Chapter I
Introduction
INTRODUCTION

Life is sustained in the environment and by the environment

The Indian Himalayan Region (IHR), extends from Jammu and Kashmir to Arunachal Pradesh. It is known for its natural, representative and unique flora. The Pteridophytic flora of the IHR constitutes very prominent part of the vegetation and over 600 species of pteridophytes are known from the region (Bir 1993). A few species are medicinal and edibles. Studies regarding pteridophytic flora of the Indian Himalayan region (IHR) has not received much attention compared to higher group of plants and many parts in IHR particularly Protected Area (PAs) have not been explored adequately.

Maximum number of Pteridophytic diversity observed in Himalayan region and most Protected areas of the Indian Himalayan Region have not received much attention in terms of floristic exploration. In Mehao Wildlife Sanctuary (MWLS) comprehensive studies on diversity, distribution pattern, habitat preference, rarity and conservation status of the Pteridophytes have not been carried out so far. The present study has been conducted in this direction.

The earth summit meeting at Rio de Janeiro in 1992 made the term "biological diversity" a political catch phrase. The term "biological diversity", is defined as follows as per the Convention on Biodiversity (CBD) in article 2-"biological diversity" means the variability among the living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part. This includes diversity within species, between species and of the ecosystem. Broadly, the term biodiversity includes three different but closely related aspects i.e. genetic diversity (diversity within the species), species diversity (diversity between species of species richness) and ecosystem diversity (habitat diversity). Whittaker used $\alpha$, $\beta$ and $\gamma$ terms for biodiversity of smaller, larger and continental regions.

In our country, out of total 108,276 identified species of microorganism, plants and animals, producers, consumers and decomposers constitute 29.6%, 58.4% and 22.0% respectively. A country like India is a very important Vavilon center of diversity and origin with over 167 important cultivated plant species and some
domesticated animals. Out of the 18 Hot spots identified in the world, India has two, i.e. (a) Eastern Himalayan region and (b) Western Ghats. These two areas contain 5332 endemic species of higher plants (3500 plus 1600 respectively), mammals, reptiles, amphibians and butterflies.

Eastern Himalayan region is richest in plant diversity but our knowledge of the region is still poor. It is estimated that nearly 48 percent of the area awaits exploration and inventory of taxonomic dynamics. Dr. R.R. Rao of NBRI (Lucknow) has suggested that East Himalayan region be declared as a National Heritage for conservation.

The state of Arunachal Pradesh in Eastern Himalayas possesses one of the richest pteridophytic floras of the country as far as the species diversity is concerned. The varied topography and miro climatic conditions are the important factors responsible for rich pteridophytic diversity. The state has been the centre of attraction of many botanists since long back. More recently botanists made a preliminary account of the status of pteridophytic diversity in the state.

The Indian sub continent is one of the richest in its unique pteridophytic diversity. Maximum pteridophytic diversity of the country is occupied by Northwestern and Eastern Himalayas region (Sikkim, West Bengal, Arunachal Pradesh, Assam, Nagaland, Manipur, Meghalaya, Mizorum and Tripura), Southern and Western Ghats (Nilgiri hills, Palni hills, Palghat gap and Salient Valley).

India is one of the eighteen megadiversity centers in the world. Out of the 18 Hot spots identified in the world, India has two, i.e. (a) Eastern Himalayan region and (b) Western ghats.

Botanical survey of India (BSI) has been actively engaged in launching exploration programmes and documentation of the vegetation as well as flora of the Biosphere Reserves, National Parks, Wildlife Sanctuaries, etc. for the last several years. In continuation to it, BSI launched on multidisciplinary exploration tour to Mebao Wildlife Sanctuary in Arunachal Pradesh during the months of November and December, 2000, to study the floristic aspect of biodiversity of the Sanctuary. The present study is related to the aspect.

