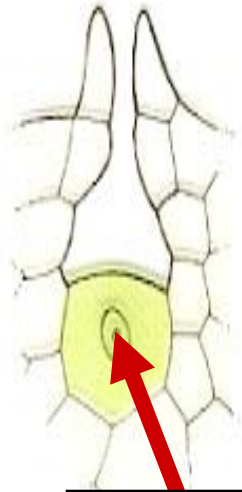


MITOSIS



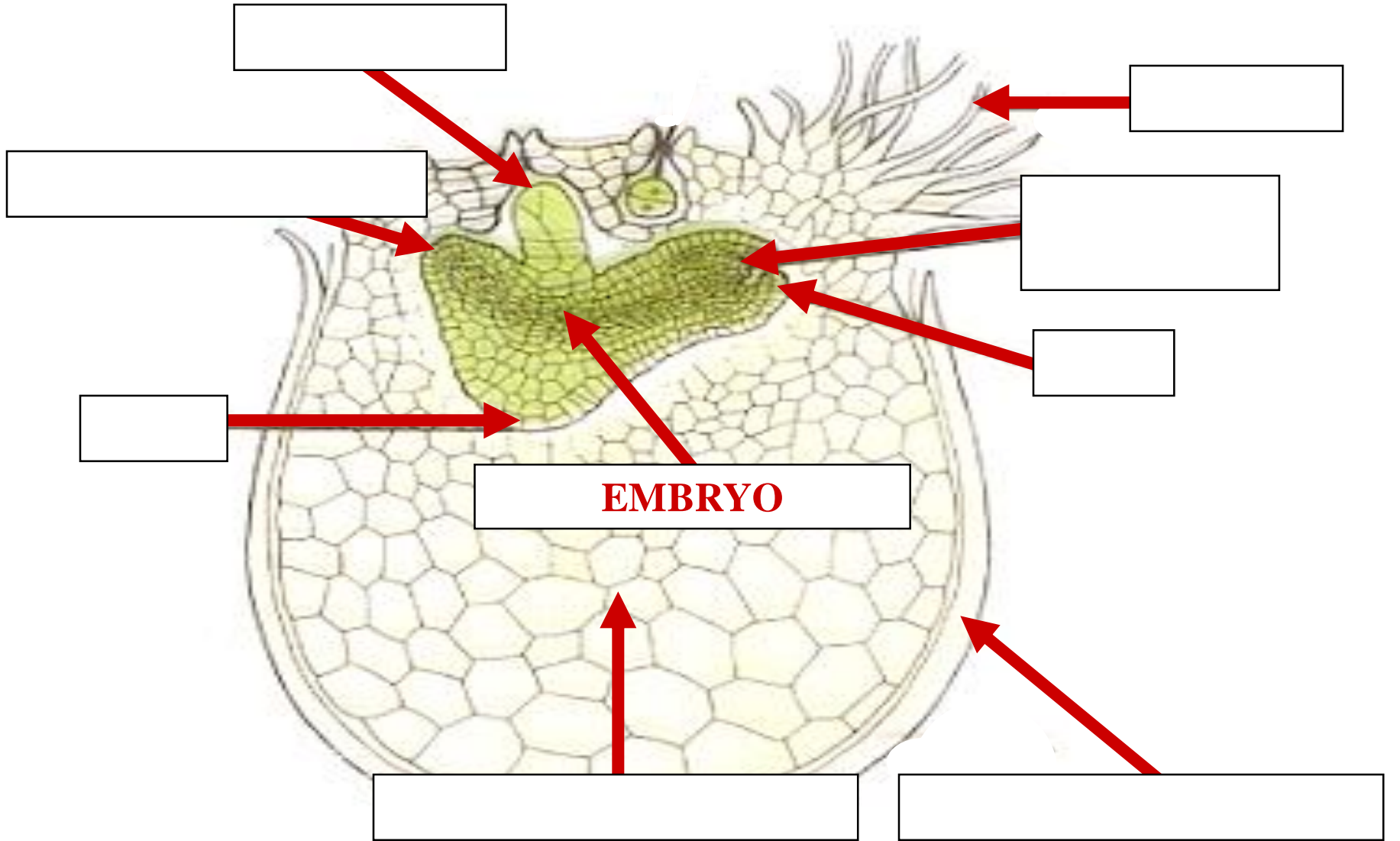
MITOSIS

SYNGAMY

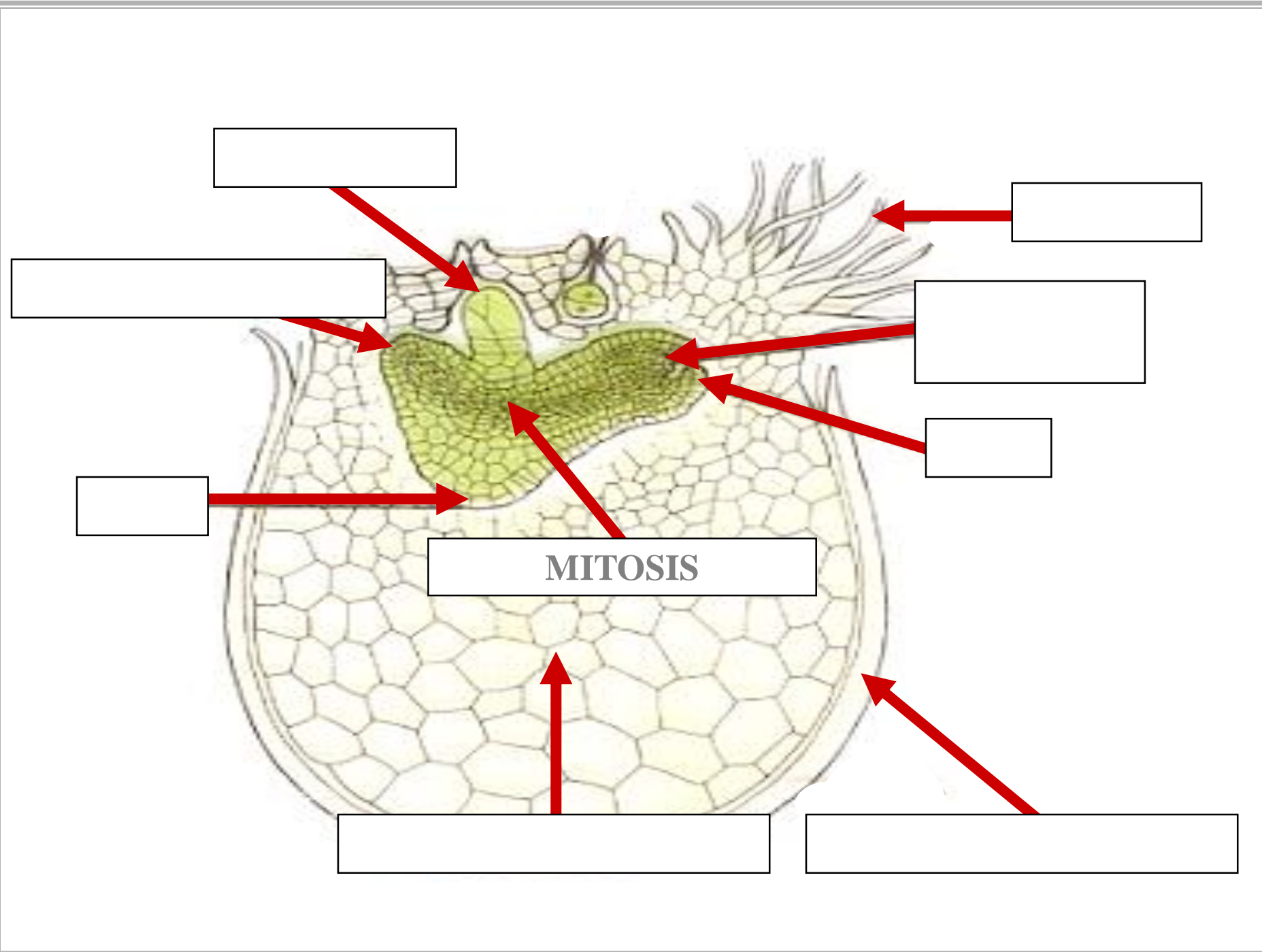
SPERM

EGG



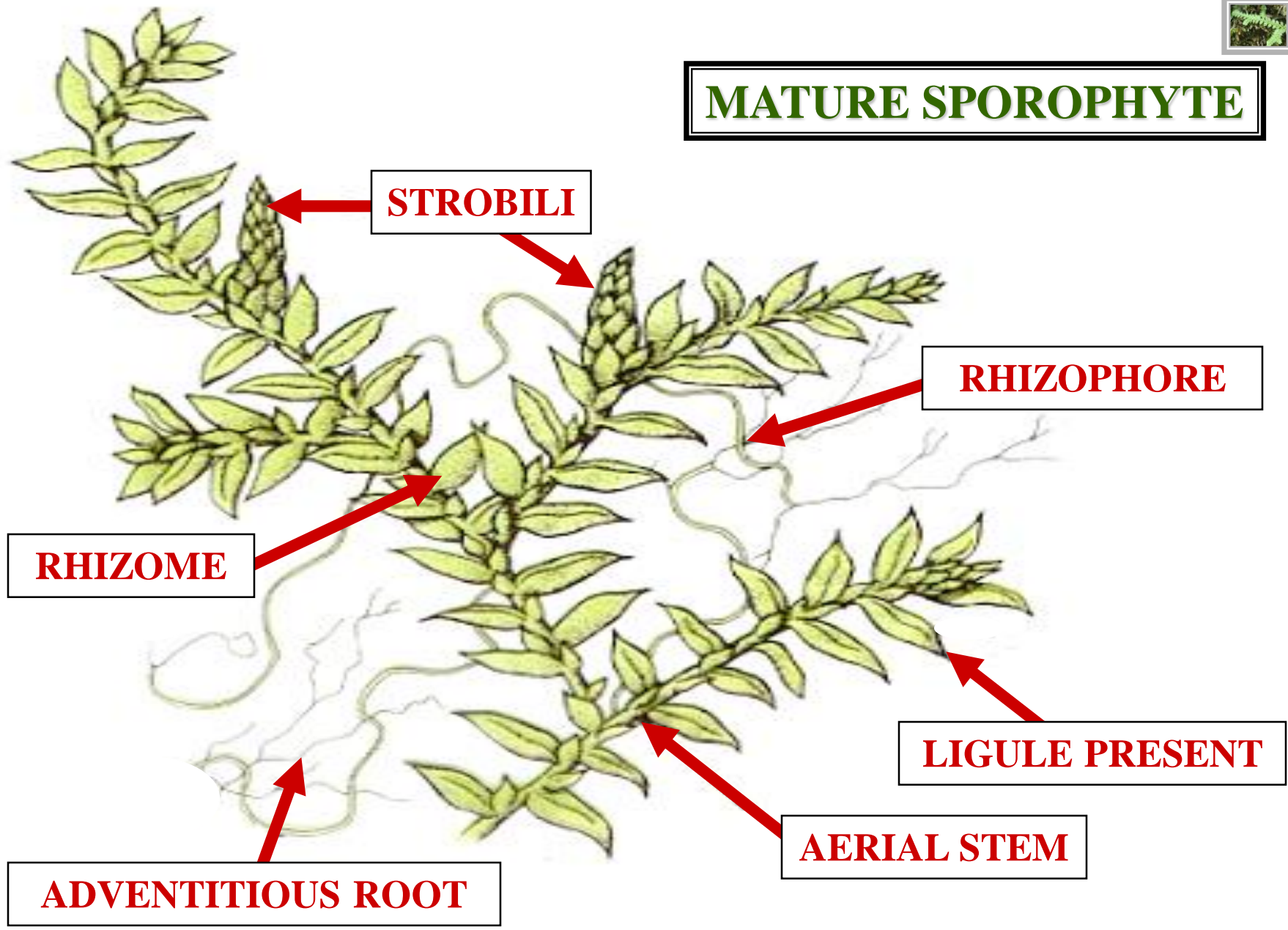


EMBRYO





MATURE SPOROPHYTE



STROBILI

RHIZOPHORE

RHIZOME

LIGULE PRESENT

ADVENTITIOUS ROOT

AERIAL STEM



SELAGINELLA

LYCOPODIOPHYTA CLASSIFICATION



ALABAMA
TRACHEOPHYTE

PHYLUM
PTERIDOPHYTA

ALABAMA
TRACHEOPHYTE

SYNONYMS



PTEROPHYTA



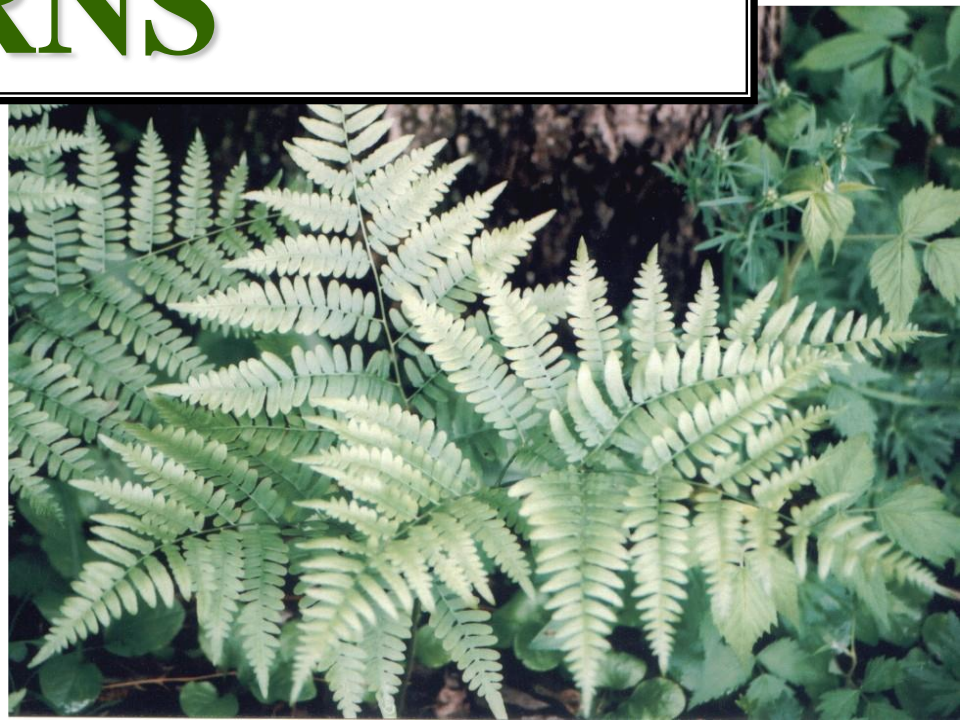
MONILOPHYTA

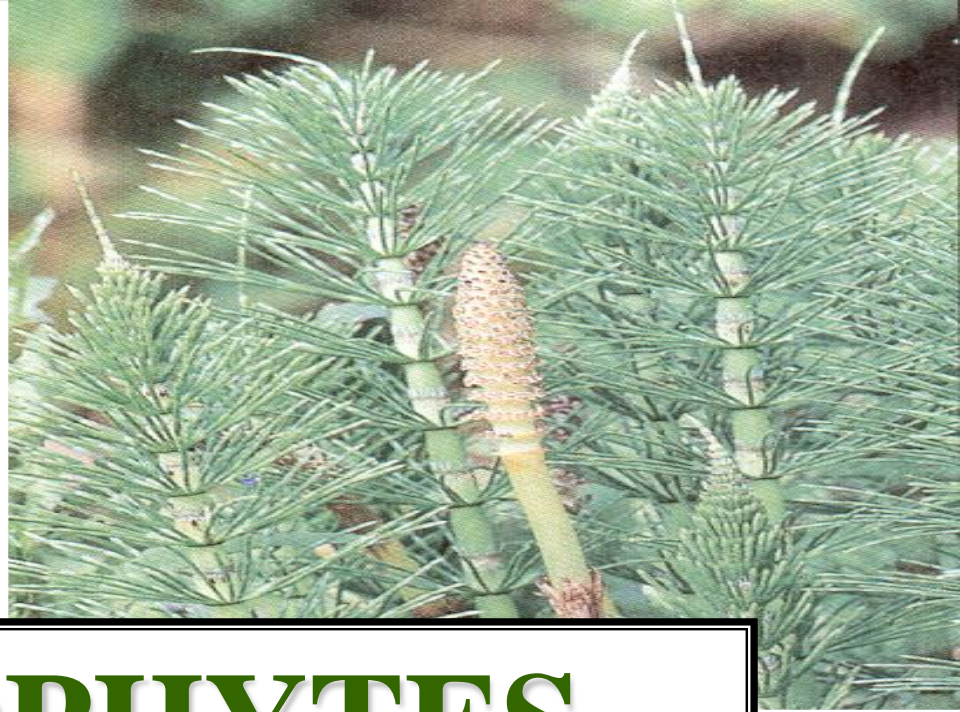
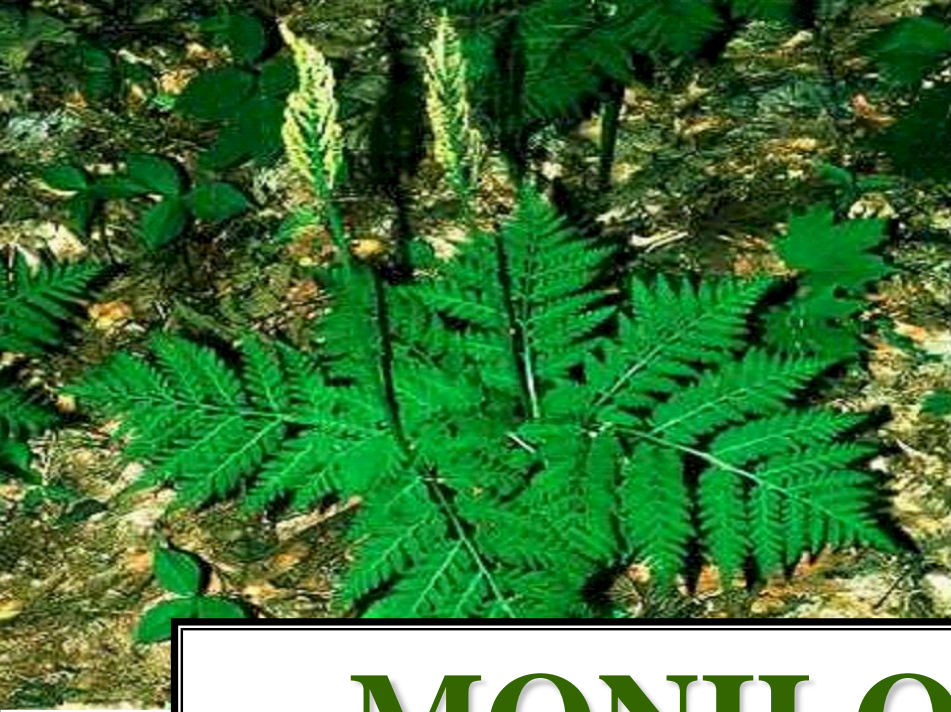


COMMON NAMES



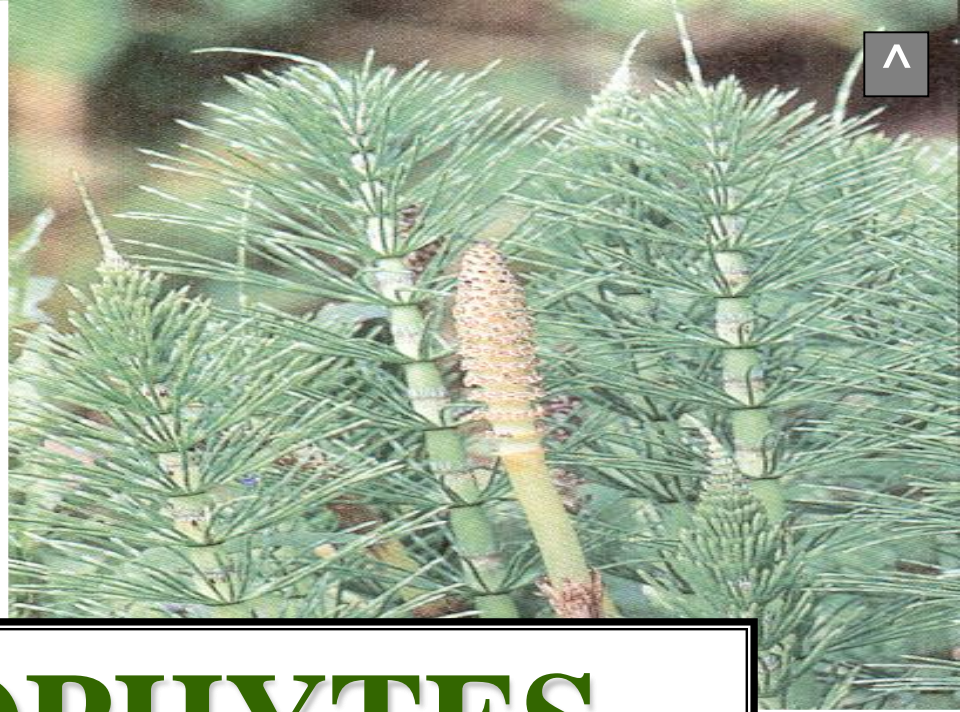
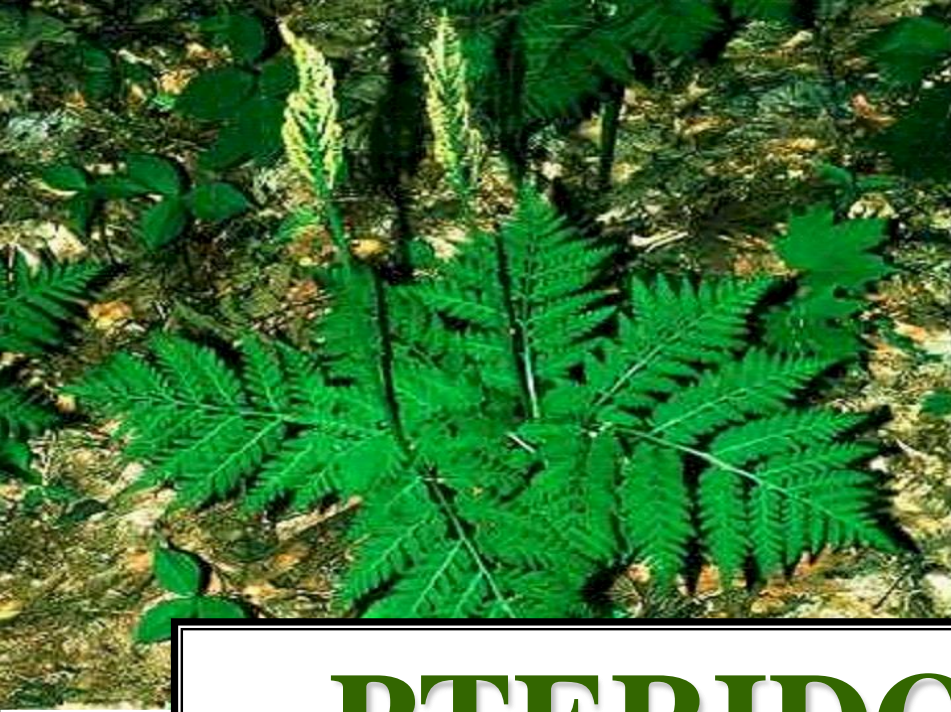
FERNS





