

Affinities of Pteridophytes

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Affinities of Pteridophytes:

- Similarities with Gymnosperms:
- (i) Plant body is sporophytic, dominant and can be differentiated into root, stem and leaves in both the groups.
- (ii) Gametophytic phase is of short duration.
- (iii) Young leaves show circinate vernation.
- (iv) Vascular tissue is well developed. Xylem lacks vessels (except in order Gnetales of Gymnosperms) and companion cells are absent in phloem).
- (v) Like Gymnosperms many Pteridophytes are heterosporous (e.g., Marsilea, Selaginella).

- (vi) Like Pteridophytes many Gymnosperms show ciliate antherozoids (e.g., Cycas, Ginkgo).
- (vii) Like Gymnosperms, in some Pteridophytes megaspore is retained within the megasporangium (e.g., Selaginella).
- (viii) Regular alternation of sporophytic and gametophytic phase is present.



Differences Between Pteridophytes and Gymnosperms

S. No.	Character	Pteridophytes	Gymnosperms
(i)	Habitat	Hygrophytes (<i>i.e.</i> , grow in moist and shady places)	Xerophytes (grow where the water supply is scanty)
(ii)	Root	Adventitious roots	Tap root
(iii)	Vascular cambium	Absent	Present
(iv)	Archegonium	Neck canal cells, venter canal cell present	Absent
(v)	Water	Essential for fertilization	Not necessary.
(vi)	Microspores and megaspores	Develop independently after being shed from their sporangia	Microspores are shed for a short time from microsporangia and the megaspores are permanently retained within megasporangia.
(vii)	Pollen tube	Absent	Present
(viii)	Ovule	Absent	Present
(ix)	Seed	Absent	Present
(x)	Gametophyte	Independent of the sporophyte	Dependent on the sporophyte.

Bryophytes/Pteridophytes

Similarities

- Both bryophytes and pteridophytes prefer to grow in moist and shady habitats.
- Both need water for the act of fertilization.
- In both bryophytes and pteridophytes sexual reproduction is oogamous type.
- Both show heteromorphic alternation of generation.
- Both bryophytes and pteridophytes have sporic meiosis.

Dissimilarities

- The plant body of bryophytes is not differentiated into true roots, leaves and stem (i.e. they are thalloid plants) while the plant body of pteridophytes are distinguished into true roots, leaves and stem.
- Bryophytes are non-vascular plants while pteridophytes are vascular plants (i.e. contain xylem and phloem).
- Gametophytic phase is dominant in the life cycle of bryophytes while contrary to this sporophytic phase is dominant in the life cycle of pteridophytes.
- In bryophytes the sporophytic phase is parasitic over the gametophytic phase while in pteridophytes both the phases are independent.

BASIS FOR COMPARISON	BRYOPHYTES	PTERIDOPHYTES
Body definition	Bryophytes has leafy or thalloid plant body.	In pteridophytes plant body in differentiated into roots, stems, and leaves.
Vasculature system	No vasculature system, which means xylem and phloem absent.	Proper vasculature is present which means xylem and phloem is present.
Vascular tissue	Absent	Present
Presence of roots	No roots, instead rhizoids are present helps in anchoring	Roots are present.
Presence of stems or leaves	No true stems or leaves are present.	True stem and leaves are present.
Archegonium and it's formation	Common exposure of archegonium, whose neck is formed of six rows of cells.	Partially embedded archegoninum and it's neck has only four rows of cells.
Antheridium	Stalked.	Sessile.
Dominating part	Gametophyte is dominating.	Sporophyte is dominating.
Cell type	It has haploid cells.	It has diploid cells.
Examples	Mosses, liverworts, hornworts.	Spikemosses, clubmosses, ferns, quillworts.
Sporophytic phase	Depends completely on gametophytic.	Saprophytic phase is an independent autotrophic.

•Thank You