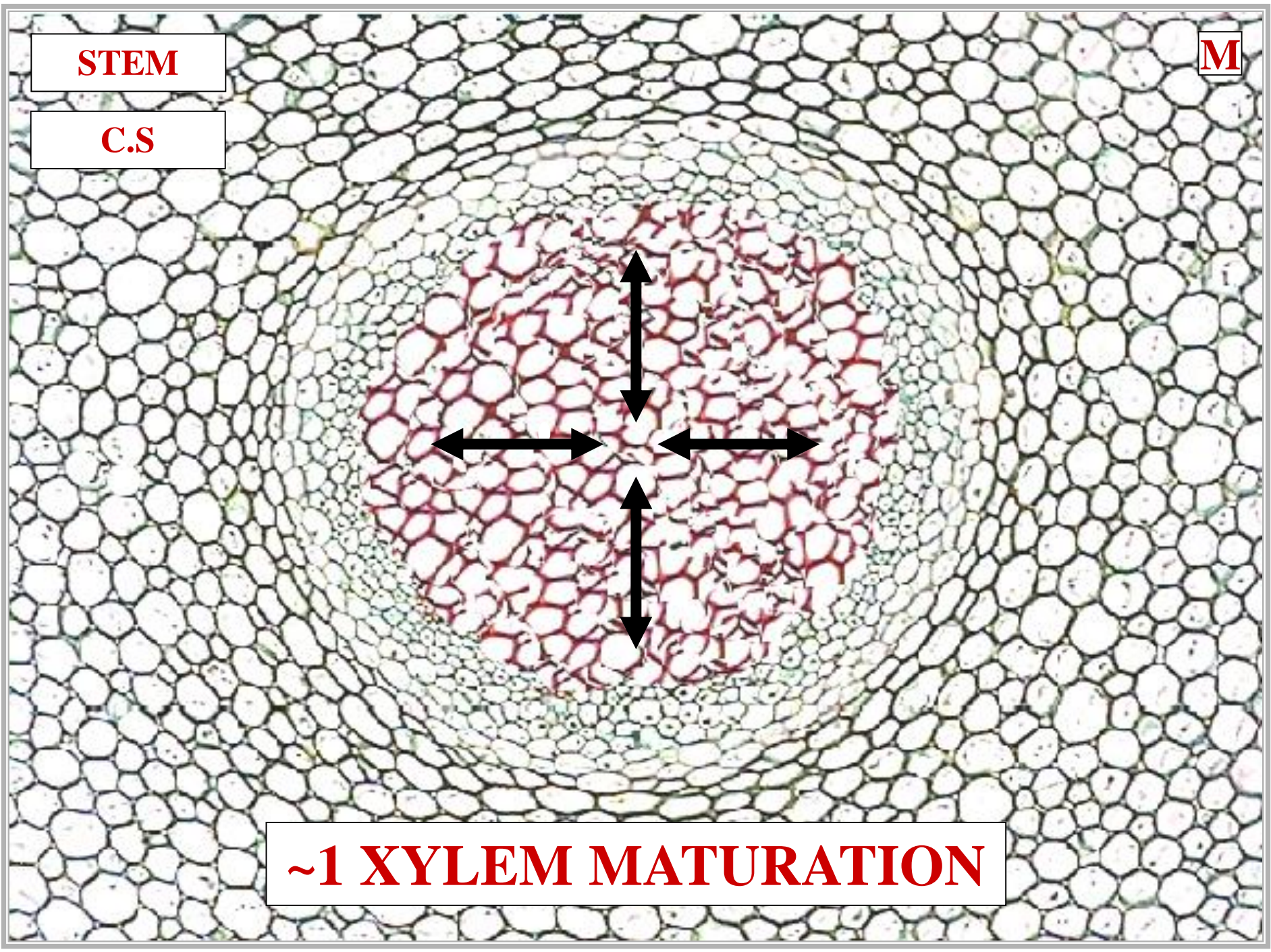


STEM

C.S

M

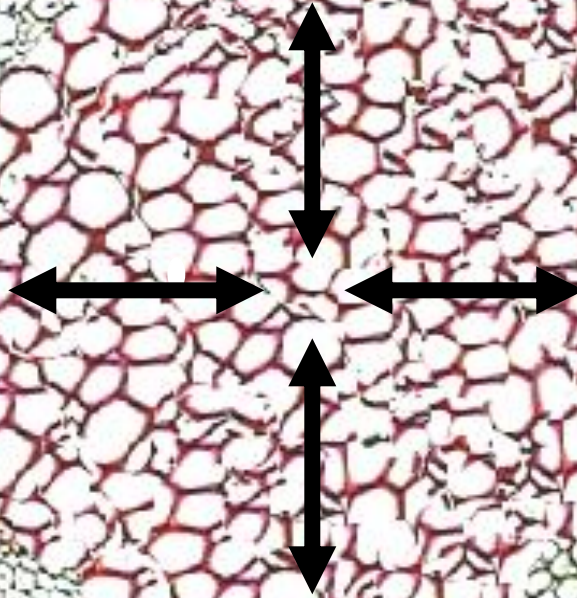
~1 XYLEM MATURATION



STEM

C.S

MESARCH



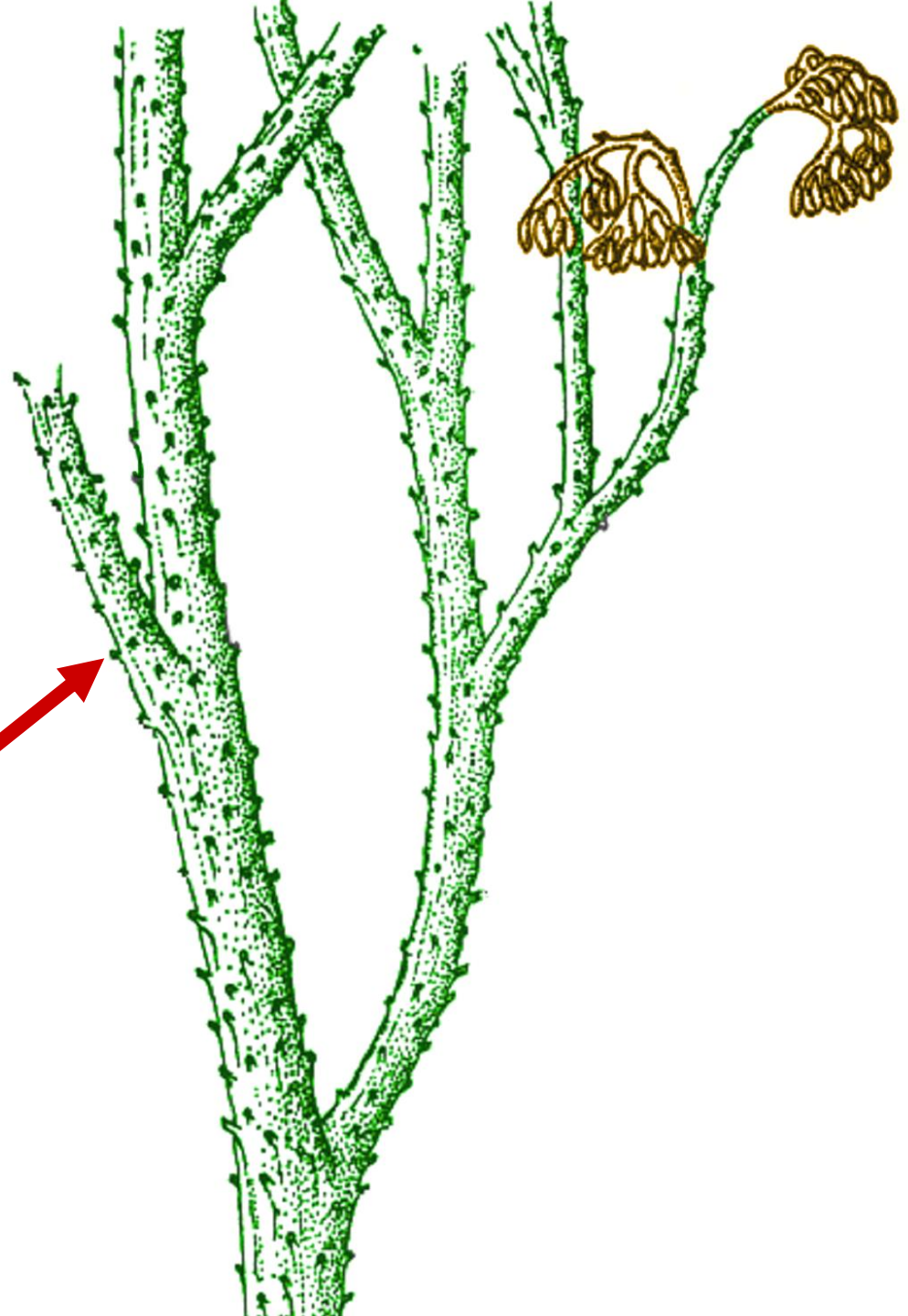


STEM MORPHOLOGY

TRIMEROPHYTON

E

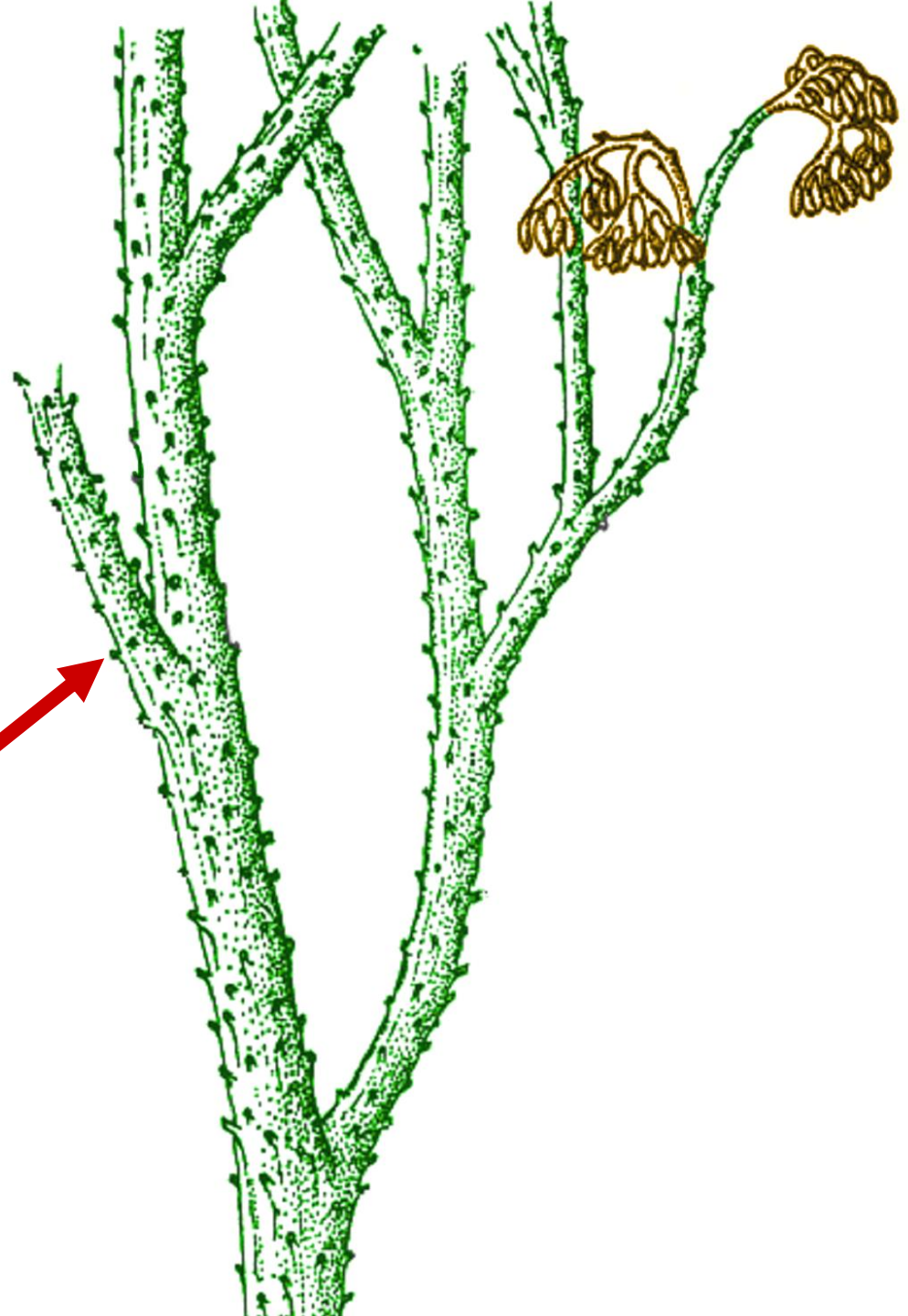
STEM



TRIMEROPHYTON

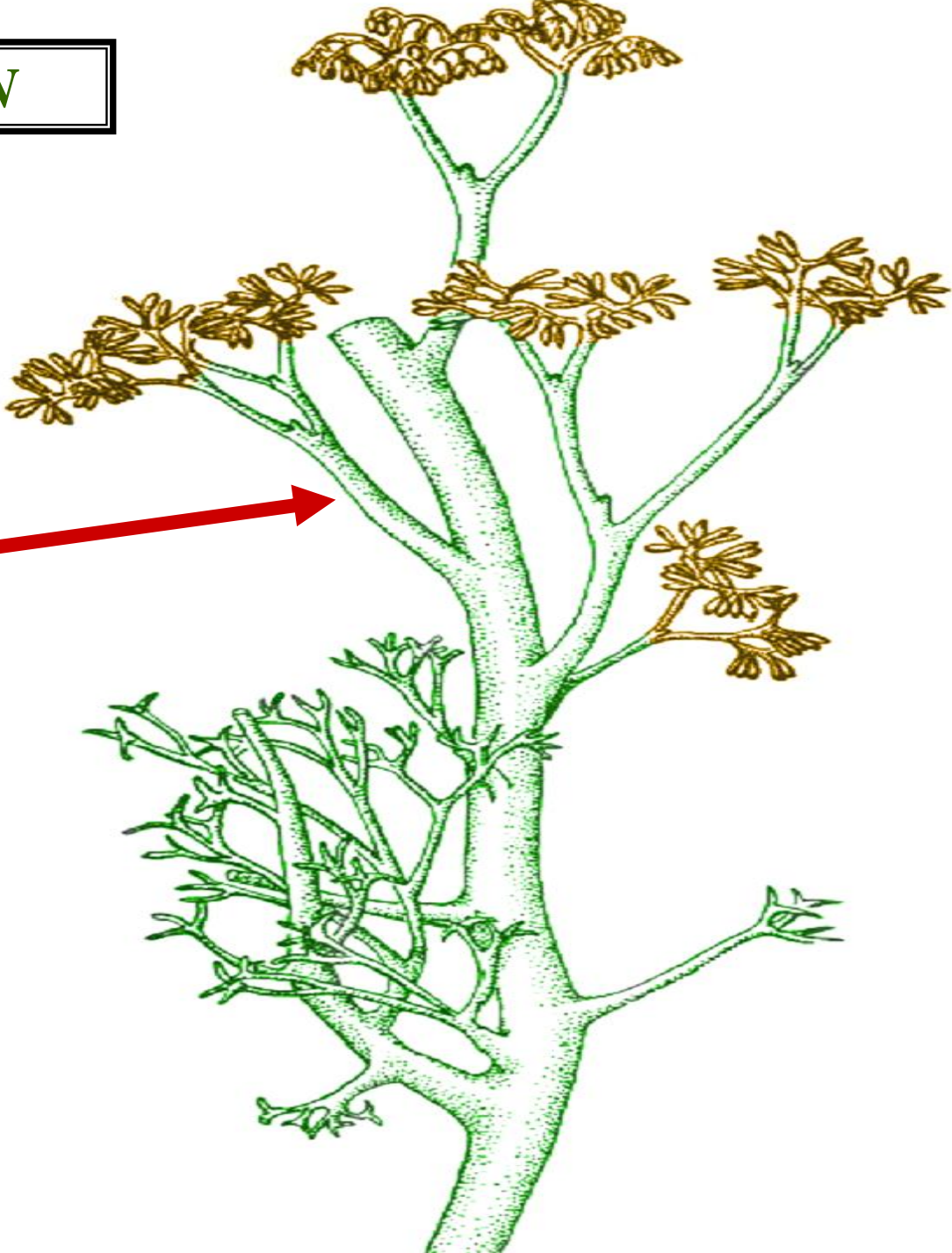
AB

**ENATIONS
PRESENT**



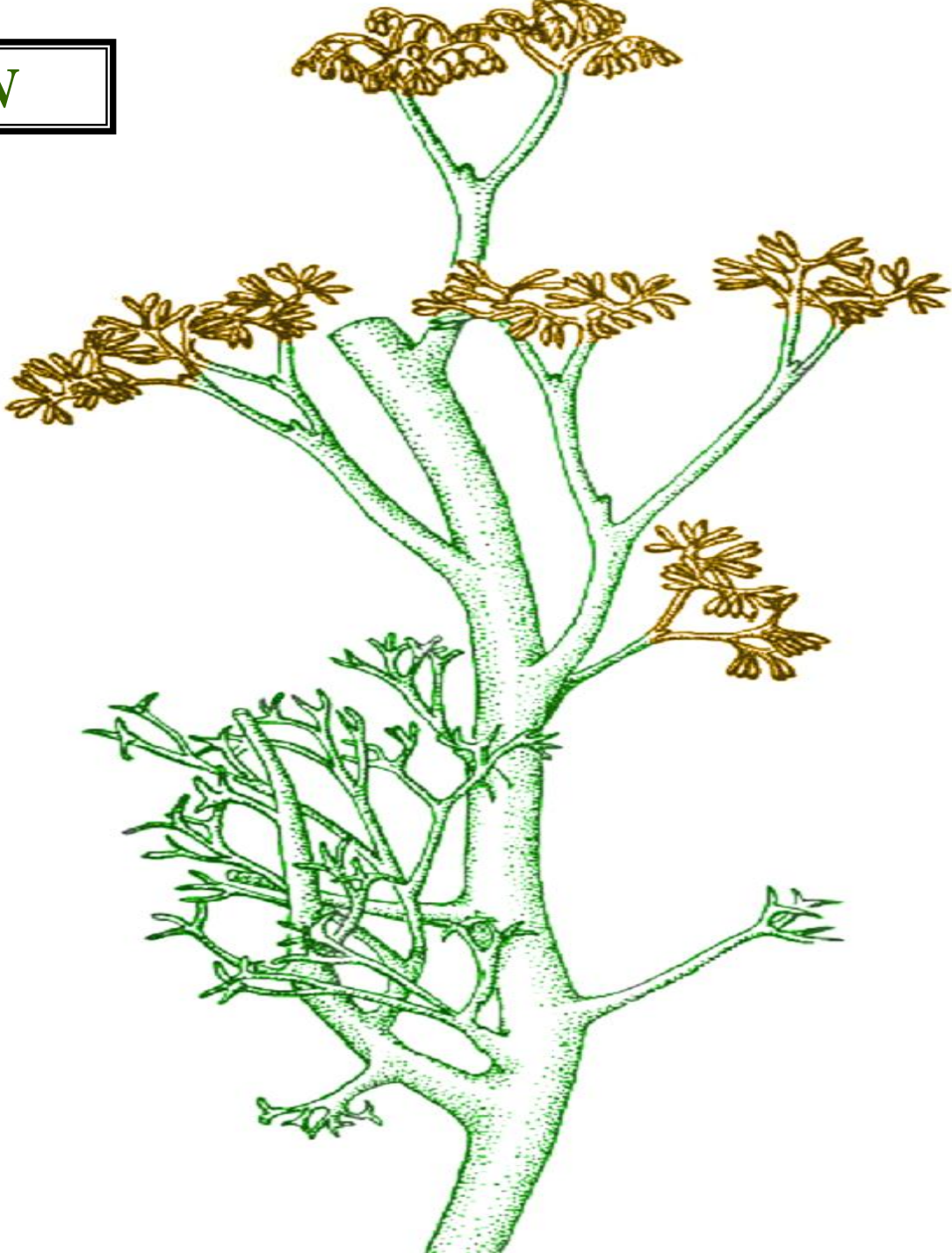
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**ENATIONS
ABSENT**



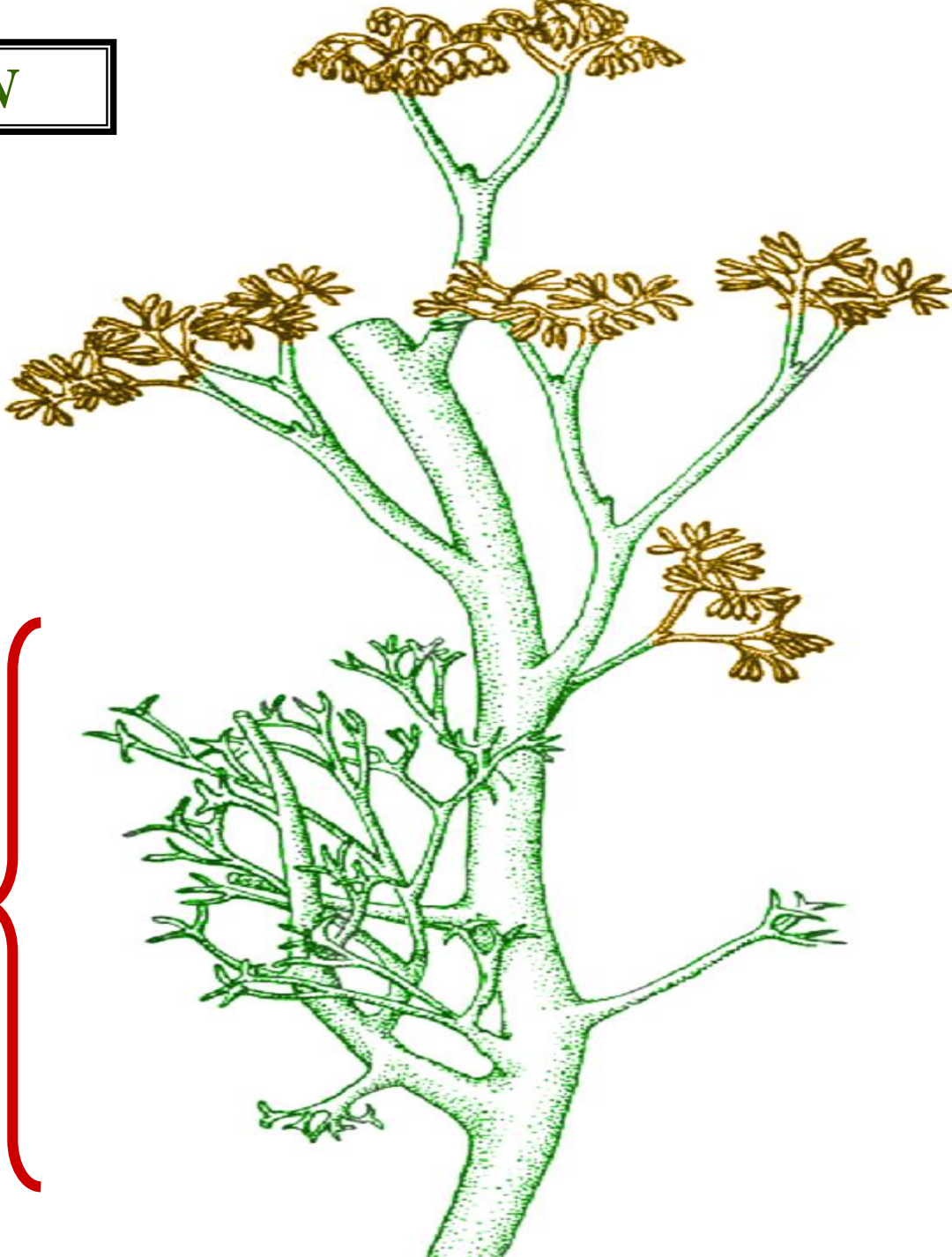
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**MONOPODIAL
BRANCHING**





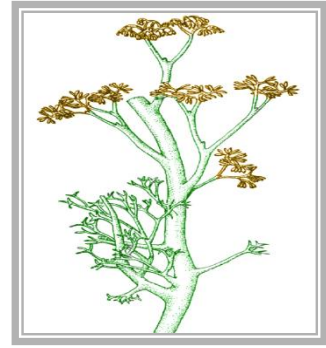
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**COMPLEX
TELOME**

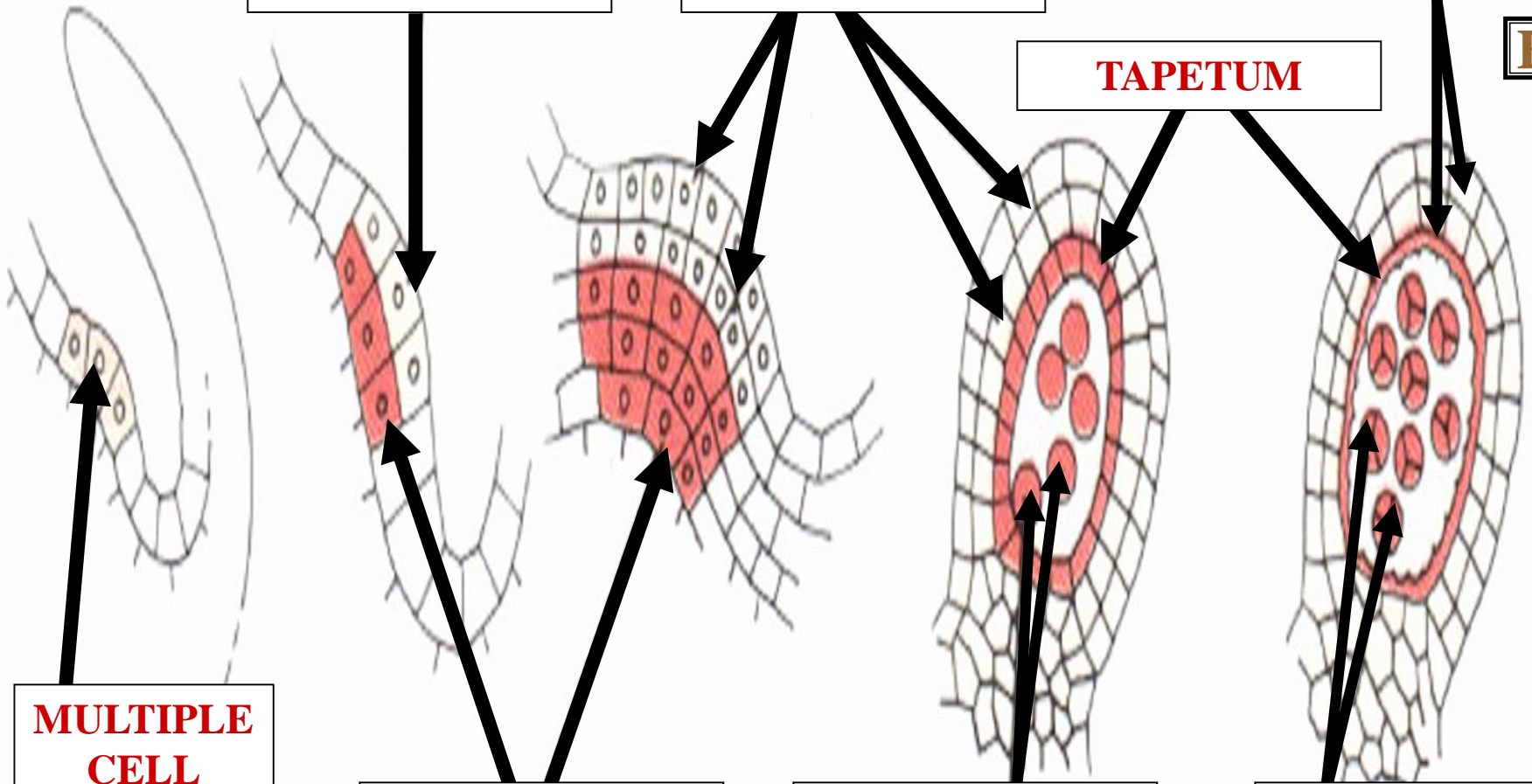


**COMPLEX
TELOME**





SPORANGIUM



WALL CELLS

WALL CELLS

LARGE SIZE

THICK WALL

E

TAPETUM

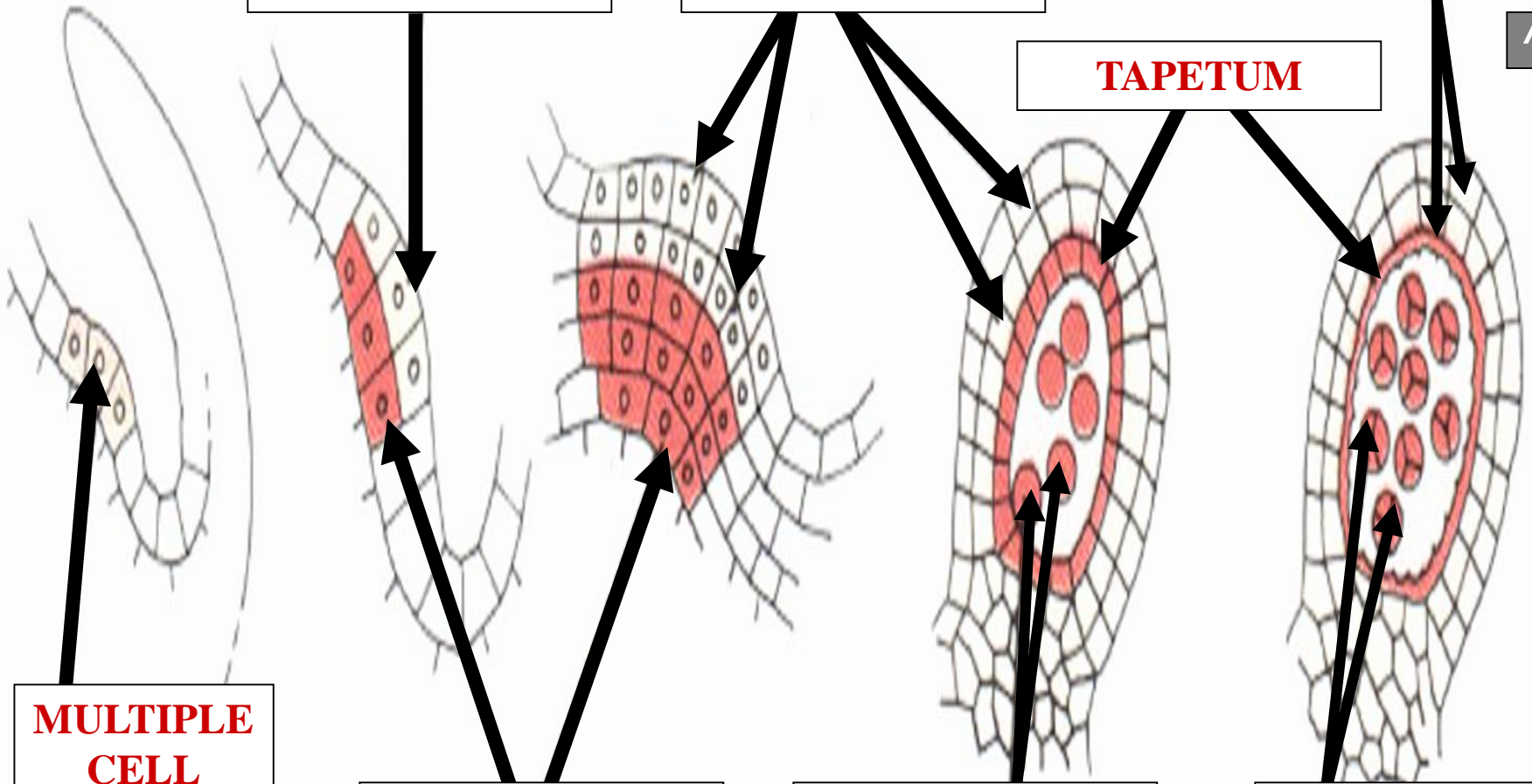
**MULTIPLE
CELL
INITIALS**

SPOROCYTES

SPOROCYTES

**NUMEROUS
SPORES**

L.S.