MONILOPHYTES





PTERIDOPHYTES

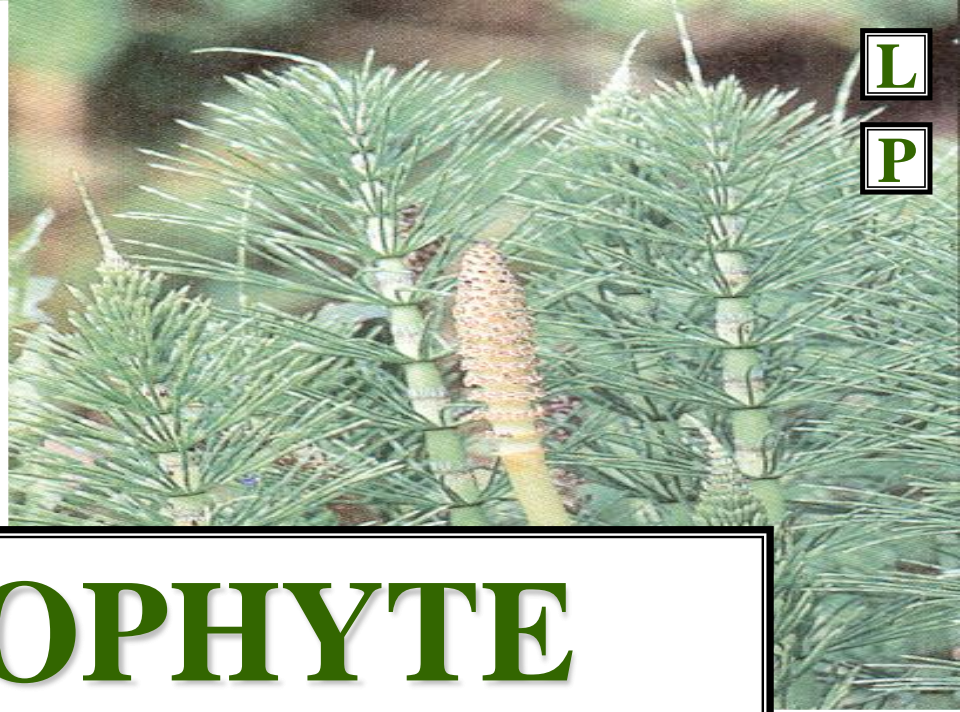




**“PTERIDOPHYTE”
TERM
CONTEXT**



“PTERIDOPHYTE”
1ST
CONTEXT



L
P

PTERIDOPHYTE BROAD CONTEXT





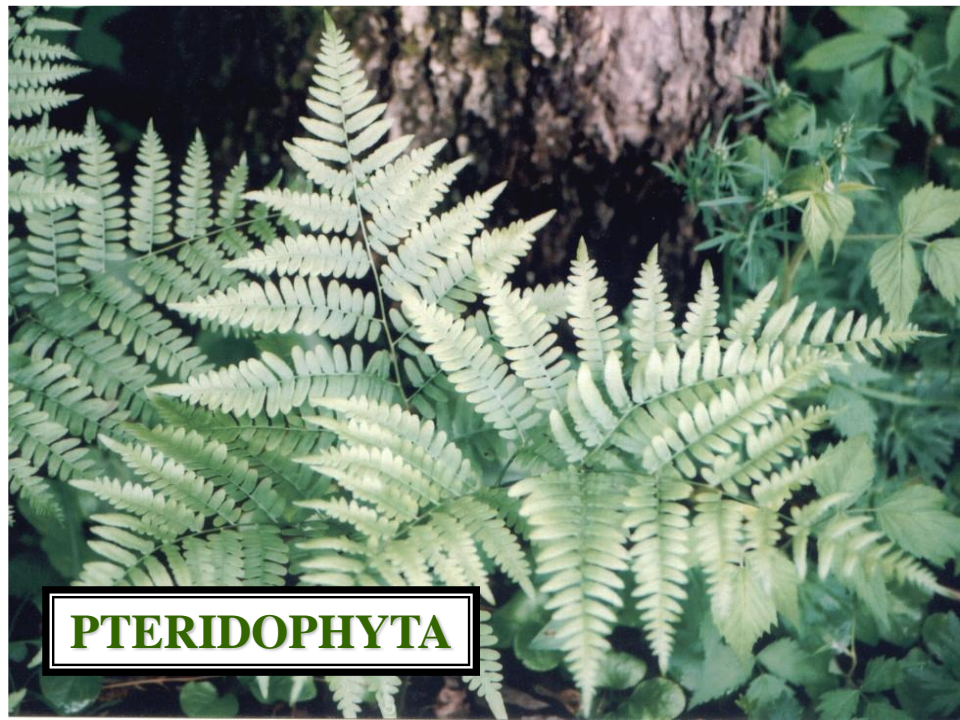
LYCOPODIOPHYTA



PTERIDOPHYTA



PTERIDOPHYTA

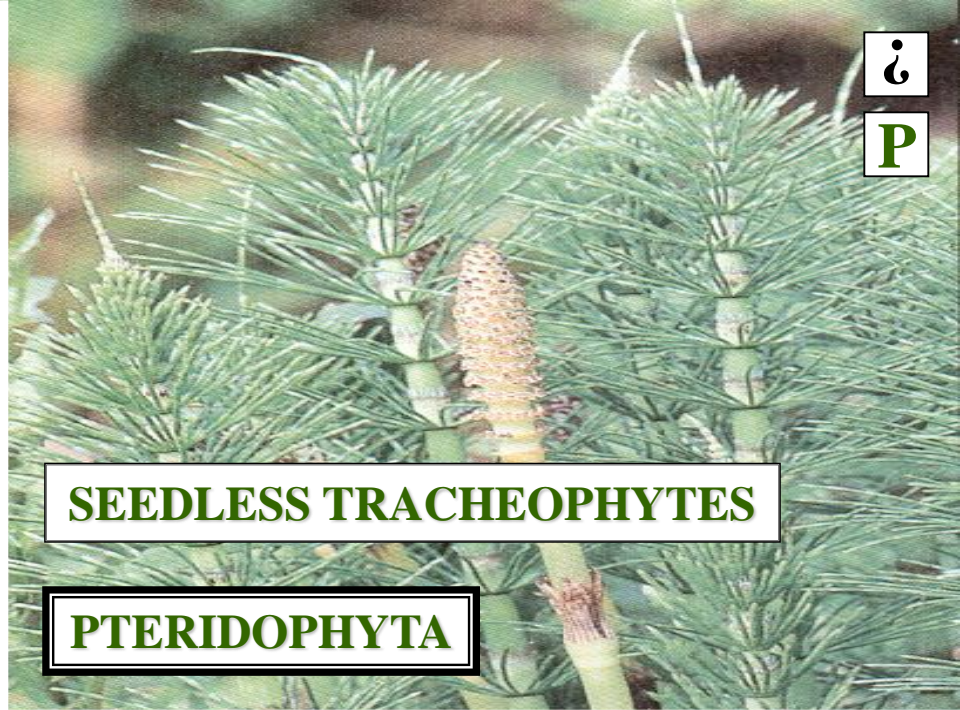


PTERIDOPHYTA



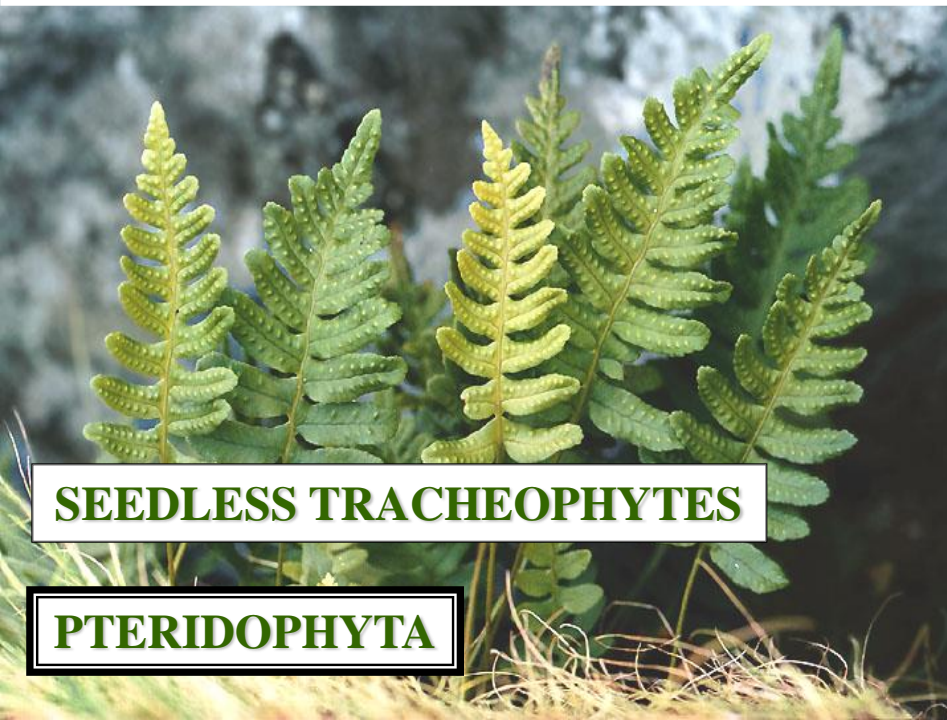
SEEDLESS TRACHEOPHYTES

LYCOPODIOPHYTA



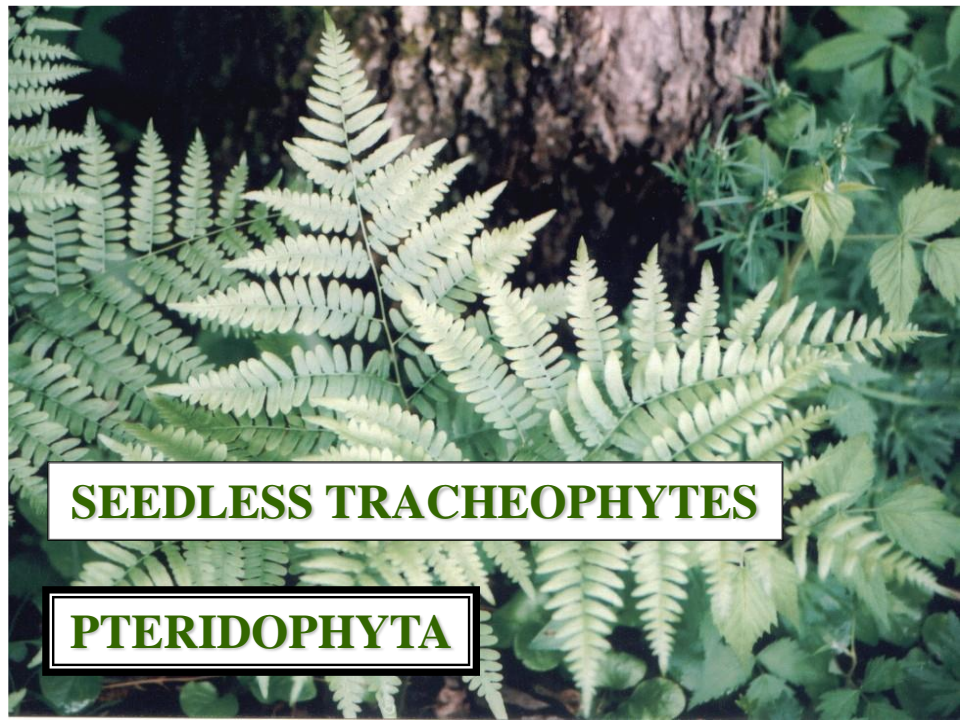
SEEDLESS TRACHEOPHYTES

PTERIDOPHYTA



SEEDLESS TRACHEOPHYTES

PTERIDOPHYTA



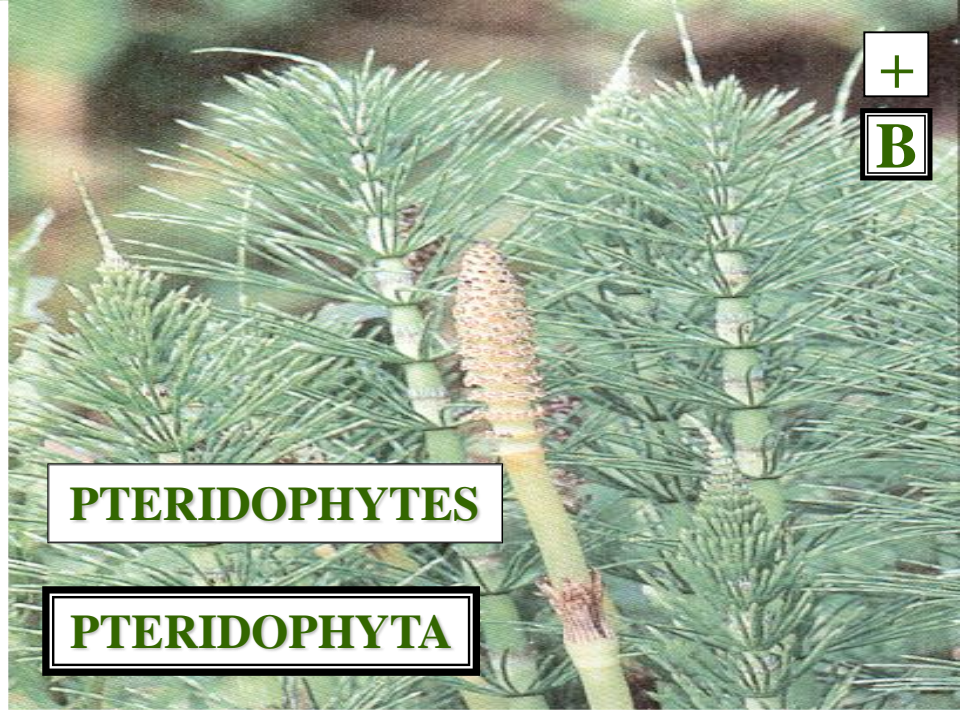
SEEDLESS TRACHEOPHYTES

PTERIDOPHYTA



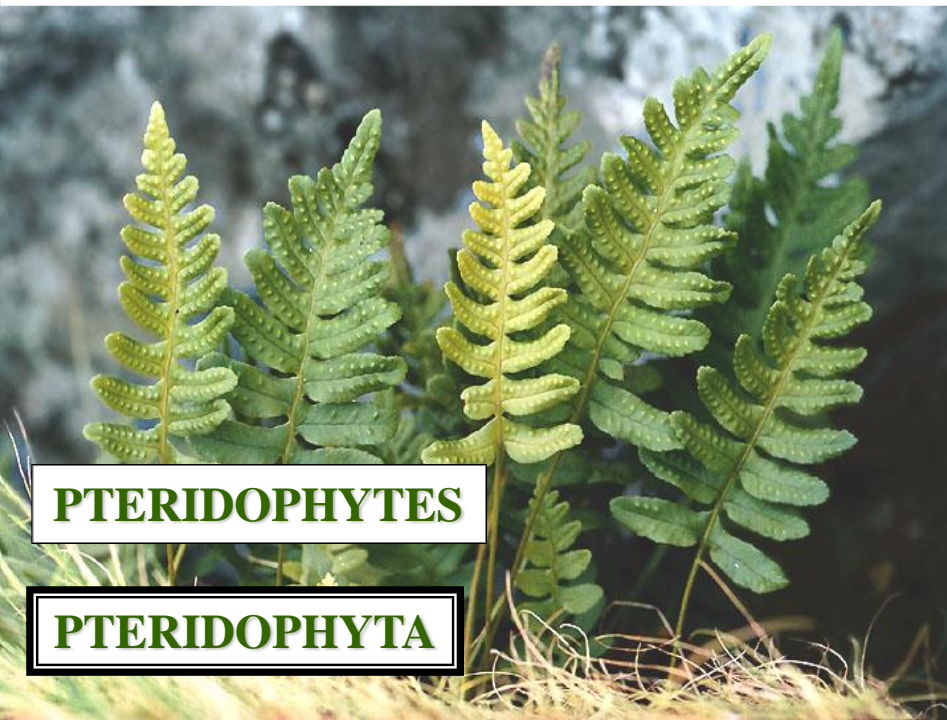
PTERIDOPHYTES

LYCOPODIOPHYTA



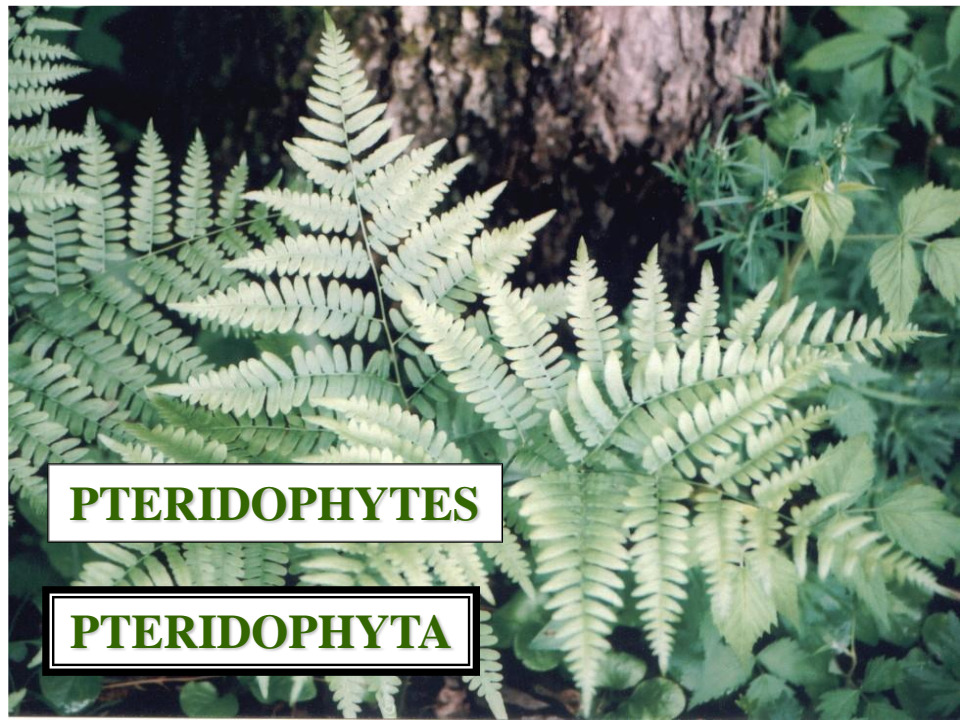
PTERIDOPHYTES

PTERIDOPHYTA



PTERIDOPHYTES

PTERIDOPHYTA



PTERIDOPHYTES

PTERIDOPHYTA



PTERIDOPHYTE BROAD CONTEXT





“PTERIDOPHYTE”

