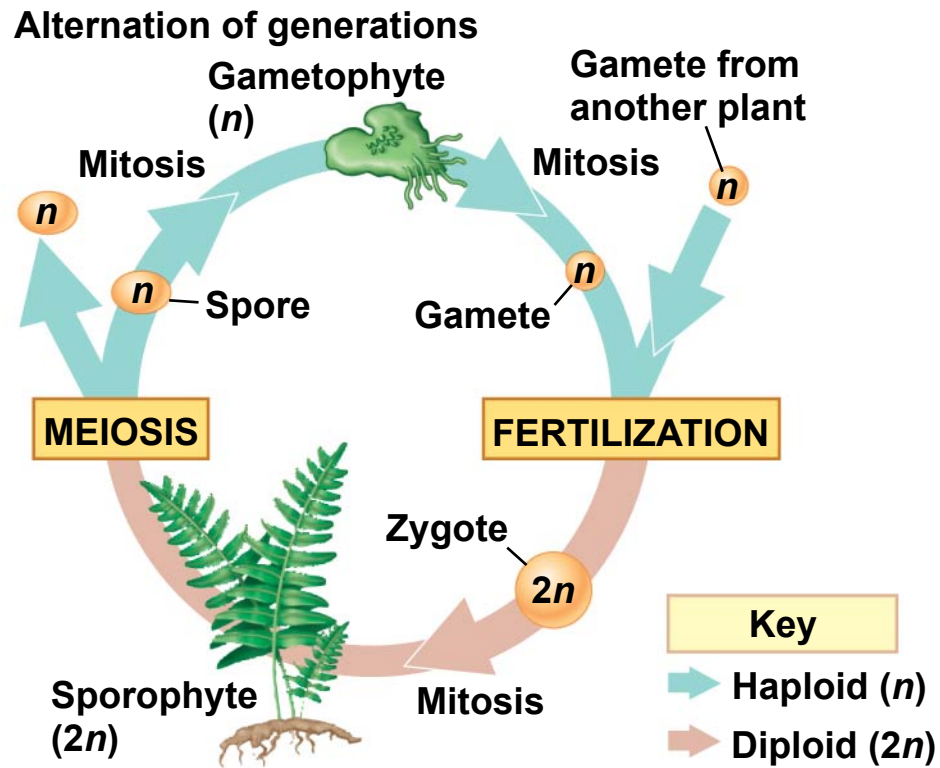
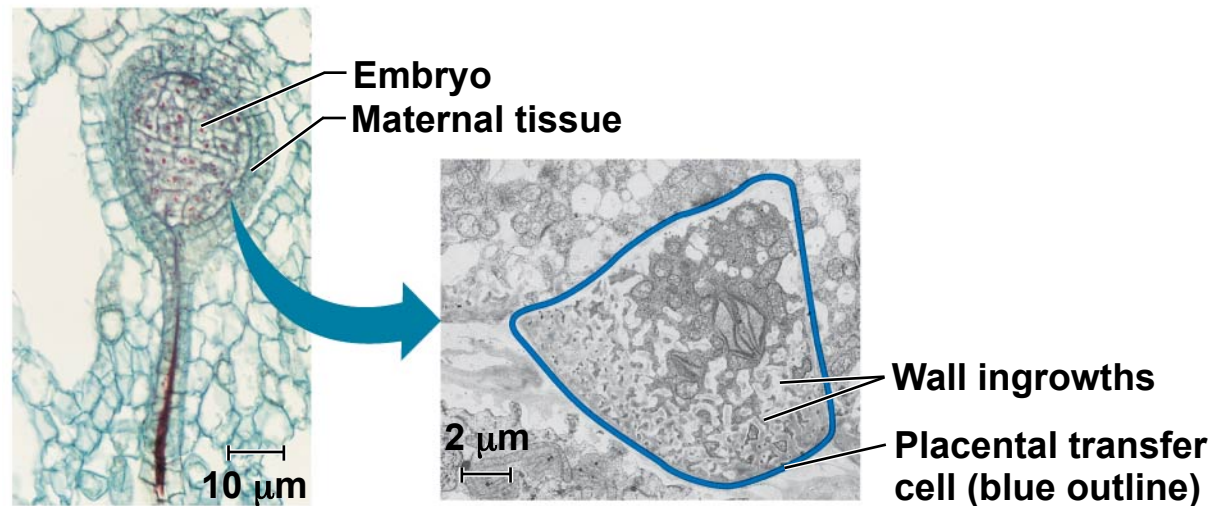
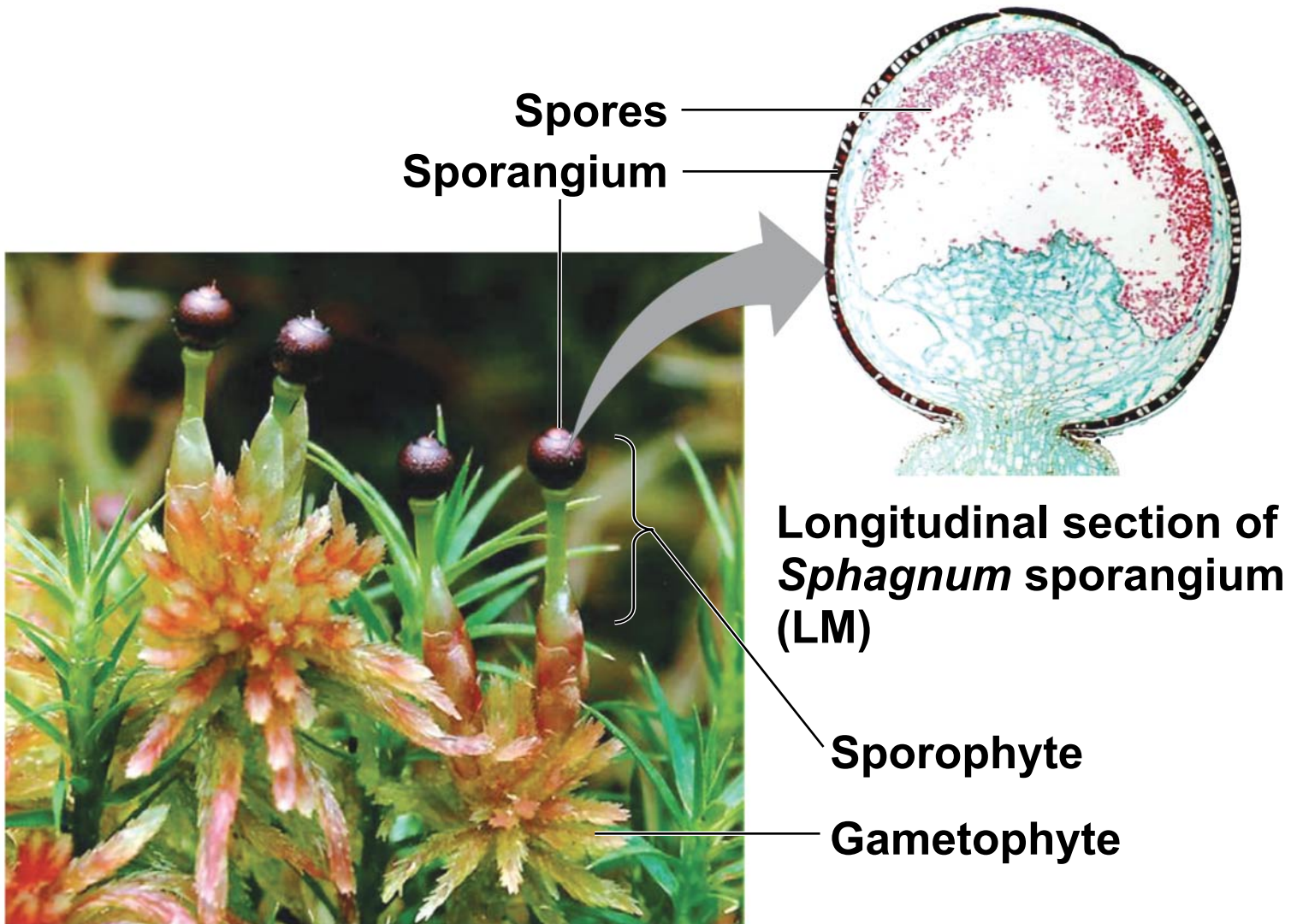