WALL CELLS

WALL CELLS

LARGE SIZE

THICK WALL

TAPETUM

**MULTIPLE
CELL
INITIALS**

SPOROCYTES

SPOROCYTES

**NUMEROUS
SPORES**

EUSPORANGIUM

L.S.



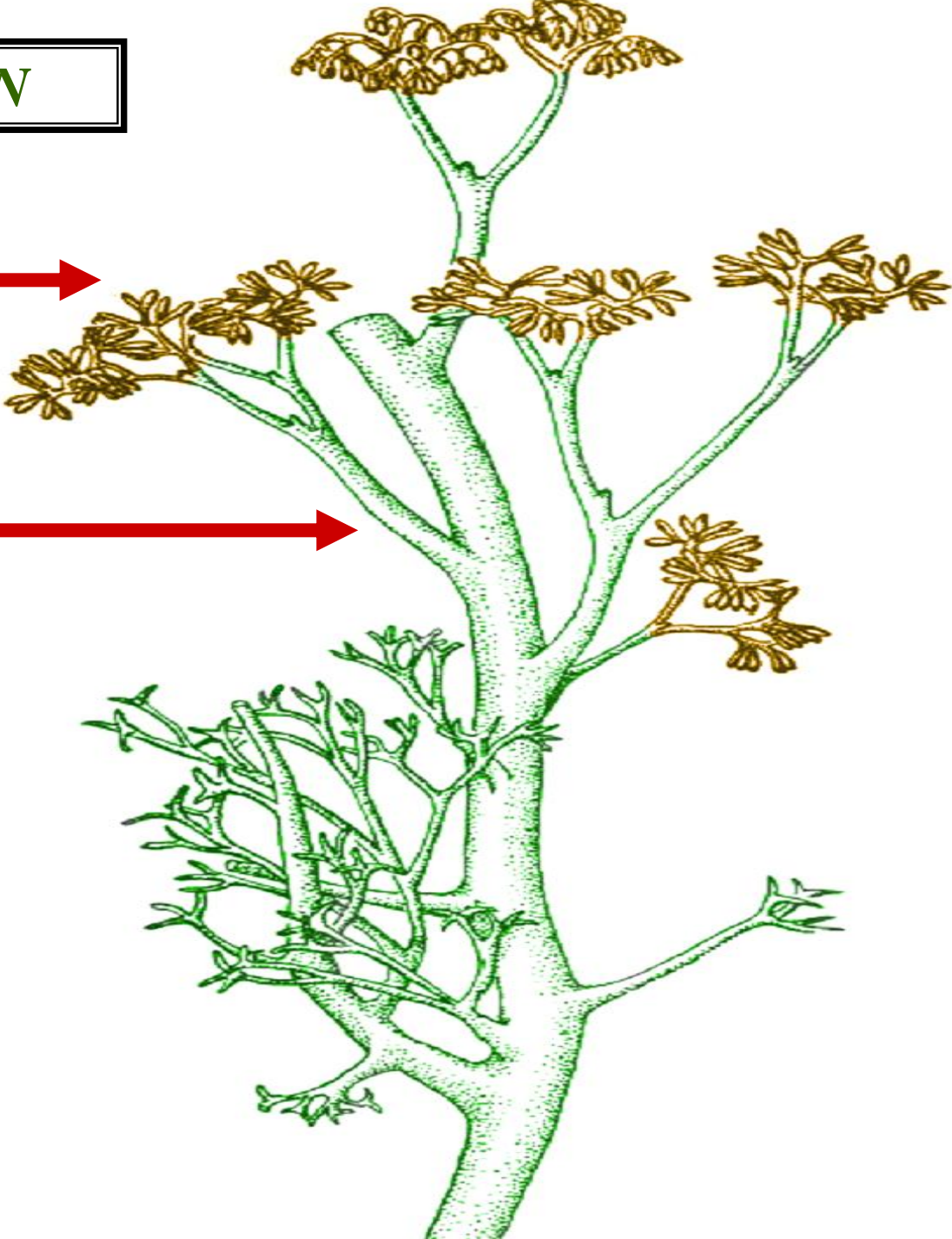
SPORANGIUM POSITION

PSILOPHYTON

EUSPORANGIA



STEM

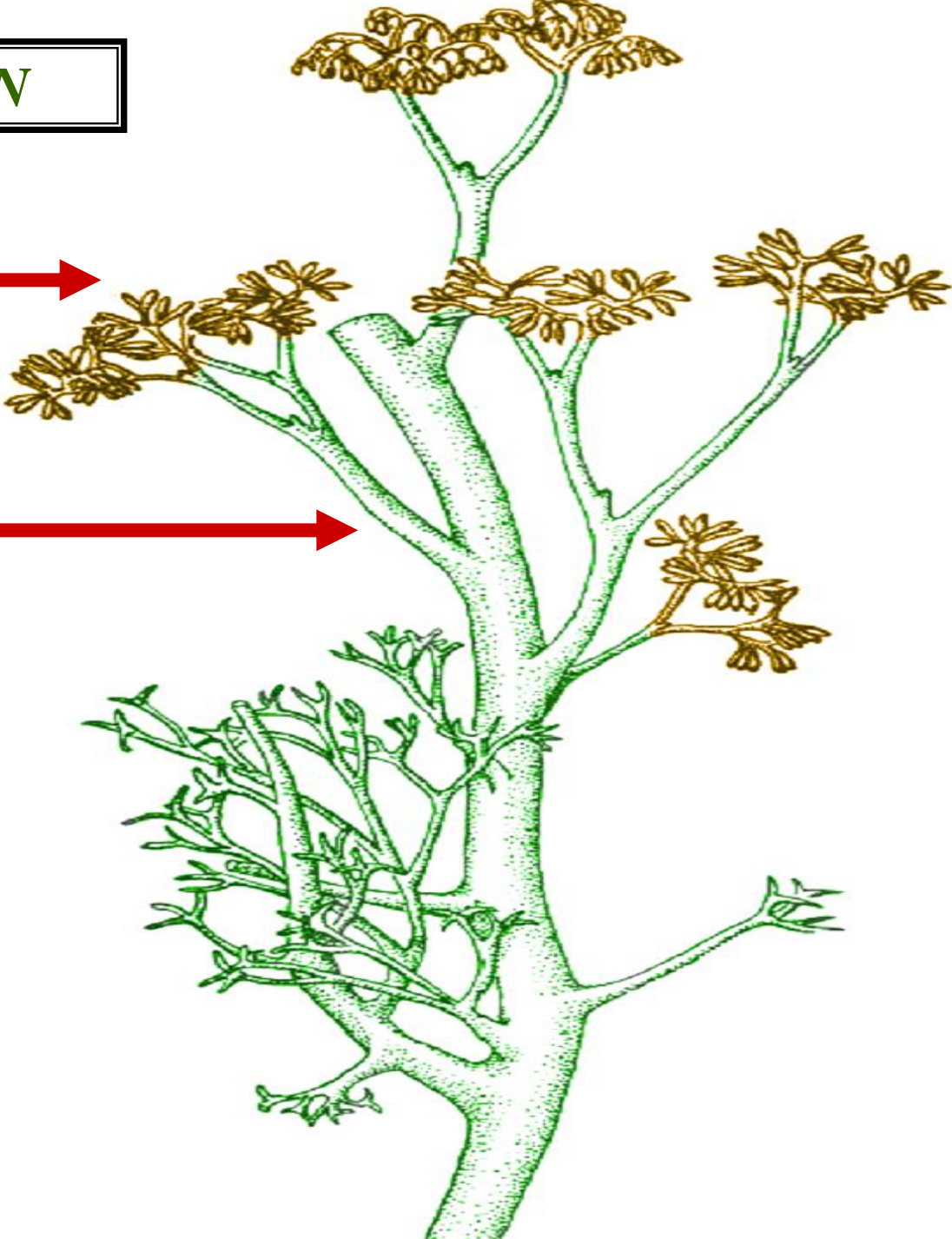


PSILOPHYTON

EUSPORANGIA



CAULINE



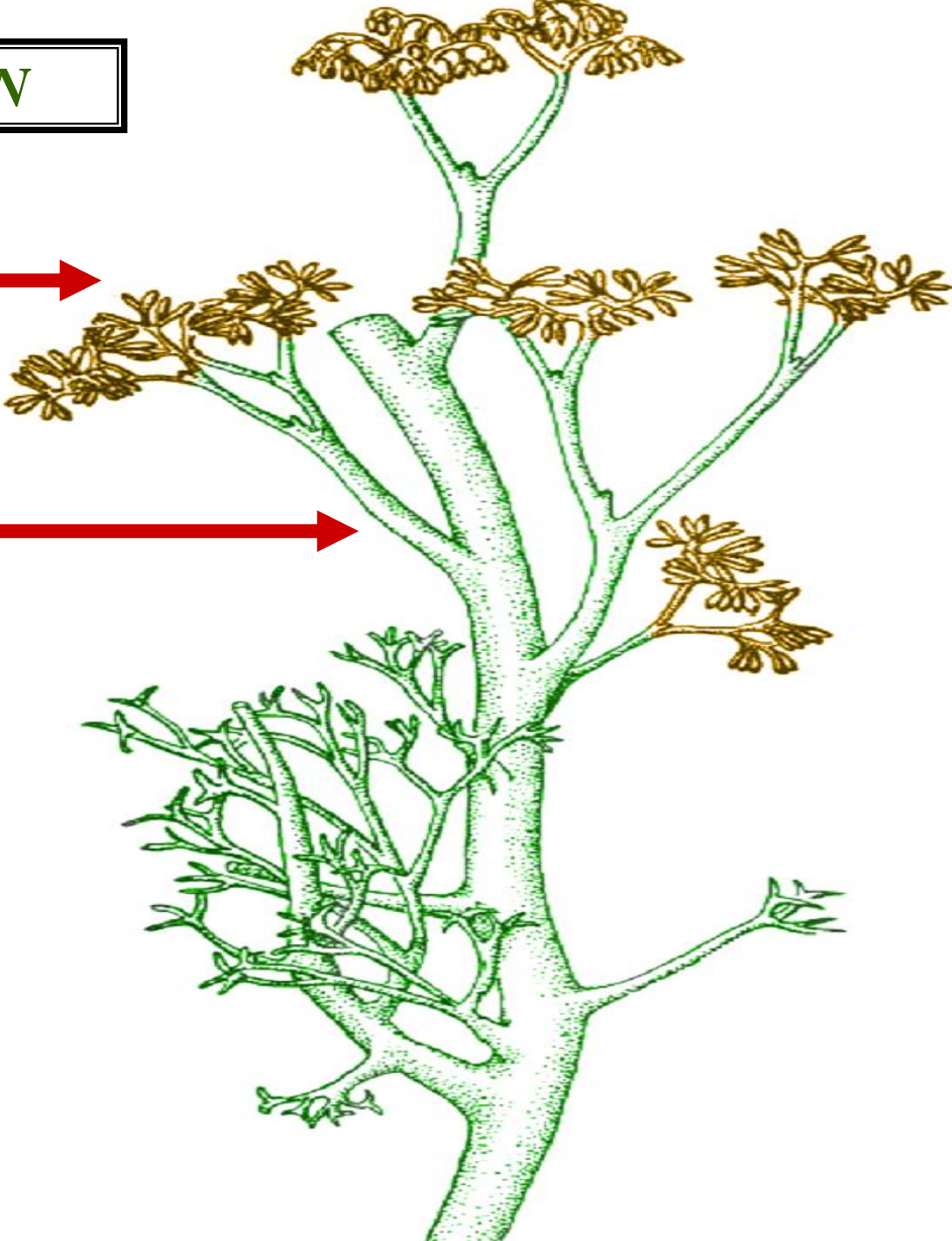


PSILOPHYTON

**EUSPORANGIA
TERMINAL
CLUSTERS**



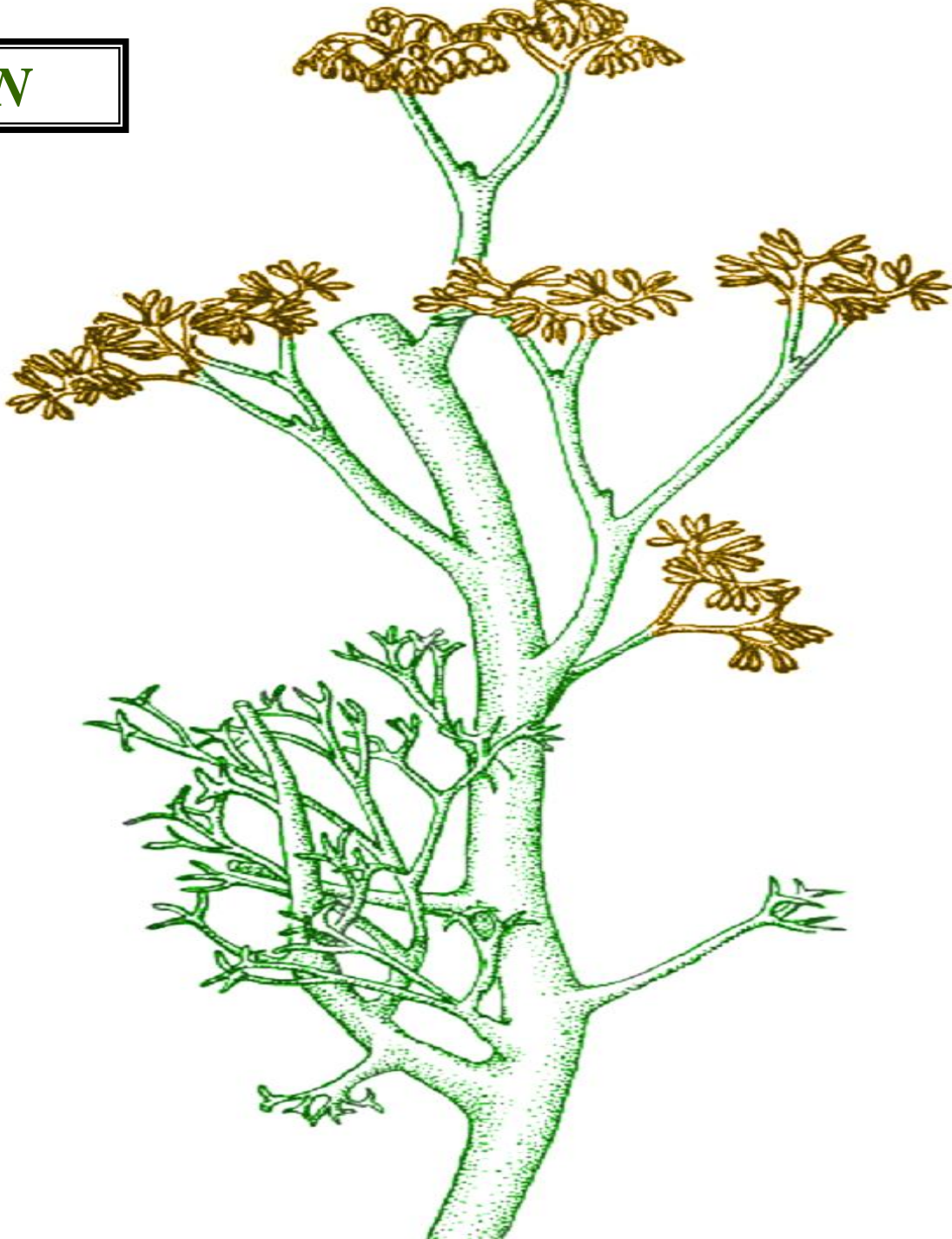
CAULINE



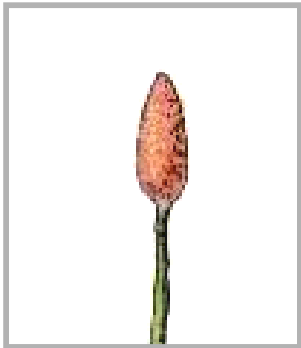


SPORANGIUM SHAPE

PSILOPHYTON



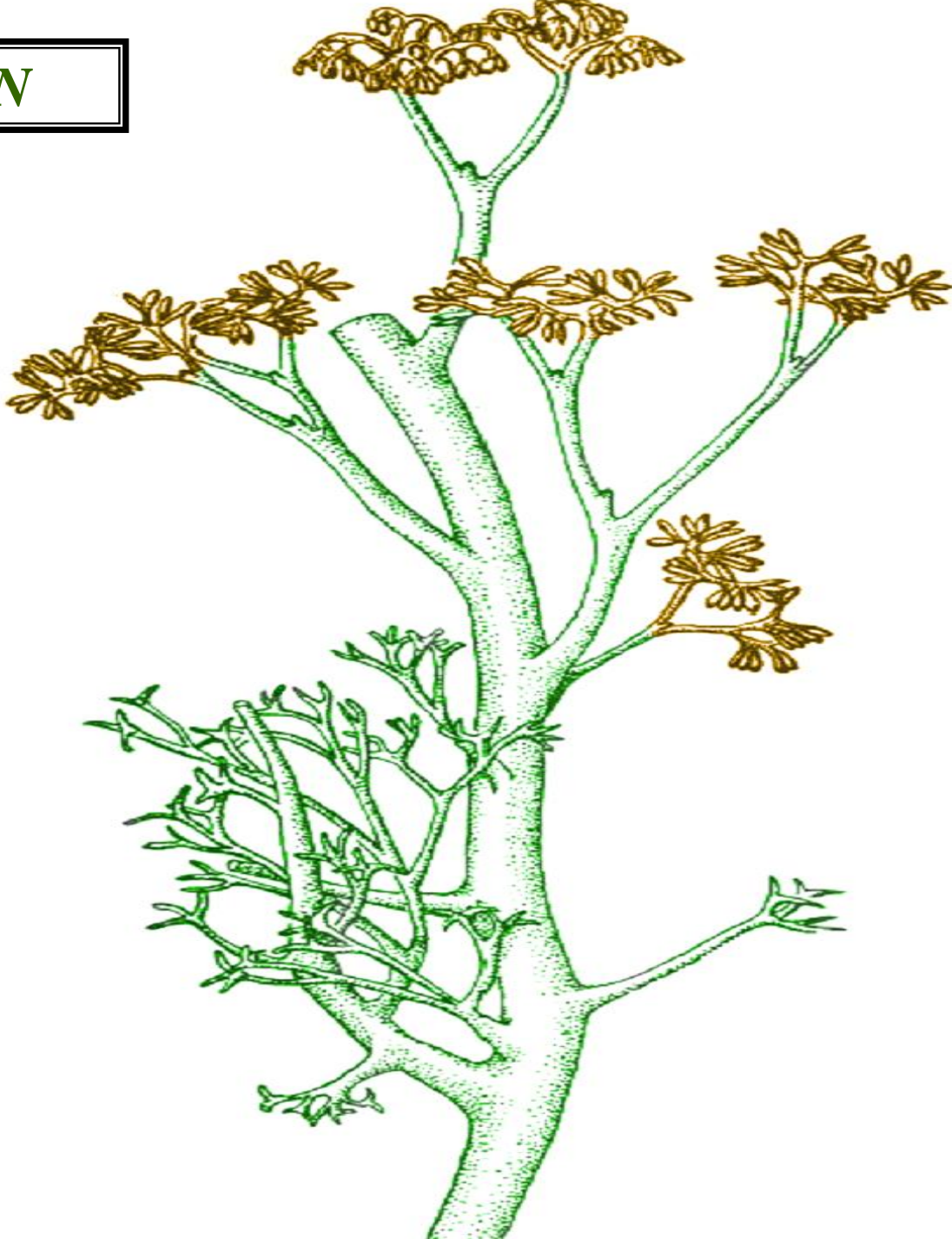
**EUSPORANGIA
TERMINAL
CLUSTER**



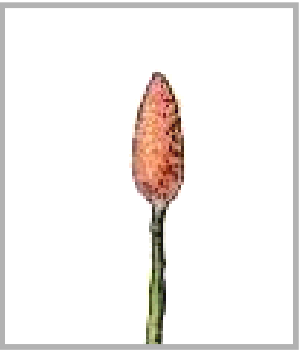
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PSILOPHYTON



**EUSPORANGIA
TERMINAL
CLUSTER**

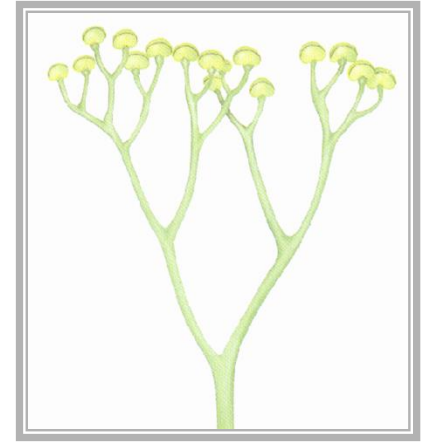


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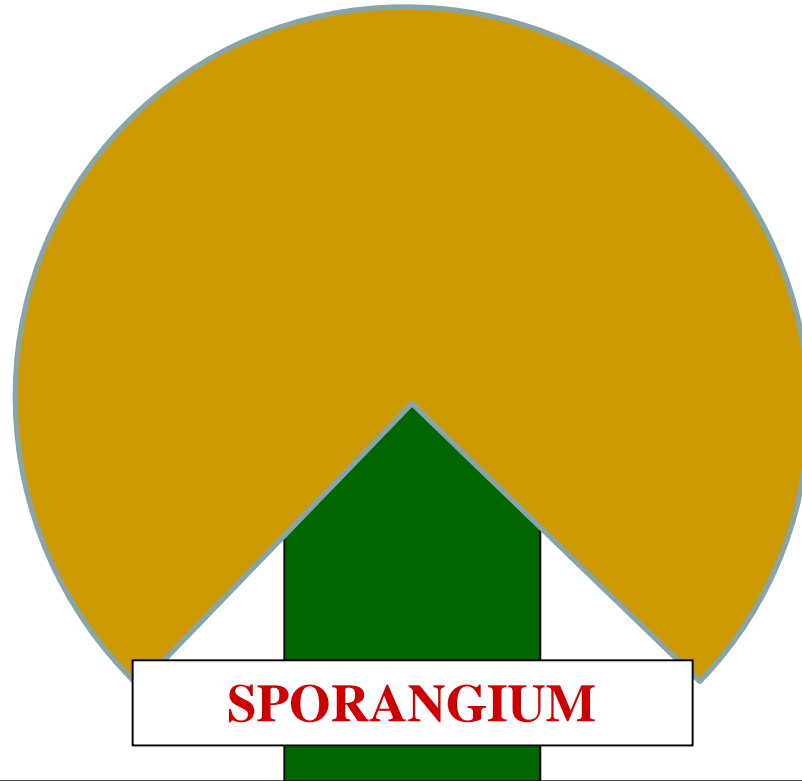


SPORANGIUM DEHISCENCE

DEHISCENCE



T

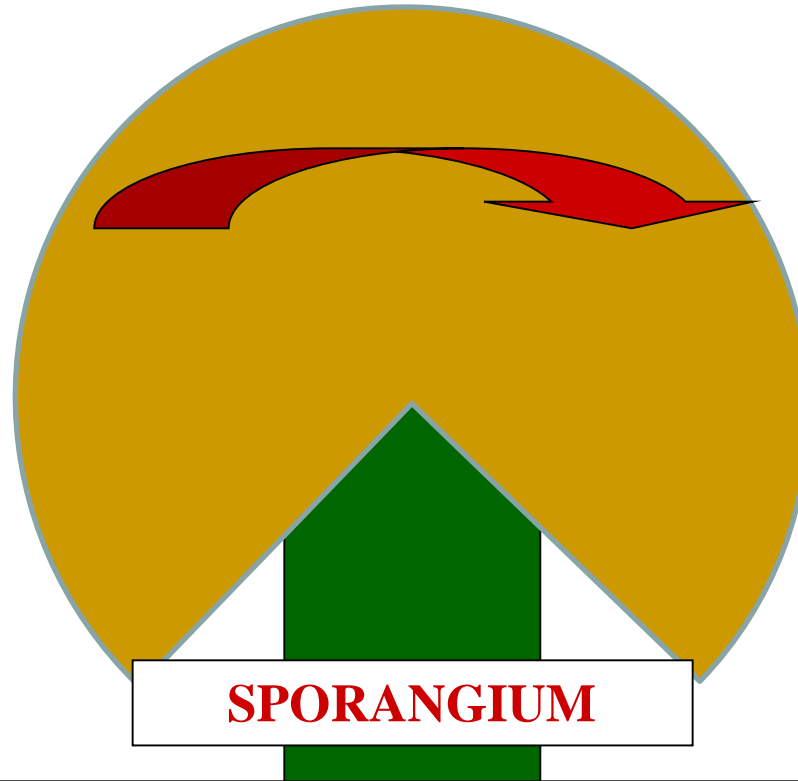
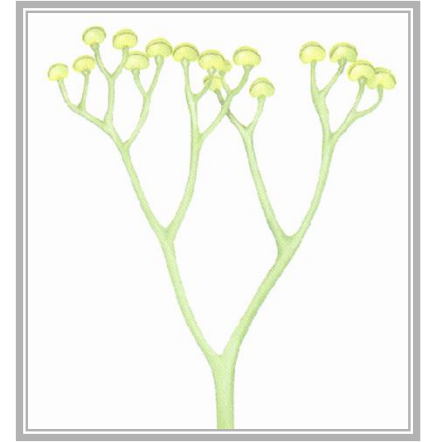