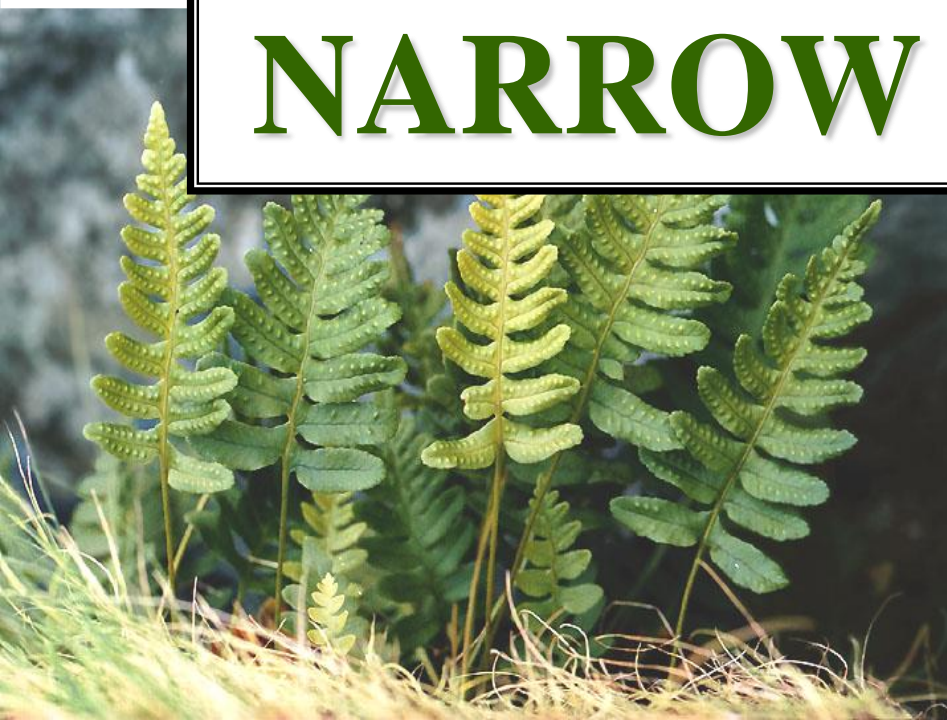
2ND

CONTEXT



P

PTERIDOPHYTE NARROW CONTEXT





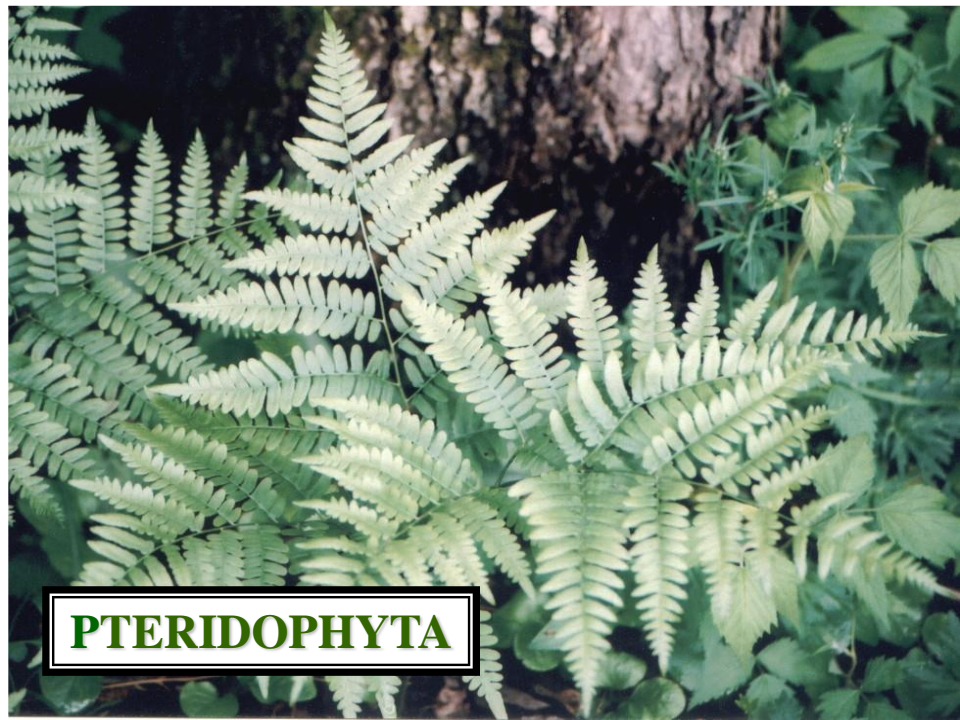
PTERIDOPHYTA



PTERIDOPHYTA



PTERIDOPHYTA



PTERIDOPHYTA



FERNS

PTERIDOPHYTA



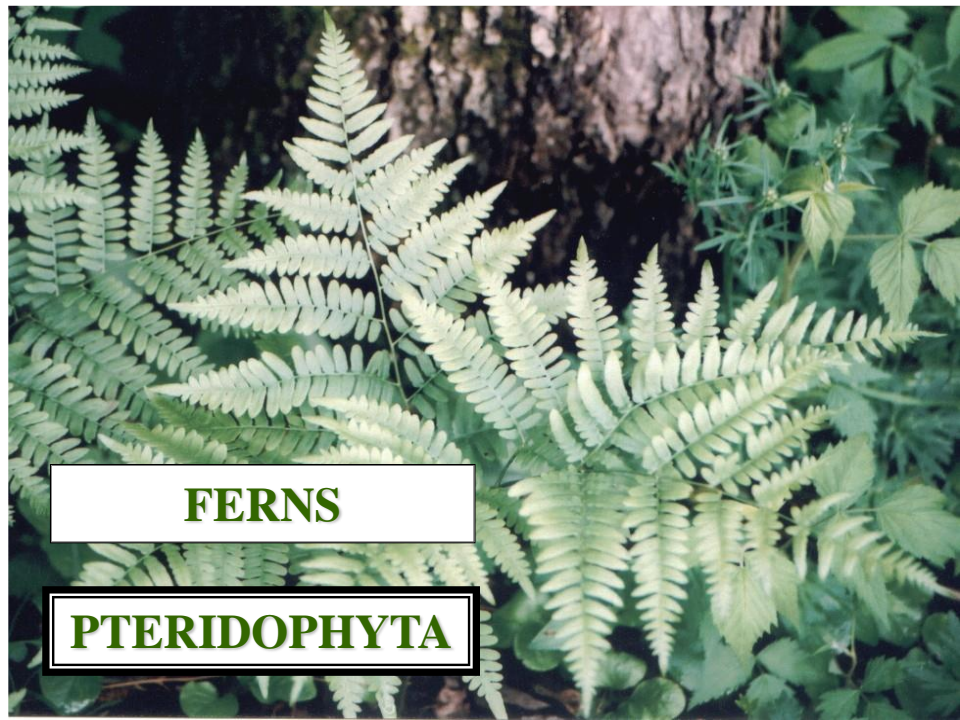
FERNS

PTERIDOPHYTA



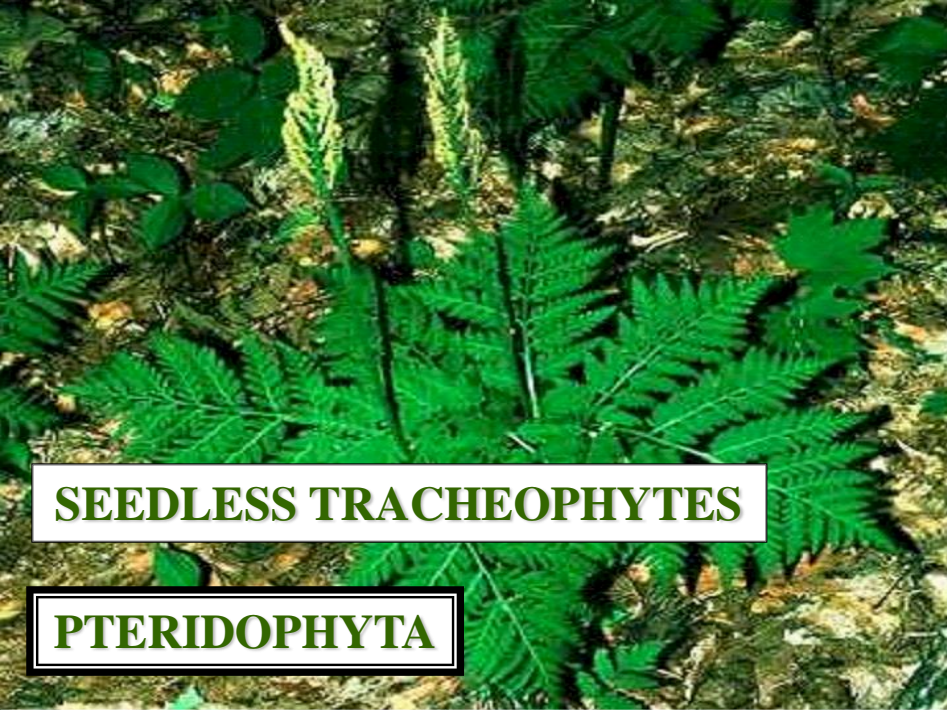
FERNS

PTERIDOPHYTA



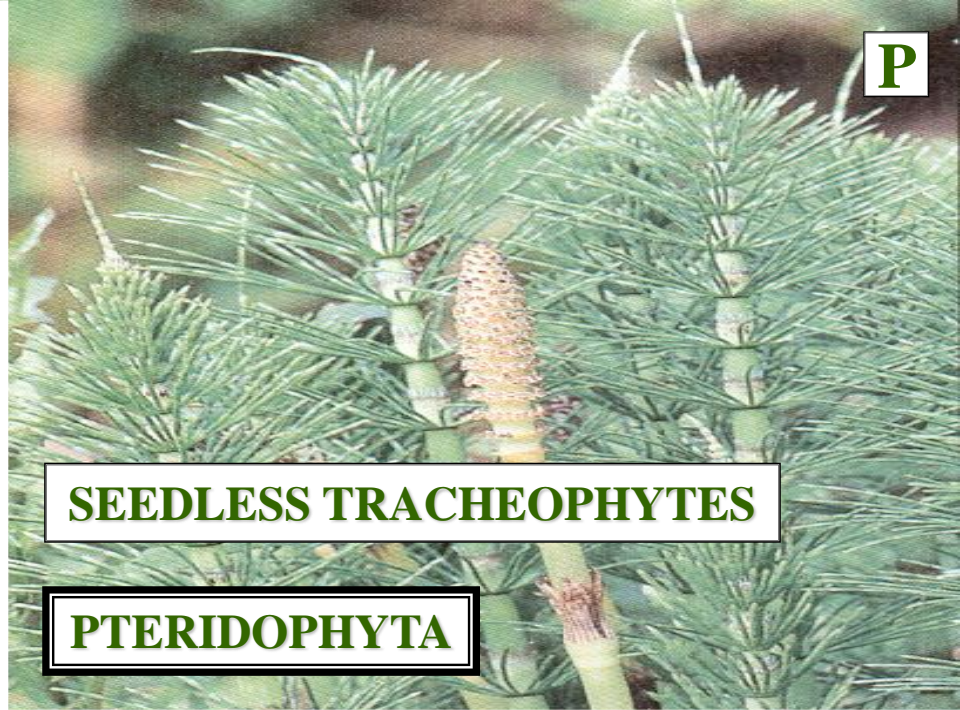
FERNS

PTERIDOPHYTA



SEEDLESS TRACHEOPHYTES

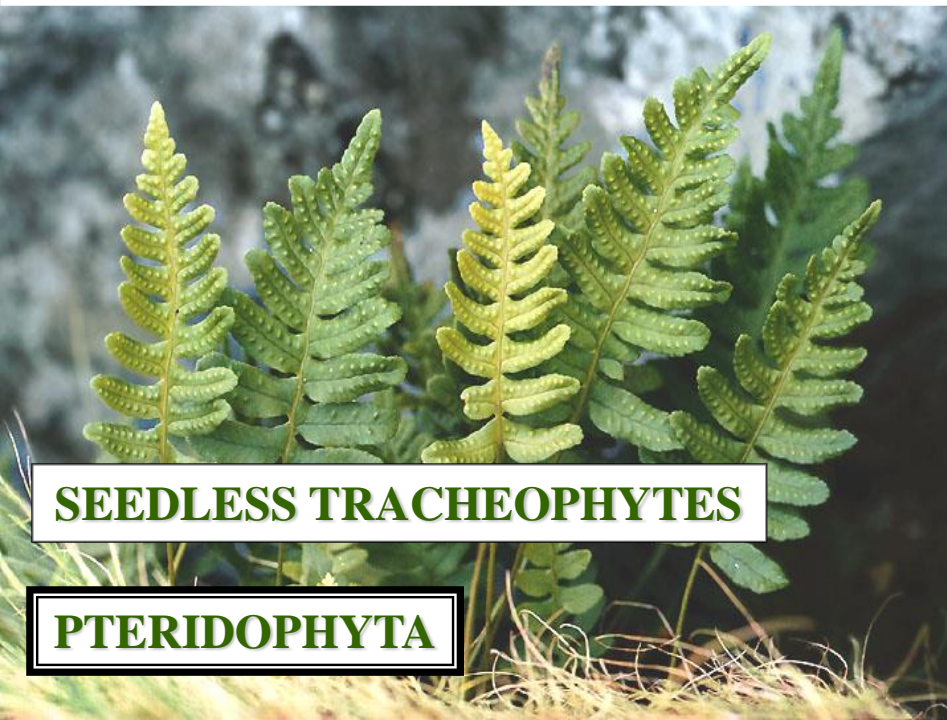
PTERIDOPHYTA



P

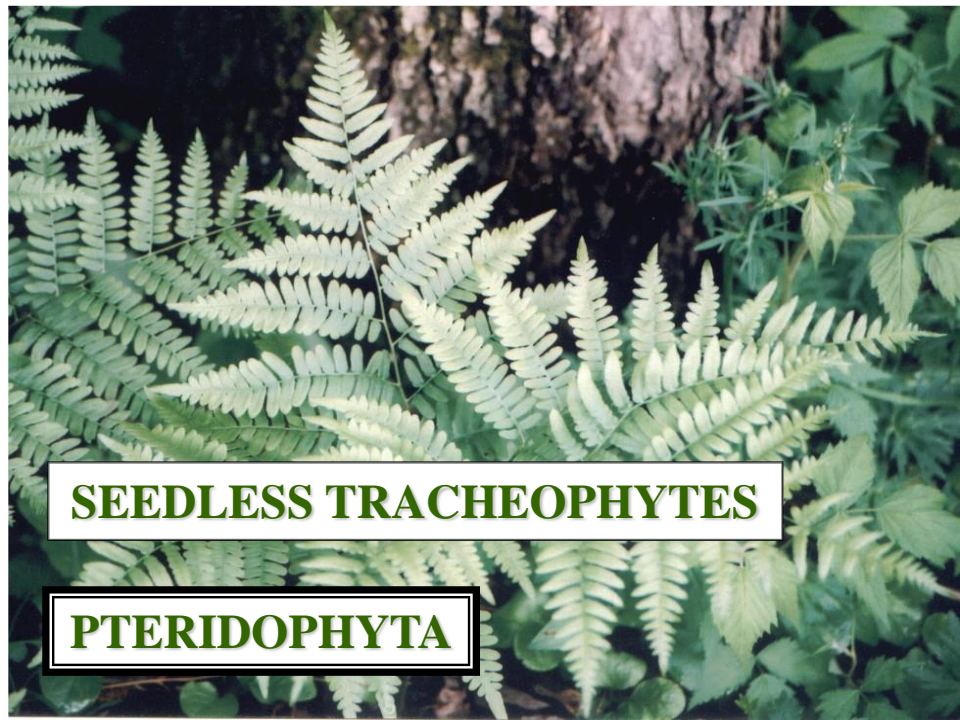
SEEDLESS TRACHEOPHYTES

PTERIDOPHYTA



SEEDLESS TRACHEOPHYTES

PTERIDOPHYTA



SEEDLESS TRACHEOPHYTES

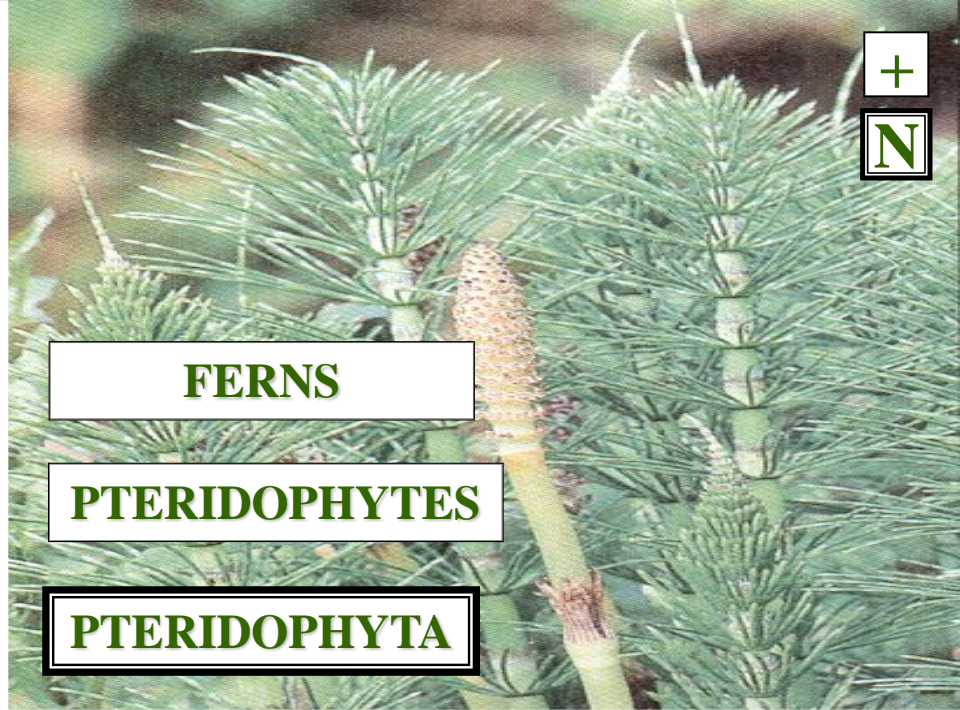
PTERIDOPHYTA



FERNS

PTERIDOPHYTES

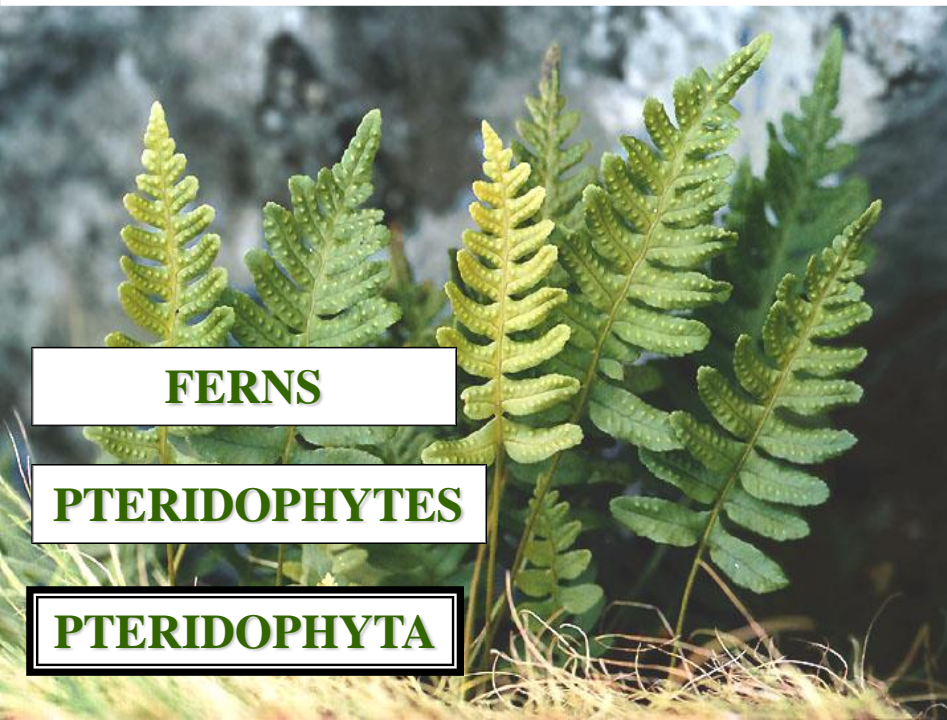
PTERIDOPHYTA



FERNS

PTERIDOPHYTES

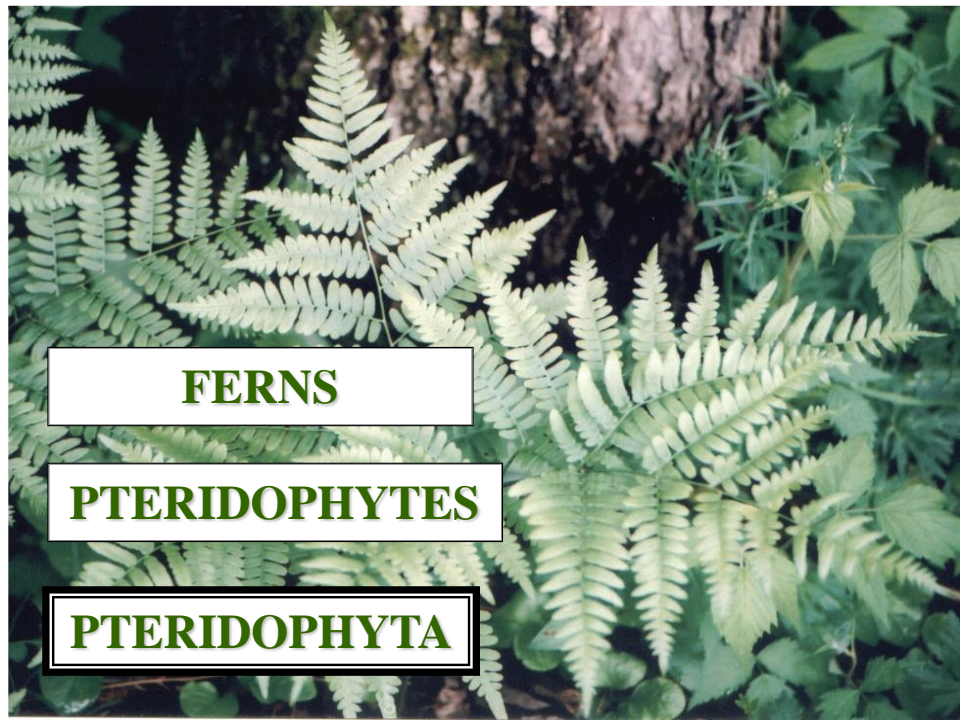
PTERIDOPHYTA



FERNS

PTERIDOPHYTES

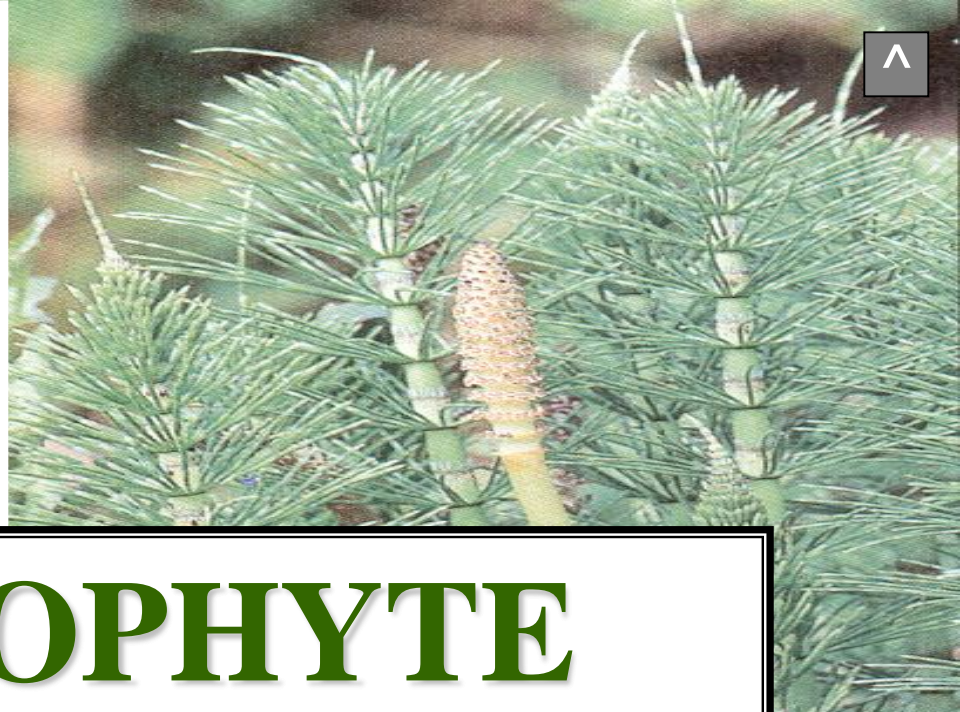
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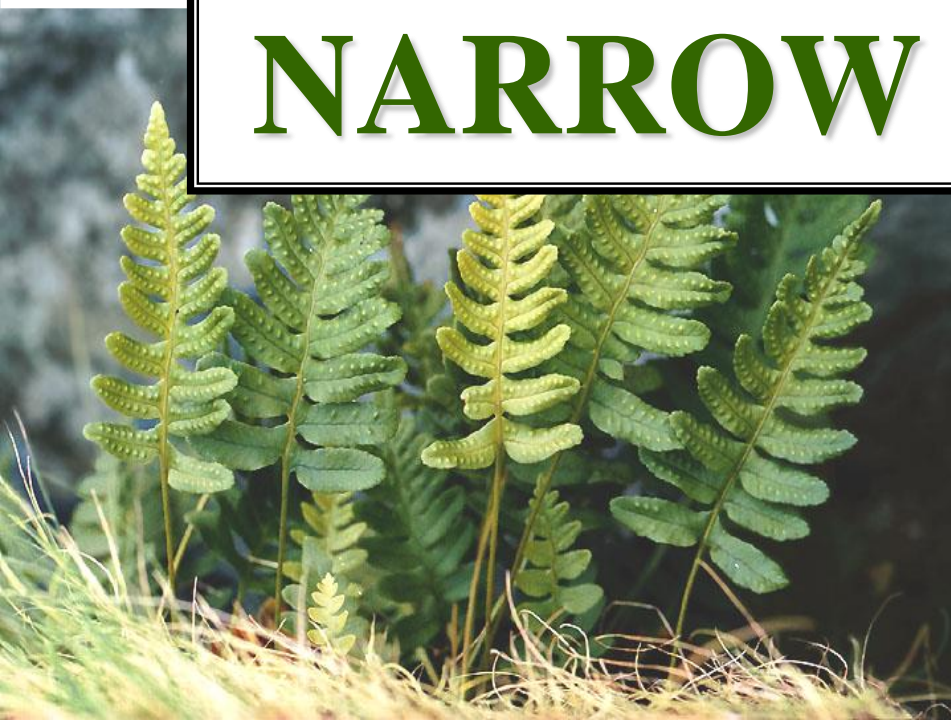
FERNS

