

First Vascular Land Plants



Horsetails

- Cool, damp, shady places
- Sandy-soil conditions

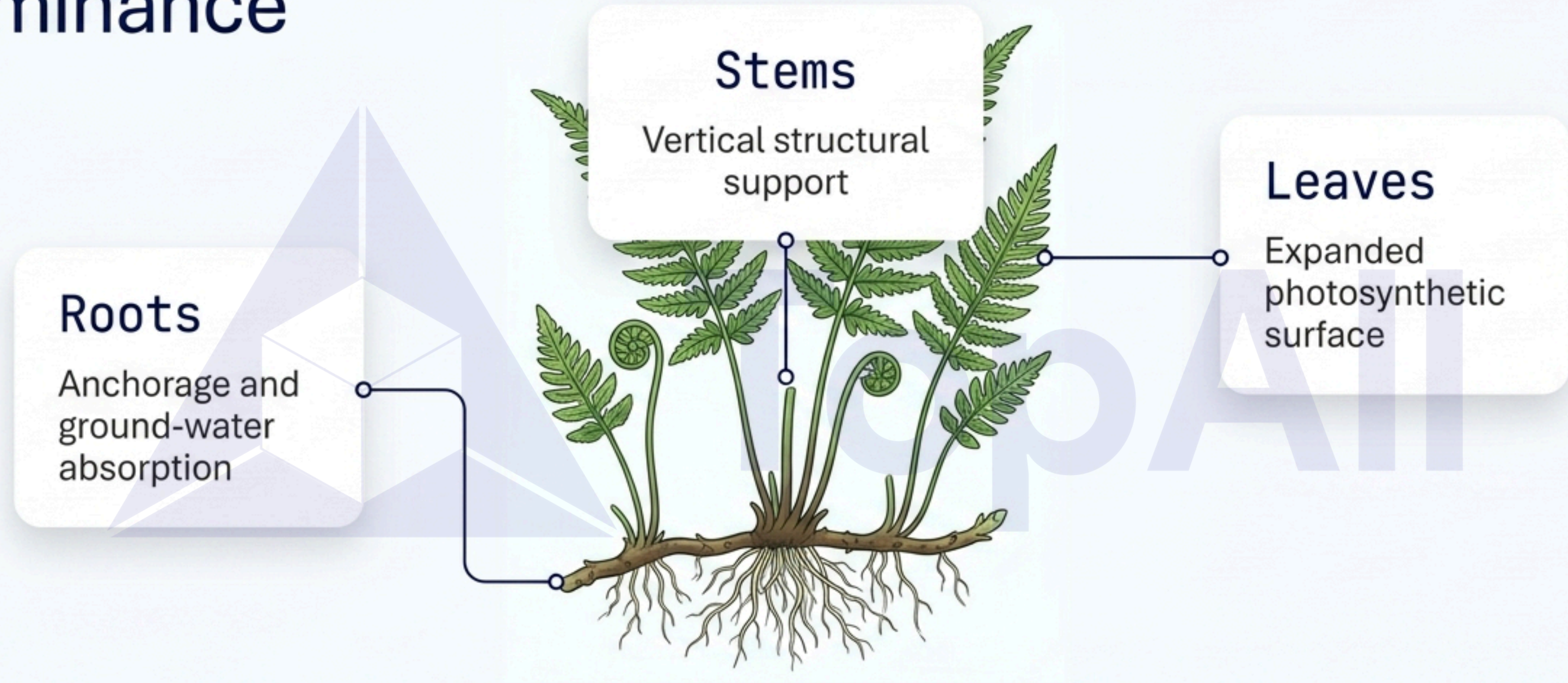
Evolutionary Pioneers: The first terrestrial plants to possess internal vascular tissues, breaking the absolute reliance on standing water for structural support.



Ferns

- Medicinals
- Soil-binders
- Ornaments

The Shift to Sporophyte Dominance



Key Evolutionary Shift: Unlike bryophytes (where the gametophyte dominates), the main plant body here is the sporophyte—fully differentiated into true roots, stems, and leaves.

Internal Plumbing: Vascular Tissues

xylem



Transports water and dissolved minerals upward from the soil. Provides rigid structural support allowing vertical growth.

phloem



Transports nutrients and sugars created through photosynthesis throughout the entire plant body.