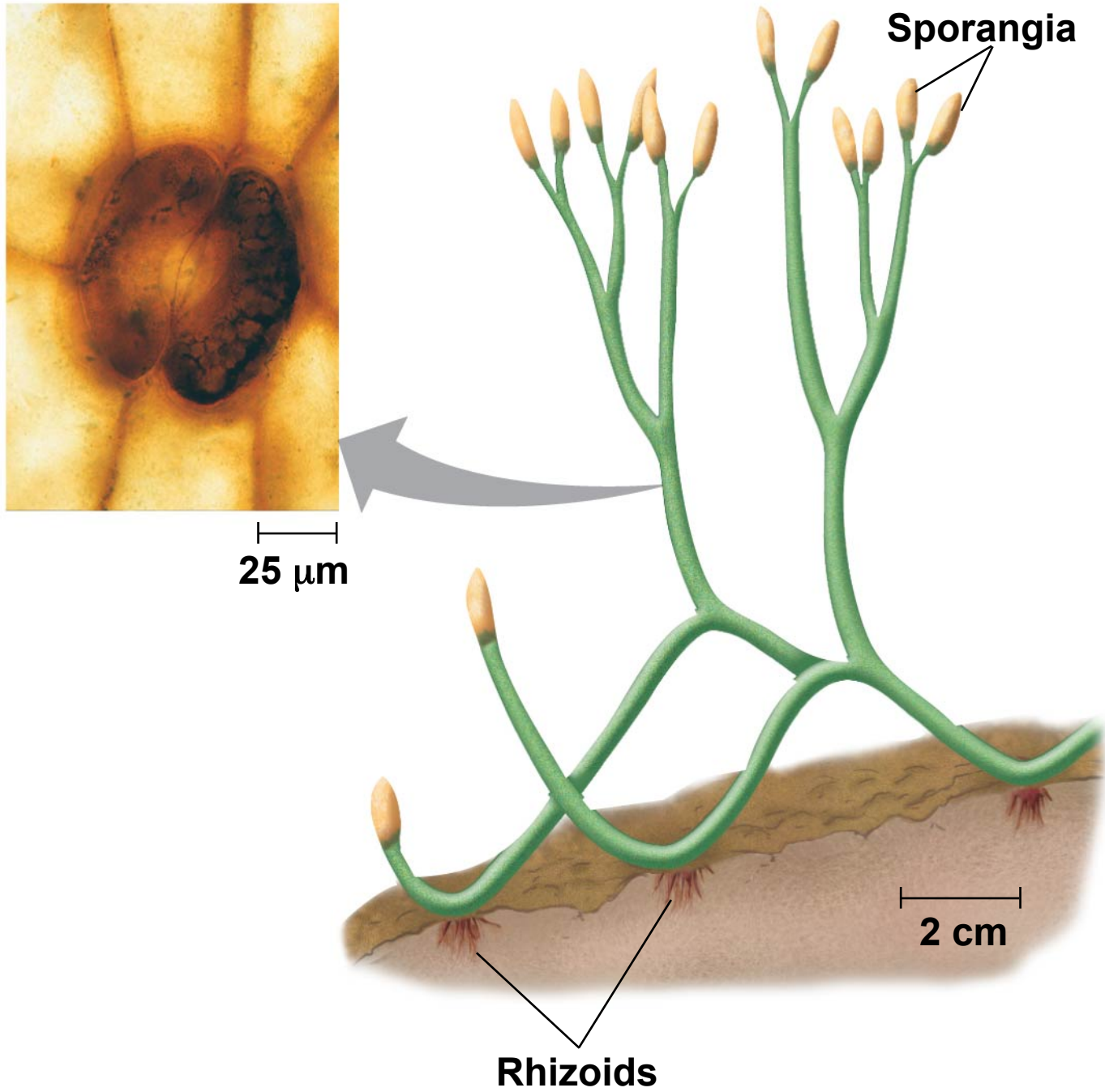
30 nm

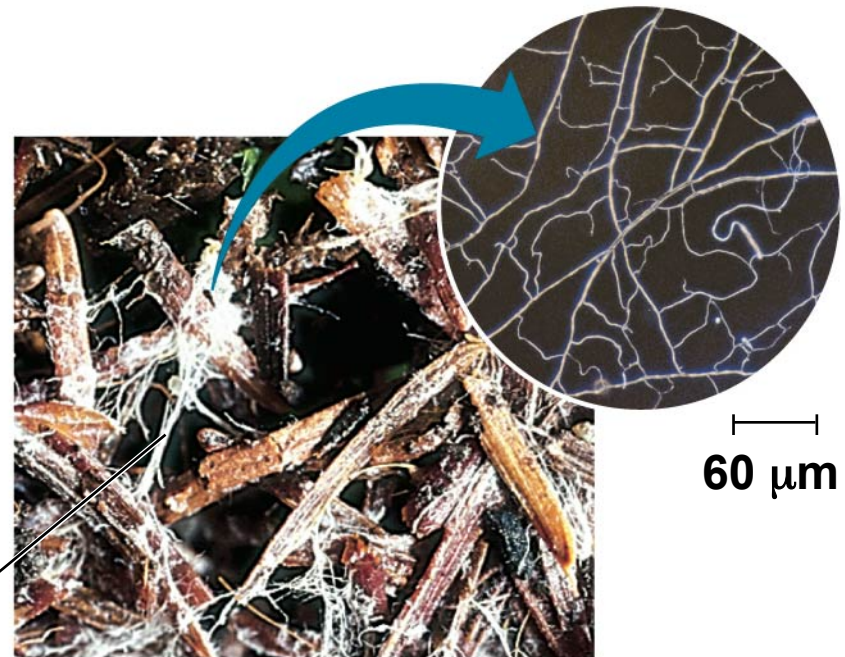
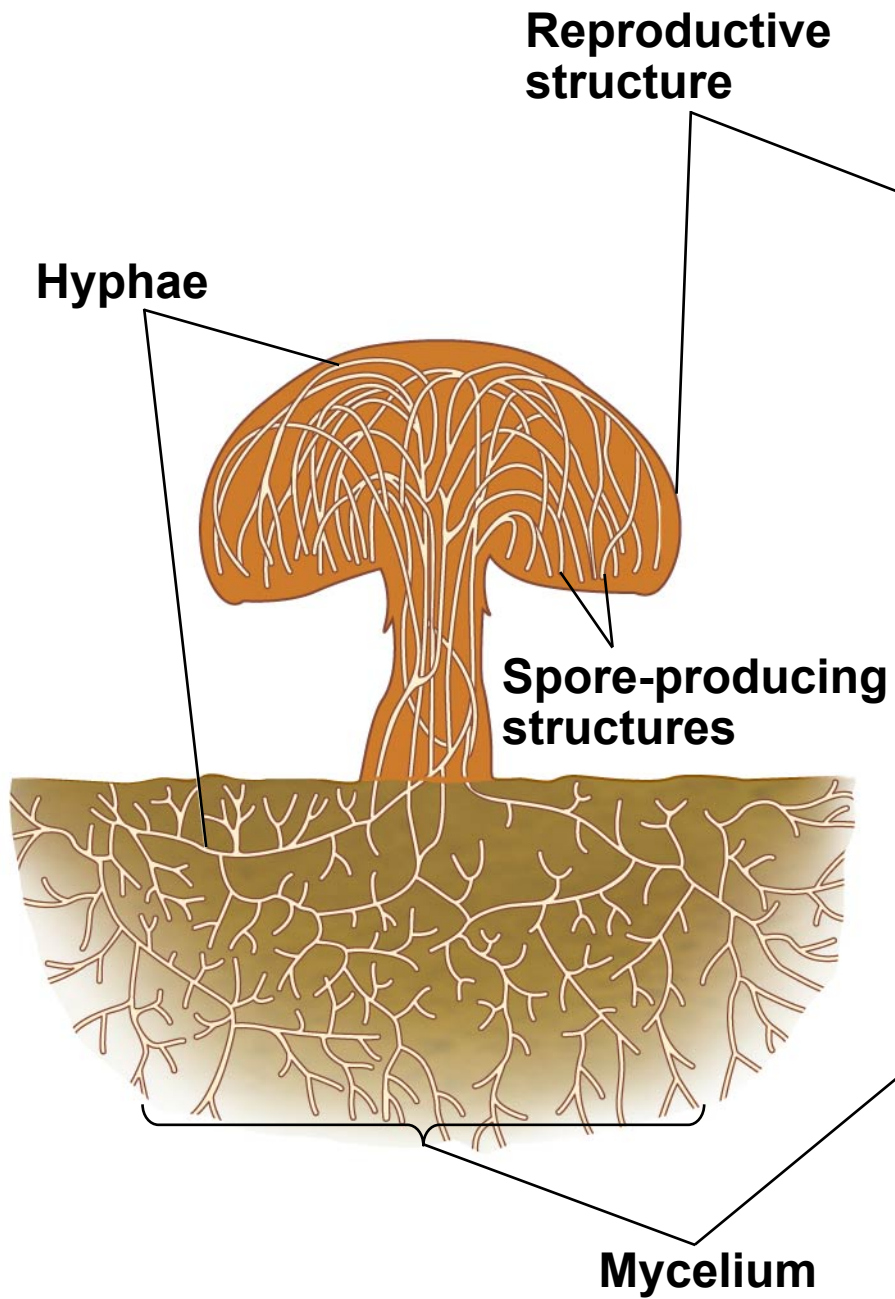


