i>	Bamboo made fishing trap
<i>Mainou</i>	The goddess of wealth
<i>Mosanai</i>	Dance
<i>Modomni Gamscha</i>	Wrapper to cover the body during winter
<i>Modon-jum-nai-ni-hi</i>	A sort of blanket, used in winter
<i>Na</i>	A house
<i>Nak-thung</i>	Wooden foot wear
<i>Na-ma</i>	House for the mother
<i>Na-ma-no</i>	Northern hut for God
<i>Nangti</i>	A small piece of cloth worn by children
<i>Na-sangou-thamang-gou</i>	Fishing
<i>No</i>	A house
<i>No-a-ghar</i>	Cooking hut; Kitchen
<i>No-nay-nay</i>	Observing the groom's house
<i>Obanlaoree</i>	The God
<i>Ojha</i>	Priest or medicine-man
<i>Oma Bidor</i>	Flesh of pigs
<i>Ondla</i>	A type of curry basically made from powdered rice
<i>Ooa</i>	Bamboo
<i>Ooal</i>	Wooden mortar
<i>Ooani Siphung</i>	Bamboo-flute
<i>Ooa-shothing</i>	Slip of green bamboo skin
<i>Phanic</i>	Bowstring

<i>Pharau Bidor</i>	Flesh of pigeons
<i>Phatusla</i>	Jute mat
<i>Phun-dung</i>	Thread
<i>Rupa-hase-nai</i>	One of the marriage customs
<i>Ruya</i>	Axe
<i>Sailon</i>	Bamboo wicker-worked tray
<i>Sanja-phu</i>	Midday meal
<i>Singi-muri</i>	Arrow-head
<i>Swrjigiri</i>	Creator
<i>Takuri</i>	Spindle used in spinning
<i>Tepai</i>	Bamboo made trap for catching small fishes
<i>Thansali</i>	Temple
<i>Thir</i>	Arrow
<i>Thursi</i>	Earthen or metal or wooden plate
<i>Ukhum</i>	Thatched roof
<i>Uta Nadi</i>	When the child is born from the feet
<i>Wat-shauno</i>	Before the burning of dead body son moves round the pyre thrice
<i>Zang</i>	Spear
<i>Zang-ni-danthe</i>	Wooden handle of spear
<i>Ze-ma</i>	Fishing net
<i>Zilit</i>	Bow

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- Das, A.P.; Ghosh, C.; **Sarkar, A.** & Biswas, R. 2007. Ethnobotanical studies in India with notes on Terai-Duars and hills of Darjiling and Sikkim, *NBU J. Pl. Sci.* 1: 67 – 83.
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Ethnobotanical formulations for the treatment of jaundice by the *Mech* tribe in Duars of West Bengal

Ajita Sarkar & AP Das*

Taxonomy & Environmental Biology Laboratory, Department of Botany, University of North Bengal, Siliguri 734013, West Bengal
E-mail: apdas.nbu@gmail.com

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Ethnomedicinal survey among the tribe *Mech* in the Duars region of West Bengal recorded 10 plant based formulations from the traditional healers to treat jaundice. While some of these formulations work nicely with high proportion of cure rate, others are of moderate or low efficiency.

Keywords: Ethnomedicine, Jaundice, *Mech* tribe, Duars, West Bengal

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Duars is a Sub-Himalayan region of West Bengal situated on the eastern bank of the River Tista and located between 27°-26°16' N latitude and 89°53'-88°4' E longitude. The total area of Duars is approximately 6,227 sq km stretching between the rivers Tista and Sankosh. Duars is bounded by Darjeeling Himalaya and Bhutan in North, Coochbehar district of West Bengal and Bangladesh in South, Assam in the East and the plain region of Darjeeling district and small part of Bangladesh lies to the West. Temperature and precipitation of the area varies in each season. However, the temperature fluctuates between 37.5°C during summer and about 6°C in winter. Rainfall mainly occurs due to South-west monsoon wind and begins from the month of May and continues till the first quarter of October. The annual rainfall of the region is about 374 cm. Most of the sectors of Duars are covered with dense forest and savannah type grasslands and, hence, is very rich in biodiversity. Villages of *Mech* tribes are situated within the vicinity of the forest and they inhabit the land along with other tribes such as *Rabha*, *Toto*, *Munda*, *Oraon*, *Garo*, etc.¹⁻³ Major part of *Mech* population (very primitive tribe of this region) in Duars (known as *Bodo* in Assam) is still dependent on traditional methods of treatment for recovering from most of their health problems. The study was conducted among these people during 2006 to 2008 to record the methods of treating jaundice, a quite common disease of the tribe.