SPORANGIUM

RHYNIOPHYTES

ZOSTEROPHYTES

**TRANSVERSE
DEHISCENCE**

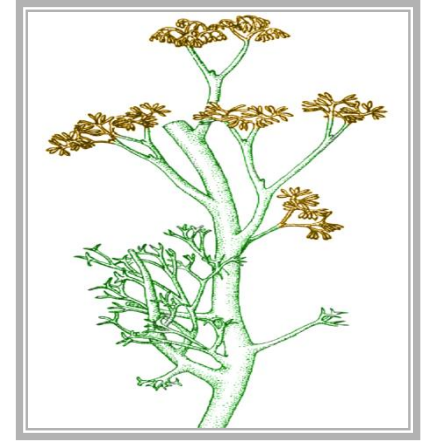


SPORANGIUM

RHYNIOPHYTES

ZOSTEROPHYTES

DEHISCENCE

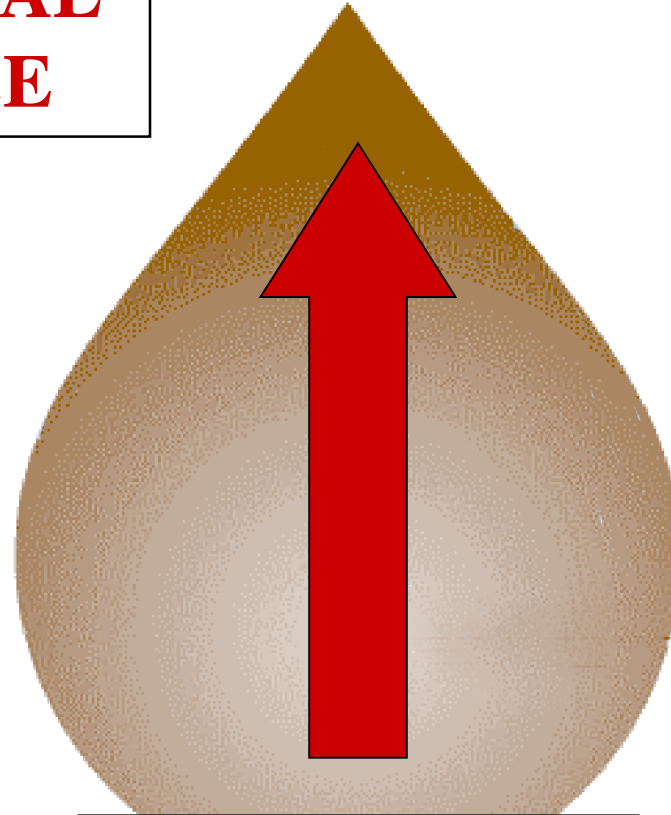


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SPORANGIUM

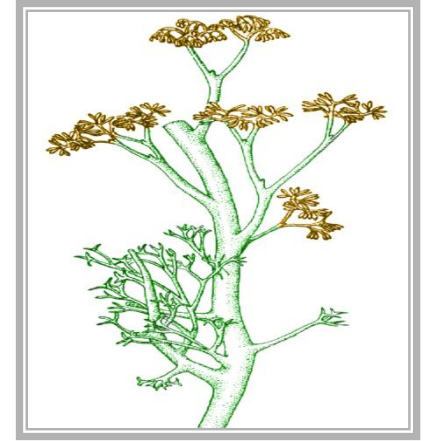
TRIMEROPHYTES

**LONGITUDINAL
DEHISCENCE**



SPORANGIUM

TRIMEROPHYTES



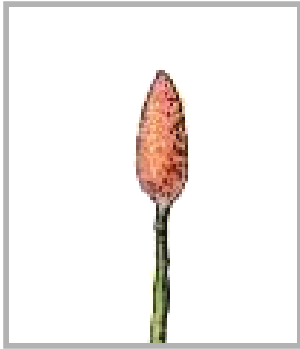
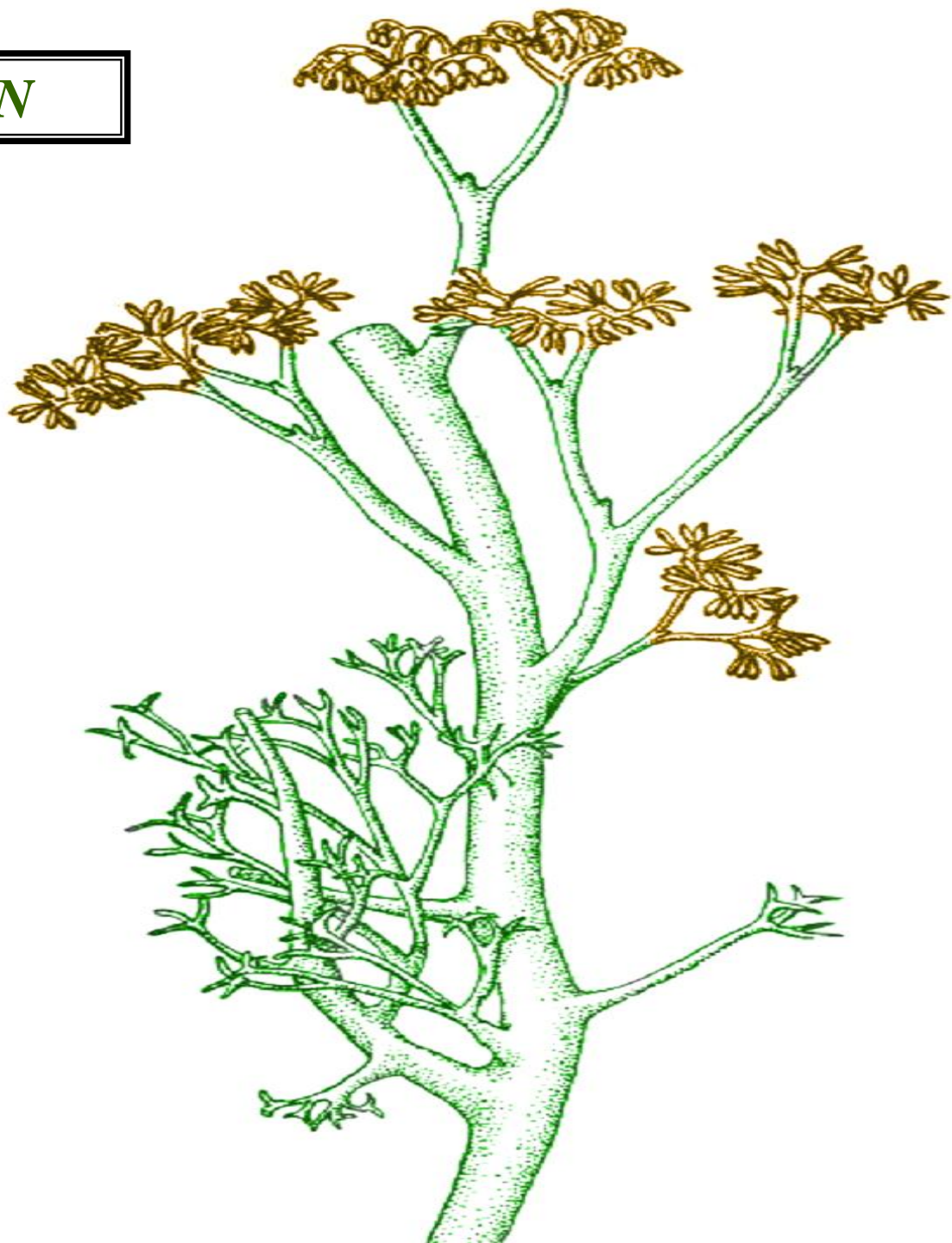
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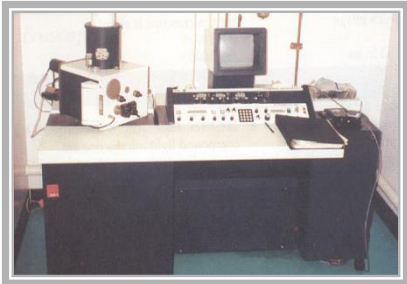
REPRODUCTION



PSILOPHYTON



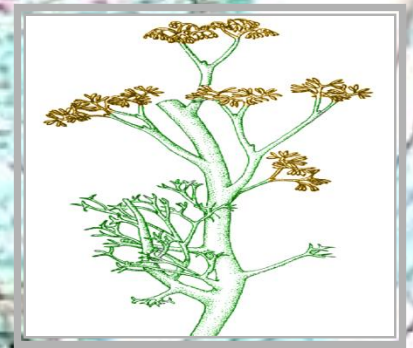
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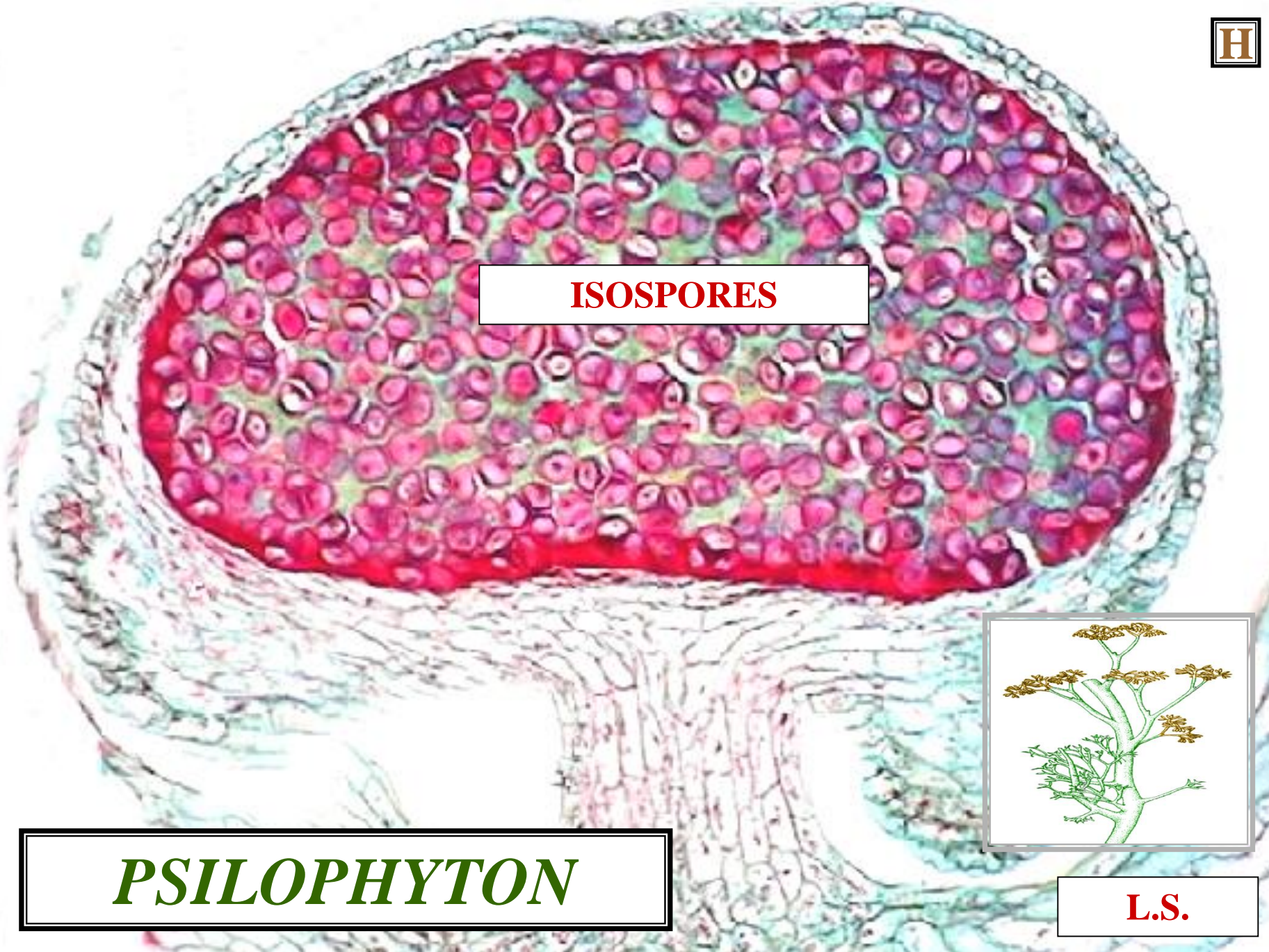
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SPORES

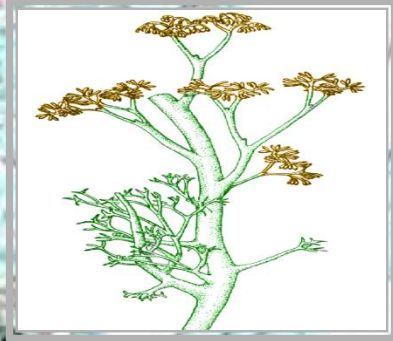
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L.S.



ISOSPORES



PSILOPHYTON

L.S.

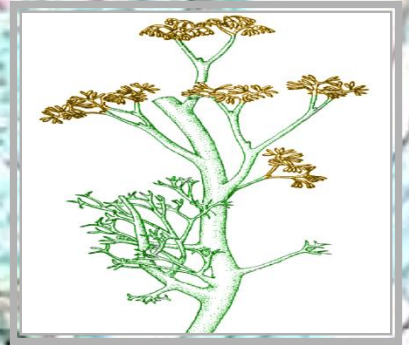
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ISOSPORES

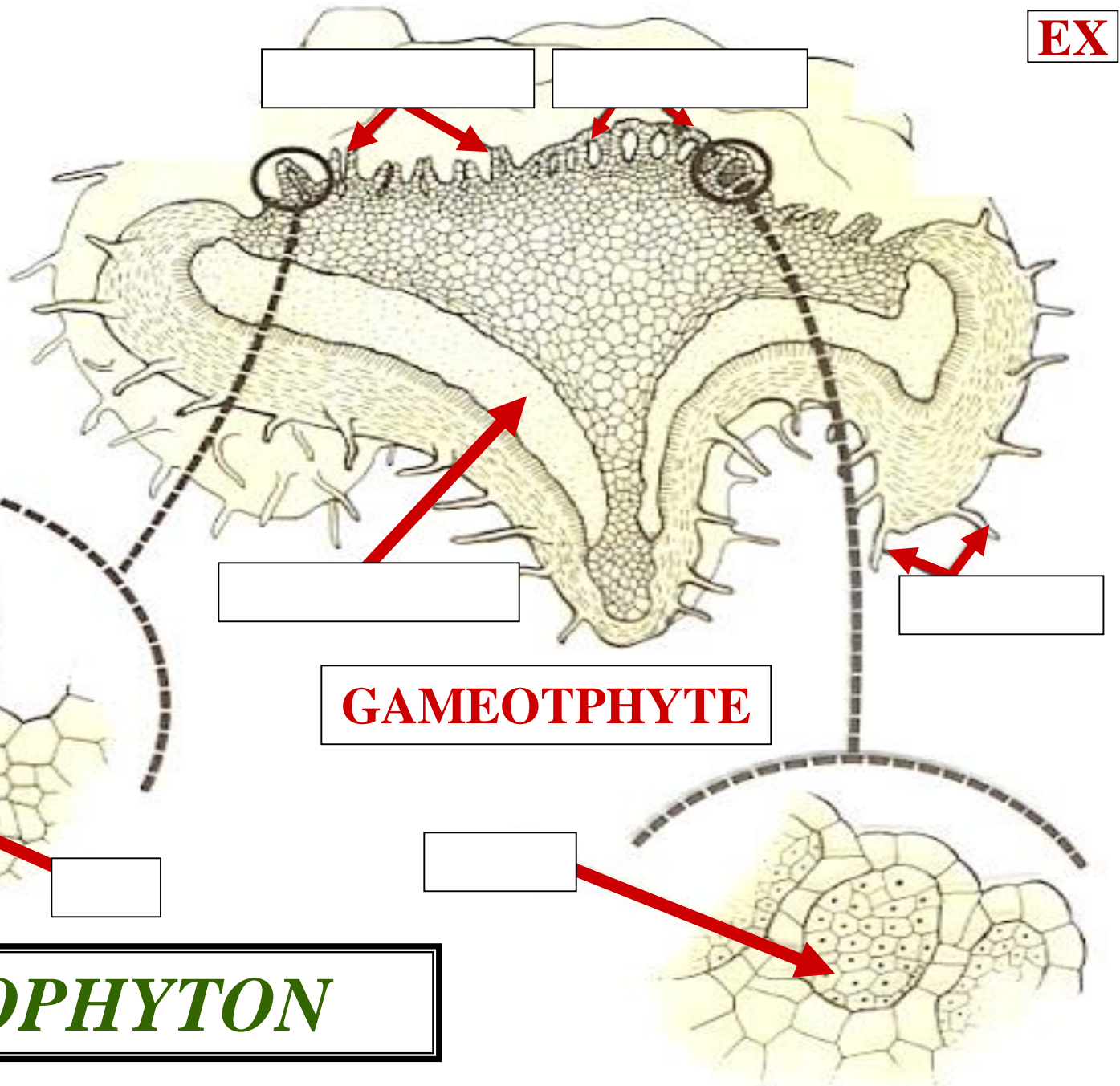
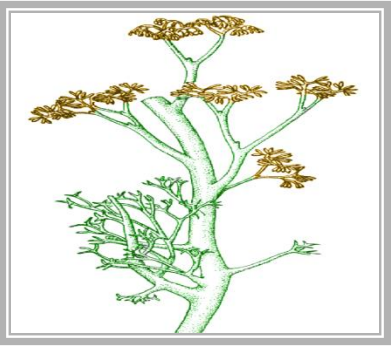
HOMOSPOROUS

PSILOPHYTON



L.S.

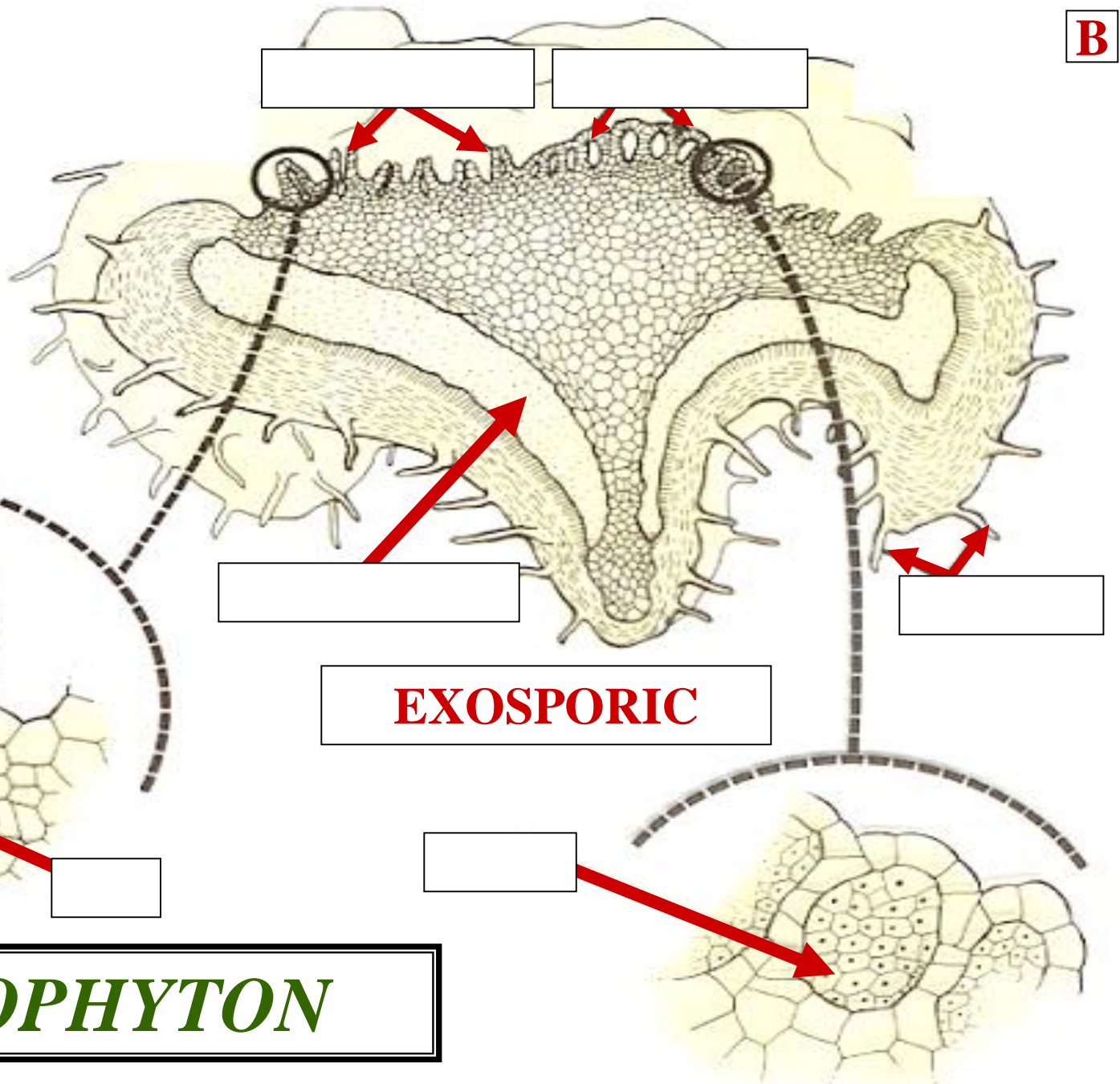
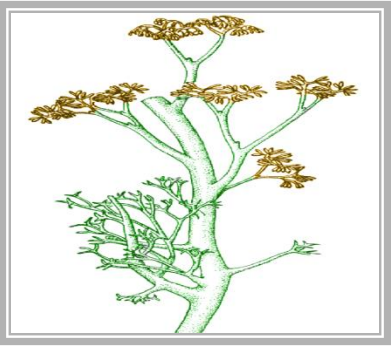
EX



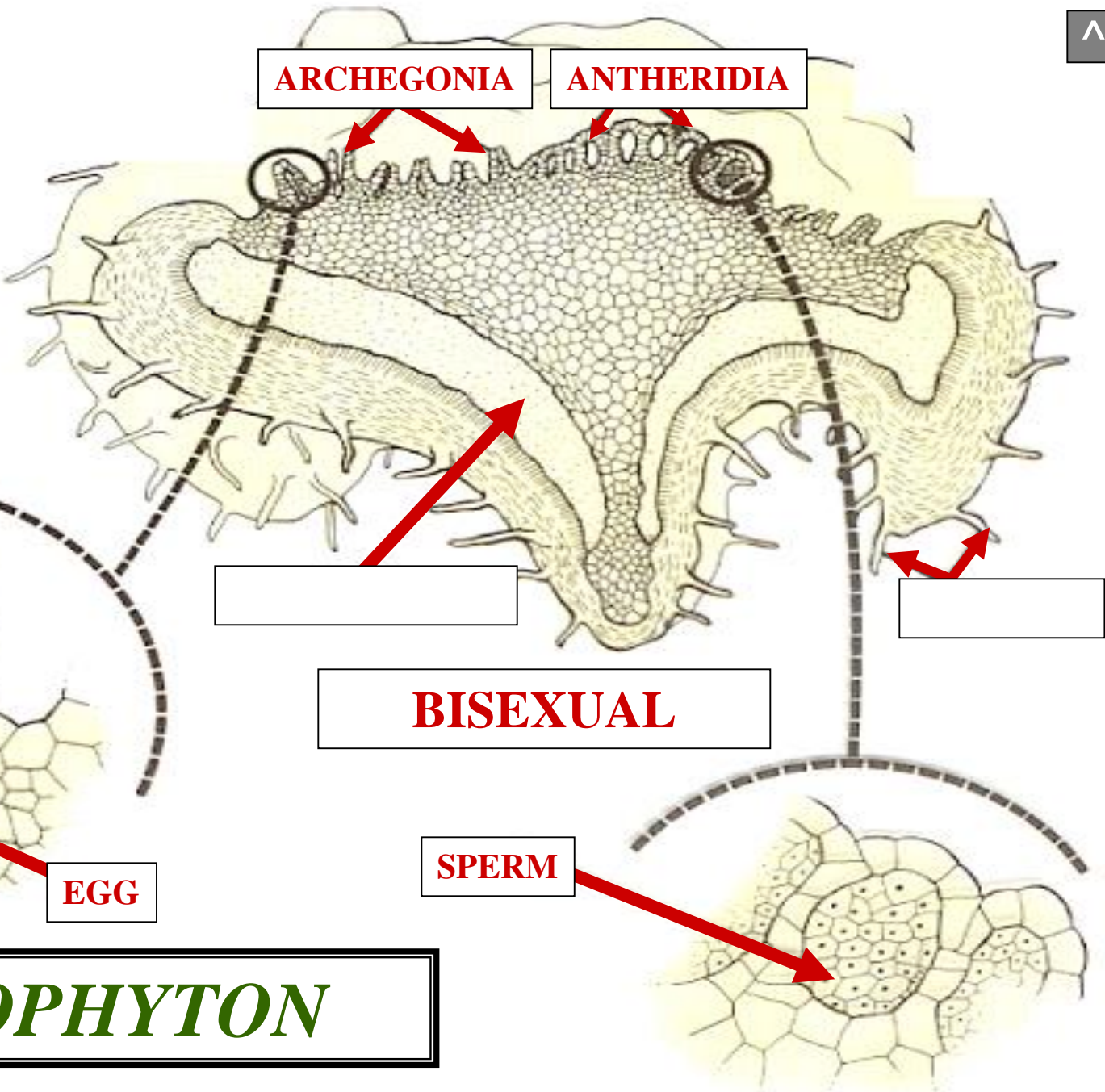
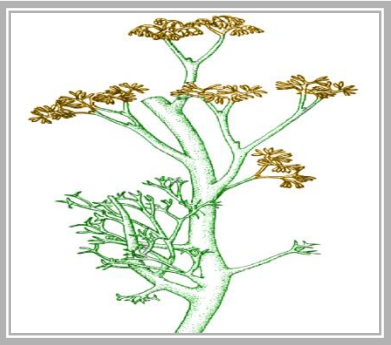
GAMEOTYPHYTE

PSILOPHYTON

B



PSILOPHYTON



ARCHEGONIA

ANTHERIDIA

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[Empty box]

