Botany, Semester II, Core course III, Palaeobotany and Palynology,

2. Introduction and Importance of Palaeobotany

PALAEOBOTANY: It is a branch of Science which deals with the study of Fossil plants.

IMPORTANCE OF PALAEOBOTANY:

It is essential for studying evolution as it enables us to see the relationship between different organisms, the phylogenetic relationship between different organisms, the phylogenetic relationship are established and/or altered with the discovery and study of any new species. This Science also enables us to study adaptations in plants and reveal the secrets of nature.

Palaeobotanist have been able to learn a lot about the progression of life on Earth by studying the plants that lived long ago. We now know that the first land plants began to grow on Earth about 700 million years ago. In fact, the presence of these early plants played a big role in making the Earth 's atmosphere more hospitable for animal life.

In dealing with the importance of PALAEOBOTANY, in the study of Botany, one has to remember that basic theme of all biological studies is evolution and the only direct proof of evolution is supplied by Palaeontological studies. The main importance of PALAEOBOTANY has been highlighted below.

1. Reconstructing the Plants: Study of Palaeobotany helps in the reconstruction of the plants, because the majority of fossil plants are generally preserved in rocks as disarticulated plant parts. A major aim of Palaeobotany is to reconstruct the whole plant, i.e., to say, put the pieces of the puzzle block together, once this is accomplished, the research can turn to other areas, such as determining the group of living plants, if any, to which the fossil is most closely related. How did

these plants reproduce, and how and what types of propagules were determined.

2. Evolution of plant Groups: Palaeobotanist are also interested in the origin and subsequent evolution of major groups plants and their interrelationships. When did the plants first inhabit the earth and how did they look like? When did the first representative of different groups of plants first arise. A number of Palaeobotanist study not only the plants but also the interactions of the plants with other organisms in the environment, especially, the symbiotic relationship between plants and other organisms.

Form and function in fossil plants: From many plant fossils it is possible to understand between form and function in ancient plants, that is, what advantages or limitations are imposed on the growth and development of a plant based on certain biochemical properties. Students of Palaeobotany examine the anatomical and morphological properties of various fossil plants, often using computer stimulation of model growth, in an attempt to better understand broad evolutionary patterns of plant growth, as well as changes in growth from through time.

4. Biostratigraphy and correlation: Palaeobotany has also played a key role in many areas of geology, especially in biostratigraphy- placing rocks units in stratigraphic order based on the fossils within them. Pollen grains and spores have been extensively used as index fossils in biostratigraphy and in the correlation of rock units as have various forms of algal cells and cysts. Pollen and spores, as well as mega fossils, are especially useful in correlating terrestrial rocks, as these are generally deposited in limited areas (former lakes, ponds, river systems, etc.) Making correlation by lithology (i.e., rock characteristics) very difficult.

5. Palaeoecology: Plants in their environment: Palaeoecology, the study of plant environments is a rapidly changing field that involves the integration and synthesis of both botanical and geological information. In recent years there has been a concerted effort by many Palaeobotanist to understand the palaeoenvironment of fossil land plants more completely. Palaeoecological studies are very important in revealing the diversity of fossil communities inhabiting a geographical area (horizontal variations in flora) at the same time.

6. Determining Palaeoclimate from Fossil plants: Understanding climate of the past has become more and more crucial to appreciating the changes occurring on our warming planet today. Palaeobotany is very important in providing baseline data to reconstruct past climates and in calibrating Palaeoclimate models based on physical parameters. This area is rapidly expanding, so we will only cover a few of the many ways in which plant fossils can be used to reconstruct Palaeoclimate.

Submitted by

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