

TELOMIE

**MEGAPHYLL
TELOME**

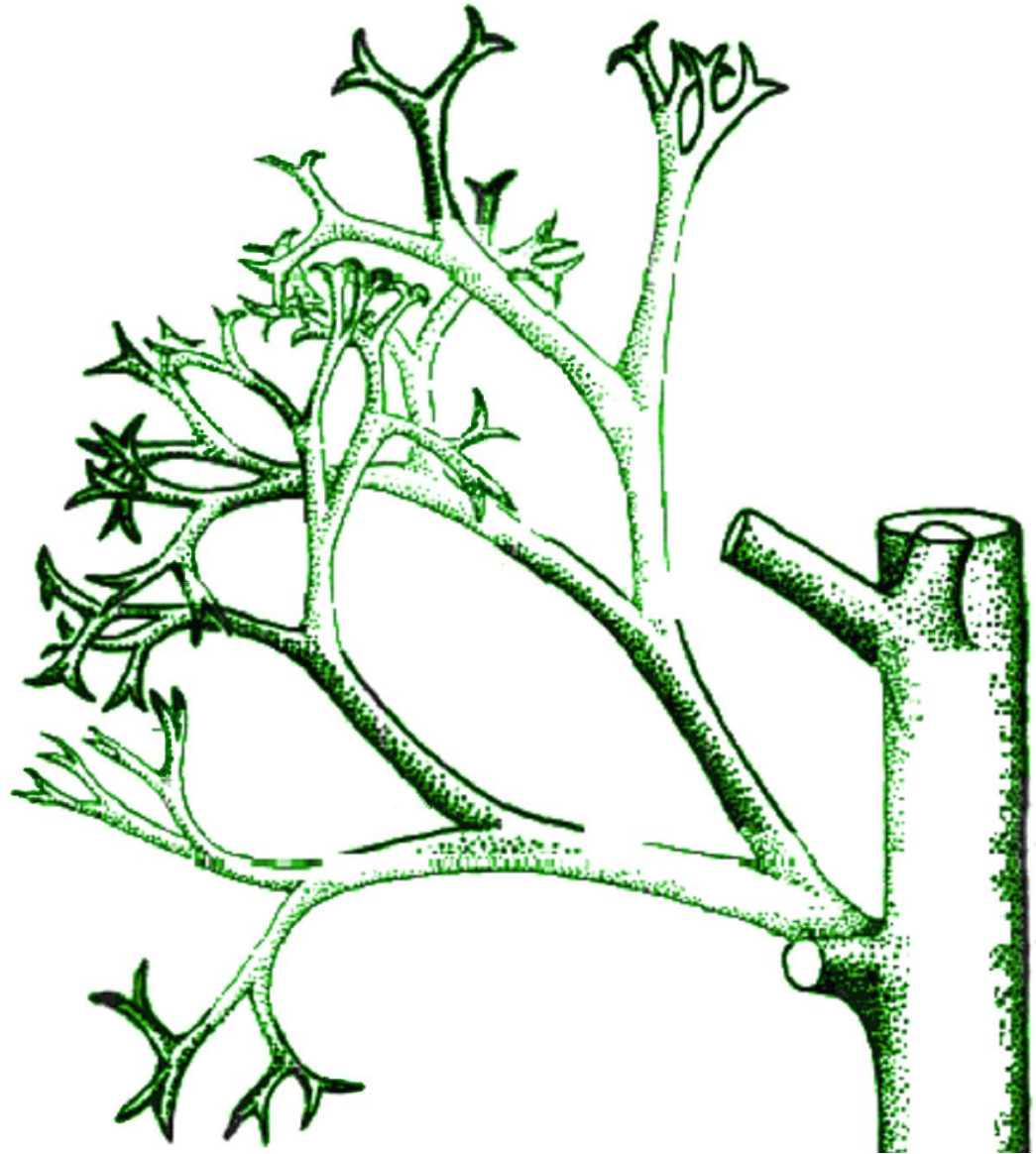


**DICHOTOMOUSLY
BRANCHED
STEM**

**MEGAPHYLL
TELOME**

DICHOTOMOUSLY
BRANCHED
STEM

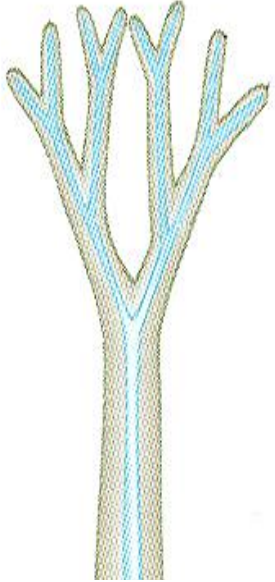
TELOME





TELOMERE THEORY COMPONENTS

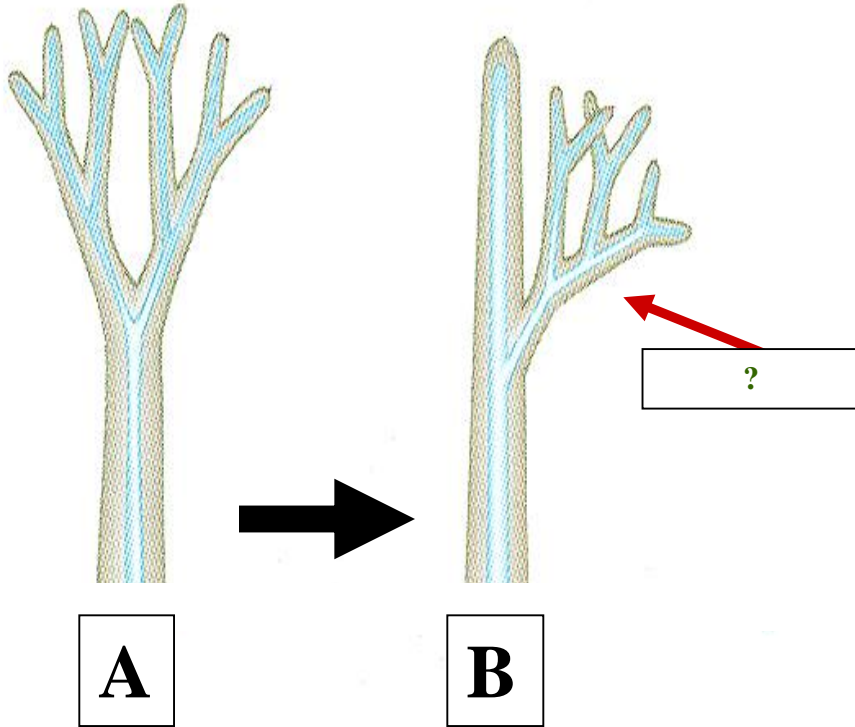
TELOME THEORY COMPONENTS



A

**TELOME
ABSENT**

TELOME THEORY COMPONENTS

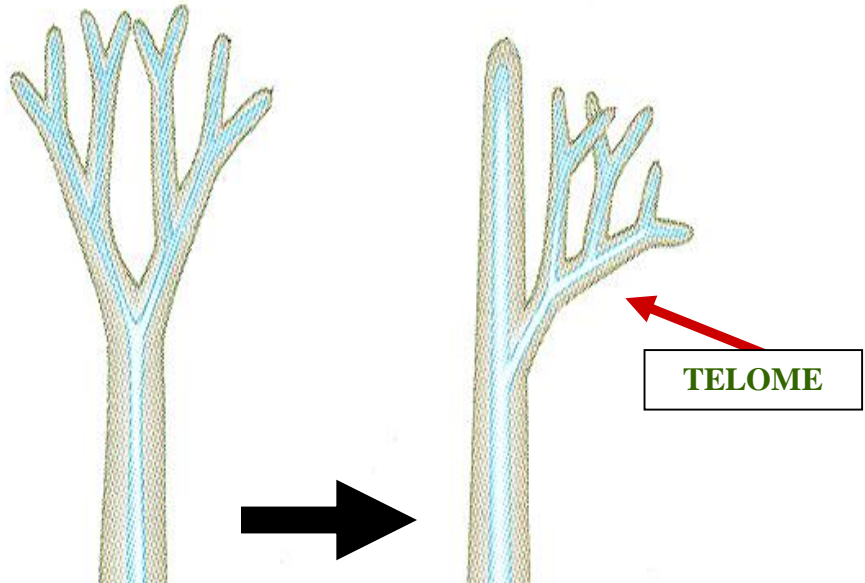


TELOME
ABSENT

→ = TIME

TELOME THEORY

COMPONENTS



A

B

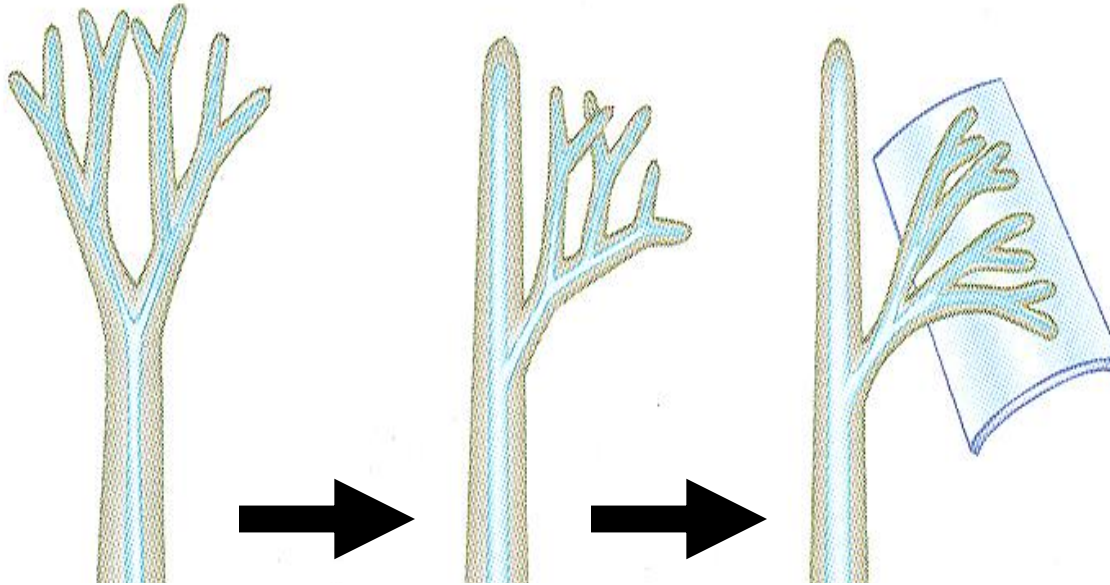
**TELOME
ABSENT**

**OVERTOPPING
TELOME**

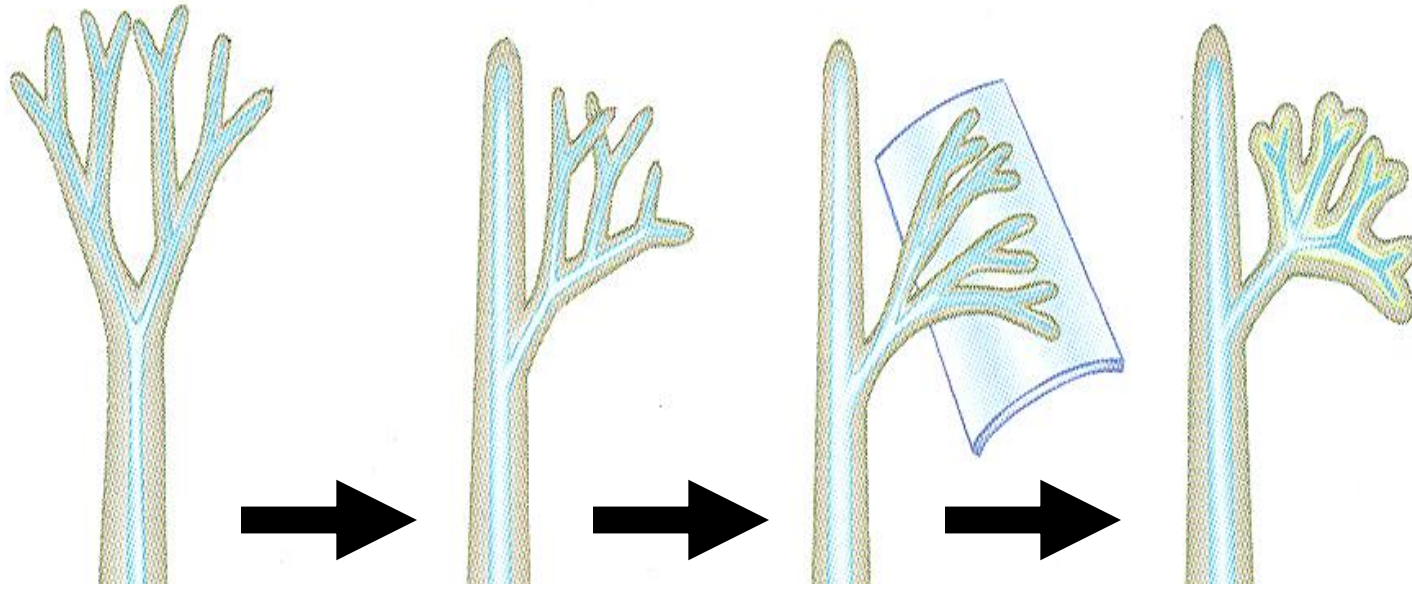
→ = TIME

TELOME THEORY

COMPONENTS

**A****B****C****TELOME
ABSENT****OVERTOPPING
TELOME****PLANATION
TELOME****→ = TIME**

TELOME THEORY COMPONENTS



A

B

C

D

**TELOME
ABSENT**

**OVERTOPPING
TELOME**

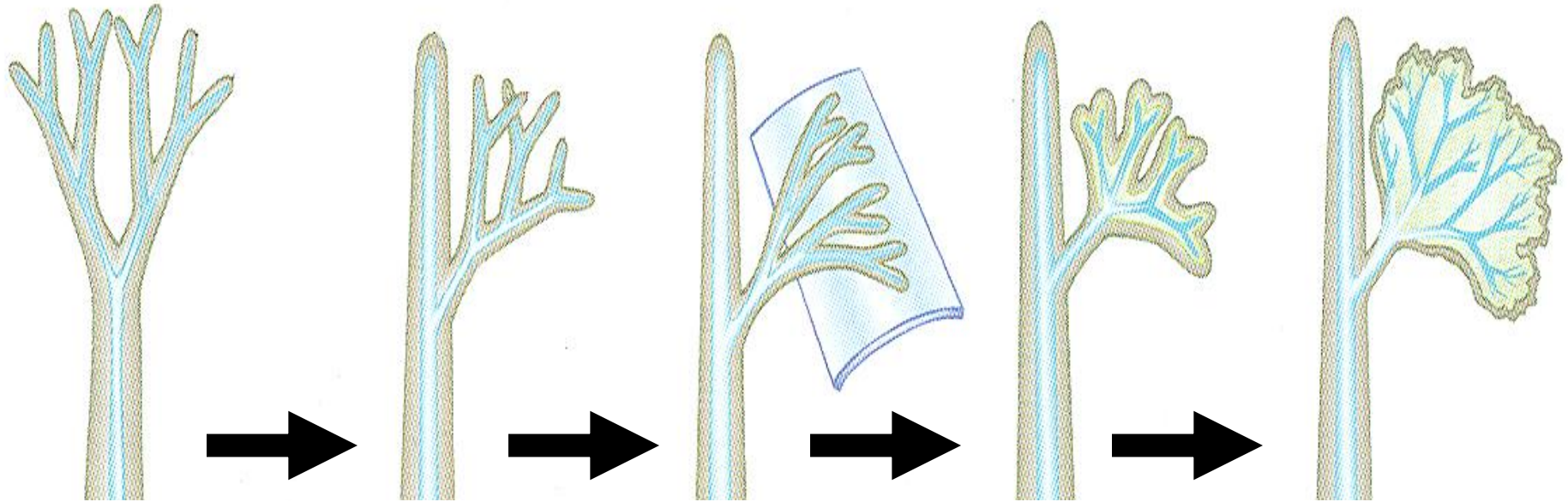
**PLANATION
TELOME**