BISEXUAL

EGG

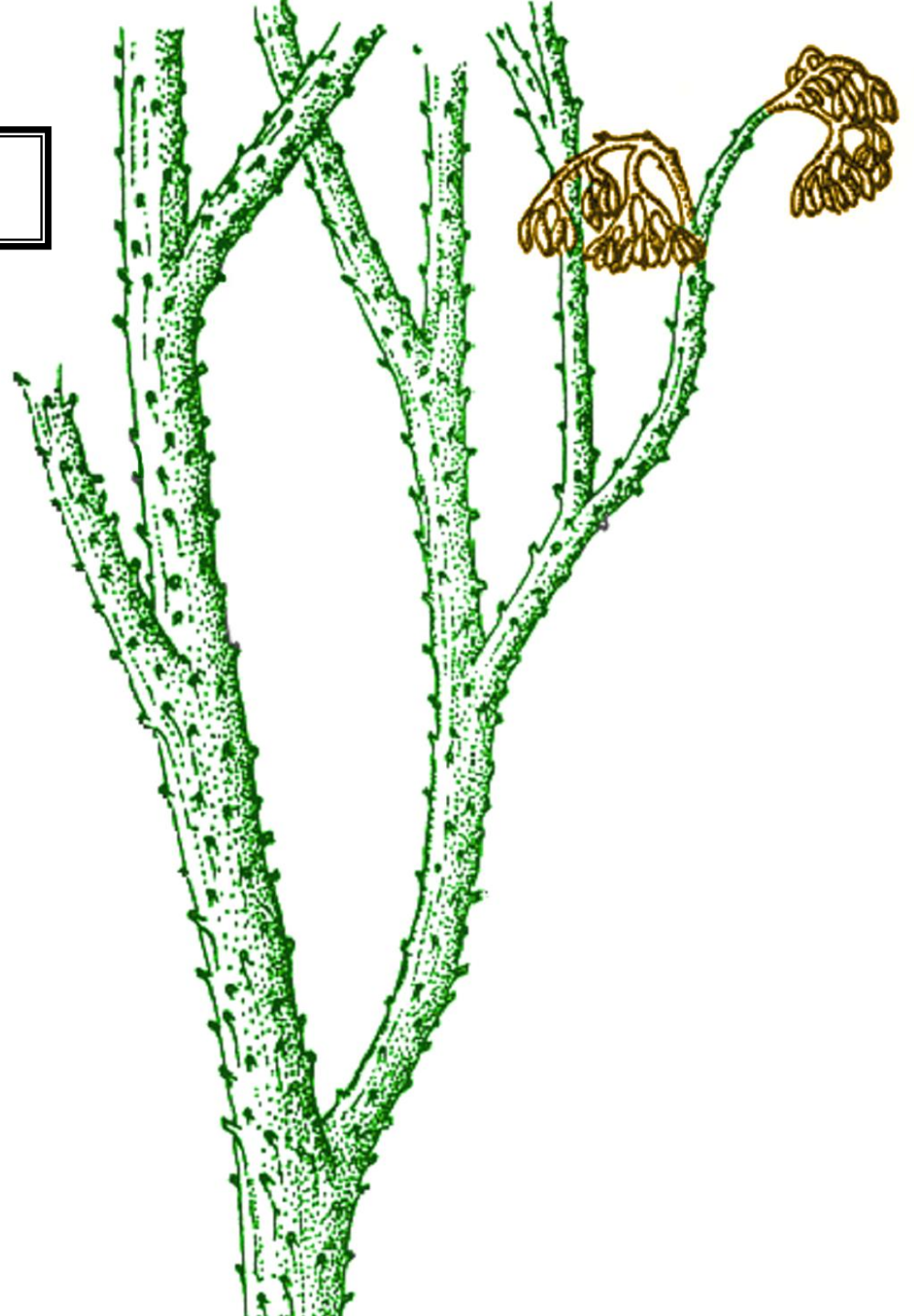
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PSILOPHYTON

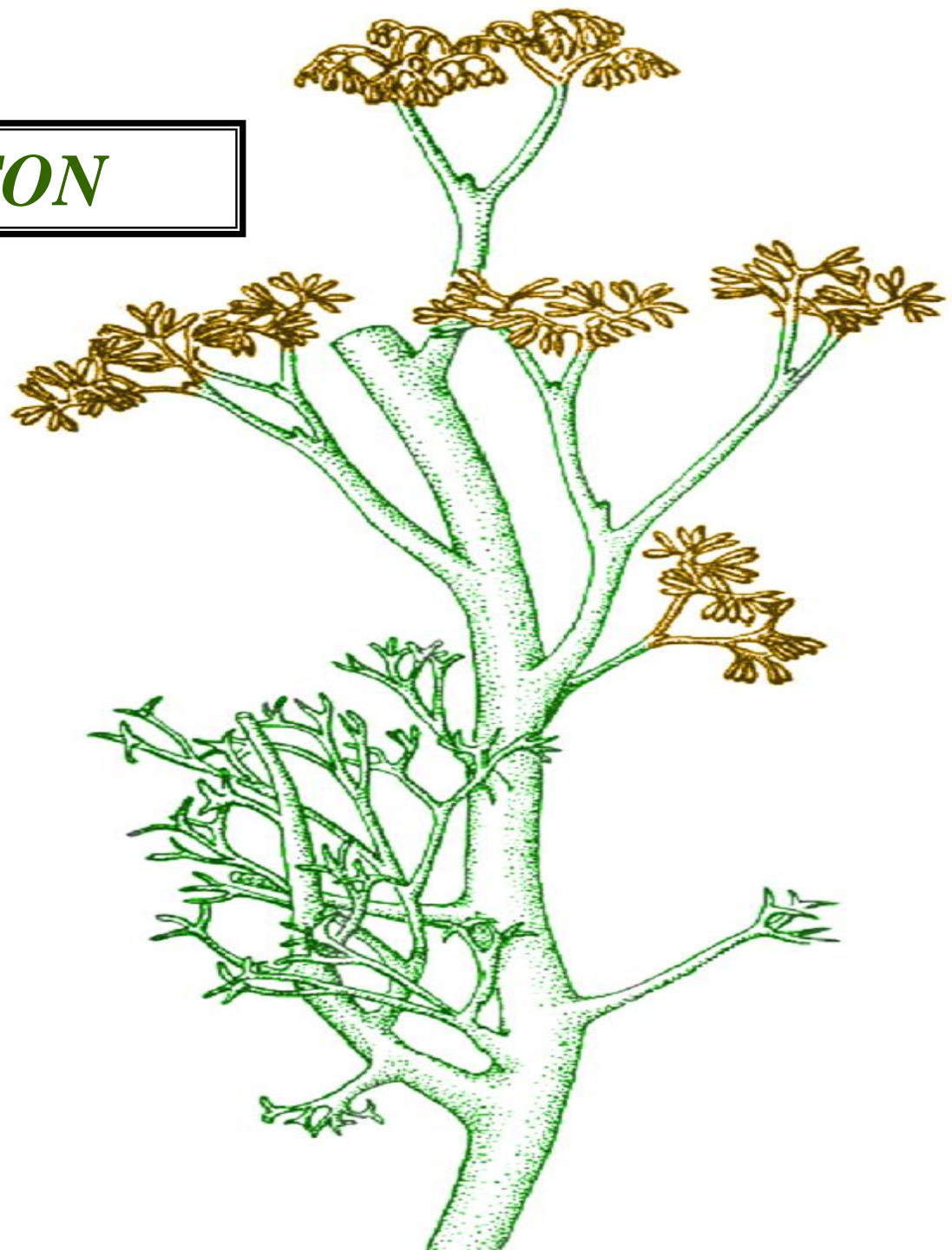


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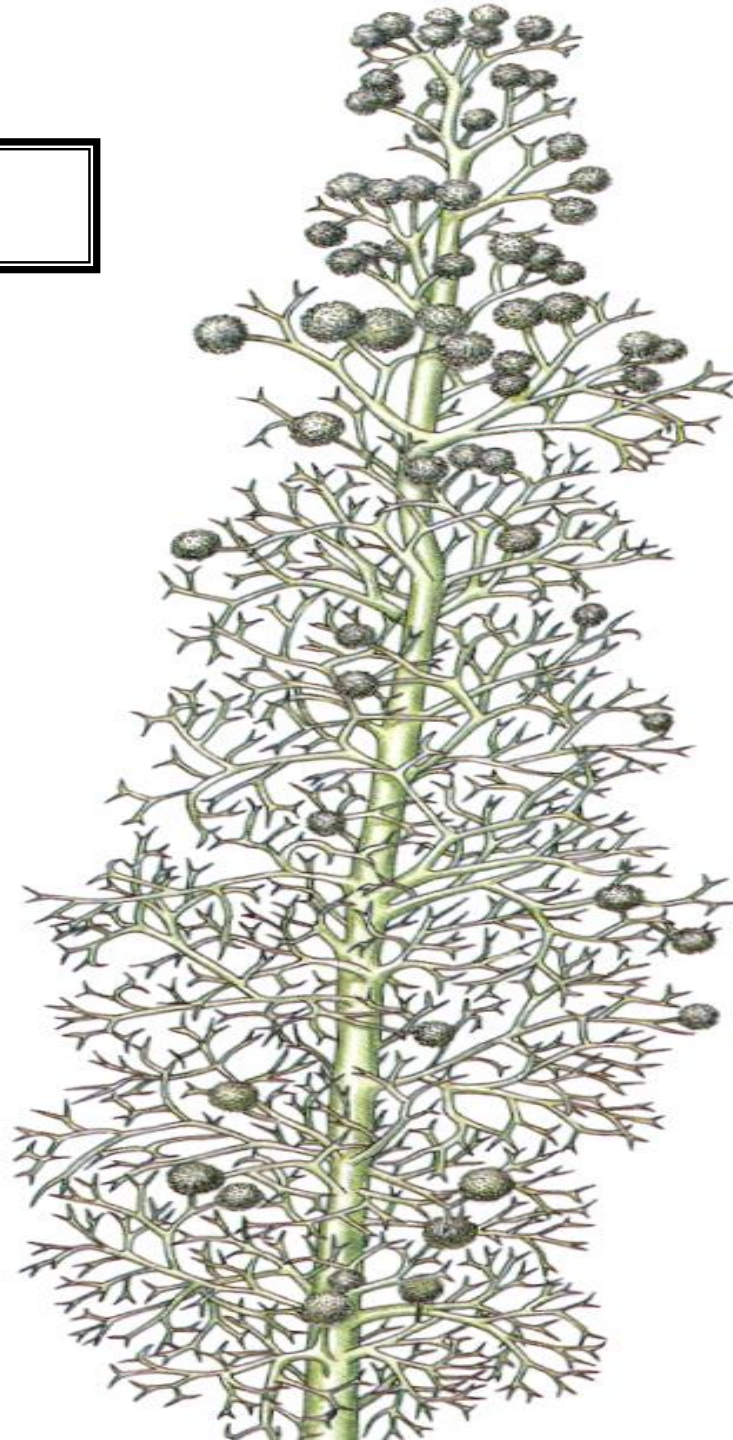
TRIMEROPHYTON



PSILOPHYTON



PERTICA



PHYLOGENETIC RELATIONSHIP

TRACHEOPHYTES

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STEM ENATIONS

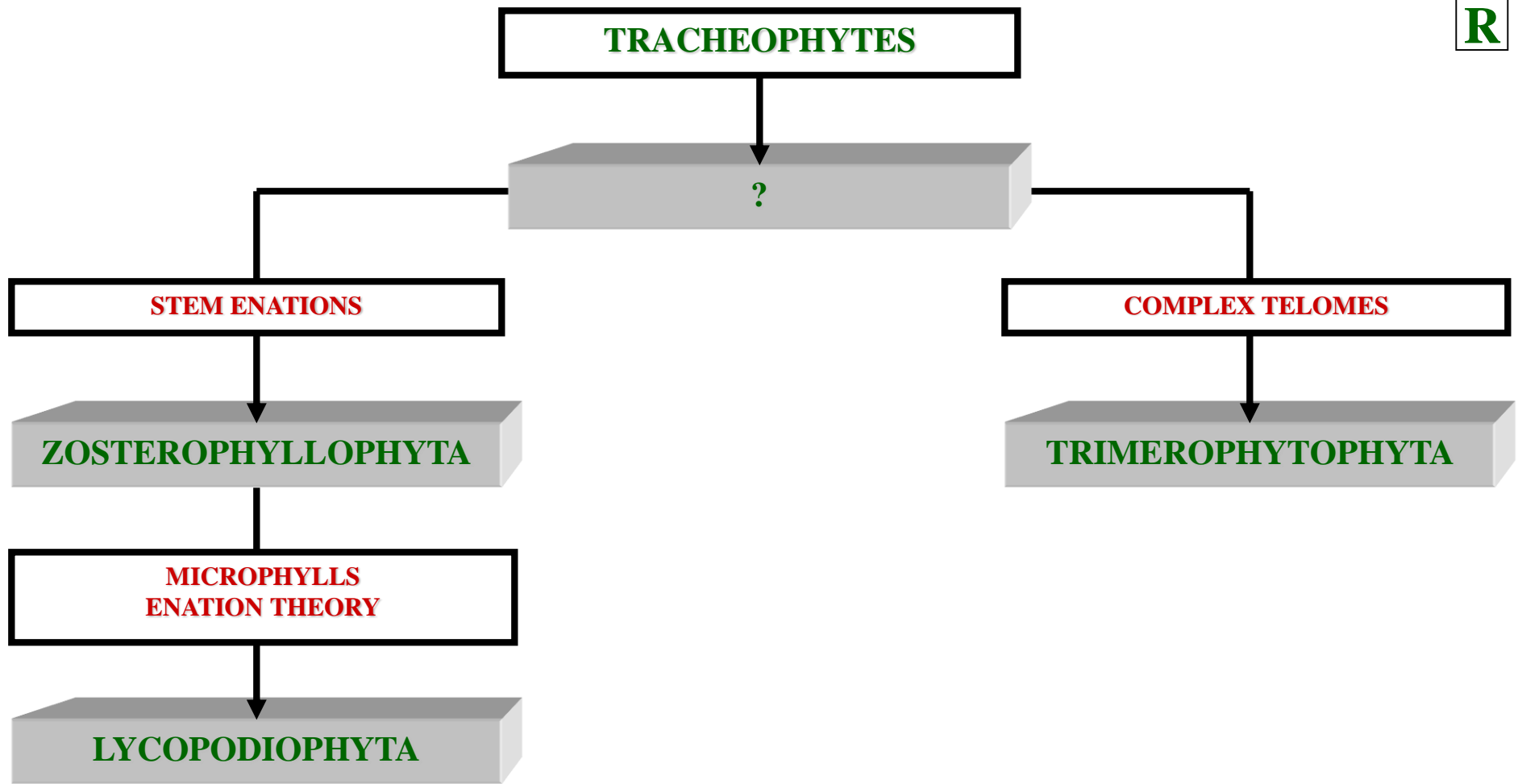
ZOSTEROPHYLLOPHYTA

**MICROPHYLLS
ENATION THEORY**

LYCOPODIOPHYTA

COMPLEX TELOMES

TRIMEROPHYTOPHYTA





TRACHEOPHYTES

RHYNIOPHYTA

STEM ENATIONS

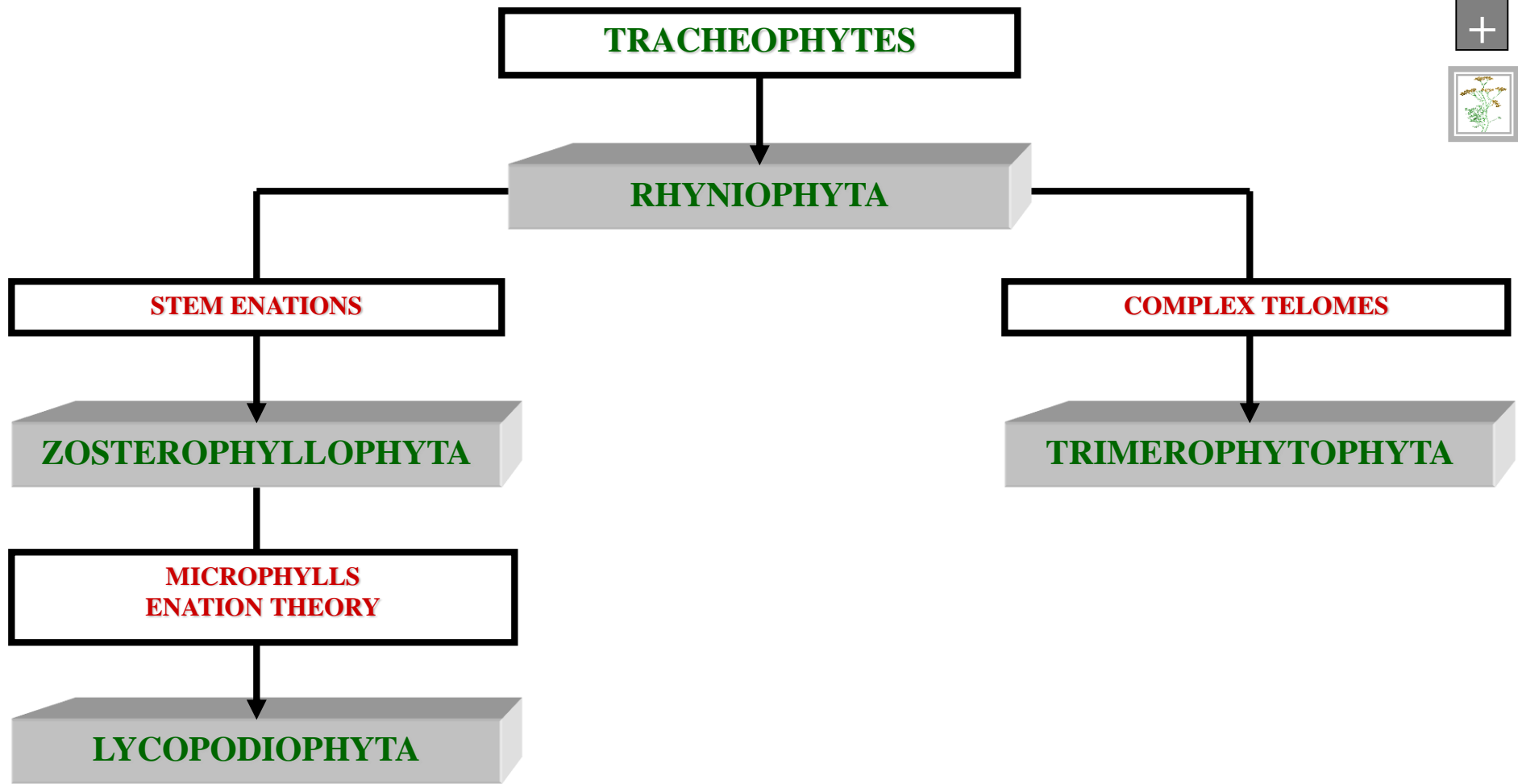
ZOSTEROPHYLLOPHYTA

**MICROPHYLLS
ENATION THEORY**

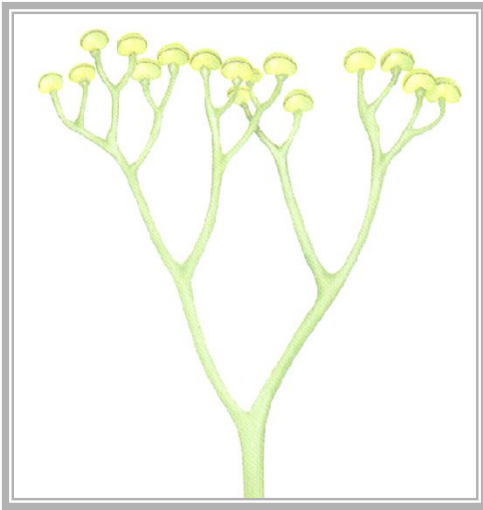
LYCOPODIOPHYTA

COMPLEX TELOMES

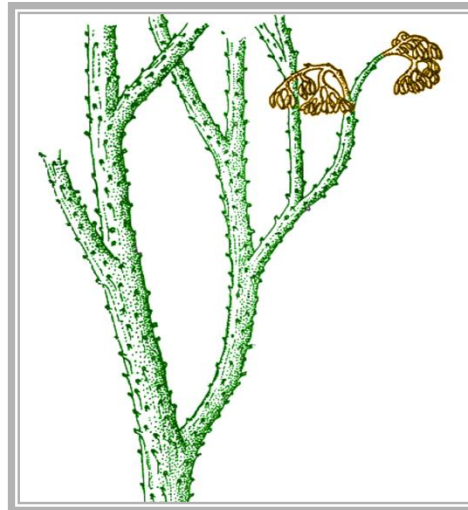
TRIMEROPHYTOPHYTA



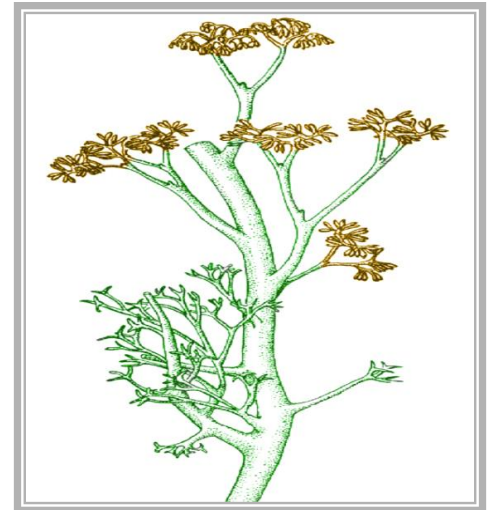
TRIMEROPHYTE EVOLUTION



RHYNIOPHYTE



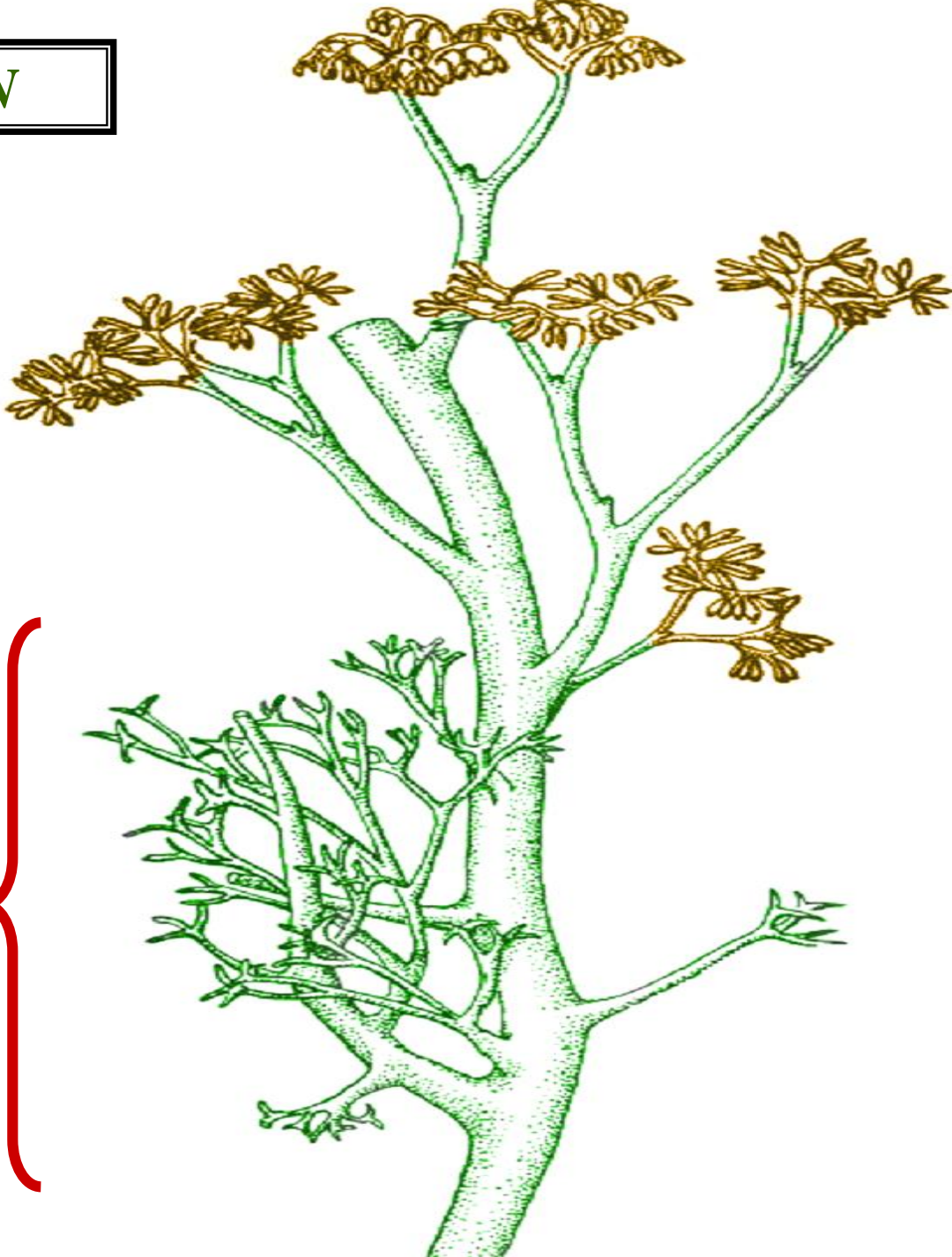
TRIMEROPHYTON



PSILOPHYTON



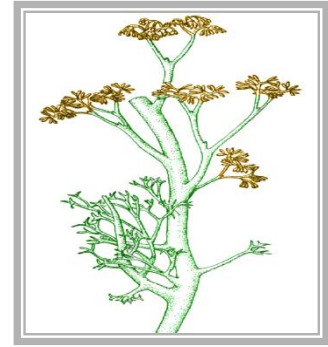
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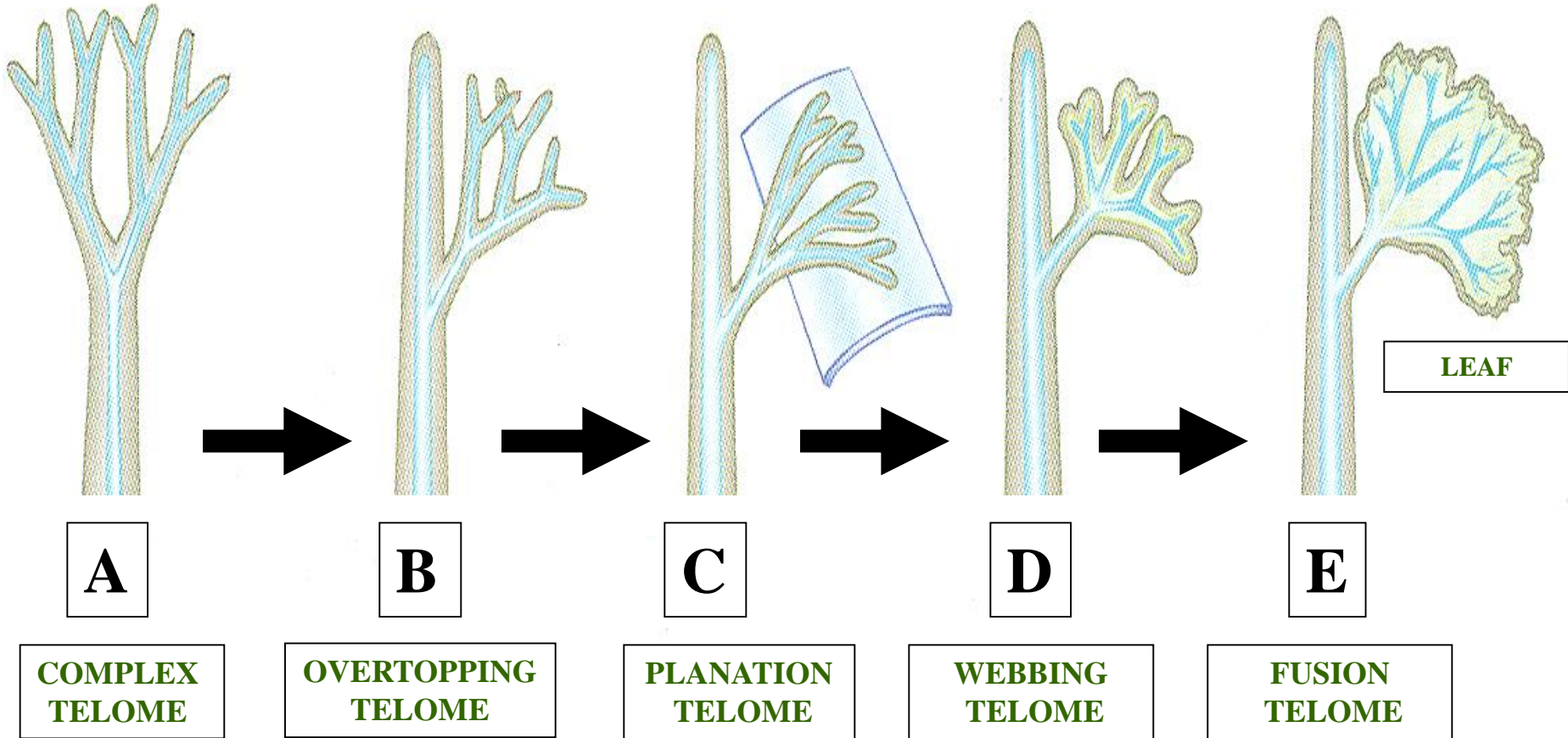
**COMPLEX
TELOME**



