



# **INTRODUCTION TO BRYOPHYTES**

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- **HORNWORTS**
- **LIVERWORTS**
- **MOSSES**



**HORNWORTS**

**LIVERWORTS**





**MOSSES**

# STREPTOPHYTE EVOLUTION

## origin of embryophytes



(Charophyceae)



Anthocerotophyta



Polysporangiophyta

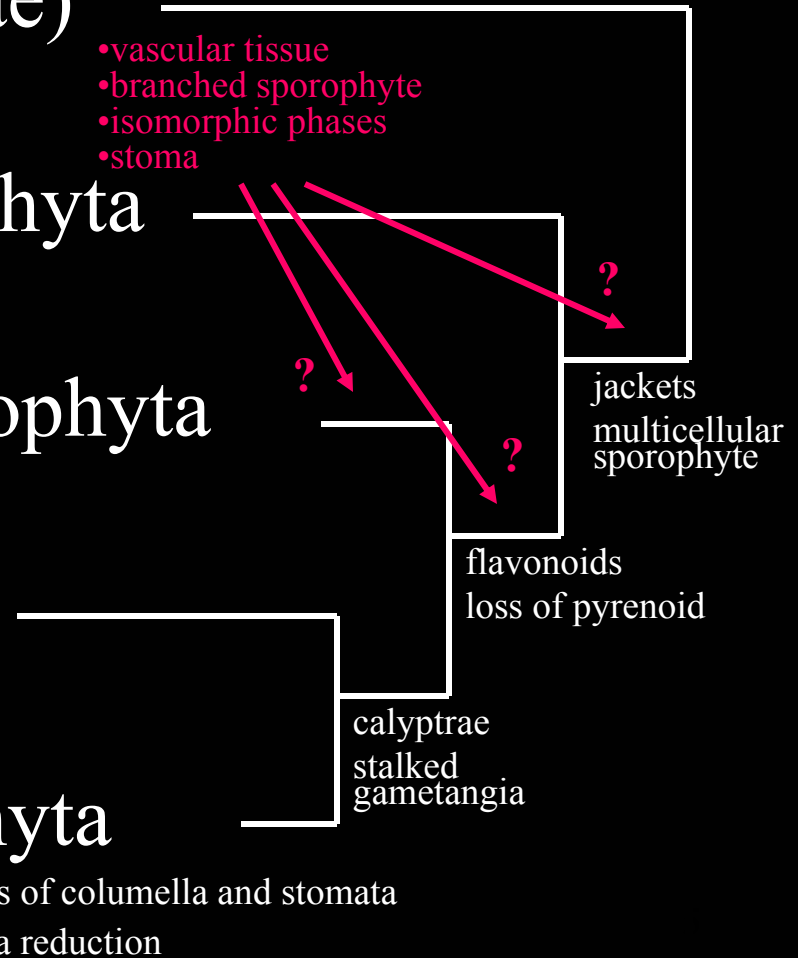


Bryophyta

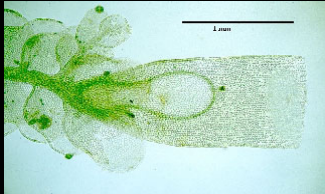
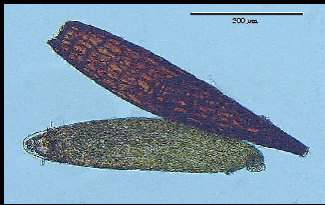
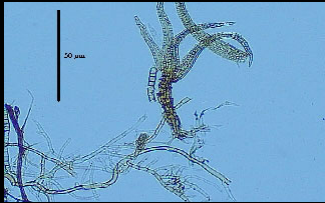


Marchantiophyta

- vascular tissue
- branched sporophyte
- isomorphic phases
- stoma



# The Life Cycle of Bryophytes



- bryophytes are diplohaplontic plants with a heteromorphic alternation of generations
- within the sporangium spores are formed by meiosis
- protonema and gametophores develop after germination
- antheridia and archegonia produce sperm and eggs
- after fertilization a new, attached sporophyte is formed