Dixit, R.D. (1984) in A Census of Indian Pteridophytes mentioned 1,000 species and 191 genera under 70 families from India. After that Chandra Subhash (2000), The fern of India (Enumeration, synonyms and distribution) revised and
compiled a catalogue of all the fern taxa recorded from the present day political boundaries of the country are 1,100 species pteridophytes (Fern and Fern-allies) form 5-7% of total Indian vascular flora, they constitute the second rank to the flowering plants due to their specific type of vegetative pattern like abundance in individuals as well as their conspicuousness in epiphytic and terrestrial vegetation along forest margins, road sides and forest floors.

According to the World Health Organization (WHO) estimates that up to 80% of the world people rely on plants for their primary health care. In China, South Africa, Malaya, USA, Europe, Canada the pteridophytes are used as medicine to cure such diseases as chest complains, cancer, rheumatism, bowel disorder, ulcer, cough, fever, leprosy, gastro-intestinal disorders eradication of worm in children and venereal diseases. In India and its surrounding countries are utilizing the different species of pteridophytes in various traditional systems of medicine. In horticulture, they are widely cultivated as indoor plants. Apart from medicine, like other group of plants they regulate climate, stabilize soils, produce oxygen and become they important part of ecosystem. Therefore, from the period of Linnaeus (1753) the botanist and scientists are actively working on pteridophytes.

Pteridophytic flora of India is rich and it is represented by ca 1100 species distributed within 191 genera. Phytogeographically North Eastern part of India constitutes an important region. It is not only for occurrence of species diversity but also due to occurrence of numerous rare, threatened and endemic taxa. Exhaustive account of pteridophytes as a whole of the region still lacking due to inaccessibility of the area. However few important contributions viz. Bir and Vasudeva (1989) from N.E. India, Rao & Baishya (1989) from Meghalaya, Kachroo (1953) from Assam, Zamir & Rao from Nagaland, Barua and Borthakur (2000) from Kamrup, Assam. Sarnam Singh & G. Panigrahi (2004) from Tirap district of Arunachal Pradesh indicates the richness of the pteridophytes in this region.

Among North Eastern states viz. Arunachal Pradesh consist maximum species diversity but least explored. Numerous protected areas in this region are the storehouses of pteridophytic flora. Mehao Wildlife Sanctuary is one of the protected areas.

No work has been done in these areas exhaustively. Keeping this in view, Mehao wildlife sanctuary in lower Dibang Valley Distt. of Arunachal Pradesh has
been related for detail pteridophytic studies. The area is virgin and study on pteridophytic flora of this area will be recorded with interesting results. On the other hand, a large number of taxonomic work has been done on the vascular plants mainly concentrates on Angiosperms, Gymnosperms etc. However there exist pronounce lack of Pteridophytes which constitute a major group of living vascular cryptogams, non-flowering, and spore bearing plants including ferns and fern allies.

Pteridophytes are well known for their beautiful foliage fronds since ancient period and occur in moist tropical and temperate eco-geographically regions ranging from sea level to the highest mountain.

One of the important components of the forests of eastern Himalayas, the pteridophytes, inhabit almost every type of habitat in different ecological regions. Pteridophytes are non flowering, vascular, spore bearing plants which include ferns and fern allies (Lycopodium, Huperzia, Pahinia, Phlegmarurus, Selaginella, Equisetum and Psilotum etc.). About 250 millions years ago pterophytes constituted the dominant vegetation but in the present day flora they are replaced by seed bearing plants. However, pteridophytes grow luxuriantly in most tropical and temperate forests and there occurrence in the different eocogeographical regions from sea levels to highest mountains are of much interest. Pteridophytes, the first group of spore bearing vascular plants include the fern-allies and the true ferns. The latter constitute a major group of living pteridophyta, which are adapted to a wide variety of habitats. Fern flora of North East India is specially quite rich, on account of the favourable climate and plantful moisture and flora conscious features of the vegetational landscape. But unfortunately this group of plant has not receive due attention by plant exploration and flora writers mainly because of difficulties involved in their collection and identification.