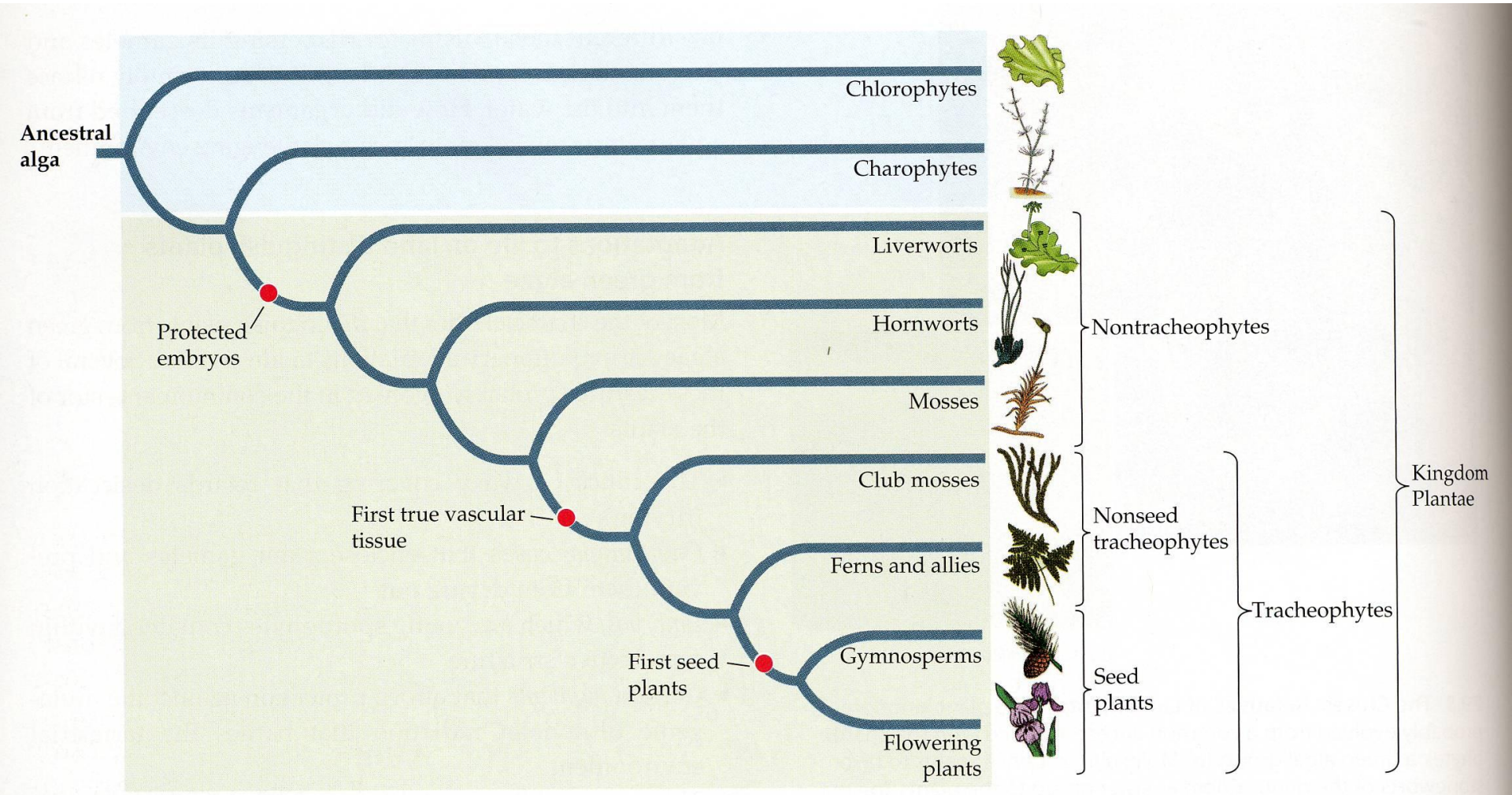
Plant Phlya using Spores for Dispersal & Dormancy