**COMPLEX
TELOME**

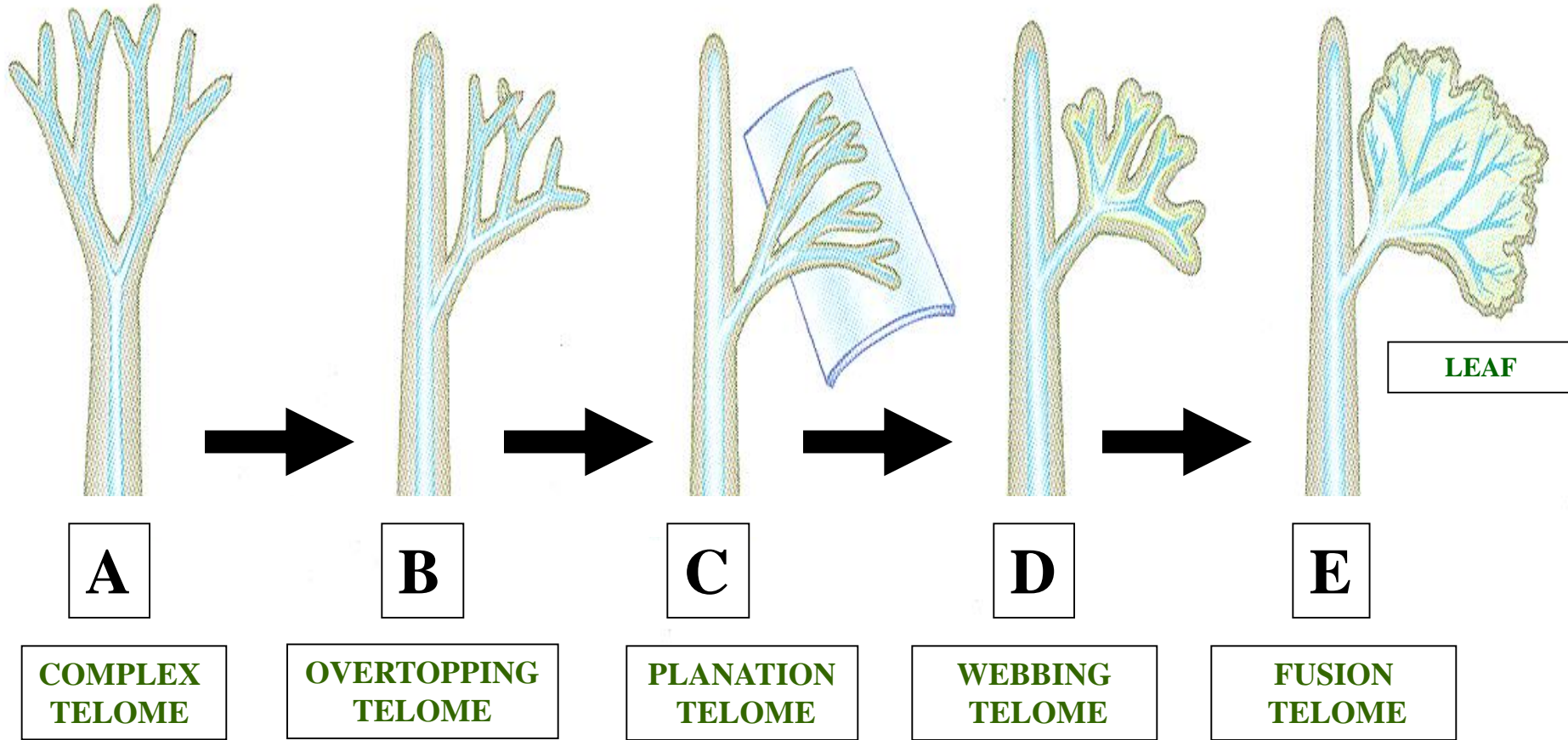


THEORY



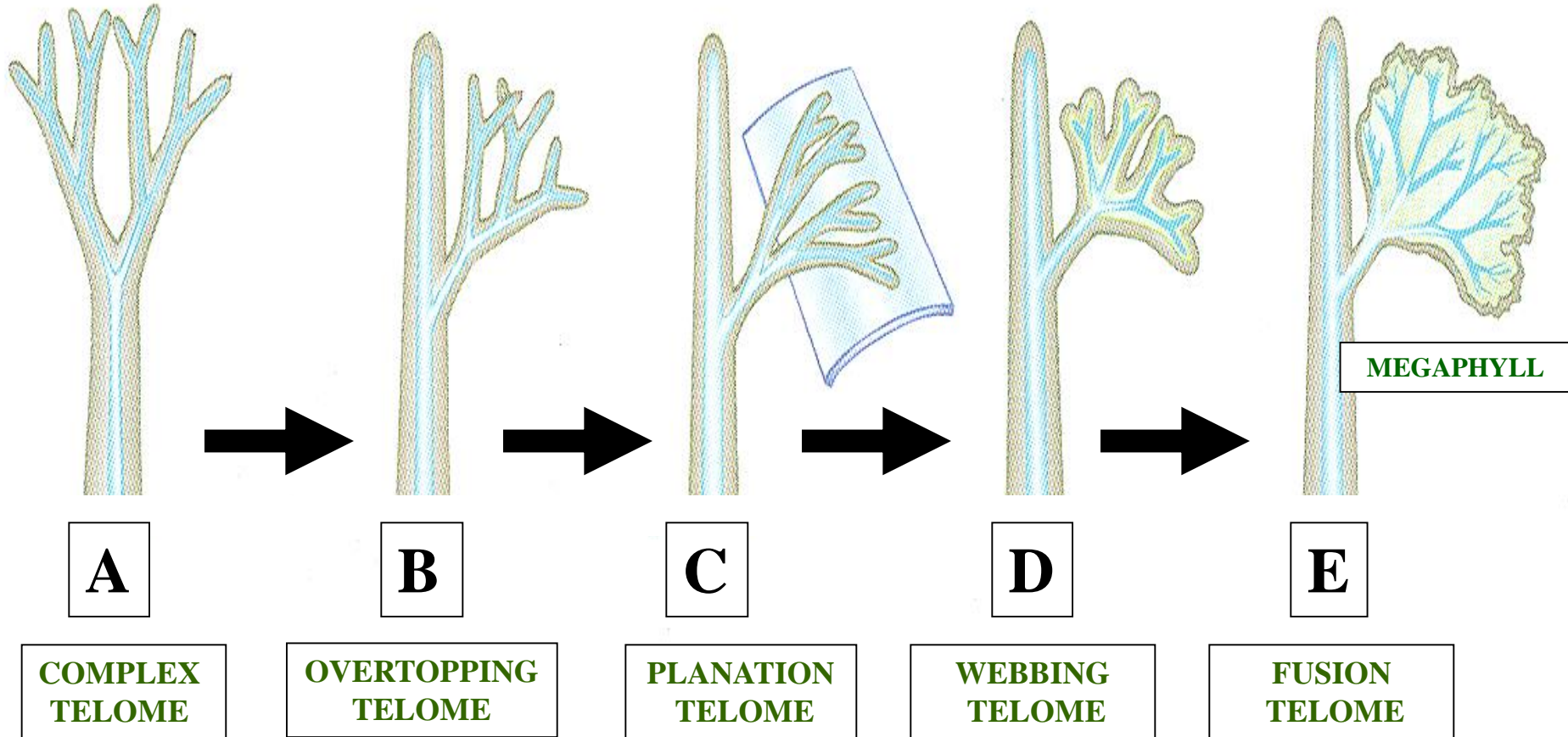
→ = TIME

TELOME THEORY

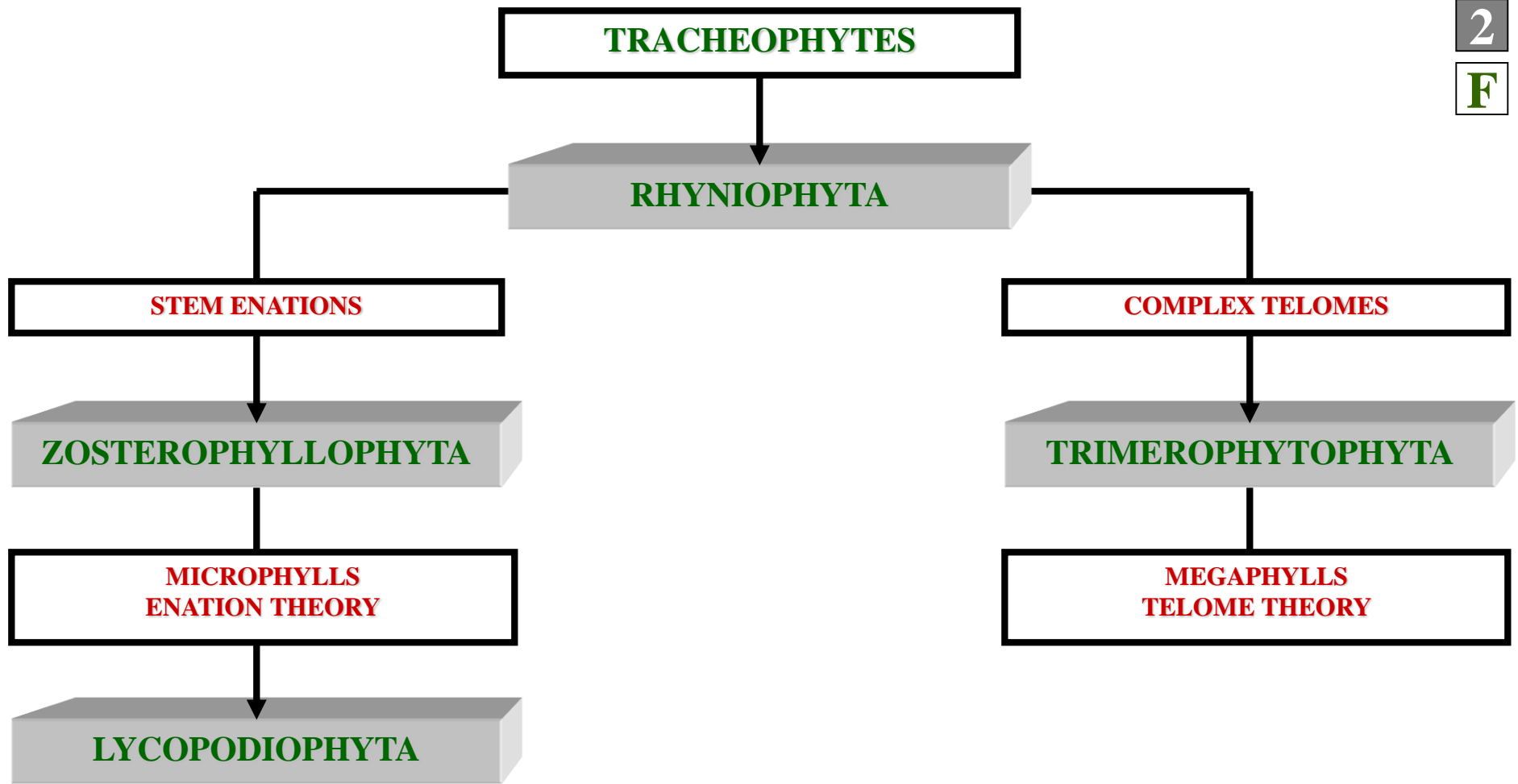


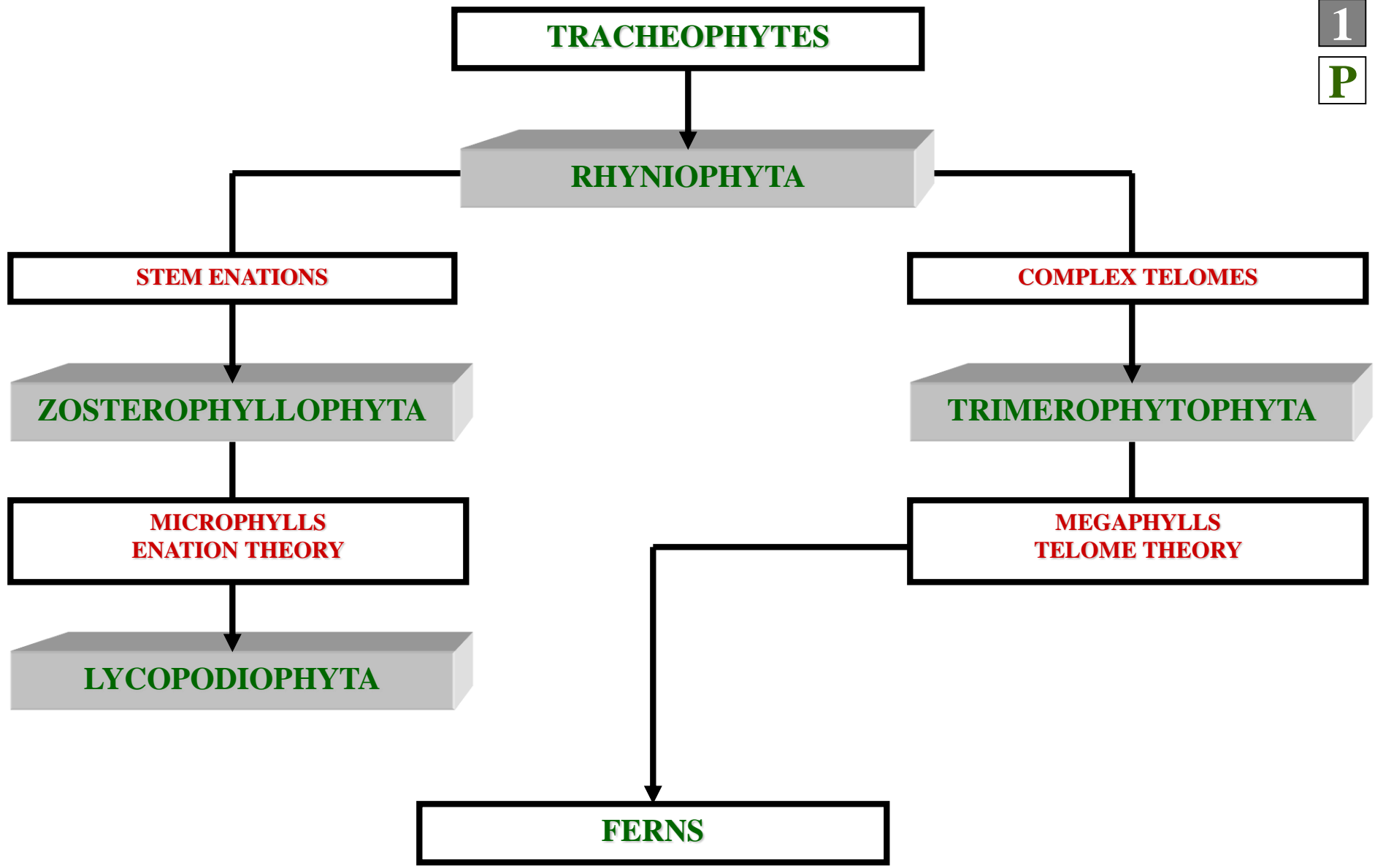
➔ = TIME

TELOME THEORY



MEGAPHYLL







TRACHEOPHYTES

RHYNIOPHYTA

STEM ENATIONS

COMPLEX TELOMES

ZOSTEROPHYLLOPHYTA

TRIMEROPHYTOPHYTA

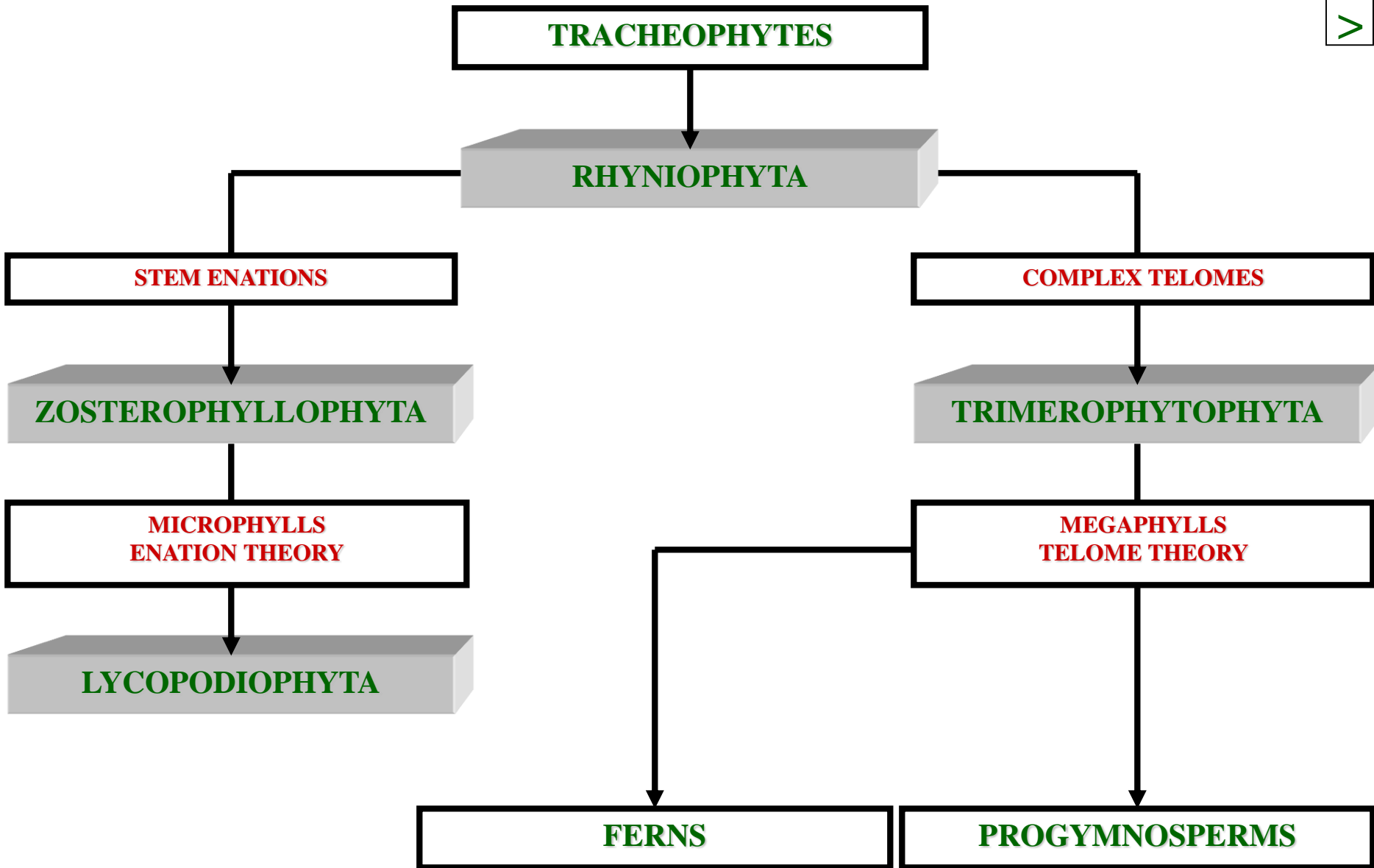
**MICROPHYLLS
ENATION THEORY**

**MEGAPHYLLS
TELOME THEORY**

LYCOPODIOPHYTA

FERNS

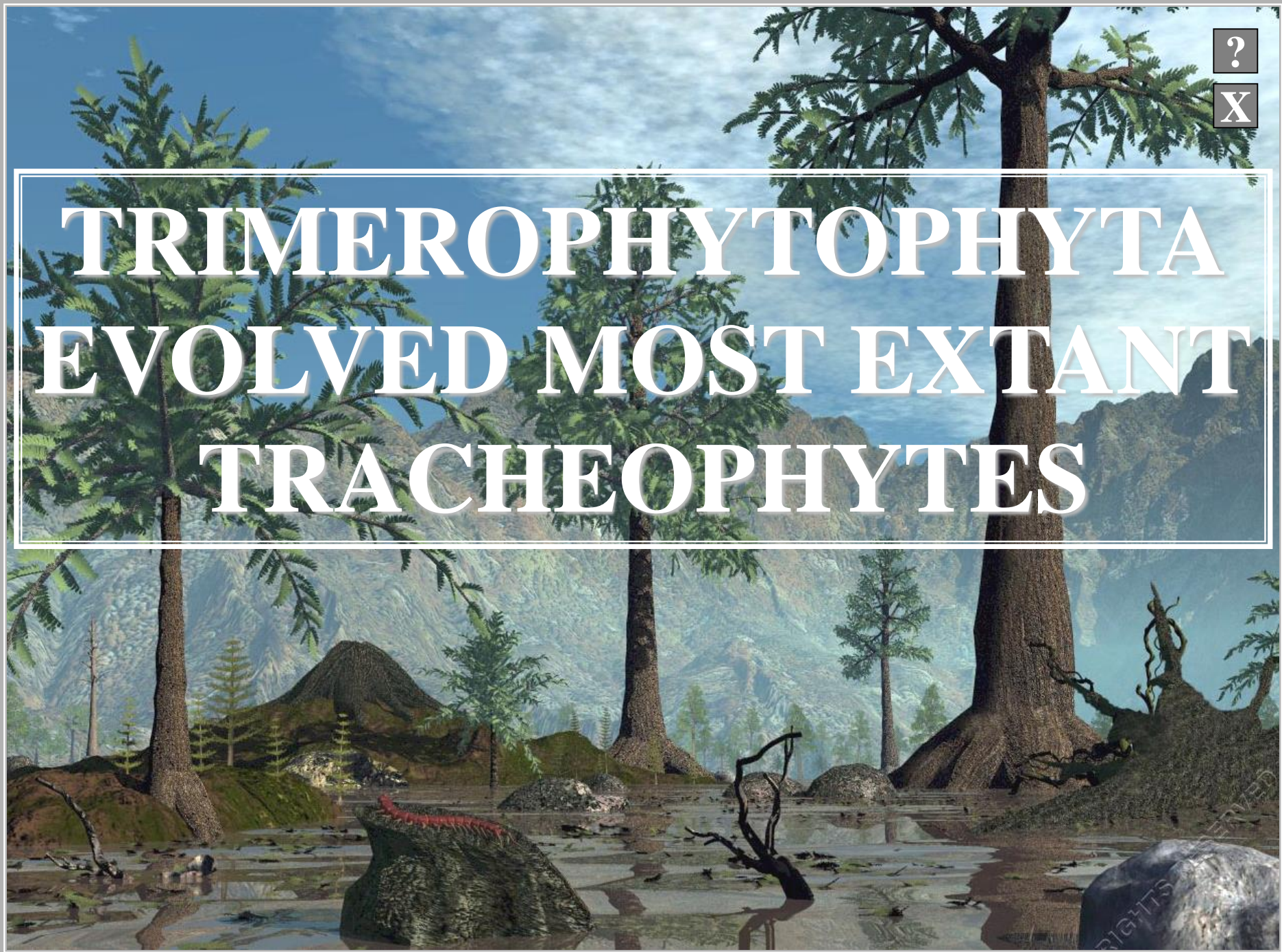
PROGYMNOSPERMS



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X

TRIMEROPHYTOPHYTA EVOLVED MOST EXTANT TRACHEOPHYTES



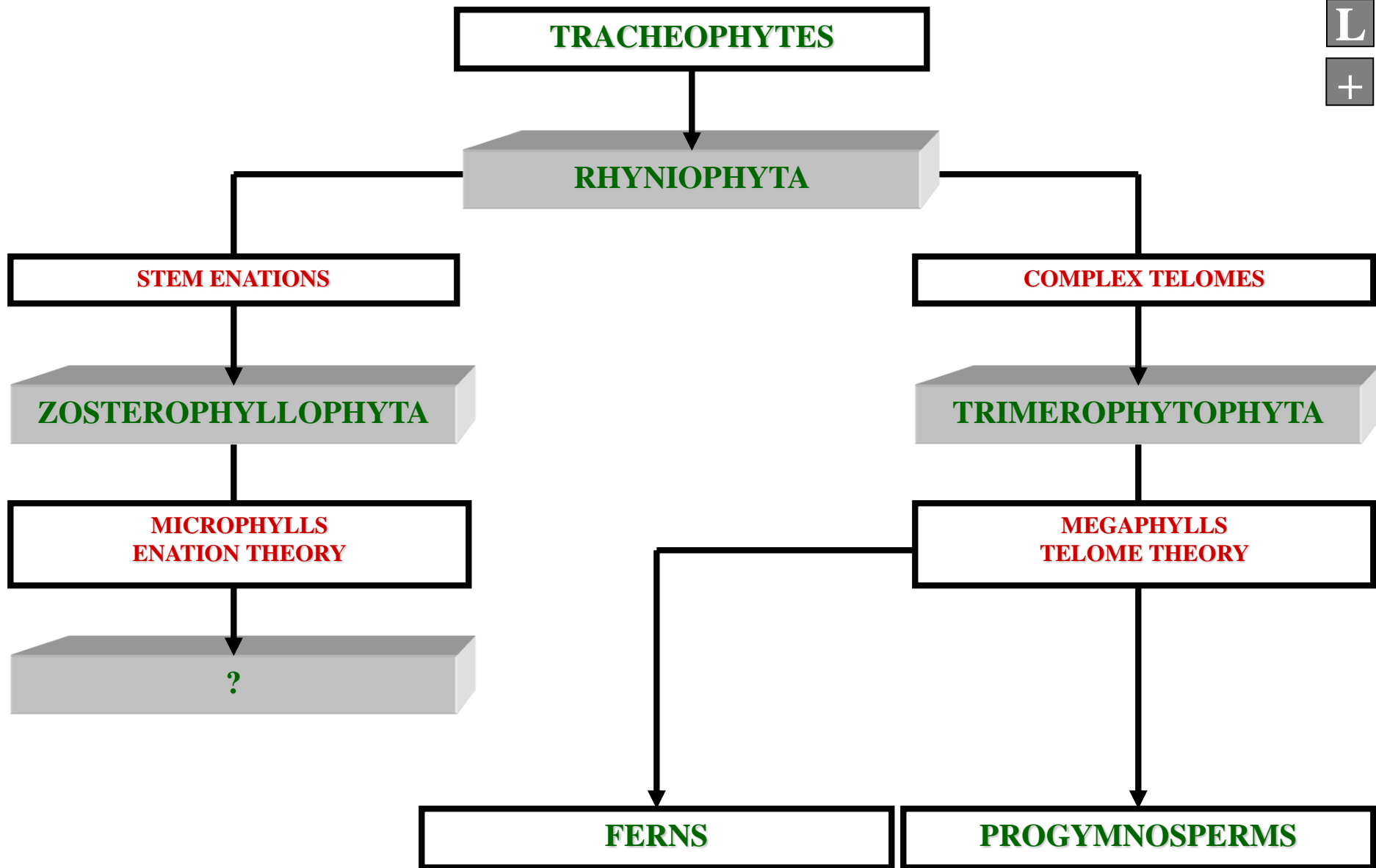
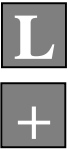
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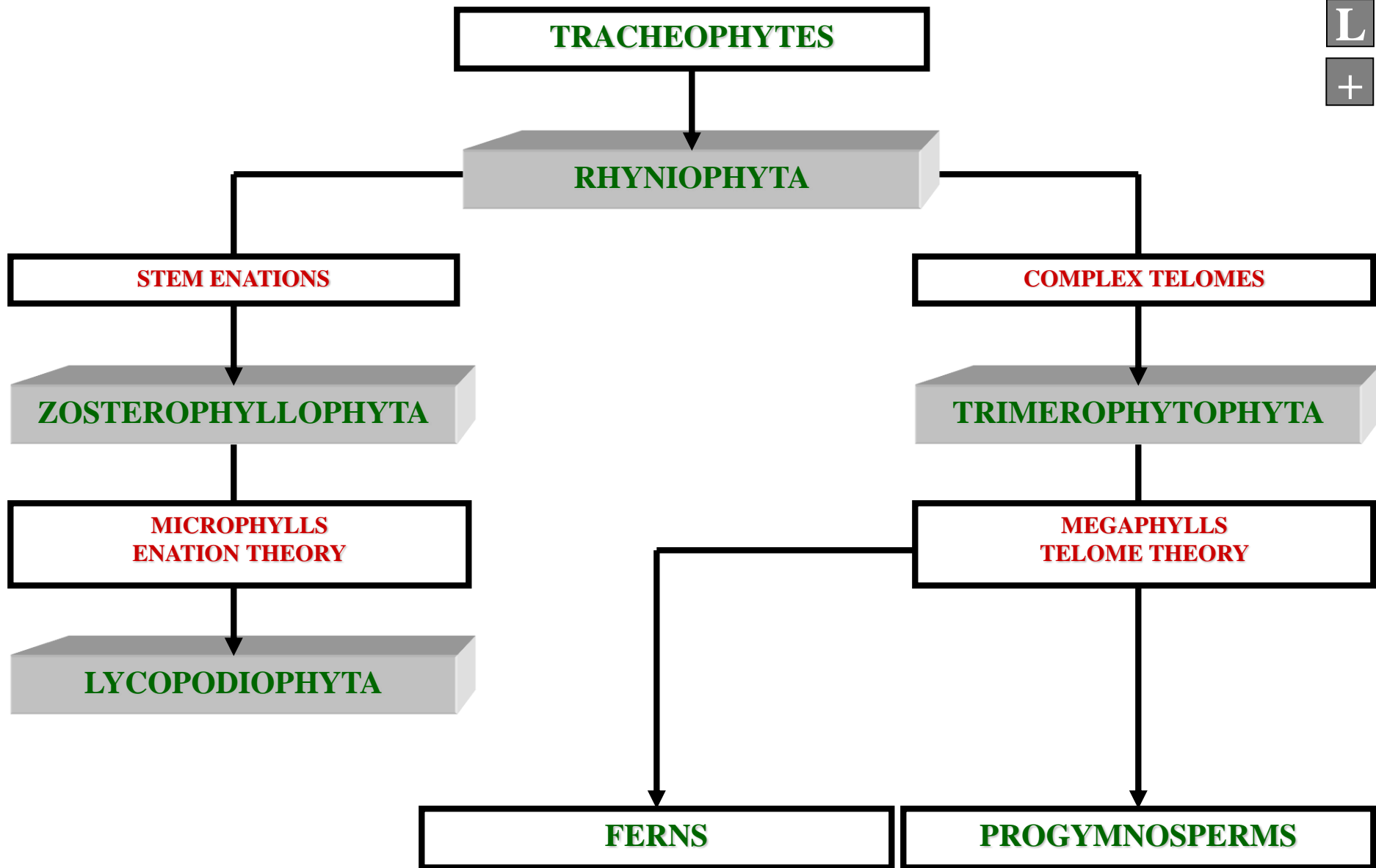
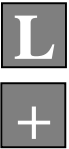
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TRIMEROPHYTOPHYTA EVOLVED MOST EXTANT TRACHEOPHYTES

?