**WEBBING
TELOME**

→ = TIME

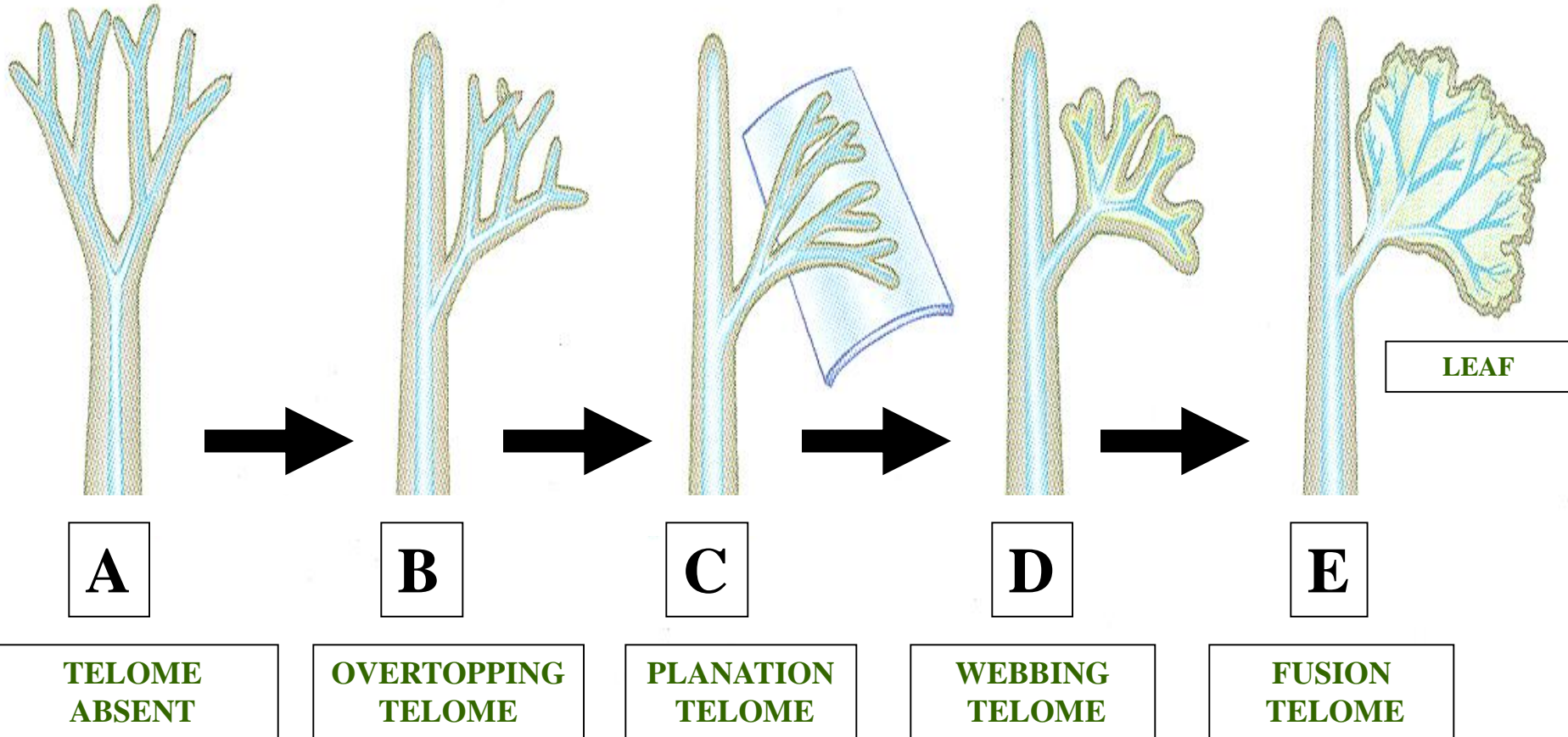
TELOME THEORY

COMPONENTS

**A****B****C****D****E****TELOME
ABSENT****OVERTOPPING
TELOME****PLANATION
TELOME****WEBBING
TELOME****FUSION
TELOME****→ = TIME**

TELOME THEORY

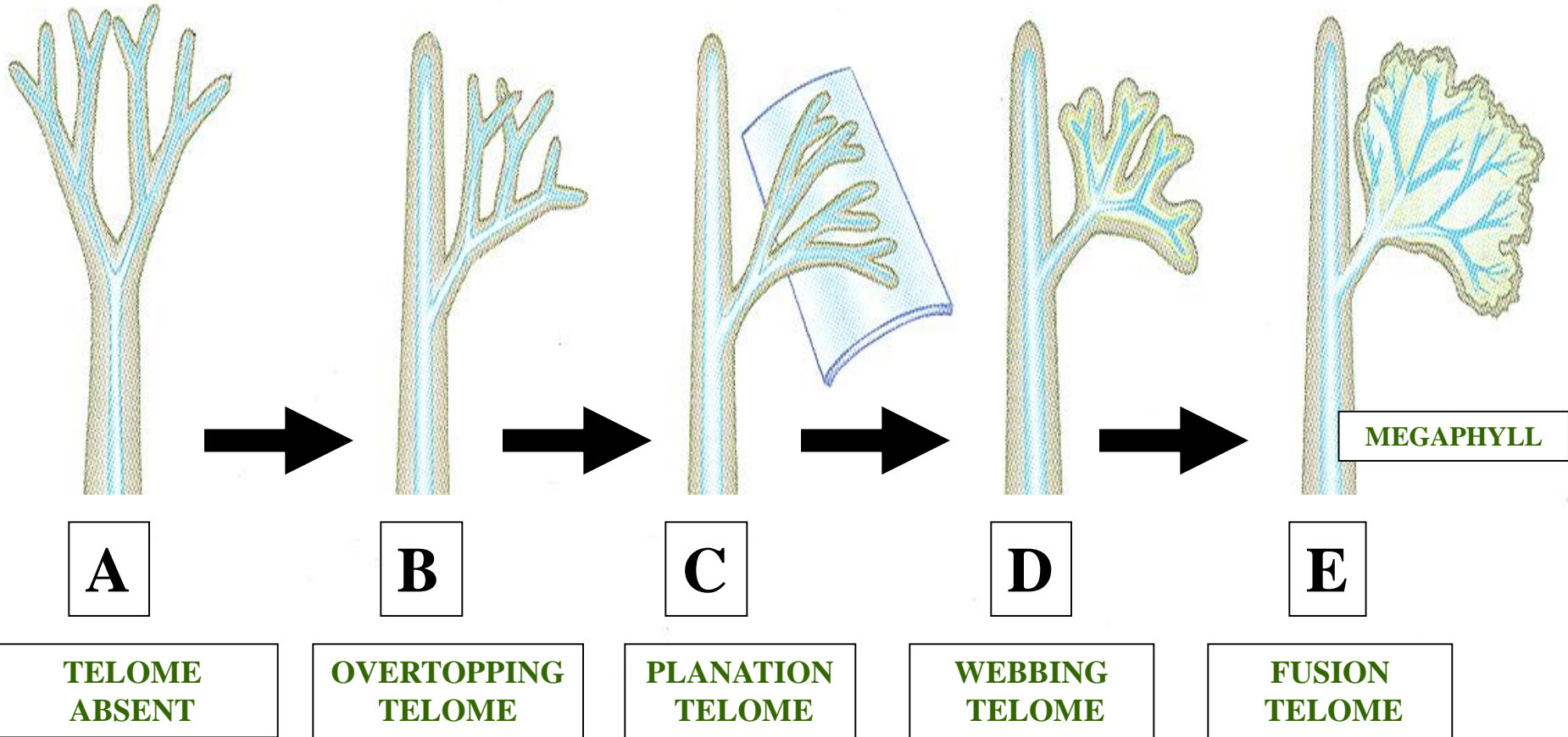
COMPONENTS



➔ = TIME

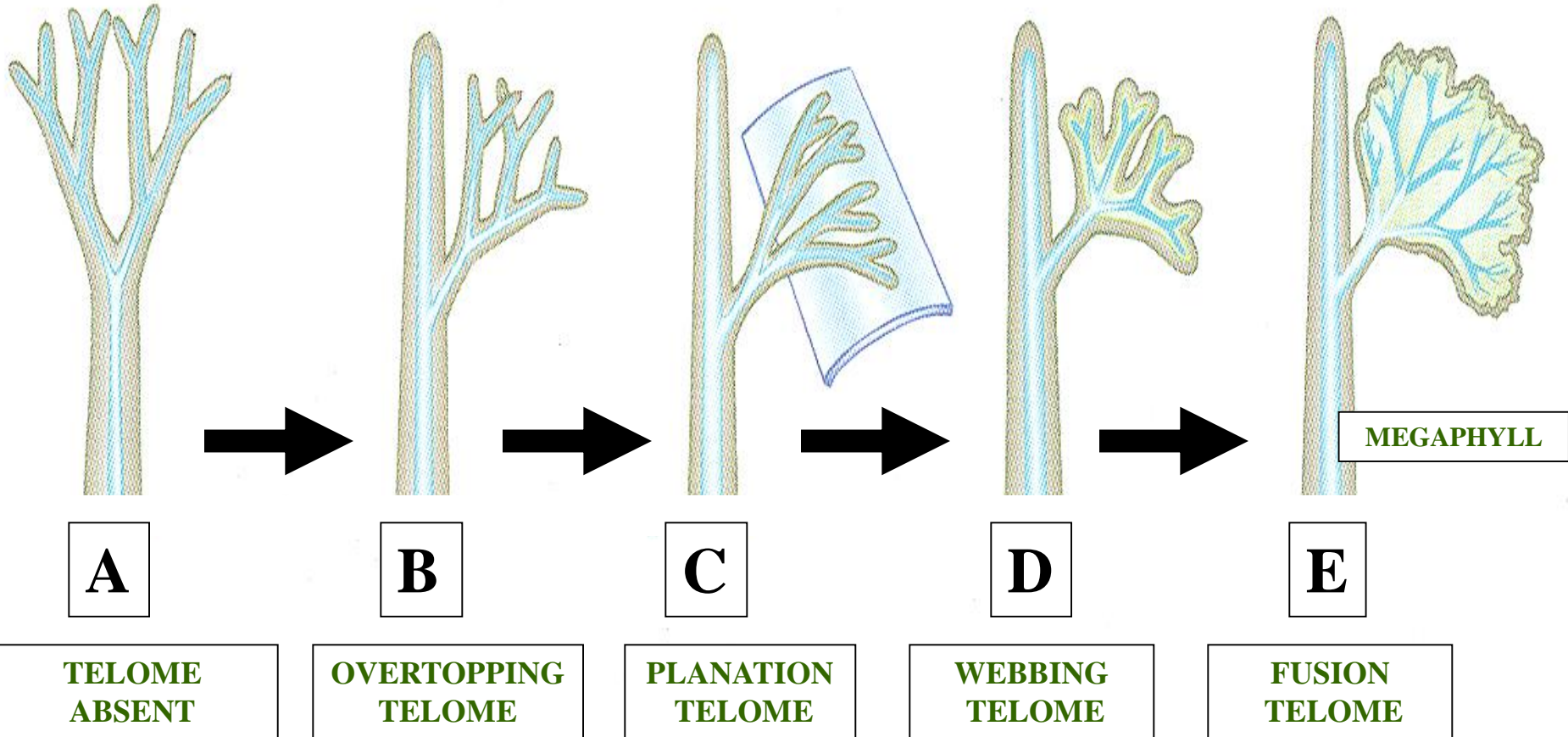
TELOME THEORY COMPONENTS

TT
+

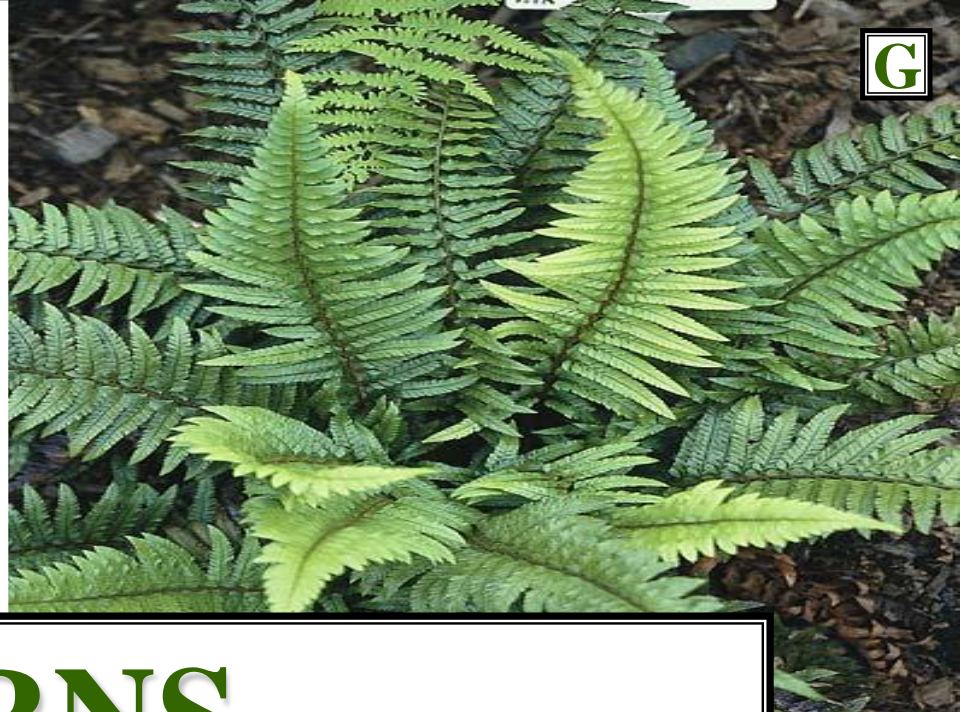


MEGAPHYLL

TELOME THEORY COMPONENTS



TELOME THEORY



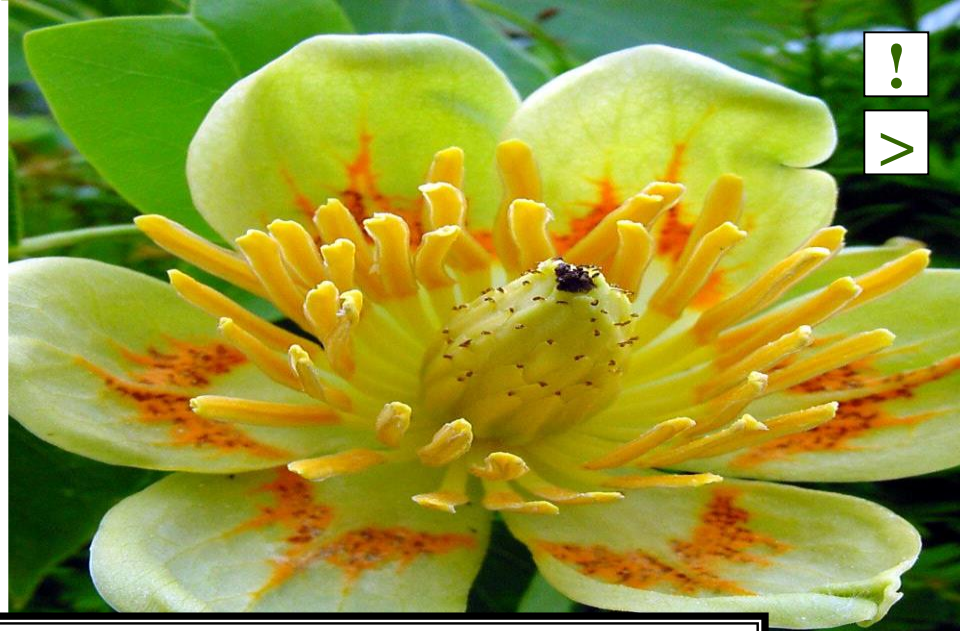
FERNS





GYMNOSPERMS





ANGIOSPERMS





MICROPHYLL

&

MEGAPHYLL

MISNOMERS

SIZE NOT DIAGNOSTIC



MICROPHYLL

&

MEGAPHYLL

DELIMITED

ANATOMICALLY

LEAF PHYLLOTAXY

PHYLLOTAXY

PHYLLOTAXY

LEAF ARRANGEMENT UPON STEM

PHYLLOTAXY

NODE

PHYLLOTAXY



NODE

LEAF

ORIGIN POINT

UPON STEM

PHYLLOTAXY

NODE

N

[]