Tracheophytes = Vascular plants

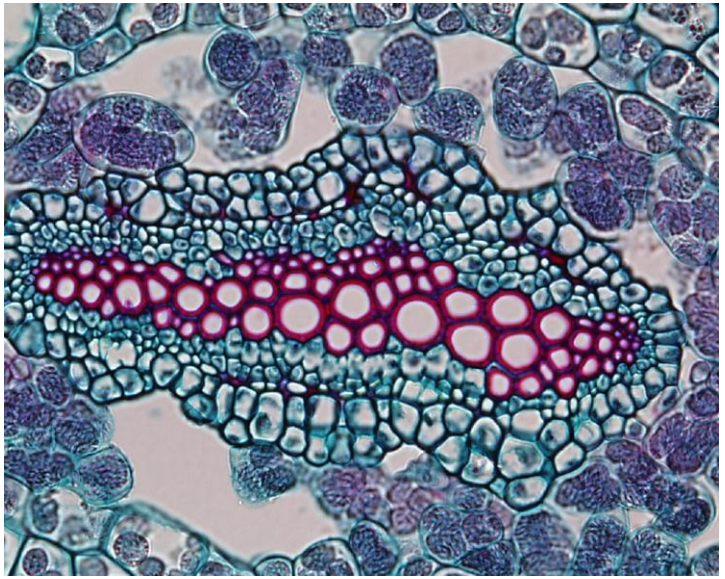
Presence of xylem & phloem

Spore producers and seed producing phyla

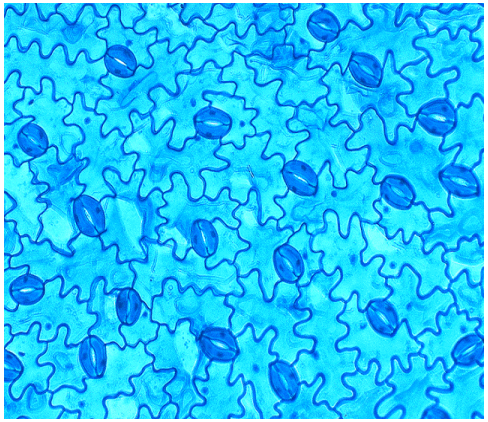


Vascular Plants = Tracheophytes

- **Vascular tissue**
- **4 Organs**
- **Waxy cuticle**



- **Stomata with guard cells**
  - **good control of water balance**



Vascular tissue: Xylem & Phloem

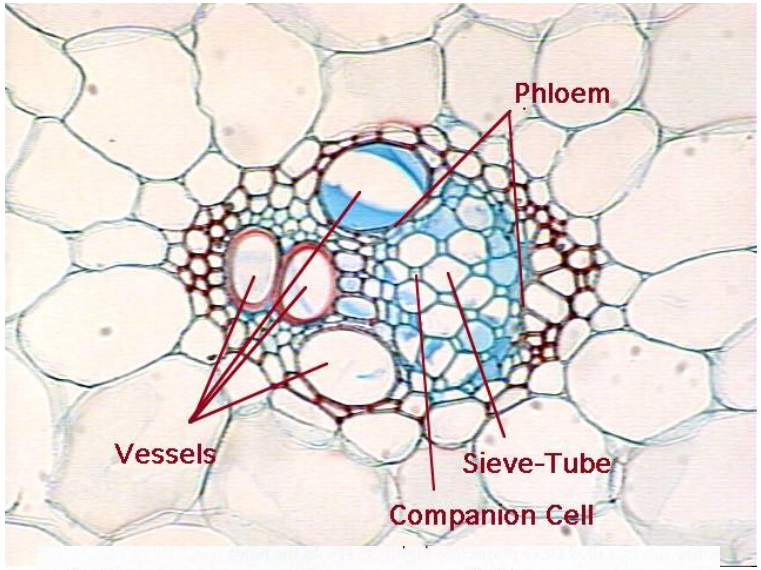
Xylem: carries water & minerals

(roots to shoots)

Cells:

Tracheids – long & narrow

Vascular Bundle = "Veins"



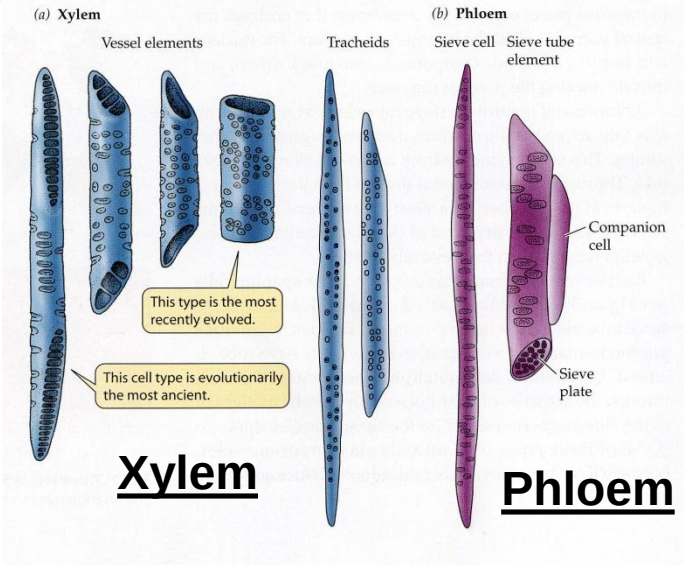
Phloem: transports sugar

(leaves to roots & reproductive organs)