RIGHTS





TRIMEROPHYTOPHYTA
EVOLVED MOST EXTANT
TRACHEOPHYTES
EXCEPTION
LYCOPODIOPHYTA

**EXTINCT
PHYLUM**

HANDOUT

RHYNIOPHYTA CHARACTERS

ZOSTEROPHYLLOPHYTA CHARACTERS

TRIMEROPHYTOPHYTA CHARACTERS

**EXTINCT
PHYLUM**



VASCULAR PLANT EVOLUTION

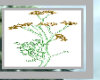


~385

MILLION YEARS

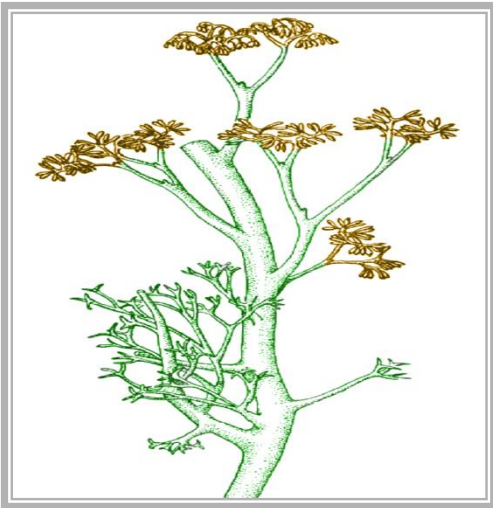
~385 MILLION YEARS AGO

PTERIDOPHYTA EVOLVE



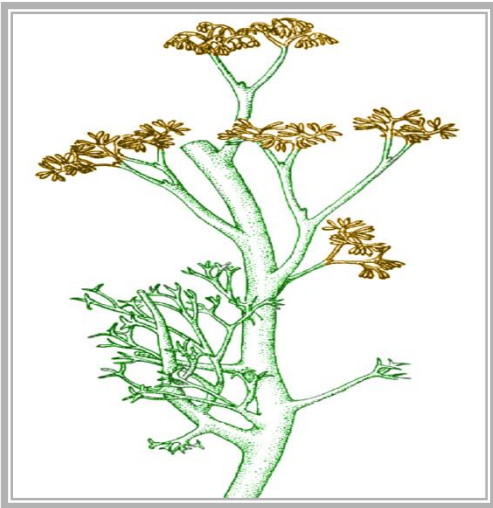
RIGHTS RESERVED

PTERIDOPHYTE EVOLUTION



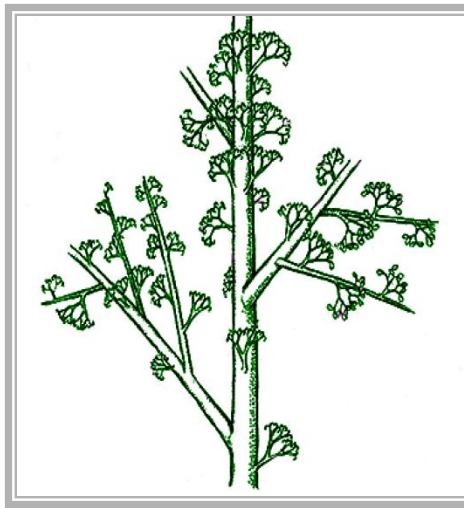
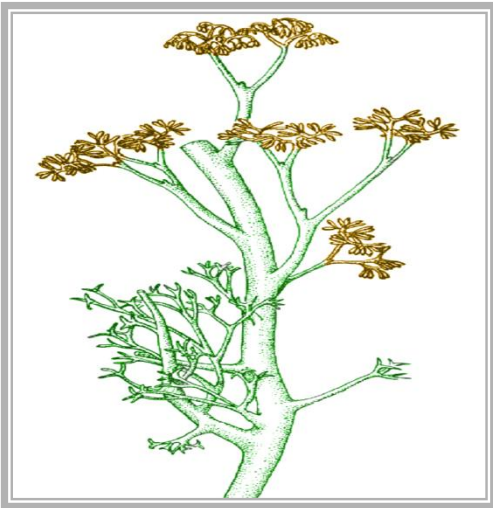
PSILOPHYTON

PTERIDOPHYTE EVOLUTION



TRIMEROPHYTE

PTERIDOPHYTE EVOLUTION

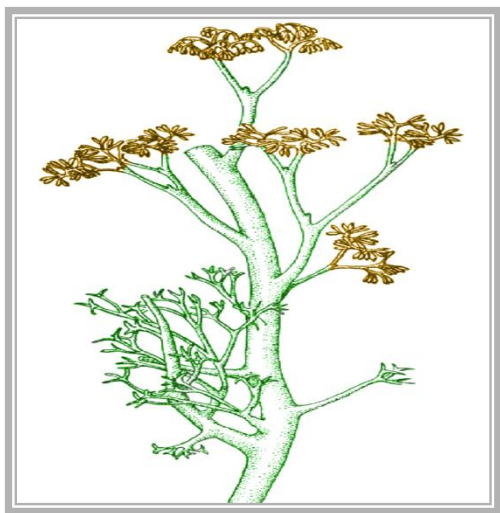


TRIMEROPHYTE

IBYKA
PRIMITIVE FERN

PTERIDOPHYTA

PTERIDOPHYTE EVOLUTION

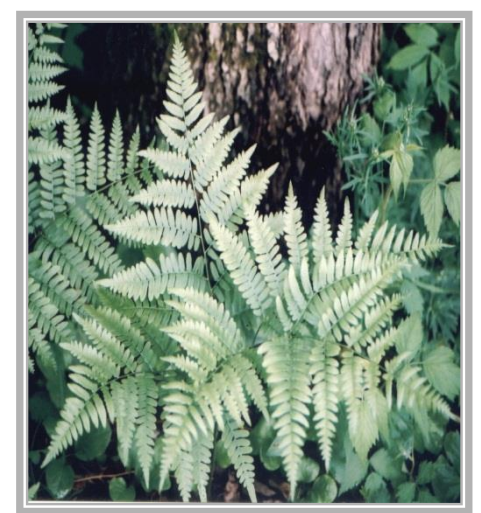


TRIMEROPHYTE



IBYKA
PRIMITIVE FERN

PTERIDOPHYTA



PTERIDIUM
ADVANCED FERN

PTERIDOPHYTA



**EXTANT
PHYLUM**

**PHYLUM
PTERIDOPHYTA**

**EXTANT
PHYLUM**

SYNONYMS



PTEROPHYTA

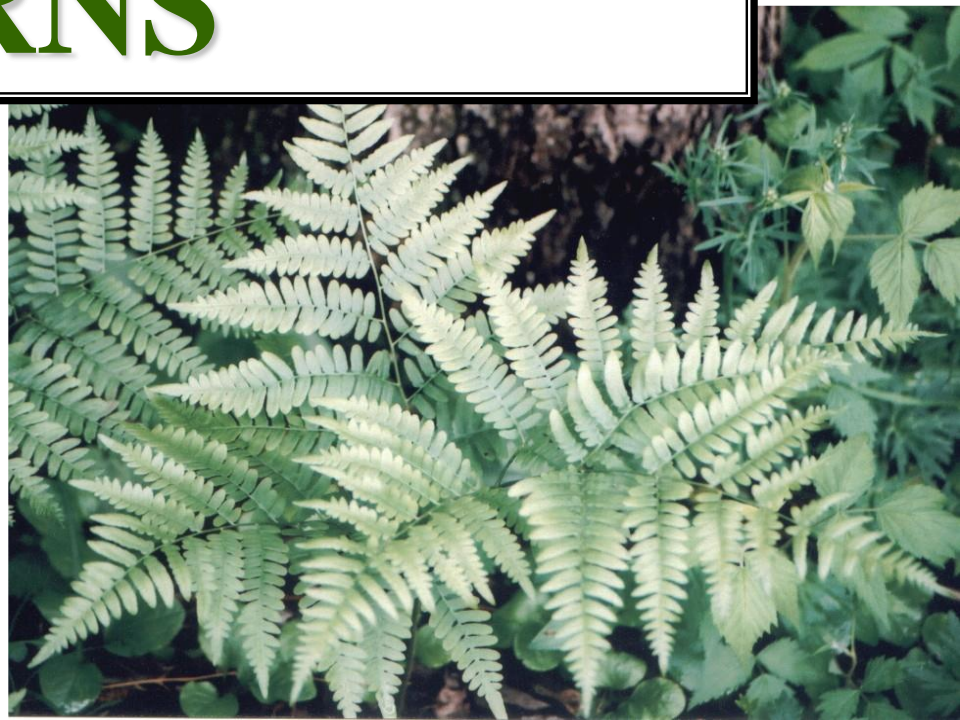


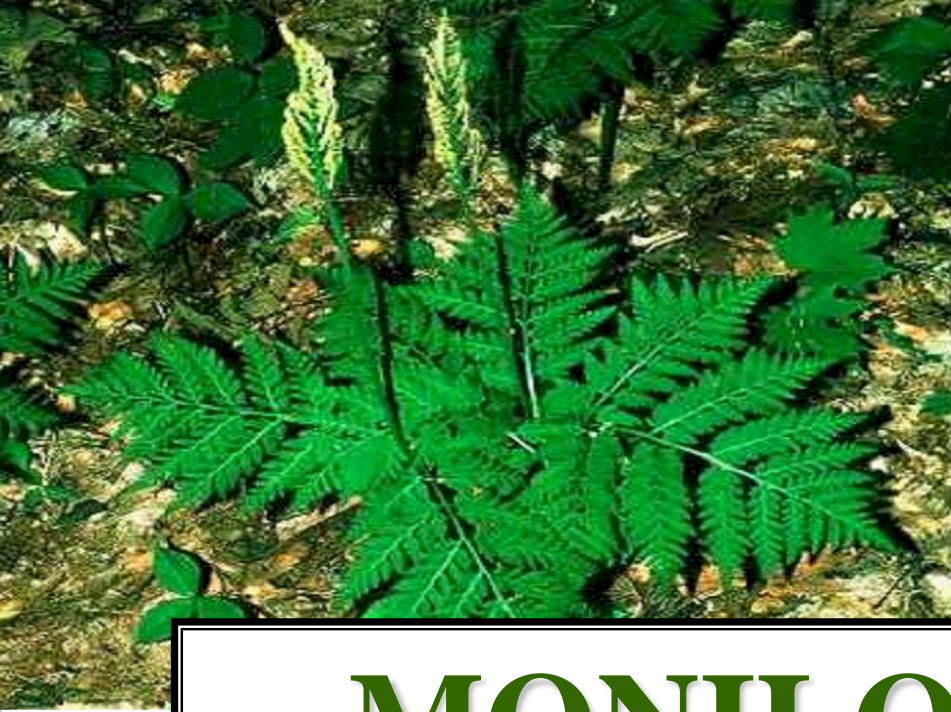
MONILOPHYTA

COMMON NAMES

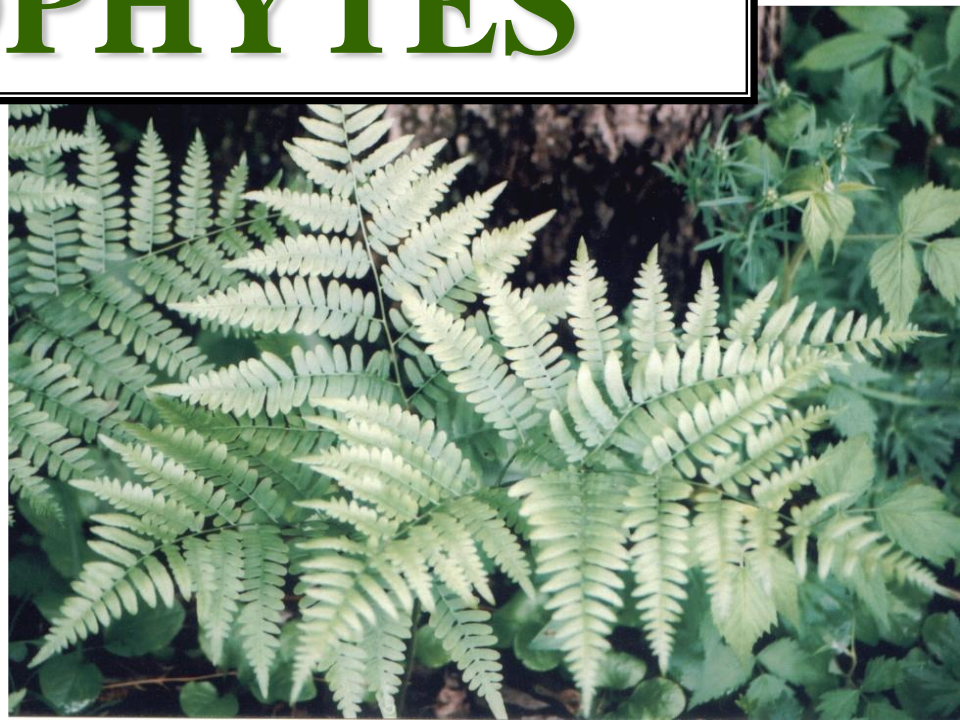
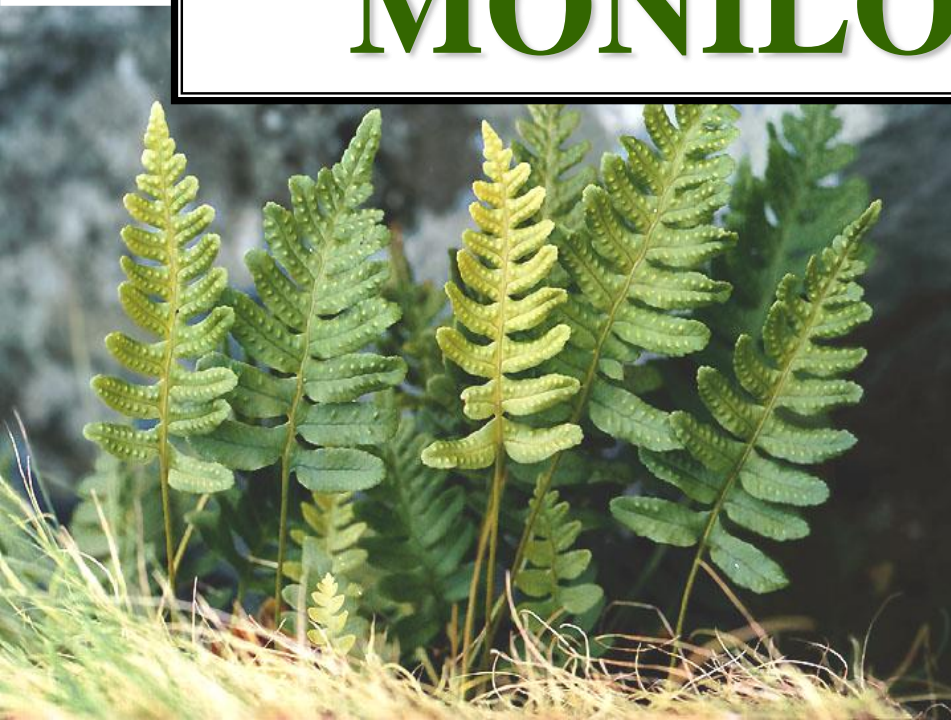


FERNS





MONILOPHYTES





PTERIDOPHYTES





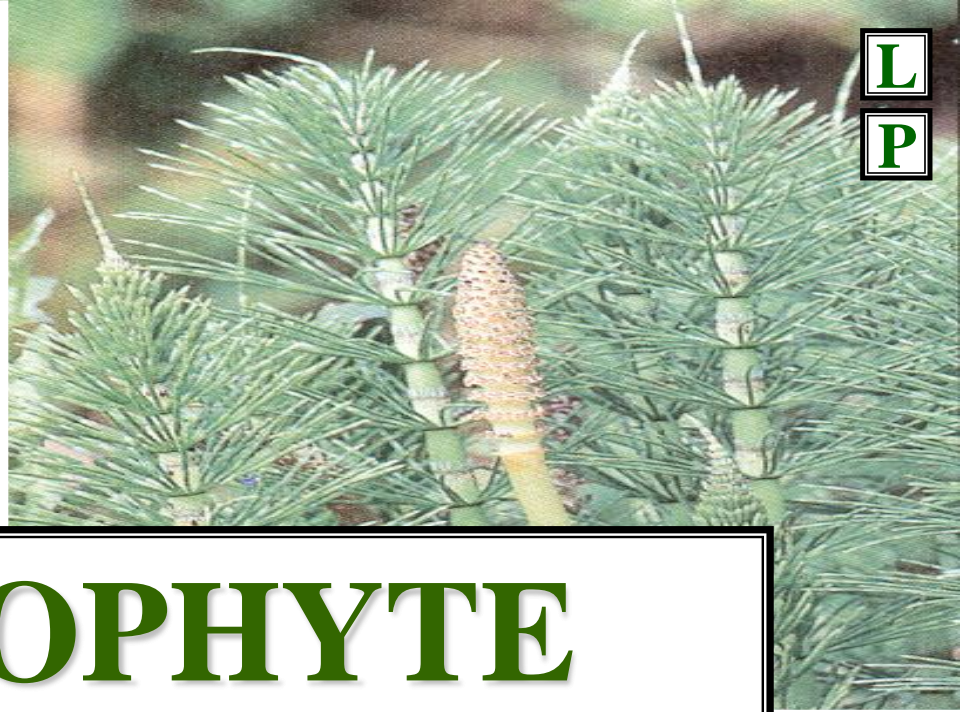
**“PTERIDOPHYTE”
TERM
CONTEXT**



“PTERIDOPHYTE”