[]



STEM

LEAF

[]



[]

[]



A

[Blank box]



NODE

STEM

LEAF

[Blank box]



[Blank box]



NODE



AXILLARY BUD

PHYLLOTAXY
AXILLARY BUD



STEM NODE
LOCATION

PHYLLOTAXY
AXILLARY BUD

A

[Blank box]



NODE

STEM

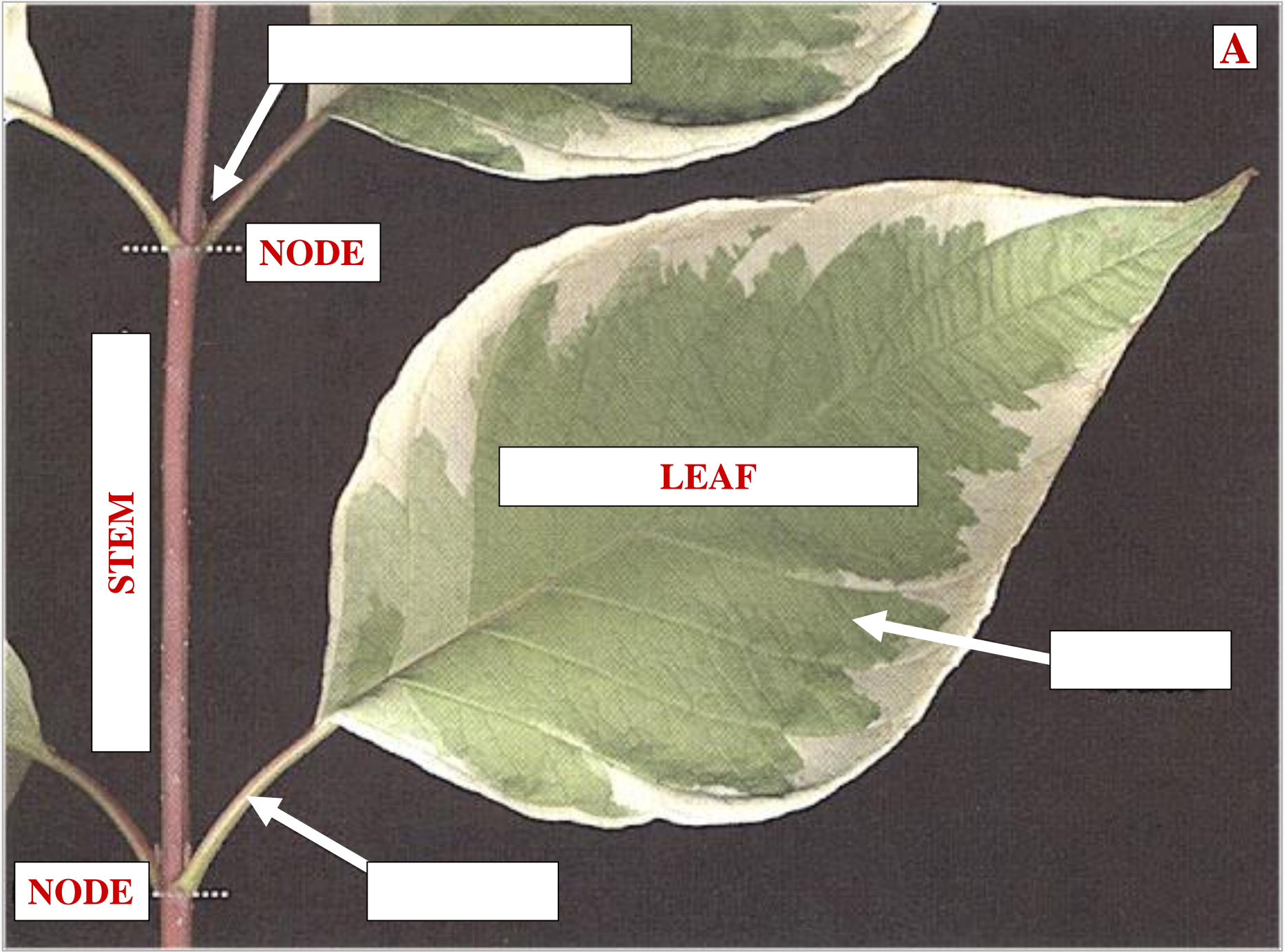
LEAF

[Blank box]



NODE

[Blank box]