Cells:

Sieve tubes – carry sugar

Companion cells – load sugar into sieve cells



4 Organs of the Vascular Plant Body

Shoots: above ground (3 organs)

1. Leaves - Photosynthesis
2. Stems - Support & transport
3. Reproductive organs
   - Gamete or spore production

4. **Roots: below ground (1 organ)**
   - Anchorage
   - Absorption

Vascular spore producering phyla

Lycophyta: Club mosses & Spike mosses

Pterophyta: Ferns & "Fern Allies"

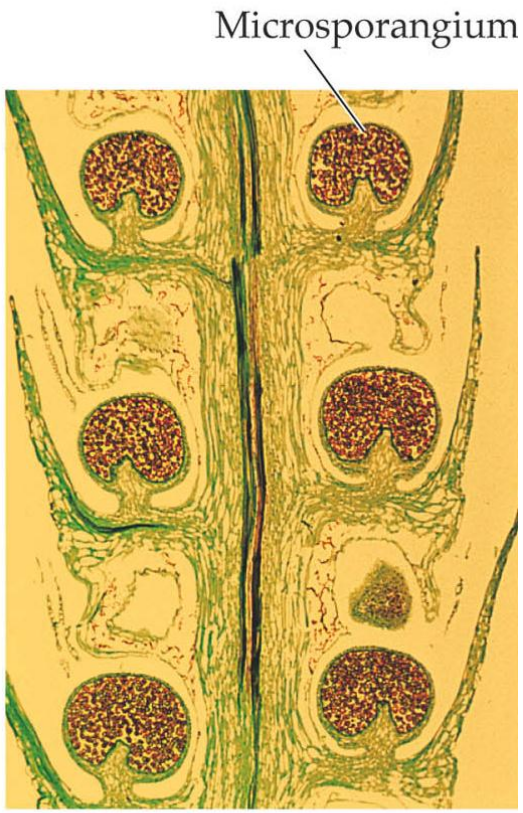
Phylum: Lycophyta

Lycophytes / Lycopods = Club & Spike "mosses"

- Looks like big moss or small fern
- Sporophyte is dominant
  - plant < 1 foot tall
- Small leaves (microphylls) with unbranched vein
  - Spiral arrangement on stem

Sporophyte

(a) *Lycopodium obscurum*



(b)

- **Strobilis at the stem tip**
- **Sporangia on upper side of leaf produce spores**

- **Small monoecious gametophyte**

Lycophytes

- **Live in moist places**
  - **shady understory of forest**

***Lycopodium* sp. = Club moss**

***Selaginella* sp. = Spike moss**

Vascular Spore producers

phylum: Pterophyta (Pteridiophyta)