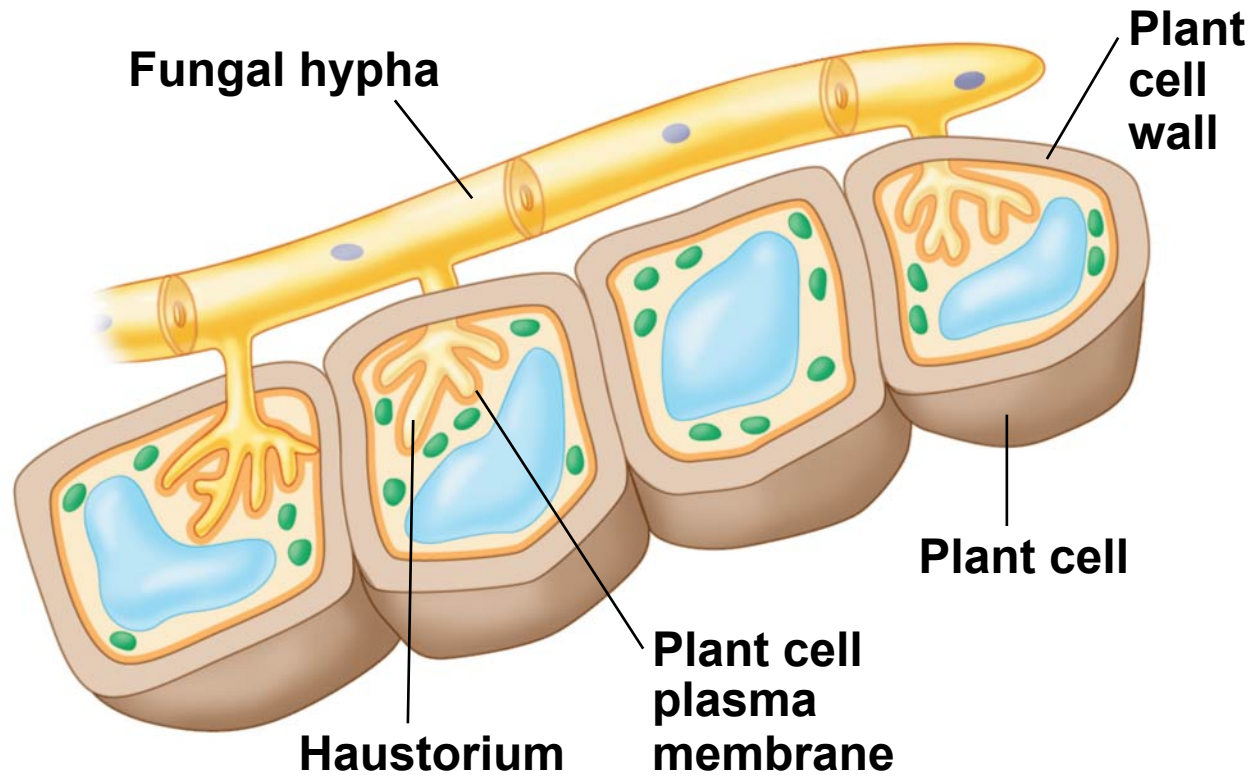
**Multicellular, dependent embryos**

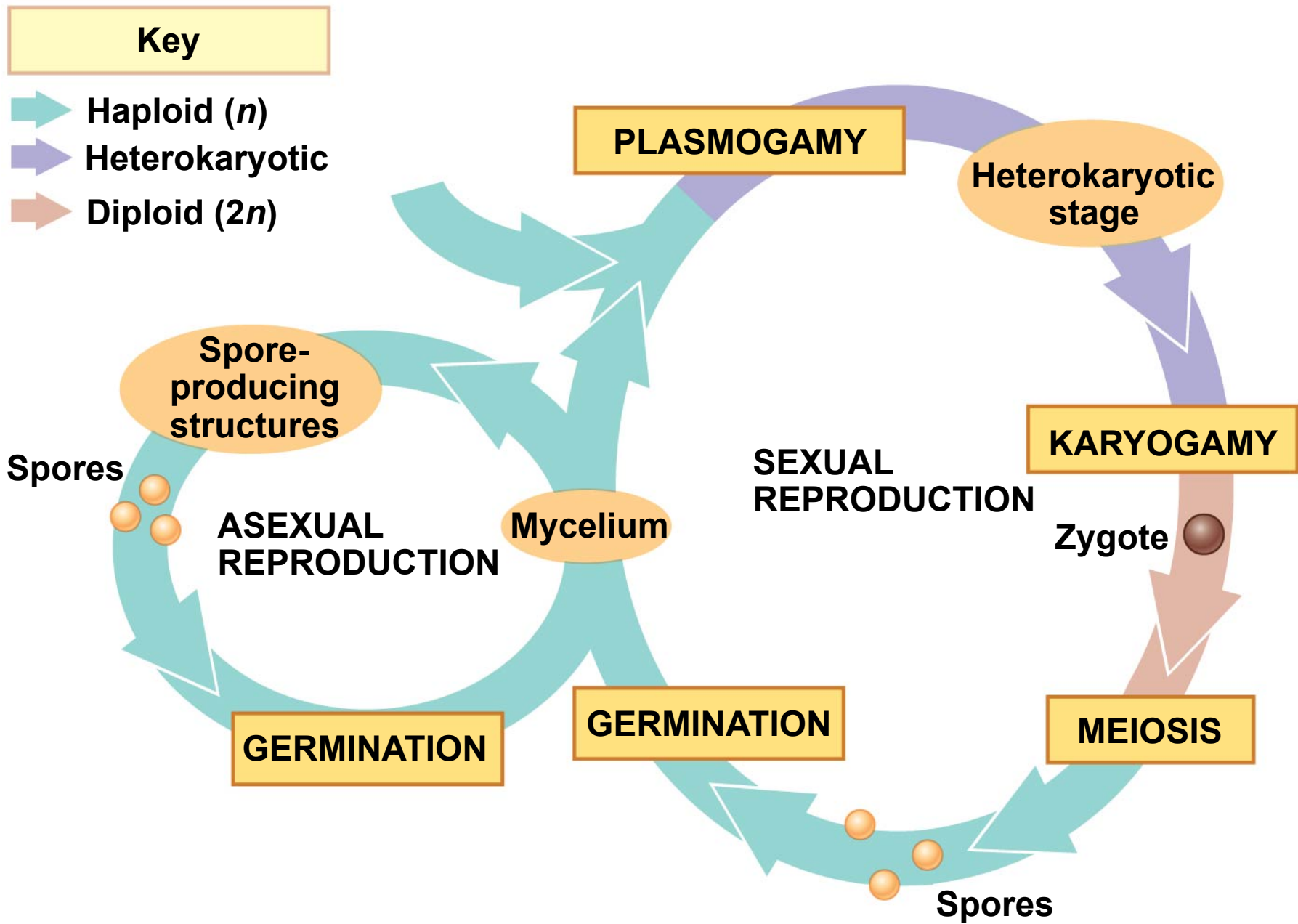




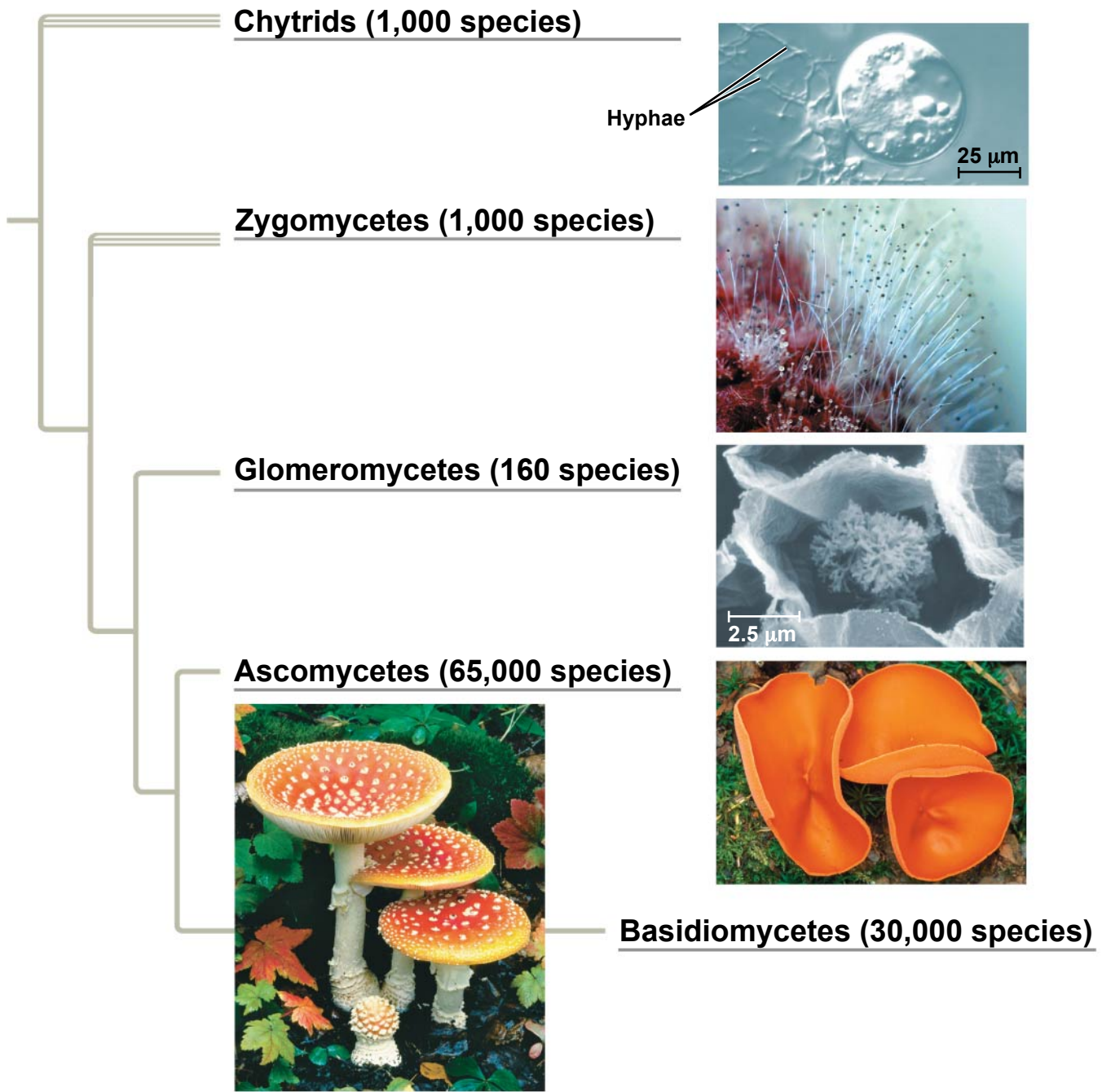


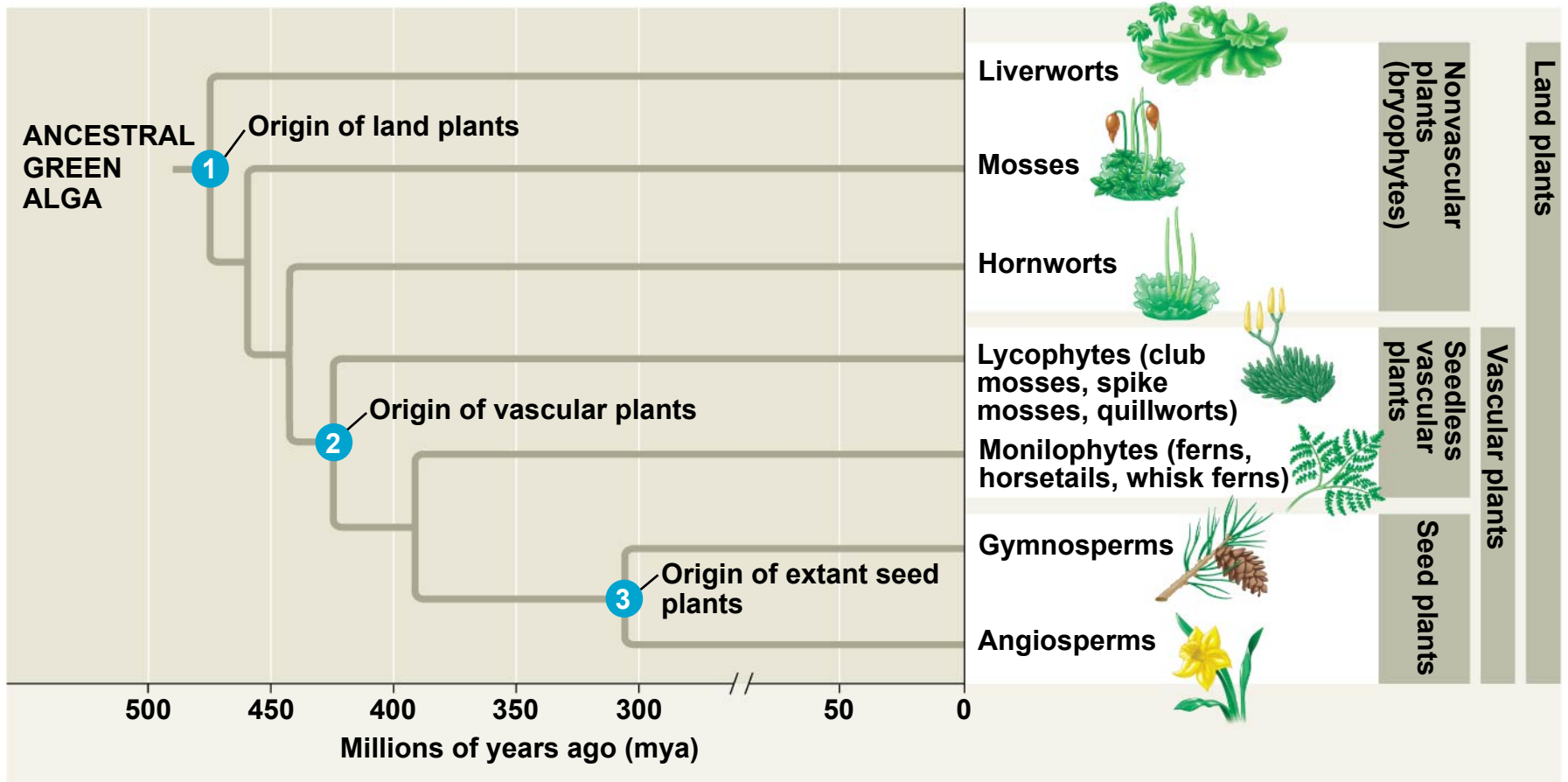














