CHAPTER-8

DIVERSITY AMONG PLANTS

Q1. Explain the geographic occurrence of pants.

Ans: The kingdom **plantae** or **plant kingdom** comprises hundreds of thousands of different species. They live in every type of habitat, from frozen arctic tundra tropical rain forests and deserts.

Q2. Point out the emergence of plants?

Ans: In the beginning the plants were restricted only to aquatic conditions. The migration started towards land nearly 400 million years ago.

Q3. Write down the division of plants and describe Non-Vascular plants.

Ans: Division of Plants: Plants are currently divided into two main groups.

(i) Non-vascular or bryophytes.

(ii) Vascular plants or tracheophytes.

Non-Vascular Plants: The non-vascular plants lack vascular tissues. These plants do not have true roots, stems and leaves. Therefore, the non-vascular plants are said to have root like, stem like, and leaf like structures.

Science Titbits

The name moss is often commonly used four plants that are not truly mosses. For example, reindeer moss is lichen that is a dominant form of

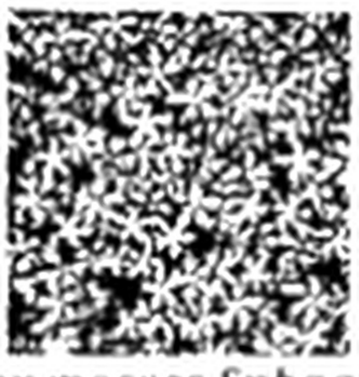
vegetation in the Arctic tundra. Spanish moss is a flowering plant and club moss is a relative to ferns.

Science Technology and Society Connections

- **Describe the formation and importance of peat bogs.**

The moss Sphagnum grows in bogy places that are low – lying, wet, spongy places forming dense and deep masses called peat bog. One of the distinctive features of these mosses is a presence of large empty cells in the leaves, which apparently function to hold water. This feature makes peat moss particularly beneficial as a soil conditioner. When added to sandy soils, for example, peat moss helps to hold and retain moisture in some area as bogs, the dead Sphagnum accumulates and do not decay. This accumulated moss called peat can be used as fuel.

Peat bog



Pear mosses Sphagnum

Q4. How can you categorize seed plants?

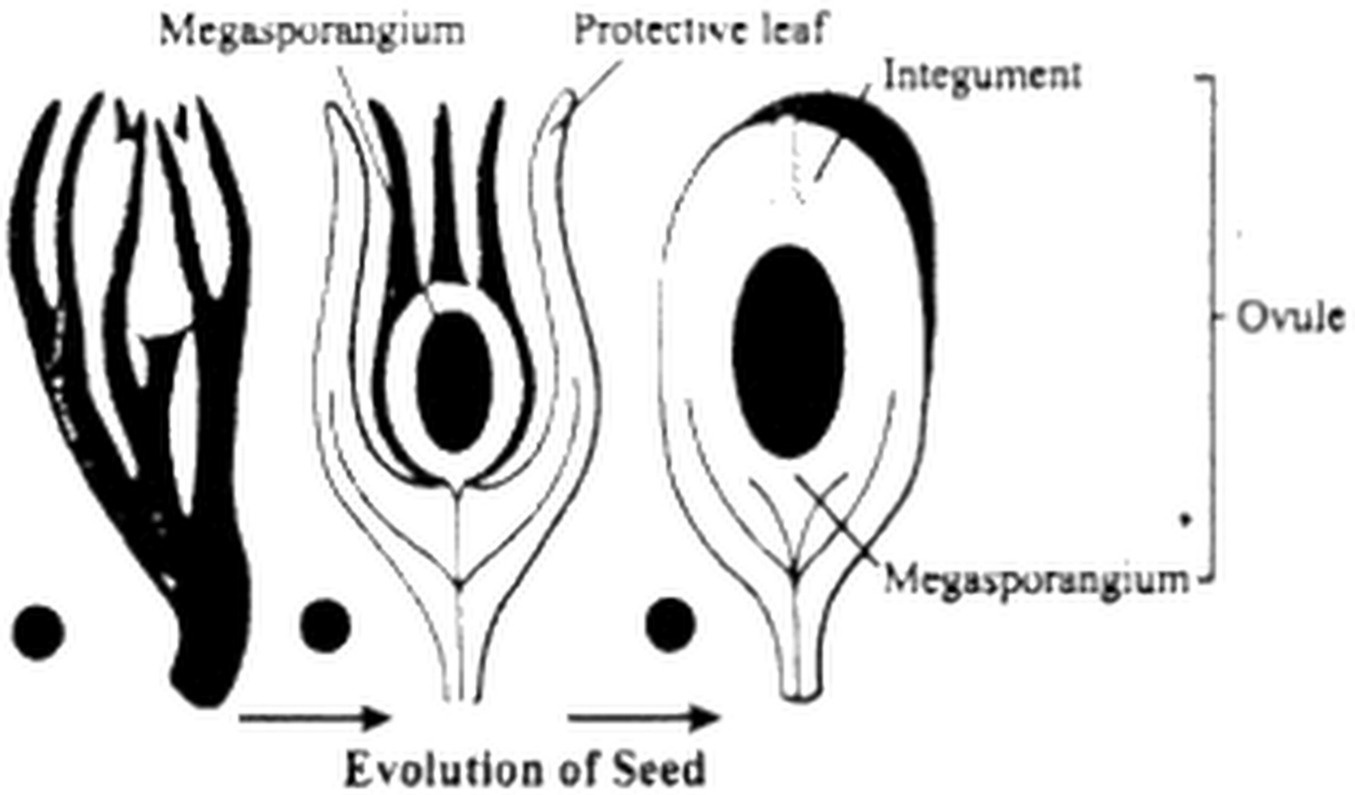
Ans: The two groups of seeds bearing vascular plants are the gymnosperms and angiosperms.