Ferns & Horsetails

Ferns

← Fiddleheads

Fronds

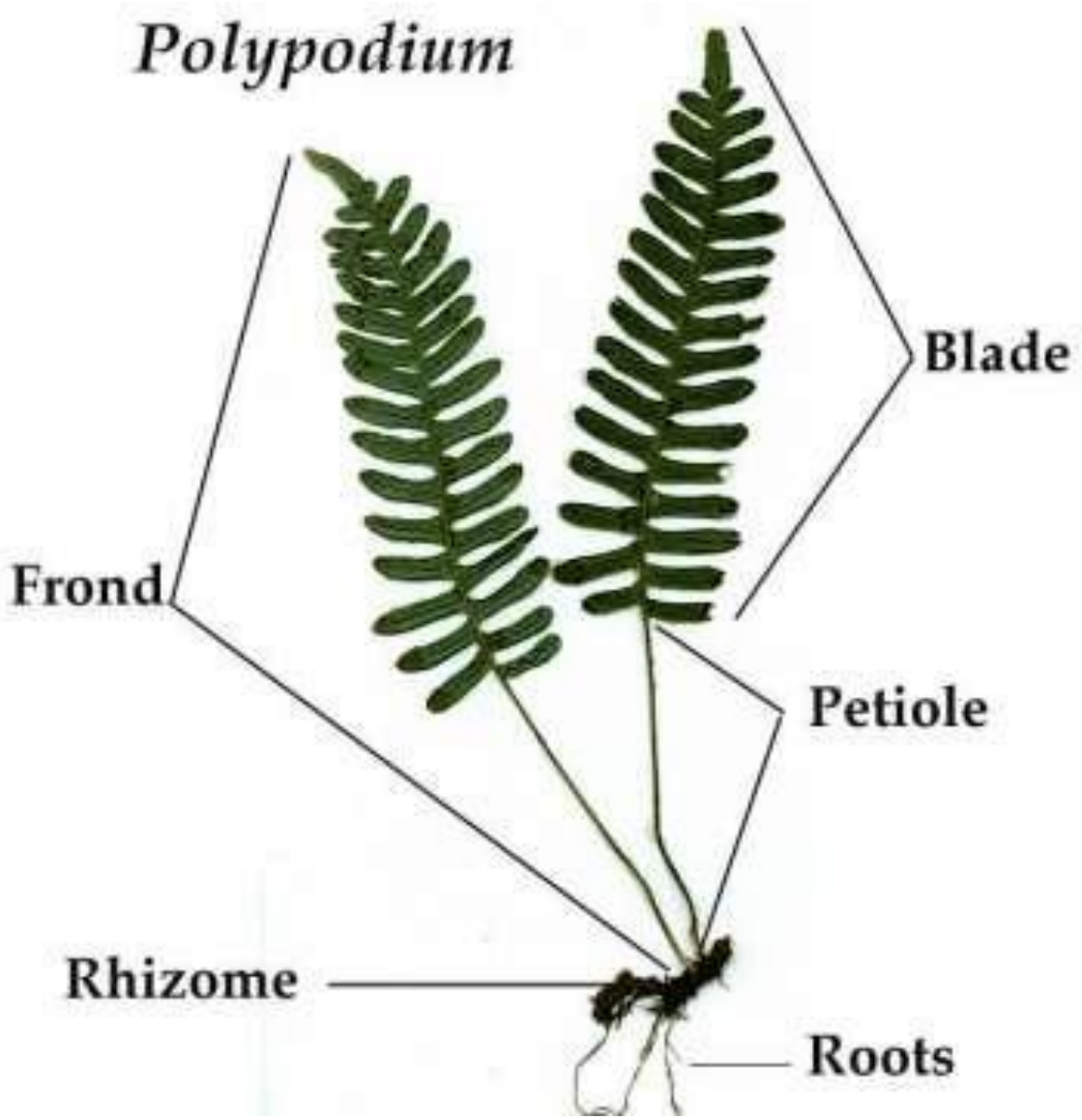
Fern Sprophyte

Frond = Leaf

Pinna = Leaflet

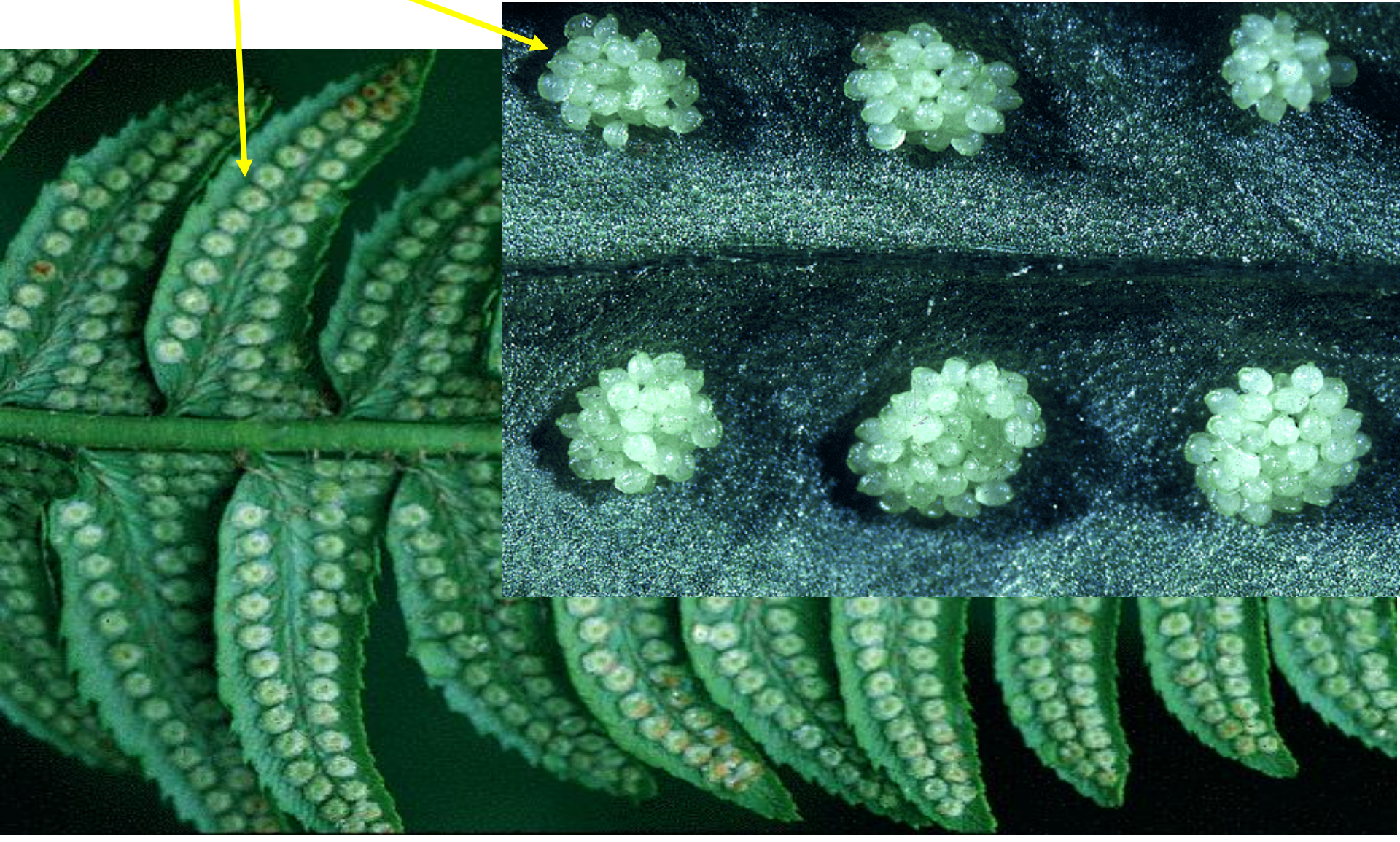
Rhizome = Underground Stem

Clumping or Spreading Rhizomes

