GENERAL INTRODUCTION

Mirik is West Bengal's latest hill resort at an altitude of 1700m with its own special charm. Mirik has its meaning, the burnt hill and is derived from the term "mi-rek" being the Lepcha name for the burning of jungle. It is located at 49 km from Darjeeling and 52 km from Siliguri. This hill resort is further beautified for having a magnificent lake fed by perennial streams. It is under the Mirik P.S. of Darjeeling district in West Bengal and is located between 26°47' N. lat. and 26°55' N. lat., 88°8' E. long. and 88°15' E. long. Mirik P.S. claims its special identity in respect of its strategic position in the Sub-Himalayan hilly tract in the northern region of West Bengal. It is bounded by Mechi and Balason rivers in the west and east respectively lying at border to Nepal. In the north it is separated from Sukhiapokri by the river Rangbang. The plains of Naxalbari P.S. lies towards its south.

Its flora is significant from the scientific, cultural and utilitarian view points. It has a wide range of habitats which provide ecological diversity. It has both the combination of tropical and temperate elements. Phytogeographically, it occupies a key position. Very few urban areas in India can claim to have such a range of economically important plants of both indigenous and exotic origin as Mirik.

All the early travellers were unanimous in describing the region as entirely covered by forest (O'Malley, 1907). Captain Herbert, the then Deputy Surveyor-General, spoke of the mountains in 1830 as "completely clothed with forest from the very top to the bottom", and similarly, General Lloyd in 1837 described it as "clothed from the top of the hills to the very bottom of the valleys with a dense forest". This, however, was only a natural incidence to a region which was practically uninhabited. With the phenomenal increase of population which has taken place and with the establishment of the tea industry, it was necessary to clear the land in order to support the people and allow the cultivation of the tea plant. The result has been that, within certain limits the forests have yielded to the plough and settled cultivation and that elsewhere they have been ruthlessly

swept away by the planter. As a result, whole forests in the region have been annihilated, leaving here and there only a solitary tree or narrow strips of forests, as evidence of the magnificent woods which have fallen a sacrifice to advancing cultivation. Moreover, due to large scale deforestation accompanied by limited aforestation, the soil of the region is subjected to insolation causing poor plant cover to encourage drastic soil erosion.

The region under study is perhaps the richest and most interesting floristic region in the country and as such, it still remains floristically incompletely known, though practically all other regions have attained comparatively better floristic familiarity through regional floras of their own. These regional floras, for Bengal (Prain, 1903), Bombay (Cooke, 1903-1908), Upper Gangetic Plains (Duthie, 1903-1929), Madras (Gamble and Fischer, 1915-1936), Bihar and Orissa (Haines, 1922-1925) and Assam (Kanjilal et al., 1934-1940), were all inspired by the Flora of British India (Hooker, 1872-1897).

North Bengal, as considered by Prain (1903) was lying West to East between Kosi and Brahamputra and from South to North between the Ganges and the lower spurs of the Himalayas. He divided it conveniently into two distinct parts, namely, Sub-Himalayan Region (Darjeeling, Cooch Behar and Jalpaiguri) and Northern Plain Region (Malda and West Dinajpur). But it has been noted that a number of species collected during present investigation have been overlooked by him. Cowan & Cowan (1929) dealt with only trees of North Bengal including shrubs, woody climbers, palms and tree ferns and which is a revisionary list of the trees, shrubs and large climbers found in the Darjeeling district by Gamble (1896). Thus the herbaceous flora of the region has totally been neglected. Though Hara (1966, 1971) and Ohashi (1975) undertook expedition to different parts of Eastern Himalaya but the major part of the region under study was not incorporated into their programme. Matthew (1981) only cited the Flowering Plants of Kurseong. Besides these, a number of workers studied Vegetation and Flora on different parts of the State other than North Bengal.

Very recently, Das (1985) recorded casually 43 species among which 31 are Dicotyledons and 12 Monocotyledons. The investigation of Das on the flora in the region is scanty and incomplete. Therefore, it has enough scope to study thoroughly the flora of the region.

The understanding of flora in a region is very essential because of the fact that different elements under flora will give some idea about present day ecological condition of the region. Cain (1950) states that the proportion of species in different categories is an indicator of climate since edaphic factors and the stage in succession greatly influences life form composition of the flora. Besides, the manipulation of vegetation/forest disturbed by rapid urbanization is possible only by the understanding of the flora in the region under study, so that the local plants can be utilized for the purpose after knowing well the plant resources of the region. For these reasons the taxonomic study in relation to the Flora of the proposed area of Mirik P.S.(1700m) and adjoining localities, such as, Sukhiapokri (2150m), Darjeeling (2200m), Ghum (2300m), Sonada (2020m), Kurseong (1450m) and Pankhabari (1200m) covering Darjeeling district has been taken into consideration.

During the last few decades, Mirik and its adjoining areas have been subjected to drastic deforestation accompanied by inadequate aforestation like all other parts of the country. As a result, the soil of the region has been affected tremendously to cause over insolation, leaching of minerals and soil erosion. In general, the soil of the region is acidic in nature and very much poor so far as its fertility status is concerned. It is thus very necessary to survey the nature of soil in relation to various species of plants which are still existing today after being adapted to drastic ecological condition. From the meteorological information so far available in the region, it appears that during the last hundred years, the rainfall has been noted to be diminished gradually to such an extent that most of the "Jhoras" and "streams" are being dried up and this factor has an effect on the vegetation of the region also. Moreover, due to rapid growth of human population in the area the growth of different plant species is being interfered. It is

for these reasons, ecological study on the region with special reference to the soil condition, rainfall, temperature, topographical relief and the present day condition of the human population, vegetation, agriculture and landuse has been stressed.

Besides, phytogeography is a branch of science which deals with spatial relationship of plants both in the present and the past. It is helpful in understanding the distribution of the plants with special reference to their migration behaviour. As the climatic condition and the edaphic factors are the chief criteria in plant migration, the study on phytogeography of the region may throw some light on the present day ecological condition of the region and to understand the validity of the botanical provinces as proposed by earlier authors (Clarke, 1898; Hooker, 1907; Calder, 1937; Chatterjee, 1939 & 1960). There is no doubt that three major aspects i.e., floristic composition, ecological condition and phytogeographical situation of the region are very much interrelated. These aspects have been taken into consideration in the present work and will be of much help for better understanding of the species for their utilization in various aspects of development in the region from ecological and economical point of view.

While the earlier trend of initial accomplishment of large floras followed by treatment for smaller areas, was perhaps appropriate in those times. It is now clear that for a satisfactory knowledge of our plant resources, it is fitting to state that small areas should be comprehensively studied first, and all information are to be pooled, reviewed and summarized for the entire country (Tutin et al., 1964 & 1968).

With this background, the Mirik and its adjoining areas are considered as a model area representing the hill region of Northern part of the State, West Bengal and the work adopted for the area under study has been represented in the thesis according to the following plan.

The thesis embraces broadly three major parts out of which Part-I includes some ecological observations on Mirik and its environs in

Darjeeling district, West Bengal with special reference to physiography, soil, climate, drainage, landuse, vegetation types and biotic influence.

Part II covers taxonomic study on the flora of Mirik and its environs in Darjeeling district, West Bengal.

Part III deals with phytogeographical study on the flora of Mirik and its environs in Darjeeling district, West Bengal.