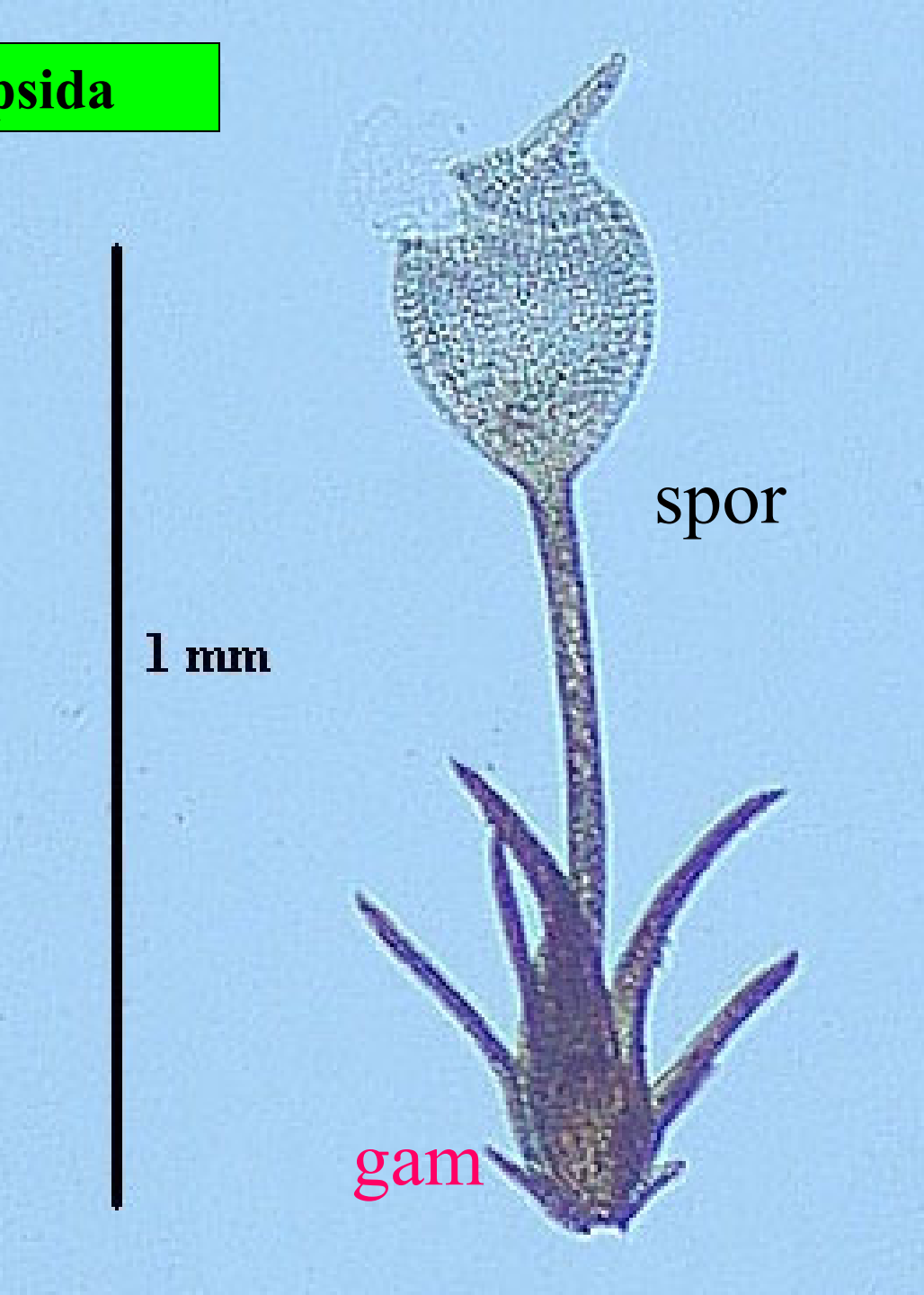
**Anthocerotopsida**

spor

gam



**Bryopsida**



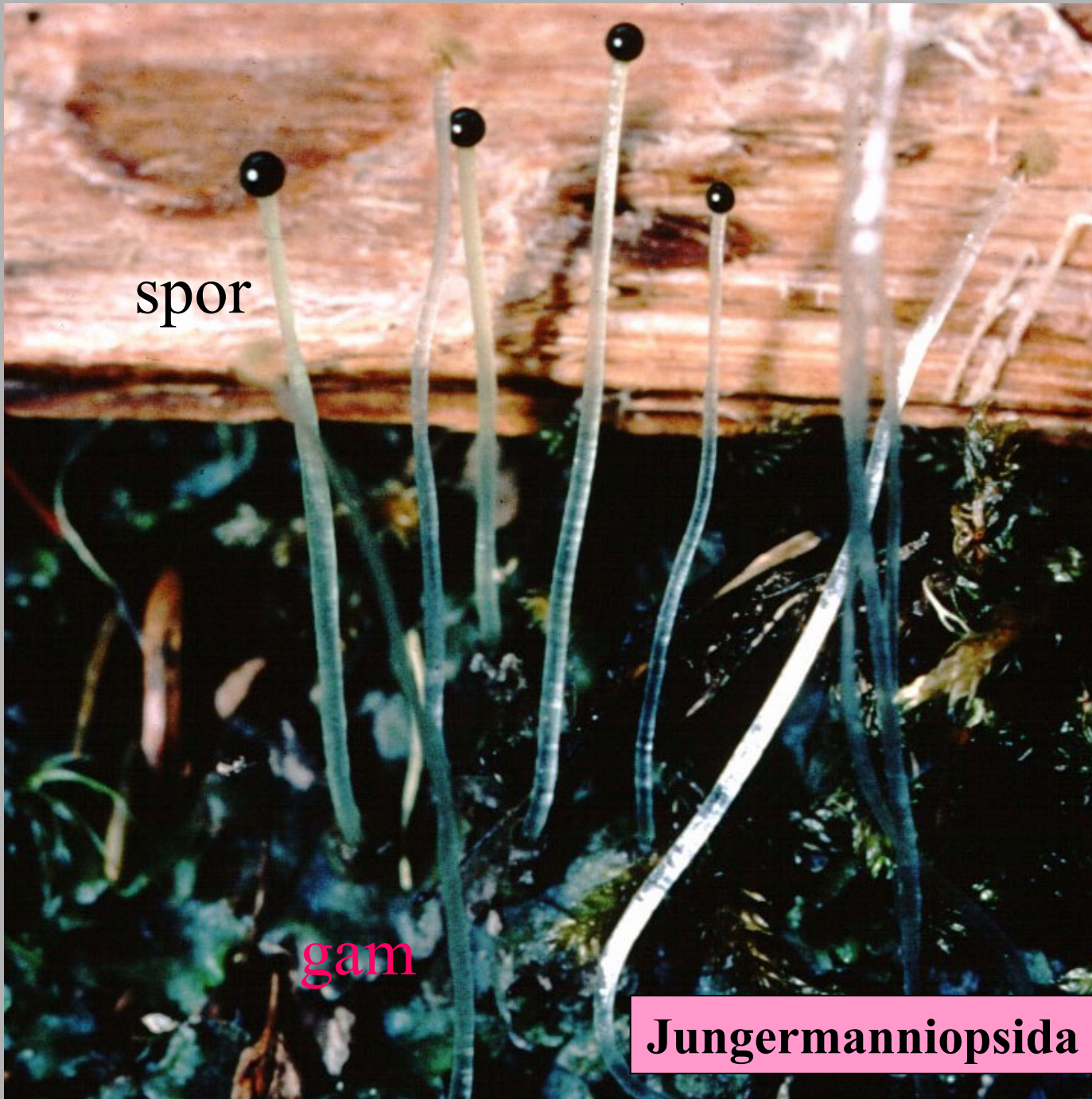


