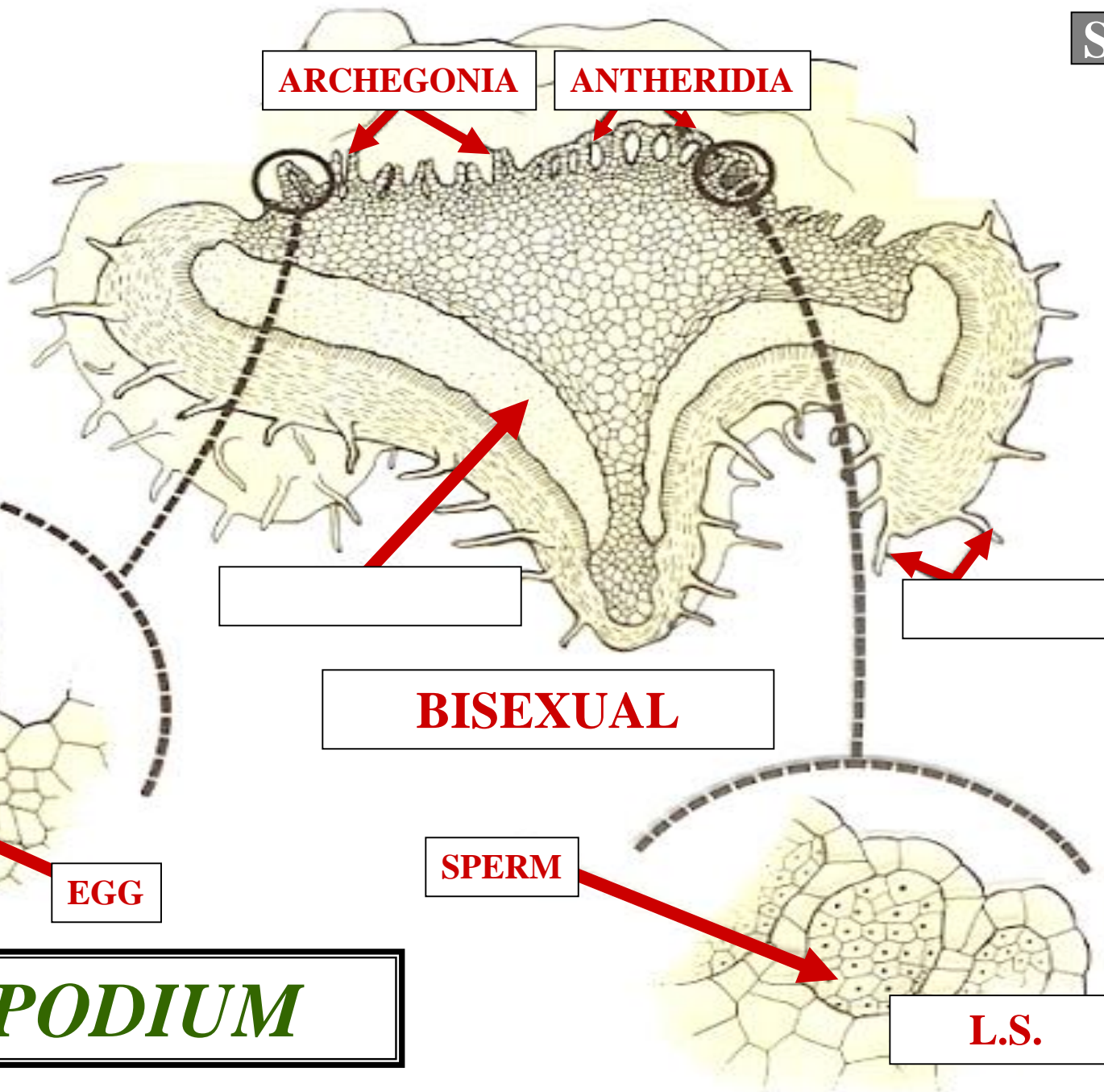


***LYCOPODIUM***



ARCHEGONIA

ANTHERIDIA

[Empty box]

[Empty box]

BISEXUAL

EGG

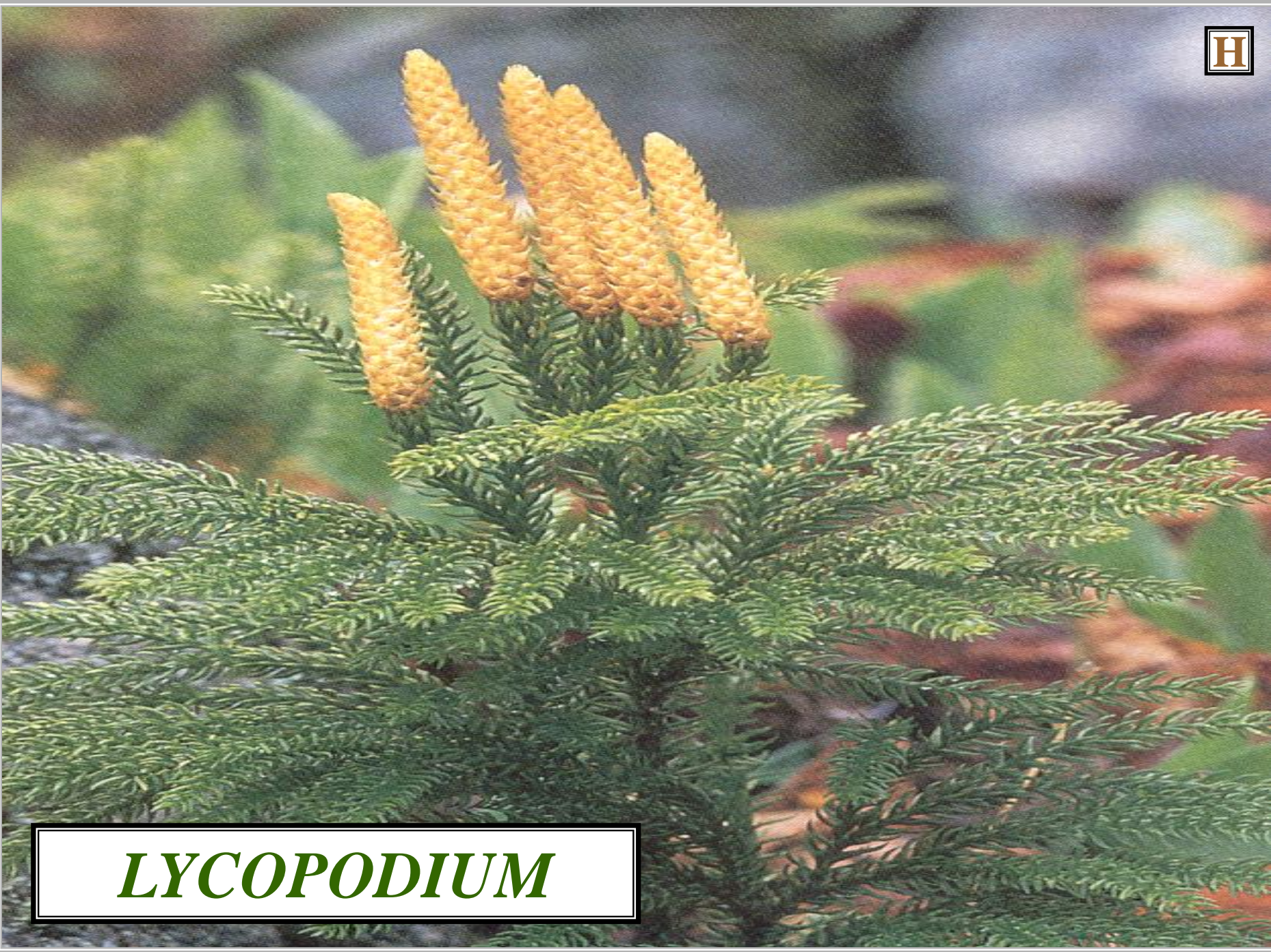
SPERM

L.S.

**LYCOPODIUM**



# **HOMOSPOROUS SUMMARY**



***LYCOPODIUM***

**HOMOSPOROUS**

***LYCOPODIUM***

**ISOSPORES**

***LYCOPODIUM***

**EXOSPORIC GAMETOPHYTE**

***LYCOPODIUM***



**BISEXUAL GAMETOPHYTE**

***LYCOPODIUM***



# HETEROSPOROUS

**HETEROSPOROUS**



**HETEROSPOROUS**

**2 SPORANGIA FORMS**

**HETEROSPOROUS**

**HETEROSPOROUS**



**2 SPORANGIA FORMS**

**---**

**2 SPORE FORMS**

**HETEROSPOROUS**

S

?



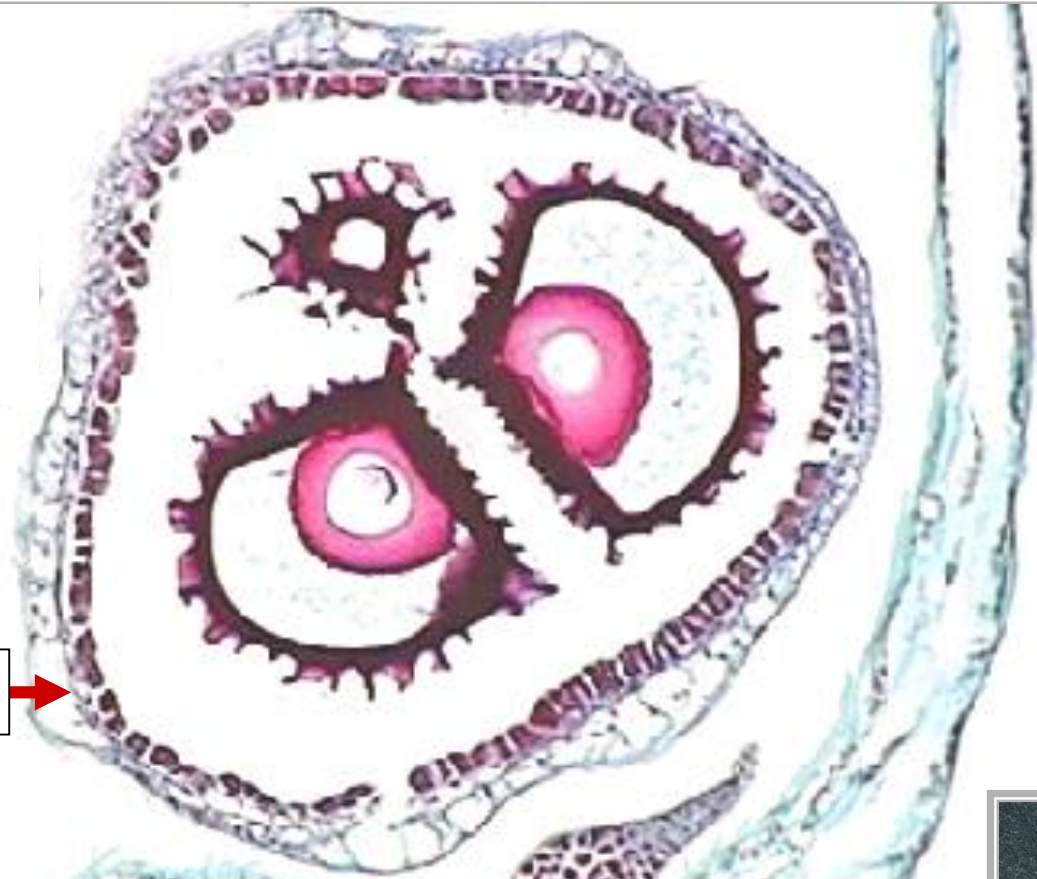


**STROBILUS**

***SELAGINELLA***



M



?



**STROBILUS**

***SELAGINELLA***

**L.S.**

M



**MEGASPORANGIUM** →



**STROBILUS**

***SELAGINELLA***

**L.S.**

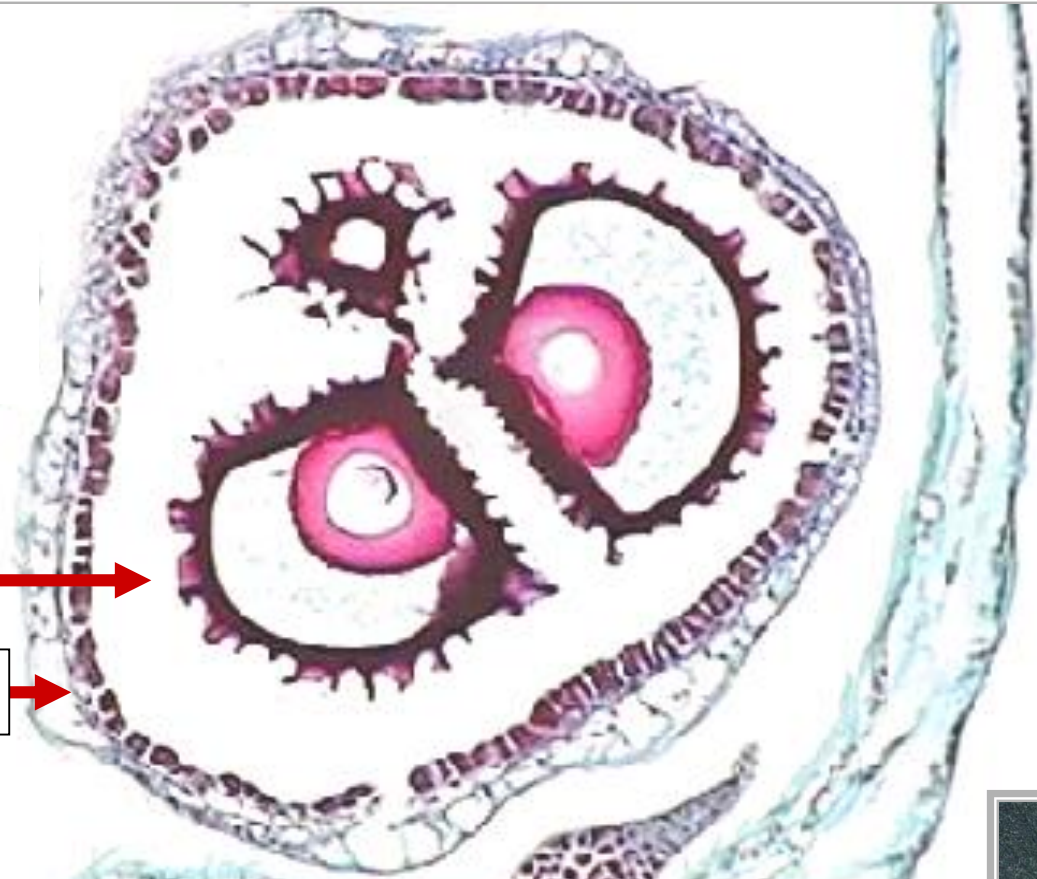




**MEGASPORES**



**MEGASPORANGIUM**



^  
M



**STROBILUS**

***SELAGINELLA***

**L.S.**

**MEGASPORE**

**MEGASPORE**

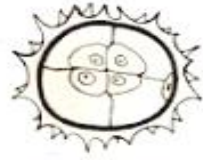
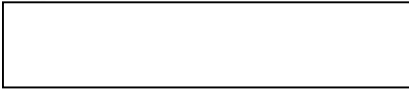


**FEMALE SPORE**

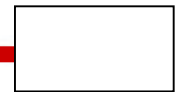
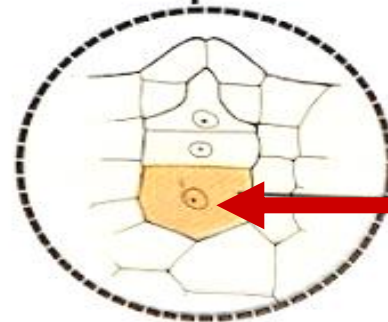
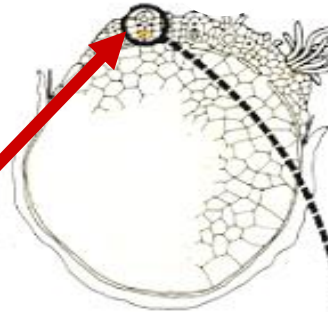
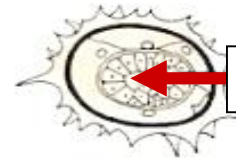
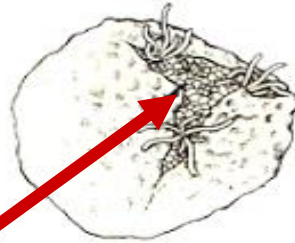
**MEGASPORE**

# SELAGINELLA

M

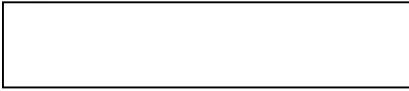


**MEGASPORE**

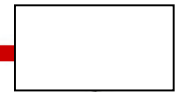
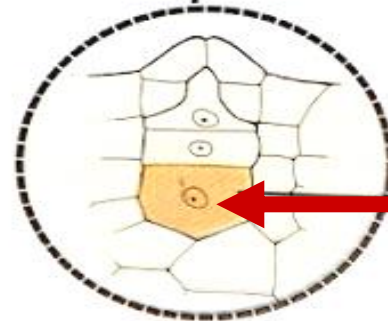
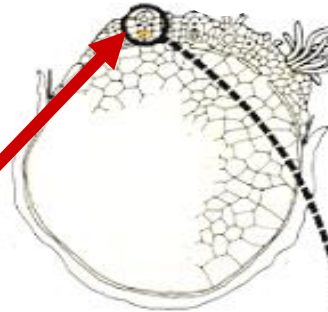
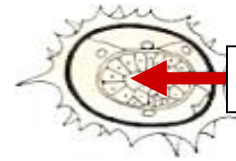
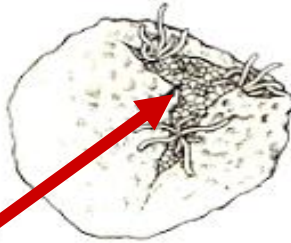