PTERIDOPHYTES

PTERIDOPHYTA



PTERIDOPHYTE NARROW CONTEXT





DIVERSITY



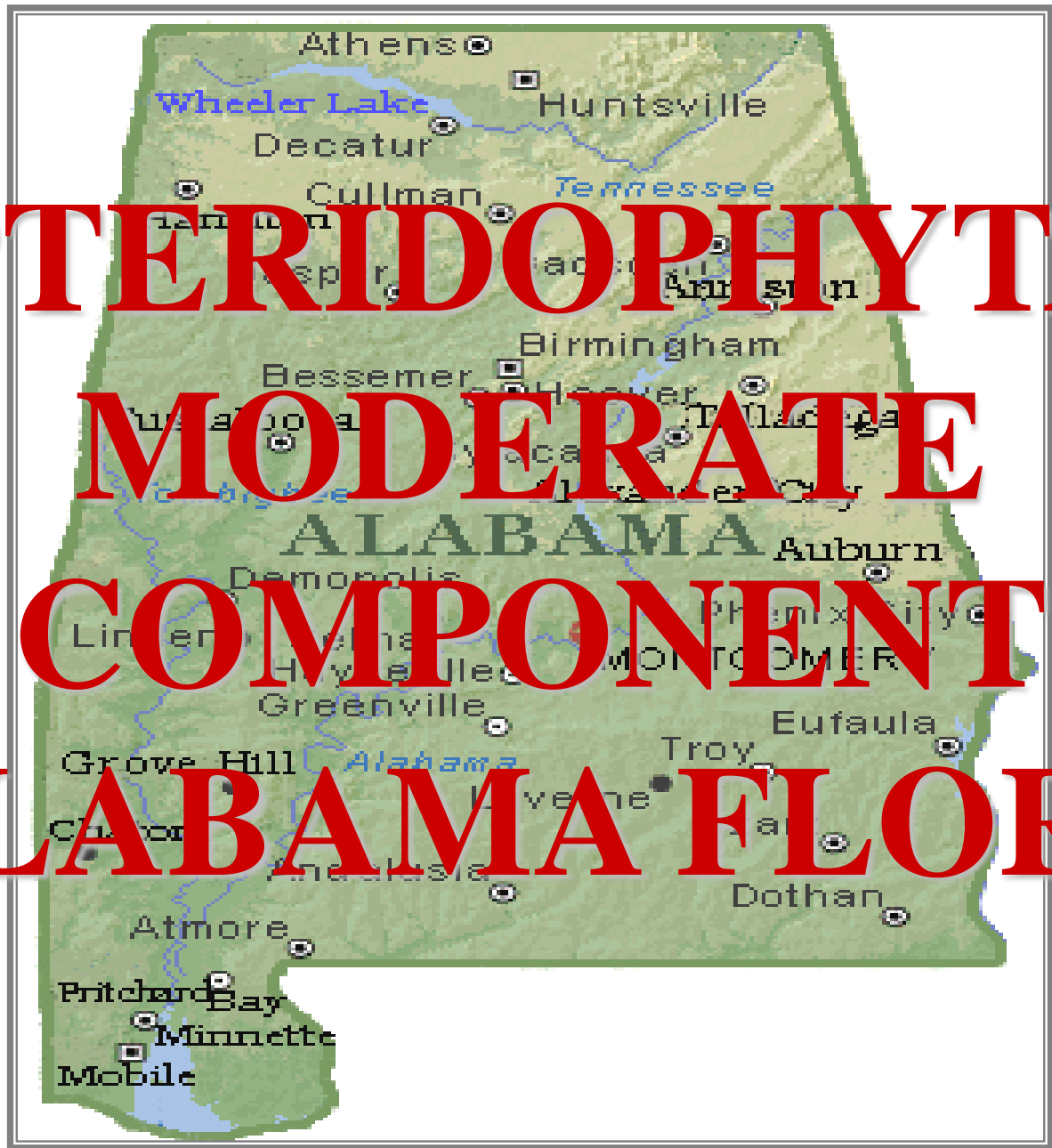
~12,000 SPECIES

EARTH



~63 SPECIES





PTERIDOPHYTA

MODERATE

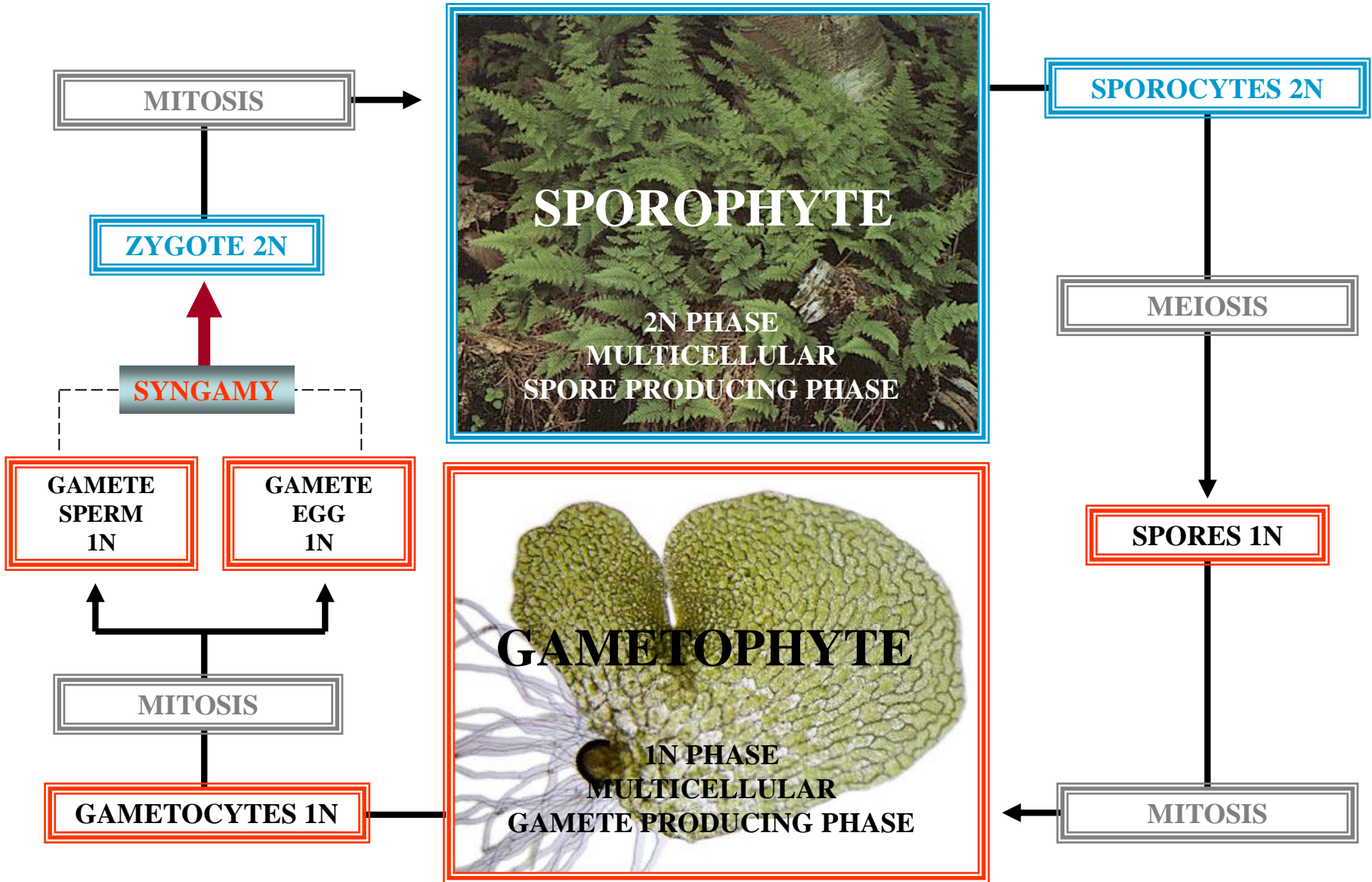
COMPONENT

ALABAMA FLORA



GENERAL CHARACTERS

PTERIDOPHYTA LIFE CYCLE

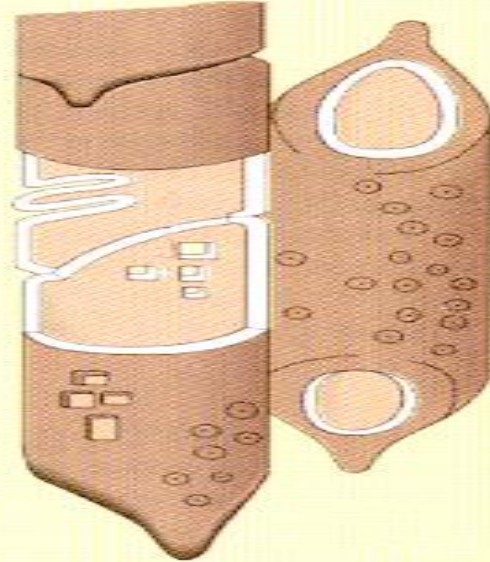
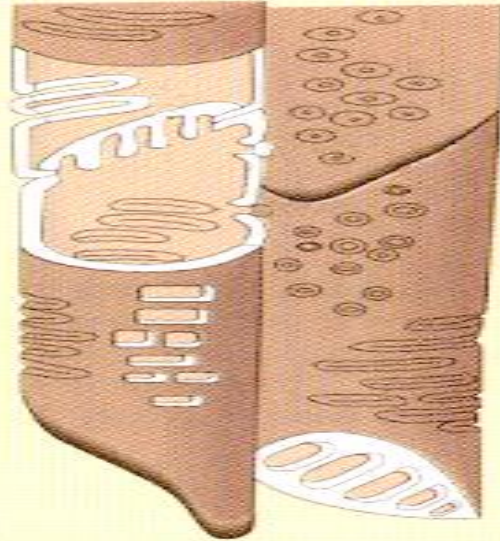
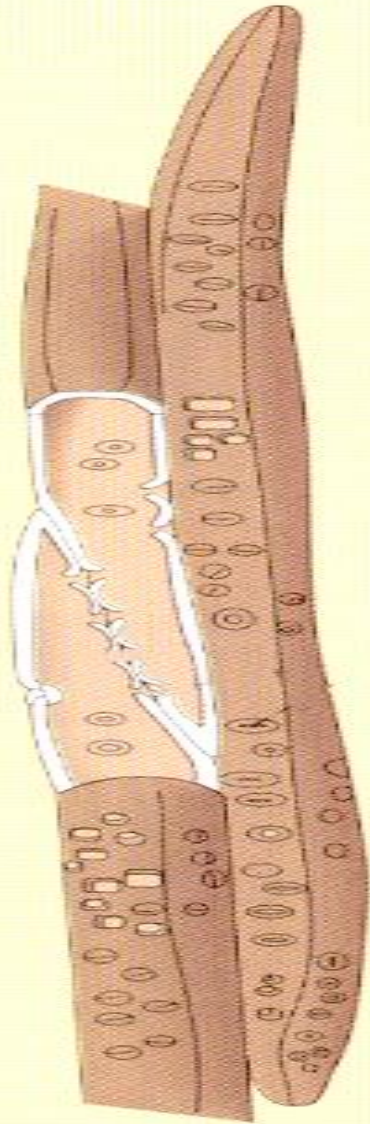




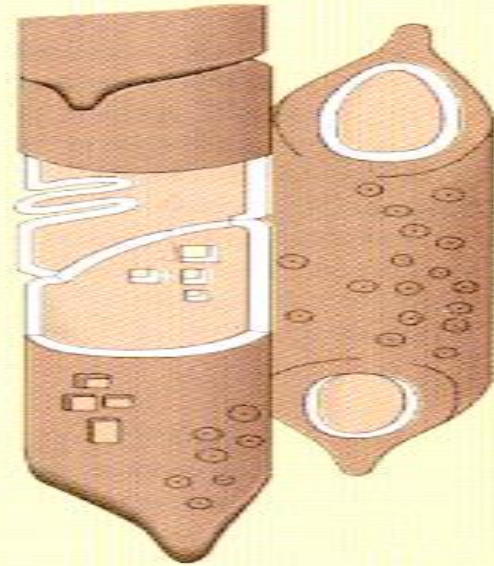
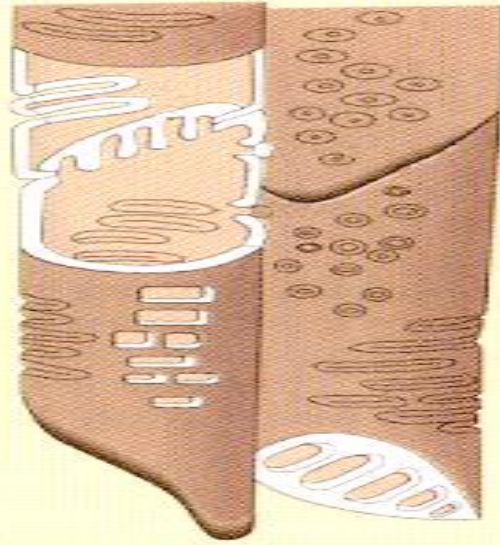
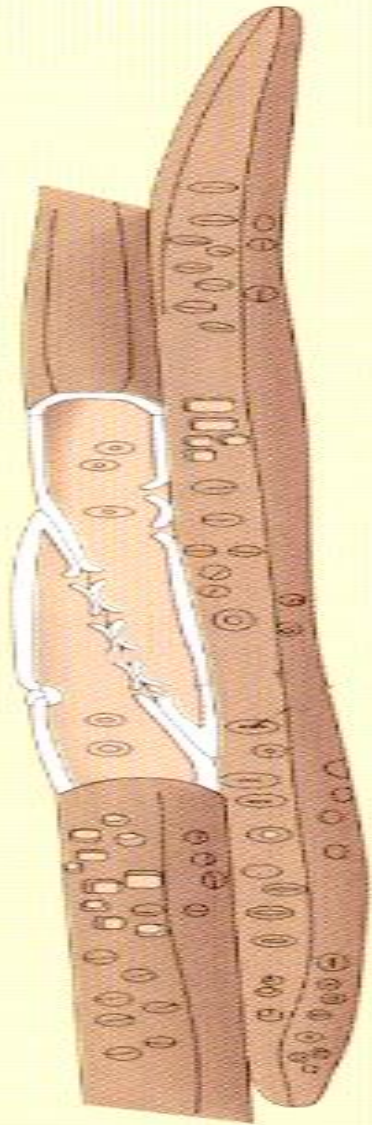
SPOROPHYTE CHARACTERS



XYLEM



XYLEM CELLS



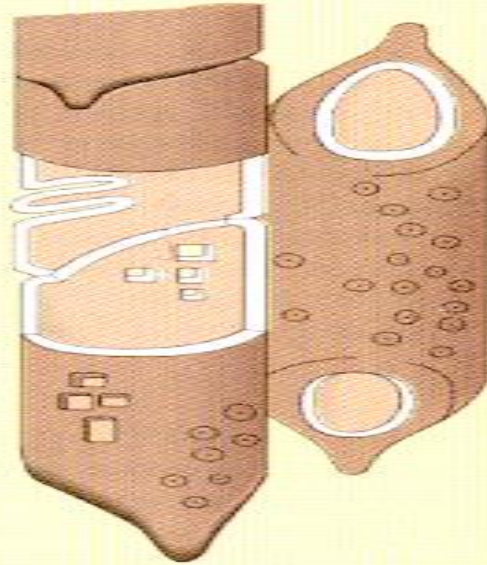
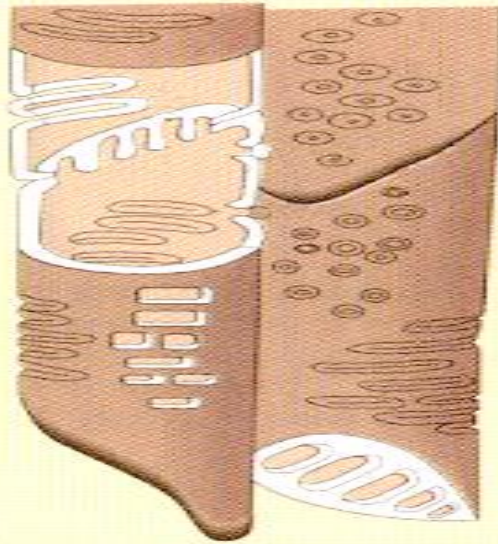
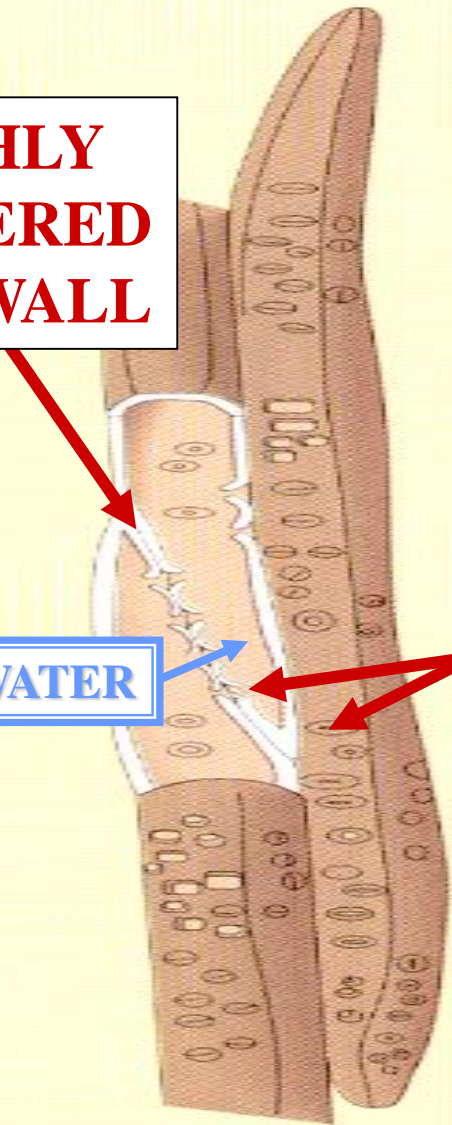
TRACHEARY ELEMENTS

**HIGHLY
TAPPED
END WALL**

WATER

PITS

?

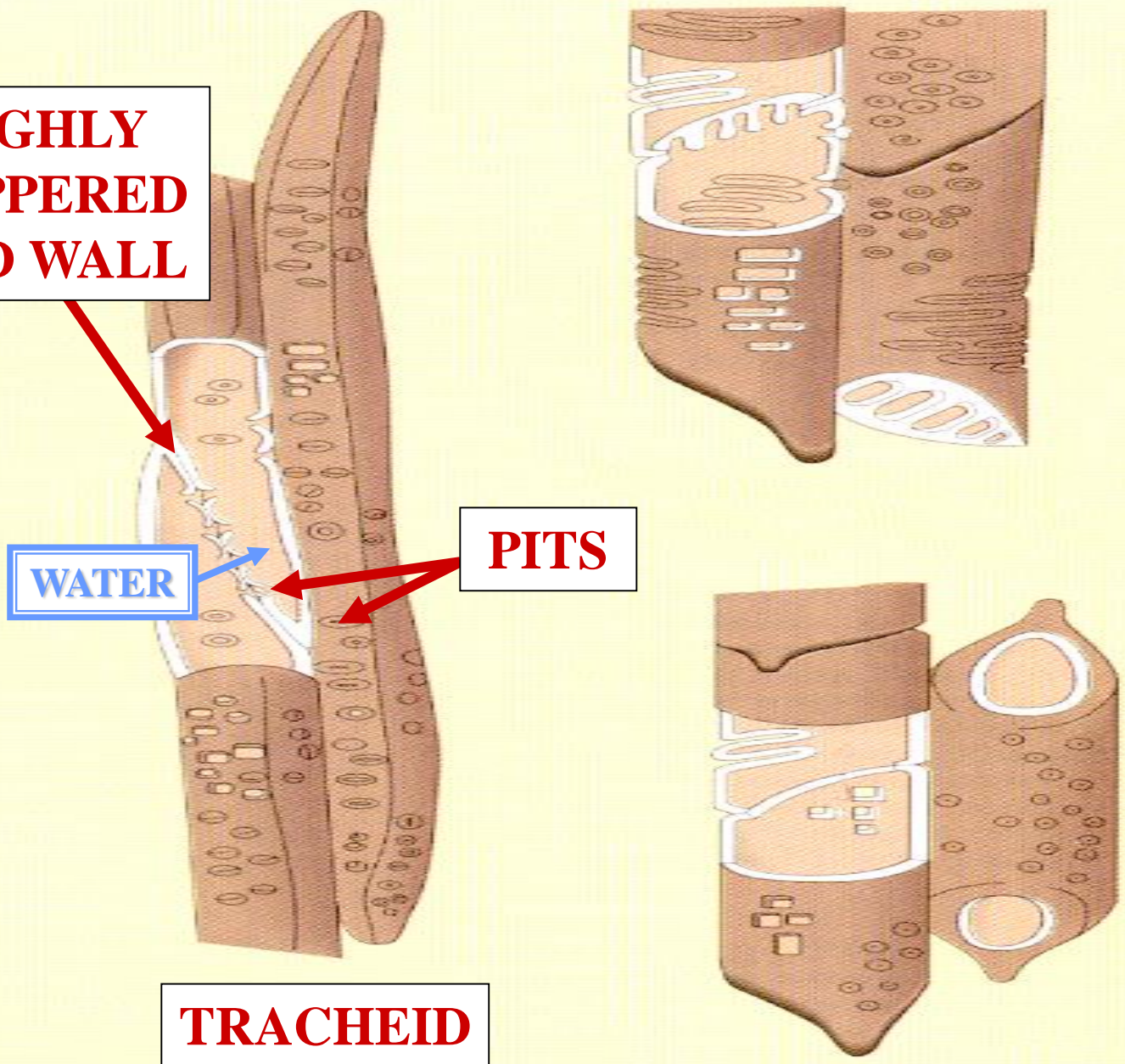


**HIGHLY
TAPPED
END WALL**

WATER

PITS

TRACHEID



**HIGHLY
TAPPED
END WALL**

**LESS
TAPPED
END WALL**

?