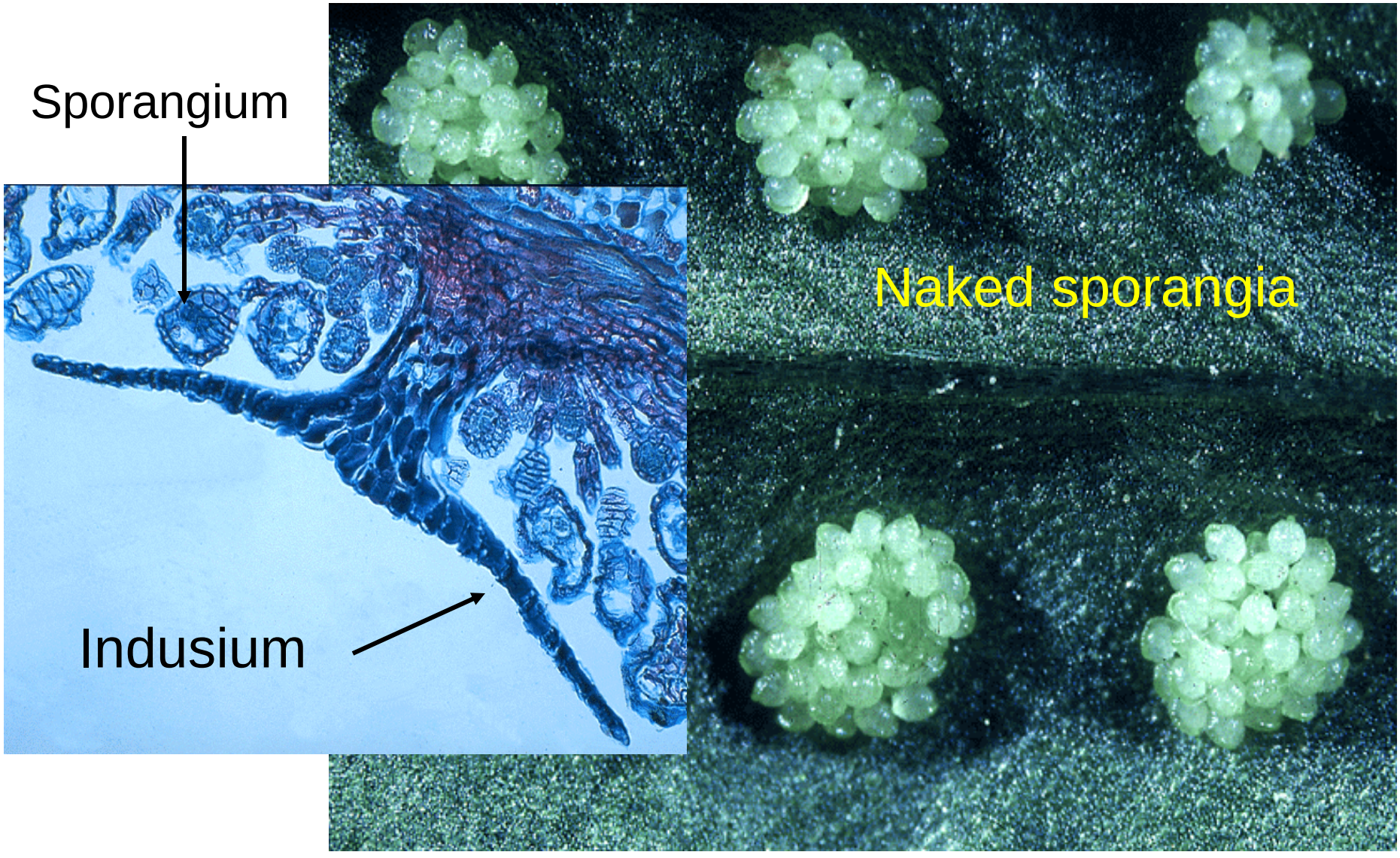


Sporangia located on underside of leaf

Sorus (sori) = group of sporangia



Sorus may or may not have protective tissue (indusium) covering sporangia



Information needed for fern identification

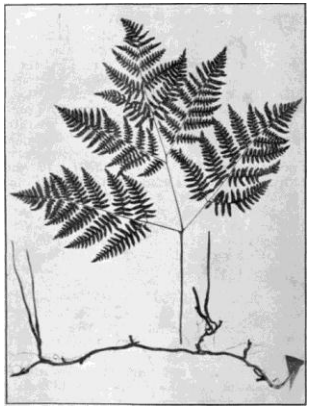
- Size & shape of frond (blade & petiole)
- Size, shape and location of sori
  - Round, oblong or linear
  - On blade, along margin
- Presence or absence of indusium
- How many time pinnate is the frond?