AXILLARY BUD



NODE

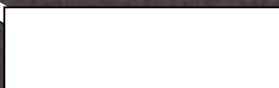


STEM

LEAF



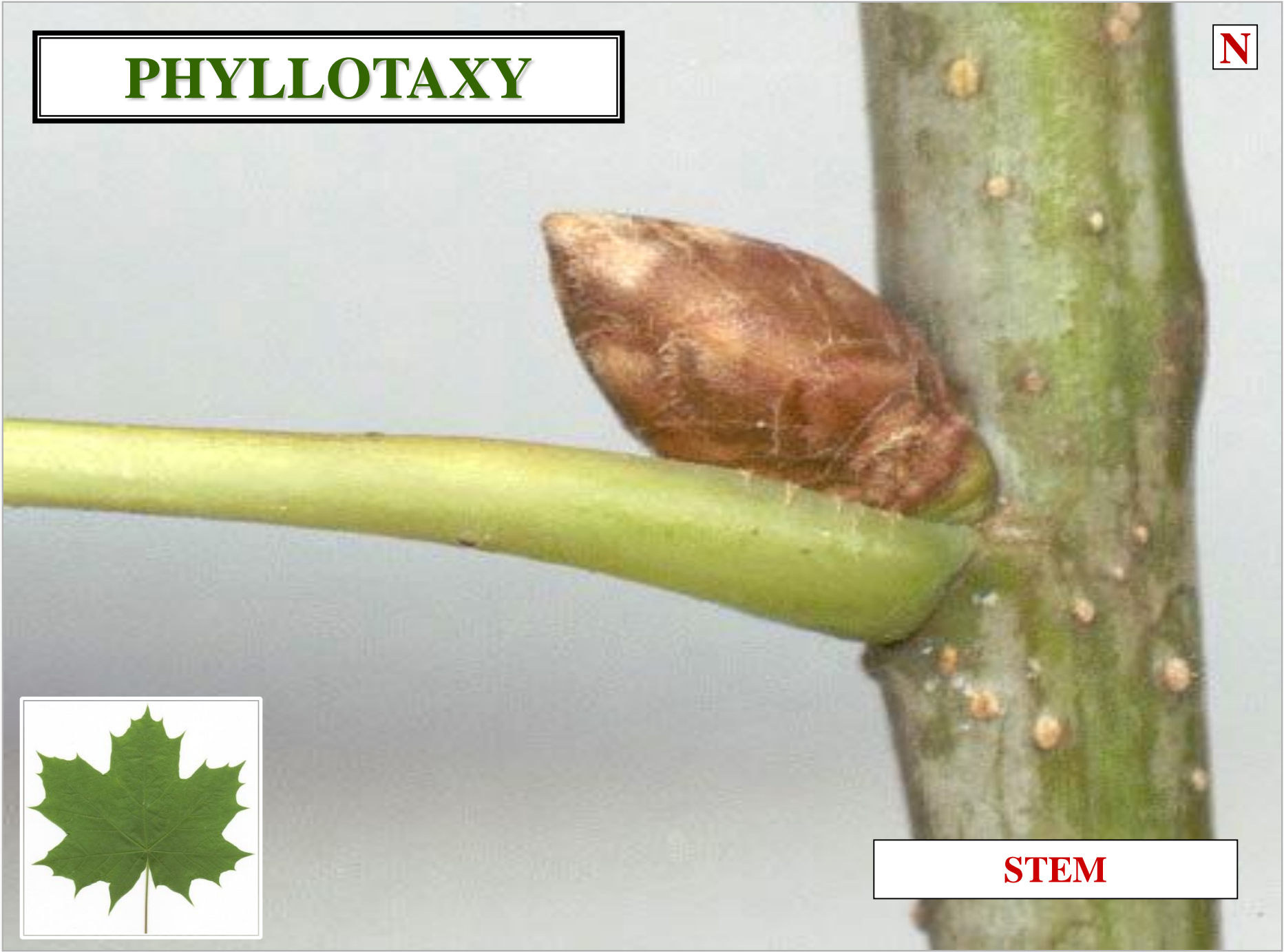
NODE





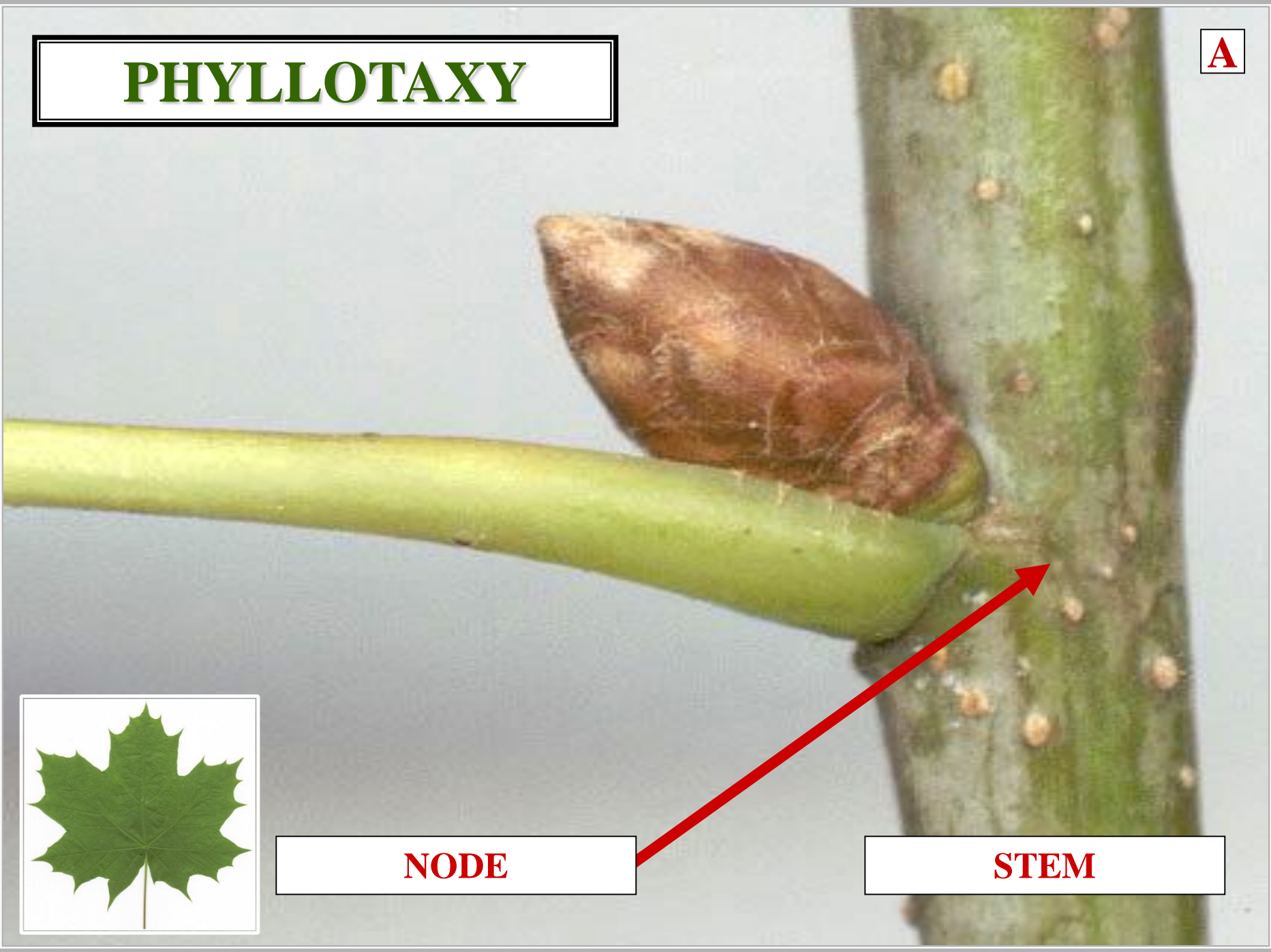
NODE
AXILLARY BUD
APPLIED

PHYLLOTAXY



STEM

PHYLLOTAXY



NODE

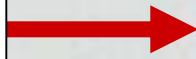
STEM



PHYLLOTAXY

L

AXILLARY BUD



NODE



STEM



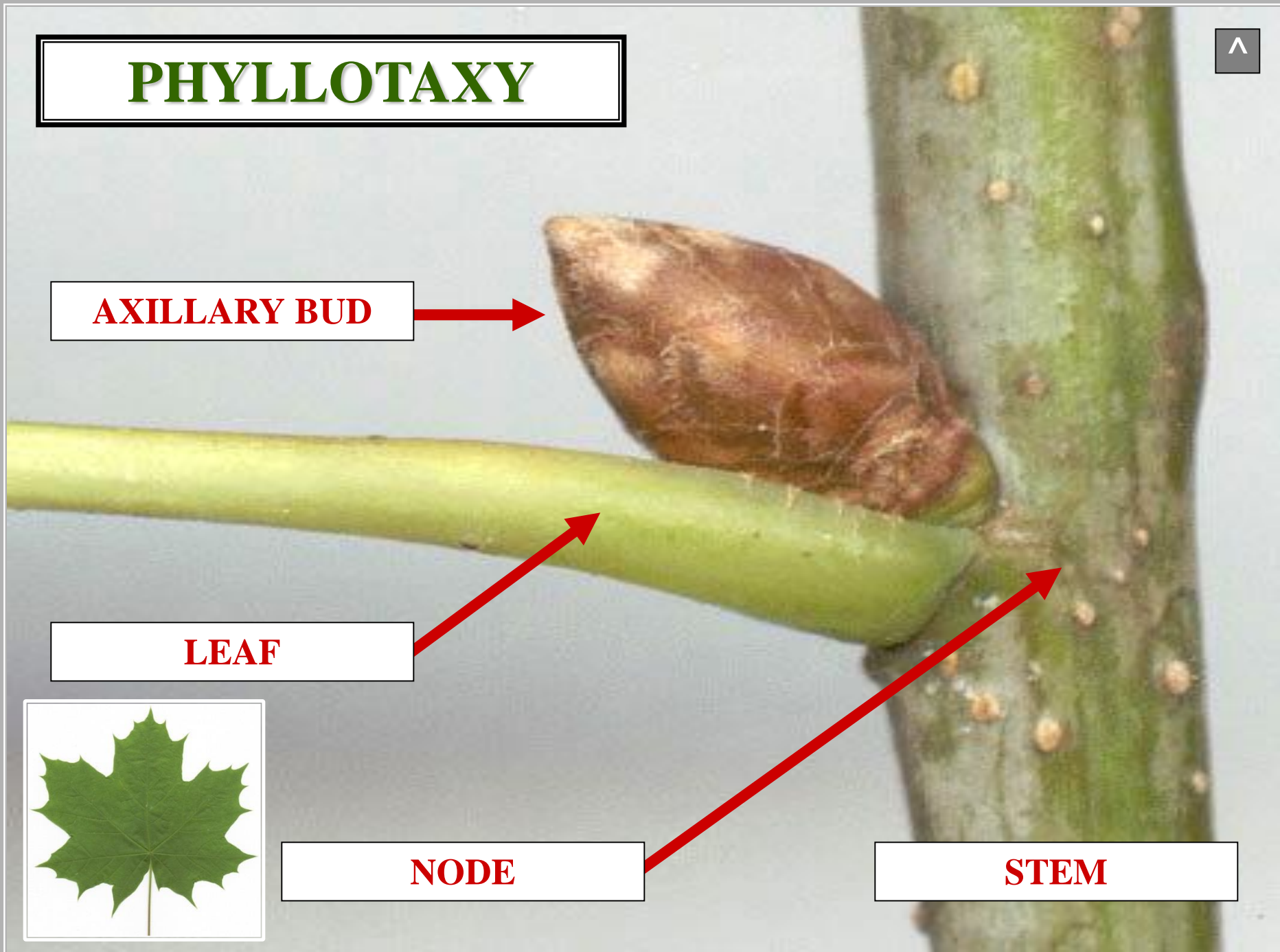
PHYLLOTAXY

AXILLARY BUD

LEAF

NODE

STEM



LEAF PHYLLOTAXY TYPES

LEAF PHYLLOTAXY TYPES

ALTERNATE

LEAF PHYLLOTAXY TYPES

LEAF PHYLLLOTAXY TYPES

**ALTERNATE
OPPOSITE**

**LEAF PHYLLLOTAXY
TYPES**

LEAF PHYLLLOTAXY TYPES

ALTERNATE

OPPOSITE

WHORLED

LEAF PHYLLLOTAXY TYPES

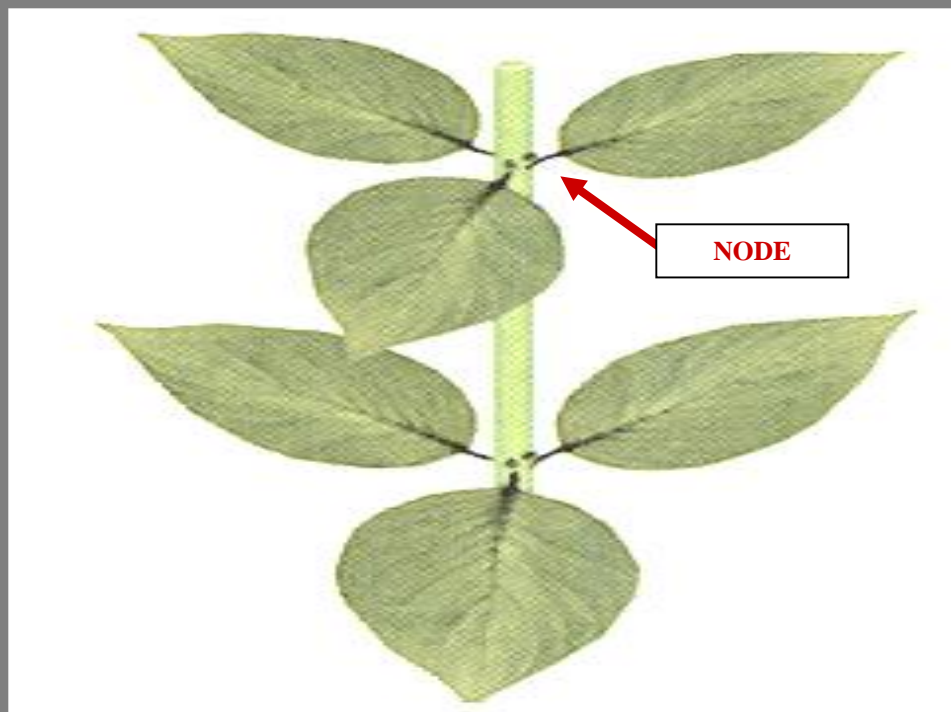
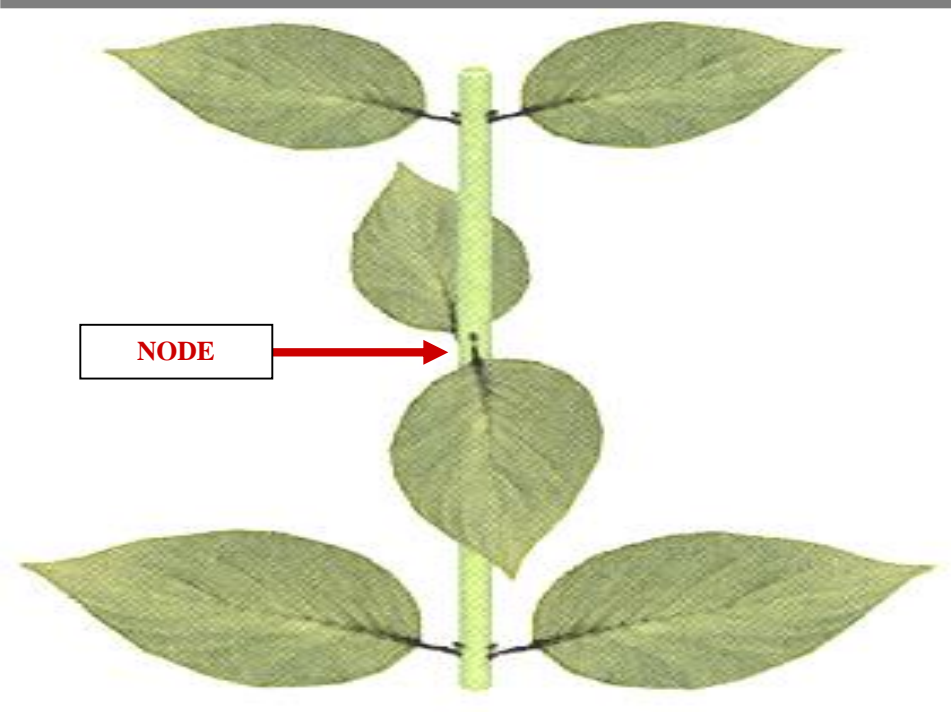
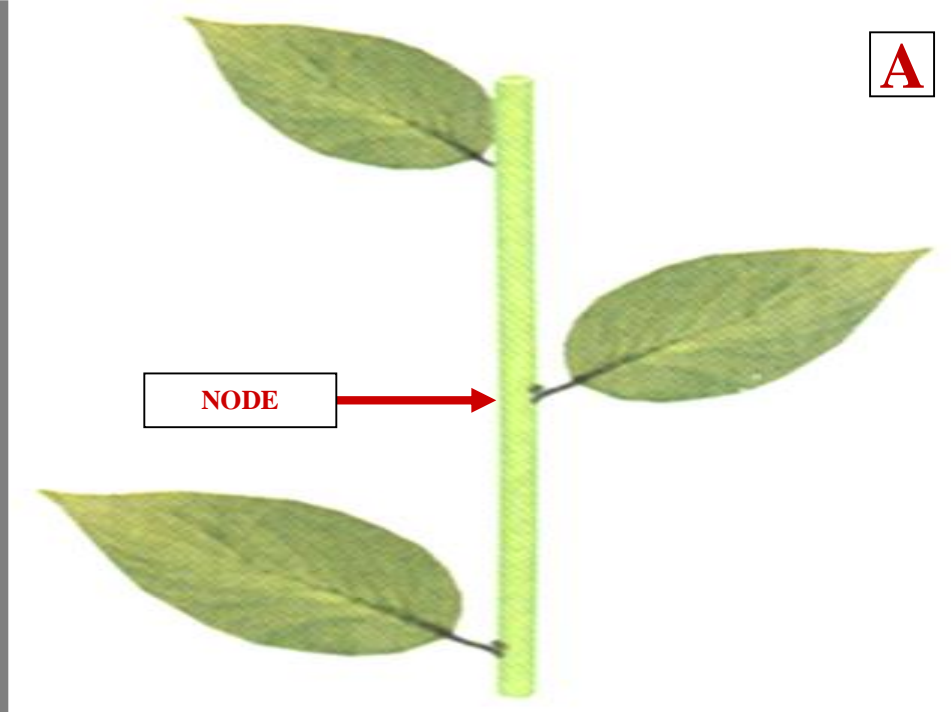
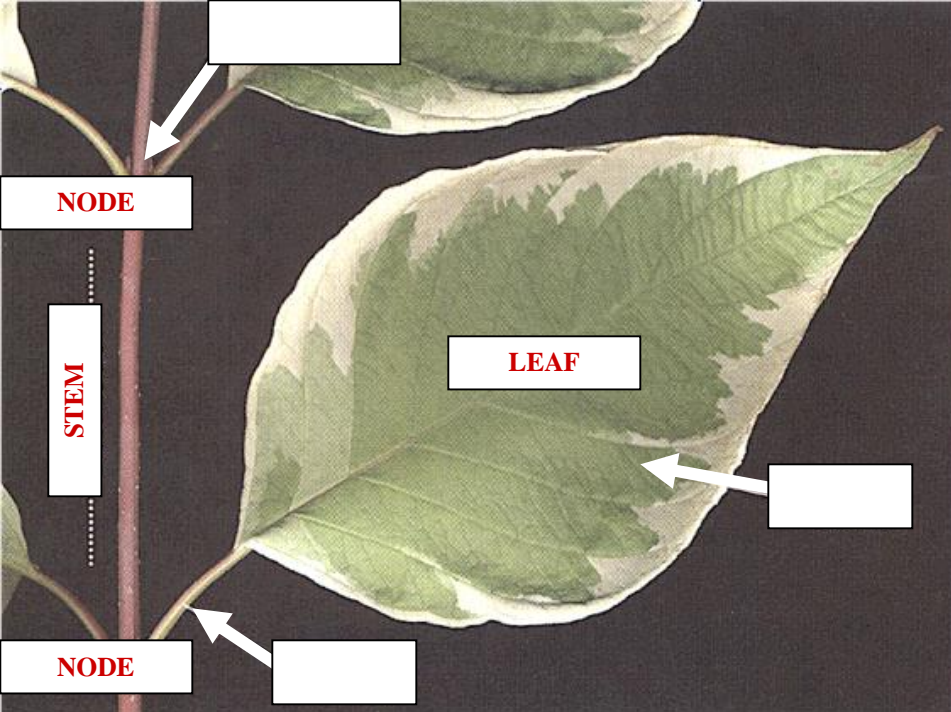
**ALTERNATE
PHYLLOTAXY**

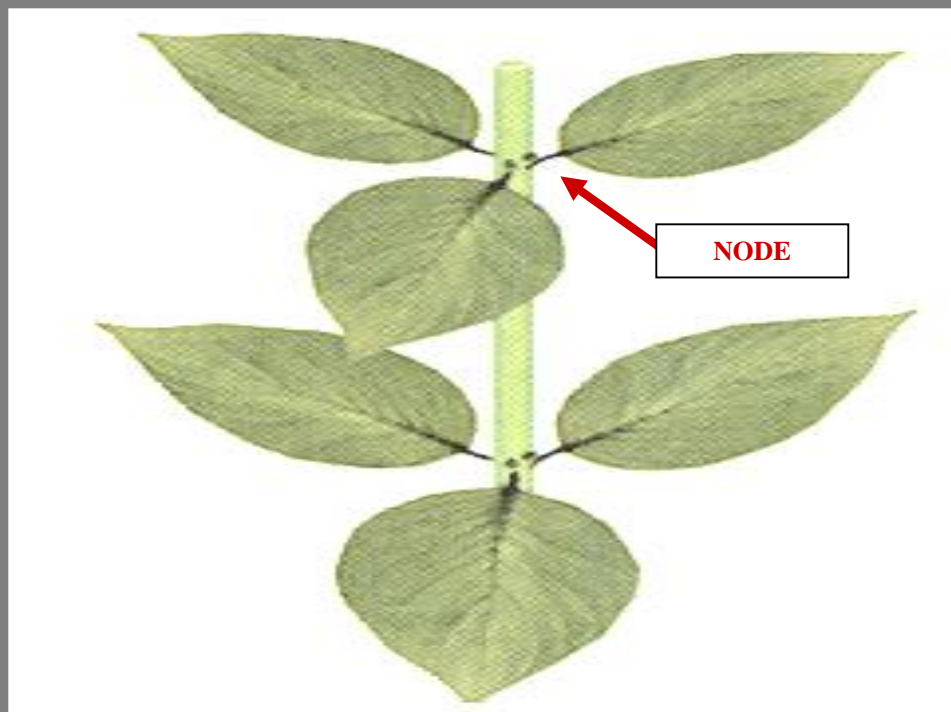
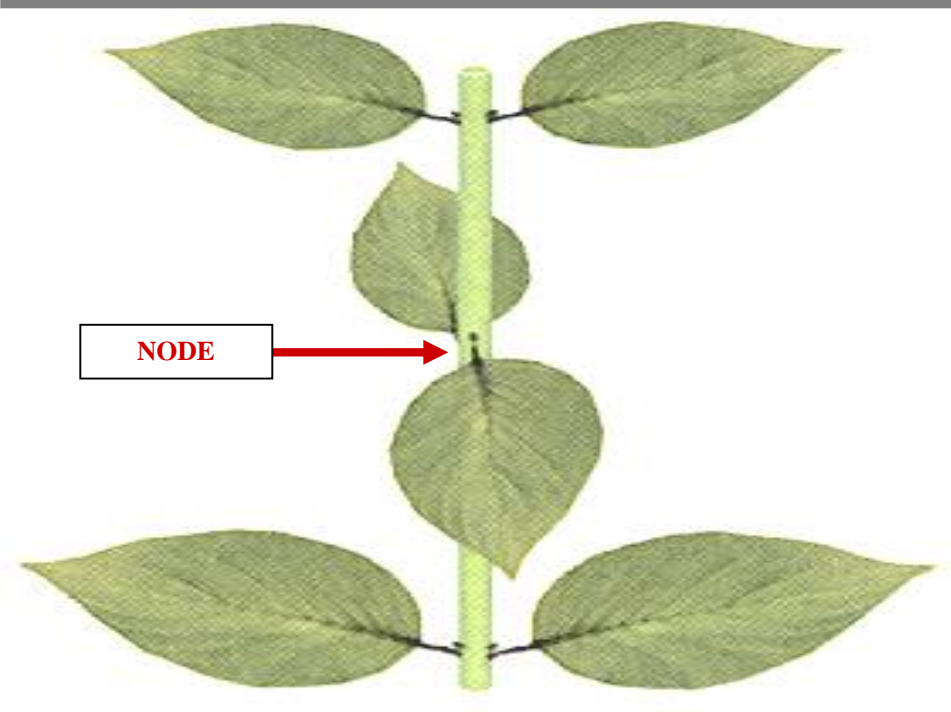
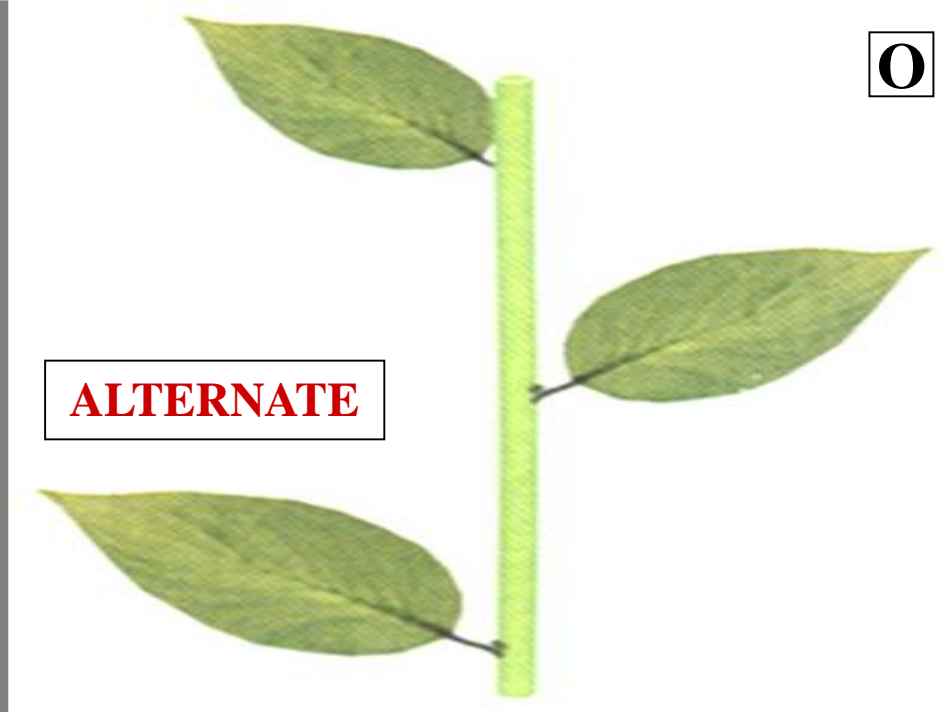
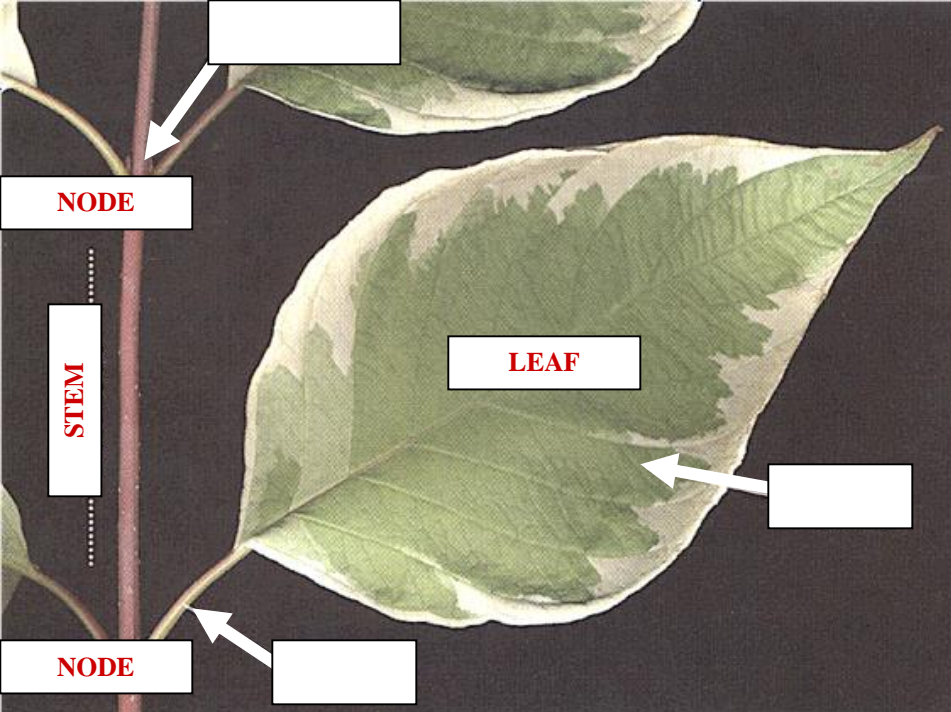