# SELAGINELLA

M

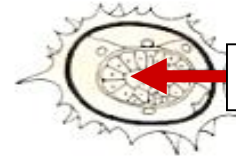


MITOSIS

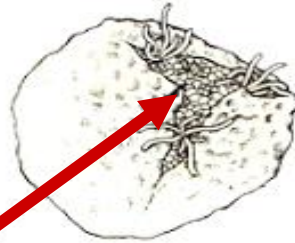


# SELAGINELLA

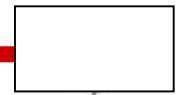
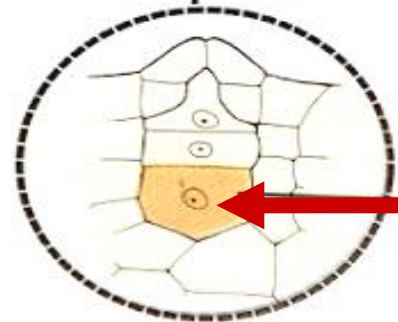
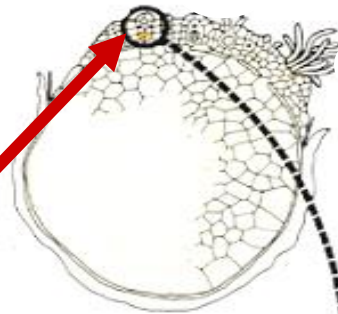
AR



MEGASPORE

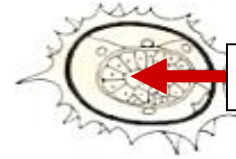
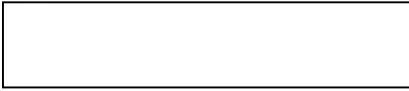


MEGAGAMETOPHYTE

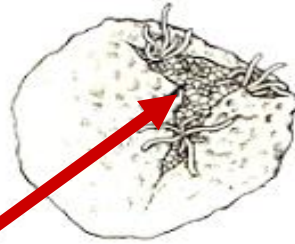


# SELAGINELLA

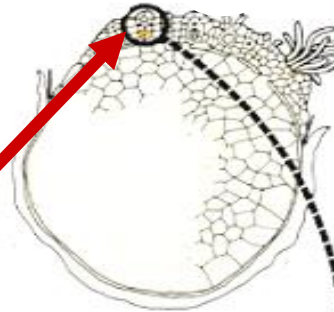
EG



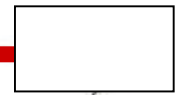
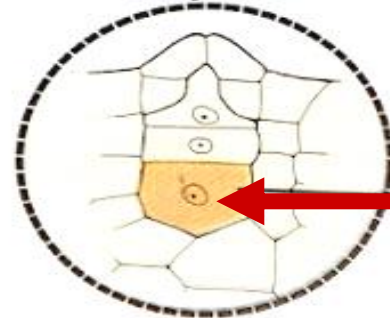
MEGASPORE



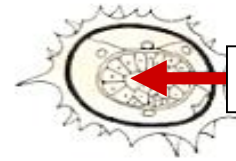
MEGAGAMETOPHYTE



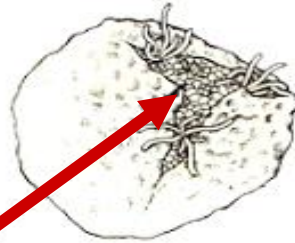
ARCHEGONIUM



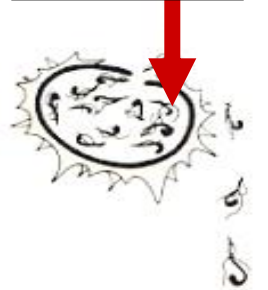
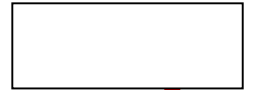
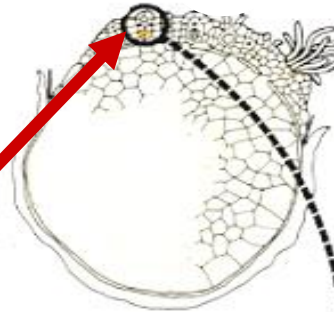
# SELAGINELLA



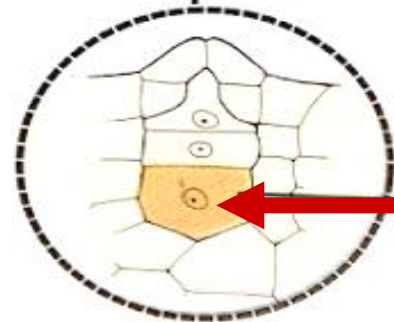
**MEGASPORE**



**MEGAGAMETOPHYTE**



**ARCHEGONIUM**



**EGG**





**STROBILUS**



***SELAGINELLA***

M



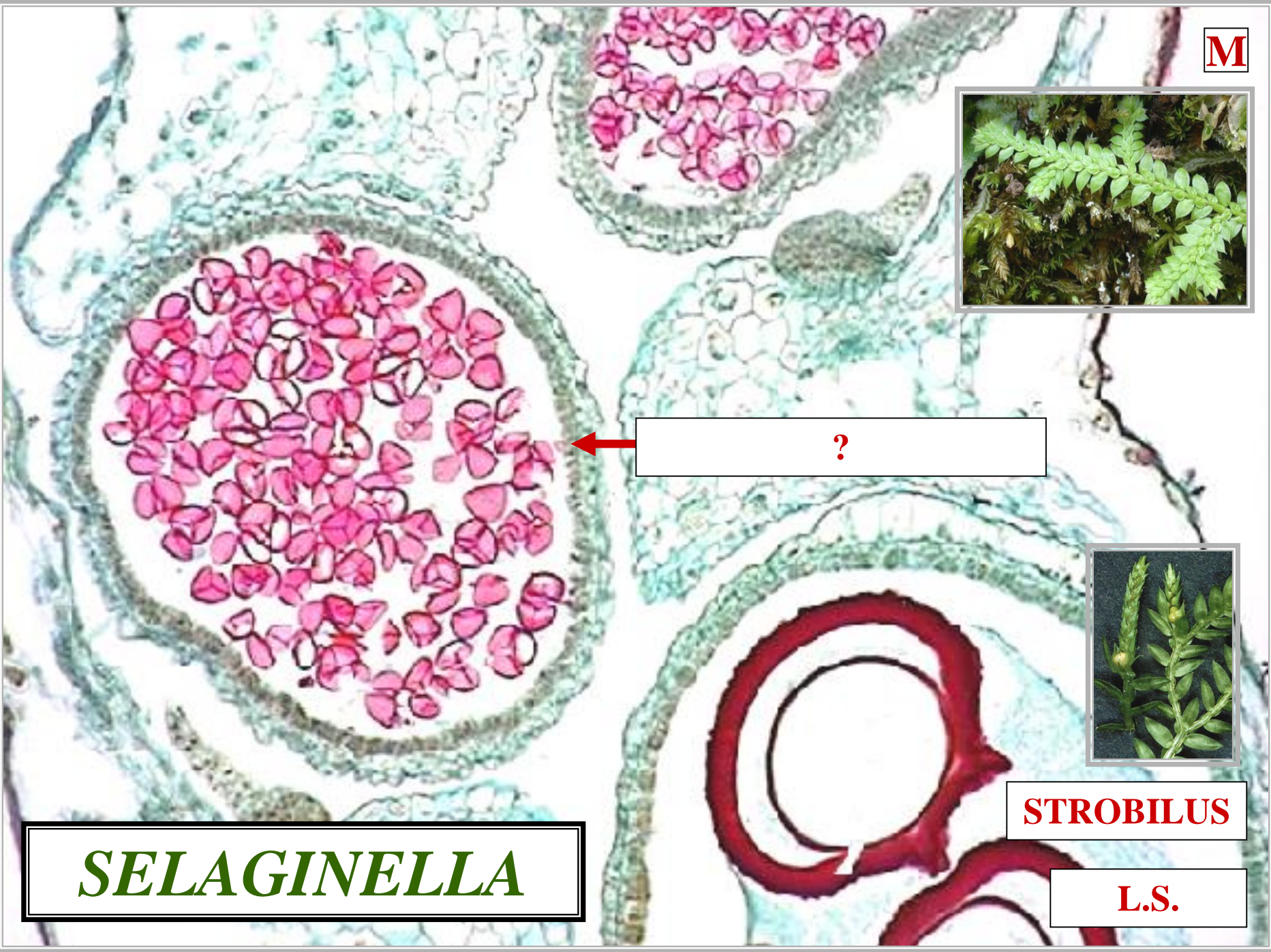
?



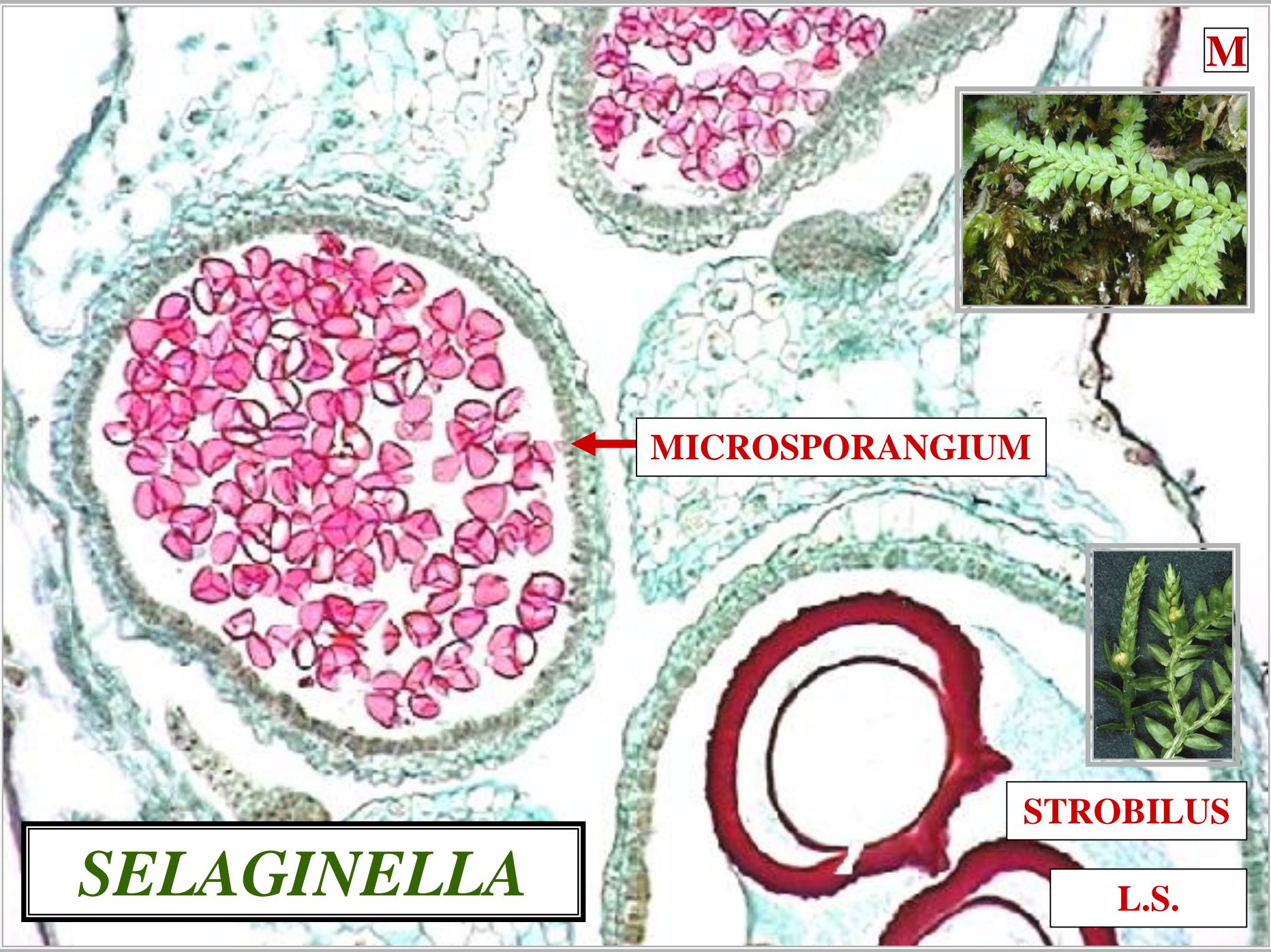
**STROBILUS**

**L.S.**

***SELAGINELLA***



M



**MICROSPORANGIUM**



**STROBILUS**

***SELAGINELLA***

**L.S.**

M



MICROSPORES

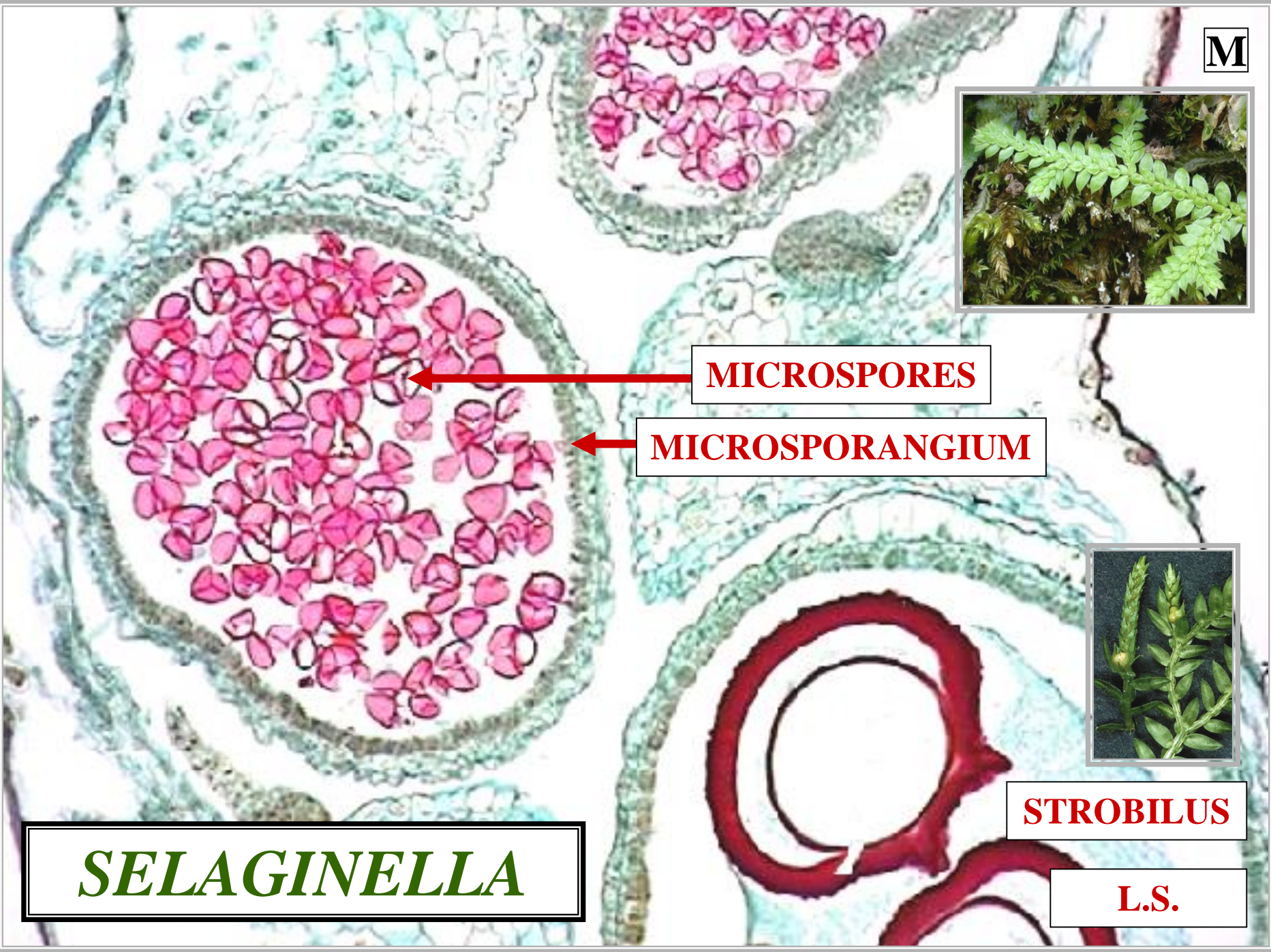
MICROSPORANGIUM



STROBILUS

L.S.