Methodology

Information about the medicinal use of several plants was collected through surveys conducted in several villages in Duars located mainly in different parts of the Jalpaiguri district of West Bengal⁴⁻⁹. These people are apparently very friendly but maintained a deep secrecy about their traditional knowledge. However, after visiting them for several times after developing confidence, they finally shared their knowledge about the medicinal uses of plants growing around them. A good number of patients suffering from jaundice were also interviewed during the survey, mostly taking them away from the healer (*Ojha*). The voucher specimens of the useful plants were spotted by the healers were collected and processed following conventional techniques¹⁰. The plant species were identified, verified and deposited in NBU herbarium.

Results and discussion

As much as ten formulations of traditional medicine are used by the *Ojhas* of the *Mech* community in Duars for the treatment of jaundice. All these formulations have been enumerated along with the methods of preparation, doses and modes of administration. A total of 10 plant species are used in these ten formulations (Table 1). Apart from plants, hen's egg, milk, curd and sugar candy are used in some formulations. There is also variation in the method of administration, decoction for massage, tying to different parts of the body and using like a

*Corresponding author

Table 1- Formulations used by *Mech* tribe for the treatment of jaundice

Formulations	Ingredients	<i>Mech</i> name	Methods
Formulation 1	<i>Stephania glabra</i> (Roxb.) Miers <i>Argyreia roxburghii</i> Arnott ex Choisy	<i>Dibauli bidat</i> <i>Dudhali bindong/ Chhaolia</i>	Pills prepared from paste of 10-15 gm tuber of <i>Dibauli bidat</i> and five leaves of <i>Dudhali</i> are dried and taken three times daily.
Formulation 2	<i>Oroxylum indicum</i> (L.) Kurz. Hen's egg	<i>Khara Khandai</i>	Two tablespoons juice of stem bark, one hen's egg and common salt are blended and fried; divided into three equal pieces, given orally thrice daily for 3 days. During the treatment, patients are advised not to take fish and meat.
Formulation 3	<i>Nastium hypericum</i> <i>Stephania glabra</i> (Roxb.) Miers <i>Argyreia roxburghii</i> Arnott ex Choisy	<i>Dokha khamflai</i> <i>Dibauli bidat</i> <i>Dudhali bindong</i>	One branch each of <i>N. hypericum</i> and <i>A. roxburghii</i> and one branch with tuber of <i>S. glabra</i> twisted together like a garland is hung round the patient's neck; used for seven days by changing regularly till recovery.
Formulation 4	<i>Stephania japonica</i> (Thunb.) Miers	<i>Chhantala</i>	Legs are massaged with leaf decoction of <i>Stephania japonica</i> at night.
Formulation 5	<i>Mangifera indica</i> L. Milk	<i>Khaizou</i>	Bark juice (4-5 spoons) of <i>Mangifera indica</i> mixed with one-cup milk is given in the morning on empty stomach.
Formulation 6	<i>Morus australis</i> Poiret	<i>Thaikhong chhef</i>	Root piece tied with a string is hung round the neck.
Formulation 7	<i>Ipomoea aquatica</i> Forsk	<i>Khalmi</i>	Necklace prepared from small pieces of stem is stuck round the head of the patient.
Formulation 8	<i>Morus australis</i> Poiret Curd	<i>Thaikhong Chhef</i>	Leaf juice mixed with one cup of curd is given once in a day till cured.
Formulation 9	<i>Sida cordifolia</i> Wight & Arnott Sugar candy	<i>Bamonmara</i>	Half-cup root juice and half-tablespoon sugar candy mixed together is given once daily till cured.
Formulation 10	<i>Plumbago zeylanica</i> L. Potato (<i>Solanum tuberosum</i> L.)	<i>Emao</i>	Making a hole in a potato, ± 1.2 cm <i>Emao</i> root is inserted, roasted, peeled off the potato and given orally once a day for three days.