1ST

CONTEXT



L
P

PTERIDOPHYTE BROAD CONTEXT





LYCOPODIOPHYTA

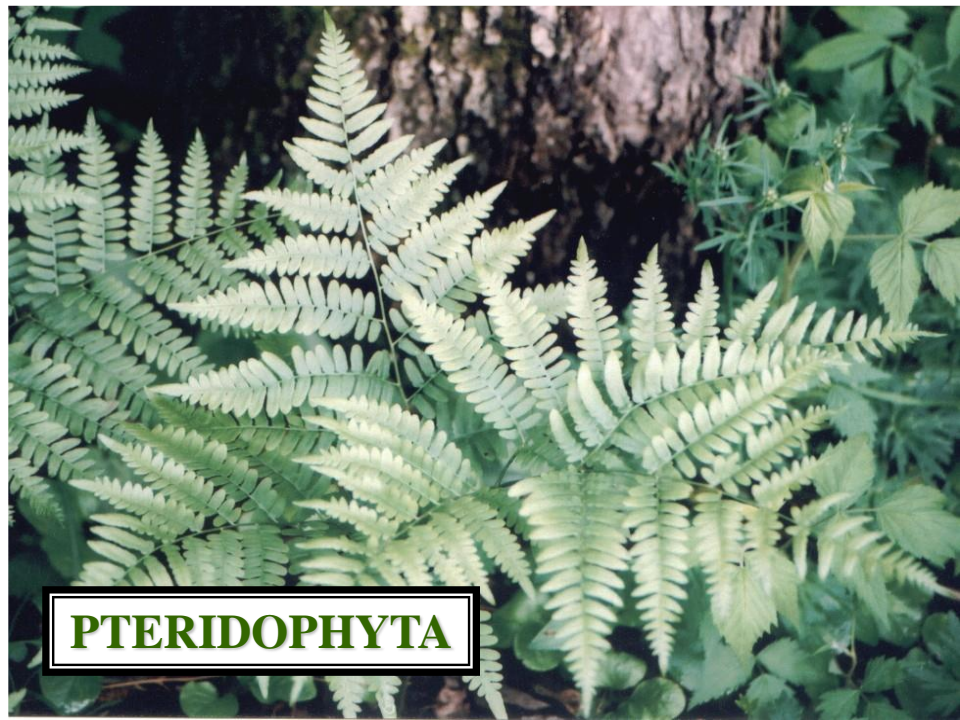


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PTERIDOPHYTA



PTERIDOPHYTA

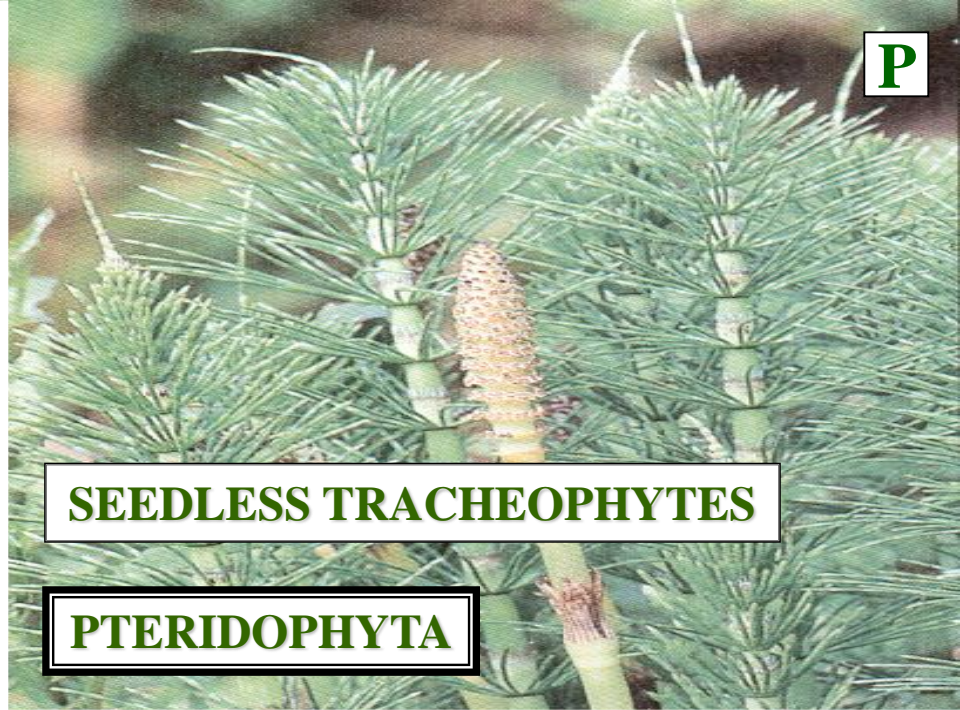


PTERIDOPHYTA



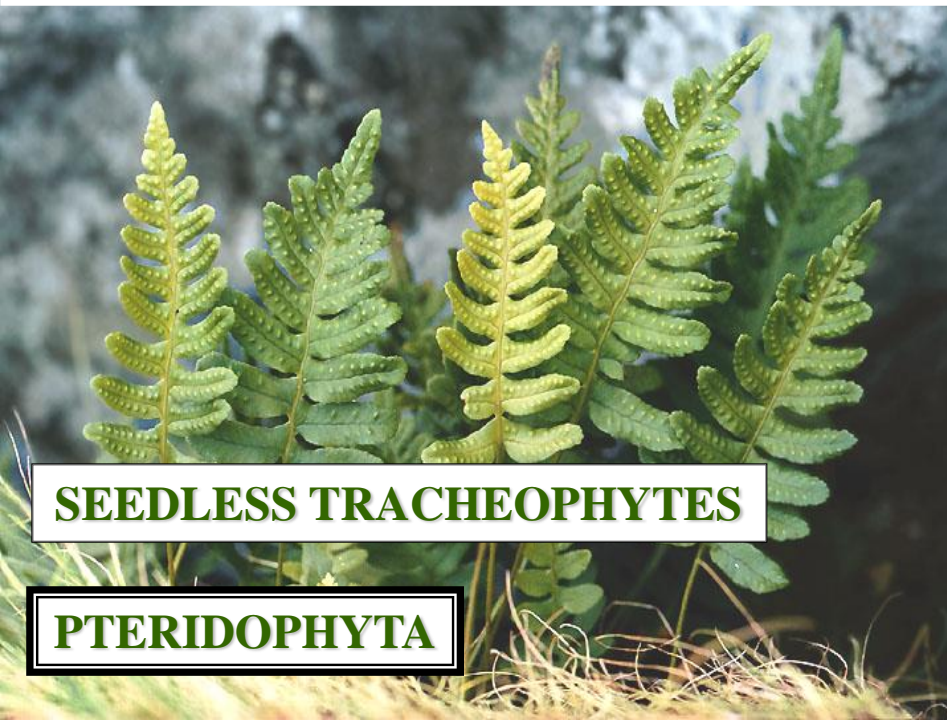
SEEDLESS TRACHEOPHYTES

LYCOPODIOPHYTA



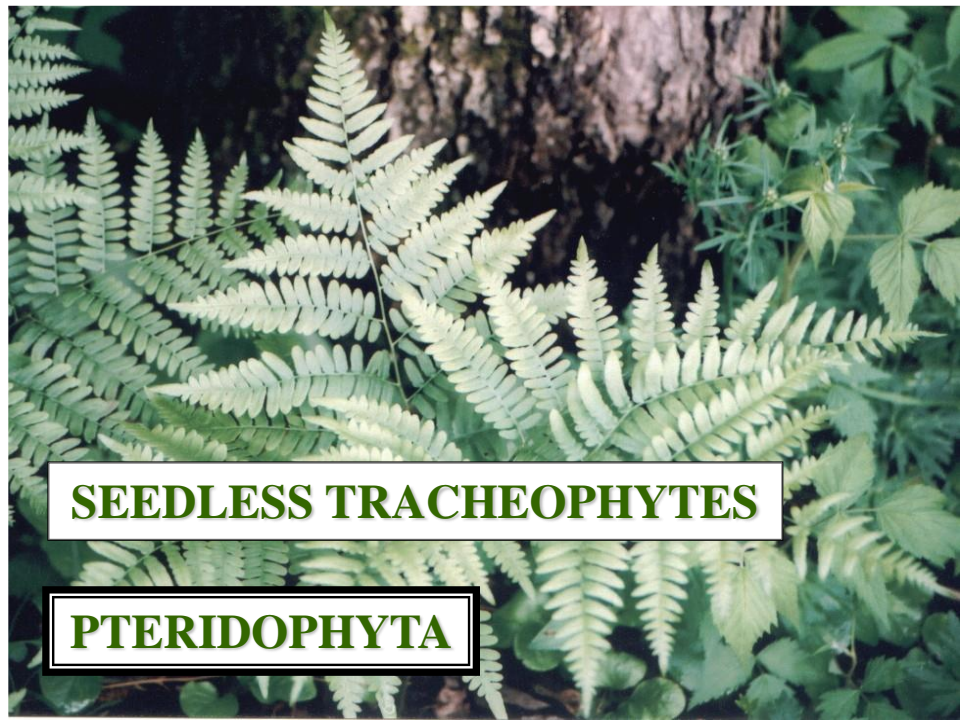
SEEDLESS TRACHEOPHYTES

PTERIDOPHYTA



SEEDLESS TRACHEOPHYTES

PTERIDOPHYTA



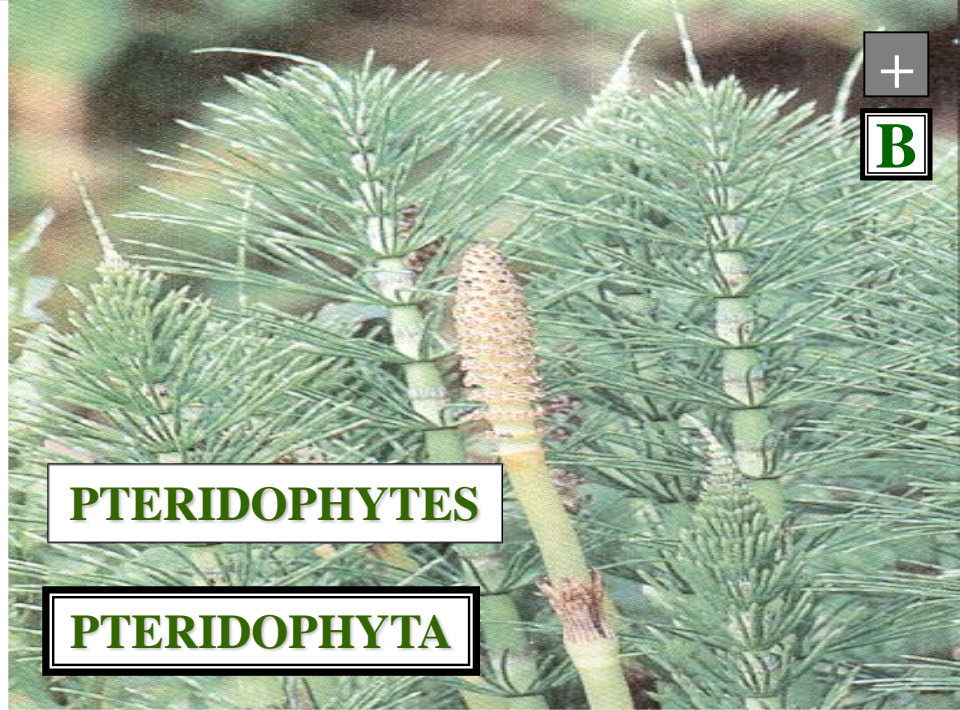
SEEDLESS TRACHEOPHYTES

PTERIDOPHYTA



PTERIDOPHYTES

LYCOPODIOPHYTA



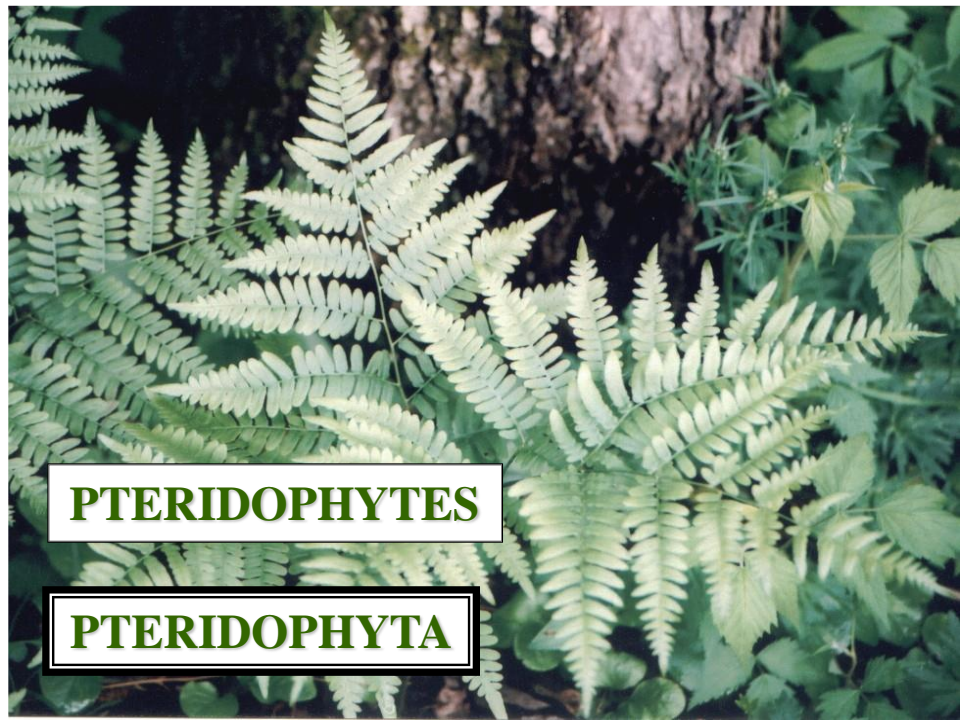
PTERIDOPHYTES

PTERIDOPHYTA



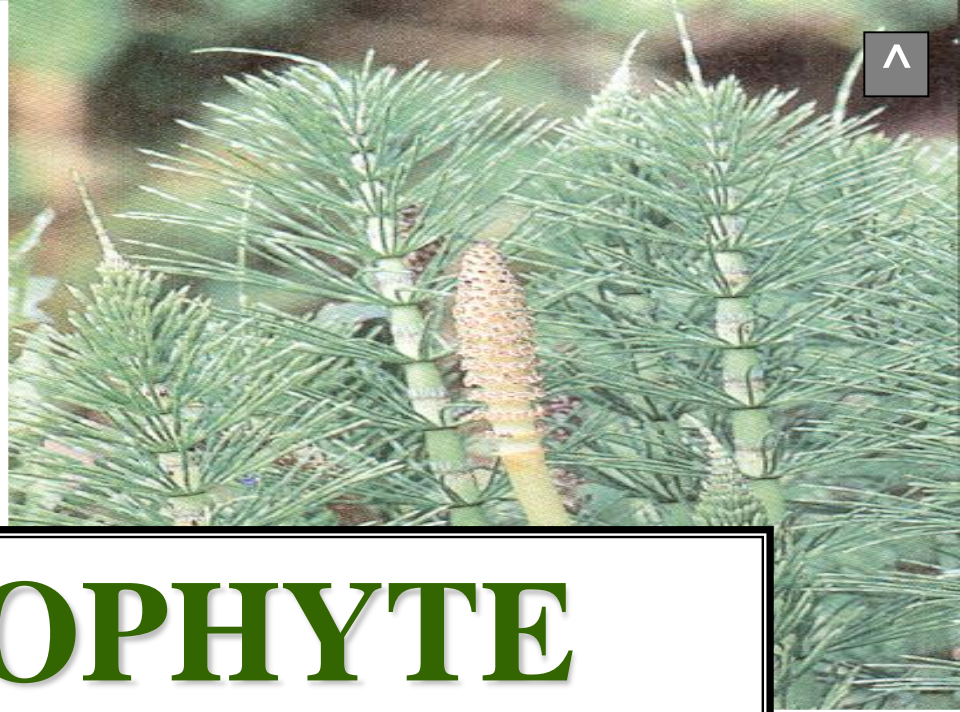
PTERIDOPHYTES

PTERIDOPHYTA



PTERIDOPHYTES

PTERIDOPHYTA



PTERIDOPHYTE BROAD CONTEXT

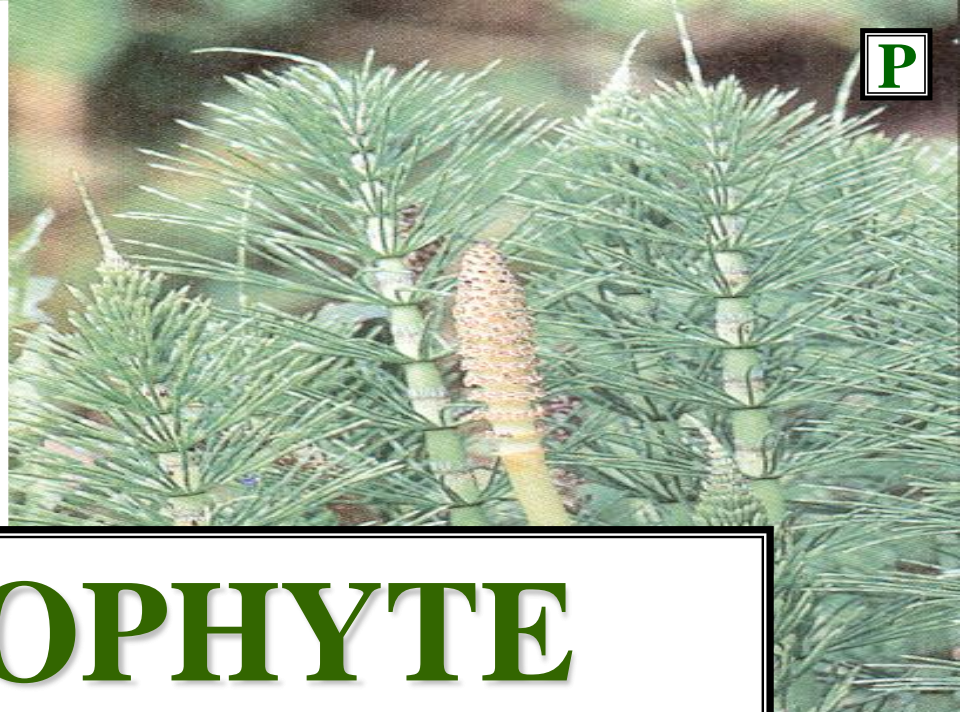




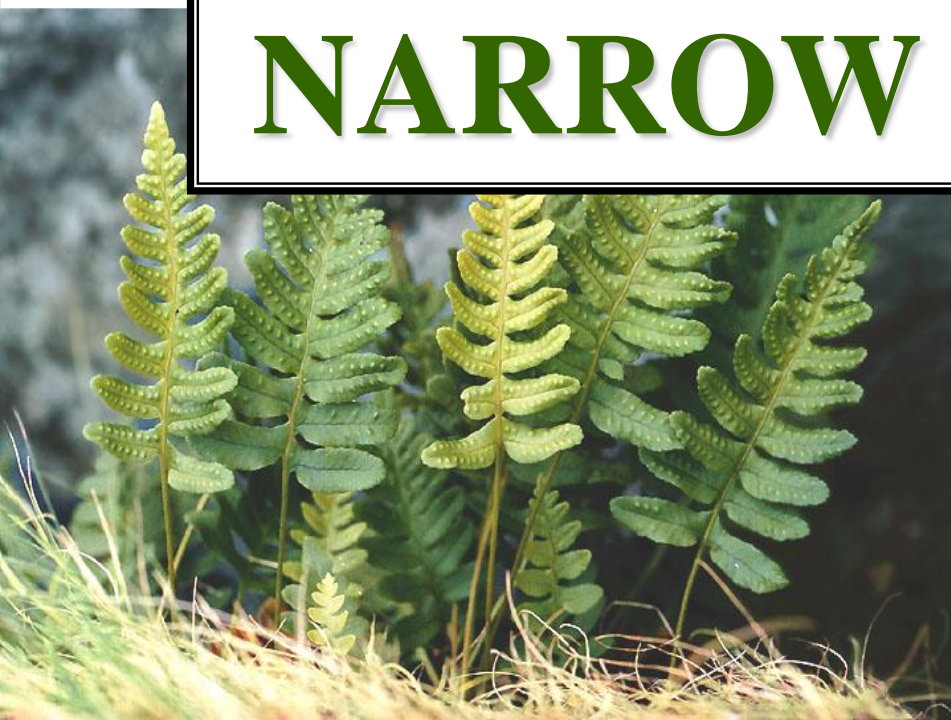
“PTERIDOPHYTE”

2ND

CONTEXT



PTERIDOPHYTE NARROW CONTEXT





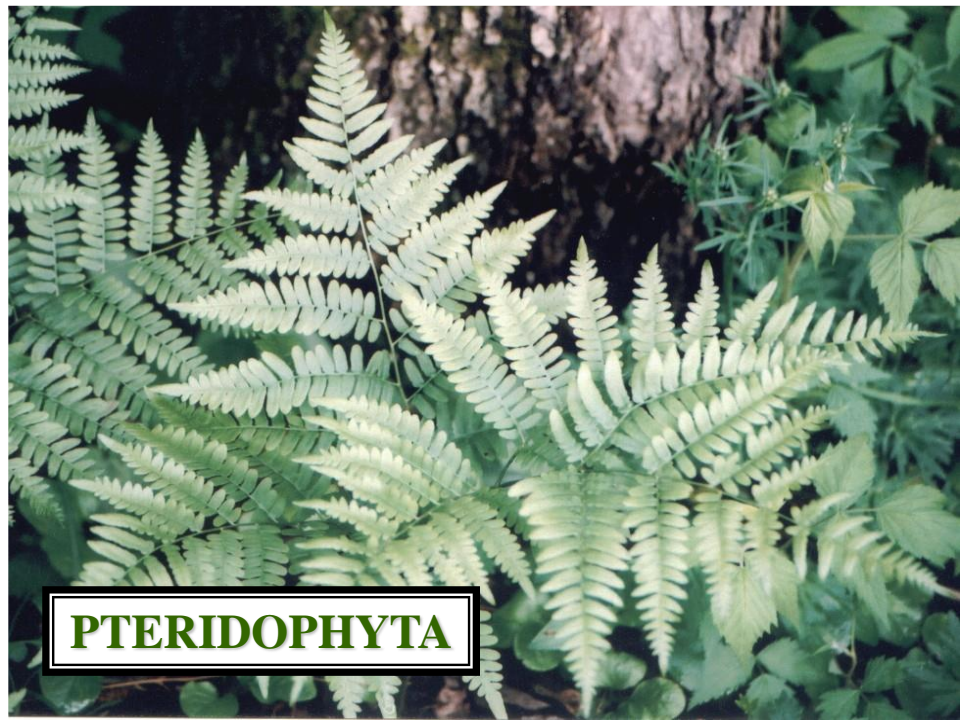
PTERIDOPHYTA



PTERIDOPHYTA



PTERIDOPHYTA



PTERIDOPHYTA



FERNS

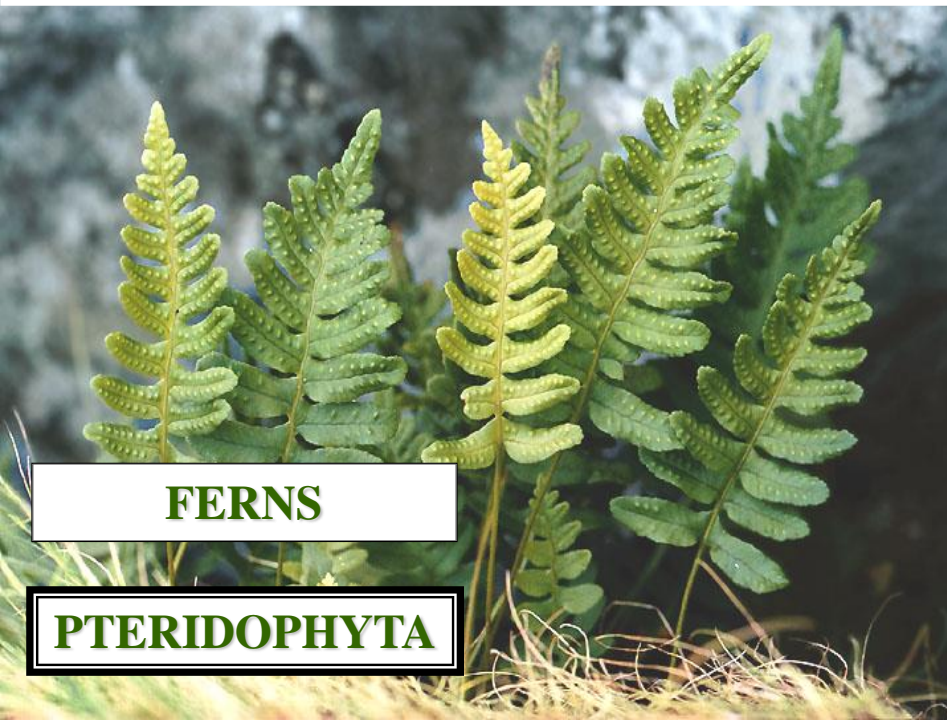
PTERIDOPHYTA



P

FERNS

PTERIDOPHYTA



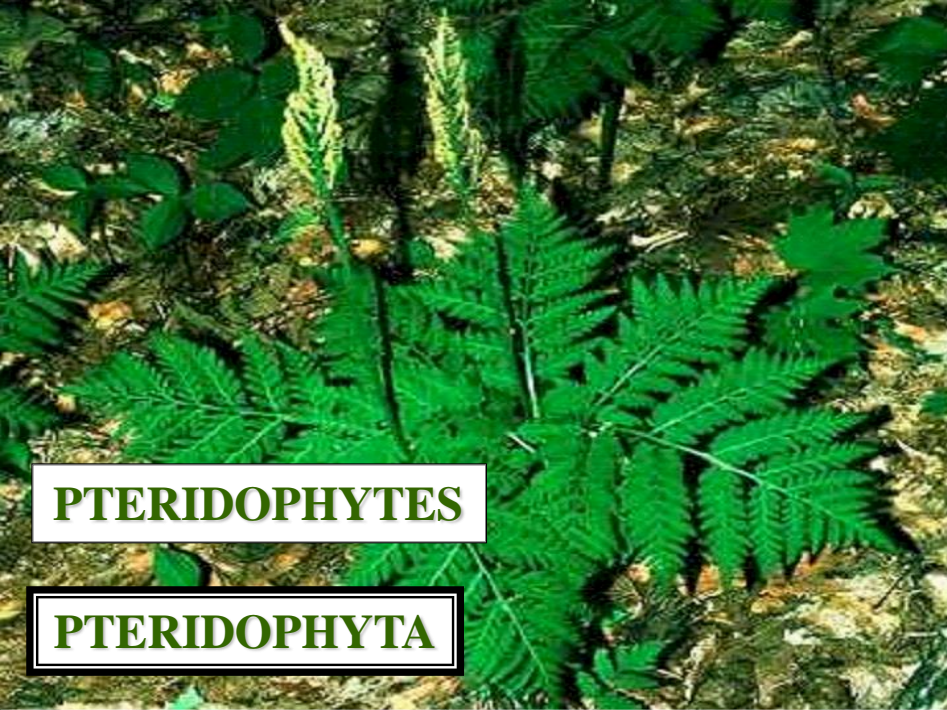
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PTERIDOPHYTA



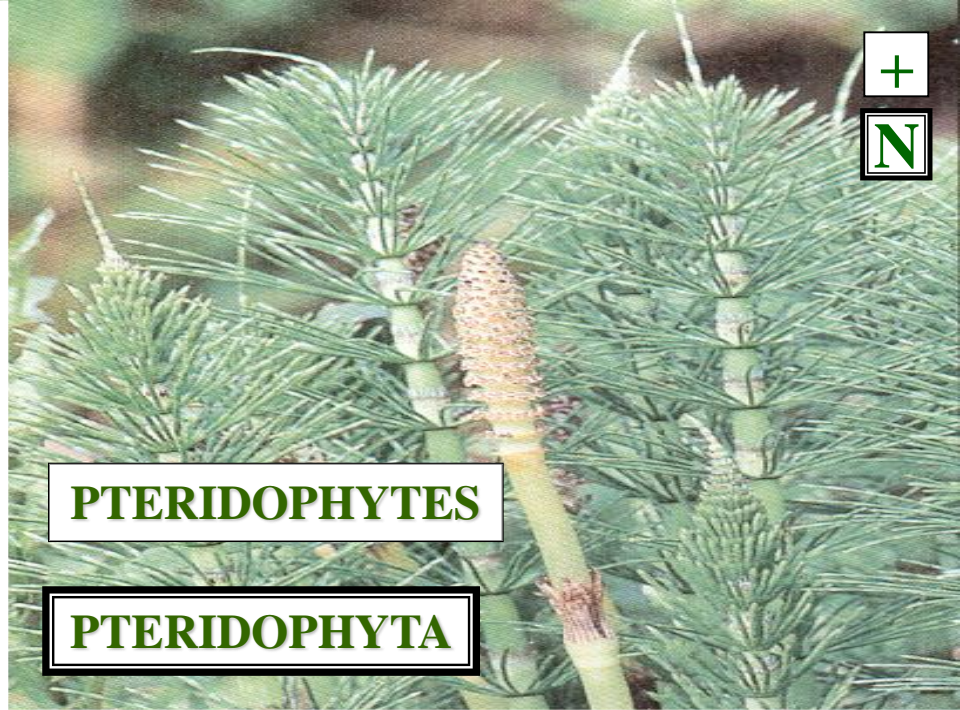
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PTERIDOPHYTA



PTERIDOPHYTES

PTERIDOPHYTA



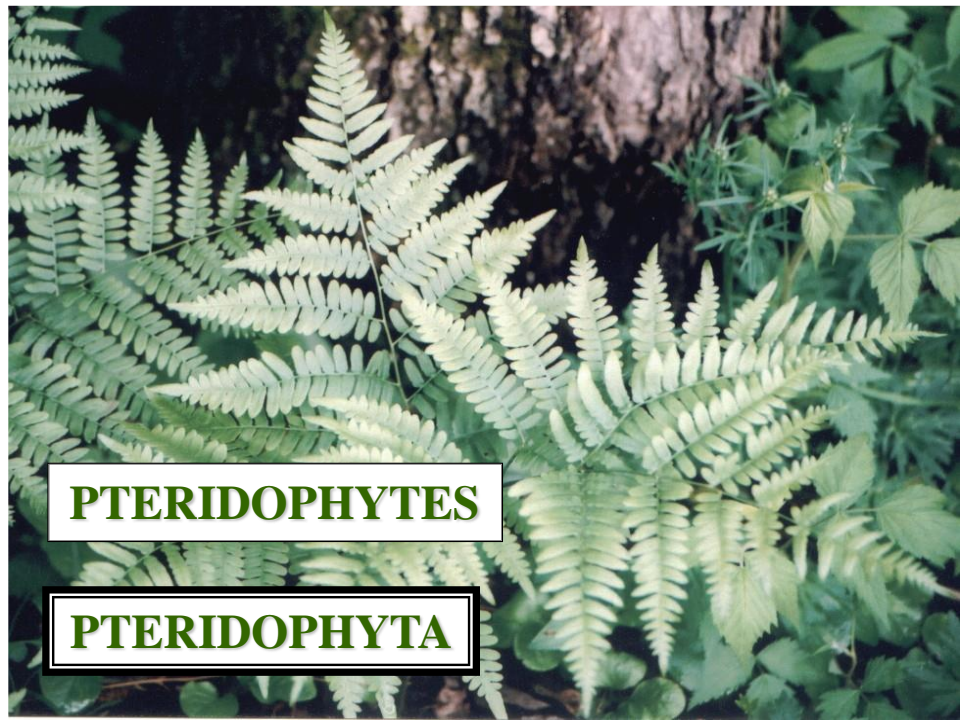
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PTERIDOPHYTA



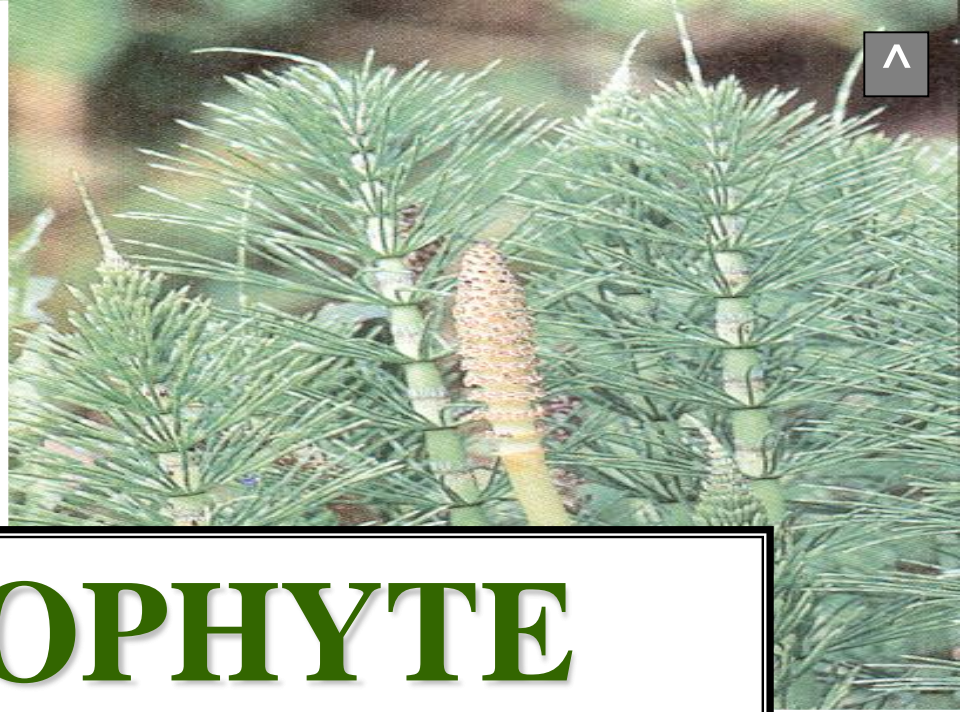
PTERIDOPHYTES

PTERIDOPHYTA

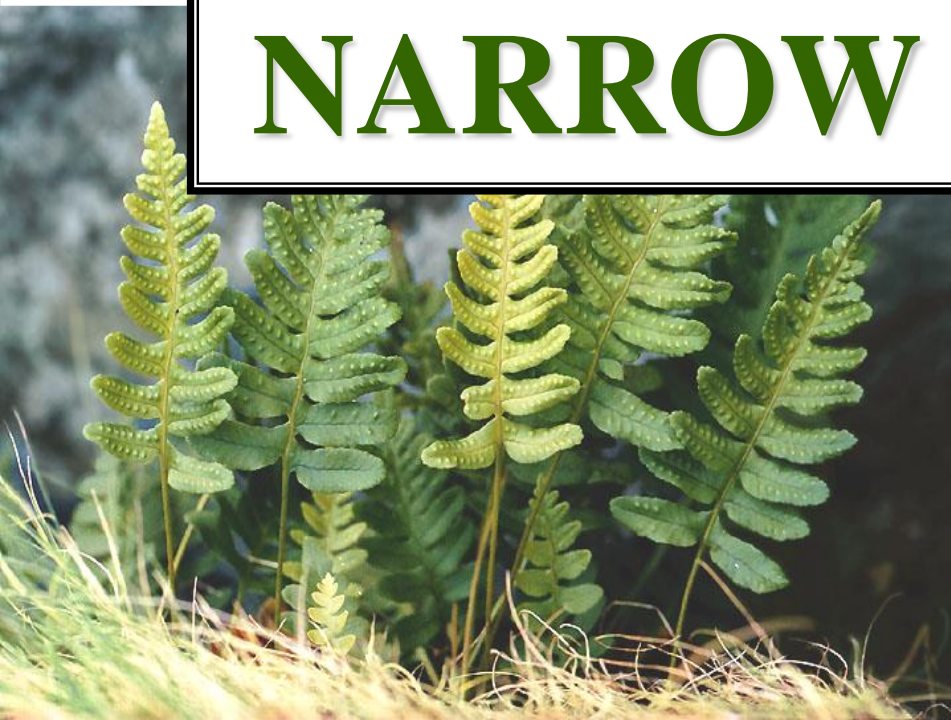


PTERIDOPHYTES

PTERIDOPHYTA



PTERIDOPHYTE NARROW CONTEXT





DIVERSITY



~12,000 SPECIES

EARTH



**PTERIDOPHYTA
MODERATE
COMPONENT
EXTANTFLORA**

EARTH

DISTRIBUTION

T

TEMPERATE

EARTH

A satellite view of Earth showing the tropical region. The image displays the Earth's curvature, with the blue oceans and white clouds of the tropics. A large white rectangular box with a black border is centered horizontally across the middle of the image, containing the word "TROPICAL" in a bold, black, serif font.