***SELAGINELLA***



**MICROSPORE**

**MICROSPORE**



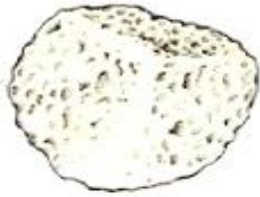
**MALE SPORE**

**MICROSPORE**

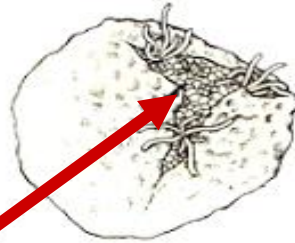
# SELAGINELLA



**MICROSPORE**



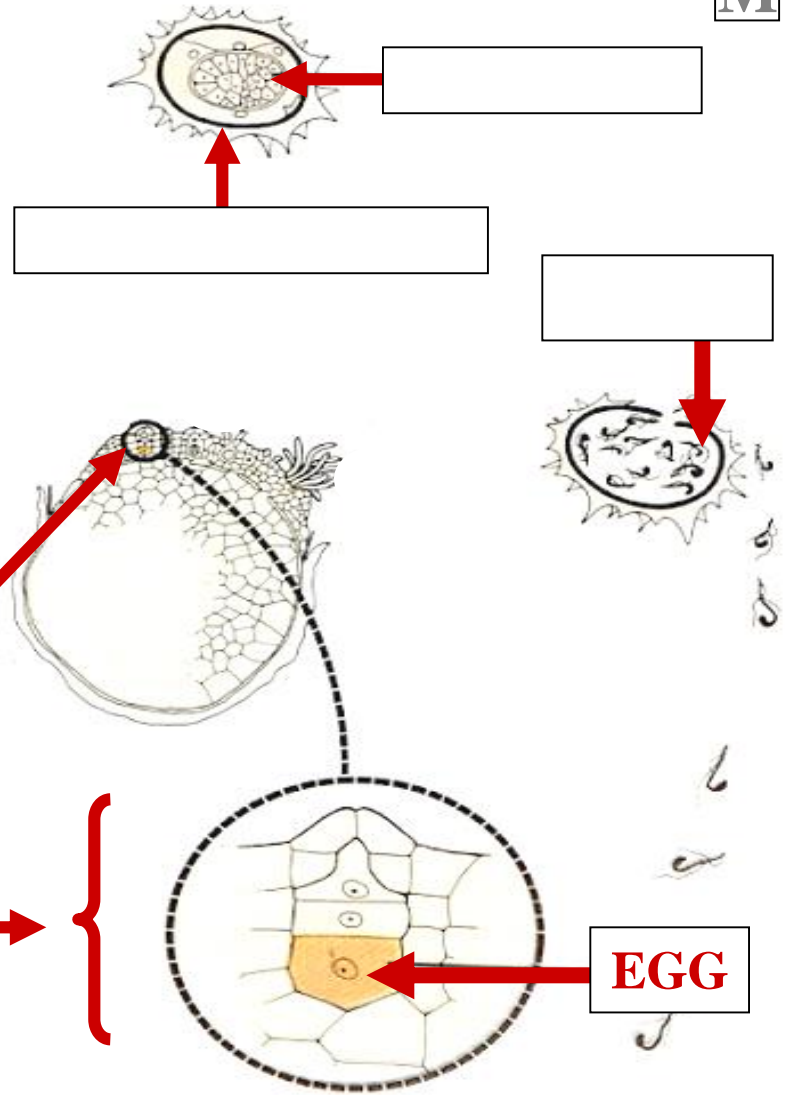
**MEGASPORE**



**MEGAGAMETOPHYTE**



**ARCHEGONIUM**



**EGG**

# SELAGINELLA

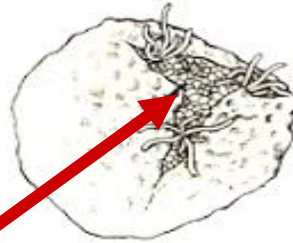
M



MITOSIS



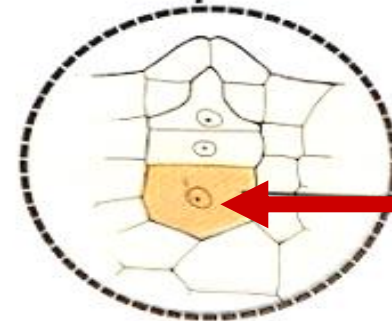
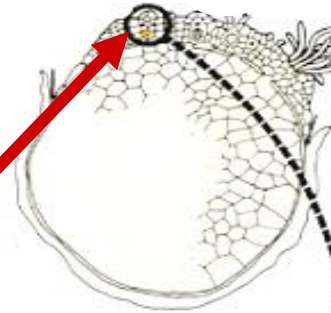
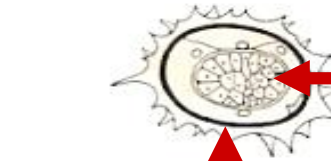
MEGASPORE



MEGAGAMETOPHYTE



ARCHEGONIUM



EGG



# SELAGINELLA



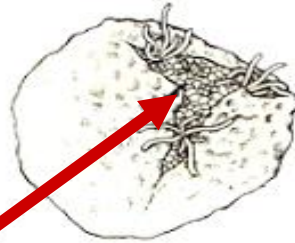
MICROSPORE



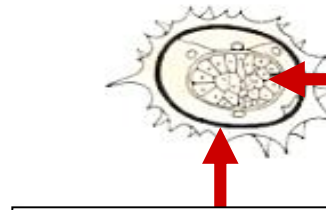
AN



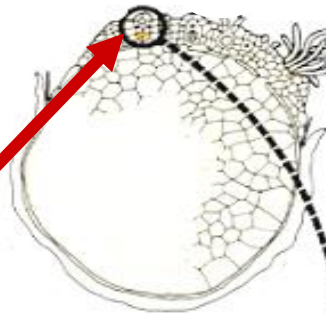
MEGASPORE



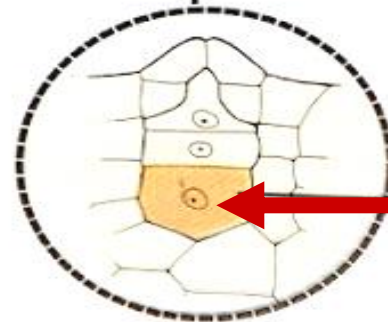
MEGAGAMETOPHYTE



MICROGAMETOPHYTE



ARCHEGONIUM



EGG

# SELAGINELLA



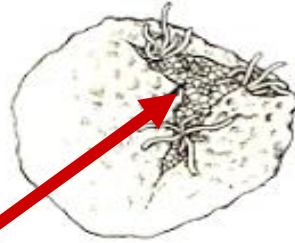
**MICROSPORE**



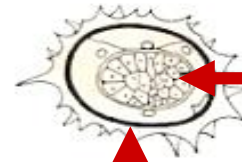
**SP**



**MEGASPORE**



**MEGAGAMETOPHYTE**

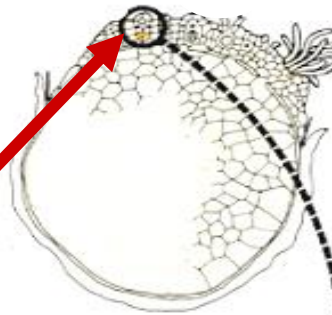


**ANTHERIDIUM**

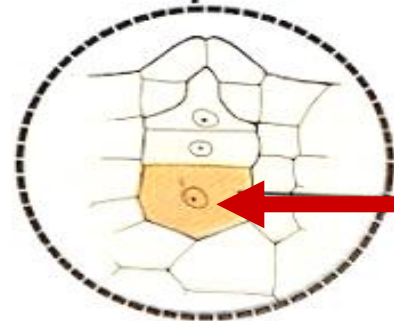
**MICROGAMETOPHYTE**



**EGG**



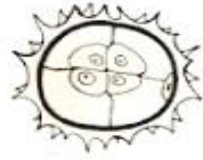
**ARCHEGONIUM**



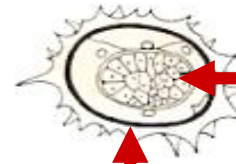
# *SELAGINELLA*



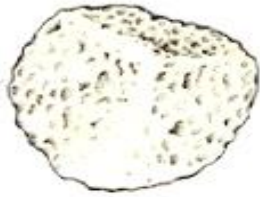
**MICROSPORE**



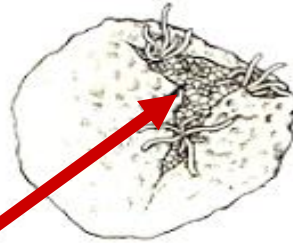
**MICROGAMETOPHYTE**



**ANTHERIDIUM**



**MEGASPORE**

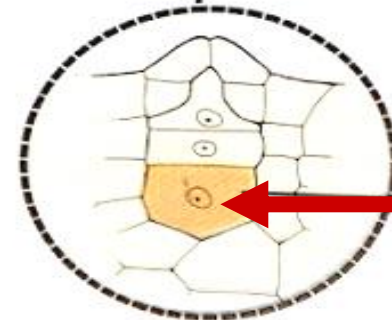
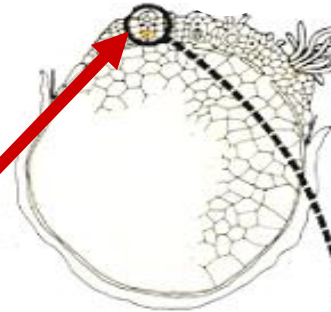


