Chapter-IV

CHAPTER IV

The Present Work

4.1. PREVIOUS FLORISTIC WORKS

The rich botanical diversity of Eastern Himalaya, including Sikkim, has attracted a large number of researchers and plant collectors from different parts of the world since the visit of D. Don in 1825. Virtually after two decades, the famous naturalist Griffith also explored the area in 1847. The famous botanist sir J.D. Hooker made his visit sometime during 1848 - 49. He is one of such botanist who explored the entire region and made a historic collection of approximately 2500 specimen of plants .His expedition and the account published by him include Flora of British India is still one of the most comprehensive descriptions of botanical splendors of the region. Significantly, his The *Flora of British India* (Hooker 1872 – '97) The *Himalayan Journals* (Hooker 1854), *Flora of India* (Hooker & Thomas1855) with T. Thomas, *Rhododendrons of Sikkim Himalayas* (Hooker 1849 – '51) and a *Sketch of the Flora of British India* (Hooker 1907) are now acknowledged as most authentic floristic records of Eastern Himalaya. However, the floristic account of Pangolakha range and the report of plant specimens collected from this rich floristic pockets is not been mentioned in this monumental works.

Several other successive botanical explorers after Hooker like C. B. Clarke (1876, 1885), George Watt (1881), King & Pantling (1898) G.A. Gammie (1894a, 1894b), J. A. Gammie (1894), C.C. Lacaita (1913) and many other botanists did not explore the Pangolakha range. Although Smith & Cave (1911) and W.W. Smith (1911,1913) has visited the few regions of alpine zone of East and North Sikkim but there is no records of specimens collected from the Pangolakha range. Although the Pangolakha range remain unknown to them even after the visit of several of other plant collector in the eastern Himalaya.

Significantly, botanists from various part the world has latter made significant contributions to the flora of Sikkim and Darjeeling Himalaya. This include J.S. Gamble (1878,1895) A.M Cowan & J. M. Cowan (1929), S.K. Mukherjee (1940), H. Ohashi (1975), A.J.C. Grierson & D.G. Long (1979, 1987). In the past K.P. Biswas (1967), R. S. Rao (1963),

Sharma & Ghosh (1970) had made successful visits to Sikkim but they were almost silent over the floristic richness of Pangolakha range. On top of that, so far no comprehensive flora of Sikkim is available except a BSI's publication "Flora of Sikkim'' (vol-1) for the classification of monocot only.

Many other eminent botanists has visited Sikkim even after the 1975 merger to India some persons from outside Sikkim like Das & Chanda (1987), Krishna & Singh (1987), Shrivastava (1992 – 1996), Hajra & Verma (1996) and very lately in 1994 and 2000 by H.J. Noltie in many hilly terrains of Sikkim beside the Pangolakha Range.

W.W. Smith (1913) visited the adjoining areas of Pangolakha ranges and few pockets of Sub alpine zone of East Sikkim. He has made a survey with his teammates at places like Changu Lake, Nathang, Padamchen, Jelepla etc. however it is being clearly visible that he has certainly missed to reach the interior terrains of the Pangolakha range. A team from Forests Department, Govt of Sikkim and WWF, Sikkim Circle has made a baseline survey of sanctuary in the year 1999 and collected some of 100 common plant species of the sanctuary (Anonymous 2000). However, it is nowhere mentioned about collection of those specimens from far interior of the sanctuary.

4.2 IMPORTANCE OF THE PRESENT WORK

Sikkim Himalaya is an important part of eastern Himalaya that is recognized as on 22nd Biodiversity Hotspot in the entire world by IUCN. The entire Landscape of Sikkim is hilly and terrain having significant rich botanical diversity, occupied an important platform for huge number of tourists, researchers and also for plant scientist (taxonomist) . Representing all the major groups of plant kingdom, it is estimated to represent a higher percentage of floras in country. The immigration of plants from wide different bordering countries, notably Chinese, and Malayan on the east and south of Oriental, European, and African on the west and of Tibetan and Siberian on the North is an important phenomenon of the flora diversity (Hooker 1906)

The region is also significantly bestowed with the considerable numbers of endemic plant species, some of those may be *Hitherto* not reported from other parts of the world (Maity & Chauhan 2002). PWS along with Kanchenjunga National Park, Dombyong valley Tankarla, Sakyong valley, Tolung, Zemu and Lhonak valley (North district), Karki, Hilley Reserve Forest (west district) Tendong, Melli, Kitam, Mainam Wildlife Sanctuary (South) are among such distinct areas in account of plant diversities. After identifying, the

significant richness in its floral and faunal diversity the entire area has been declared as Pangolakha Wildlife Sanctuary in the year 2000.