(a) *Plagiochila deltoidea*, a liverwort



Sporophyte

Gametophyte

(c) *Anthoceros* sp., a hornwort



Capsule

Seta

Gametophyte

Sporophyte  
(a sturdy  
plant that  
takes months  
to grow)

(b) *Polytrichum commune*, a moss

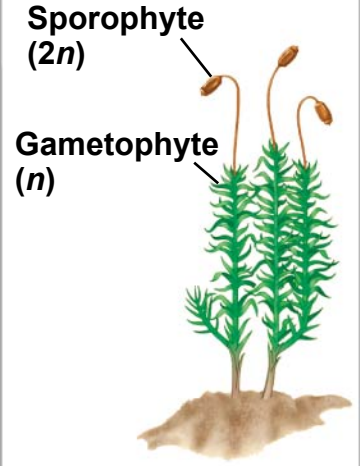

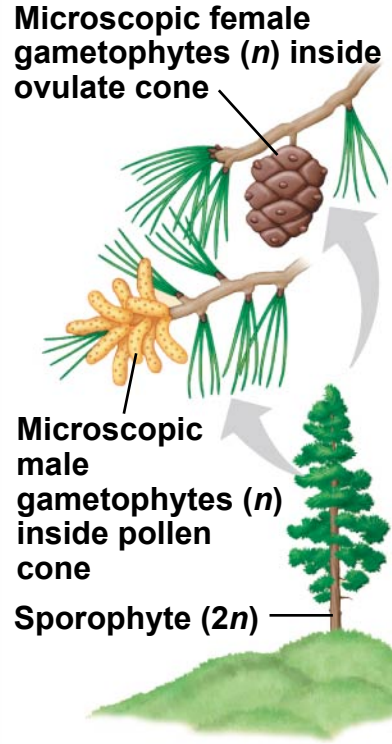
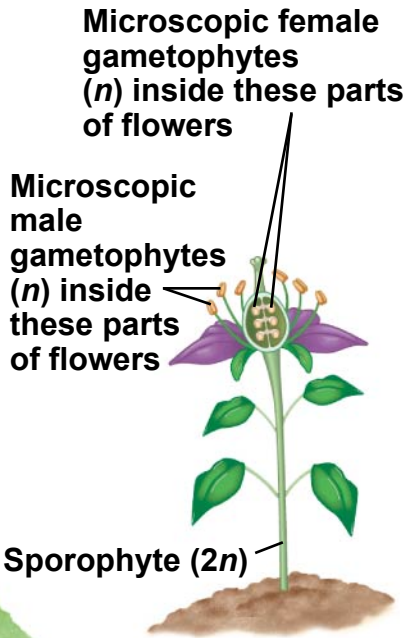
**Strobili  
(conelike  
structures  
in which  
spores are  
produced)**