**MEGAGAMETOPHYTE**

**SPERM**



**ARCHEGONIUM**



**EGG**

# ENDOSPORIC GAMETOPHYTE

**ENDOSPORIC  
GAMETOPHYTE**



**ENDOSPORIC  
GAMETOPHYTE**

**GAMETOPHYTE  
MATURES INSIDE  
SPORE WALL**

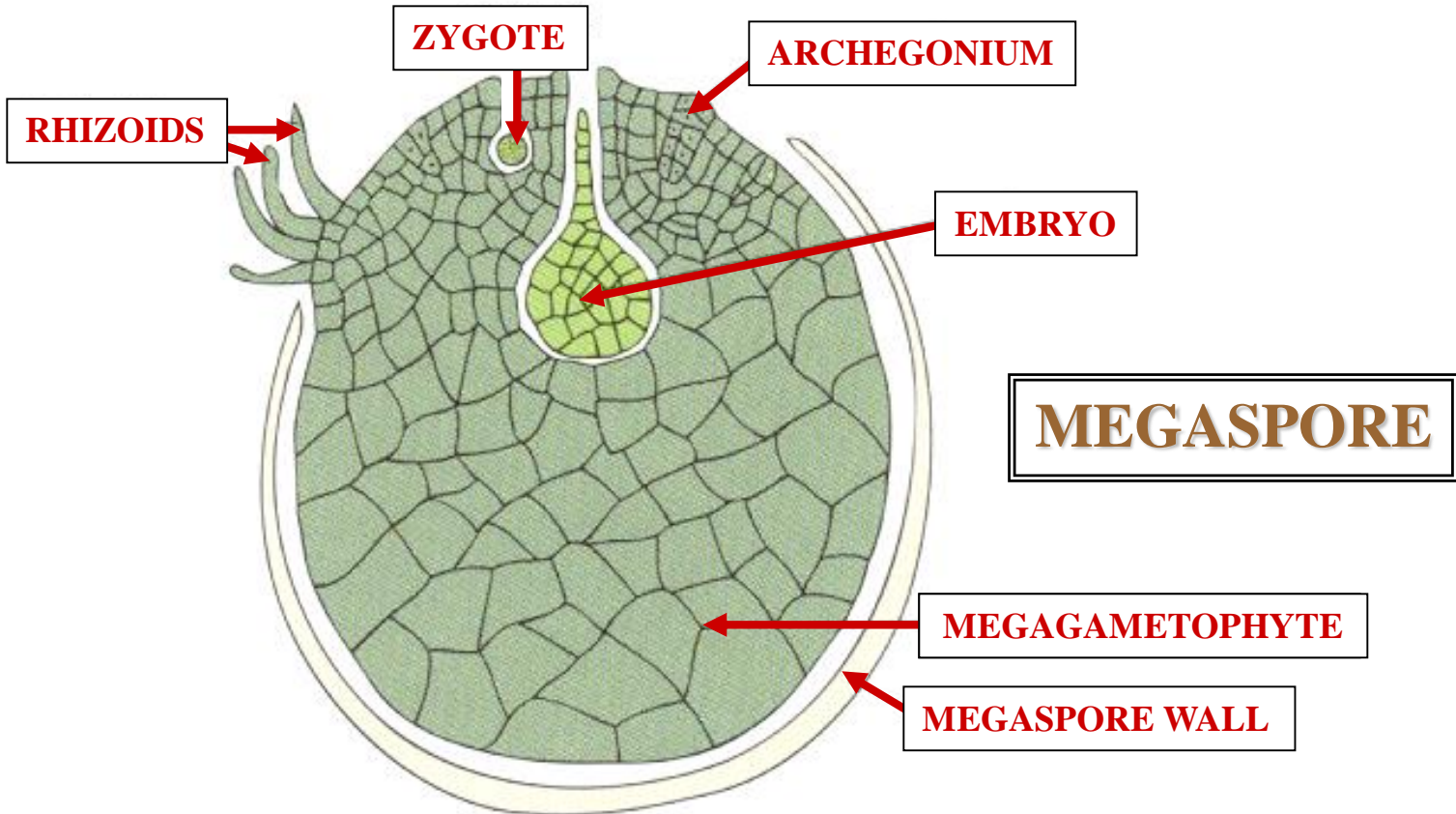
**ENDOSPORIC  
GAMETOPHYTE**



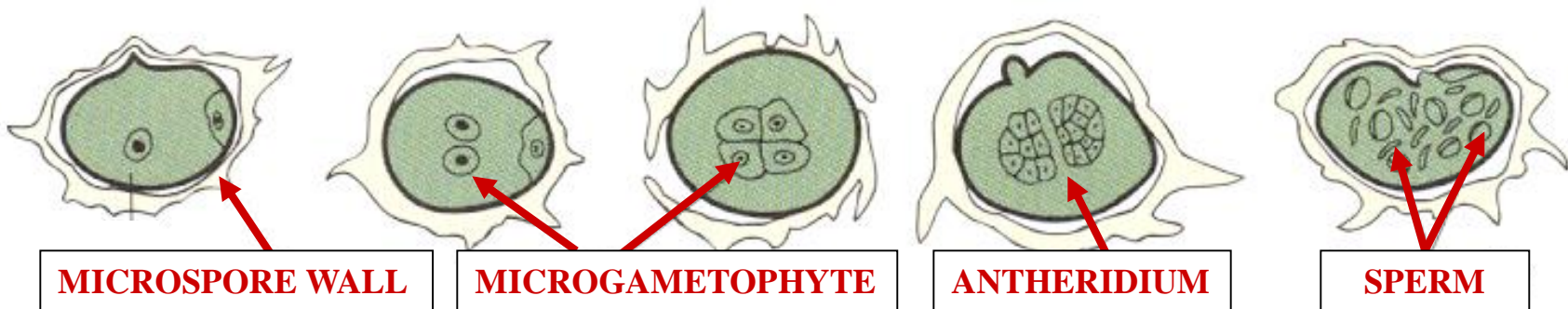
**ENDOSPORIC  
GAMETOPHYTE**

**GAMETOPHYTE  
UNISEXUAL**

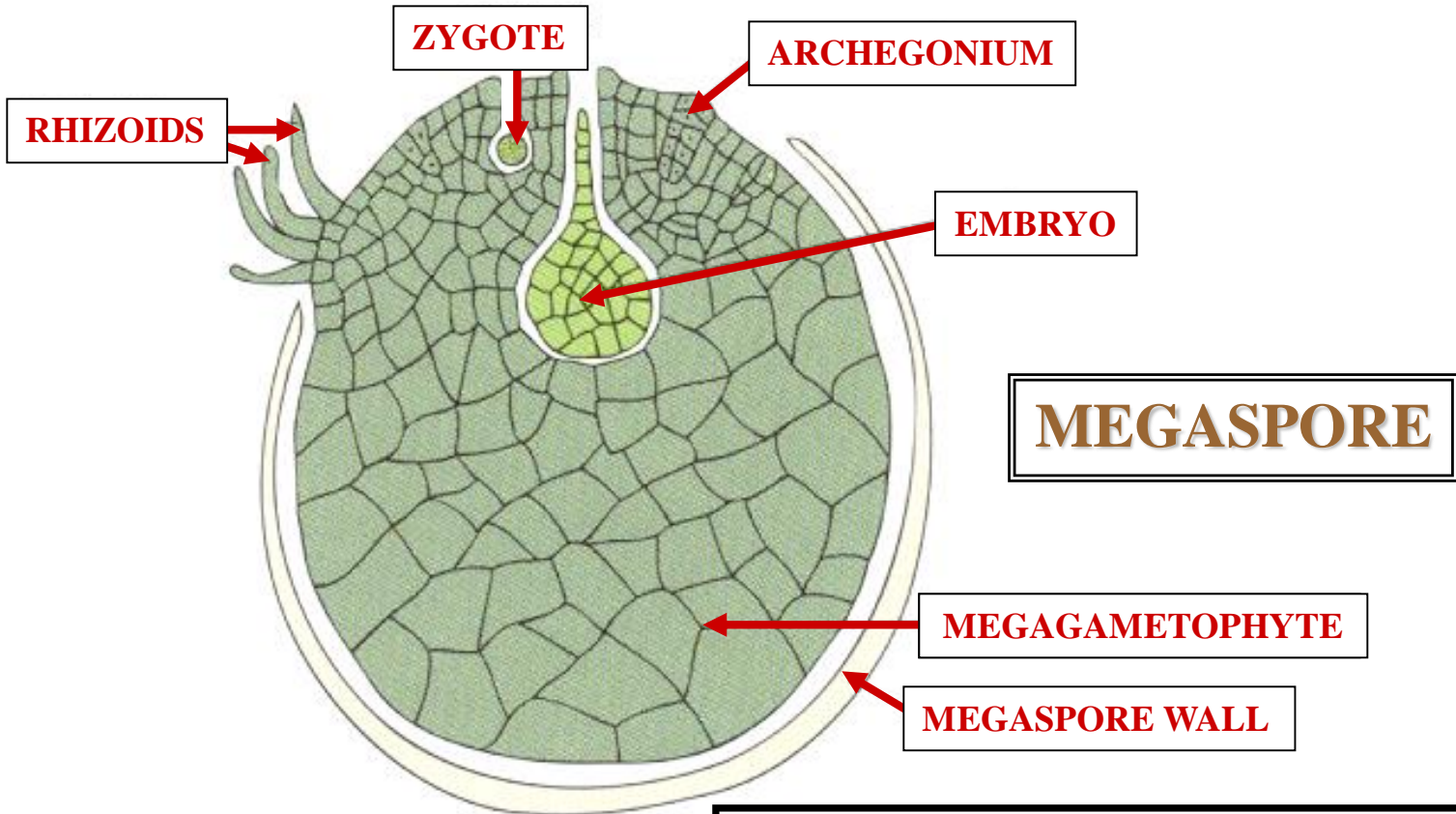
**ENDOSPORIC  
GAMETOPHYTE**



**MICROSPORE**

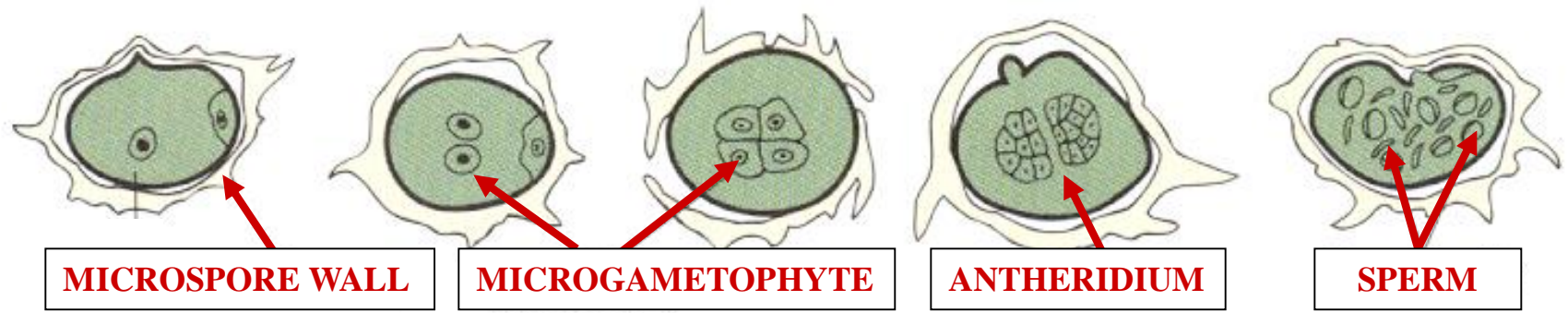


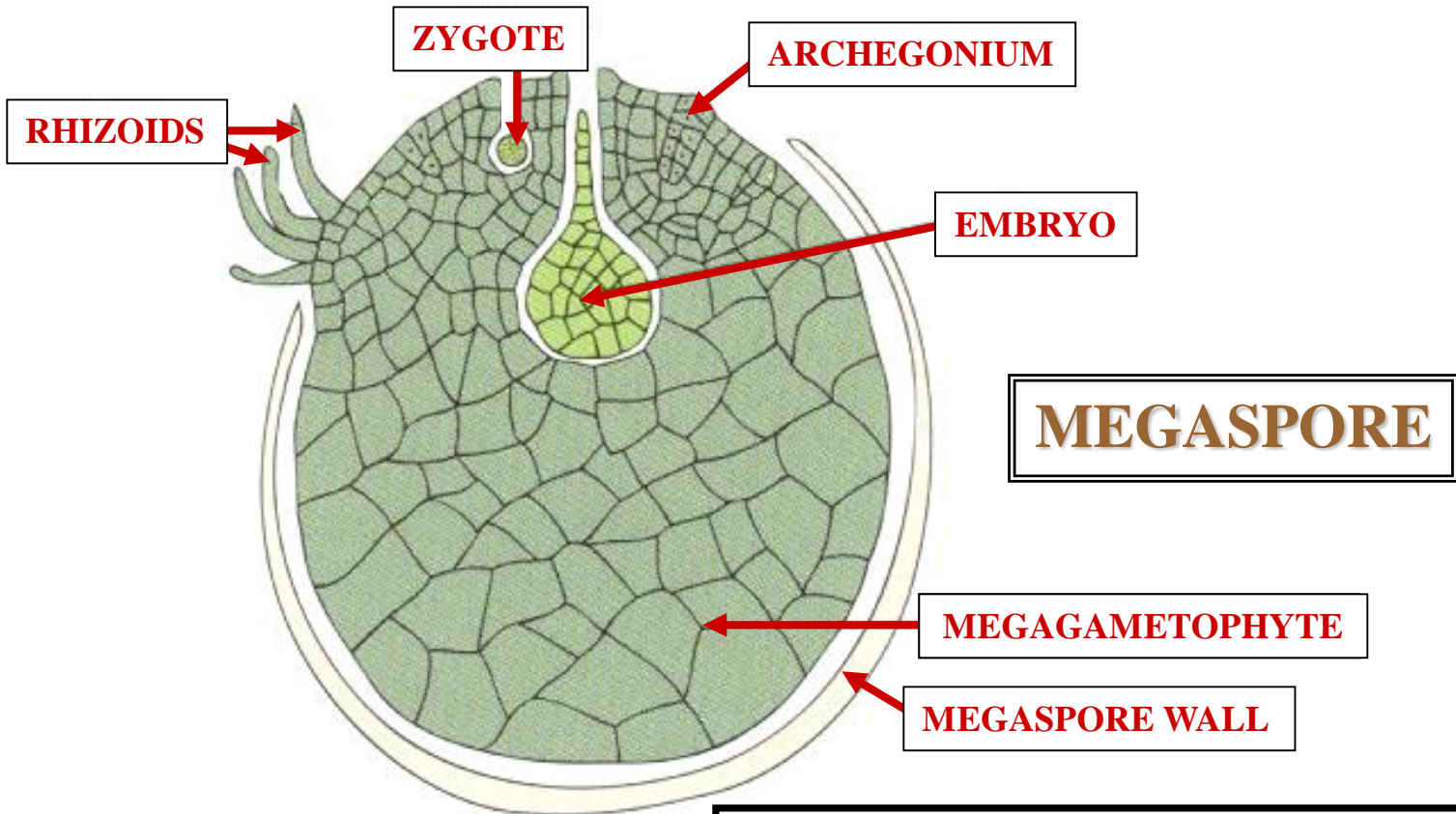




**MICROSPORE**

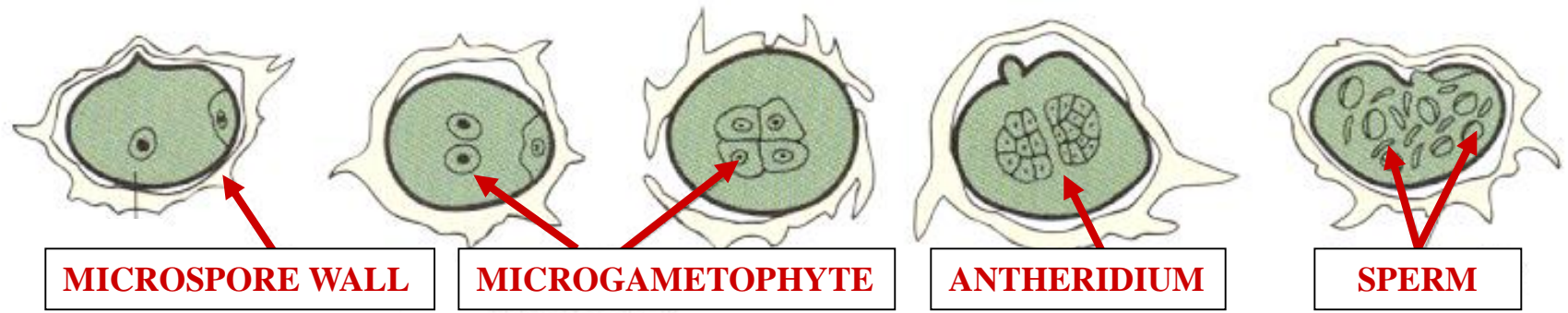
**ENDOSPORIC**





**MICROSPORE**

**UNISEXUAL**





# **HETEROSPOROUS SUMMARY**



***SELAGINELLA***

**HETEROSPOROUS**

***SELAGINELLA***

**MICROSPORES & MEGASPORES**

***SELAGINELLA***

**ENDOSPORIC GAMETOPHYTE**

***SELAGINELLA***



**UNISEXUAL GAMETOPHYTE**

***SELAGINELLA***





**MICROPHYLL**

**&**

**MEGAPHYLL**

**MISNOMERS**

**SIZE DOES NOT CORRELATE**



**MICROSPORE**

**&**

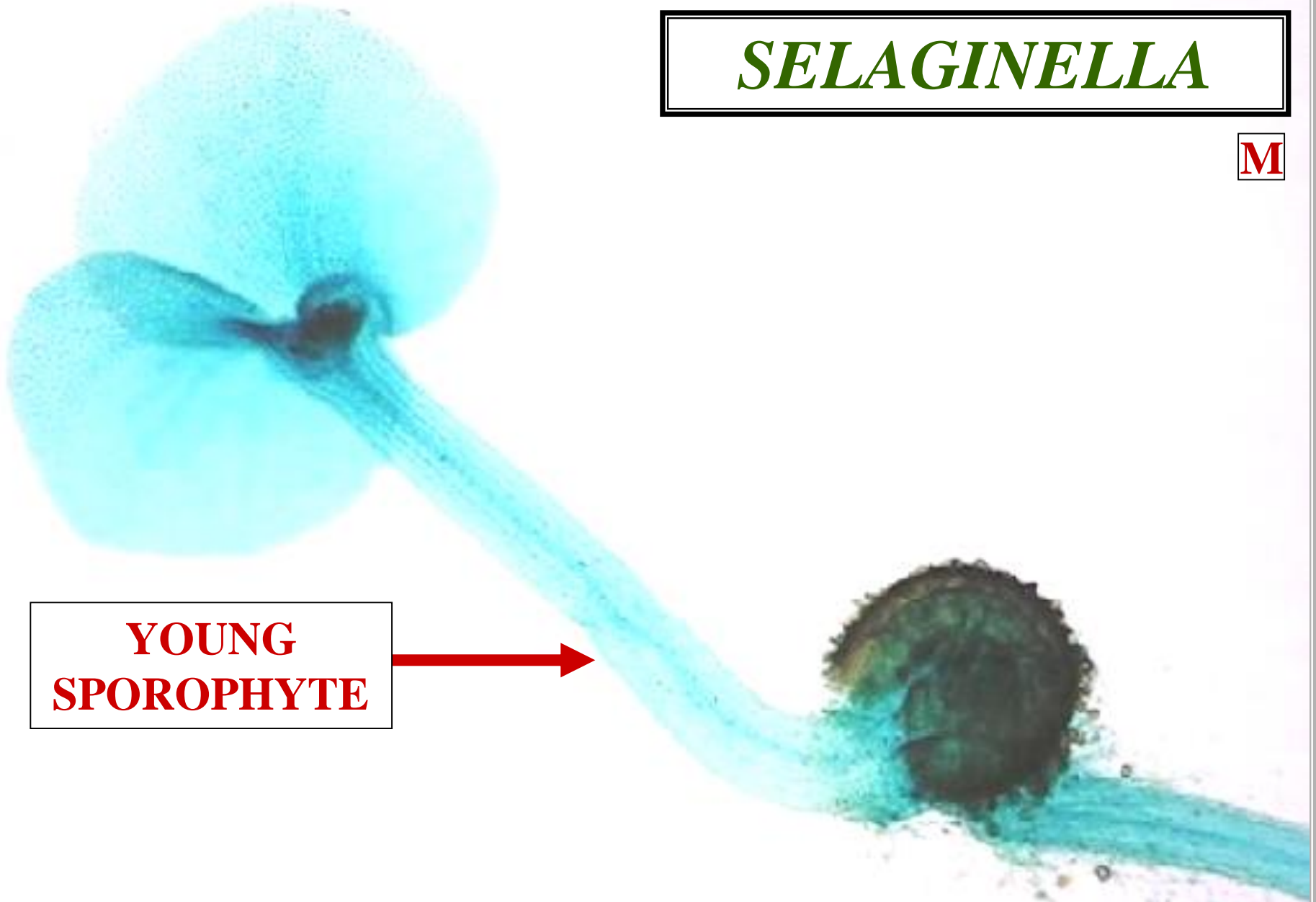