Table 2- Traditional *Mech* healers and the efficacy status of their formulations

Formula No	Name of healer	Total No of patients	Fully cured	Partly cured	Not cured
Formula 1	Dhanabir Champramari	7	5	2	0
Formula 2	Satish Narjeenary	10	7	3	0
Formula 3	Bhaben Champramari	6	3	2	1
Formula 4	Brajendra Basumata	5	0	3	2
Formula 5	Satish Narjeenary	8	4	3	1
Formula 6	Surendra Basumata	4	1	2	1
Formula 7	Surendra Basumata	5	2	1	2
Formula 8	Bolen Boro	3	1	0	2
Formula 9	Anita Bramha	4	2	1	0
Formula 10	Nomili Narjinary	6	2	3	1
Total		58	27	20	10

necklace. These formulations have been collected from eight *Ojhas* and 6 of them use just one formulation; 2 of them, Satish Narjeenary and Surendra Basumata use 2 formulations (Table 2). It is important to know the efficacy of the methods of treatment. For this, at different times, a total of 58 jaundice patients were consulted, who were under treatment for at least 2 months (Table 2). With 2 formulations (2 & 5), Satish Narjeenary treats a good number of patients and 18 of them (10+8) were interviewed and 11 patients (7+4) were fully cured

and six (3+3) were partly cured. The record of successful treatment (50% or more) was also quite high with the formulations 1, 3 and 9. Not a single patient was cured with formulation 4 and the result is not satisfactory for formulations 6, 7, 8 and 10. However, none of these patients were tested for their blood sugar level prior or after the treatment and the general feelings or few symptoms were used for disease recognition and to understand the recovery status.

Documentation of these medicinal plants used by the *Mech* tribe is the firsthand report which shows that

these people are still so much dependent on local vegetation for their healthcare. Unless such reports are documented, the knowledge will be lost along with the old people of the tribes. However, the rapid loss of natural vegetation in the country is posing threat about the availability of these ethnically useful plants¹¹. Not only the conservation of different types of natural vegetation of Duars needs to be implemented seriously, the Forest Department should educate the tribal people about the sustainable use of area's plant resources.

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Ethnobotany of Kirat Festival of Magar Community in Buxa Duar area of West Bengal, India

Ajita Sarkar, Kishor Biswas and A.P. Das

Taxonomy & Environmental Biology Laboratory, Department of Botany, University of North Bengal,
Siliguri-734013 (India)

E-mails : ajitasarkar2007@rediffmail.com, firmiana@rediffmail.com, apdas.nbu@gmail.com

This paper deals with *Kirat festival (Parab) of Magar* community living in Buxa Duar area of West Bengal. *Magar* tribe has a rich tradition of religion. As may as 12 plant species have been recorded which are directly or indirectly related with this festival. Significance of the rituals related to the ceremony are not only to protect the traditional knowledge but also linked to the biodiversity conservation.

Key Words : Ceremony; *Magar*; Buxa Duar; West Bengal

Introduction

The Buxa area is a mountainous tract of the district of Jalpaiguri in West Bengal, situated on Chotta Sinchula range of Eastern Himalaya. Buxa Duar is located between 27° to 26° 16' N latitude and 89°53' to 88°4' Longitude at an altitude of 795 m amsl. The area is mostly covered with densely wooded deciduous forests and grasslands. Northern boundary runs along the international border with Bhutan, Assam State in the east, Coochbehar District and Bangladesh in south and the plain region of Darjeeling district and small part of Bangladesh lies to the west. It forms the entire forested area of Buxa National Park. Numerous rivers and streams intersect this extensive tract of forests reaching up the hills. However, Buxa is famous for Buxa Duar Fort, used as a prison by the British rulers. Many freedom fighters, including Netaji Subhash Chandra Bose, were imprisoned here. After independence, it served as a refugee camp for Tibetans and Bangladeshis (Kar 2005). Temperature of the region fluctuates between 37.5° C during summer to about 6°C in winter. Rainfall occurs mainly due to south-west monsoon wind and begins from the month of May and continues till the first quarter of October. The average annual rainfall of the region is about 374 cm. There are several examples of trees being worshipped traditionally in many parts of the world

under all religions and beliefs. The main objective behind plant worship has always been their conservation and utilization in the most sustainable manner.