**You've Learned the Theory.
Let's Test Them Now.**

$$E=mc^2$$



Turn theory into marks with **unlimited MCQs, smart analysis, and focused revision.**

Practice Now



At prep.topall.app

Key Highlights

- » Free Study Material, Videos & Infographics
- » Push Your Limits with Level-Based Challenges
- » Climb the Leaderboard Among Fellow Aspirants
- » Practice Unlimited MCQs for NEET & JEE
- » Get Clear Explanations, Not Just Marks
- » Track Your Performance Smarter



Foliage Diversity: Two Paths of Leaf Evolution

microphylls



Small, simple leaves with a single, unbranched vein.

Example: *Selaginella*

macrophylls



Large, complex leaves with highly branched vascular networks.

Example: Ferns

Reproductive Architecture

Macro

sporophylls

A leaf-like appendage.



Zoomed

sporangia

The capsule subtended by the sporophyll. Meiosis occurs in spore mother cells here.



Micro

spores

The haploid units produced inside.



Compact Configuration

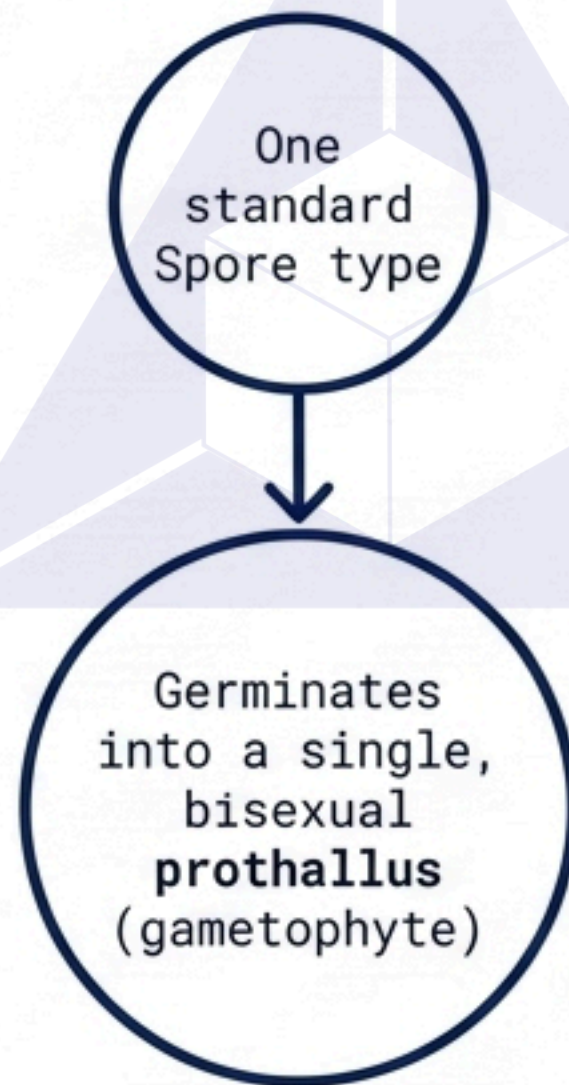
In genera like *Selaginella* and *Equisetum*, sporophylls compress into dense cones called **strobili**.