# Sphagnopsida



spor

gam



spor

gam

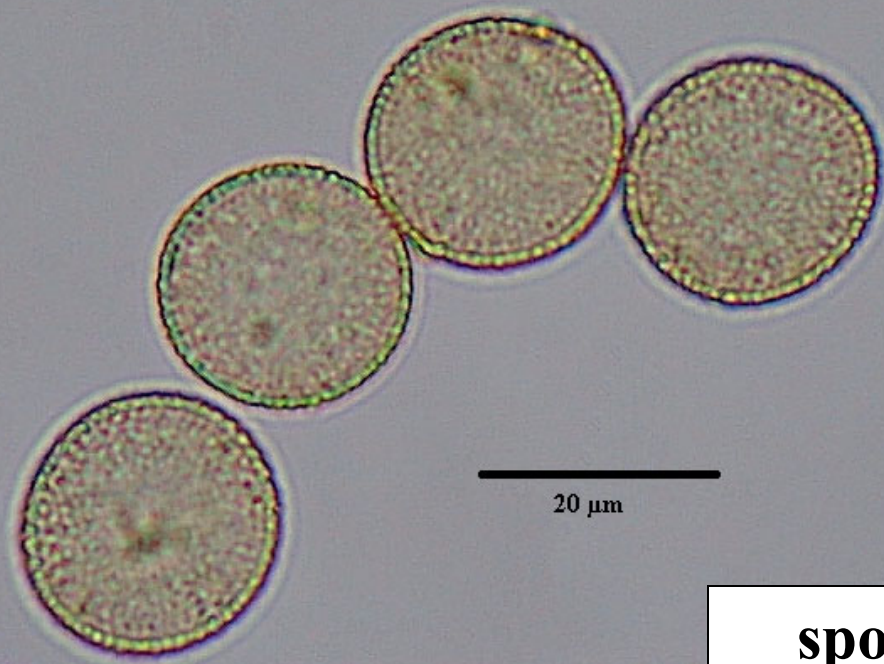
Jungermanniopsida

# Marchantiopsida

spor

gam