TROPICAL

A satellite view of Earth showing the tropical region. The image displays the Earth's curvature, with the blue oceans and white clouds of the tropics. A large white rectangular box with a black border is centered horizontally across the middle of the image, containing the word "TROPICAL" in a bold, black, serif font. Below this, a smaller white rectangular box with a black border is centered horizontally, containing the word "EARTH" in a bold, blue, serif font.

EARTH

A satellite view of the Earth showing the Western Hemisphere, including North and South America, the Atlantic Ocean, and the Pacific Ocean. The image is framed by a thin white border.

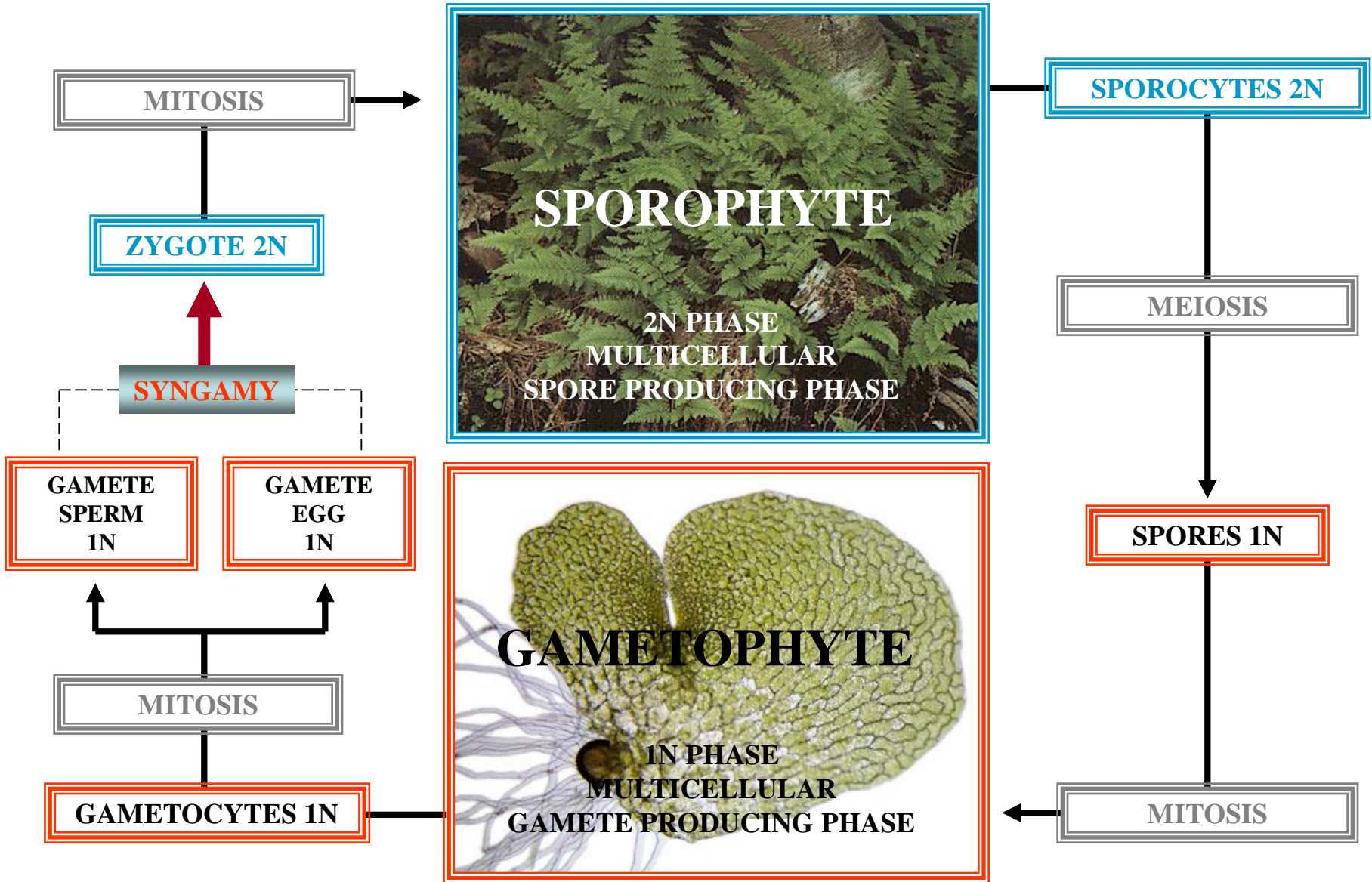
DOMINATELY TROPICAL

EARTH



GENERAL CHARACTERS

PTERIDOPHYTA LIFE CYCLE

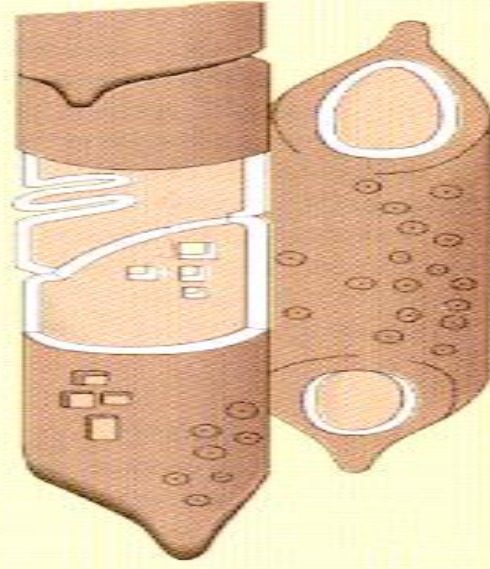
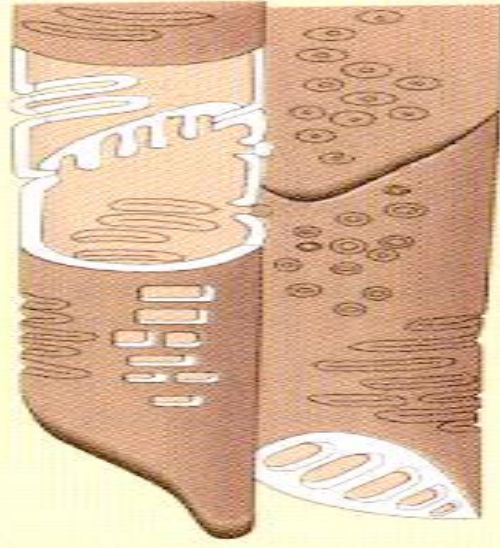
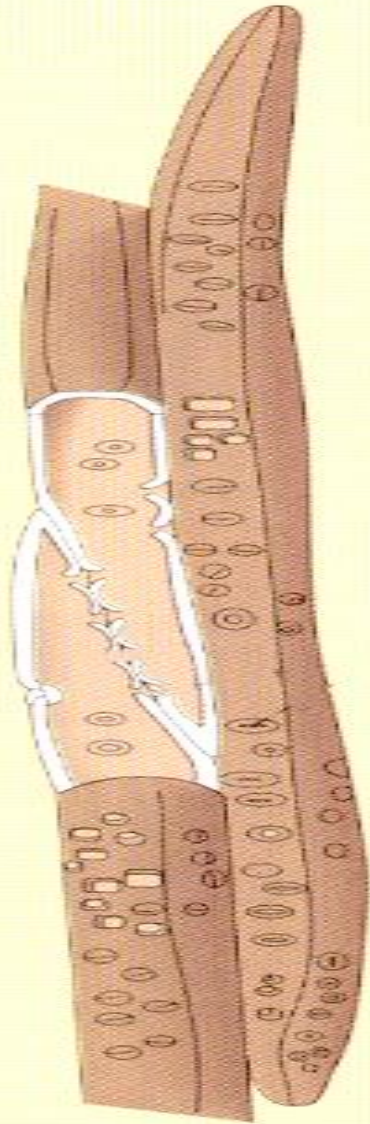




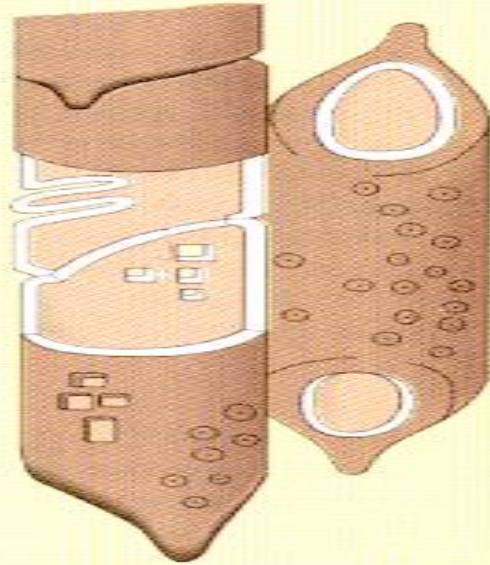
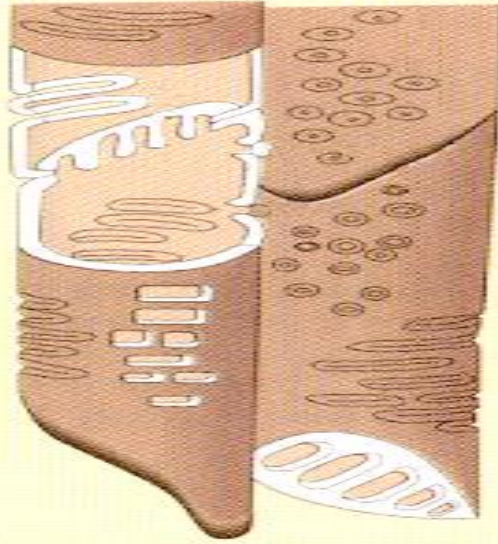
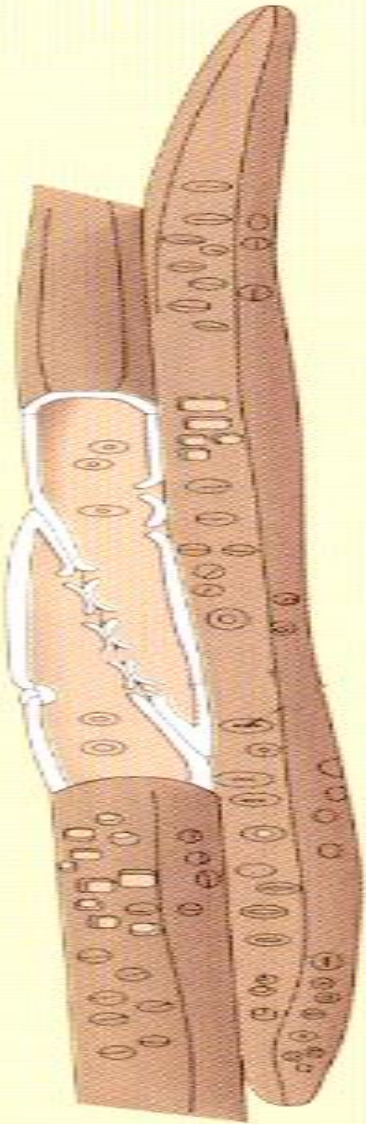
SPOROPHYTE CHARACTERS



XYLEM



XYLEM CELLS



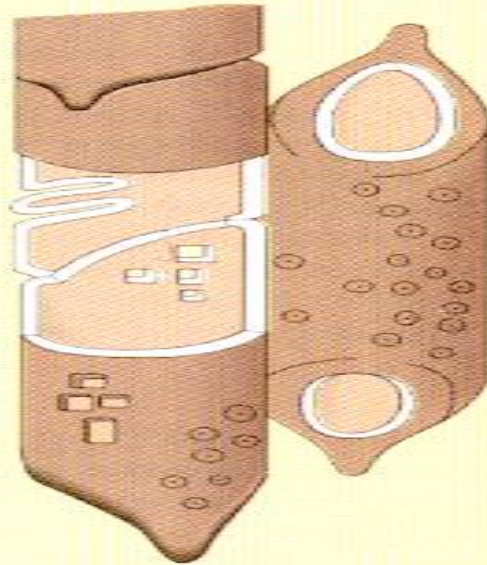
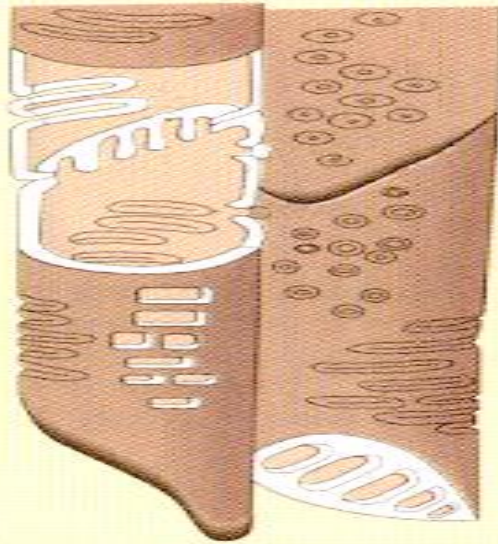
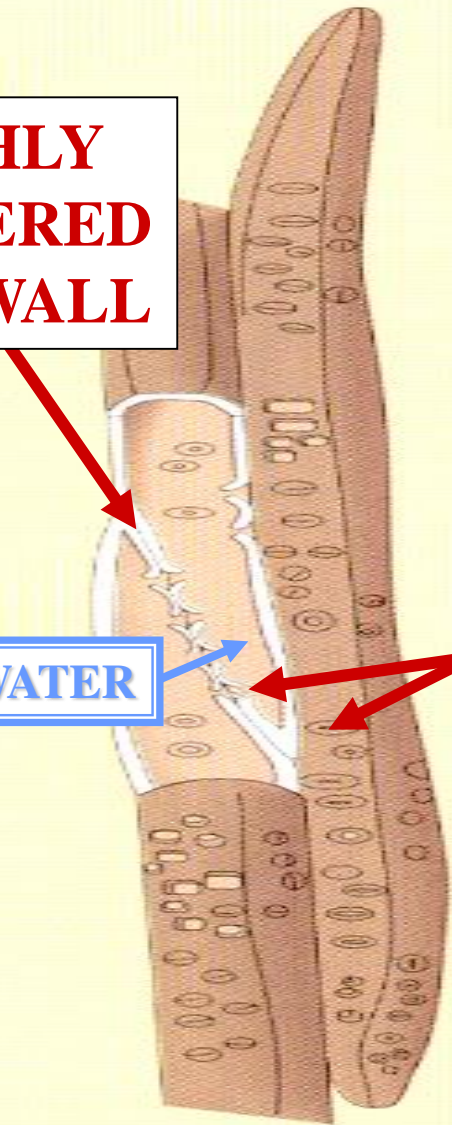
TRACHEARY ELEMENTS

**HIGHLY
TAPPED
END WALL**

WATER

PITS

?

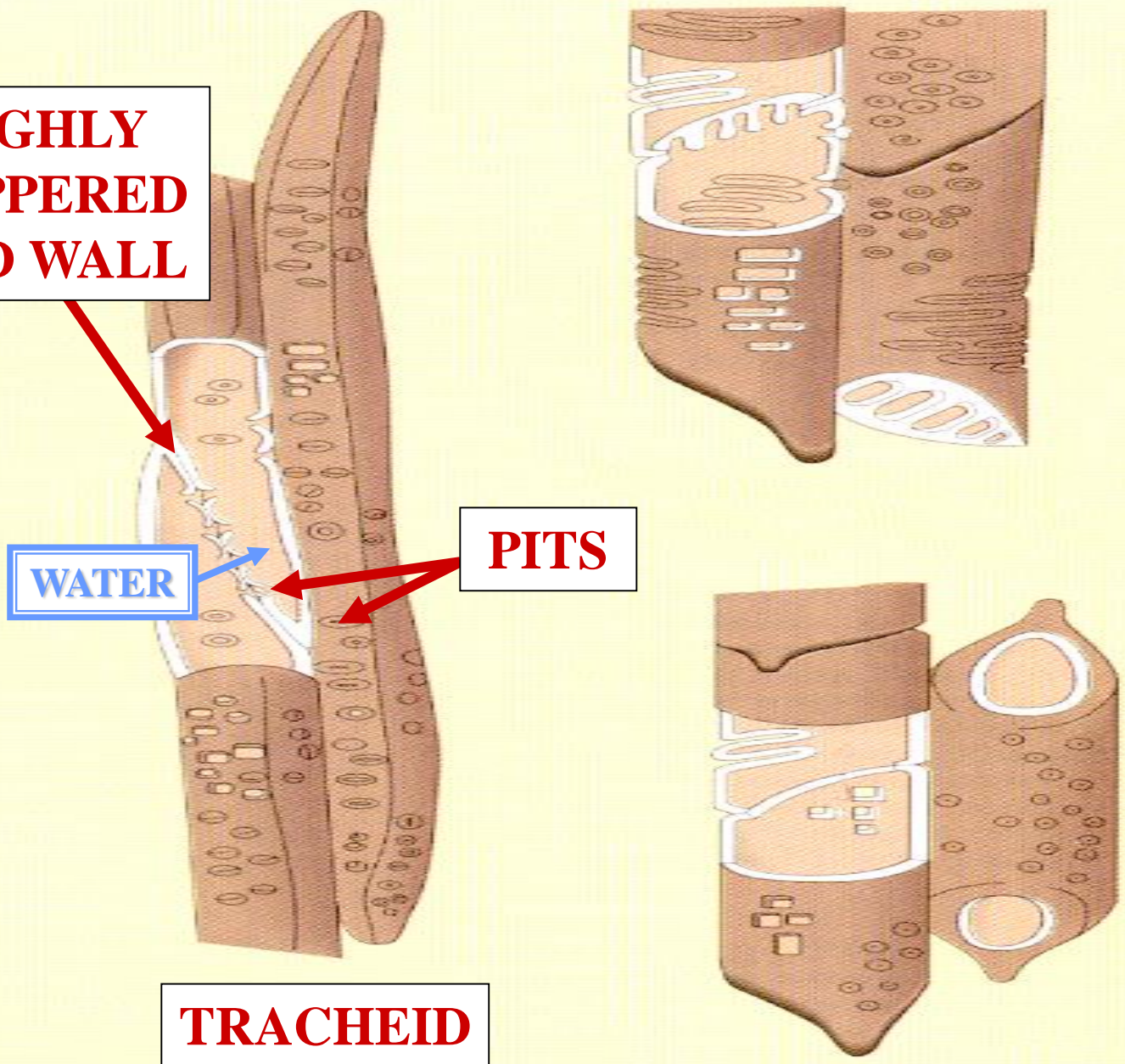


**HIGHLY
TAPPED
END WALL**

WATER

PITS

TRACHEID



**HIGHLY
TAPPED
END WALL**

**LESS
TAPPED
END WALL**

?

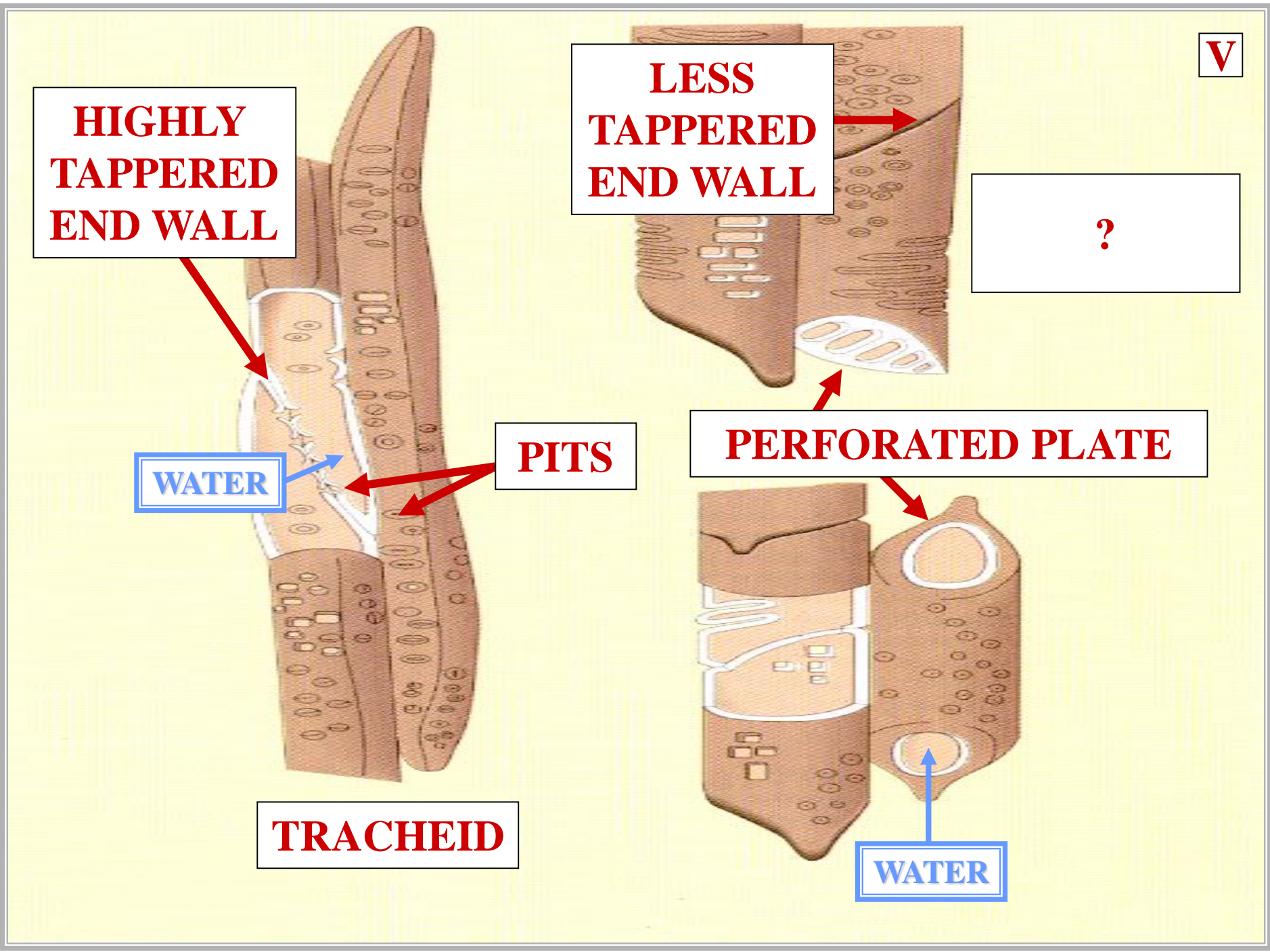
WATER

PITS

PERFORATED PLATE

TRACHEID

WATER





T

**HIGHLY
TAPPED
END WALL**

**LESS
TAPPED
END WALL**

**VESSEL
MEMBER**

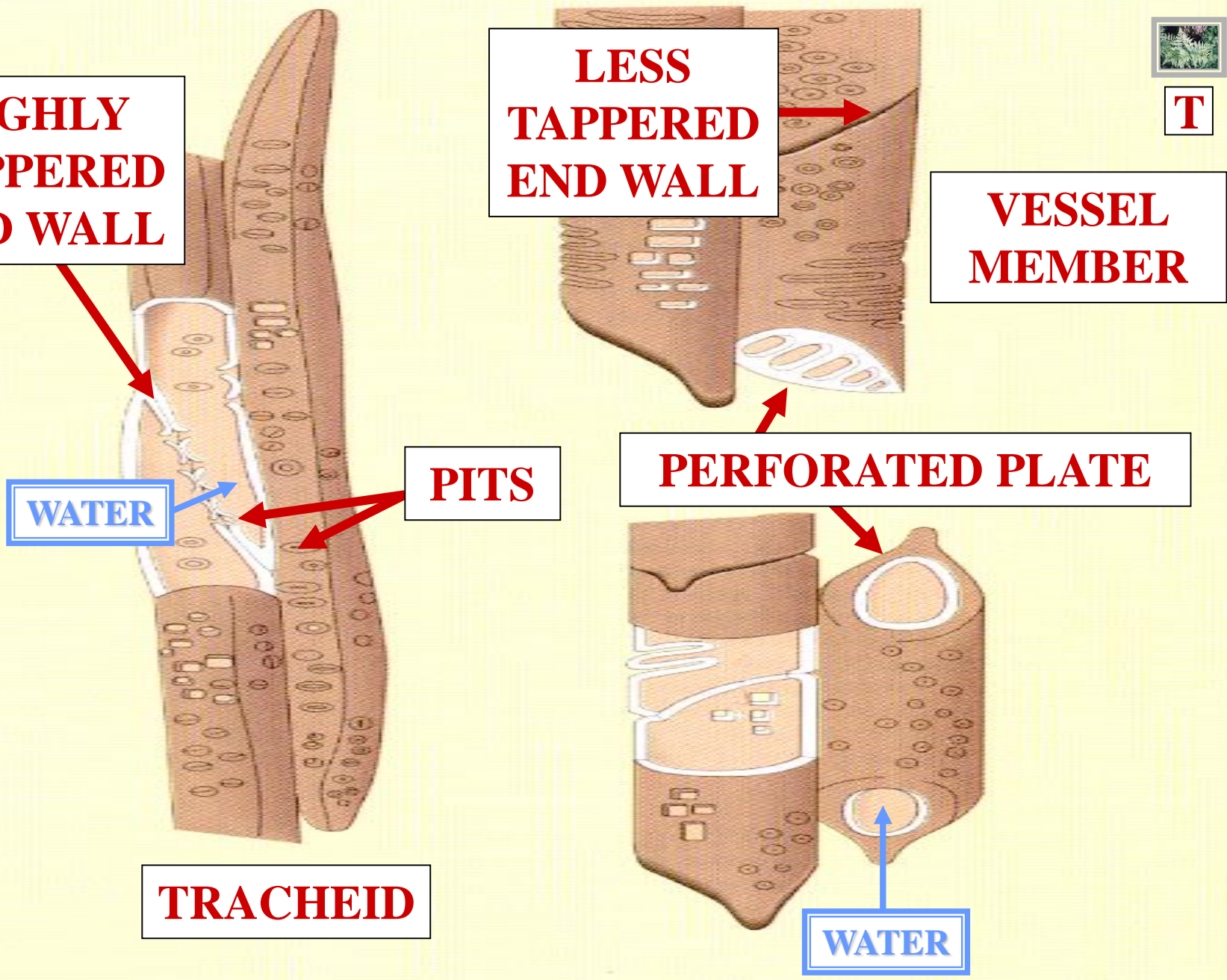
WATER

PITS

PERFORATED PLATE

TRACHEID

WATER





TRACHEIDS