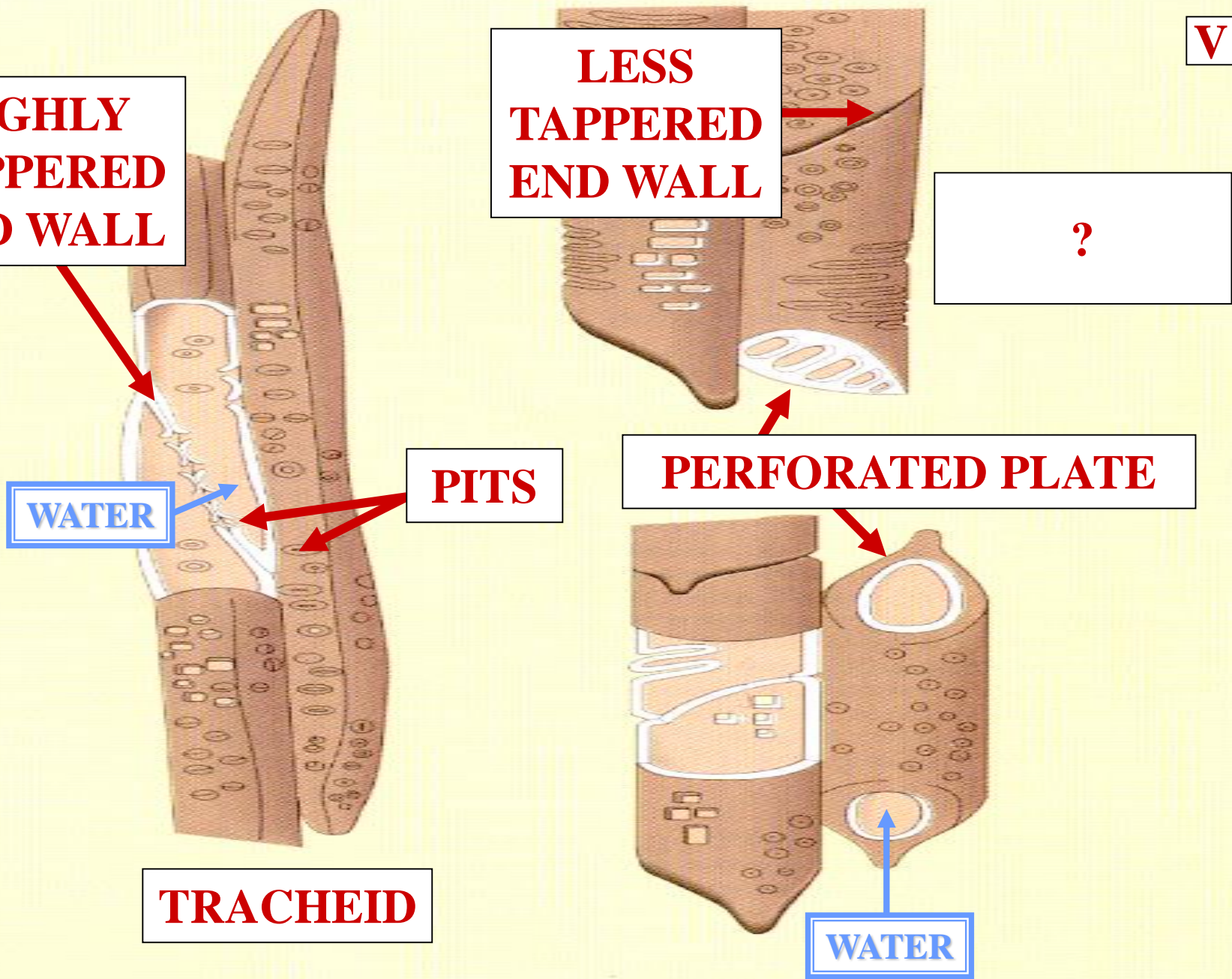
WATER

PITS

PERFORATED PLATE

TRACHEID

WATER





T

**HIGHLY
TAPPED
END WALL**

**LESS
TAPPED
END WALL**

**VESSEL
MEMBER**

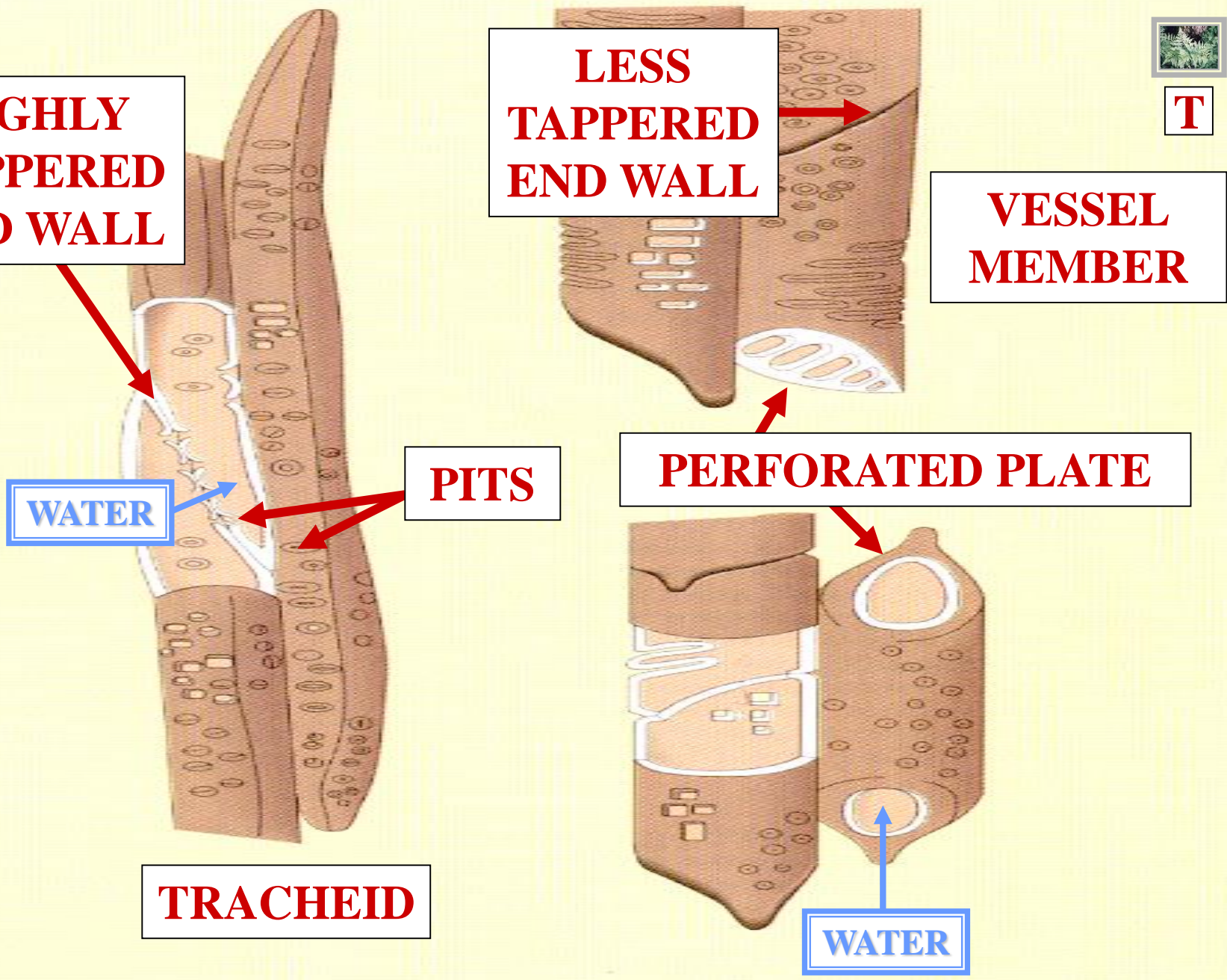
WATER

PITS

PERFORATED PLATE

TRACHEID

WATER





TRACHEIDS





**TRACHEIDS
&
VESSEL MEMBERS**

ROOT

TRUE ROOT PRESENT

AB

YOUNG SPOROPOPHYTE FROND

GAMETOPHYTE

FOOT

SHOOT APEX

RHIZOIDS

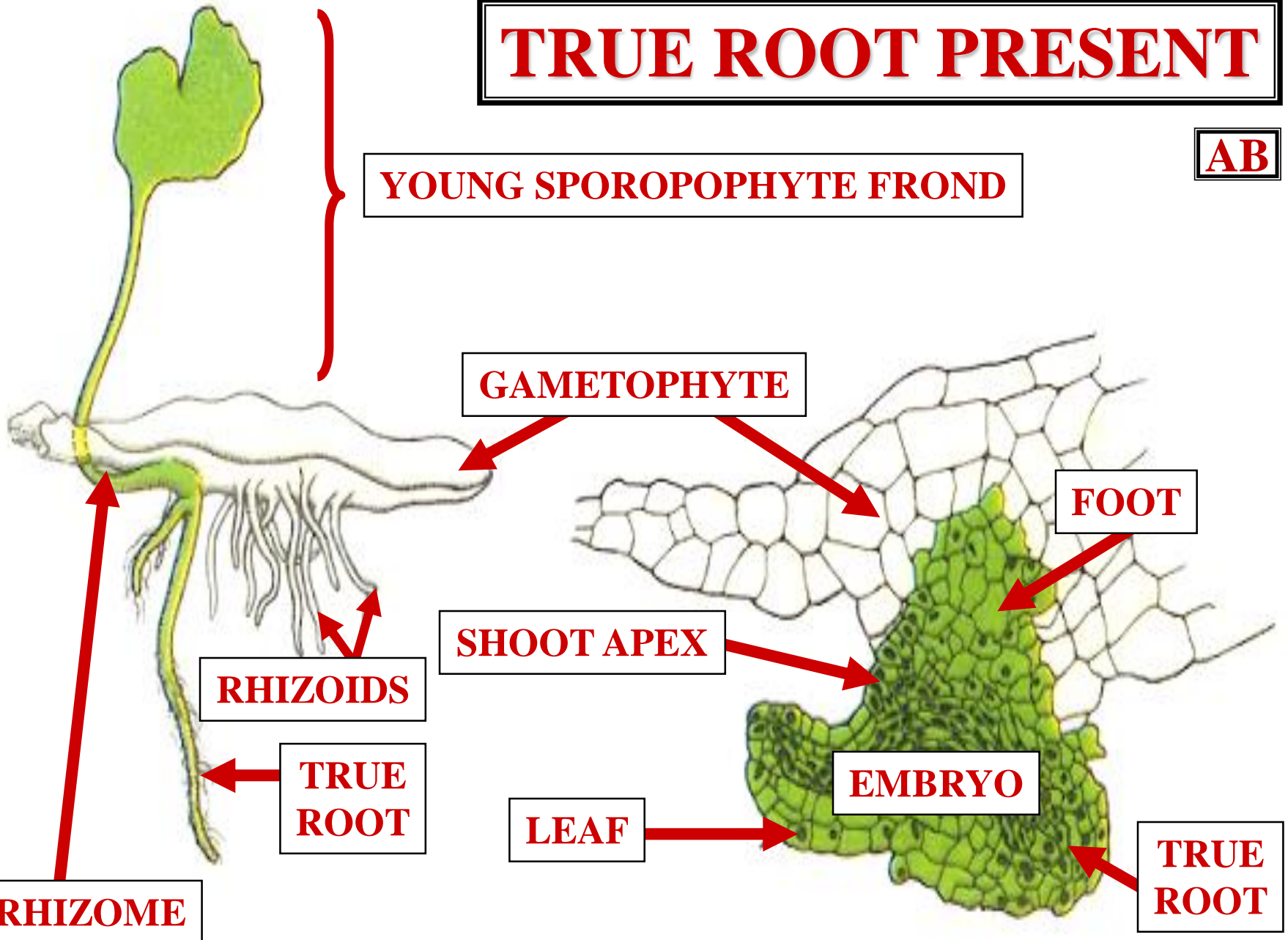
EMBRYO

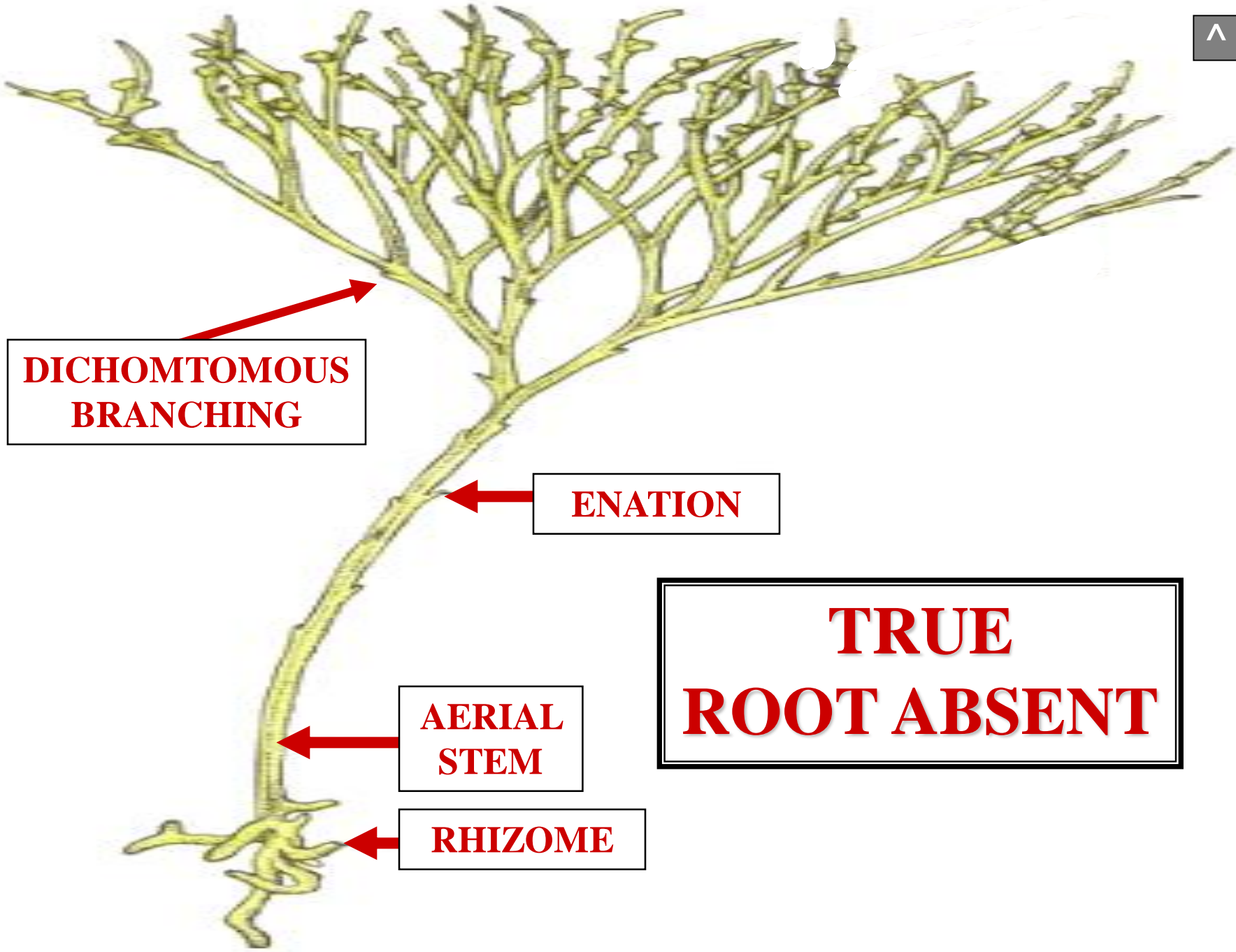
TRUE ROOT

LEAF

TRUE ROOT

RHIZOME





**DICHOTOMOUS
BRANCHING**

ENATION

**AERIAL
STEM**

RHIZOME

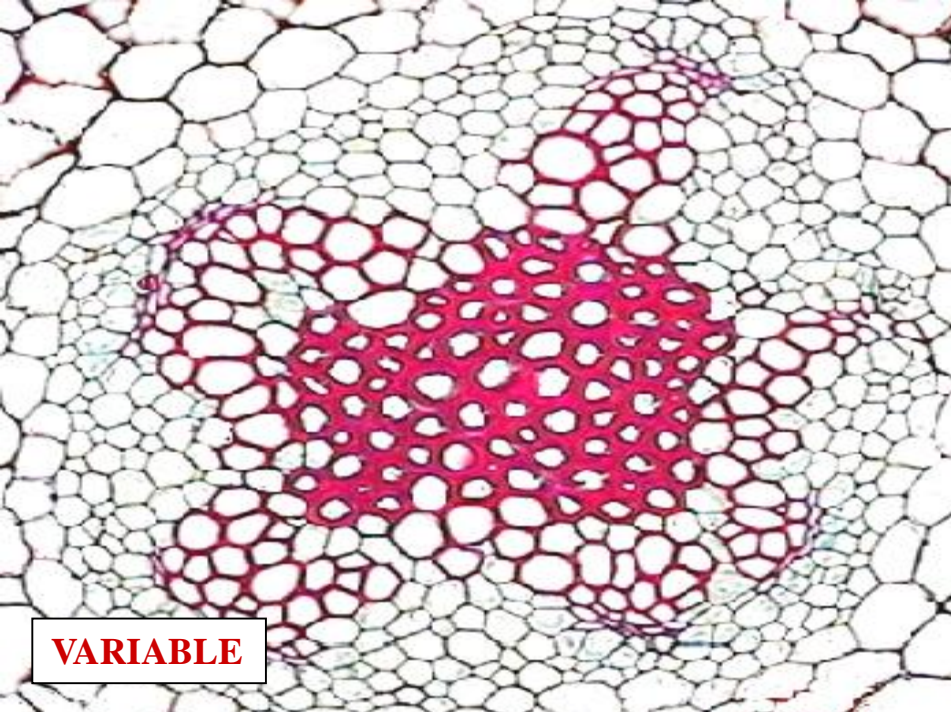
**TRUE
ROOT ABSENT**



STEM



STEM STELE

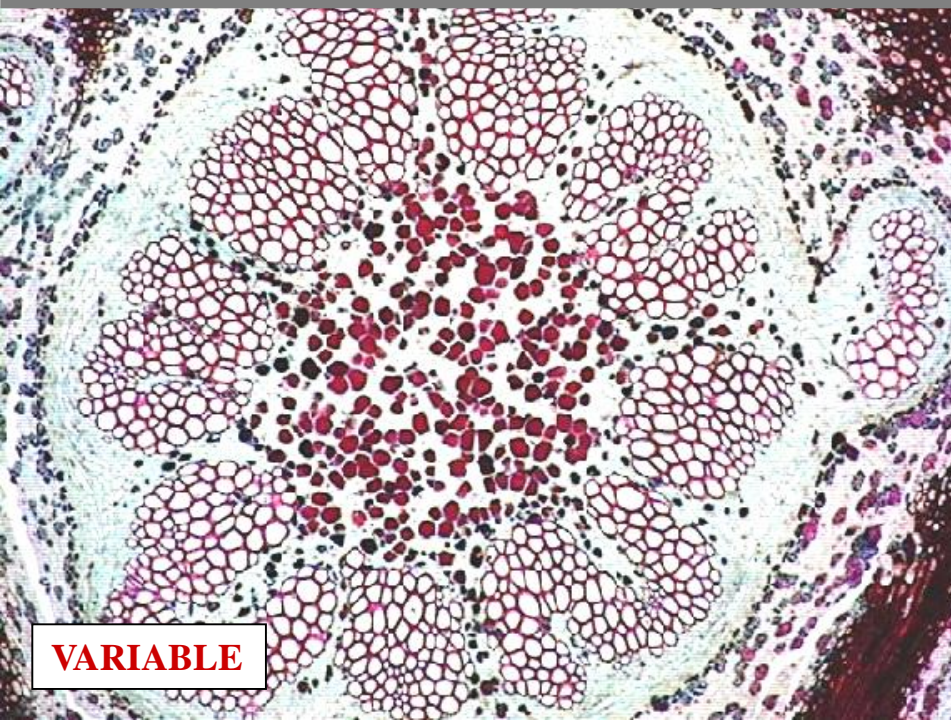


VARIABLE



P

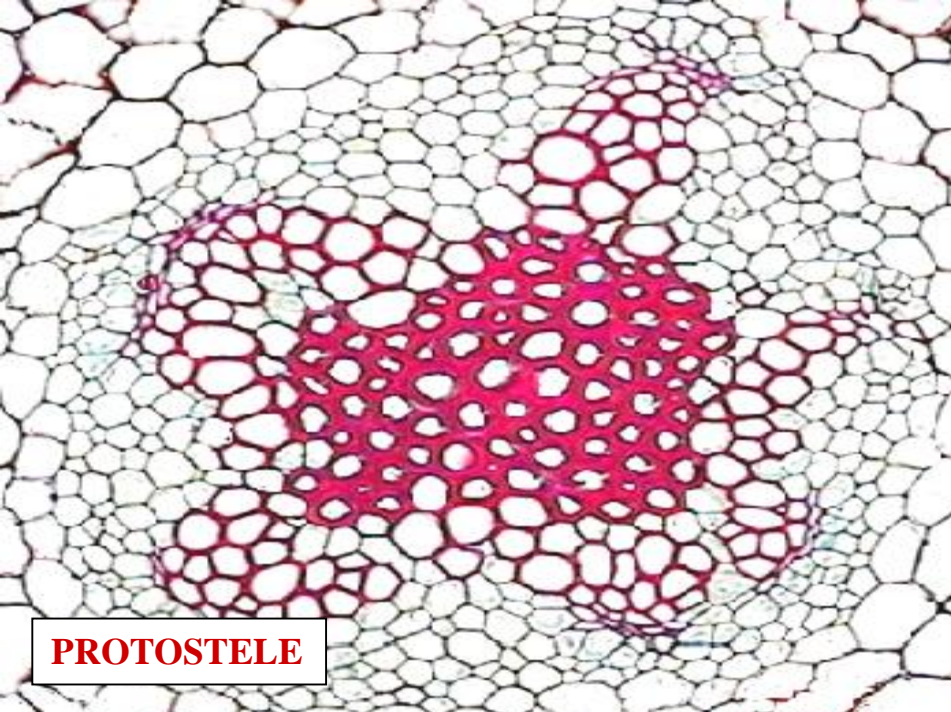
VARIABLE



VARIABLE



VARIABLE

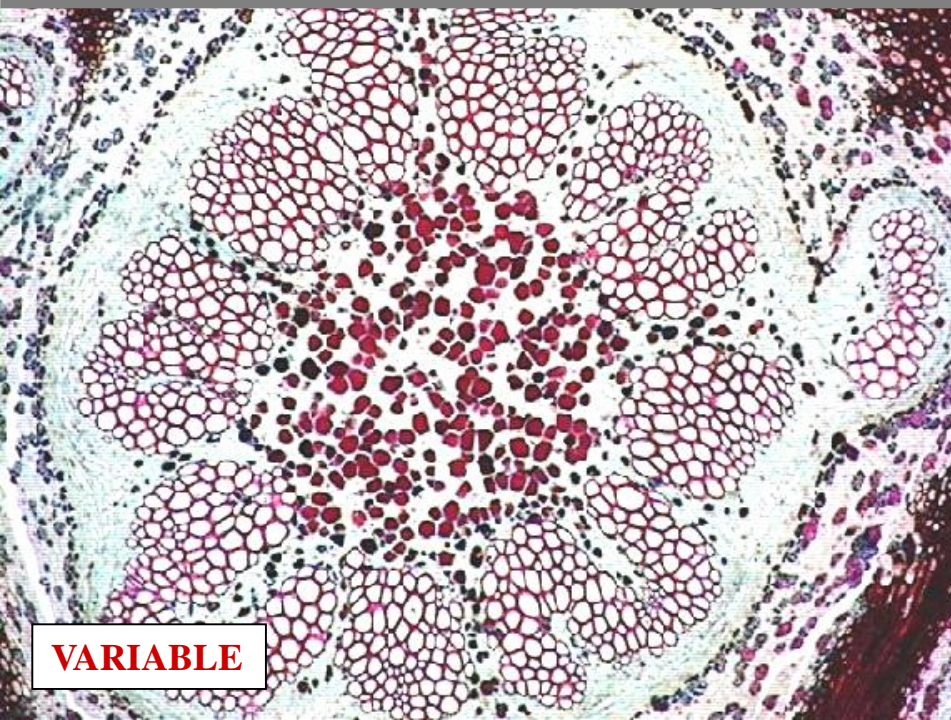


PROTOSTELE



S

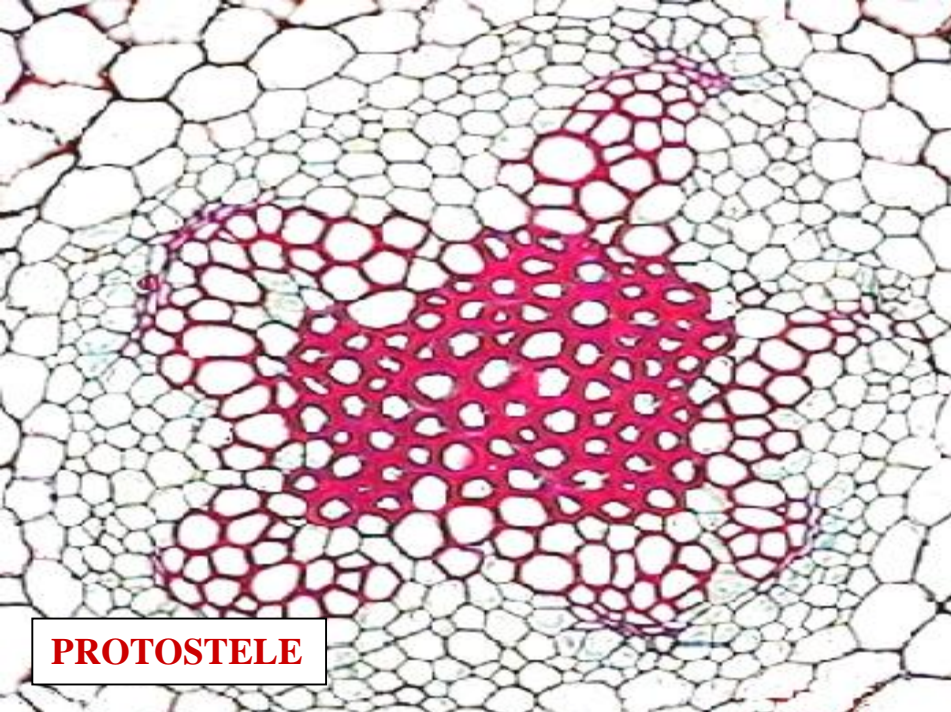
VARIABLE



VARIABLE



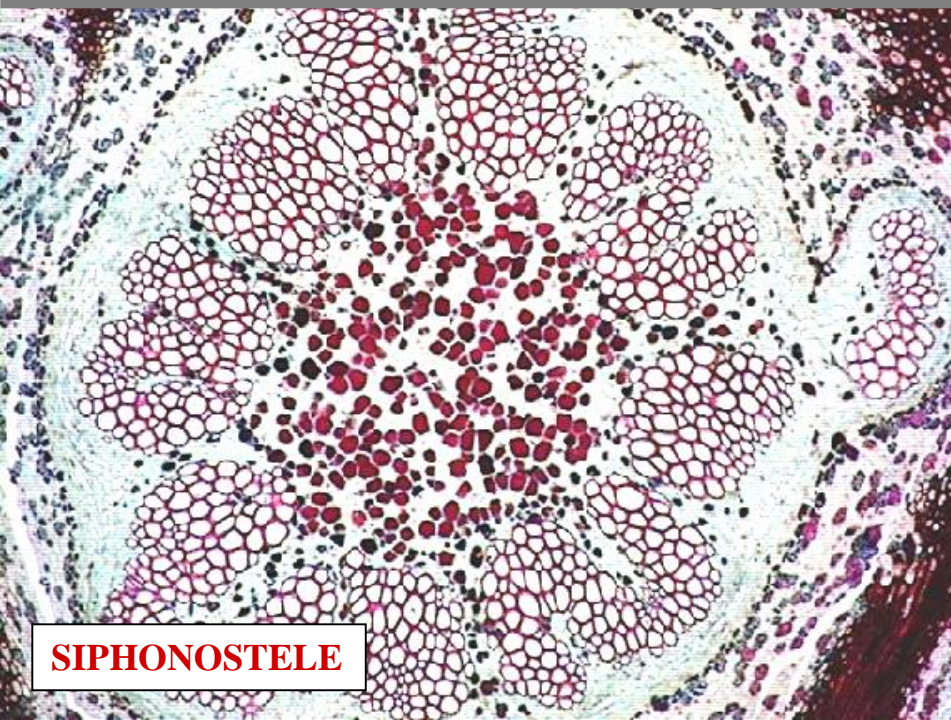
VARIABLE



PROTOSTELE



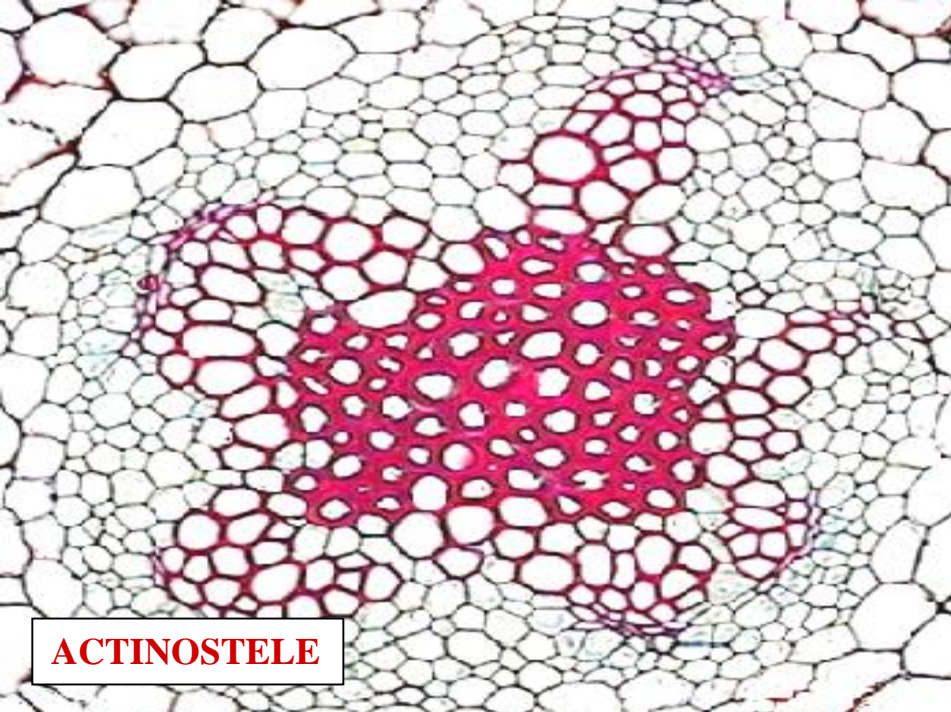
SIPHONOSTELE



SIPHONOSTELE



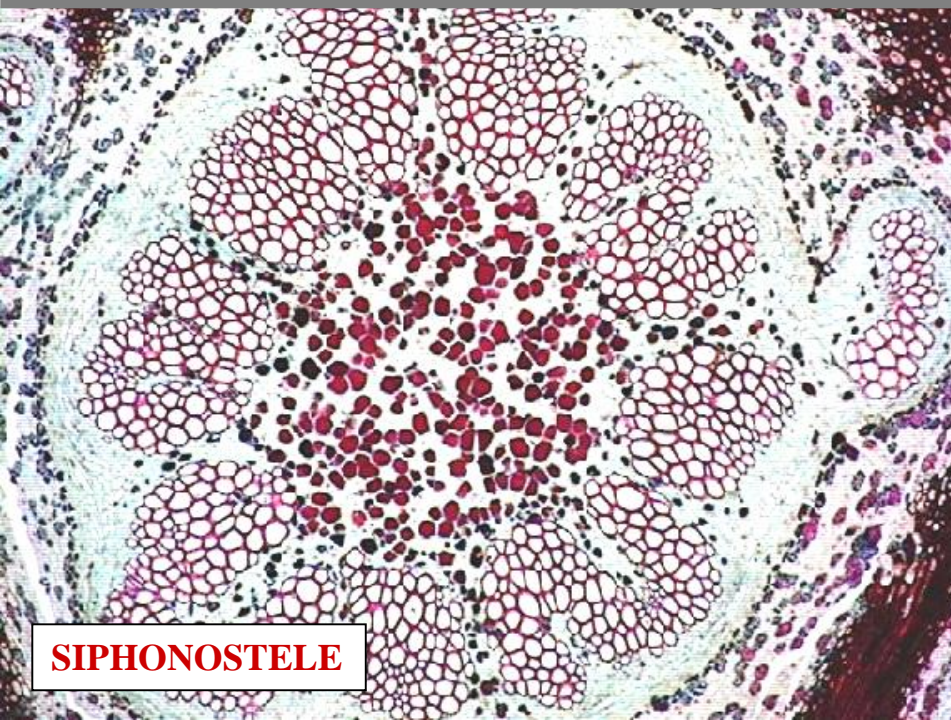