20  $\mu\text{m}$

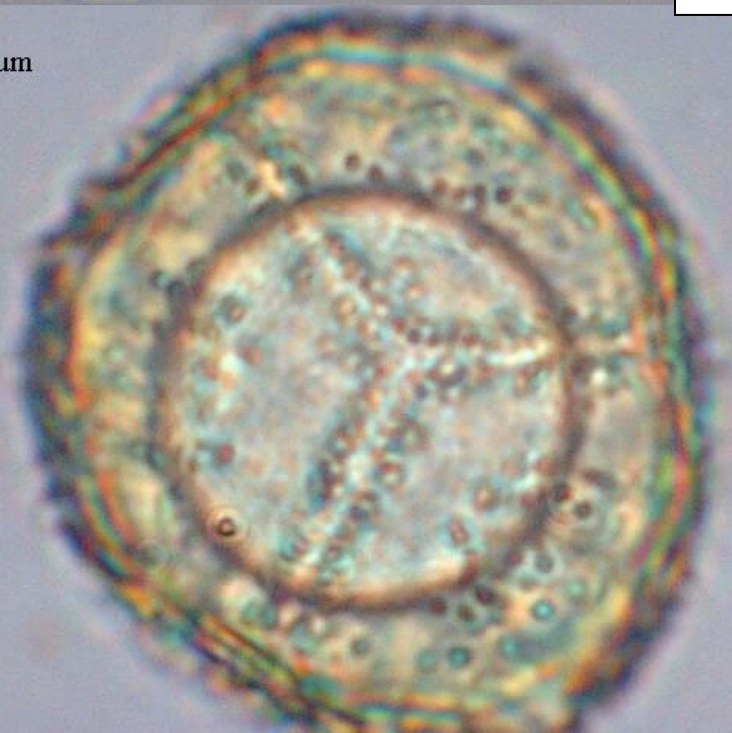
20  $\mu\text{m}$

spores



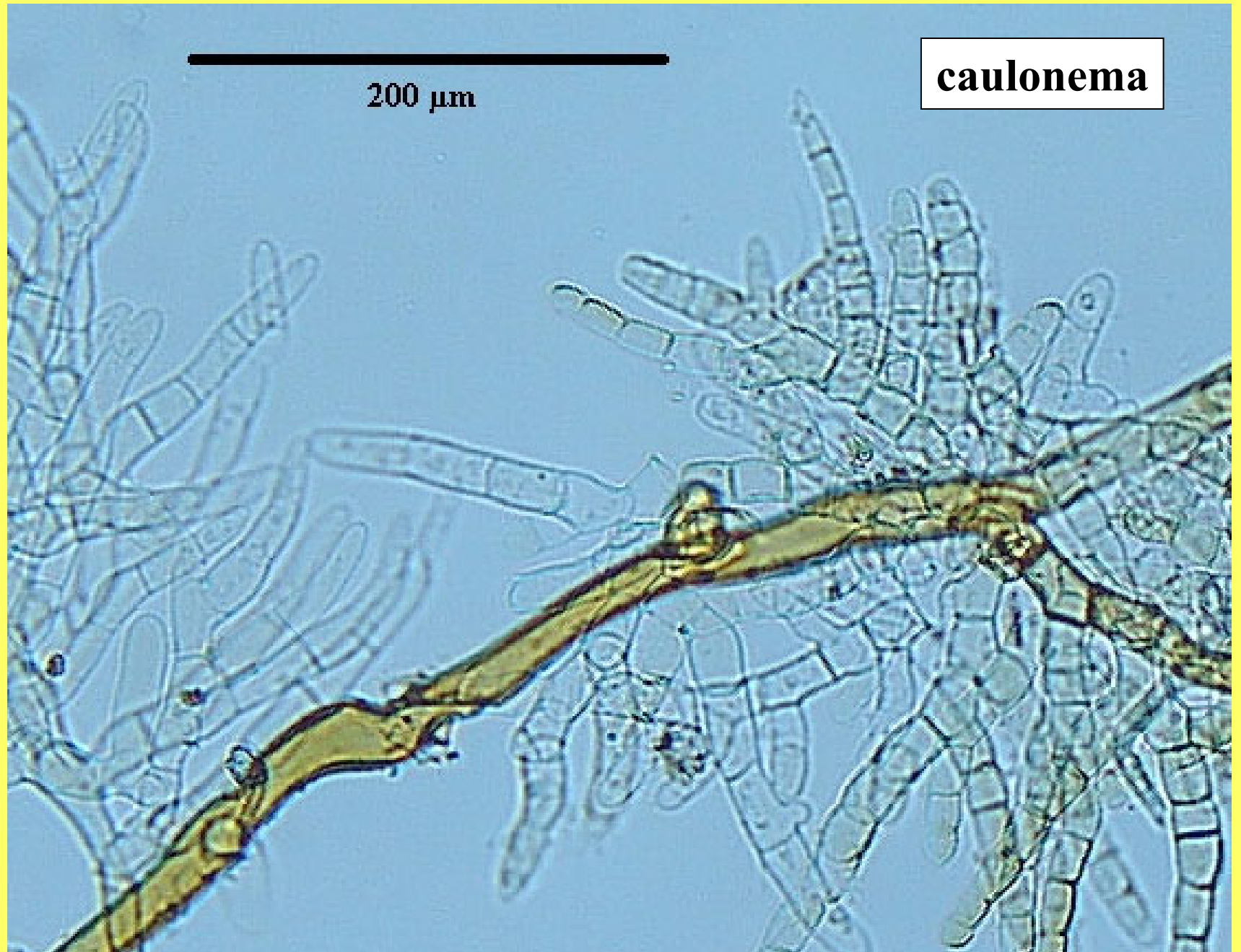
20  $\mu\text{m}$

