Chapter-1

INTRODUCTION
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Biodiversity can be defined as the sum total of all plants, animals (including human beings) and microorganisms existing as an interacting system in the biosphere. The global biodiversity comprises about more than 50 millions of species of which 2,70,000 plants species, including 10,000-12,000 species of ferns and fern-allies, are widely distributed in about 200 countries. Human beings and most of the animals totally dependent on plants, directly or indirectly, as a source of energy through their ability to convert the sun’s energy through photosynthesis. Plants have always been the source of food, fuel, fodder, medicine, shelter, etc and other necessities of man’s life since ages. The survival of humanity depends on how best we manage the biodiversity and genetic resources within the carrying capacity of the supporting ecosystem.

The Indian sub continent possesses a characteristic flora of its own and is bounded by efficient barriers like the Indian Ocean, the Himalayas range and the deserts of Sind. The immense variety in physiography and range of climatic conditions result in a diversity of ecological ranging from tropical, subtropical, temperate and alpine to desert. Its flora is rich and divers. It has over 1,15,000 species of plants and animals already identified and described. The country is gifted with 48,000 species including about 17,000 angiosperms, 23000 fungi, 2700 bryophytes, 5000 algae, 1,000 lichens and 1132 pteridophytes which account for 15% of the known world plant population (cf. Nayar, 1996; Sarat Babu and Arora, 1999). India is one of the eighteen megadiversity centers in the world. The main bio-diversity centers represent as viz. Himalayas, Gangetic plains, Western and Southern ghats and Thar Desert.
The Indian subcontinent 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, Mizoram and Tripura), Southern and Western Ghats (Nilgiri hills, Palni hills, Palghat gap and Salient Valley). In Central region Madhya Pradesh (Pachmarhi and Amarkantak), Chhattisgarh (Bailadilla hills) and Orissa (Parasnath hills) are the rich sites for pteridophytic diversity. Gangetic plains and Aravalli hills or towards Northwest region, the percentage of pteridophytic diversity is too poor except occurrence of few species. Its physiography, much variable climatic conditions like vapid nature of rain fall, temperature, humidity, topography and altitudinal ranges, are the factors responsible for luxuriant growth of pteridophytes, from sea level to high mountainous regions.

The pteridophytes, consisting of the ferns and fern-allies are one of the oldest land plant groups occurring on the earth. They are the second largest vascular cryptograms, non-flowering and spore bearing plants. They are considered next to the Angiosperms in their distribution and diversity. Their intermediate position between the lower cryptogams and higher vascular plants have made this group more fascinating and interesting. Generally they grow in abundance in moist tropical and temperate forests through out the India and world.

About 250 millions years ago, pteridophytes constituted as the dominant vegetation on earth surface. However, seed-bearing plants in present flora now replaces them. Ferns are always attracting the attention of naturalists and scientists since ages because of their beautiful foliage fronds, its evolutionary status in the plant kingdom and occurrence in eco-fragile regions.

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, rhumatism, 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 the important part of
ecosystem. Therefore, from the period of Linnaeus (1753) the botanist
and scientists are actively working on pteridophytes.

About 12,000 species of pteridophytes are well distributed
throughout the world. Dixit (1984) in *A Census of Indian
Pteridophytes* mentioned 1,000 species and 191 genera under 70
families from India. After that Chandra (2000) revised and compiled a
catalogue of all the fern taxa recorded from the present day political
boundaries of the country are 1,100 species, 144 genera under 34
families including about 235 endemic species. Pteridophytes (Fern and
Fern-allies) form 5-7% of total Indian vascular flora but due to their
specific type of vegetation pattern like abundance in individuals as well
as their conspicuousness in epiphytic and terrestrial vegetation along
forest margins, road sides and forest floors, they constitute the second
next rank to the flowering plants. Now, they form an important and
interesting part of our national flora with their distinctive ecological
distributional patterns.

Today diversity of pteridophytes facing serious threats, largely due
to habitat distraction, degradation and increasing of natural resources.
According to World Resources Institute, India figures among 28 countries
that are facing serves effects of increasing ecological imbalance if
preservation is not taken on war footing.