Magars were originally living in the low altitude hills of eastern Nepal and were immigrated later to Darjeeling Hills and nearby Duars region to settle down permanently (Anonymous 2001). They used local plant resources for their sustenance from the very beginning. They were tree dwellers and also living in caves, situated in the dense forests. Their food included mainly fruits, tubers, rhizomes, honey, etc. collected from forests. From there, the *Kirat festival (Kirat = son of the land)* started among the *Magars*. It is celebrated on the first day of month of *Magh* (in local calendar), which generally falls in the middle of January.

On this day there is the ritual of Holy bath in the nearby river/pond in the morning before talking to anybody. Different types of tubers of *Dioscorea* species (Tarul) are collected (Plate I, Fig. A), boiled, cleaned and offered to the Sun God (Plate I, Fig. B). This is mainly confined in the morning session of the day.

Materials and Methods

During the course of the present investigation, a large of elderly people of Buxa Duar were

Table 1 : List of plants, their common and botanical names, families and parts used during Kirat festival

Plant name, Family and Voucher Specimen No.	Local Name	Part used
<i>Dioscorea alata</i> Linn. (Dioscoreaceae) [Ajita & AP Das-054]	'Bag Tarul'	Root-tuber
<i>D. belophylla</i> Voigt ex Haines (Dioscoreaceae) [Ajita & AP Das-074]	'Pani Tarul'	Root-tuber
<i>D. bulbifera</i> Linn. (Dioscoreaceae) [Ajita & AP Das-075]	'Githa'	Root-tuber
<i>D. deltoidea</i> Wallich ex Kunth (Dioscoreaceae) [Ajita & AP Das-087]	'Charpale Tarul'	Root-tuber
<i>D. esculenta</i> (Loureiro) Burkill (Dioscoreaceae)	'Ghar Tarul'	Root-tuber
<i>D. hamiltonii</i> Hook. f. (Dioscoreaceae) [Ajita & AP Das-046]	'Ban Tarul'	Root-tuber
<i>D. pentaphylla</i> Linn. (Dioscoreaceae) [Ajita & AP Das-060]	'Bhyagur'	Root-tuber
<i>D. pubera</i> Blume (Dioscoreaceae) [Ajita & AP Das-055]	'Panglang'	Root-tuber
<i>Ipomoea batatas</i> (Linn.) Lamarck (Convolvulaceae) [Ajita & AP Das-141]	'Sakar Kand'	Tuber
<i>Manihot esculenta</i> Crantz (Euphorbiaceae) [Ajita & AP Das-101]	'Simal Tarul'	Root-tuber
<i>Sesamum indicum</i> Linn. (Pedaliaceae) [Ajita & AP Das-145]	'Til'	Seeds
<i>Sterculia villosa</i> Smith (Sterculiaceae) [Ajita & AP Das-146]	'Simali'	Root
<i>Xanthosoma brasiliense</i> (Desf.) Engler (Araceae) [Ajita & AP Das-148]	'Sikume Pindalu'	Rhizome

interviewed about *Kirat festival* using a short questionnaire. The common names of different plants were noted down and the specimens are spotted by the native people. Some local priests, commonly referred to as 'Dami', were also contacted and were pestered to gain knowledge about the ceremony.

Collected specimens were processed as herbarium sheets and were identified in the Taxonomy & Environmental Biology Laboratory of the Department of Botany, North Bengal University, using different floras, verified and deposited in the NBU Herbarium. Only the aerial parts of the plants were collected as voucher specimens and root-tubers were used by *Magars* as the availability of many of these plants were scarce. However, some of these plants were also introduced into the Garden of Medicinal Plants, University of North Bengal for their conservation.