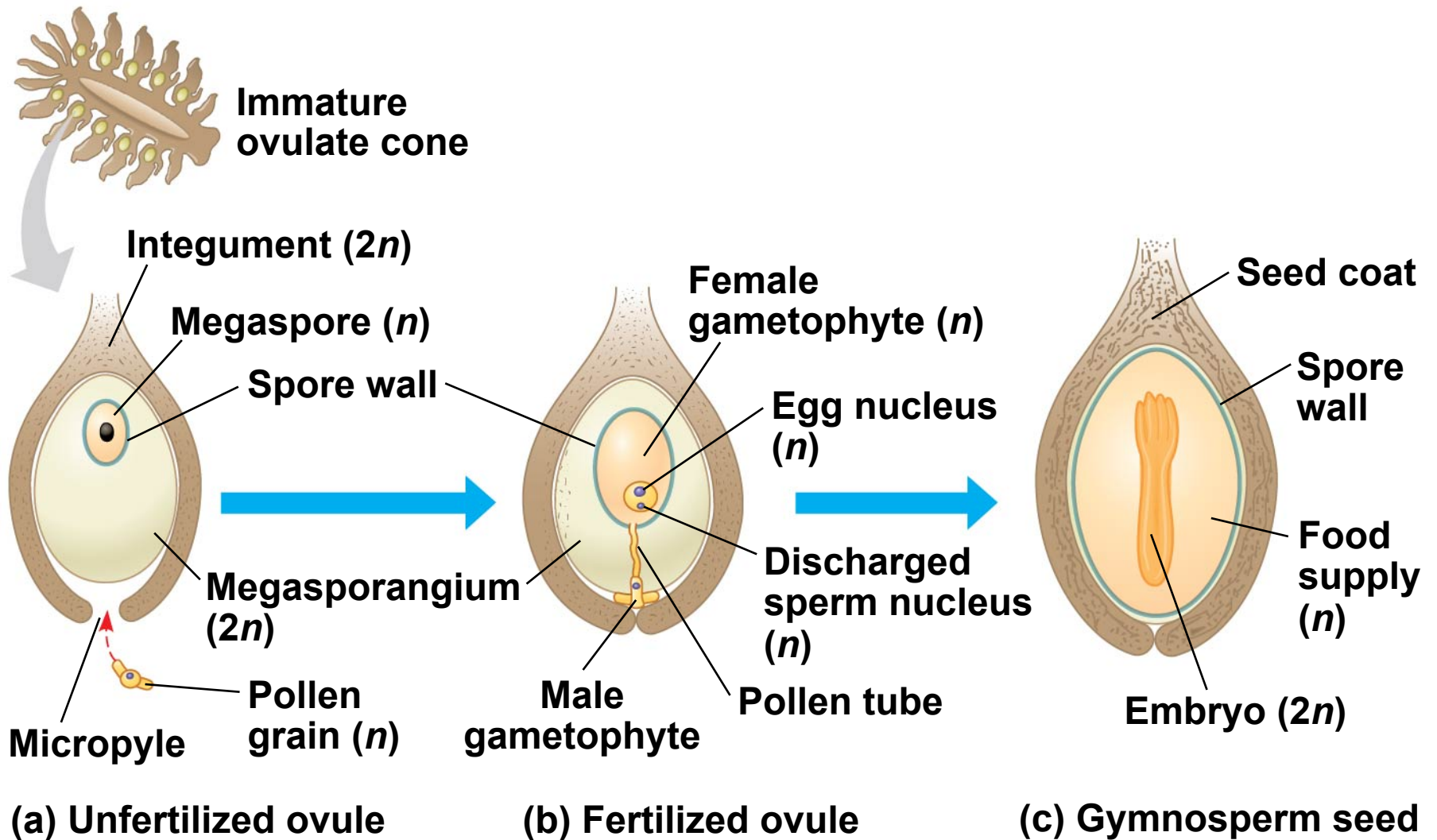


**(a) *Diphasiastrum tristachyum*, a lycophyte**



**(b) *Athyrium filix-femina*, a monilophyte**

		PLANT GROUP			
		Mosses and other nonvascular plants	Ferns and other seedless vascular plants	Seed plants (gymnosperms and angiosperms)	
Gametophyte	Dominant	Reduced, independent (photosynthetic and free-living)	Reduced (usually microscopic), dependent on surrounding sporophyte tissue for nutrition		
Sporophyte	Reduced, dependent on gametophyte for nutrition	Dominant	Dominant		
Example	 <p>Sporophyte (2n)</p> <p>Gametophyte (n)</p>	 <p>Sporophyte (2n)</p> <p>Gametophyte (n)</p>	<p><b>Gymnosperm</b></p>  <p>Microscopic female gametophytes (n) inside ovulate cone</p> <p>Microscopic male gametophytes (n) inside pollen cone</p> <p>Sporophyte (2n)</p>	<p><b>Angiosperm</b></p>  <p>Microscopic female gametophytes (n) inside these parts of flowers</p> <p>Microscopic male gametophytes (n) inside these parts of flowers</p> <p>Sporophyte (2n)</p>	