**MEGASPORE**

**SIZE**

**CORRELATES**

# *SELAGINELLA*

M



**YOUNG  
SPOROPHYTE**

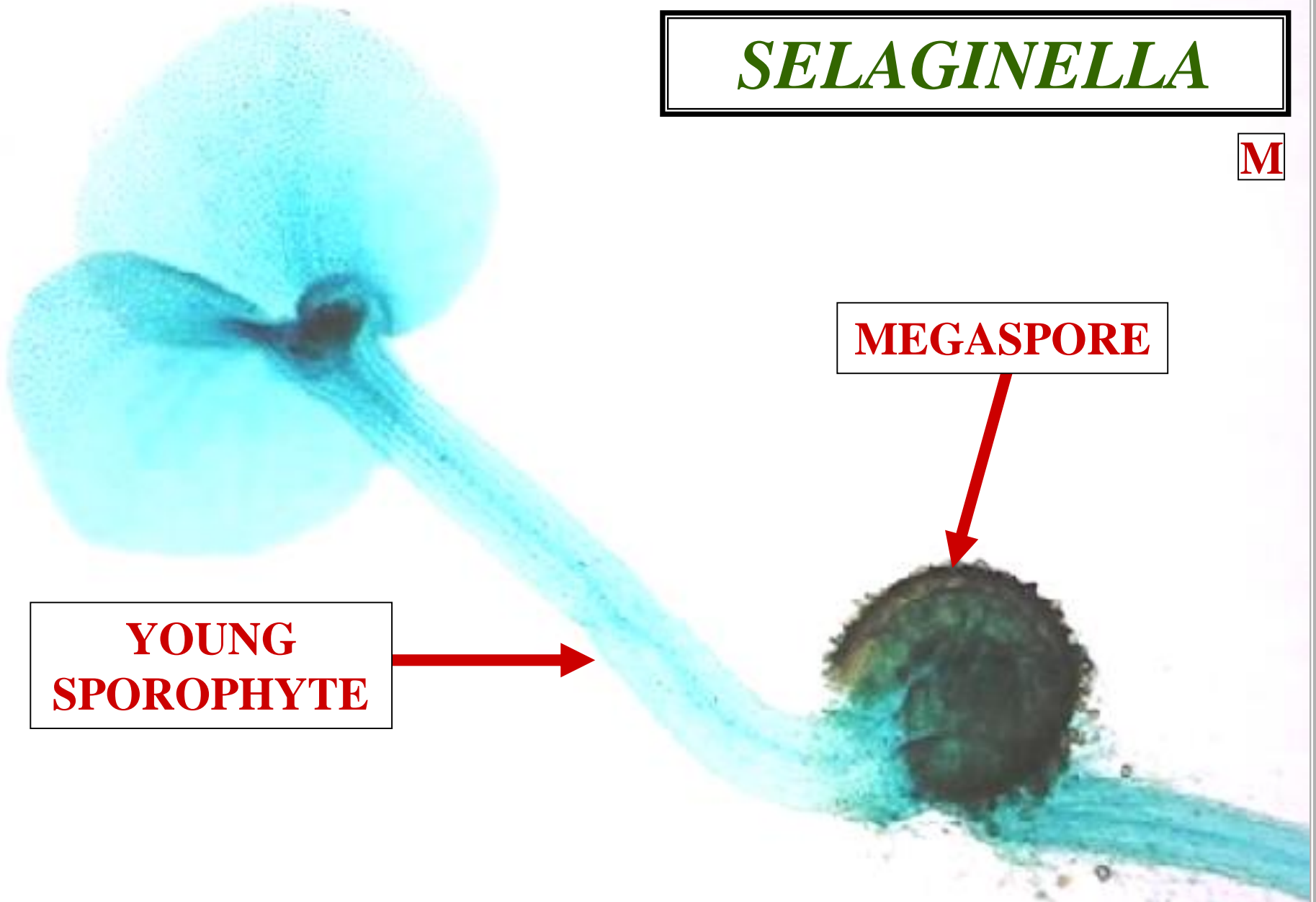


# *SELAGINELLA*

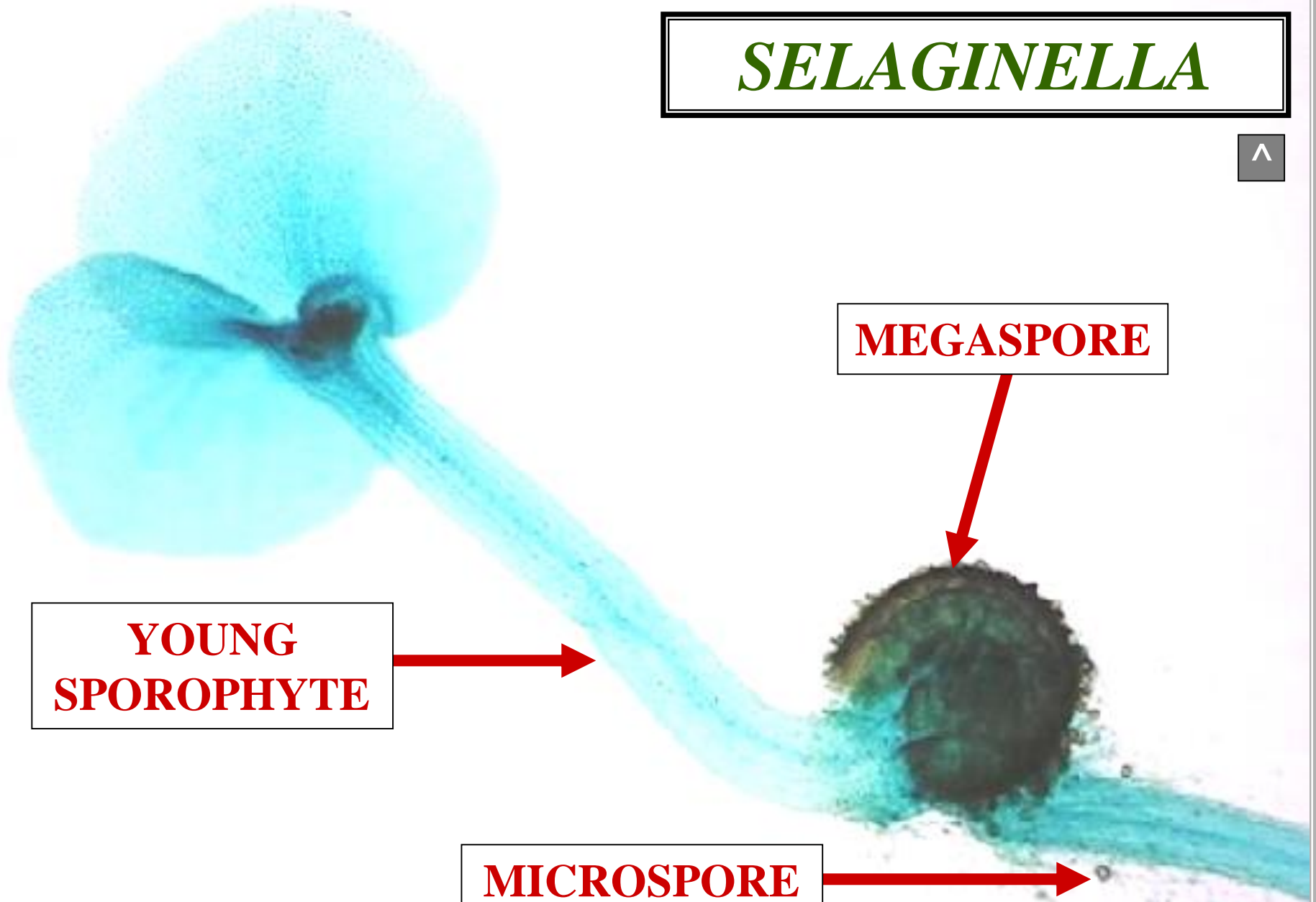
M

MEGASPORE

YOUNG  
SPOROPHYTE



# *SELAGINELLA*



**MEGASPORE**

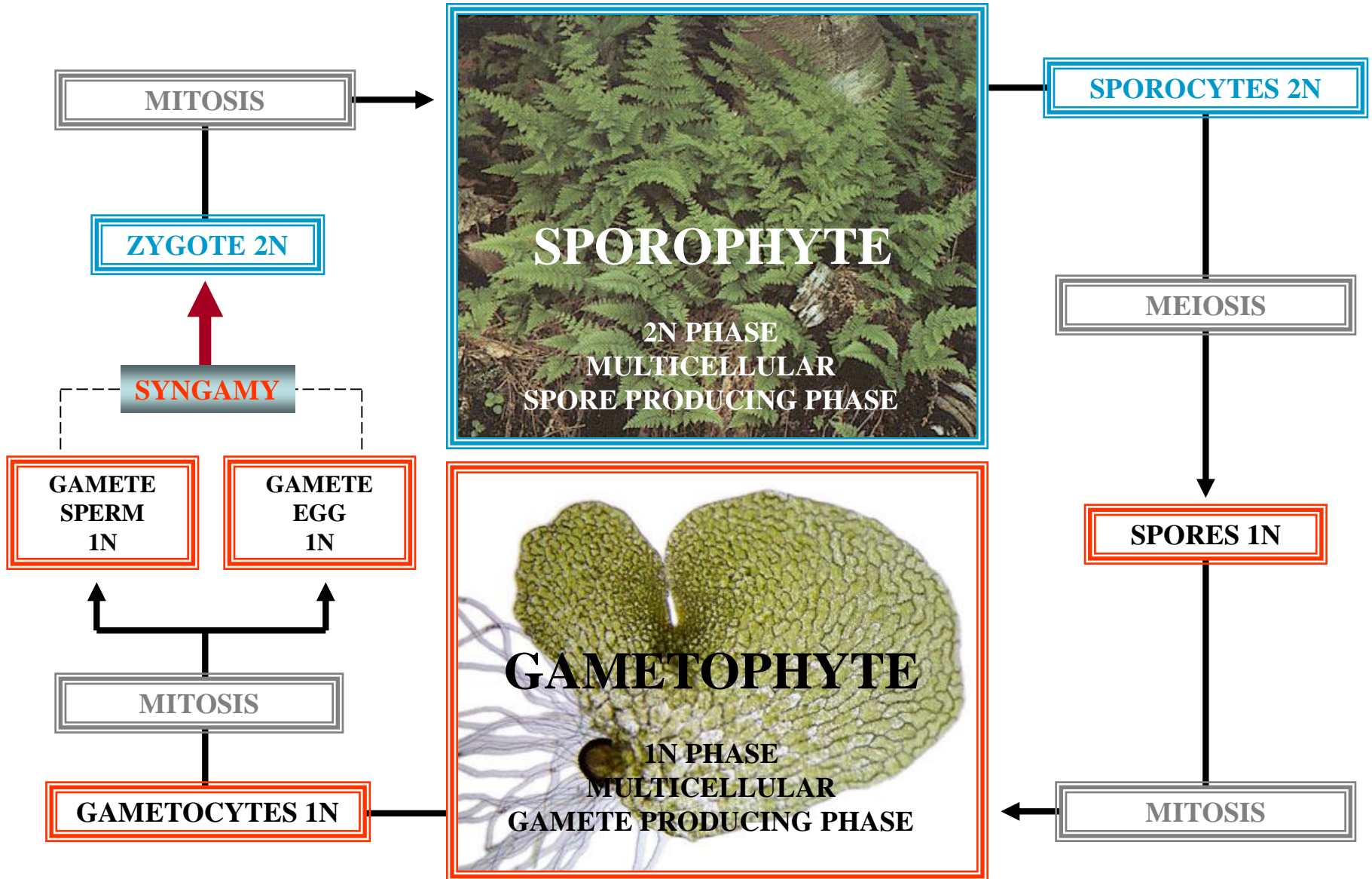
**YOUNG  
SPOROPHYTE**

**MICROSPORE**

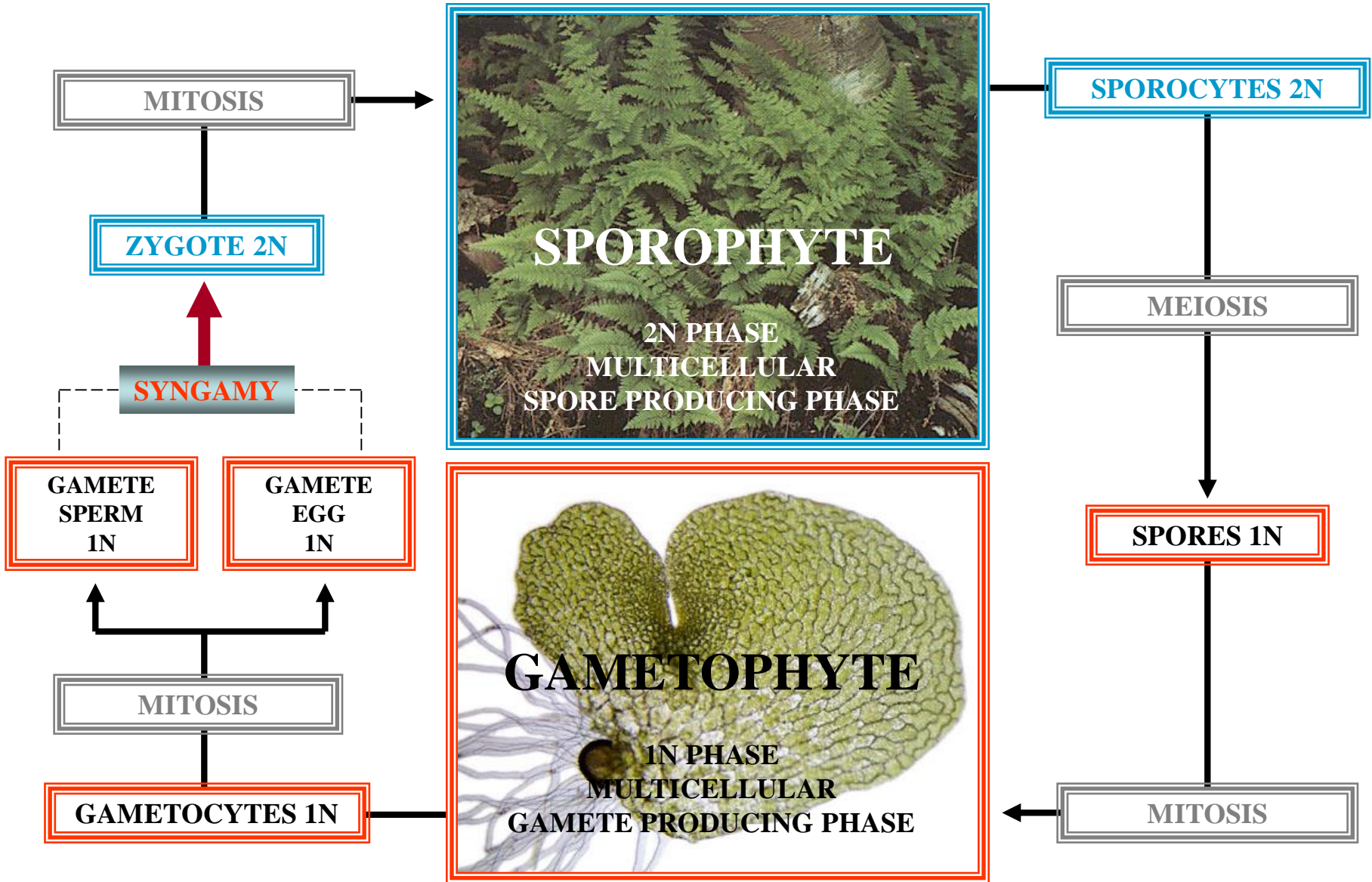


# TRACHEOPHYTE REPRODUCTION

# TRACHEOPHYTE LIFE CYCLE

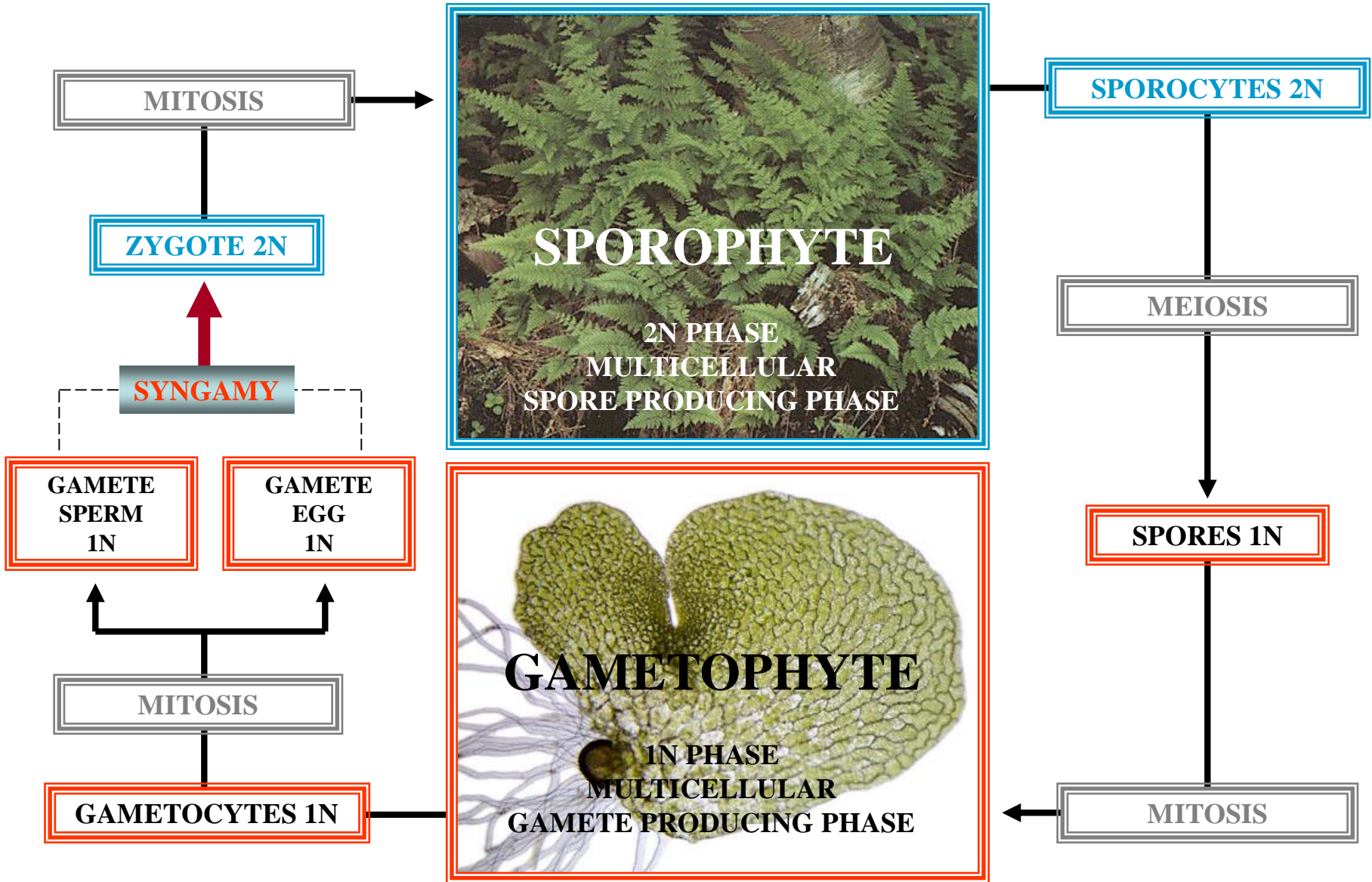


# TRACHEOPHYTE SPORIC LIFE CYCLE





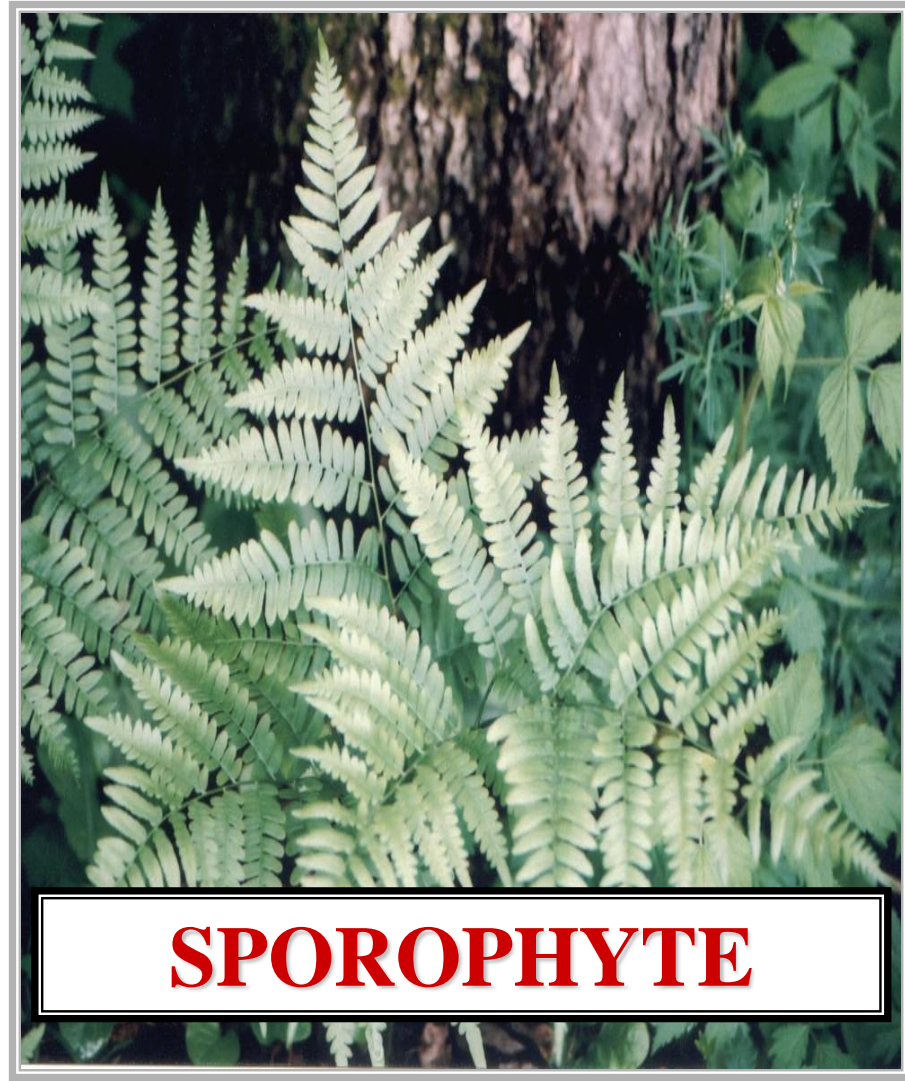
# TRACHEOPHYTE HETEROMORPHIC SPORIC LIFE CYCLE





# TRACHEOPHYTE REPRODUCTION GAMETOPHYTE

# TRACHEOPHYTE GAMETOPHYTE VS SPOROPHYTE





# TRACHEOPHYTE GAMETOPHYTE VS SPOROPHYTE

**GAMETOPHYTE**

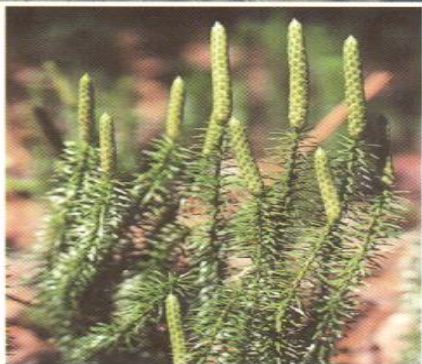
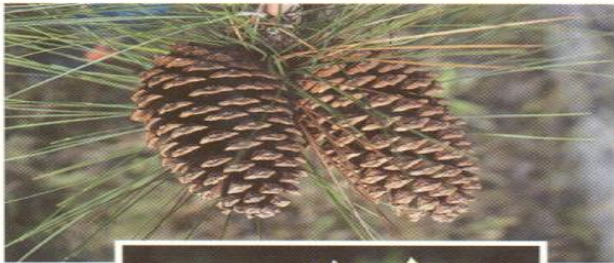
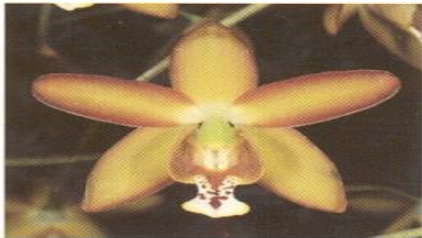