The present study area (sanctuary) falls in the alpine and sub-alpine regions of East Sikkim, which is not only the home for some rare and interesting faunas of alpine Himalayas, but also got the huge tract of unexplained vegetation. 75 % of area under sanctuary being remains under snow covers for at least 4 - 5 months annually i.e. from December - April, resulting very harsh climatic conditions followed by very low temperature almost through out the year. Consequently, it is not less than a Herculean task to undertake floristic studies; however, the work is extremely essential in order to supervise the government while framing the work plan to conserve the biodiversity of the state of Sikkim as a whole. Apart from that, the intensive flora studies of the Pangolakha ridge and its counter parts would certainly increase the knowledge about the flora of Sikkim (Singh & Chauhan 1998).

There is absolutely, no records of floristic studies previously been carry out here. Therefore, the flora of this range particularly being hilly terrain of irregular landscape the interior regions were either to remained virgin in floristic point of view. The present study is associated with the floristic work, through field visits, survey by making extensive explorations and recording of the floristic components of the Pangolakha range. During the study , the latest updated nomenclature of plant species , brief taxonomic descriptions, vernacular names, flowering and fruiting seasons, distributions, their ecological status and the ethno-botanical knowledge of local people residing at adjoining places of sanctuary have significantly dealt for the future use.

Besides, the listing of all important plants and preparation of check list flora of Pangolakha Wildlife Sanctuary perceived through this work shall remained as an indispensable source of information for students, researchers, scientists and policy makers in near future for the meaningful utilization and management of biodiversity.

The famous place of east Sikkim like Nathula, Kupup, Changu, Nathang, Baba Mandir and Men-Menchu has been recently identified as an important tourist destination of the state. Therefore, the State Government under the guidance of Central Government for last four to five years has initiated a significant emphasis on the extension of ecotourism activities in the area projected above. The reopening of trade route between China and India through Nathula in June 2006 long after 1962 shall fetch opportunities to the local people by generating alternative income by adopting the tools of ecotourism.

However, the state government most also perceive the annual depletion of floristic components due to mismanagement of biodiversity through making comparative assessment with the results of the present study. Innumerable medicinal plants of the projected area have already been under serious constrain followed by the vanishing of many rare and endemic components.

Pangolakha range has contributed a significant value to the local people who is residing in its periphery. For many centuries, they have been closely associated for the foods, shelters and for alternative medicines. The documentation of the ethno botanical information from the tribal people of the periphery shall be important resources in near future. With the completion of the studies, the outcome is preparation of Flora of Pangolakha Wildlife Sanctuary, which shall be important reference while assessing natural resources. These ultimately enable identification thereby conserving the economically potential plants species. This high value plants of the Pangolakha range are comprises of aromatic, ornamental, wild edibles, timbers. Spices, herbal plants etc. The flora of sanctuary may be an essential tools for naturalists , plant taxonomist, ecologist, foresters for conservation activities, sustainable exploitation, environmental strategies planning and over all planning of numerous basic developmental activities.

However, the studies also ultimately enable to identify the status of our endemic, endanger, and critically endangered floral elements of the projected region. Most importantly, the herbarium sheet of specific species achieved during the explorations may definitely be useful for students, foresters, ecologists, botanist and other researchers for reference.