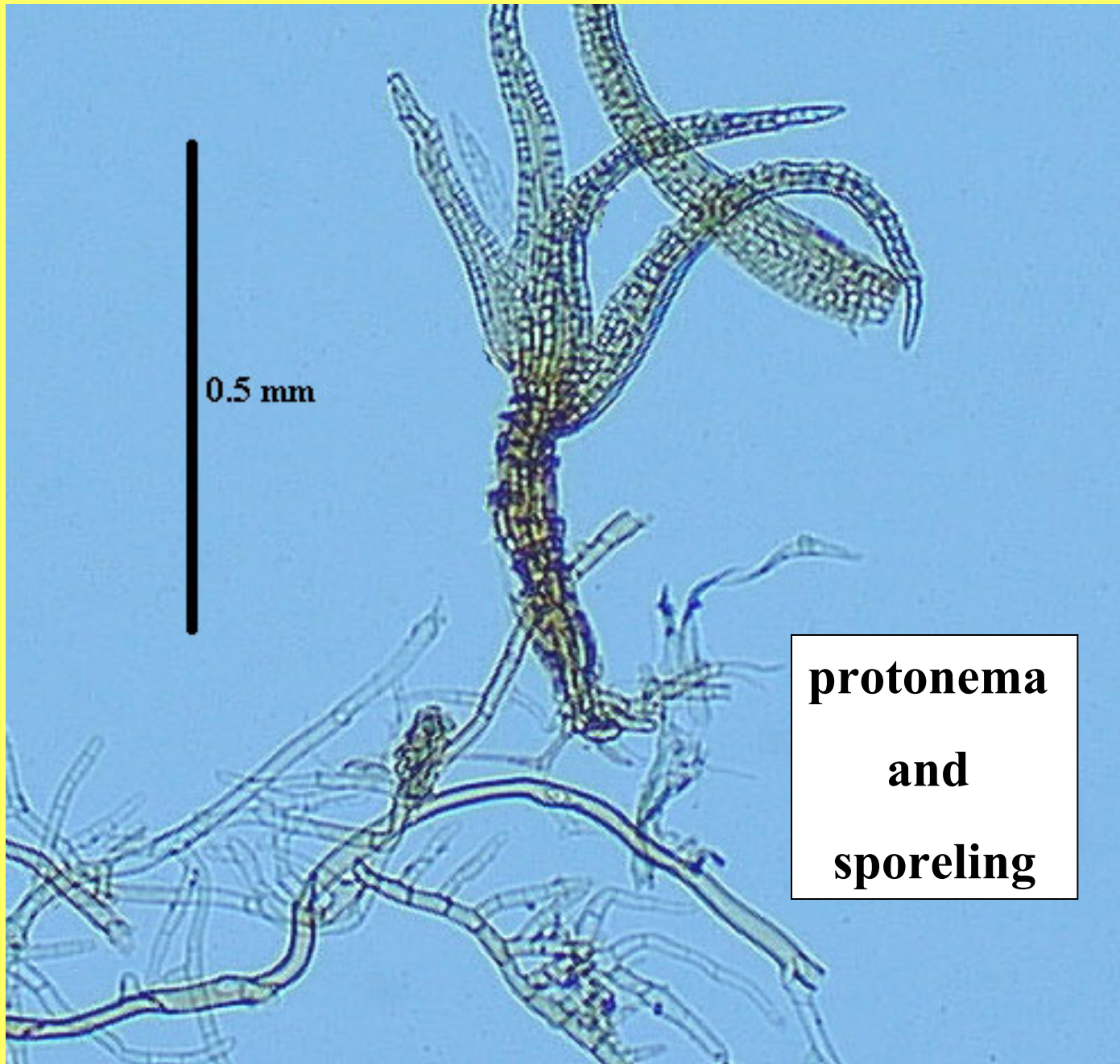
20  $\mu\text{m}$



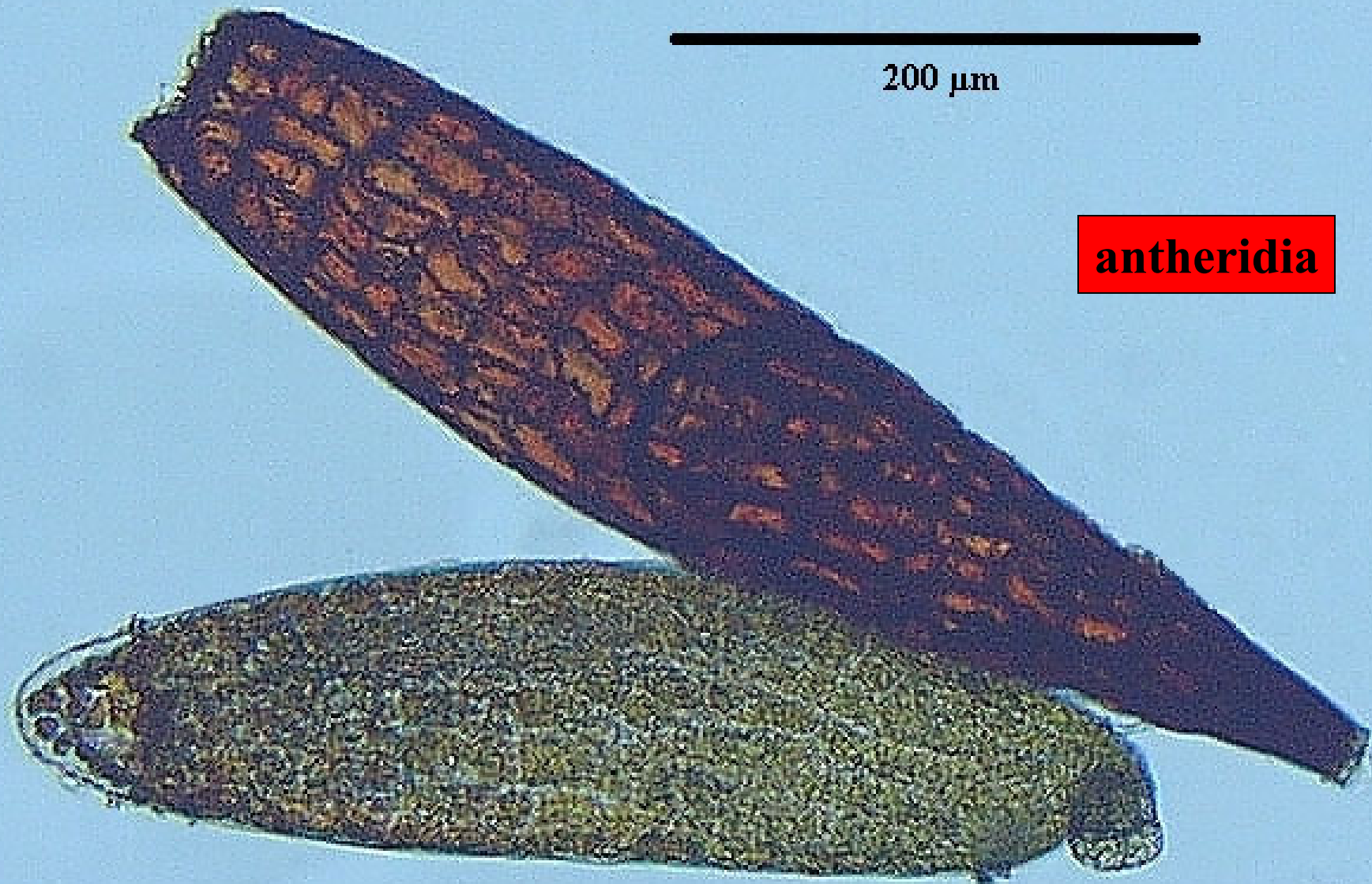
200  $\mu\text{m}$

caulonema