SIPHONOSTELE



ACTINOSTELE



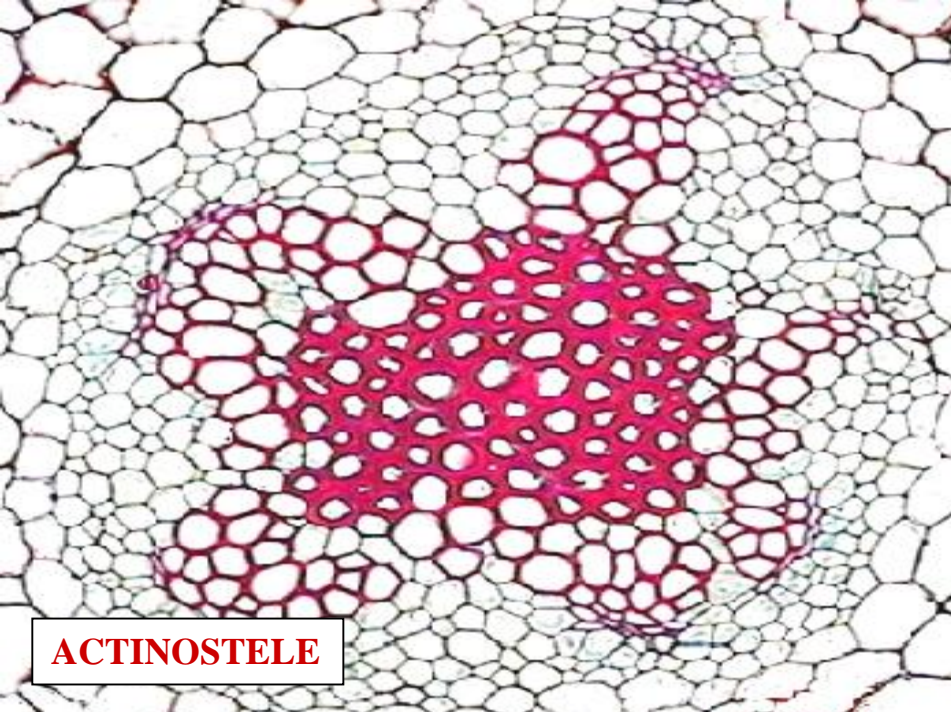
SIPHONOSTELE



SIPHONOSTELE



SIPHONOSTELE

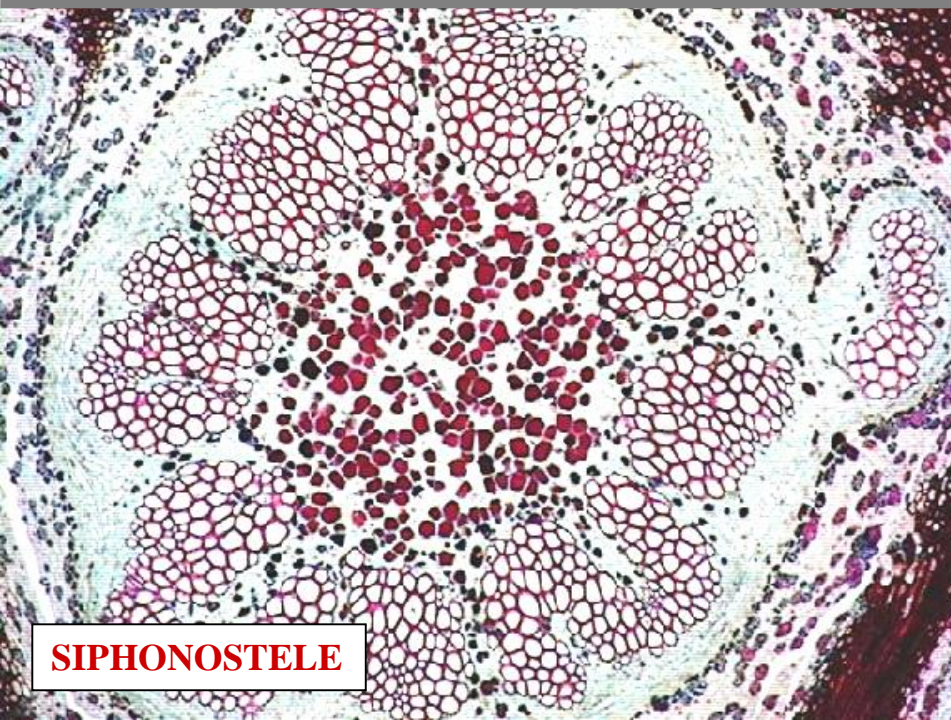


ACTINOSTELE



A

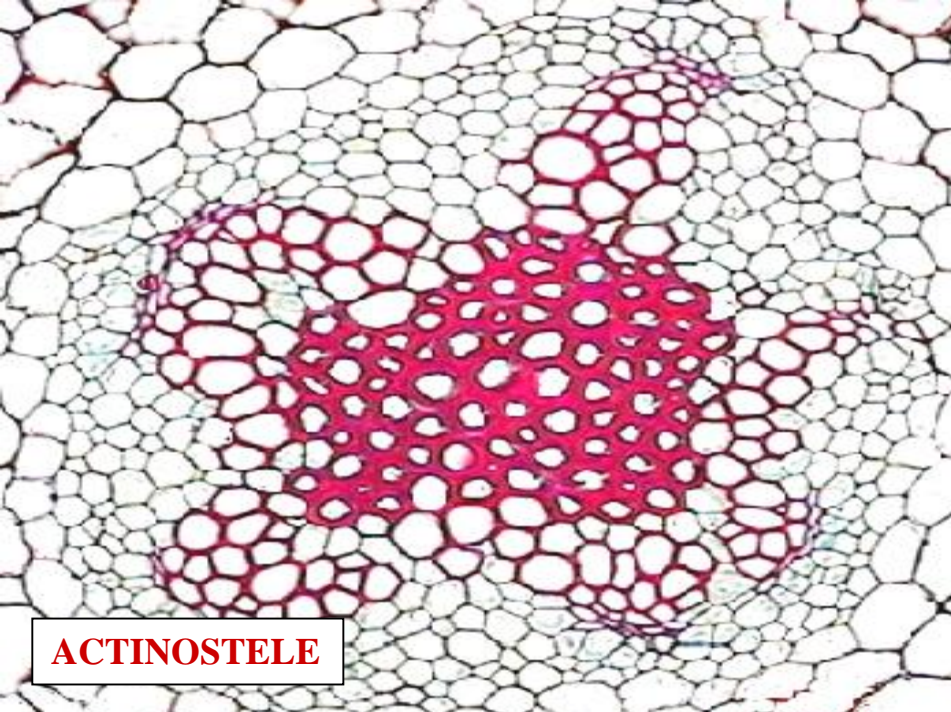
SIPHONOSTELE



SIPHONOSTELE



SIPHONOSTELE

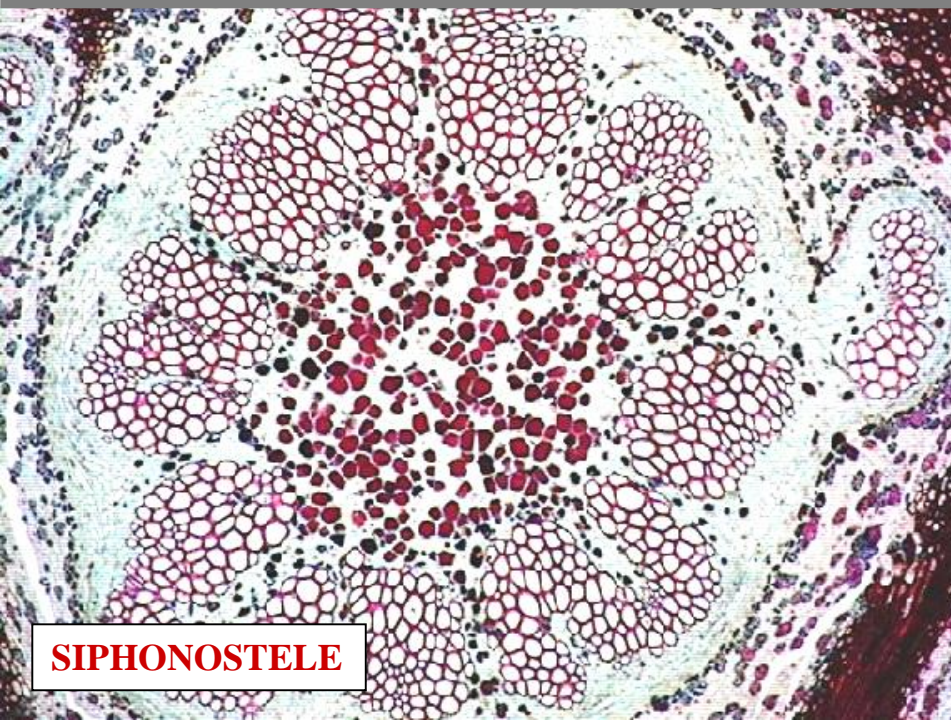


ACTINOSTELE



E

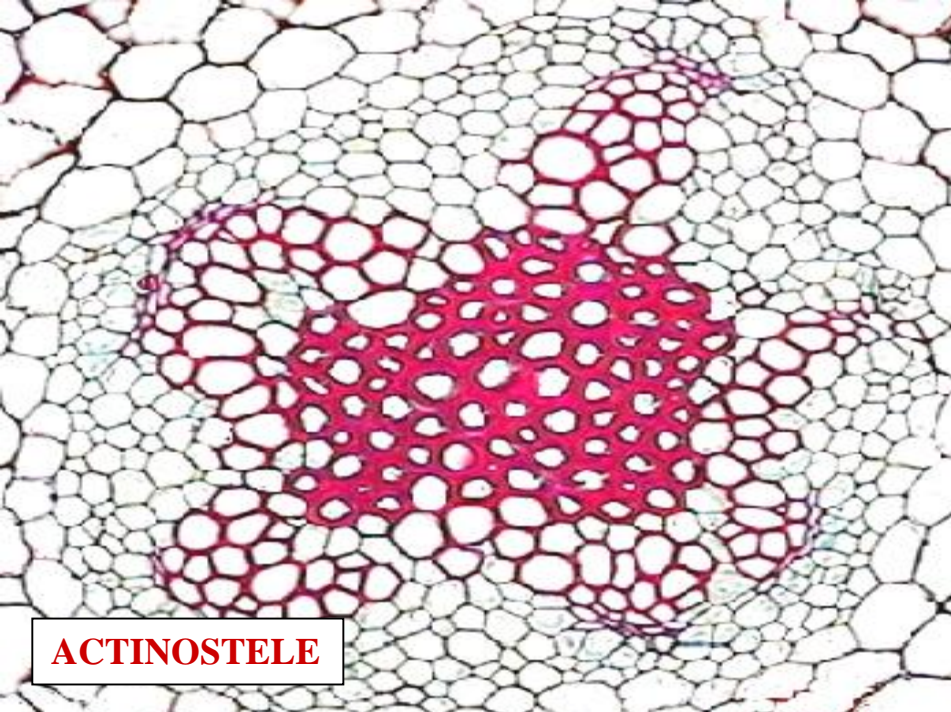
AMPHIPHLOIC



SIPHONOSTELE



SIPHONOSTELE

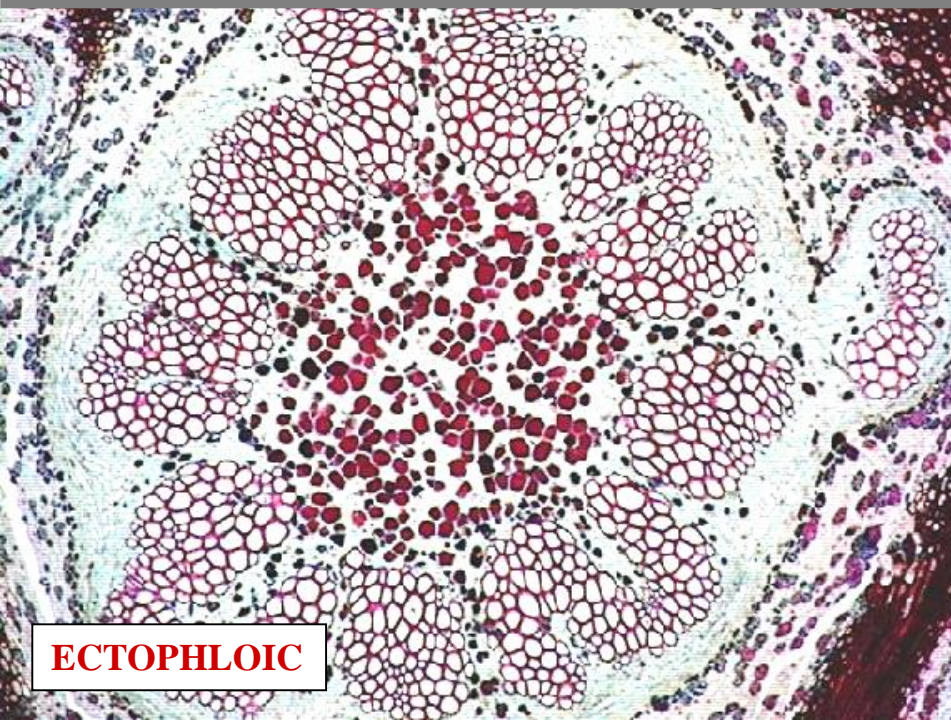


ACTINOSTELE



E

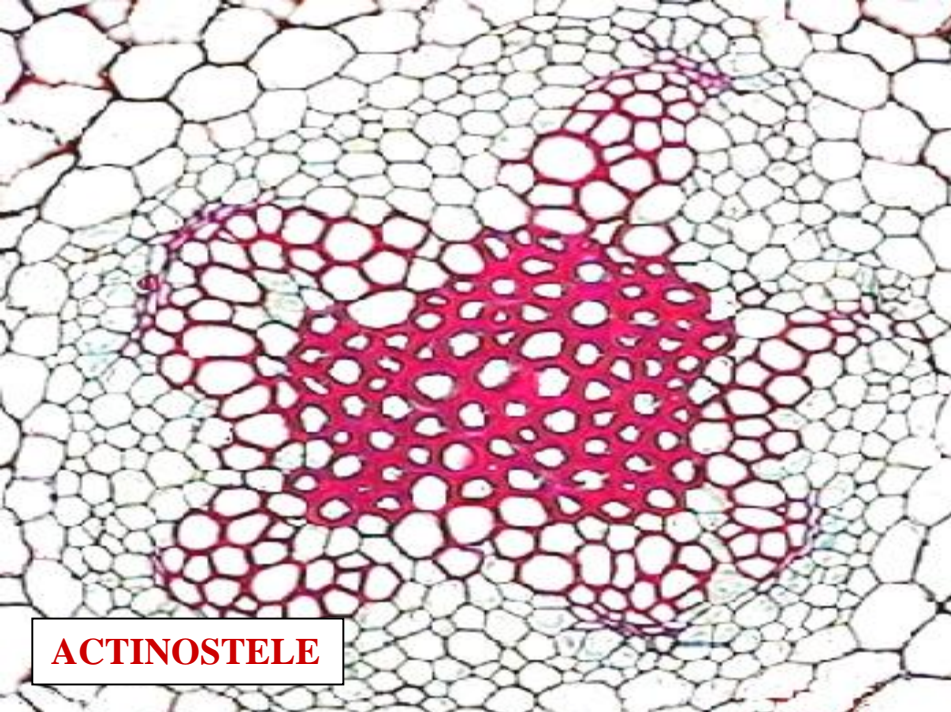
AMPHIPHLOIC



ECTOPHLOIC



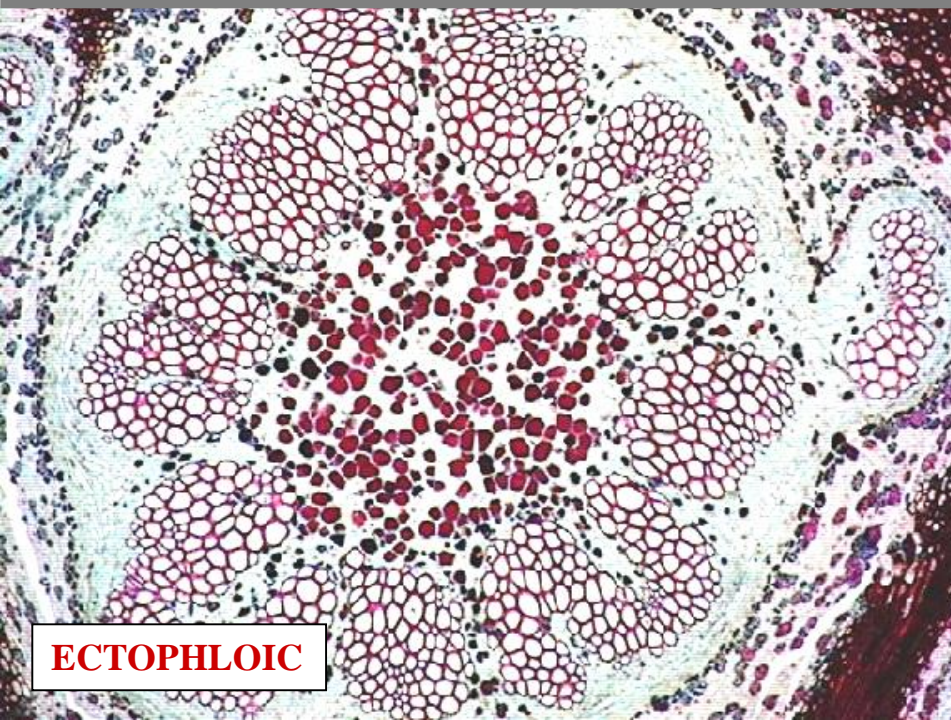
SIPHONOSTELE



ACTINOSTELE



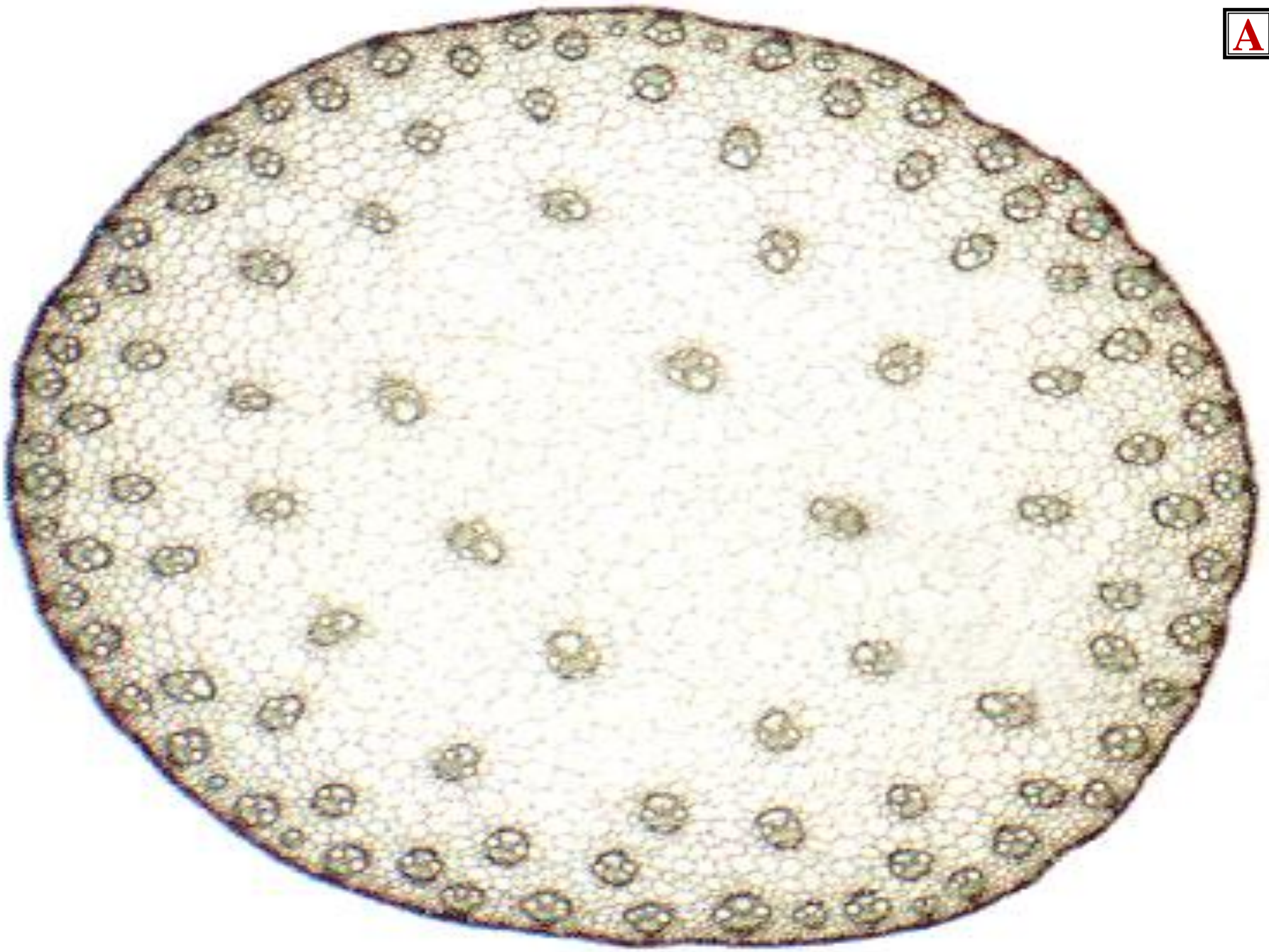
AMPHIPHLOIC



ECTOPHLOIC



EUSTELE





ATACTOSTELE: ABSENT



RHIZOME

**NON-FERTILE
FRONDS**

**LATERAL
RHIZOME**

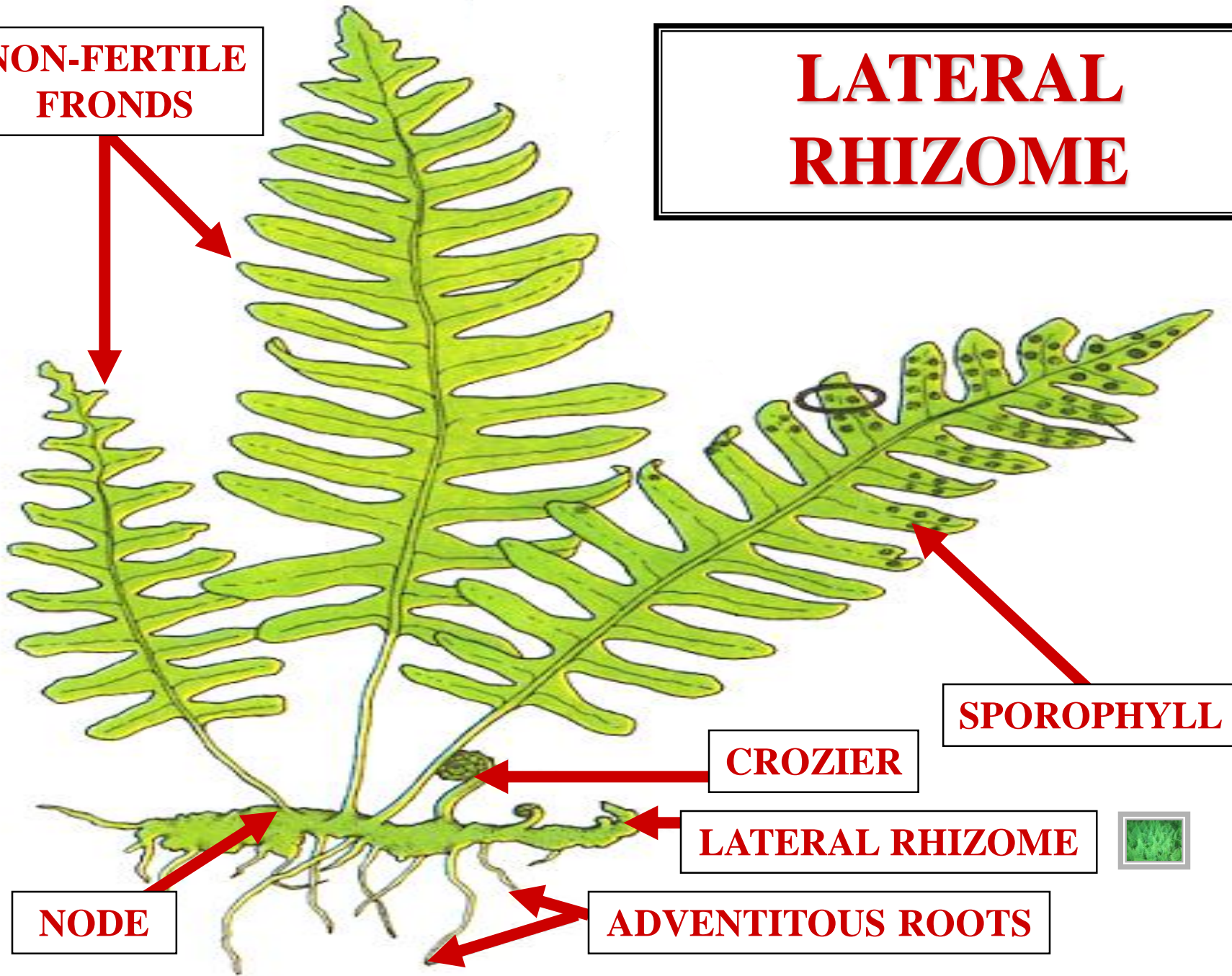
CROZIER

SPOROPHYLL

LATERAL RHIZOME

NODE

ADVENTITIOUS ROOTS





**RHIZOME
EXTENSIVE LATERAL GROWTH**



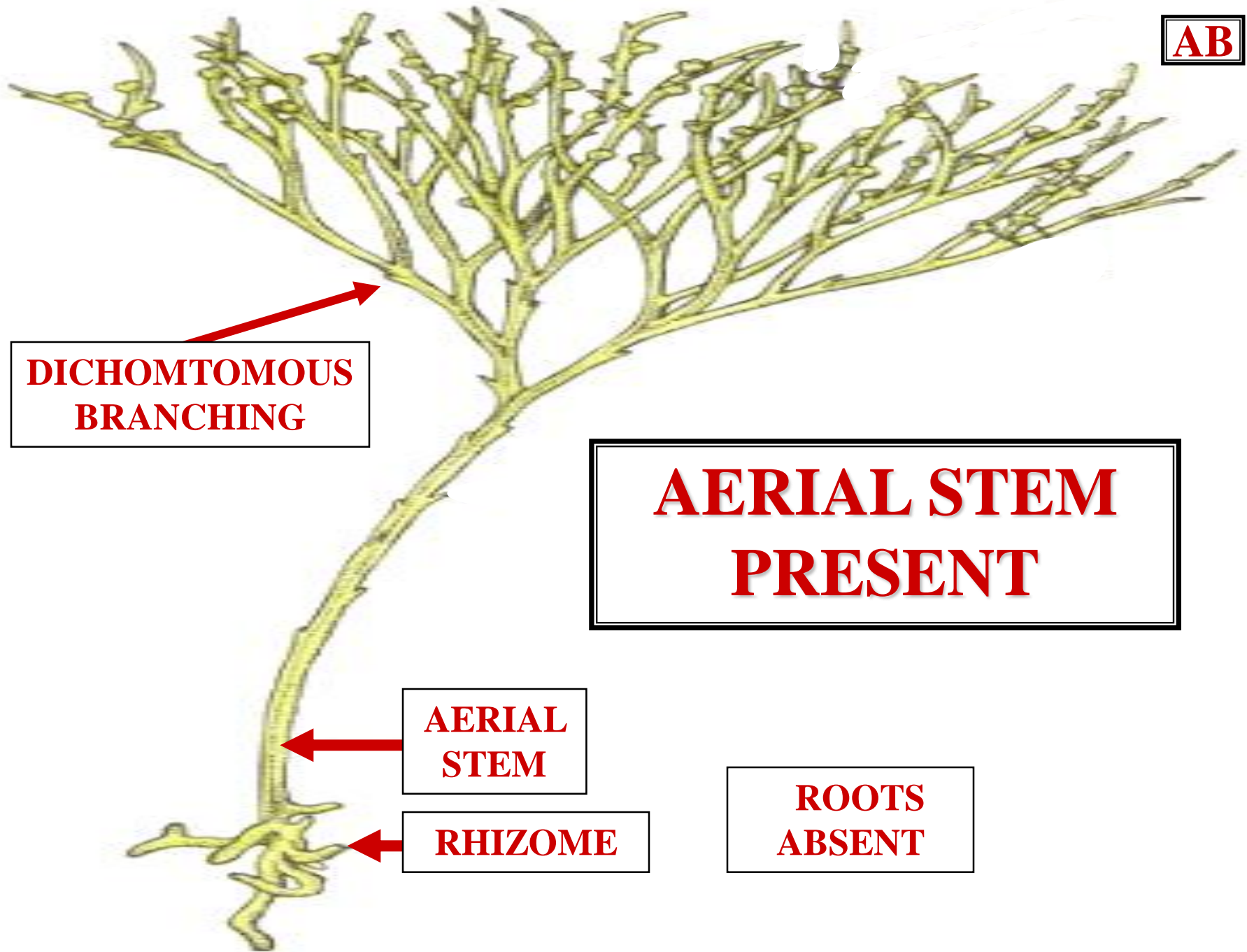
VERTICAL RHIZOME



**ADVENTITIOUS
ROOTS**

**RHIZOME
VERTICAL GROWTH**

AERIAL STEM



**DICHOTOMOUS
BRANCHING**

**AERIAL STEM
PRESENT**