Spore Typology: Two Reproductive Strategies

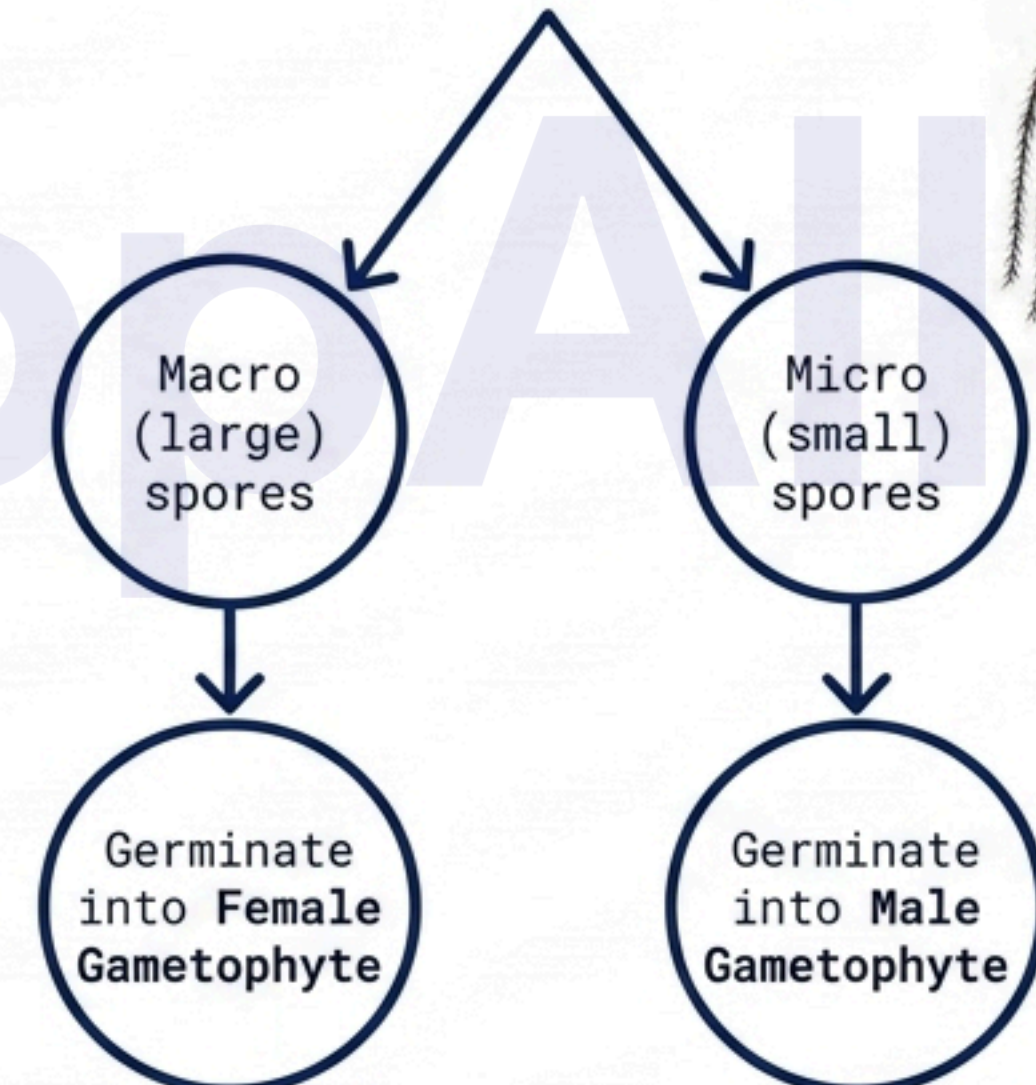
Homosporous

The vast majority of Pteridophytes.



Heterosporous

Examples: Selaginella and Salvinia



The Precursor to the Seed Habit



Dimorphism

Plant produces distinct macrospores and microspores (**Heterospory**).

Retention

The **female gametophyte** is retained on the parent **sporophyte** instead of being released.

Internal Development

Fertilization occurs, and the **zygote** develops into a young **embryo** entirely within the retained **female gametophyte**.

The Evolutionary Leap:
Retaining the **female gametophyte** and nurturing the **embryo** on the **parent plant** is the exact biological mechanism that directly paved the way for the evolution of seeds in higher plants.

Taxonomy & Ecological Constraints

Psilopsida

Example: Psilotum

Lycopsida

Examples: Selaginella, Lycopodium

Sphenopsida

Example: Equisetum

Pteropsida

Examples: Dryopteris, Pteris, Adiantum

The Amphibian Constraint: Despite their vascular plumbing, pteridophyte spread is restricted to narrow geographical regions. Their free-living gametophyte (**prothallus**) requires cool, damp environments, and male gametes (**antherozoids**) absolutely require water to swim to the female organ (**archegonium**) for fertilization.



You've Learned the Theory. Now Let's Test It.

Reading notes gets you knowledge.

Practicing MCQs gets you marks.

That's exactly what TopAll Pro is built for.

Try TopAll Pro Now

What TopAll Pro Does Differently

-  **Stuck? Snap it. Solve it. — Doubts AI**
Photo → step-by-step solution in seconds, 24/7
-  **Your AI Coach finds your blind spots**
Concept-level weakness detection — not just chapter-level
-  **4.5 Lakh+ questions. Never run out.**
13× more content than any other prep app in India
-  **Build your own test in 60 seconds**
Pick a chapter, set difficulty — AI does the rest instantly.
-  **AI Recommendation that helps you improve**
AI Recommendation Analysis your Tests and tell you where you need to improve.



Practice the moment you finish studying
Jump in while the concept is still fresh in your head

4.5L+
MCQs

1.5L+
Students

AI Powered
In-Depth Analysis