PLATE V

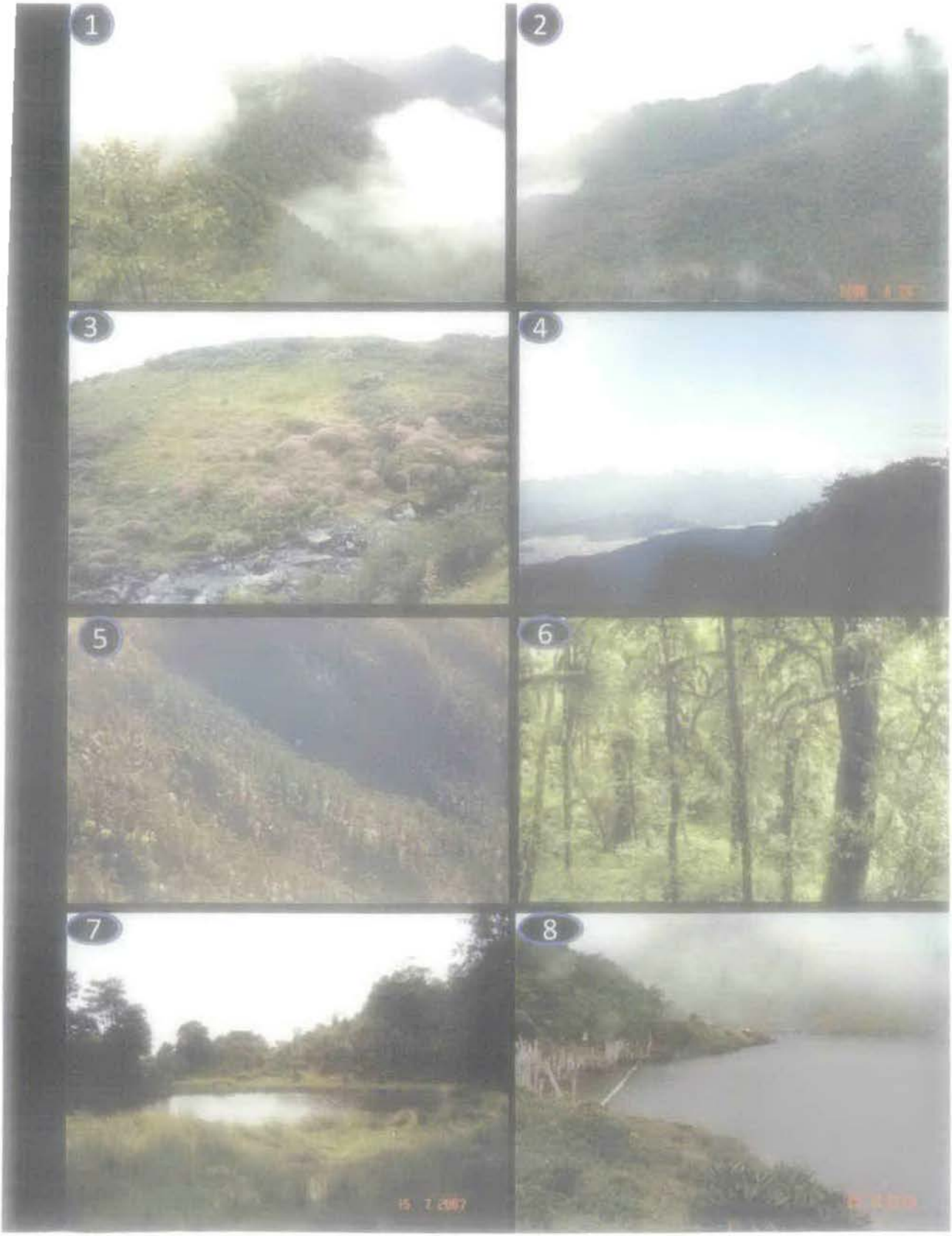

PLATE VI

LEGEND OF PHOTOS

Plate V

1. Dense canopy of forest of Pangolakha range
2. The undisturbed forest of PWS
3. Alpine meadows near Bhimbase
4. A perpetual view of Mt. Kanchenjunga and other mountain peaks from Panglakha.
5. A view of *Abies* forest near Nathang
6. An en-route to Rachela trijunction
7. View of a pristine Rachela lake, a permanent source of water for numerous wild animals.
8. A view of Changu lake surrounded by sub-alpine plants

Plate VI

9. A morning view of Pangolakha ridge from Pakyong, East Sikkim.
10. A continued vegetation patterns from Panglakha ridge to Neora valley
11. A compact growth of ground vegetation
12. A spreading patches of *Juncus* and other grasses.
13. A view of Ronchu water stream near Kyongnosla
14. Rhododendron scrubs near Zuluk.
15. Dominating growth of *Yushania sp* near Rachela.
16. En-route to Rachela from Phusrey