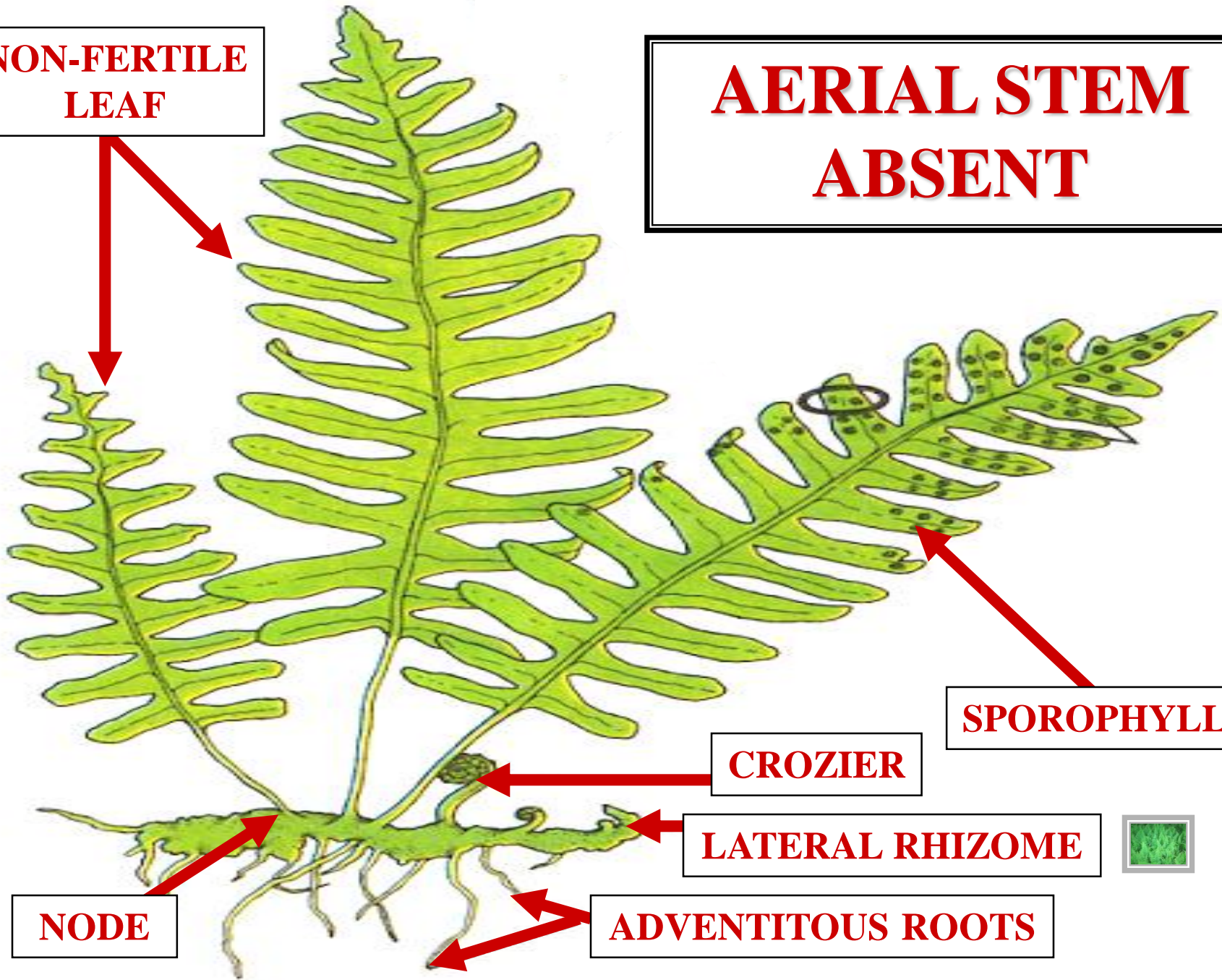
**AERIAL
STEM**

RHIZOME

**ROOTS
ABSENT**

**NON-FERTILE
LEAF**

**AERIAL STEM
ABSENT**



SPOROPHYLL

CROZIER

LATERAL RHIZOME

NODE

ADVENTITIOUS ROOTS



AERIAL STEM ABSENT



LEAF

FERN LEAF

?

F



FERN LEAF FROND

F



FROND



FROND

FERN LEAF

FROND

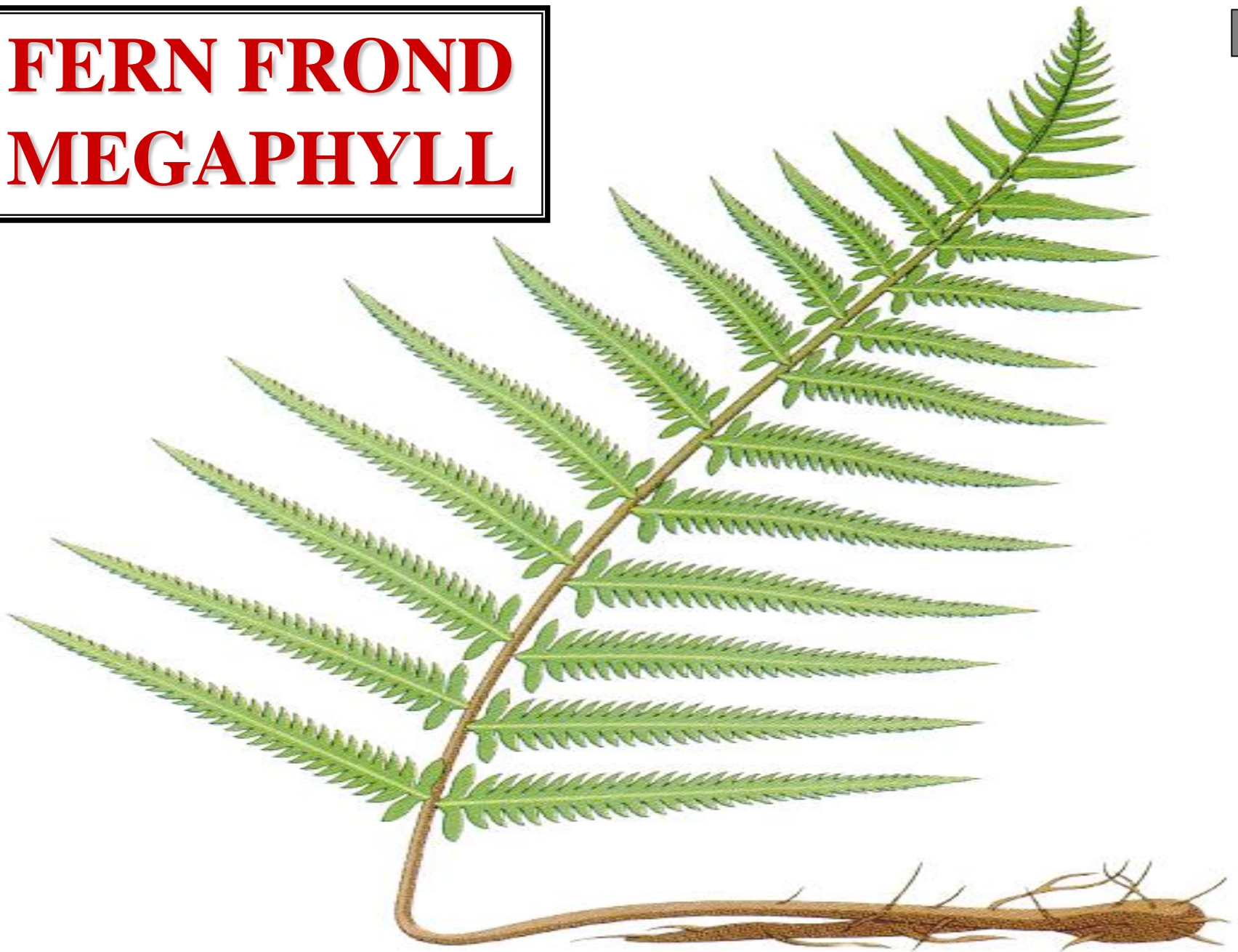
FERN FROND

?

M



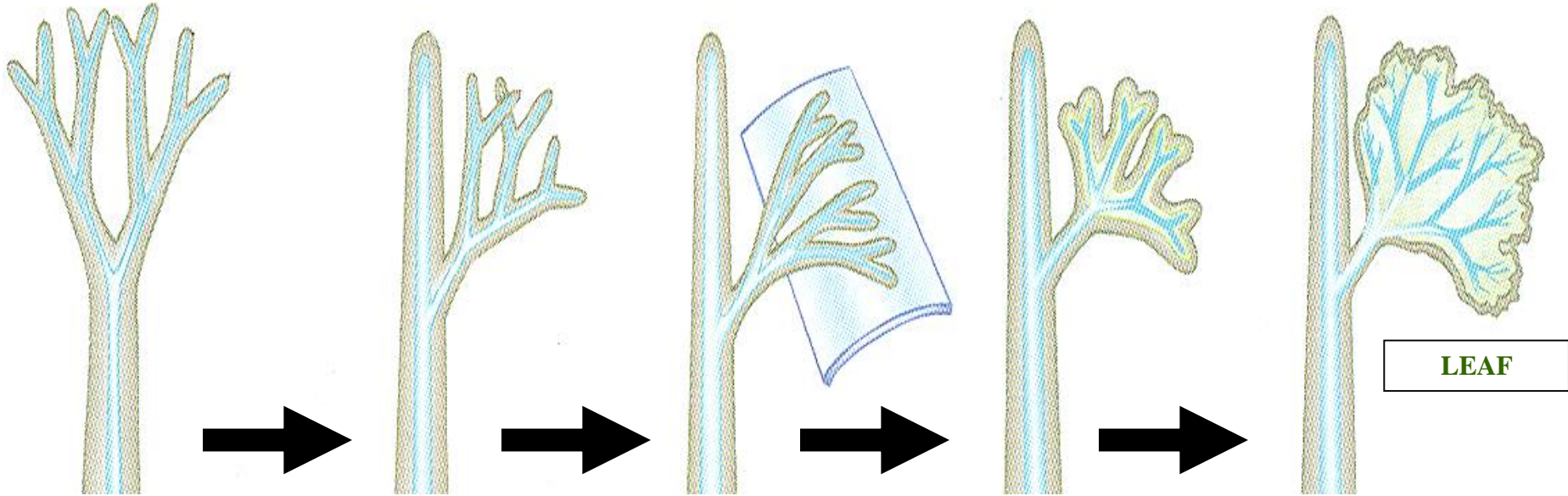
FERN FROND MEGAPHYLL





LEAF EVOLUTION

MEGAPHYLL



A

B

C

D

E

**DICHOTOMOUS
TELOME**

**OVERTOPPING
TELOME**

**PLANATION
TELOME**

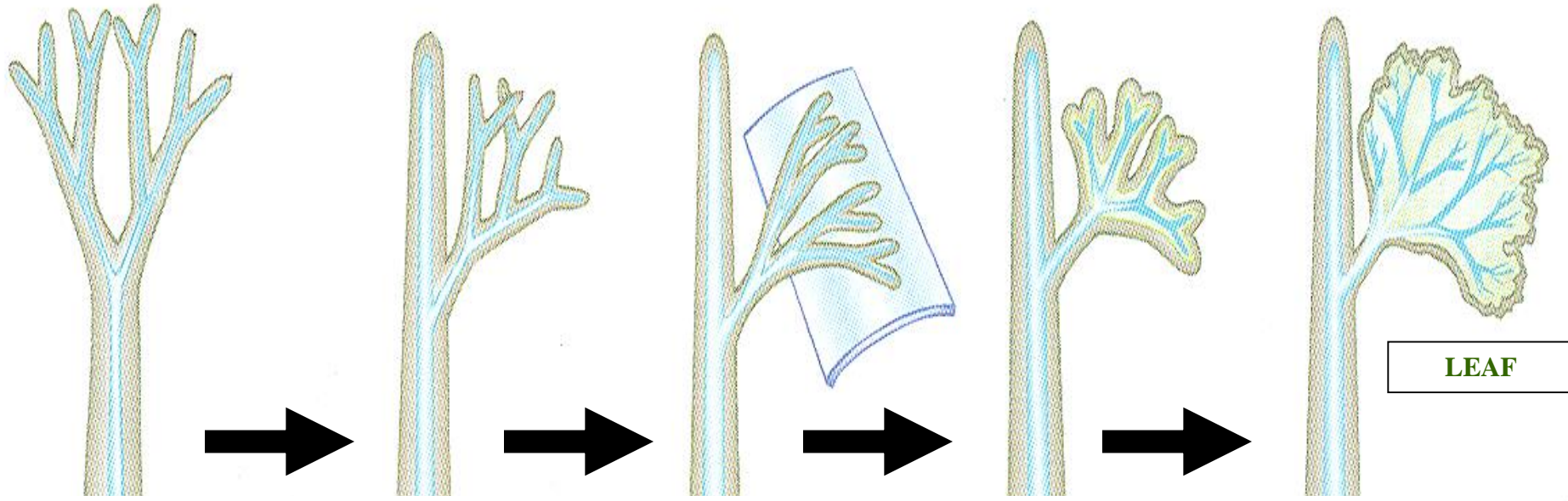
**WEBBING
TELOME**

**FUSION
TELOME**

LEAF

→ = TIME

THEORY



A

B

C

D

E

LEAF

DICHOTOMOUS
TELOME

OVERTOPPING
TELOME

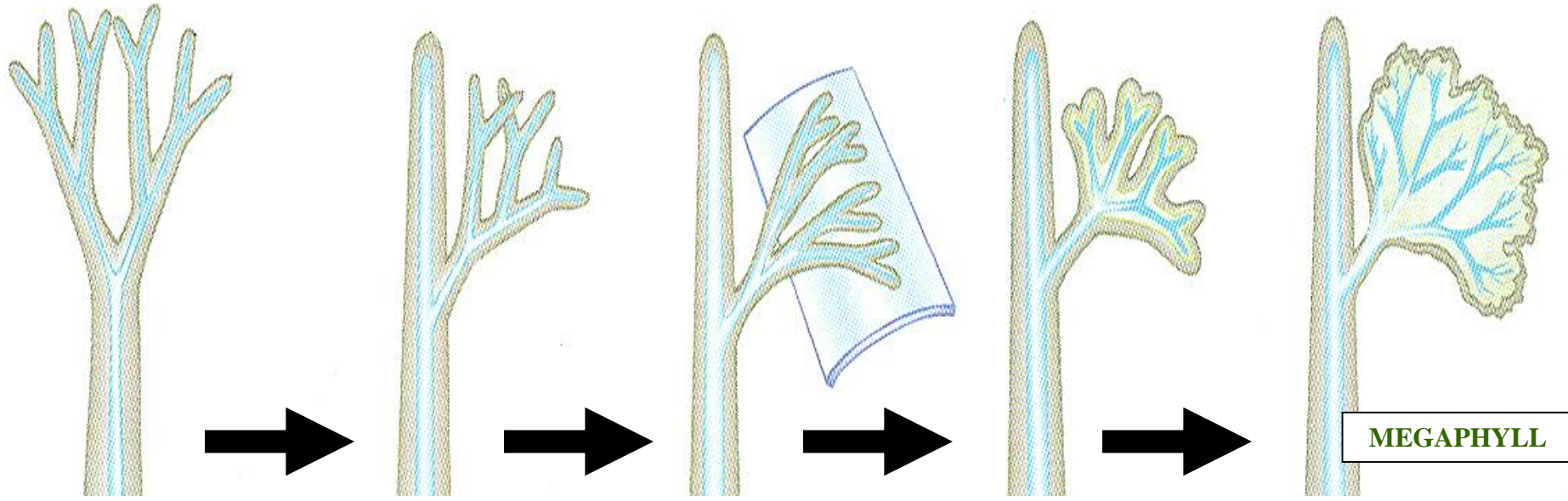
PLANATION
TELOME

WEBBING
TELOME

FUSION
TELOME

➔ = TIME

TELOME THEORY



A

B

C

D

E

MEGAPHYLL

**DICHOTOMOUS
TELOME**

**OVERTOPPING
TELOME**

**PLANATION
TELOME**

**WEBBING
TELOME**

**FUSION
TELOME**

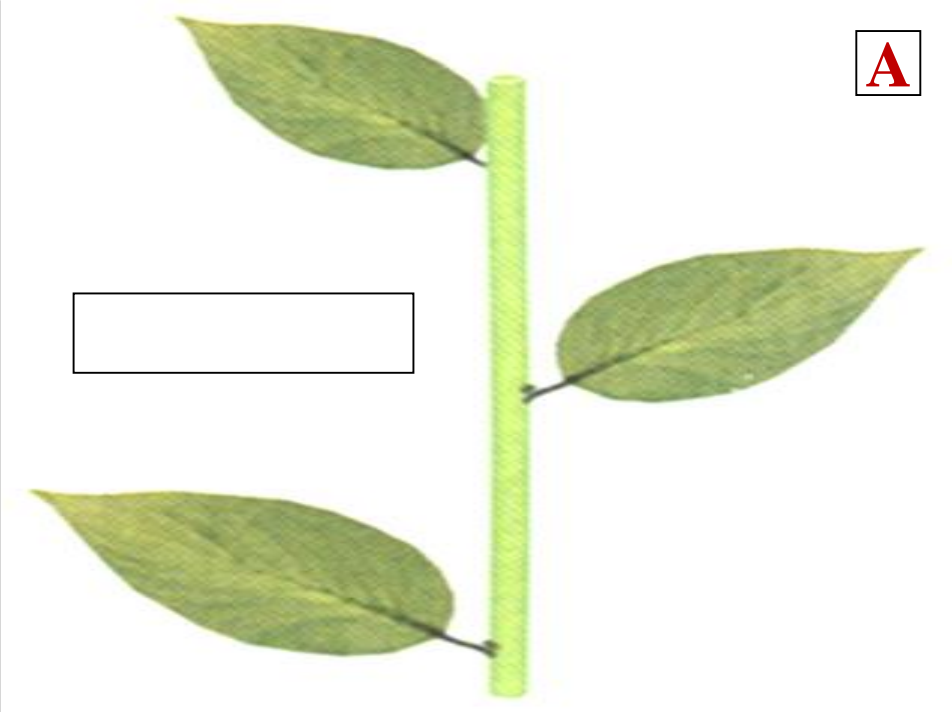
MEGAPHYLL EVOLUTION

PHYLLOTAXY

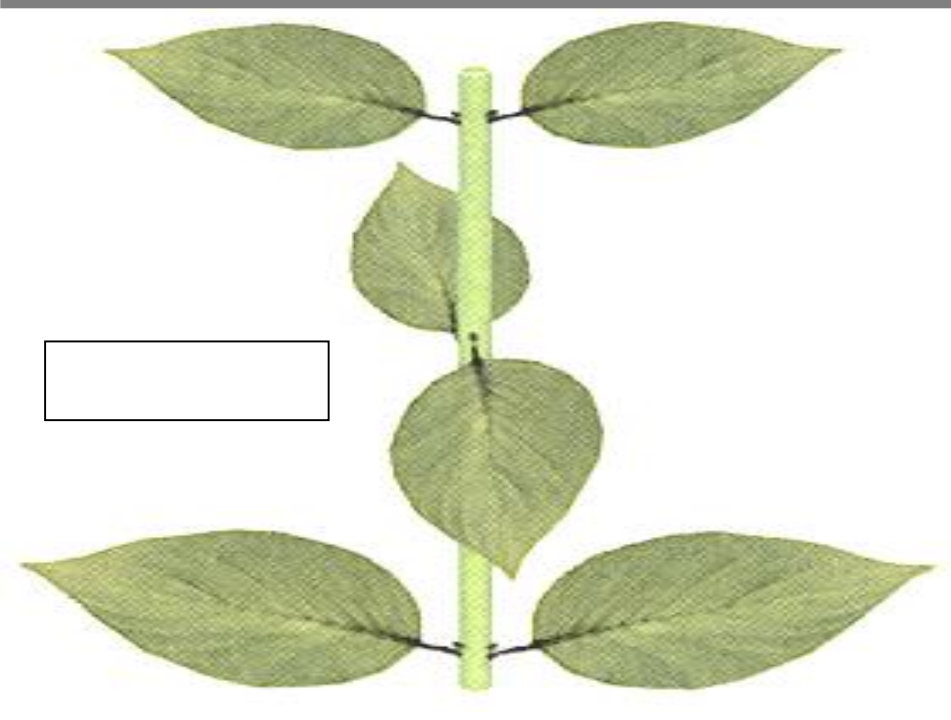


FERN FROND

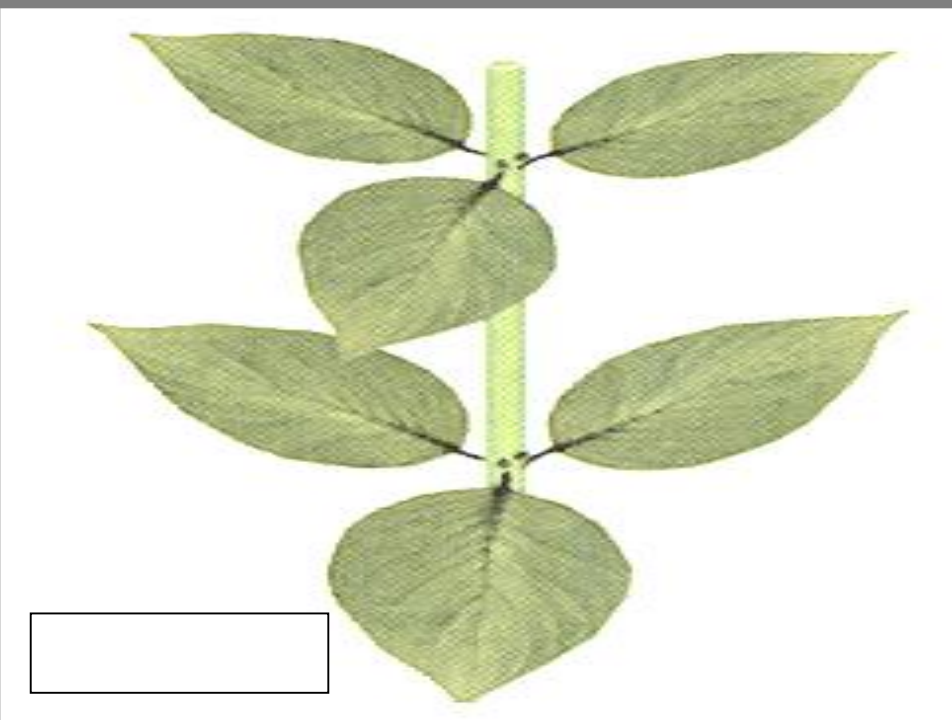
A



[]