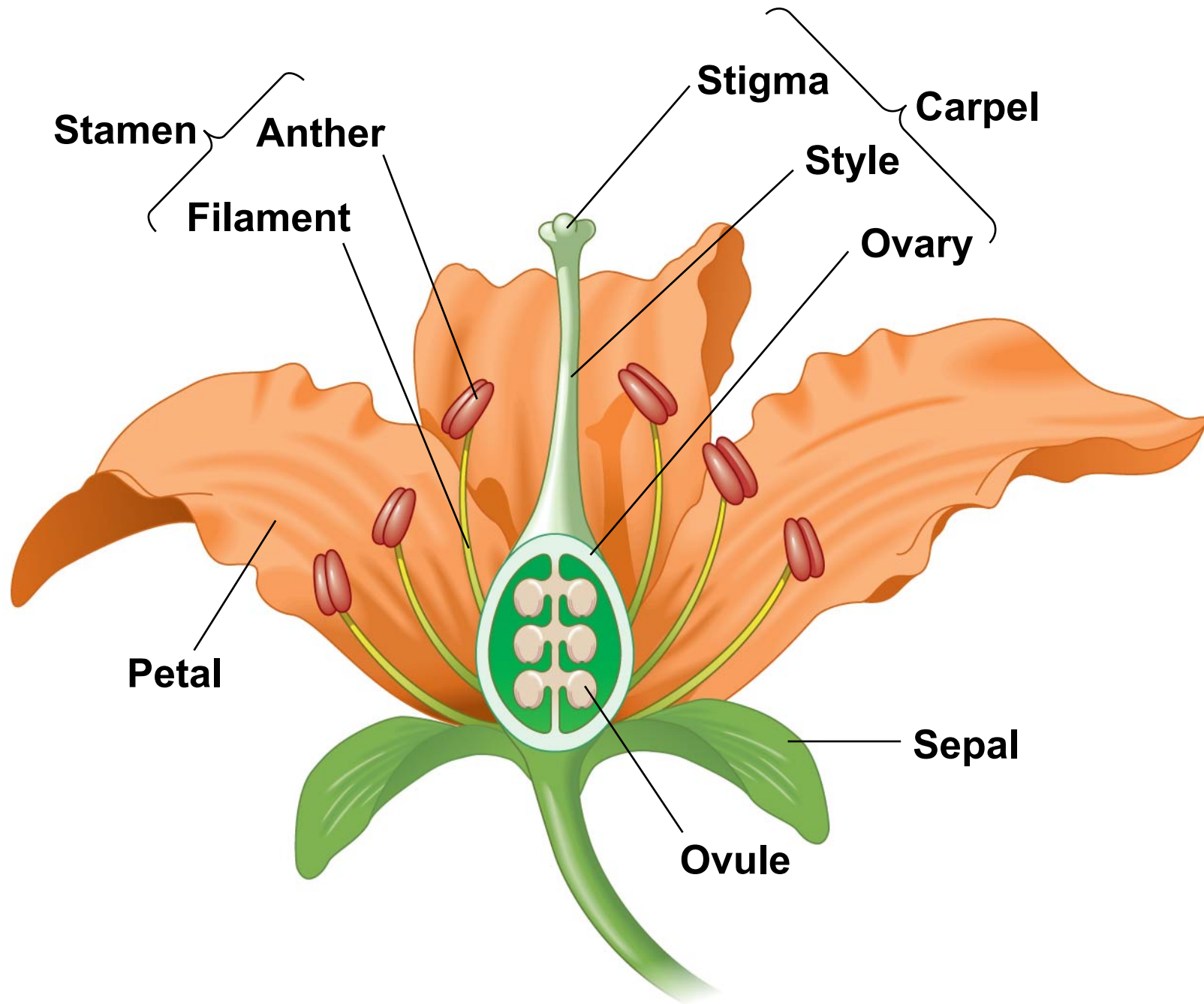
**(a) Sago palm (*Cycas revoluta*)**



**(b) Douglas fir (*Pseudotsuga menziesii*)**



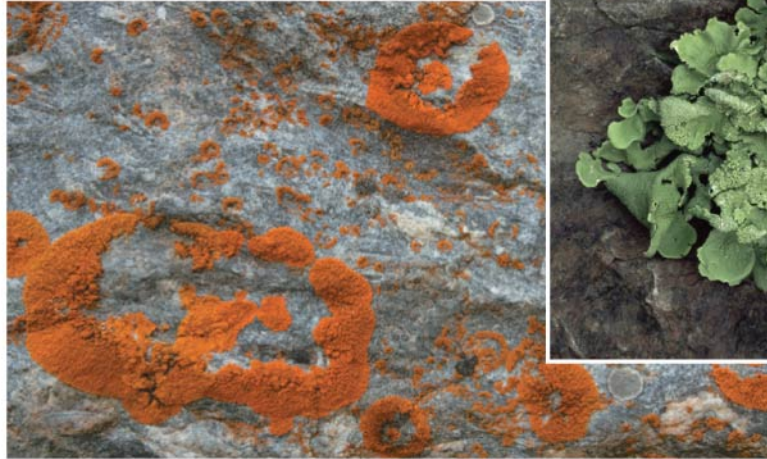
**(c) Creeping juniper (*Juniperus horizontalis*)**





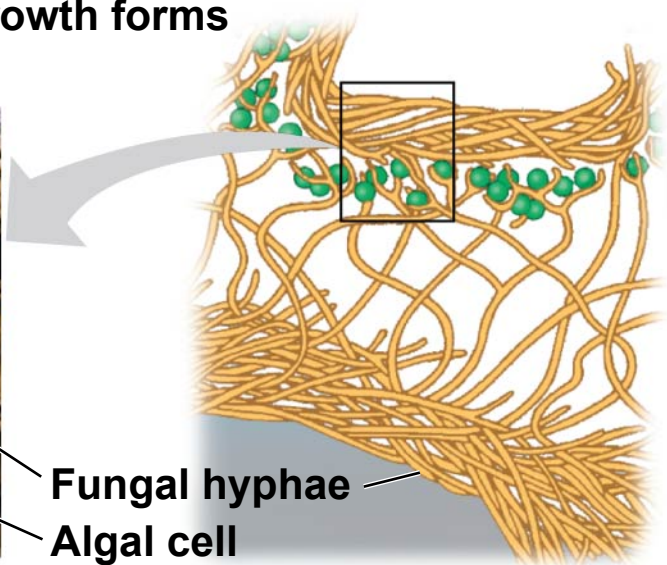
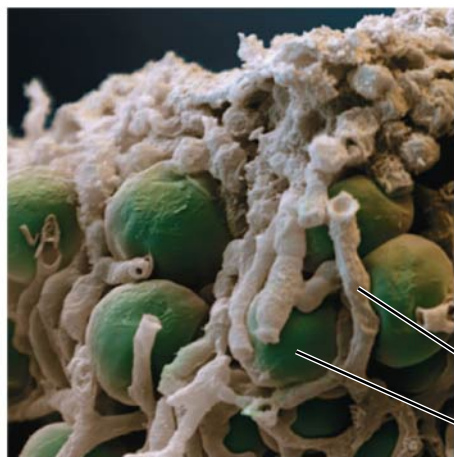
▼ A foliose (leaflike) lichen