**protonema  
and  
sporeling**



200  $\mu\text{m}$

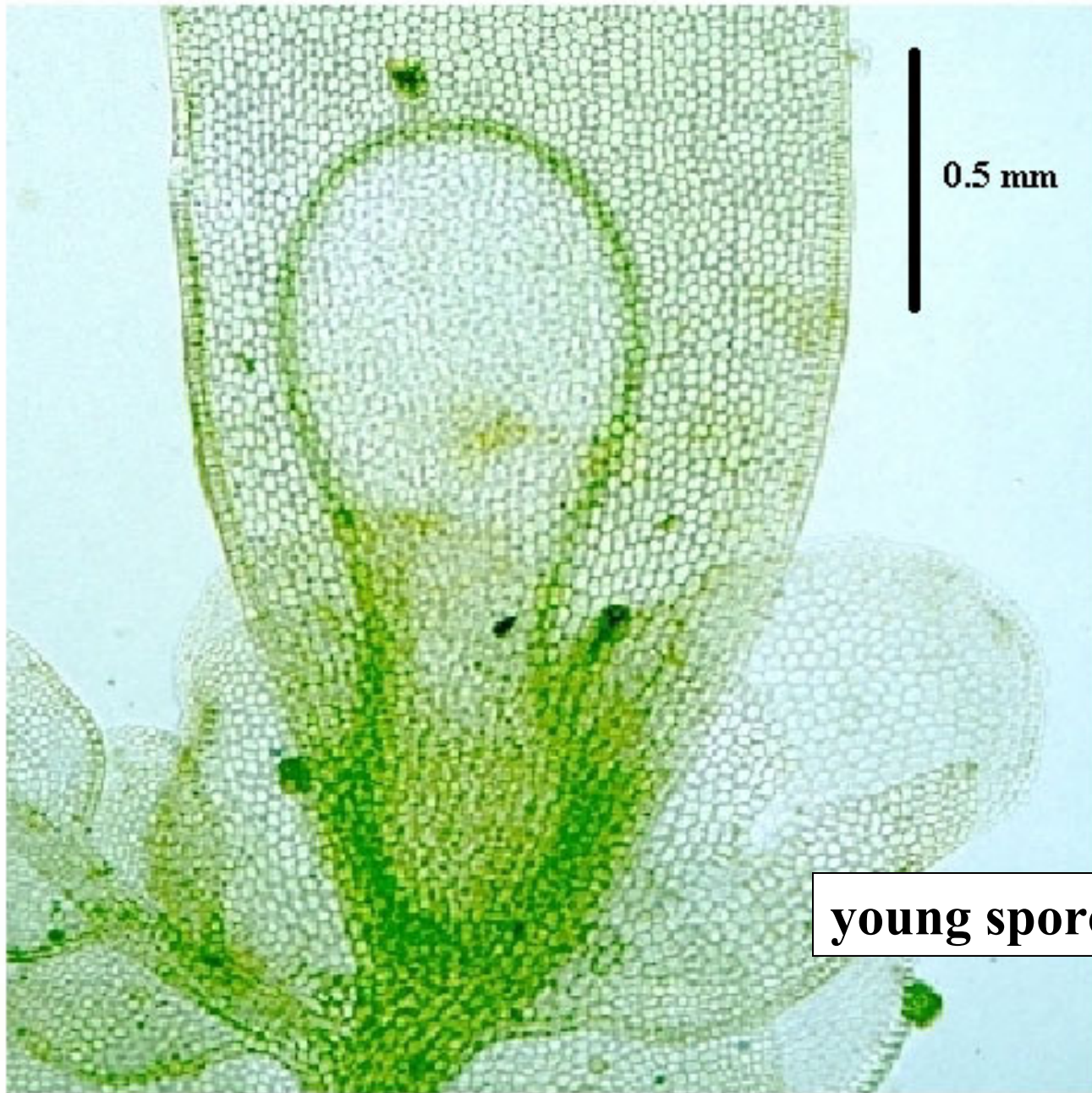
**antheridia**

200  $\mu\text{m}$