Discussions

The interviews with natives provided interesting scientific and mythological information about the plants and the significance of *Kirat festival*. Among the tubers 'Ban Tarul' (*Dioscorea*

spp.) has its unique importance on this occasion because in earlier times 'Ban Tarul' was their principal food. Earlier, these plants were abundant in the surrounding vegetation and native people collected tuberous root-stock regularly. On the day of festival they offer tubers of different species to God in the morning (Plate I, Fig. B). After that they put a *tika* (mark on the forehead) made of a thin slice of uncooked Ban Tarul and de-coated seeds of Til (*Sveto til*) on the forehead (Plate I, Fig F) and eat first the uncooked Ban Tarul as 'Prasad' (Plate I, Fig. E). After that they take different other varieties of boiled root-tubers including *Manihot esculenta*, species of *Dioscorea* and *Xanthosoma* and 'Set Rooti' (a kind of traditional home made bread) (Plate I, Fig. C). They boil the yams in the previous night. 'Set Rooti' is made of rice powder. The rice powder is battered in water along the milk and sugar. Other essential ingredient is mucilaginous root juice of Simali (*Sterculia villosa*), which makes the rooti soft. The prepared batter is then left for about 2-3 hours and then given the shape of small rings and fried to golden brown in boiling mustard oil for 10-12 minutes.



PLATE I: Kirat Festival. A. Collection of *Dioscorea* root-tuber; B. Accumulation of all desired plant materials; C. A plate of ceremonial food; D. Plant materials after collection and cleaning; E. All family members taking part in the festival; F. Kirat children with *ika* on forehead.

Based on the observations made during survey, a list of plants which are boiled to consume, have been presented in Table-I along with the local and botanical names, families and parts used.

Yams (*Dioscorea* sp.), edible aroid (*Xanthosoma* sp.), tapioca (*Manihot esculenta*) and sweet potato (*Ipomoea batatas*) provide the stable carbohydrate source for over 500 million people in the world (Coursey 1983, O'Hair 1990). Sweet potato and *Xanthosoma brasiliense* are cultivated in localities in Buxa area. Yams are widely grown primarily in this region and some of these are also cultivated. Yams are generally propagated with their bulbils and the upper part of the root-stock. Eating of fresh yam tubers supply a good amount of antioxidant in its natural form; and it prevents the free radicals related to human diseases like cancer and cardiovascular ailments (Bhandari & Kawabata 2004). The presence of diosgenin in certain species of *Dioscorea* converting into corticosteroidal drugs and hormones is helpful in curing many diseases (Basu & Gautam 2002).

Out of the recorded plants *Ipomoea batatas*, *Manihot esculenta* and *Xanthosoma brasiliense* are exotics but are widely cultivated in different tropical and subtropical areas of the world including foot-hill regions of Eastern Himalaya.

Most of the religious beliefs of the ethnic culture have some significance with their bases in

history of the community and its neighborhood. Due to the advent of modernization these beliefs are becoming weaker day by day and are likely to be forgotten in the near future. Recording the native culture by using modern techniques has thus become necessary.

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भारत में पश्चिम बंगाल के बक्सा-दुआर क्षेत्र में मगर समुदाय के 'कीरत उत्सव' की लोकव्यवस्था

अजीता सरकार, किशोर विश्वास एवं ए.पी. दास

पादपवर्गिकी एवं पर्यावरणीय जीव विज्ञान प्रयोगशाला, वनस्पति विज्ञान विभाग, उत्तरी बंगाल विश्वविद्यालय,
सिलीगुड़ी-734 013 (भारत)

इस प्रपत्र में पश्चिम बंगाल के बक्सा-दुआर क्षेत्र के मगर समुदाय के निवासियों के 'कीरत उत्सव,' (परब) के विषय में वर्णन किया गया है। मगर आदिवासी लोग धार्मिक परम्पराओं एवं रीति-रिवाजों के धनी होते हैं। लगभग ऐसी 12 पादप-प्रजातियाँ ज्ञात हैं जोकि प्रत्यक्ष एवं परोक्ष रूप से इस उत्सव से संबंधित हैं। उत्सव से संबंधित अनुष्ठान के महत्व से सिर्फ वनोपार्थीय ज्ञान का सुरक्षित रखना ही नहीं है बल्कि इसका संबंध जैव-विविधता के संरक्षण से भी है।

