

CHAPTER 4

REVIEW OF LITERATURE

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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 losing 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.