ALTERNATE PHYLLOTAXY

**ONE
LEAF PER NODE**

ALTERNATE PHYLLOTAXY





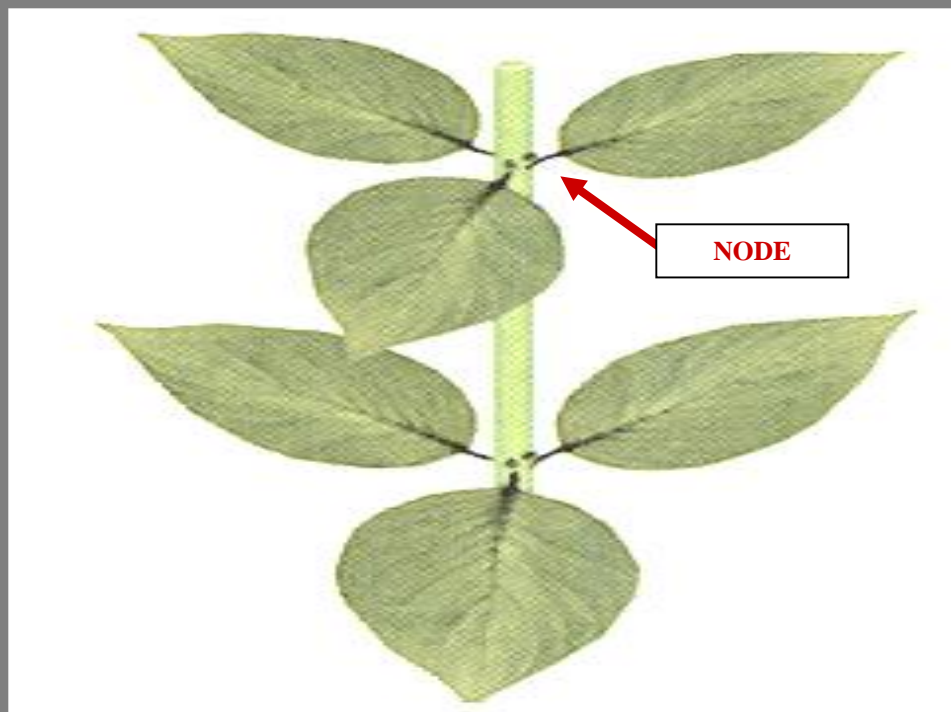
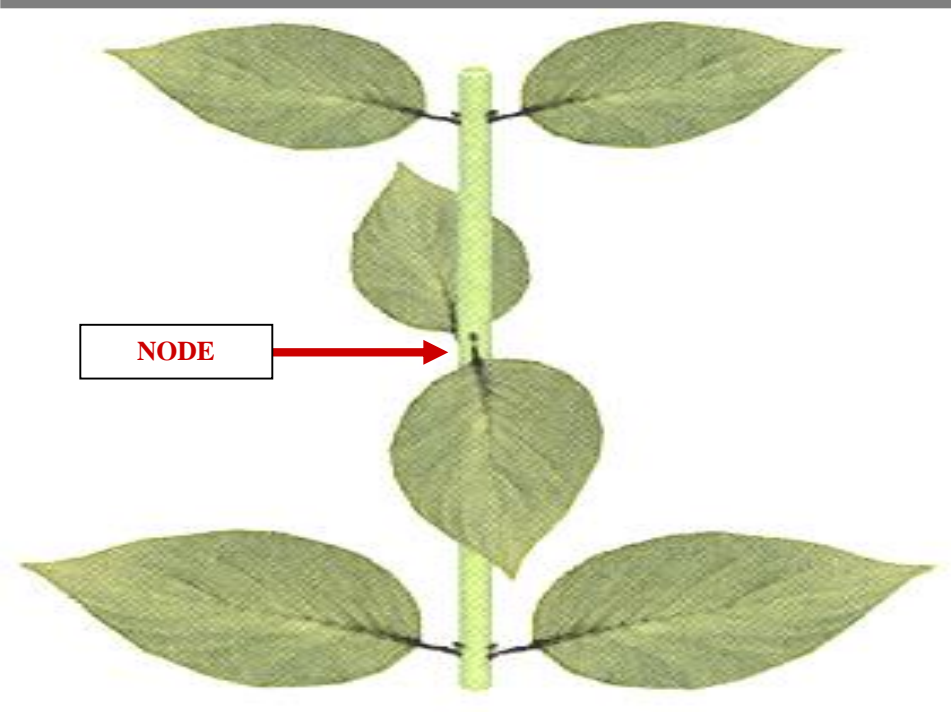
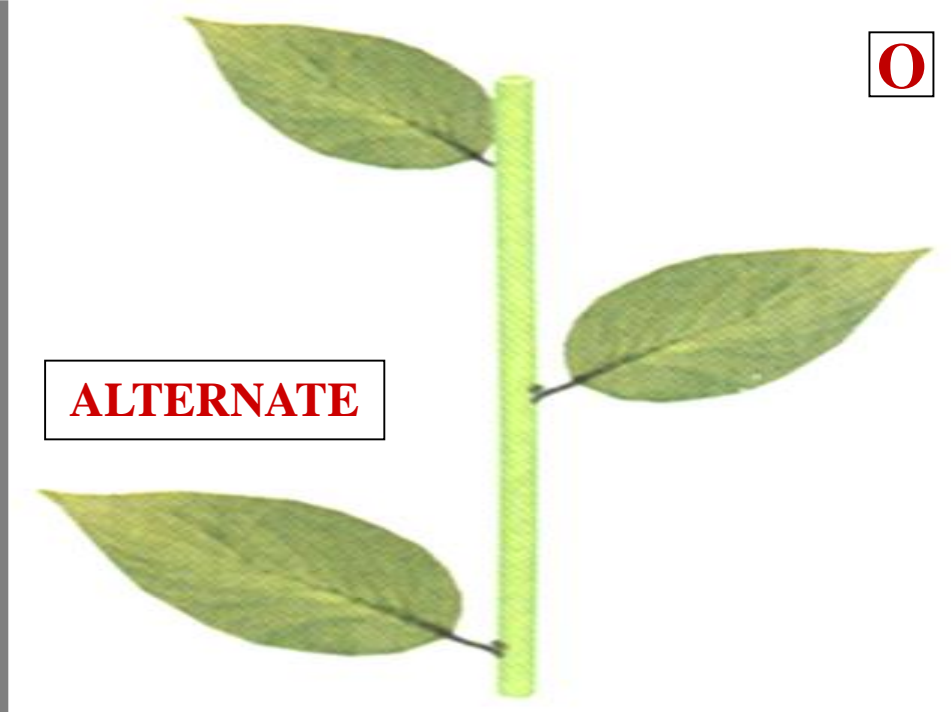
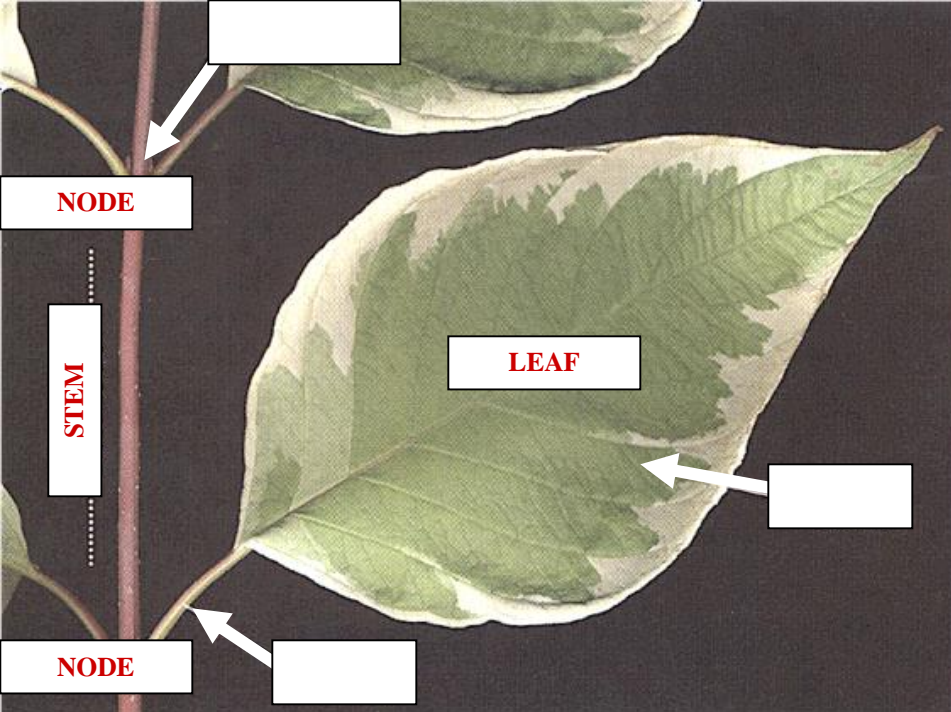
OPPOSITE PHYLLOTAXY

