CHAPTER 3

Plant Kingdom

TRY YOURSELF

ANSWERS

1. Pliny the Elder.

2. (i) John Ray (1627-1705) : English naturalist who classified plants on the basis of similarities and differences that have emerged from observation. He published his system of classification in *Historia Plantarum*.

(ii) George Bentham (1800-1884) and Joseph Dalton Hooker (1817-1911) : These two English botanists classified plants based on original studies of specimens. They published their well known scheme of classification in *Genera Plantarum*. This system of classification is still regarded as the best classification, especially from the practical point of view.

3. In phylogentic system of classification, flowering plants are placed in ascending series related to complexity of floral morphology.

4. Chemotaxonomy or biochemical taxonomy is based on the protein and serum analysis and on the chemical constituents of the organisms. This type of taxonomy is particularly utilised in the classification of plants as chemical constituents of plant species are stable and do not change easily.

5. *Chondrus* and *Gigartina*.

6. Differences between Chlorophyceae and Phaeophyceae are as follows:

Characteristic	Chlorophyceae	Phaeophyceae
Major pigments	Chlorophyll *a, b*	Chlorophyll *a,c*, fucoxanthin
Stored food	Starch	Mannitol, laminarin
Cell wall	Cellulose	Cellulose and algin
Flagellar number and position of insertions	2-8, equal, apical	2, unequal, lateral
Habitat	Freshwater, brackish water, salt water	Freshwater (rare) brackish water, salt water

7. To become successful land plant a plant should not be dependent on water to reproduce. Successful land plants like angiosperms have developed special mechanism to accomplish pollination. They absorb water from soil as they possess deep penetrating root system for absorption of water, minerals from the soil. They possess vascular tissues for conduction, stomata for gaseous exchange, coating of cuticle and waxes to resist dessication and mechanical tissue for strength. The bryophytes, on the other hand, do not possess all these characters of land plants. Moreover, successful land plants produce seeds for their survival and multiplication unlike reproduction through spores in bryophytes. Therefore, bryophytes could not become successful land plants.

8. Bryophytes need external water for successful completion of their life-cycle. Therefore, they grow luxuriently during the rainy season near the regular supply of water.

9. Prothallus is a small, flattened multicellular structure that represents the independent gametophytic generation in pteridophytes, *e.g.*, club mosses and ferns.

10. The sex organs of pteridophytes are antheridia and archegonia. The antheridia produce male gametes which are flagellated antherozoids. They are liberated in water and swim to reach the archegonia. The female sex organs – *i.e.*, archegonia possess non-motile egg. Thus, fertilisation can occur only when water is present in the surrounding medium.

11. When fertilisation occurs with the help of a tube (pollen tube) formed by male gametophyte, it is called siphonogamy.

12. In gymnosperms, the ovule is generally orthotropous (straight) with a single integument.

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