

Evolution of Bryophytes

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- There are two main hypothesis regarding evolution of Bryophytes:
 - I.Pteridophytean Hypothesis-** Bryophytes are descendants of Pteridophytes
 - II.Algal Hypothesis-** Bryophytes have evolved from Algae

I. Pteridophyteen Hypothesis



- **Proponents** are Scott, Lang, Kidston, Haskell, Kashyap etc.

Similarity between Bryophytes and Pteridophytes

- Close similarity between sex organs of Bryophytes and Pteridophytes
- Resemblance between sporogonium of Anthoceros and terminal sporophytes of fossil pteridophytes-Sporogonites and Horneophyton
- Similarity in pigments, cell walls, food reserves, reproductive methods and life cycle.

It is proposed that bryophytes have evolved by simplification or reduction of Pteridophytes

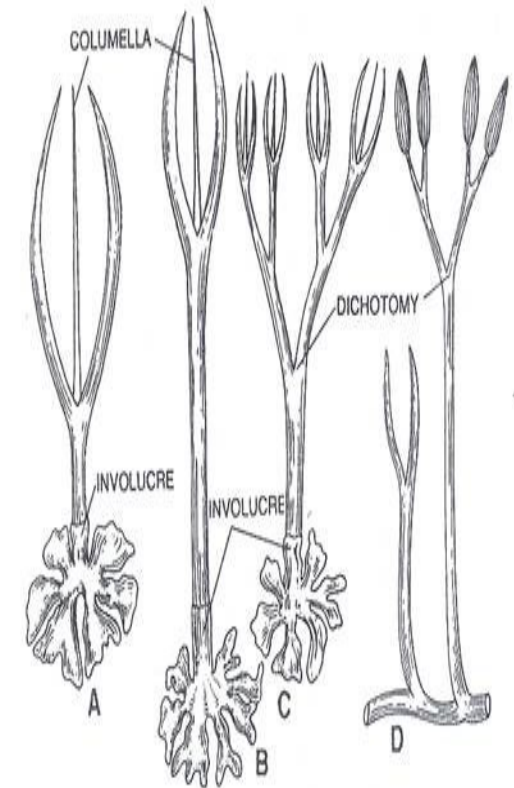


Fig. 25.2. Origin of the Pteridophytes. A-D, this scheme shows the origin of early land plants from *Anthoceros* (a bryophyte) like ancestors.

Pteridophytean Hypothesis

- **i.Scott**

- Presence of chlorophyll and plastids in sporogonium of mosses, liverworts and Anthoceros
- Presence of stomata in pteridophytes and in sporogonium of Anthoceros and apophysis of mosses
- These are persistent ancestral features when sporophyte is independent as in Pteridophytes
- Sporogonium of Anthoceros is independent to a large extent of the gametophyte

Pteridophyteen Hypothesis

- ii. Haskell** (1949) proposed the bryophyteen origin of pteridophytes with the following evidences:
- Resemblance between sporogonium of *Anthoceros* and terminal sporophytes of fossil pteridophytes-*Horneophyton*
 - Presence of stomata in pteridophytes and in sporogonium of *Anthoceros* and apophysis of mosses
- **It is proposed that bryophytes represent a degenerate evolutionary line of pteridophytes**

II. Algal Hypothesis

- **Aquatic origin of Bryophytes**

- Occurrence of flagellated sperms
- Presence of a filamentous protonema

- **Algal origin of Bryophytes**

Bryophytes have evolved from green algae, rather than brown algae- Chlorophycean hypothesis of bryophyte origin

- Identical photosynthetic pigments (chlorophyll and xanthophyll)
- Thallus like plant body without vascular tissues
- Starch is the reserve food
- Presence of cellulosic cell wall

Modern View

- Bryophytes represent a blind offshoot of plant evolution
- To avoid competition in water, ancestral algae moved to terrestrial habitat
- Primitive amphibious plants developed multicellular sex organs as an adaptation to live on land