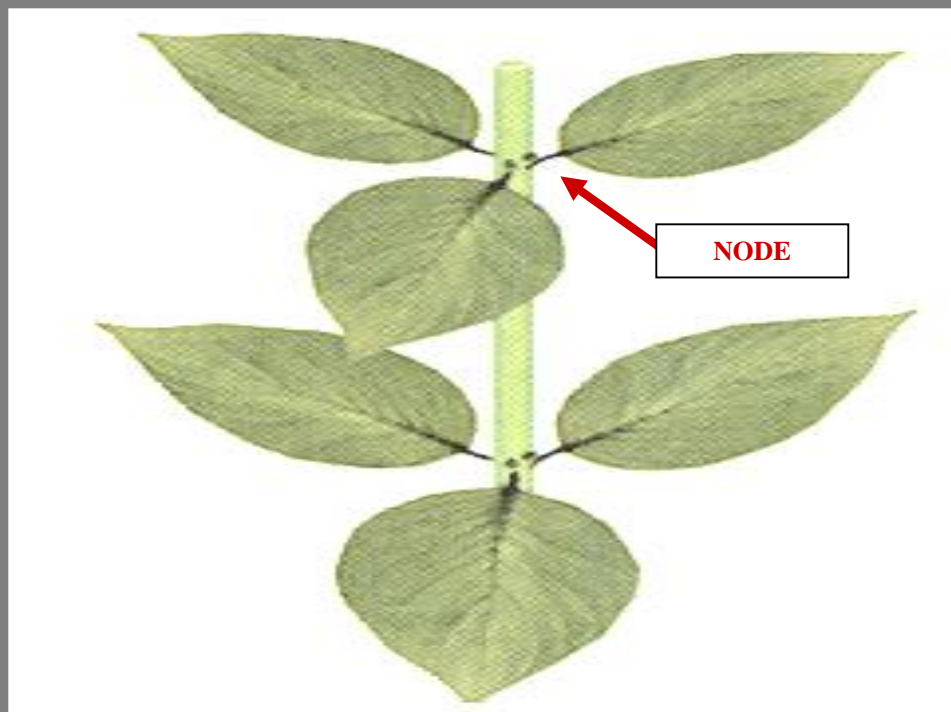
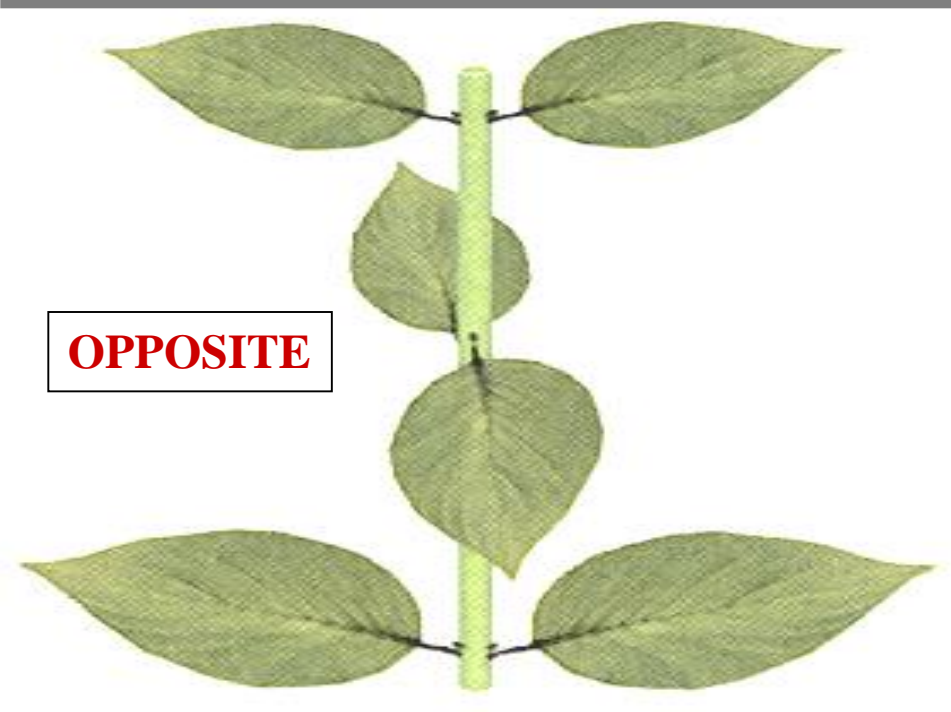
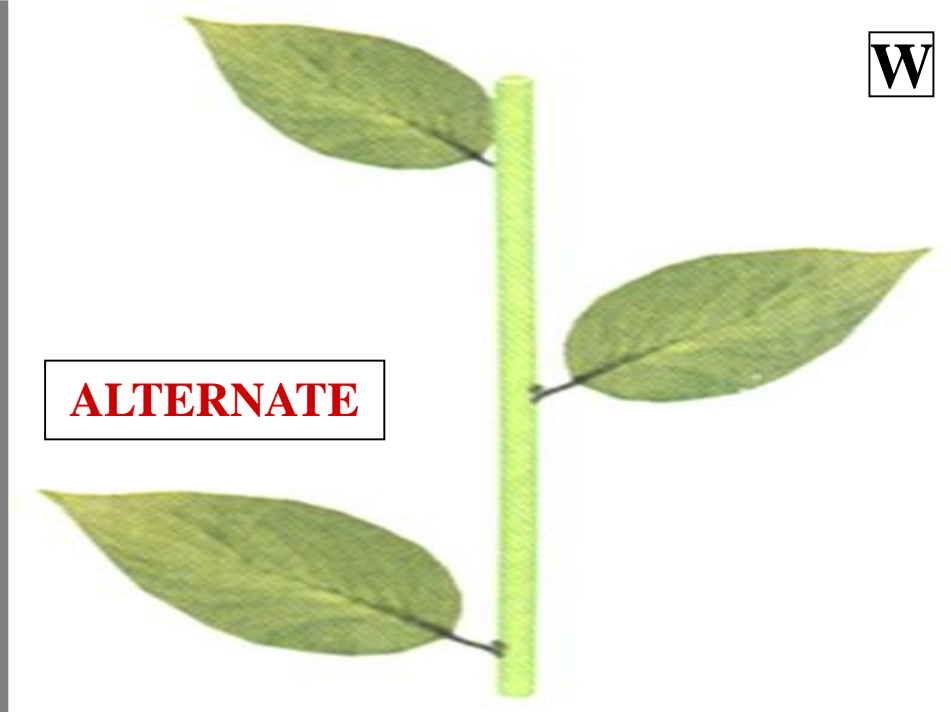
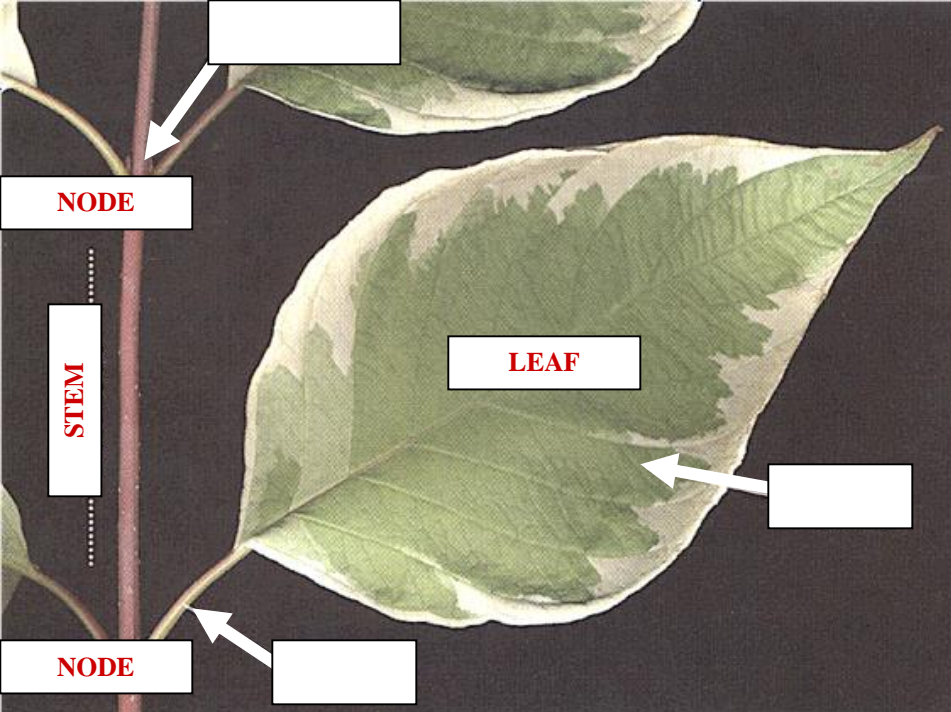


OPPOSITE PHYLLOTAXY

**TWO
LEAVES PER NODE**

OPPOSITE PHYLLOTAXY





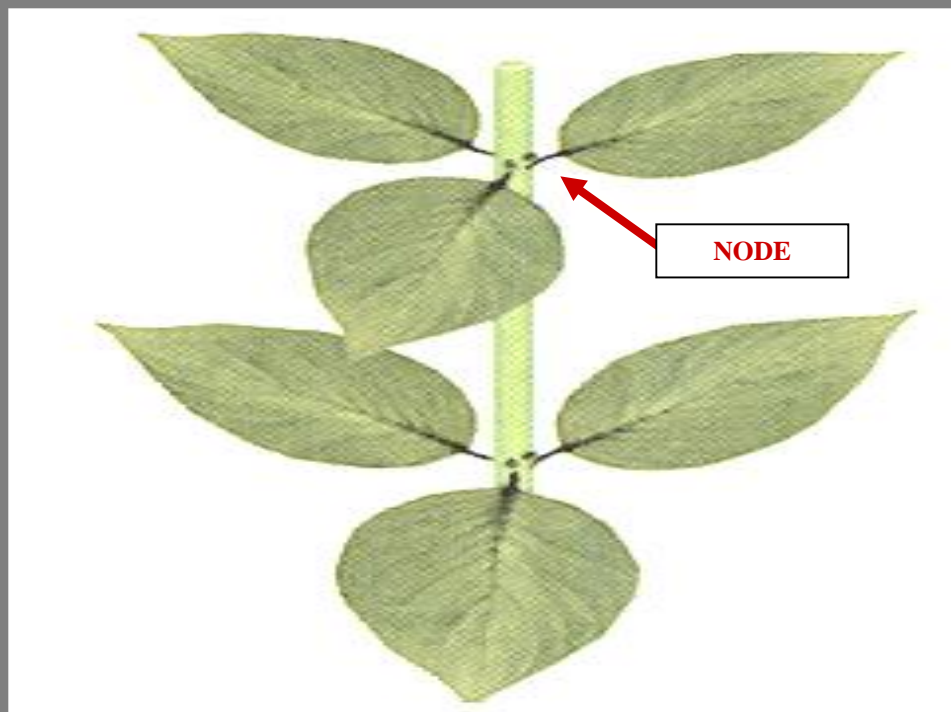
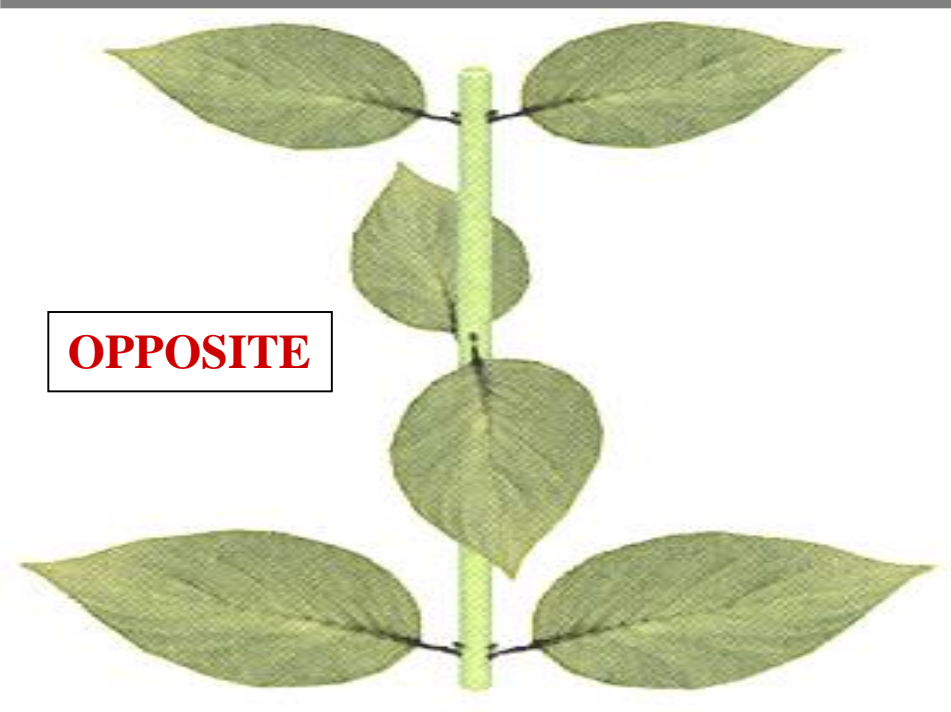
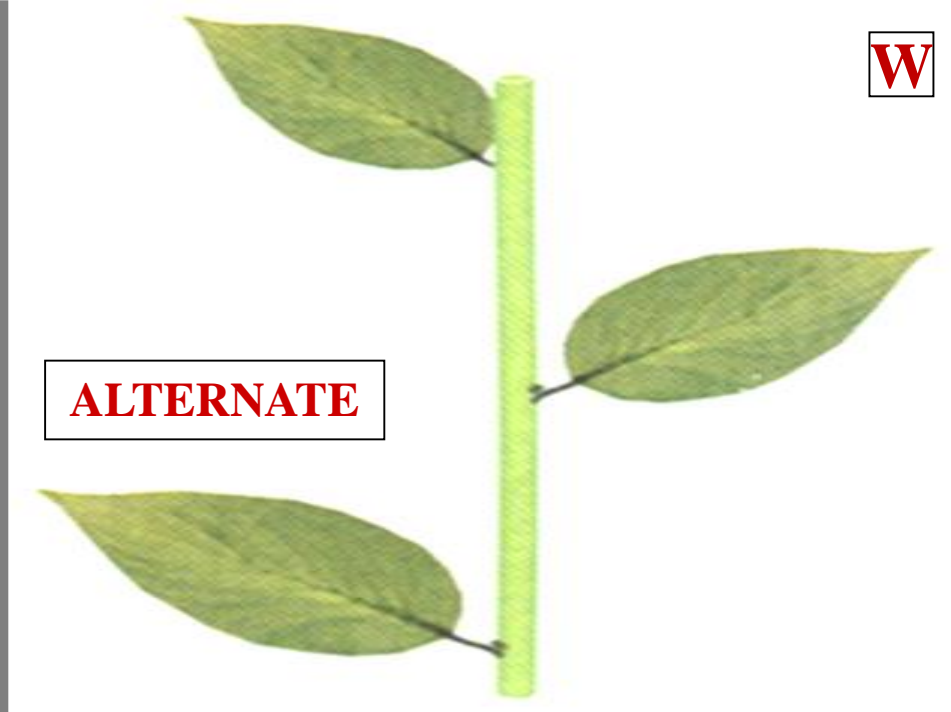
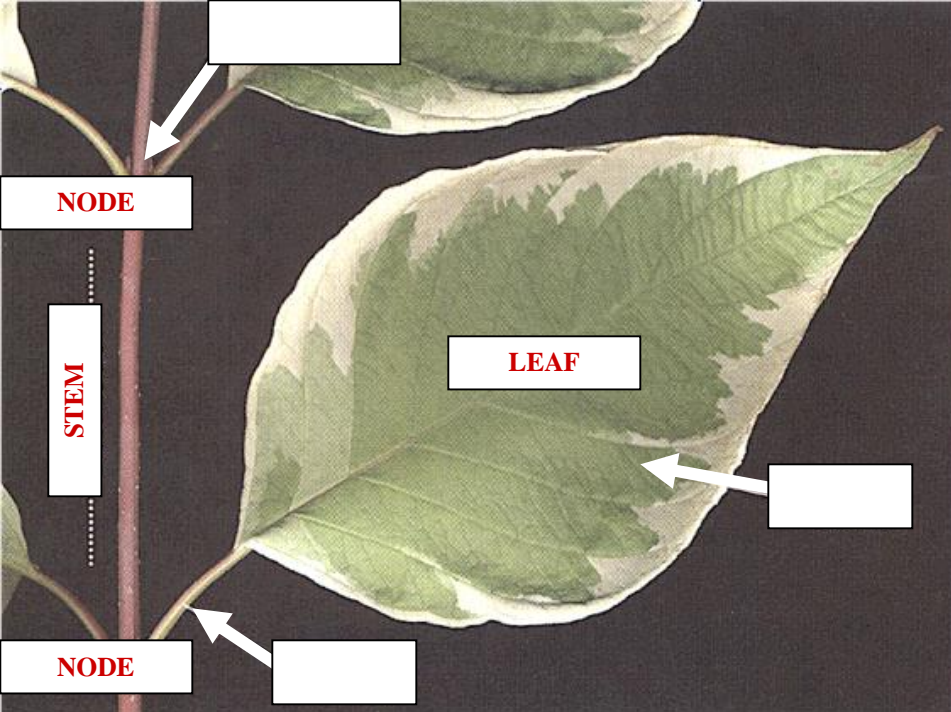
WHORLED PHYLLOTAXY

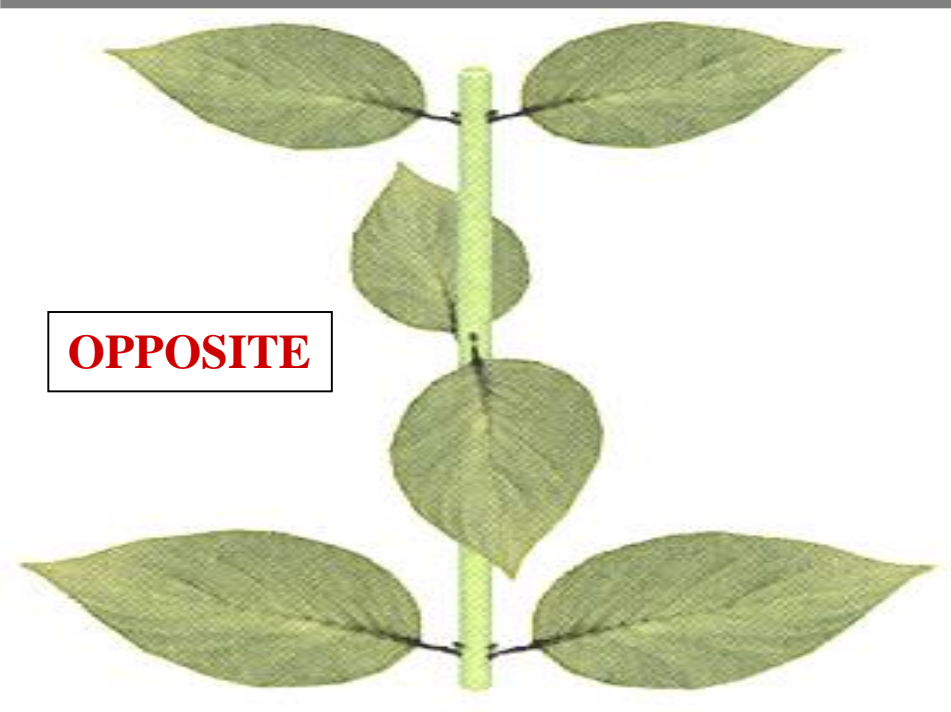
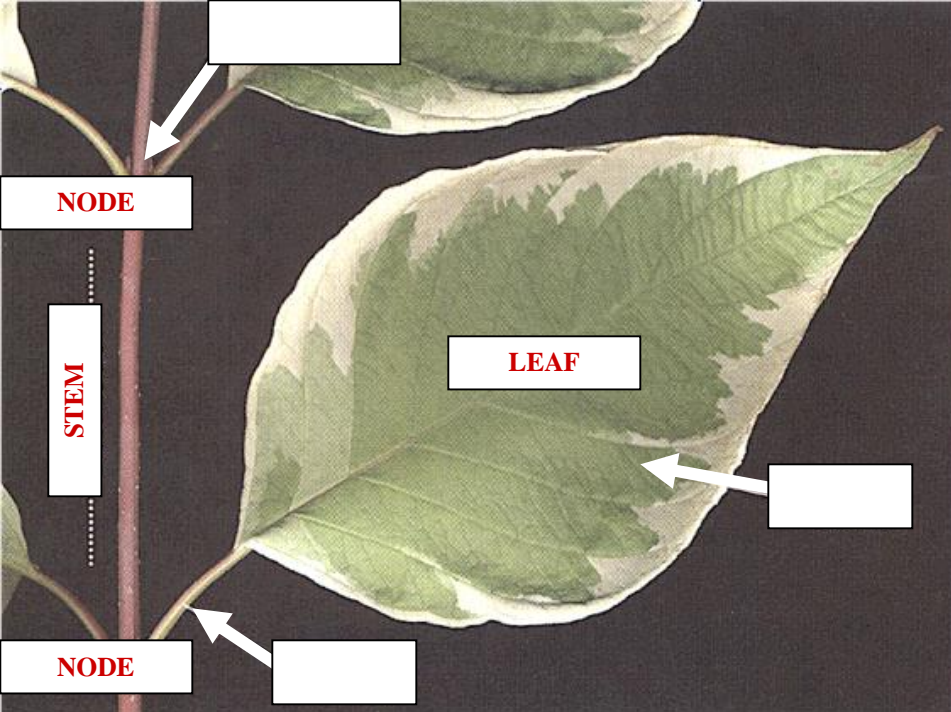