archegonia





**young sporophyte**



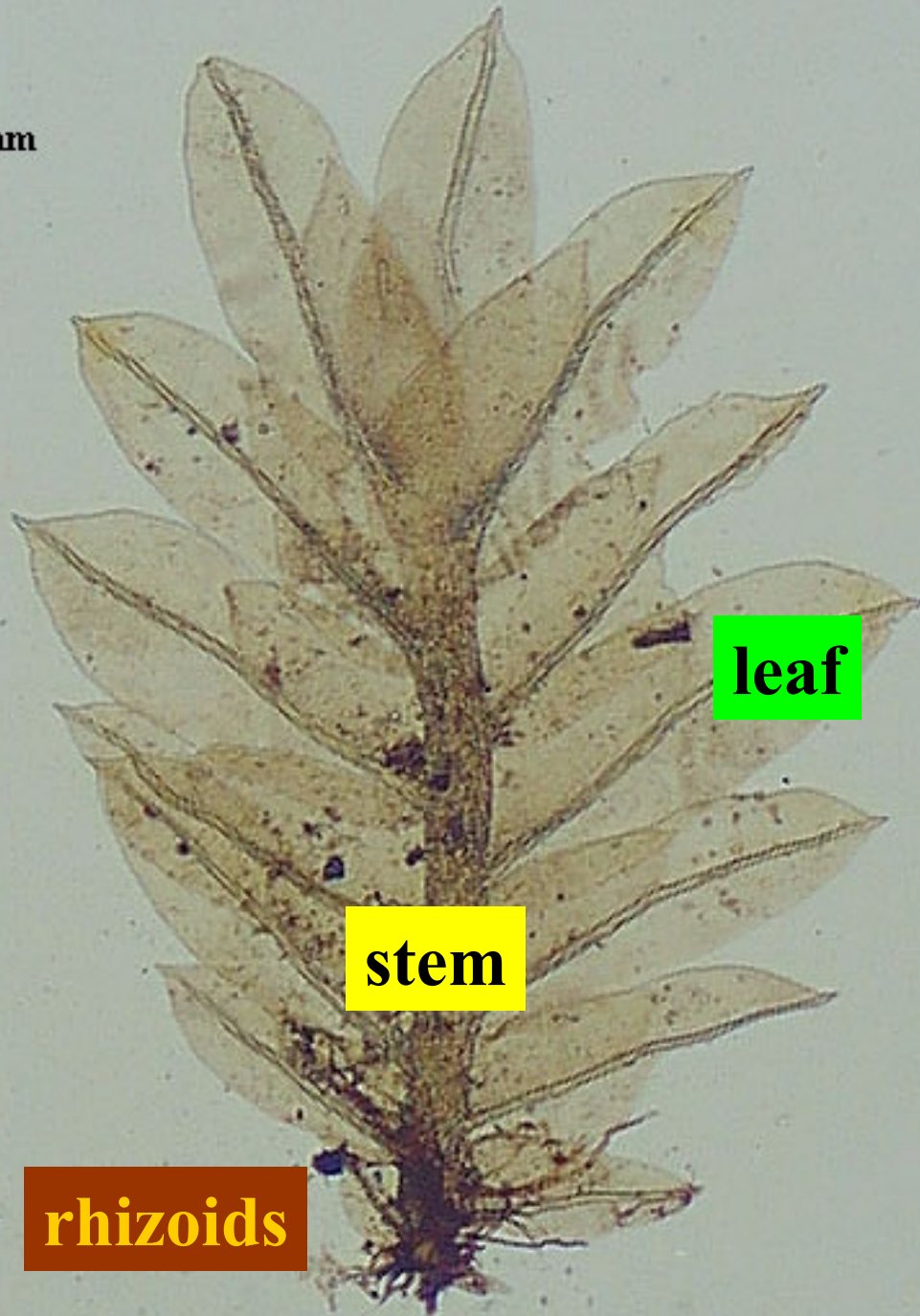
**sporophytes**

2 mm

leaf

stem

rhizoids



500  $\mu\text{m}$

