## 1.18 RESEMBLANCES OF PTERIDOPHYTES WITH BRYOPHYTES

1. Members of both the groups show heteromorphic alternation of generations.
2. Antheridia and archegonia are present in both.
3. Sex organs are jacketed and multicellular in both.
4. Motile male gamete and nonmotile female gamete are present in both.
5. Absence of asexual spores formed by the ordinary division of mitosis is shown by both the groups.
6. Members of both bryophyta and pteridophyta show oogamous type of sexual reproduction.
7. In all the bryophytes and some pteridophytes (*Rhynia*, *Psilotum*), rhizoids are present instead of roots.
8. All the bryophytes as well as a large number of pteridophytes possess only one type of spores showing homosporous condition.
9. Fertilisation in both bryophytes and pteridophytes takes place in the presence of water.

## 1.19 DIFFERENCES BETWEEN PTERIDOPHYTES AND BRYOPHYTES

1. Plant body in pteridophytes is sporophytic, whereas it is gametophytic in bryophytes.
2. Plant body in pteridophytes is differentiated into roots, stem and leaves, whereas it is thallus-like in bryophytes.
3. Vascular tissues are absent in bryophytes while present in pteridophytes.
4. Roots are absent in bryophytes while present in pteridophytes.
5. Bryophytes, in general, are much smaller in size than pteridophytes.
6. Vegetative reproduction is more prevalent in bryophytes than pteridophytes.
7. Bryophytes are strictly homosporous whereas many pteridophytes are heterosporous.

## *1.3 GENERAL CHARACTERITICS OF PTERIDOPHYTES*

1. The main independent plant body is sporophyte with vascular system.
2. The pteridophytes grow mostly in cool, moist and shady places, but some are aquatic (*Marsilea, Salvinia, Azolla etc.*) and few are xerophytic (*Selaginella rupestris, S. respanda, Marselia rajasthanensis, Marselia condenseta* etc.).
3. Plants are differentiated into true roots, shoots and leaves. Some primitive members lack true roots and well developed leaves (e.g.; in members of order Psilophytales and Psilotales).
4. Except few woody tree ferns all living pteritophytes are herbaceous.
5. They may be dorsiventral or radial in symmetry with branched stems.
6. The leaves of ptridophyte may be Scale like leaf (e.g. *Equisetum*), small sessile leaves (e.g., *Lycopodium and Selaginella*) and large, petiolate compound leaves occurs in true ferns.

7. The stem bears leaves which may be microphyllous type in which the leaves are quite small with unbranched midrib (e.g. *Lycopodium, Selaginella, Equisetum*), or megaphyllous type, in which the leaves are large with branched midrib (e.g. ferns).
8. In fern, the young leaves show circinate vernation (curved inwards).
9. Primary embryonic roots are short lived and replaced by adventitious roots.
10. The pteridophytes reproduce by haploid spores which are produced within a specialized structure called sporangium.
11. Plants may be homosporous (all spores are same in shape and size) and heterosporous (spores are of two different shape and sizes, smaller one called microspore and larger one megaspore).
12. In some pteridophytes the sporangia developed on stems in the axil between leaf and stem, or on leaves (mostly ventral surface of leaves). On the stem sporangia may be terminal e.g. *Rhynia*, lateral in *Lycopodium*, on the surface of leaves in Ferns. The sporangia borne on ventral side of specialized leaf and such leaf is called Sporophyll. In aquatic ferns micro and megasporangia together are covered by a common membrane and this bean shaped structure is called sporocarp.

13. In true ferns the sporangia are located on the lower surface of the leaf as clusters called sori (sorus).
14. The haploid spore is a unit of gametophyte. On germination it develops into gametophytic prothallus.
15. The Gametophytic plant is called prothallus since it more or less looks like the thallus of a primitive bryophytes.
16. Gametophyte bears sex organs archegonia and antheridia. As a result of fertilization the zygote or oospore is formed.
17. The homosporous plants are monoecious (antheridia and archegonia borne on same thallus).
18. Heterosporous plants are mostly dioecious (antheridia and archegonia borne on separate thalli).
19. Microspore gives rise to male prothallus which bears the male sex organs antheridia.
20. Megaspore gives rise to female prothallus which bears the female sex organs archegonia.

21. The sex organs are embedded or projected in the prothallus.
22. The male gametes are called antherozoids and produced inside the antherdium.
23. Antherozoids are unicellular, spirally coiled and flagellate.
24. The archegonia are flask shaped and differentiated into upper neck and lower broader venter.
25. The achegonial neck is projected and the venter is embedded.in the prothallus.
26. Water (moisture) is essential for completion of fertilization.
27. The egg and antherozoids fuse to form diploid zygote. The Zygote develops into new sporophytic plant body.
28. Clear alternation of generation takes place in the life cycle of Pteridophytes which is always heteromorphic type.