Pinnatifid

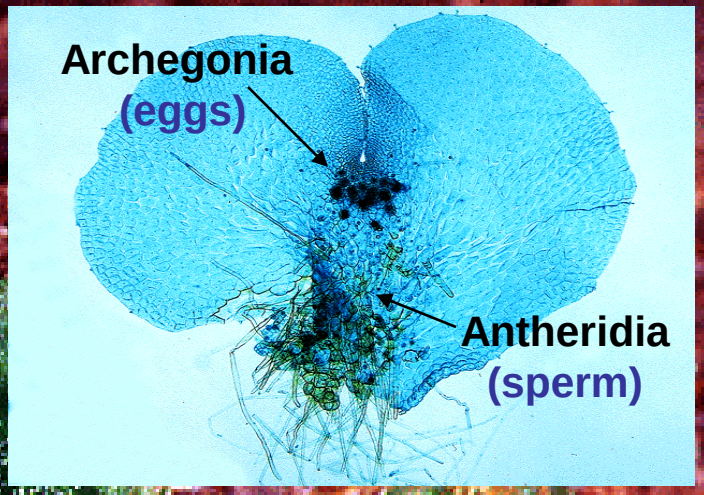
1x pinnate

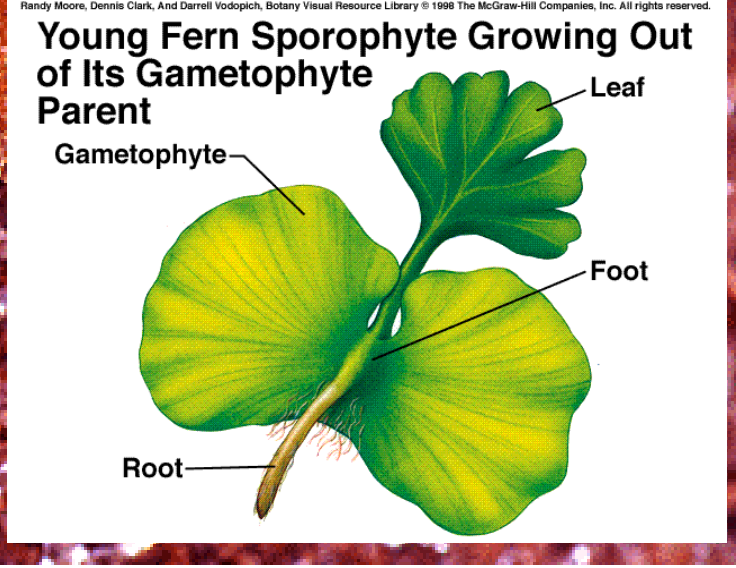
2x pinnate

3x pinnate



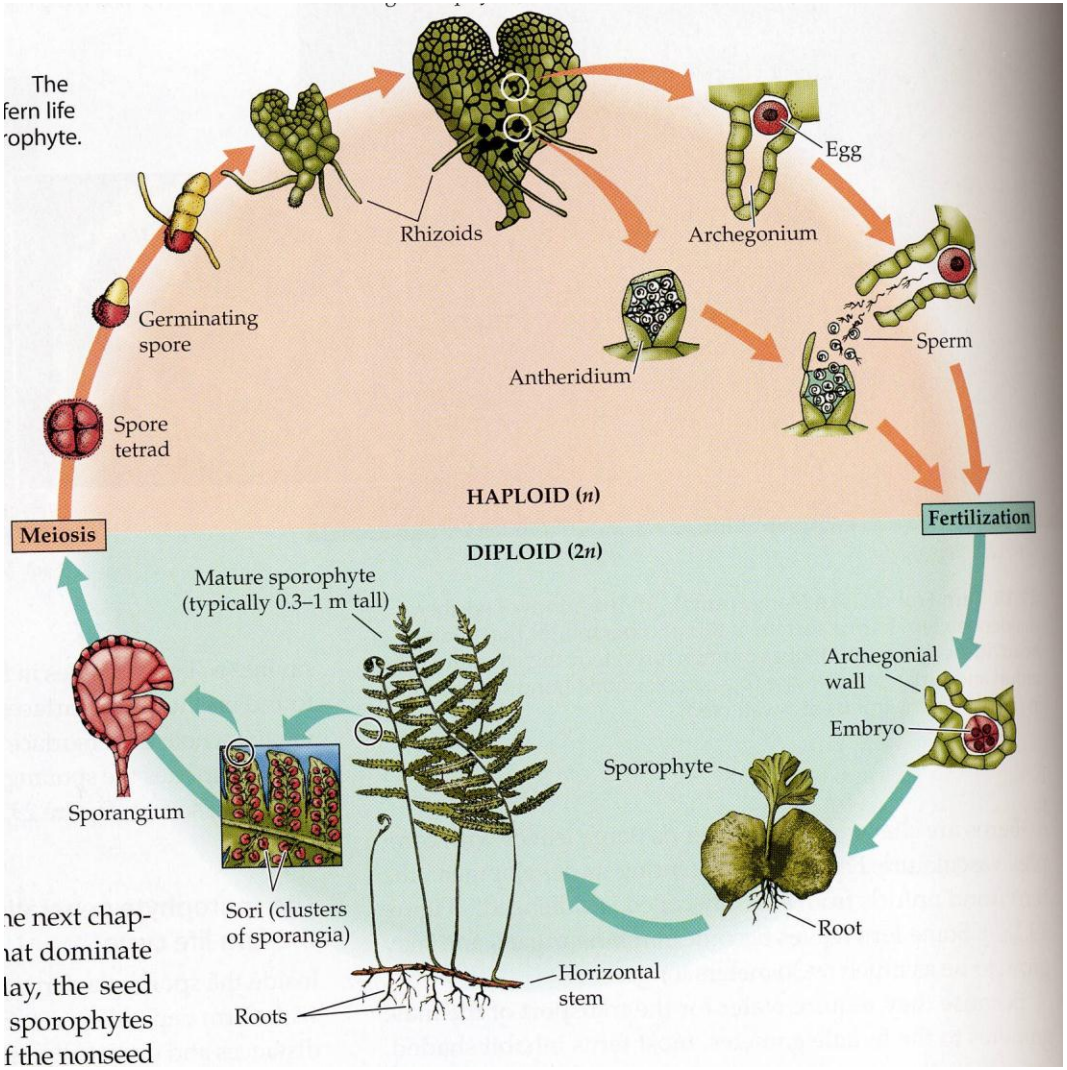
Fern Gametophyte





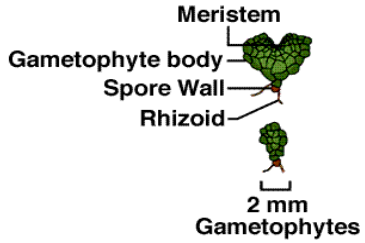
Sporophyte stage is dominant in tracheophytes

Gametophyte is small & free-living



Sperm swim to egg

***Thelypteris normalis* Gametophytes**



"Fern Allies"

(old phylum: Sphenophyta)

<u>today: part of Pterophyta</u>

Horsetails have whorls of branches

1 extant genus:
Equisetum

Horsetails
&
Scouring rushes

Scouring rushes do not

Live in moist soils

- River & stream banks