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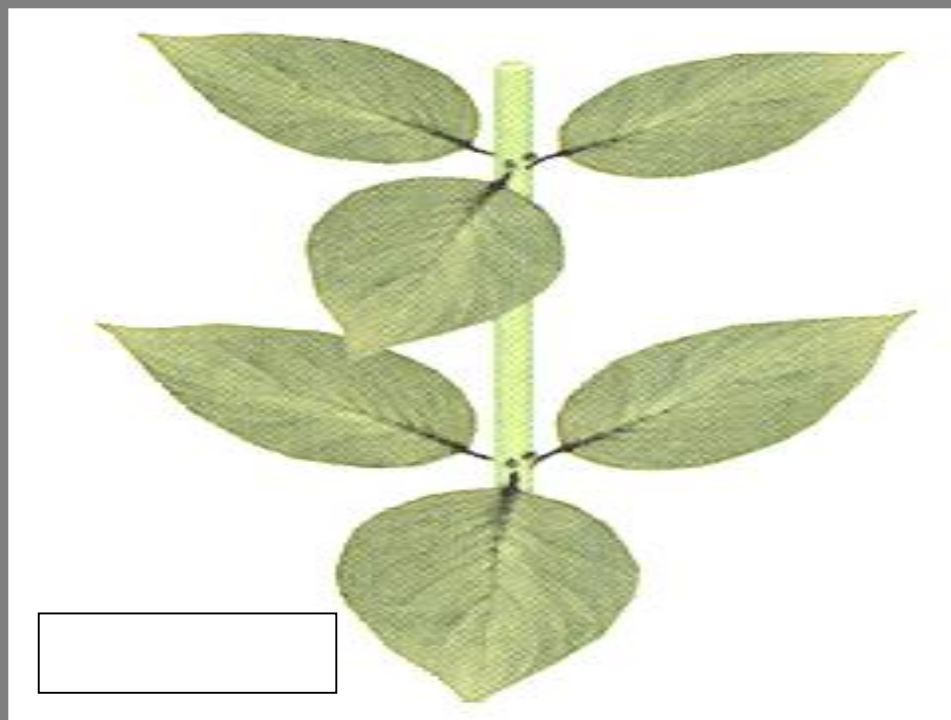
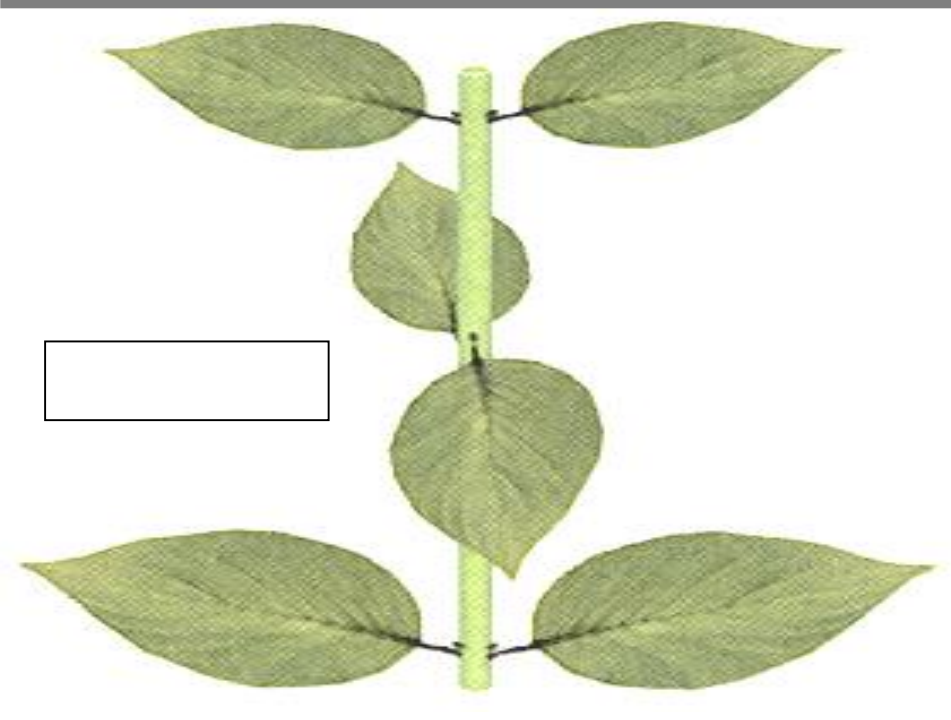


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ALTERNATE

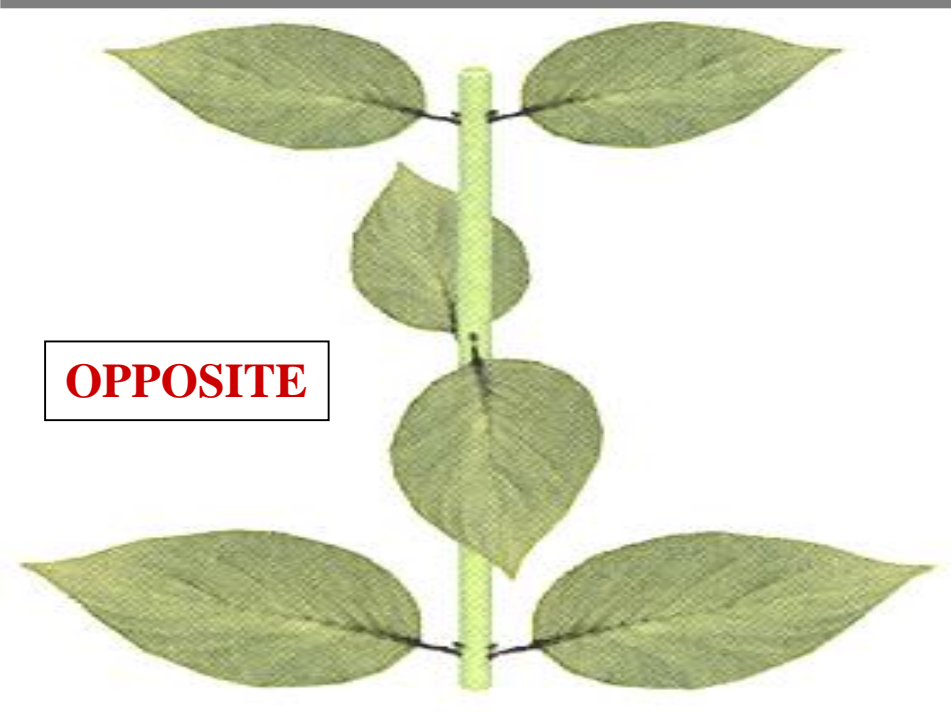




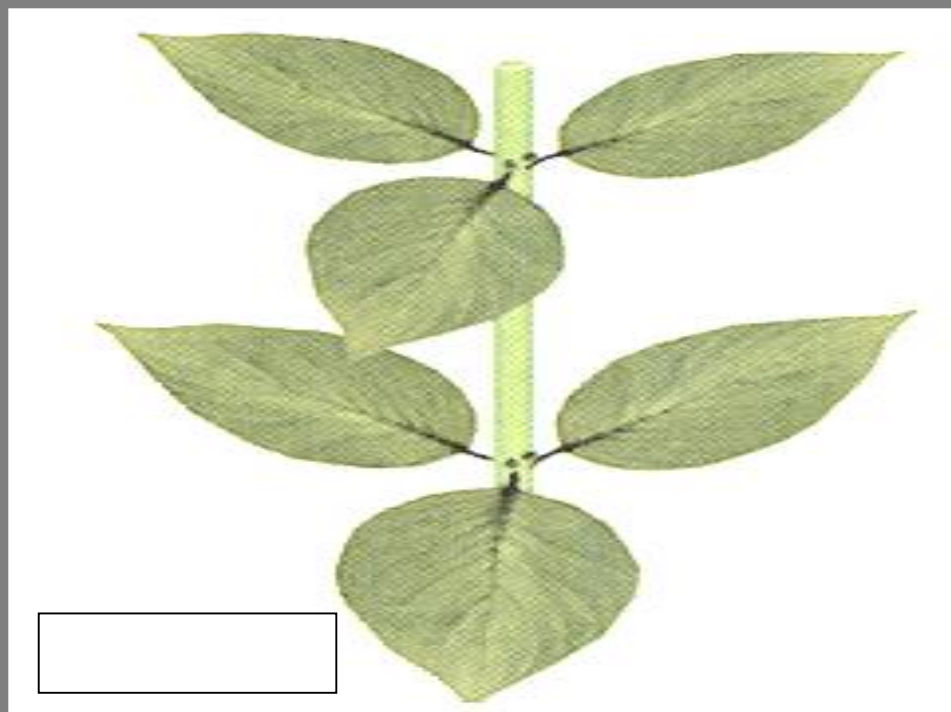
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OPPOSITE



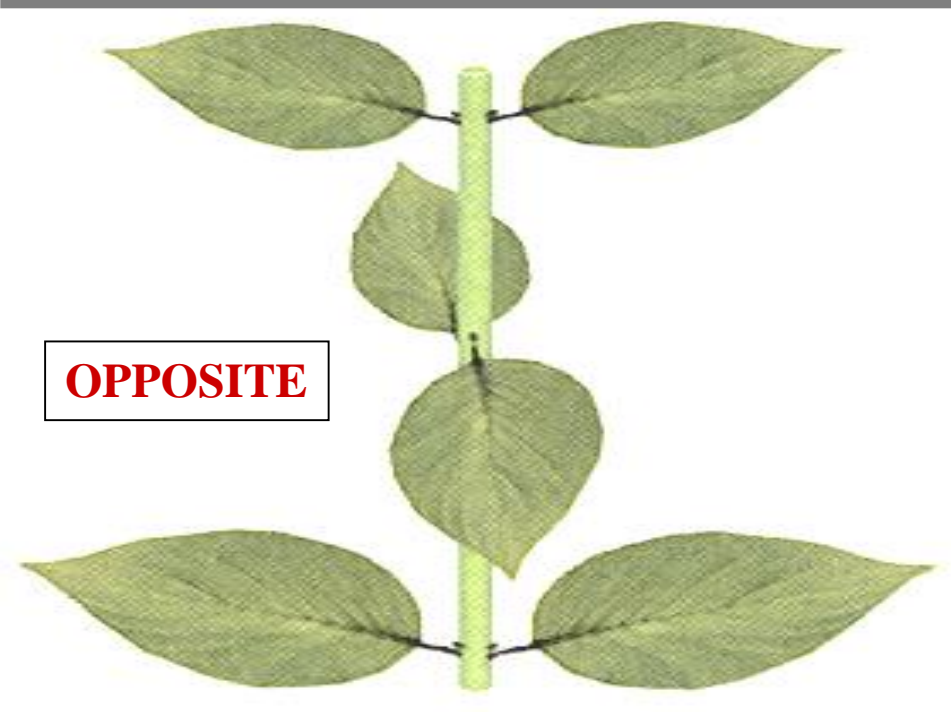


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ALTERNATE



OPPOSITE



WHORLED

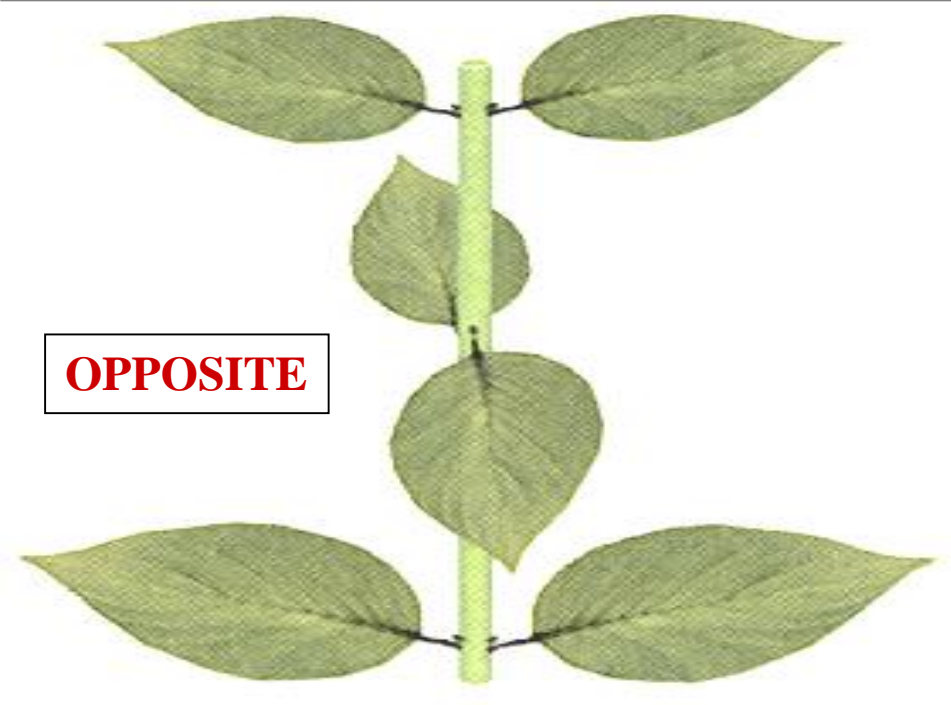


ALTERNATE

FERN FROND



ALTERNATE



OPPOSITE



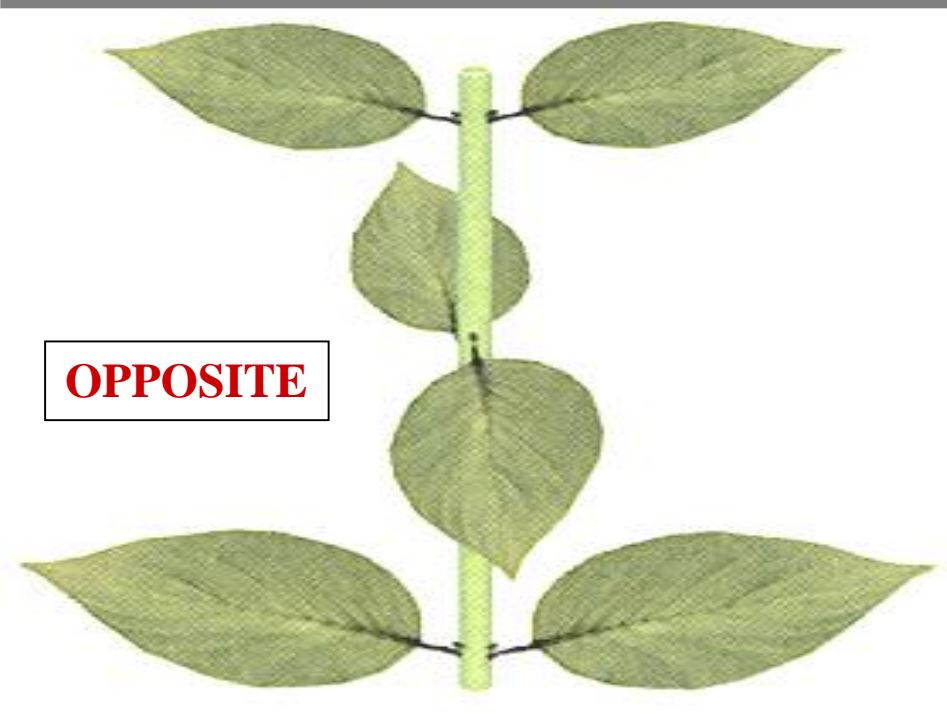
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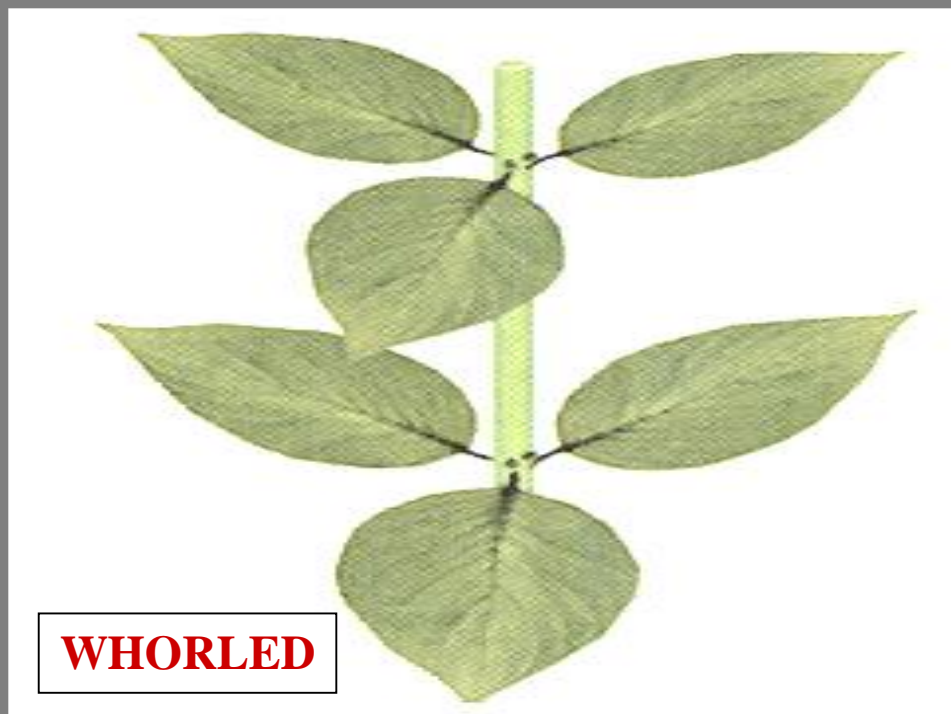
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ALTERNATE



OPPOSITE



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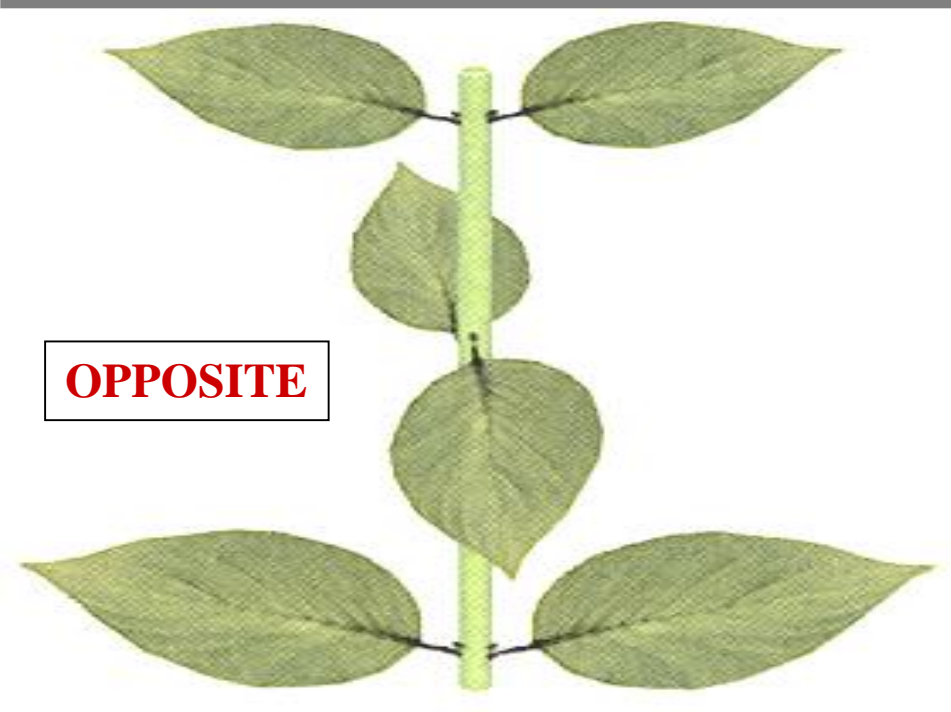


WHORLED

FERN FROND



ALTERNATE



OPPOSITE



WHORLED



FROND VERNATION

VERNATION



VERNATION

LEAF

BUD EMERGENCE

PATTERN

VERNATION

FROND VERNATION TYPES

VERNATION TYPES

CONDUPLICATE

**VERNATION
TYPED**

VERNATION TYPES

**CONDUPLICATE
CIRCINATE**

**VERNATION
TYPED**

**CONDUPLICATE
LEAF
VERNATION**

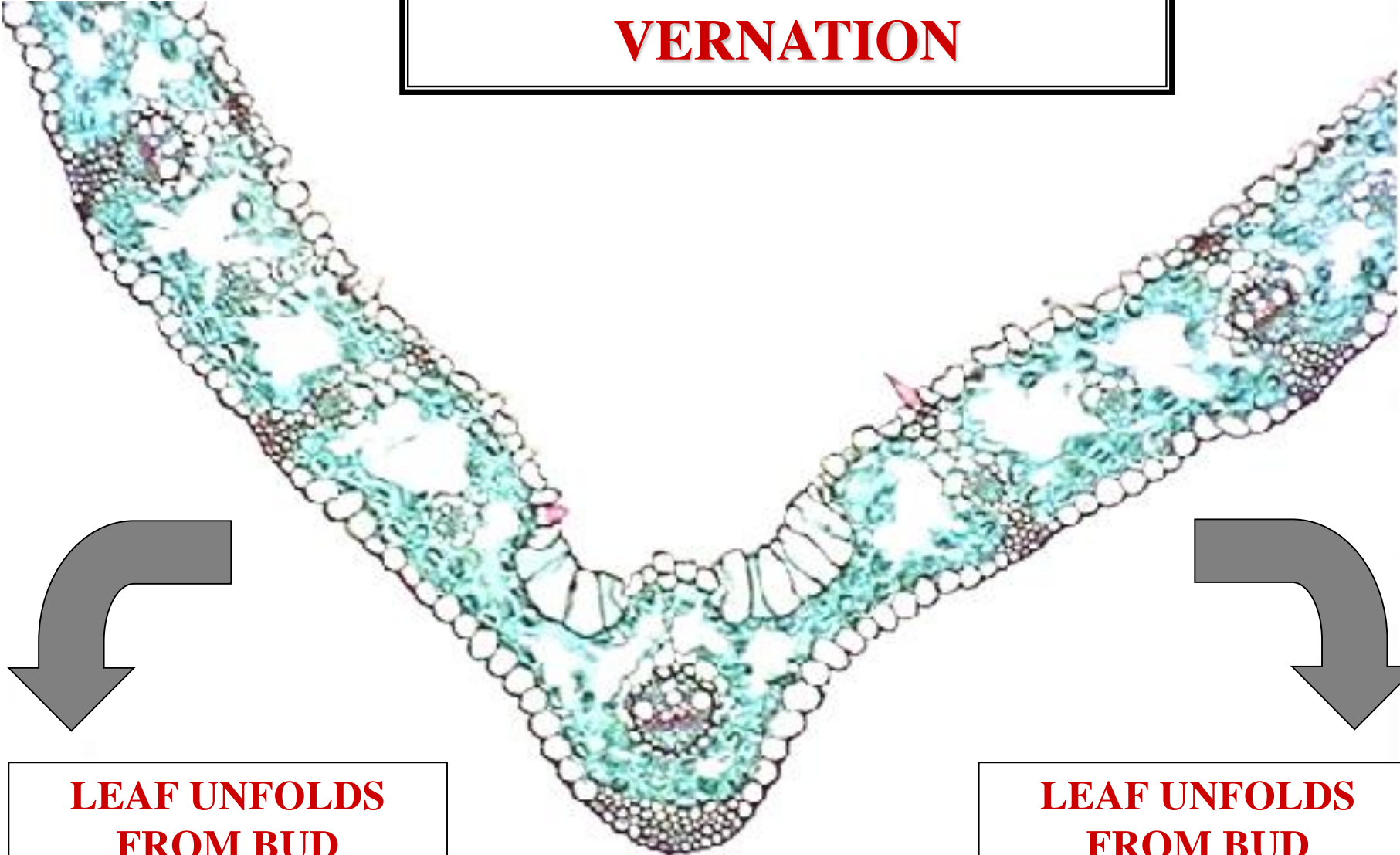
**CONDUPLICATE
VERNATION**



**LEAF UNFOLDS
FROM BUD**

**CONDUPLICATE
VERNATION**

**CONDUPPLICATE
VERNATION**



**LEAF UNFOLDS
FROM BUD**

**LEAF UNFOLDS
FROM BUD**

**CIRCINATE
LEAF
VERNATION**

**CIRCINATE
VERNATION**



**LEAF UNROLLS
FROM BUD**

**CIRCINATE
VERNATION**



CIRCINATE VERNATION

**LEAF UNROLLS
FROM BUD**

CROZIER