WHORLED PHYLLOTAXY

THREE OR MORE
LEAVES PER NODE

WHORLED PHYLLOTAXY

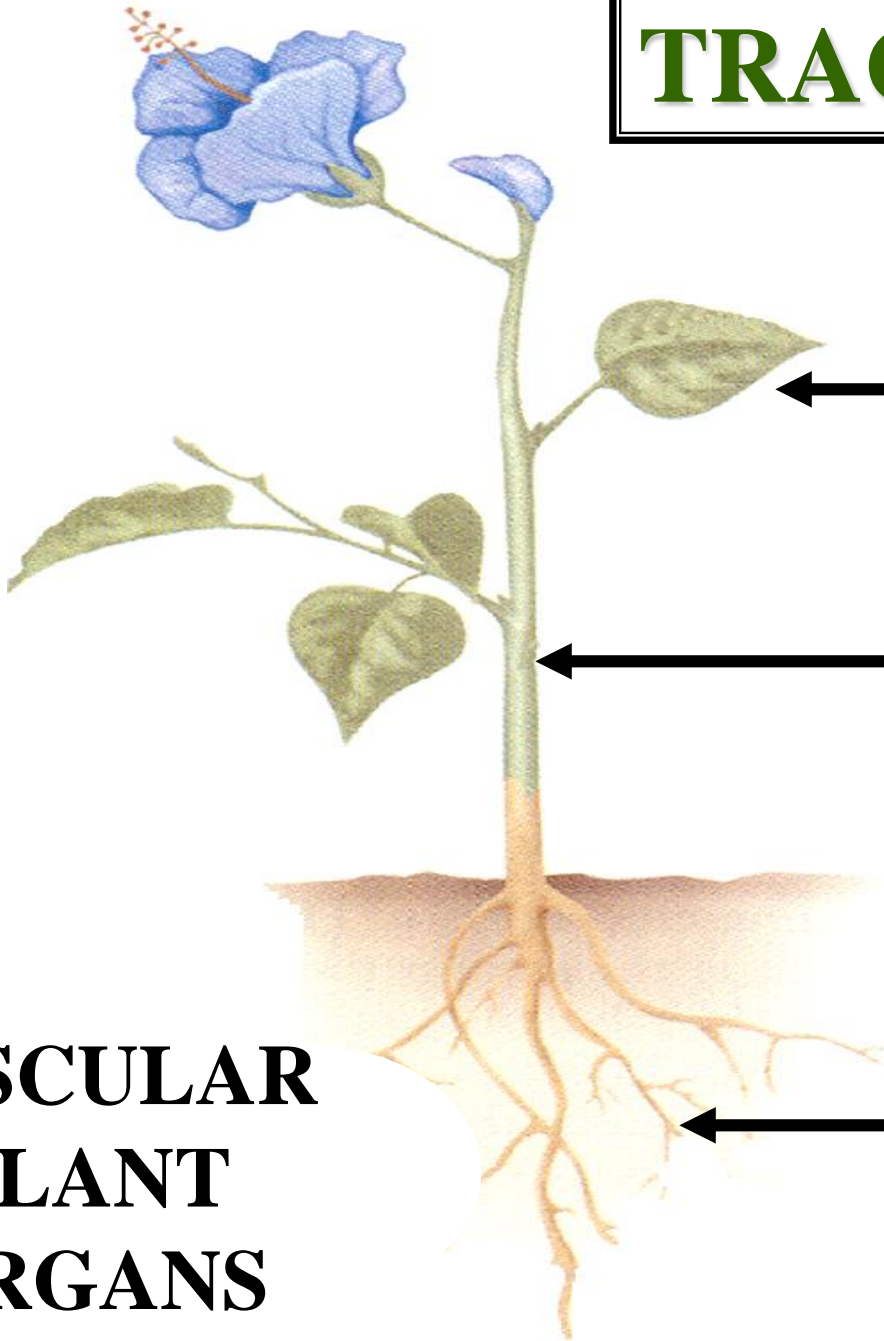






TRACHEOPHYTE ORGANS SUMMARY

TRACHEOPHYTE



LEAF

STEM

ROOT

**VASCULAR
PLANT
ORGANS**

SPOROPHYLL

SPOROPHYLL



SPOROPHYLL

**SPORANGIUM
BEARING LEAF**

SPOROPHYLL

L



?

?

LYCOPODIUM

?



