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Q. Give an illustrated account of sphaerocarpeles and discuss its affinities.

Ans:- **INTRODUCTION** → Sphaerocarpeles are natural Hepaticopsida consisting of simple, primitive thalloid members showing a marked tendency towards the formation of leaves. It shows an advancement over other members of the group. But peculiar to it, there is no internal differentiation of the thalli.

The ontogeny of sex-organs is of primitive type. Such as the antheridium is of Marchantioid type while the archegonium resembles the Jungermanniales. The sex organs in contrast to other members of Bryophyta remains enclosed inside an envelope. Again the sporogonium lacks both the seta and elaters.

CHARACTERISTICS OF SPHAEROCARPELES → The group is associated with the following important characteristics —

1. The thallus in some members shows a tendency towards the differentiation of leaves or leaf like structure.
2. Internal organisation of the thallus appears least differentiated.
3. Scales are absent.
4. The ventral surface of the thallus bears only smooth walled rhizoids.
5. Scales are replaced by multicellular

murilage hairs.

6. Sex organs resemble in their ontogeny to both the Marchantiales and Junggermanniales.
7. Each sex organ is surrounded by a special envelops. ~~peridium~~
8. Seta is ~~freely~~ ^(freely) developed. _{weak}
9. Elaters are absent.
10. Capsule lacks fibrous thickening from its single layered capsule wall.

CLASSIFICATION → It has been divided into two families —

Family 1 — Sphaerocarpaceae.

Genera — (i) Sphaerocarpus
(ii) Geothallus.

Family 2 — Riellaceae

Genera — (i) Riella.

DISTRIBUTION AND HABITAT → Plants are aquatic, growing in moist place or purely under aquatic environment.

Sphaerocarpus has been recorded from various part of the world where as Geothallus is a Californian genus closely allied to Sphaerocarpus. They grow upon the ground in crowded patches.

In contrast Riella belong to aquatic class, growing either as free floating (R. clausensis) or under submerged condition such as R. capensis, R. biolata, R. helicophylla etc. It is native to some

countries like Algeria, France, Sardinia, Geneva, Turkistan, Elizabeth, South Africa etc

MORPHOLOGY OF THALLUS → The three genera of the groups forms a evolutionary series in their morphology. Sphaerocarpus can be considered as the most primitive among the three plants. Greothallus is intermediate and Riella represents the most advanced members of the group.

The thallus of Riella, Sphaerocarpus and Greothallus are dioecious. In Sphaerocarpus the thallus consists almost entirely of uniform green cells. They are arranged in several layers at the middle but thickening out a single layer at margin. The margin are notched. Each notch marks the growing point. The ventral region of the thallus bear smooth walled rhizoids and the apical portion of the thallus is provided with multicellular club shaped mucilage hairs. They have been regarded as sedimentary leaves corresponding to the ventral scales of the Marchantiales and the Amphigastria of the Acrogyrae; The size of the thallus depends upon the moisture contents. It has been observed that presence of excess moisture result in increasing the size of the thallus but it is accompanied by marked reduction in the number of

sexual organs.

Creothallus differs from sphaerocarpus in being a much larger plant and in the definite organization of the leaves. This makes Creothallus a great advance upon Sphaerocarpus. The thallus in this genus is differentiated axis and leaves formed from the lateral segments of the apical cells. The leaves at first are placed vertically but latter become shifted to the upper surface of the axis.

The thallus of Riella as a cylindrical axis bearing dorsal lamina or wing which may be more or less spirally placed owing to Torsion of the axis. The morphology of this genus clearly shows a co-relation between the breadth of the wing and the size of leaves. It has been noted that the borders of wing, the smaller are the leaves and vice-versa. The leaves are relatively enlarged in free floating species.