**EPHEMERAL**



**SPOROPHYTE**

# TRACHEOPHYTE PHYLOGENY



**GAMETOPHYTE**

# TRACHEOPHYTE GAMETOPHYTE VS SPOROPHYTE

**GAMETOPHYTE**



**EPHEMERAL**



**SPOROPHYTE**

# TRACHEOPHYTE GAMETOPHYTE VS SPOROPHYTE

**GAMETOPHYTE**



**REDUCTION**



**SPOROPHYTE**



# TRACHEOPHYTE REPRODUCTION SPOROPHYTE



# TRACHEOPHYTE GAMETOPHYTE VS SPOROPHYTE

**GAMETOPHYTE**



**EPHEMERAL**



**SPOROPHYTE**



# TRACHEOPHYTE GAMETOPHYTE VS SPOROPHYTE

**GAMETOPHYTE**



**EPHEMERAL**

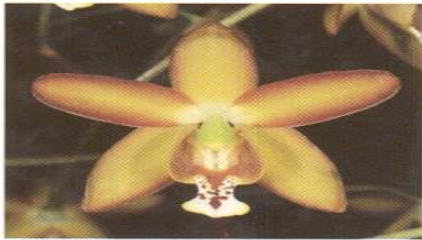
**SPOROPHYTE**



**DOMINATE**

# TRACHEOPHYTE PHYLOGENY

+



**SPOROPHYTE**

# TRACHEOPHYTE GAMETOPHYTE VS SPOROPHYTE

**GAMETOPHYTE**



**REDUCTION**

**SPOROPHYTE**



**DOMINATE**

# TRACHEOPHYTE GAMETOPHYTE VS SPOROPHYTE

**GAMETOPHYTE**



**REDUCTION**

**SPOROPHYTE**



**AUGMENTS**



# TRACHEOPHYTE FOSSIL RECORD

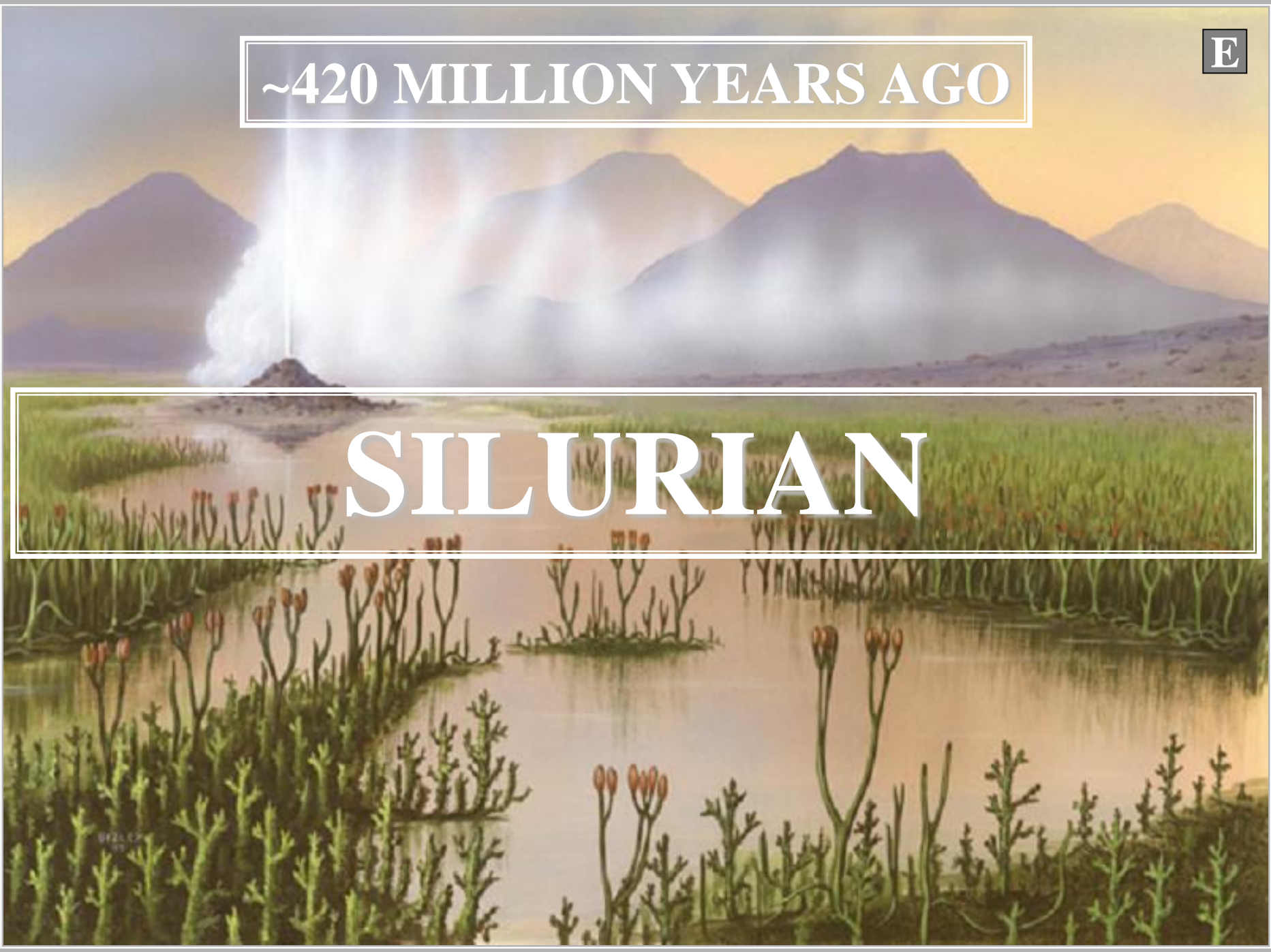


**~420**

**MILLION YEARS**

~420 MILLION YEARS AGO