The seed of gymnosperms are produced exposed on the surface of the sporophylls that make up cones. The seeds of angiosperms are usually enclosed by a fruit produced from a flower.

Q5. Describe the events involve in evolution of seed.

Ans: Evolution of seed:

A seed may be considered as a fertilized megasporangium. It has integument around the embryo. During evolution the seed has passed through following stages.



Evolution of Seed

Development of heterospory.

All seed plants are heterosporous i.e. produce microspore and megaspore in microsporangia and megasporangia respectively. The megaspore grows into a female gametophyte and microspore grows into a male gametophyte. The megaspores of seed plants are retained inside the sporangium, where the megaspore develops into a tiny female gametophyte.

Evolution of pollen tube: The evolution of pollen tube parallels the evolution of seed. The egg produced inside an ovule is very well protected in the sporangium. It is so well protected that flagellated sperm would not have the slightest chance of ever reaching an egg. These obstacles have been overcome the developments of **pollen tubes.** Once the pollen grain reaches the cone or flower, it germinates.

The germinated pollen grain is a tiny male gametophyte. It produces along pollen tube, which grows to the ovule and then the digests its way through protecting layers to the enclosed egg.

Evolution of Integument around the Megasporangium and seed:

In carboniferous period (geological period to 80 – 350 million years ago) fern like plants were present. The sporophyte of these plants has little protective branch like out growths surrounding the megasporangium. During evolution the out growths fused together forming integument, enclosing the megasporangium. Megaspore is retained megasporangium. These modified structures are called an ovule. The fertilized ovule evolved into seed because of retention of developing embryo.

Science Titbits

There are four groups of gymnosperms. Conifers, Cycads, Ginkgo and Gnetophytes. In gymnosperms, the seed are not covered. Instead they are exposed on the surface of the sporophyll, leaves that bear sporangia. Reproductive organs are usually borne in the cones on which sporophylls are spirally arranged. Other than these features the four groups of gymnosperms have little in common.

Teacher's Point

Teachers would guide the students that how do the life cycles of seedless plants and seed plant differ? In what fundamental way are they alike?

Science, Technology and Society Connection

- **Justify plants as a medical treasure.**

Herbalism (also herbal medicine or phytotherapy) is the study of botany and use of plants intended for medicinal proposes or for supplementing a diet plants have been basis for medical treatments through much of human history and such traditional medicine is still widely practiced today.

Also, a large number of drugs are obtained from flowering plants. Some of the drugs are aconite, belladonna, quinine, malathi, santonin, digitalis, asgandh, etc.

Activity

1. Identification of the vegetative and reproductive structures of *Marchantia* and *Funaria* by examining the fresh or preserved material

2. Identification of the vegetative and reproductive structures of a local fern and a Pinus and relate them with the concerned life cycles

3. Study of different types of inflorescence of *Cassia, Brassica, Achyranthus, Morus, Candytuft, Helianthus and Avena sativa*

4. Describing the flowers of rose, *Cassia fistula, Solanum nigrum and Avena sativa*