apiculus

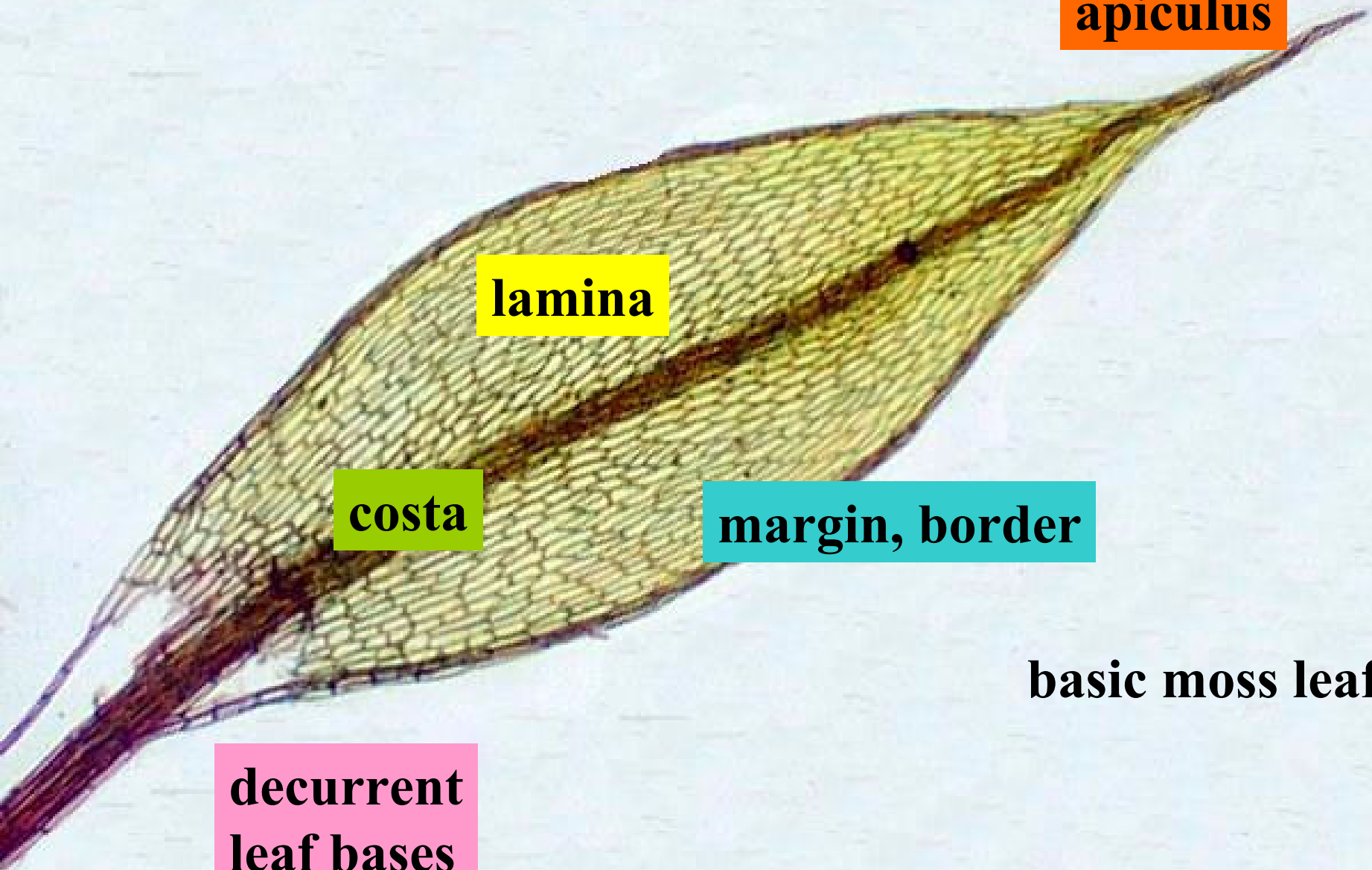
lamina

costa

margin, border

basic moss leaf

decurent  
leaf bases



# The End