SILURIAN



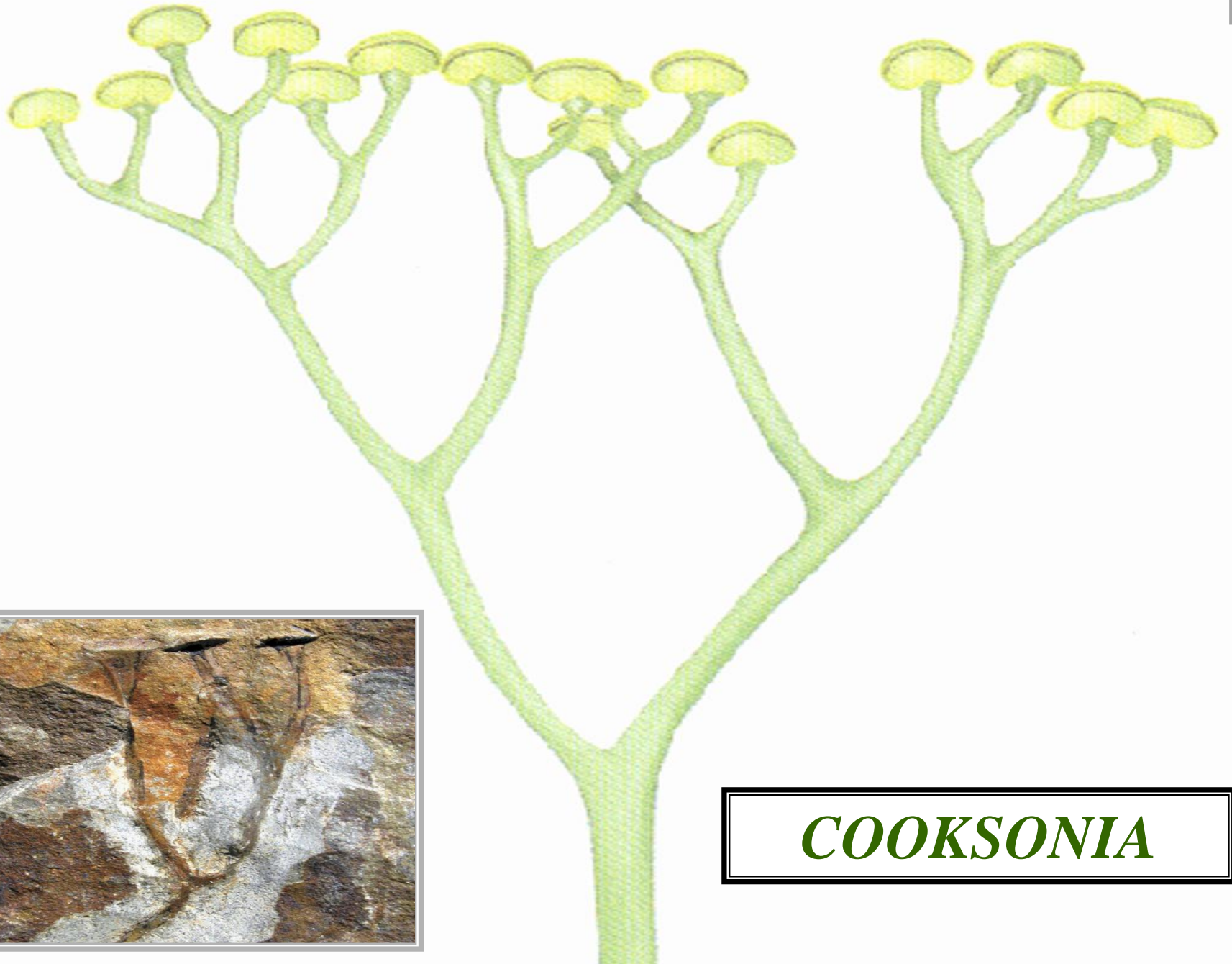


~420 MILLION YEARS AGO

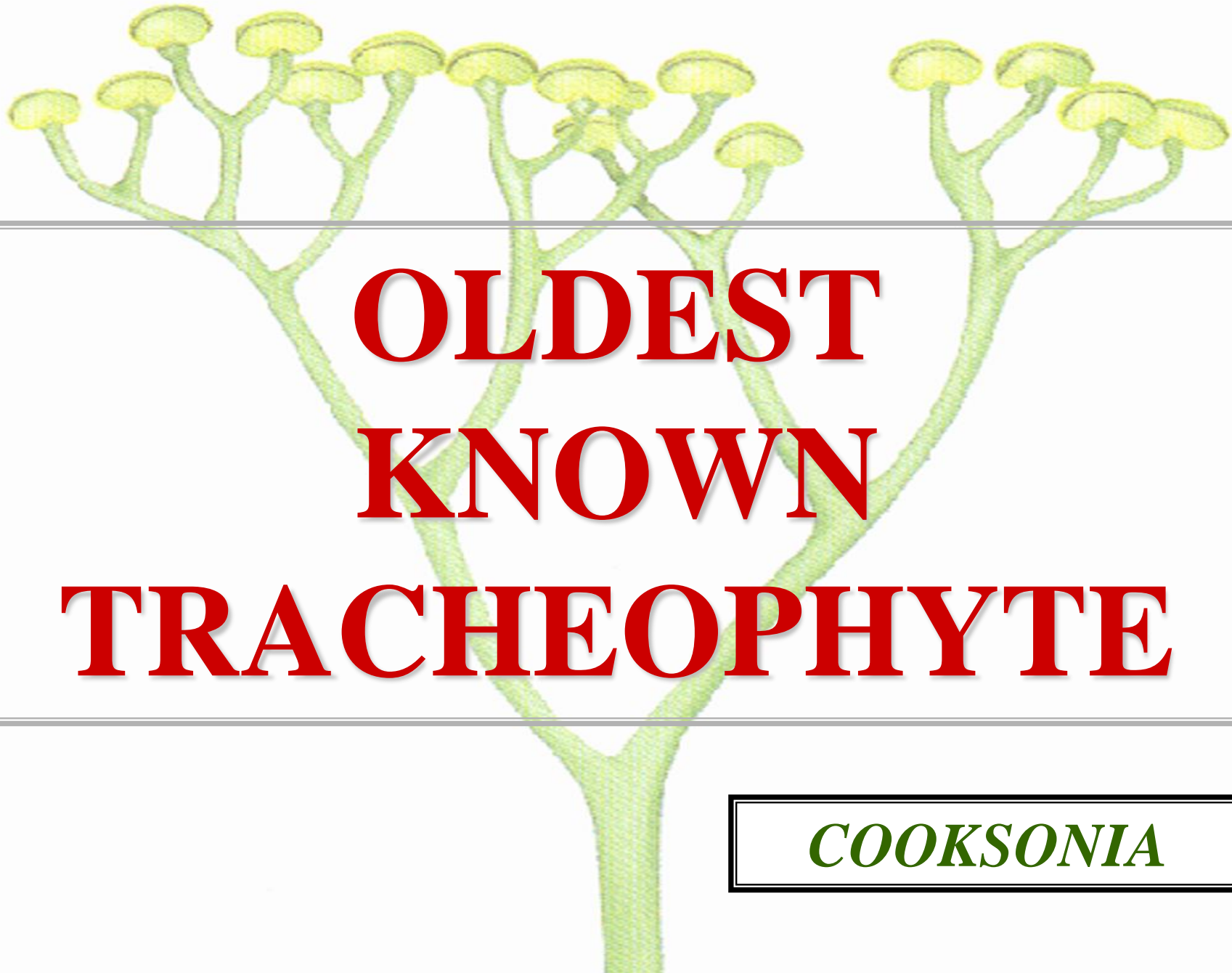


# TRACHEOPHYTES EVOLVE





***COOKSONIA***



**OLDEST  
KNOWN  
TRACHEOPHYTE**

*COOKSONIA*



**~360**

**MILLION YEARS**

~360 MILLION YEARS AGO

T

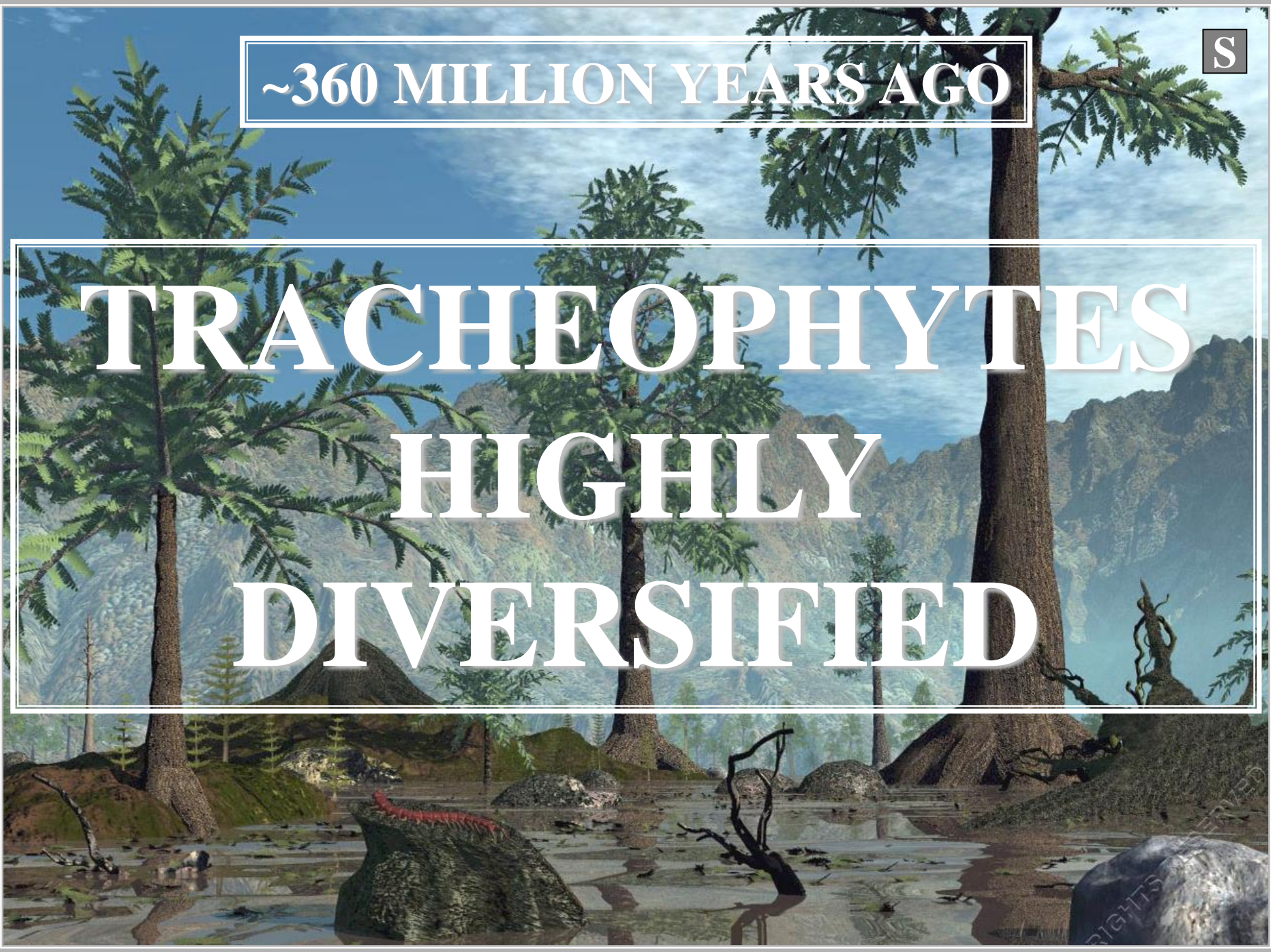
DEVONIAN



~360 MILLION YEARS AGO

S

TRACHEOPHYTES  
HIGHLY  
DIVERSIFIED

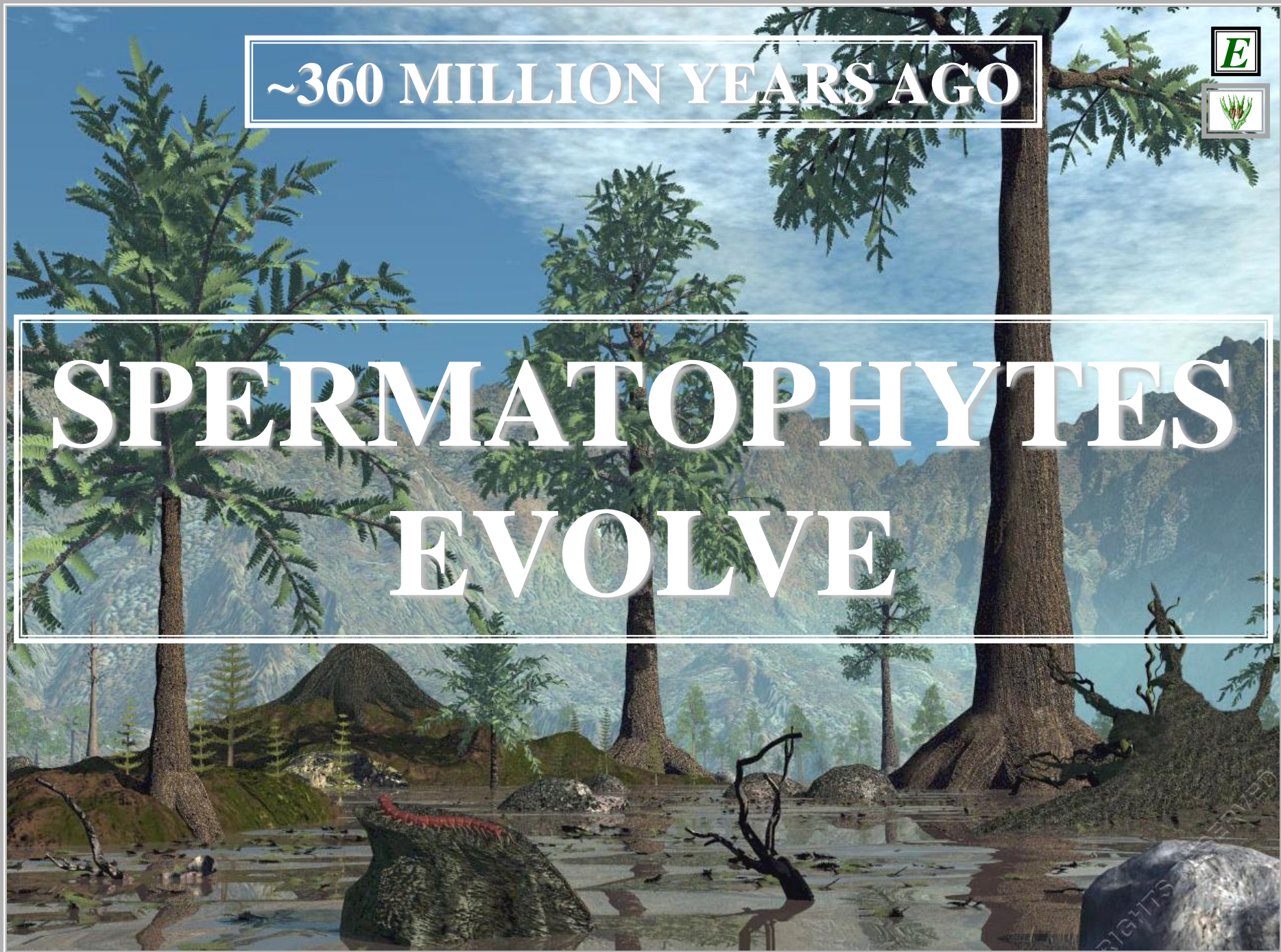


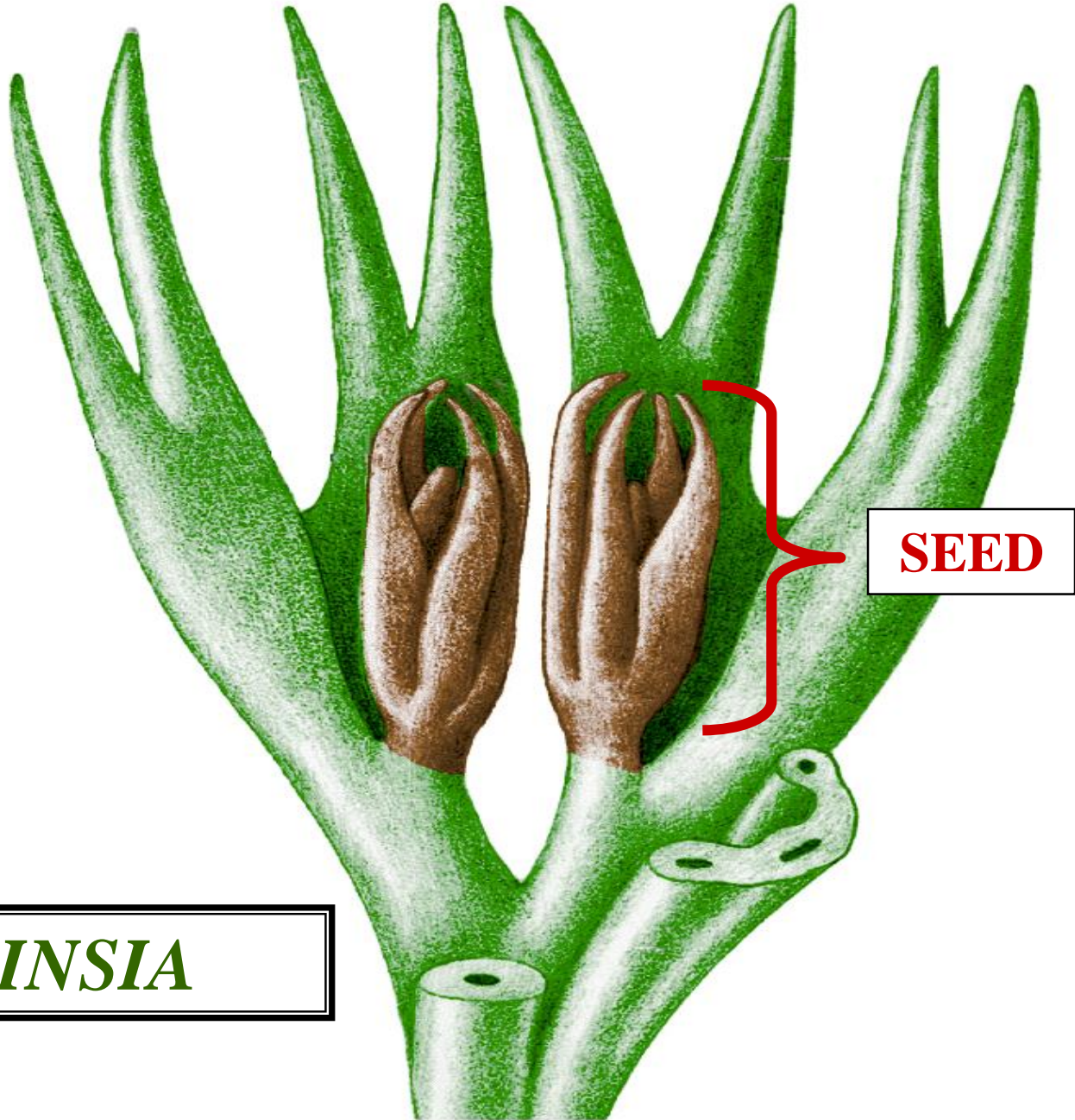
~360 MILLION YEARS AGO

E



# SPERMATOPHYTES EVOLVE





*ELKINSIA*





**OLDEST  
KNOWN  
SPERMATOPHYTE**

*ELKINSIA*



**~130  
MILLION YEARS**

~130 MILLION YEARS AGO

A

CRETACEOUS



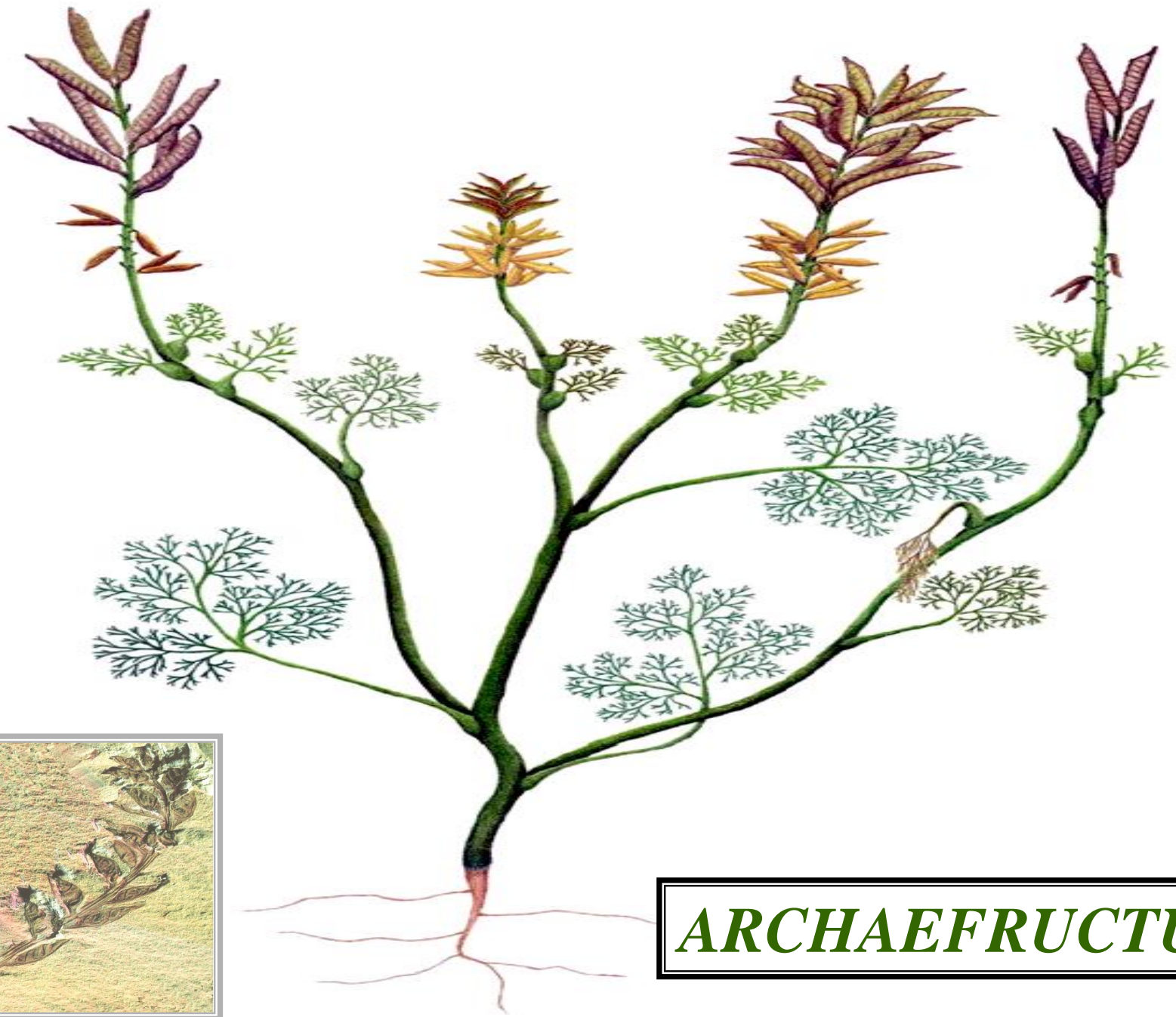
~130 MILLION YEARS AGO

A



# ANGIOSPERMS EVOLVE





***ARCHAEFRUCTUS***

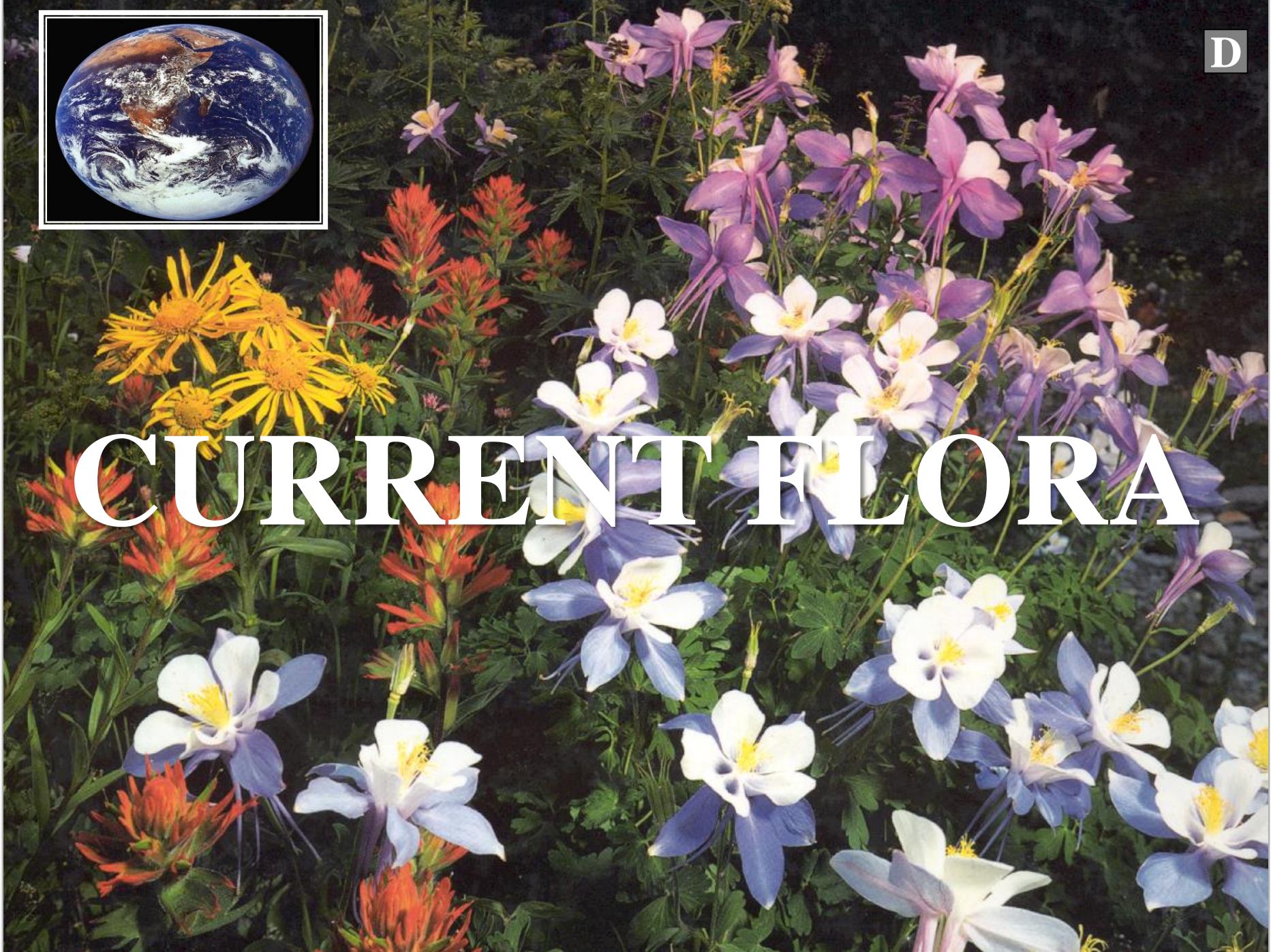


**OLDEST  
KNOWN  
ANGIOSPERM**

*ARCHAEFRUCTUS*