▼ Crustose (encrusting) lichens



(a) Two common lichen growth forms

50  $\mu\text{m}$

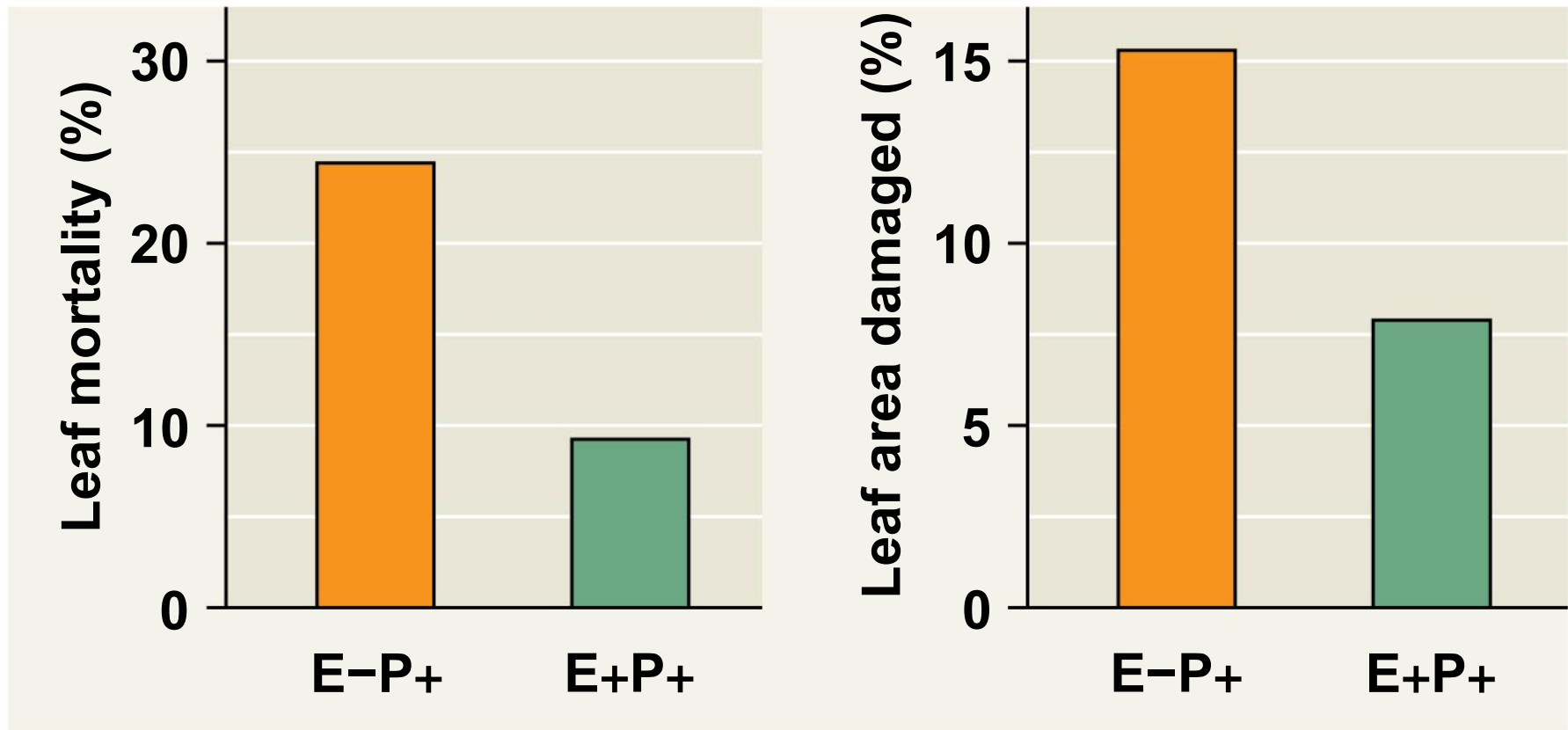


Fungal hyphae  
Algal cell

(b) Anatomy of a lichen involving an ascomycete fungus and an alga

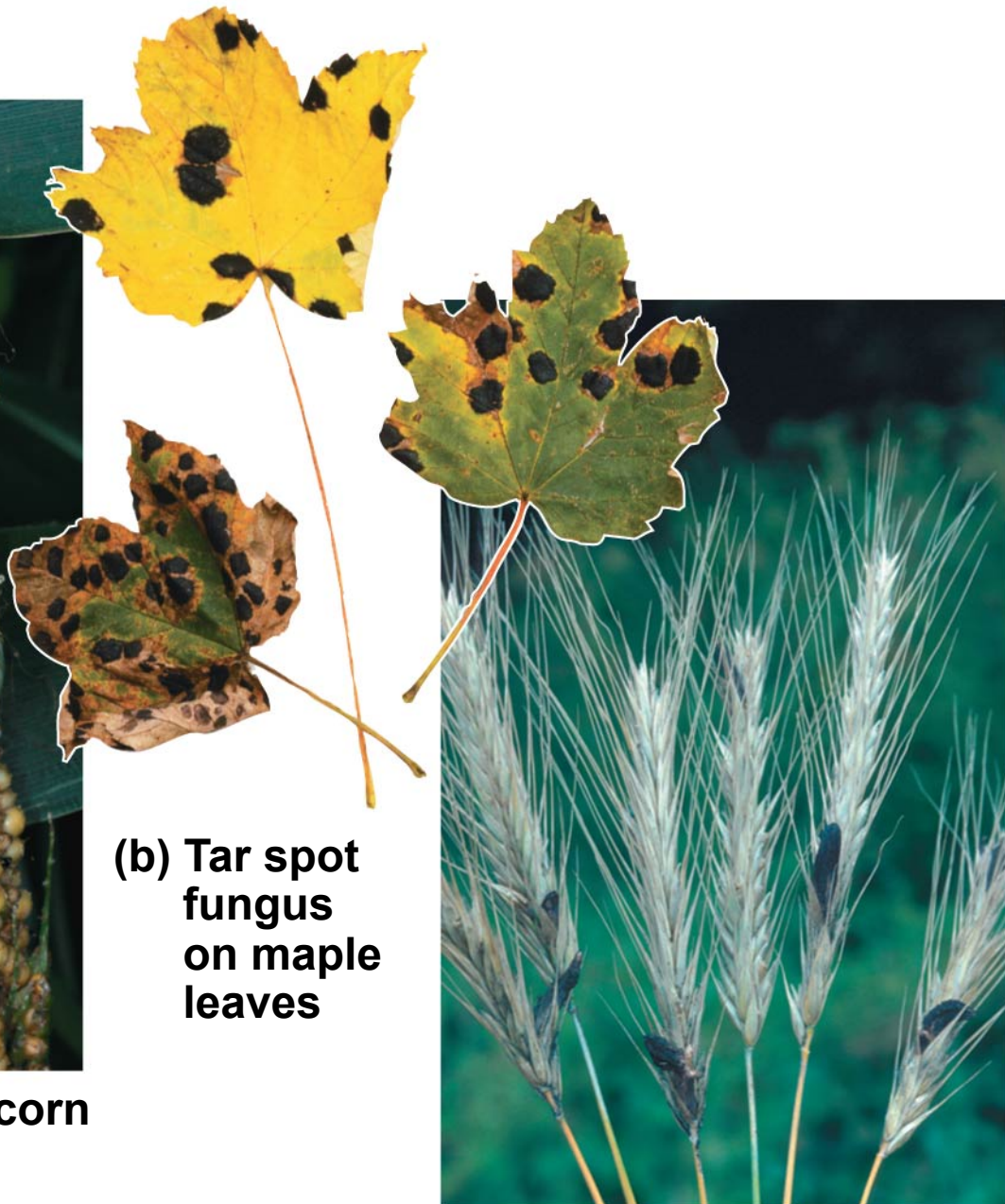
## Results

-  Endophyte not present; pathogen present (E-P+)
-  Both endophyte and pathogen present (E+P+)





**(a) Corn smut on corn**

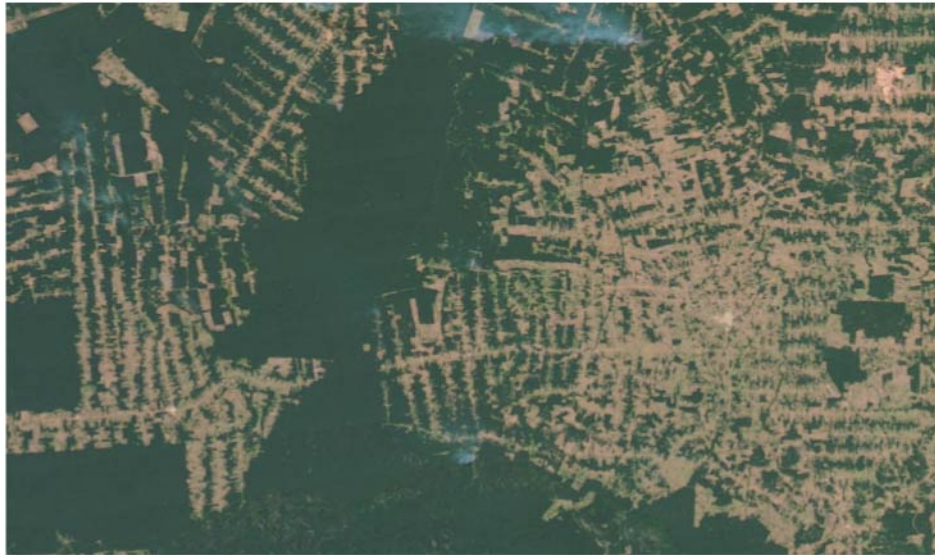


**(b) Tar spot  
fungus  
on maple  
leaves**

**(c) Ergots on rye**



**(a) A satellite image from 2000 shows clear-cut areas in Brazil (brown) surrounded by dense tropical forest (green).**



**(b) By 2009, much more of this same tropical forest had been cut down.**

4 km



**Bilateral symmetry**



**Radial symmetry**