- Wet meadows
- Seep zones in forests

Rhizomes: underground stems

True roots from rhizomes at nodes

Horsetails & Scouring rushes

Pterophyta

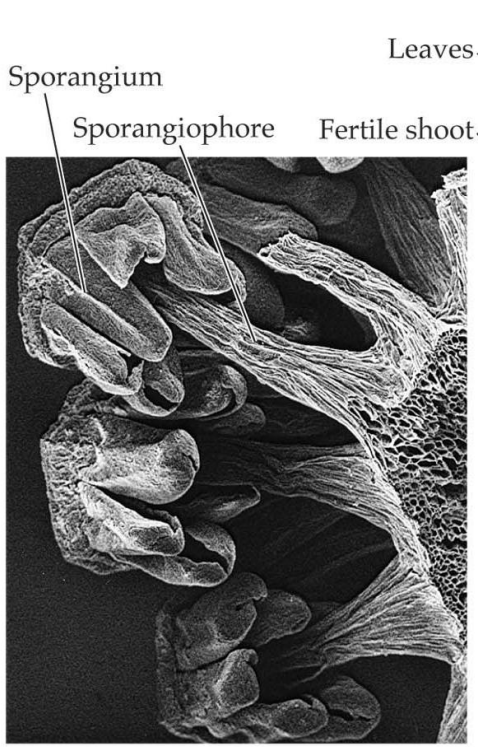
(b) *Equisetum palustre*

- Ribbed photosynthetic stem
- Hollow at internodes
- Horsetails have branches
- Scouring rushes don't
- Very reduced leaves

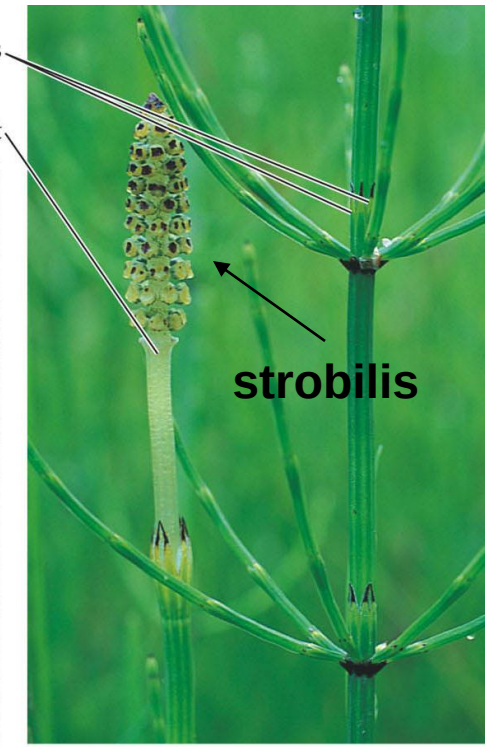
Horestails & Scouring rushes

(phylum : Pterophyta)

Strobilis at the stem tip produces spores inside of sporangia



(a) *Equisetum arvense*



(b) *Equisetum palustre*

LIFE: THE SCIENCE OF BIOLOGY, Seventh Edition, **Figure 29.11 An Ancient Forest**