# CURRENT FLORA





**ANGIOSPERMS  
DOMINANT  
EXTANT PHYLIUM**



# TRACHEOPHYTE GRADES

**TRACHEOPHYTE  
GRADES**

**PTERIDOPHYTES**

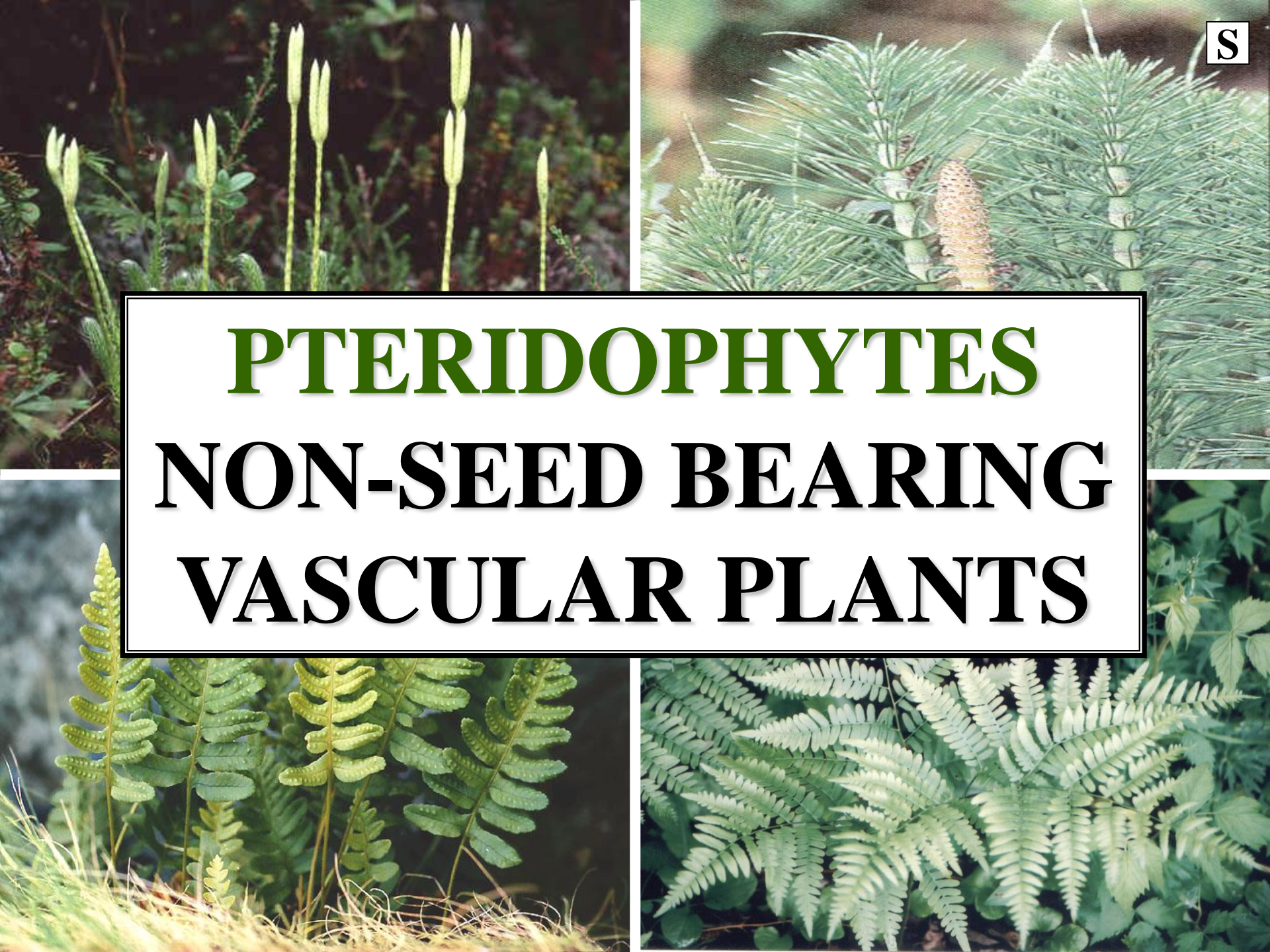
**TRACHEOPHYTE  
GRADES**

# **TRACHEOPHYTE GRADES**

**PTERIDOPHYTES  
SPERMATOPHYTES**

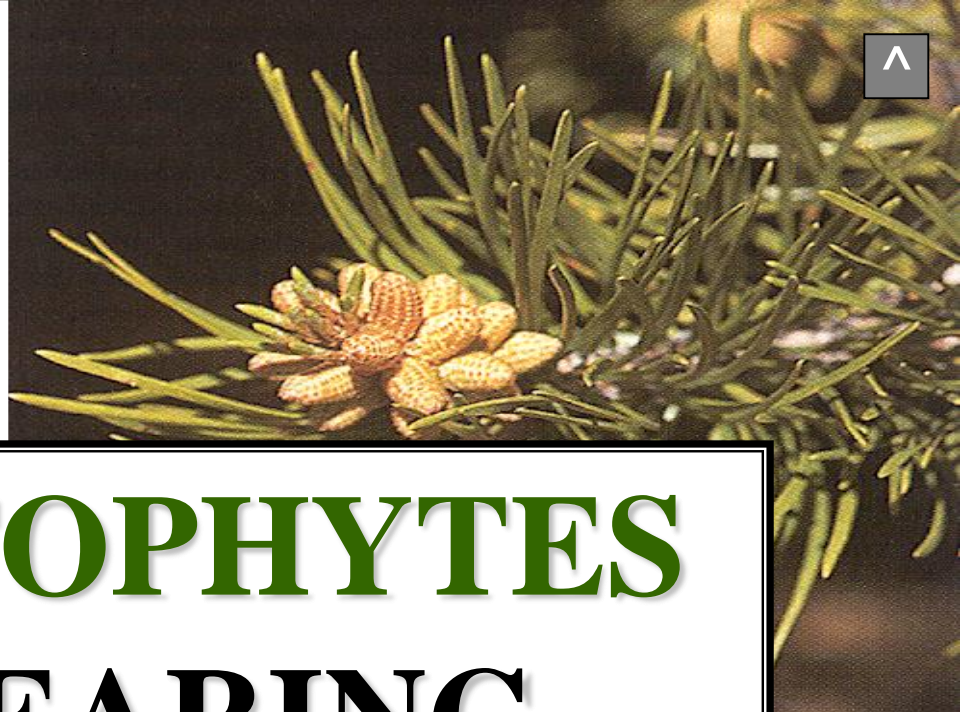
**TRACHEOPHYTE  
GRADES**

# **PTERIDOPHYTES**

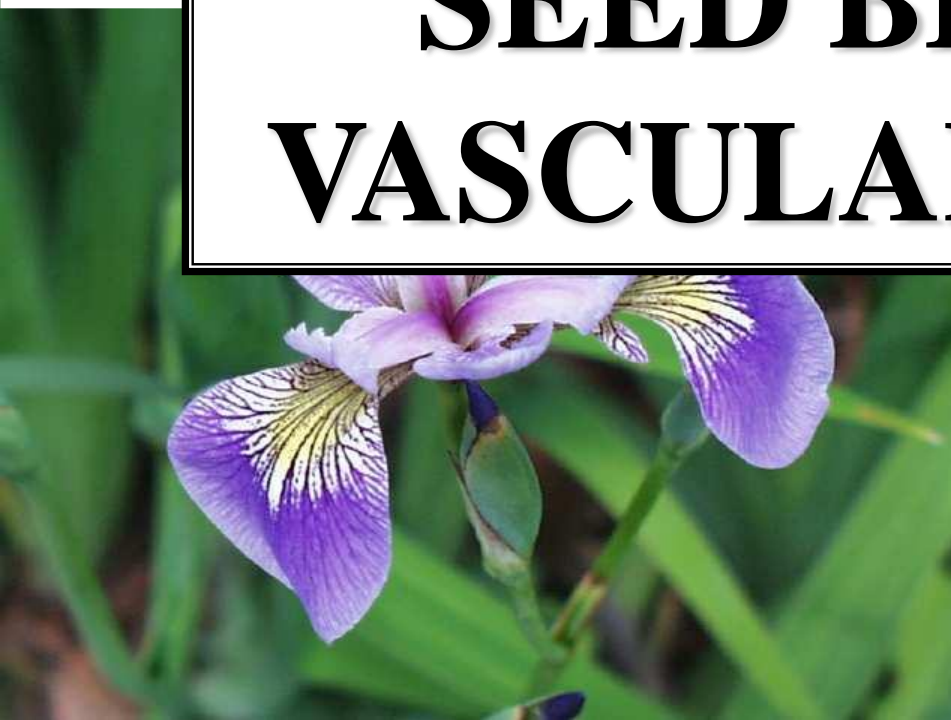


**PTERIDOPHYTES**  
**NON-SEED BEARING**  
**VASCULAR PLANTS**

# **SPERMATOPHYTES**



**SPERMATOPHYTES**  
**SEED BEARING**  
**VASCULAR PLANTS**



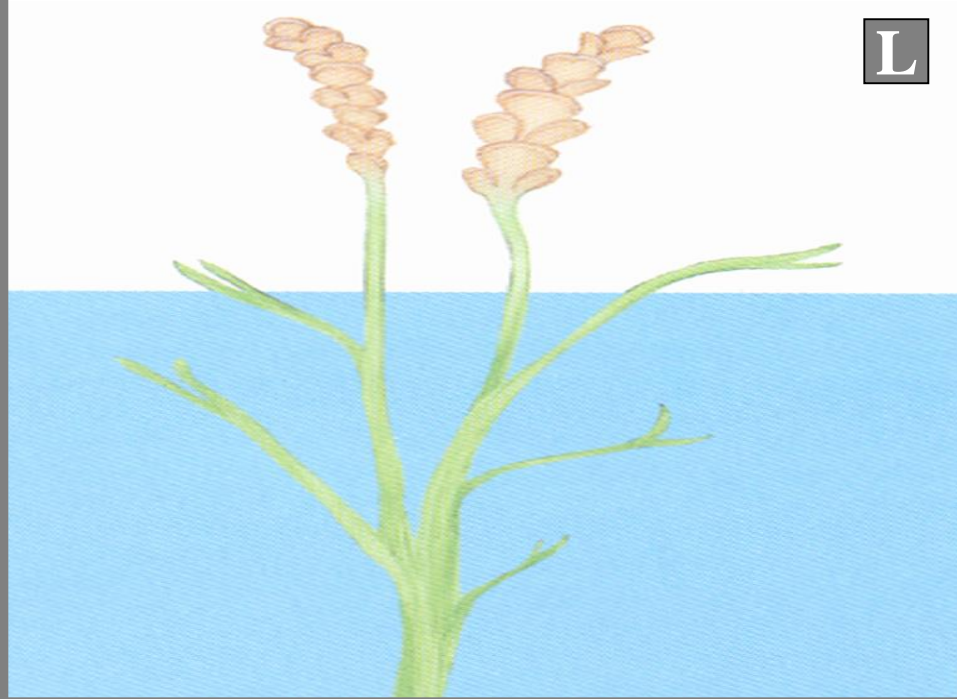
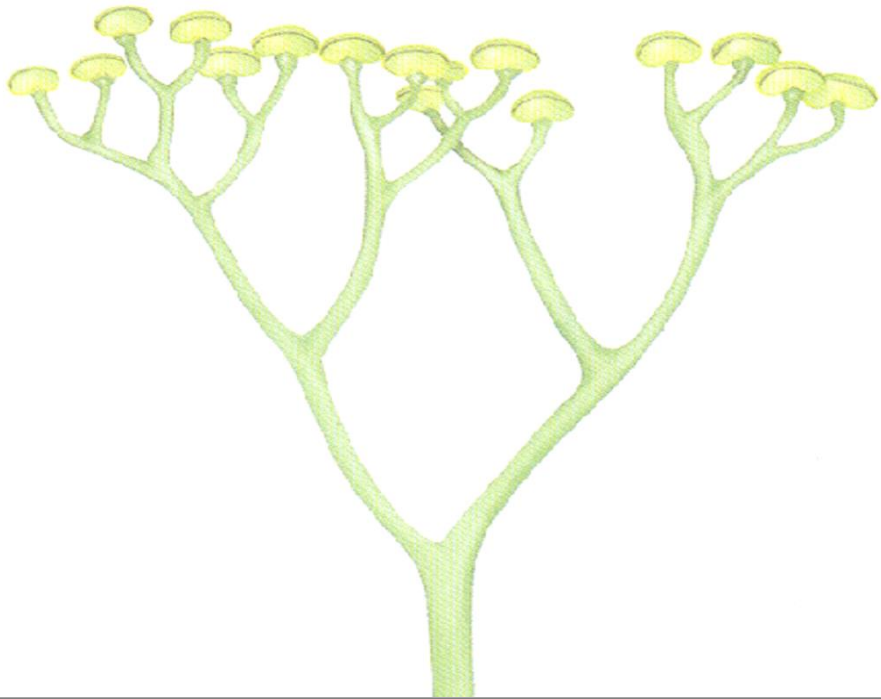


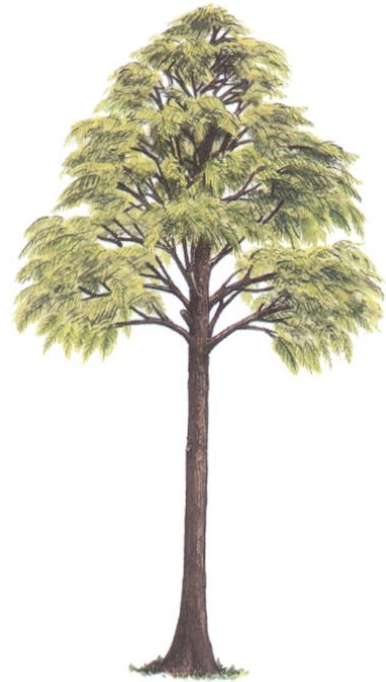
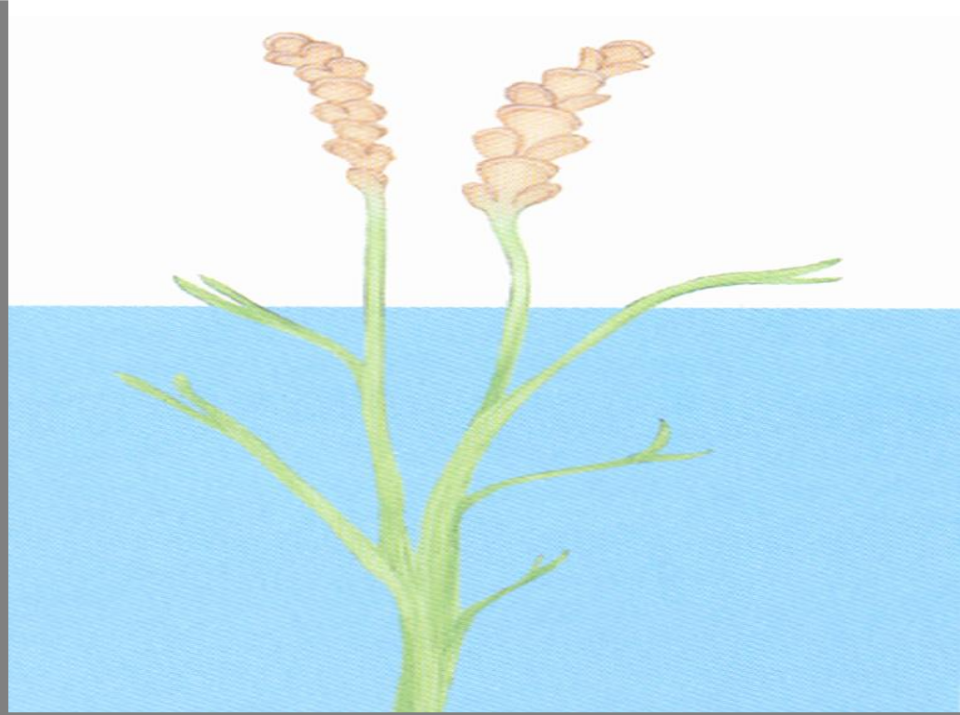
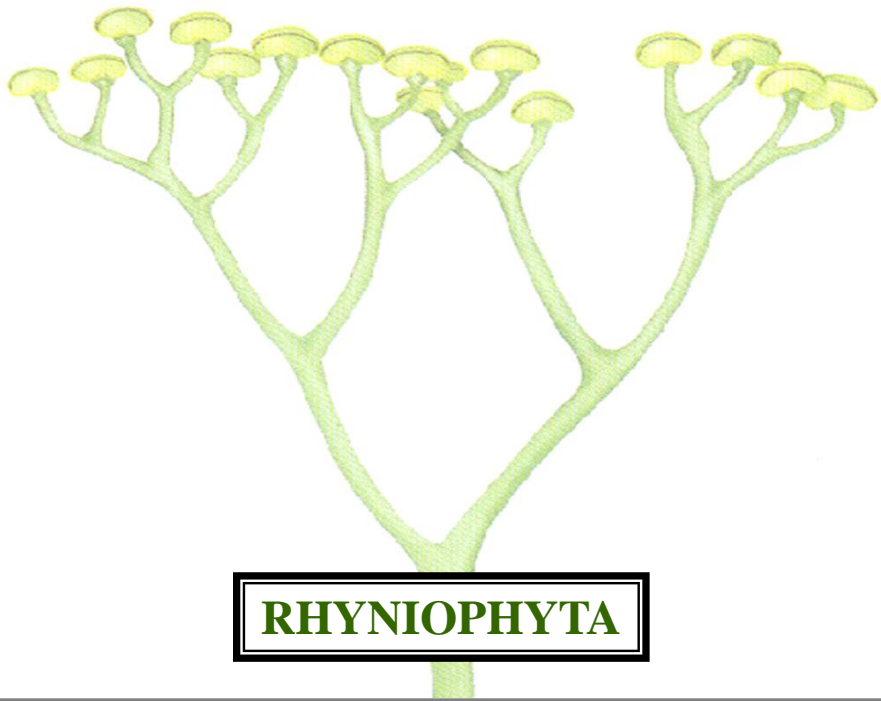
# PTERIDOPHYTE PHYLA

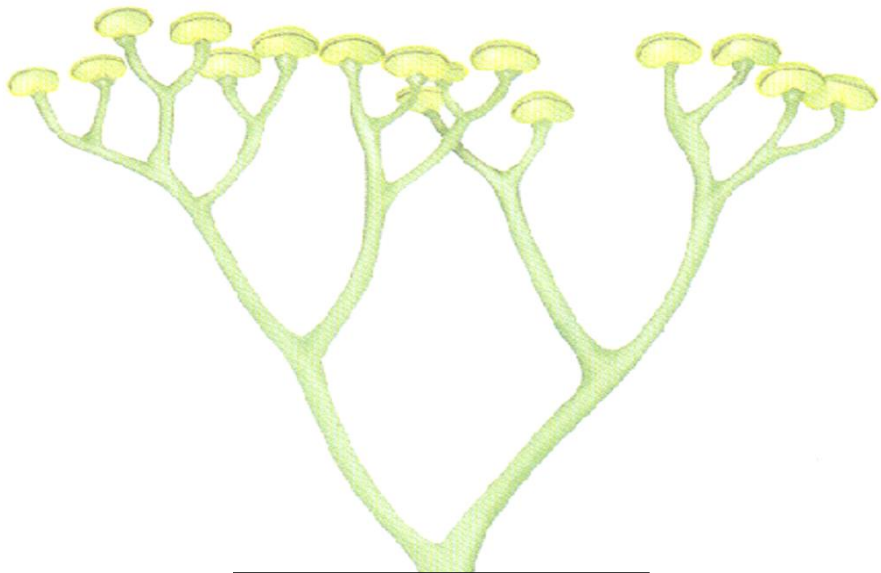




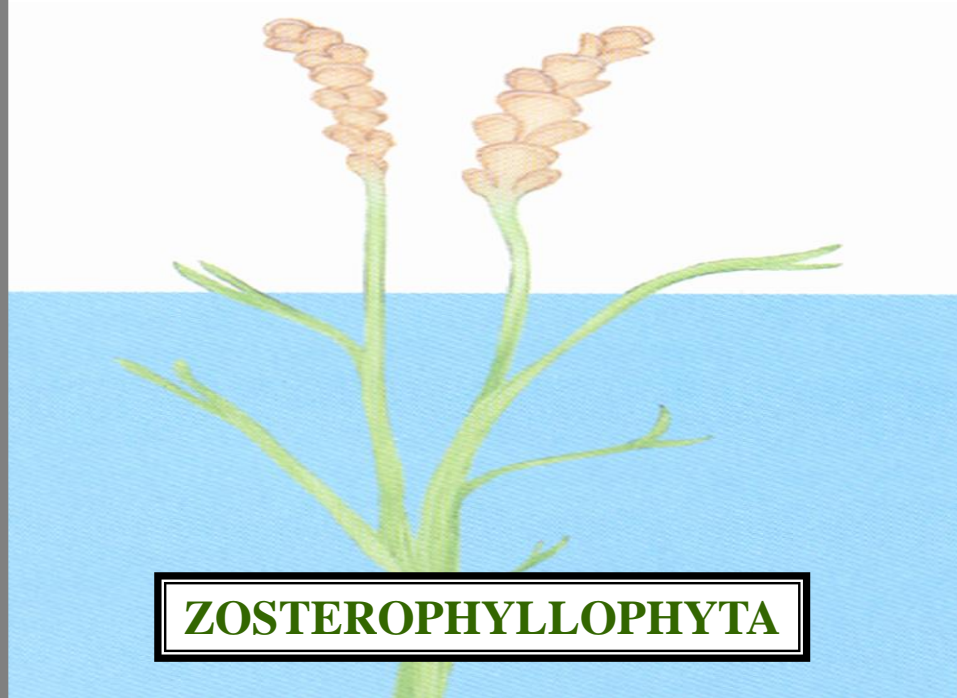
# EXTINCT PTERIDOPHYTE PHYLA







**RHYNIOPHYTA**



**ZOSTEROPHYLLOPHYTA**