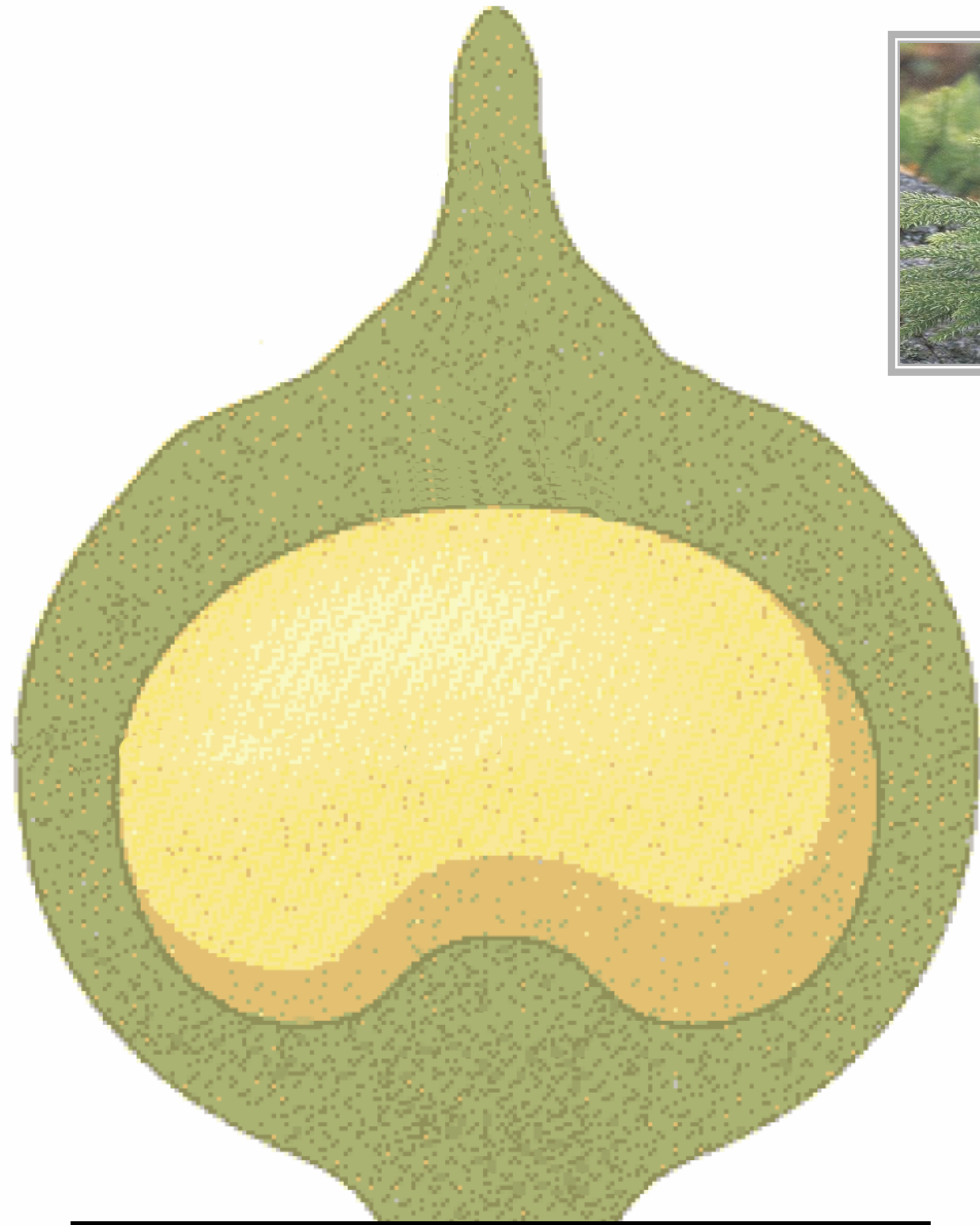
LYCOPODIUM



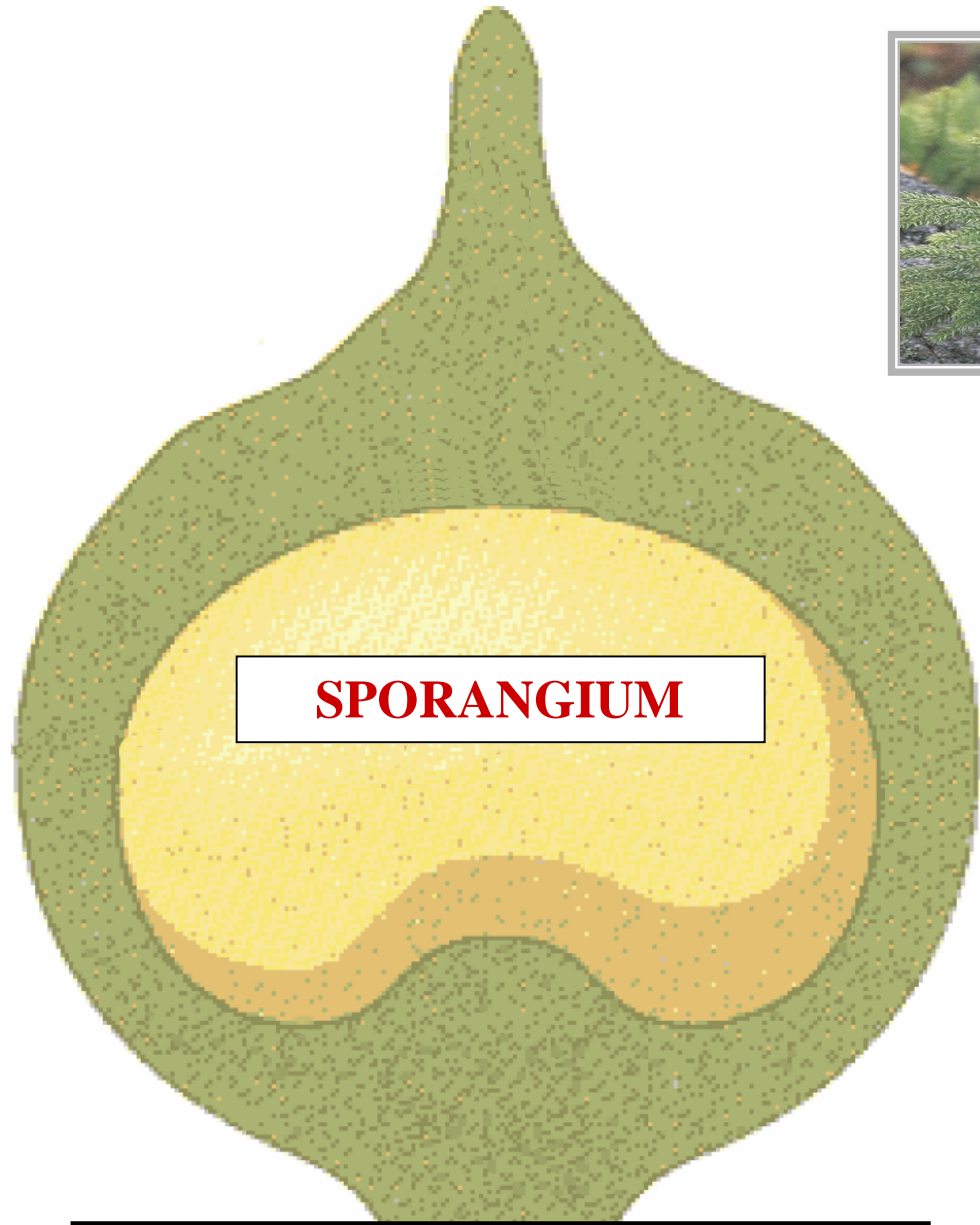
STROBILUS



LYCOPODIUM



SPOROPHYLL



SPORANGIUM

SPOROPHYLL

SPORANGIUM

SPORANGIUM



SPORANGIUM

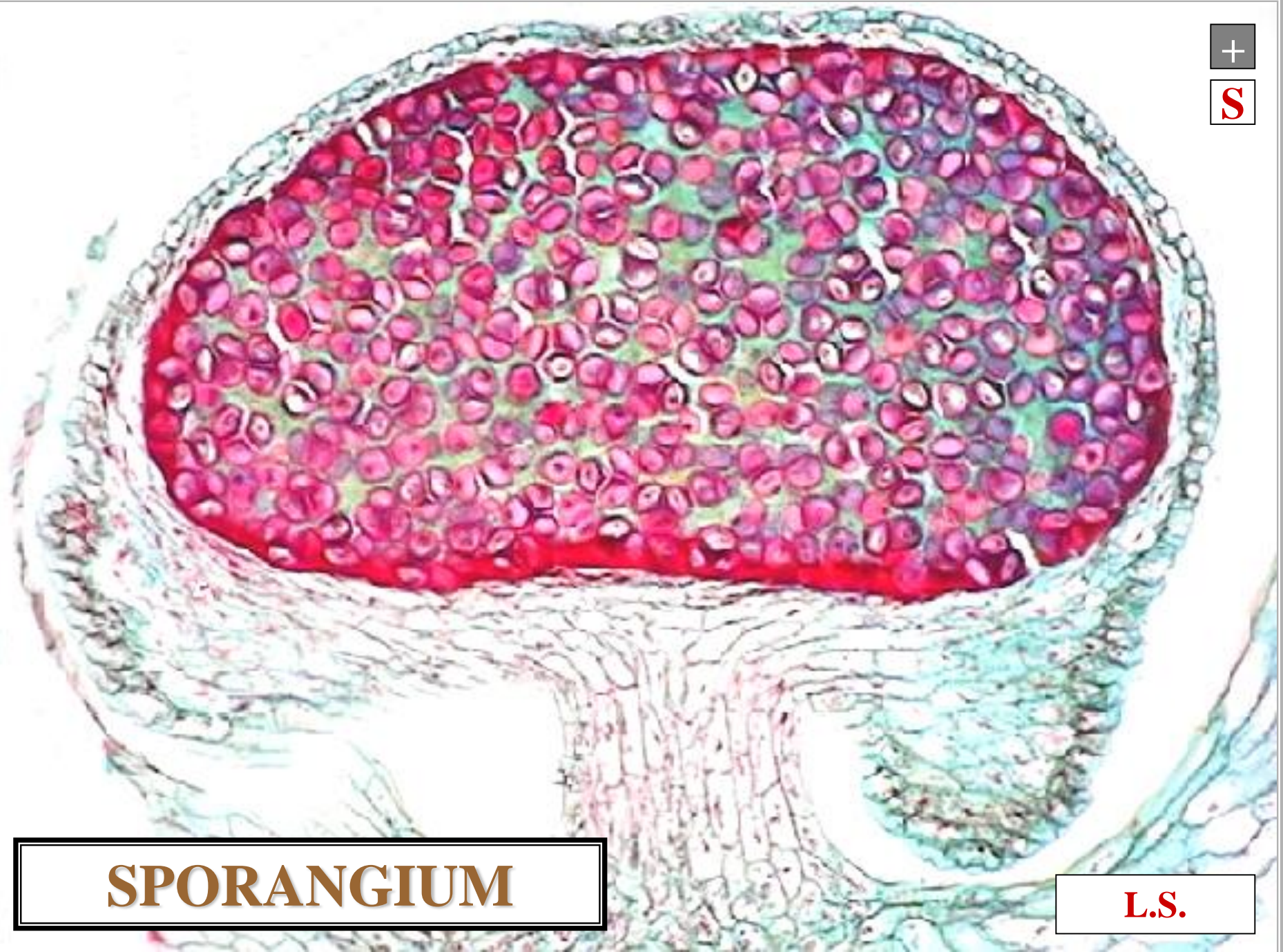
SPORE

PRODUCING STRUCTURE

SPORANGIUM

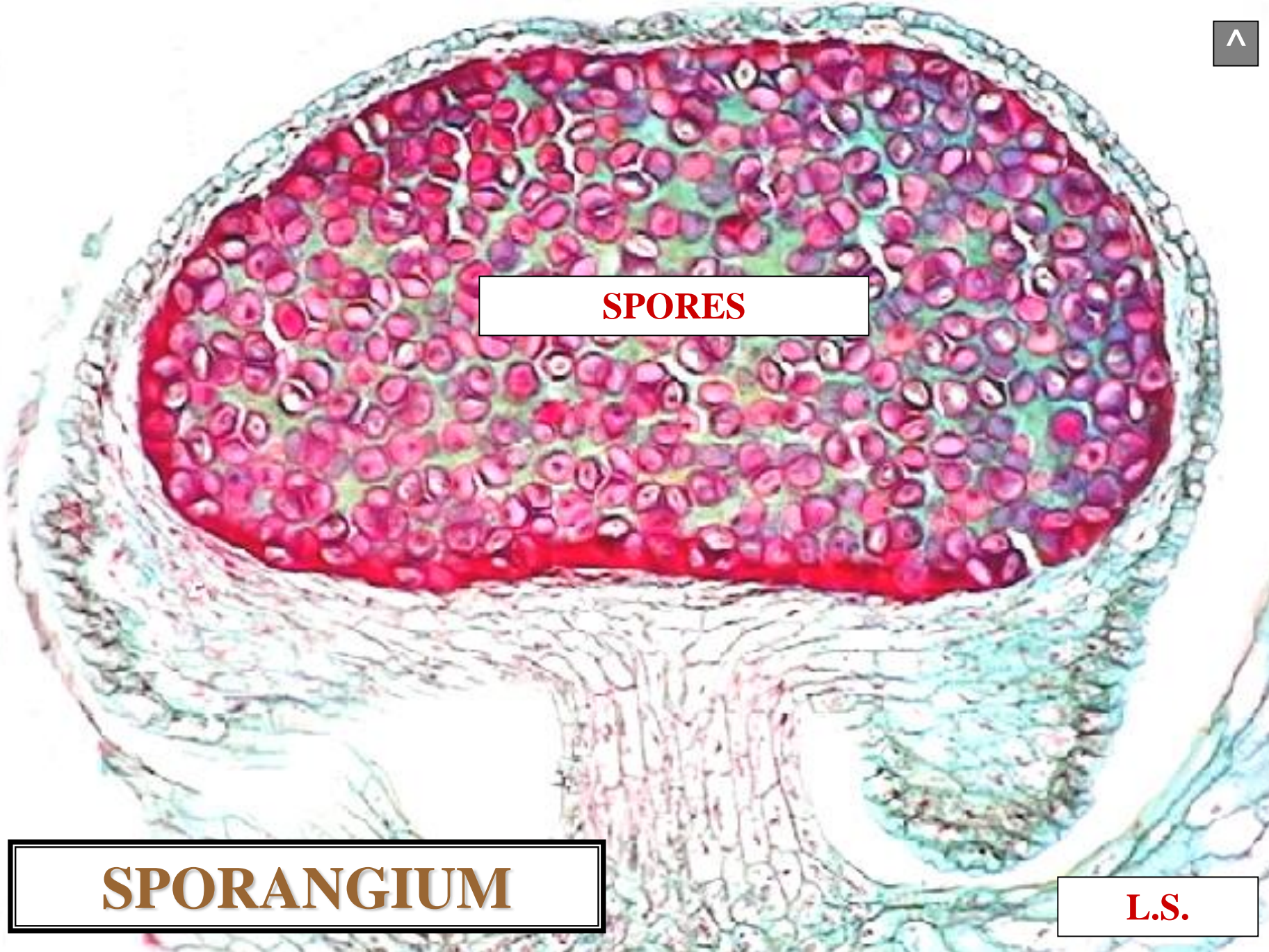
+

S



SPORANGIUM

L.S.



SPORES

SPORANGIUM

L.S.




EUSPORANGIUM

VS

LEPTOSPORANGIUM



EUSPORANGIUM



**EUSPORANGIUM
KNOWN TO MOST
VASCULAR PLANTS**



LYCOPHYTES





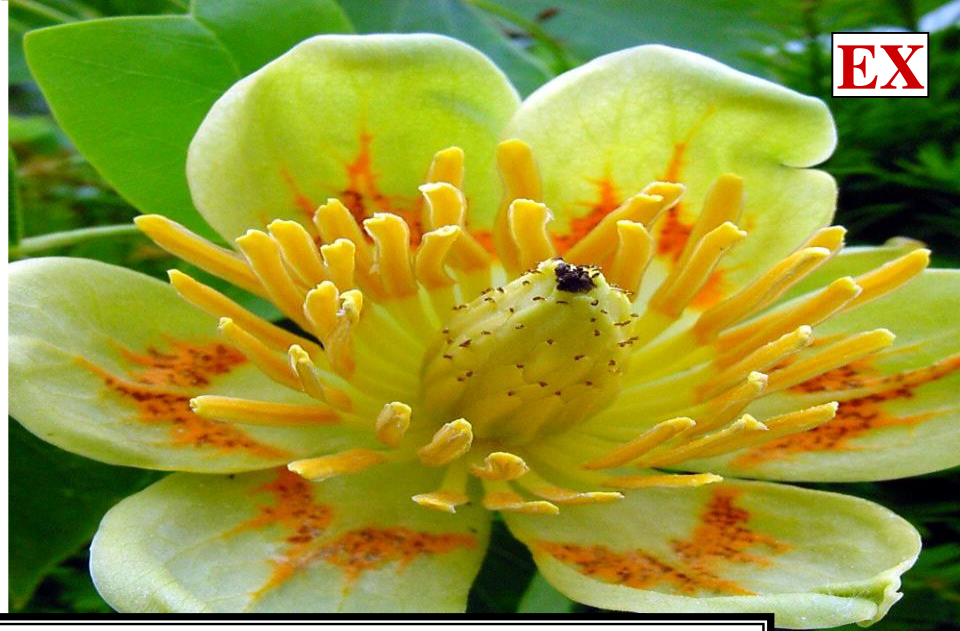
FERNS





GYMNOSPERMS





ANGIOSPERMS



EXCEPTION



EUSPORANGIUM

EXCEPTION

“ADVANCED FERNS”

EXCEPTION

LEPTOSPORANGIUM



LEPTOSPORANGIUM



“ADVANCED FERNS”

LEPTOSPORANGIUM



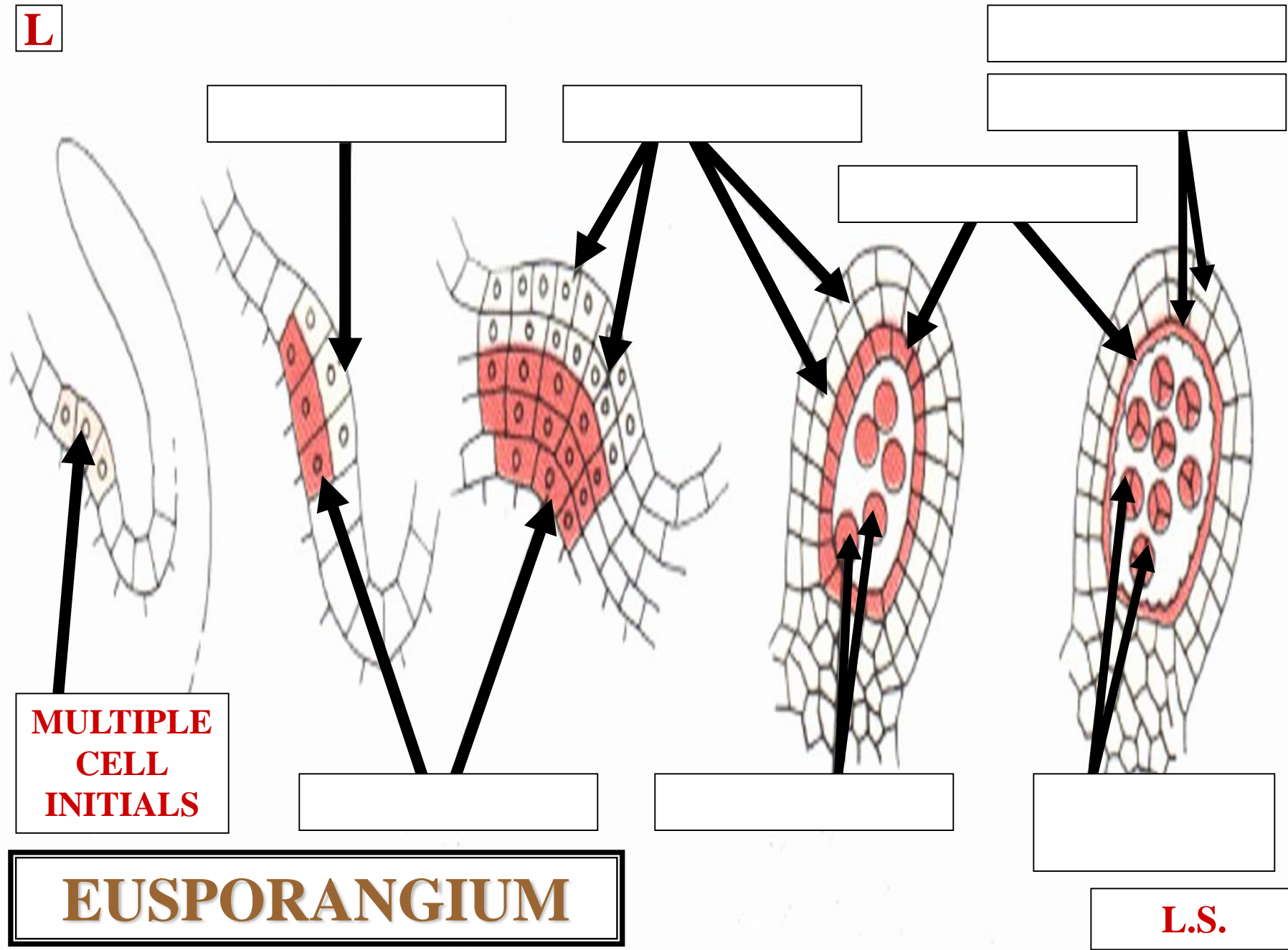
LEPTOSPORANGIUM





EUSPORANGIUM CHARACTERS

L



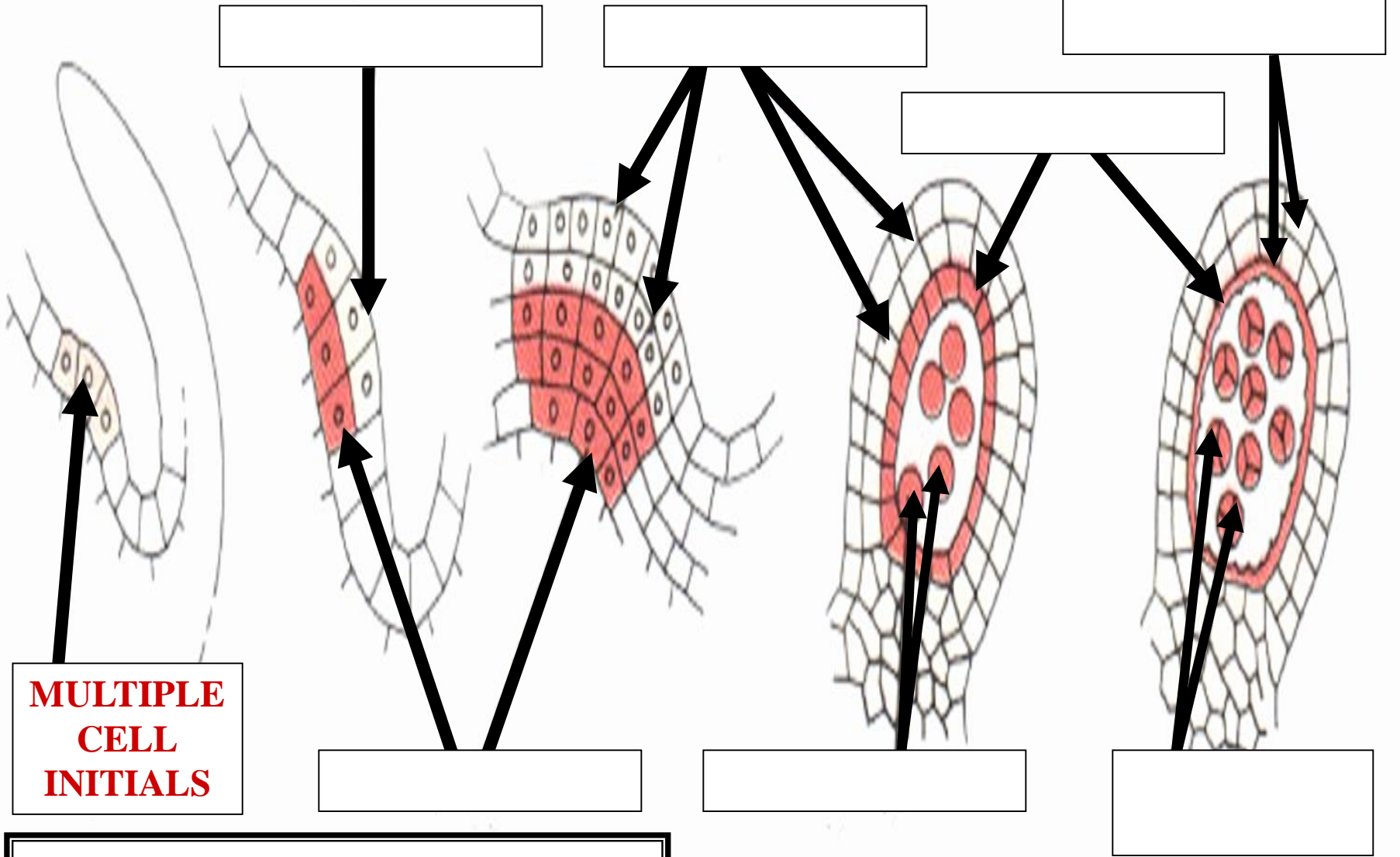
**MULTIPLE
CELL
INITIALS**

EUSPORANGIUM

L.S.

T

LARGE SIZE



**MULTIPLE
CELL
INITIALS**

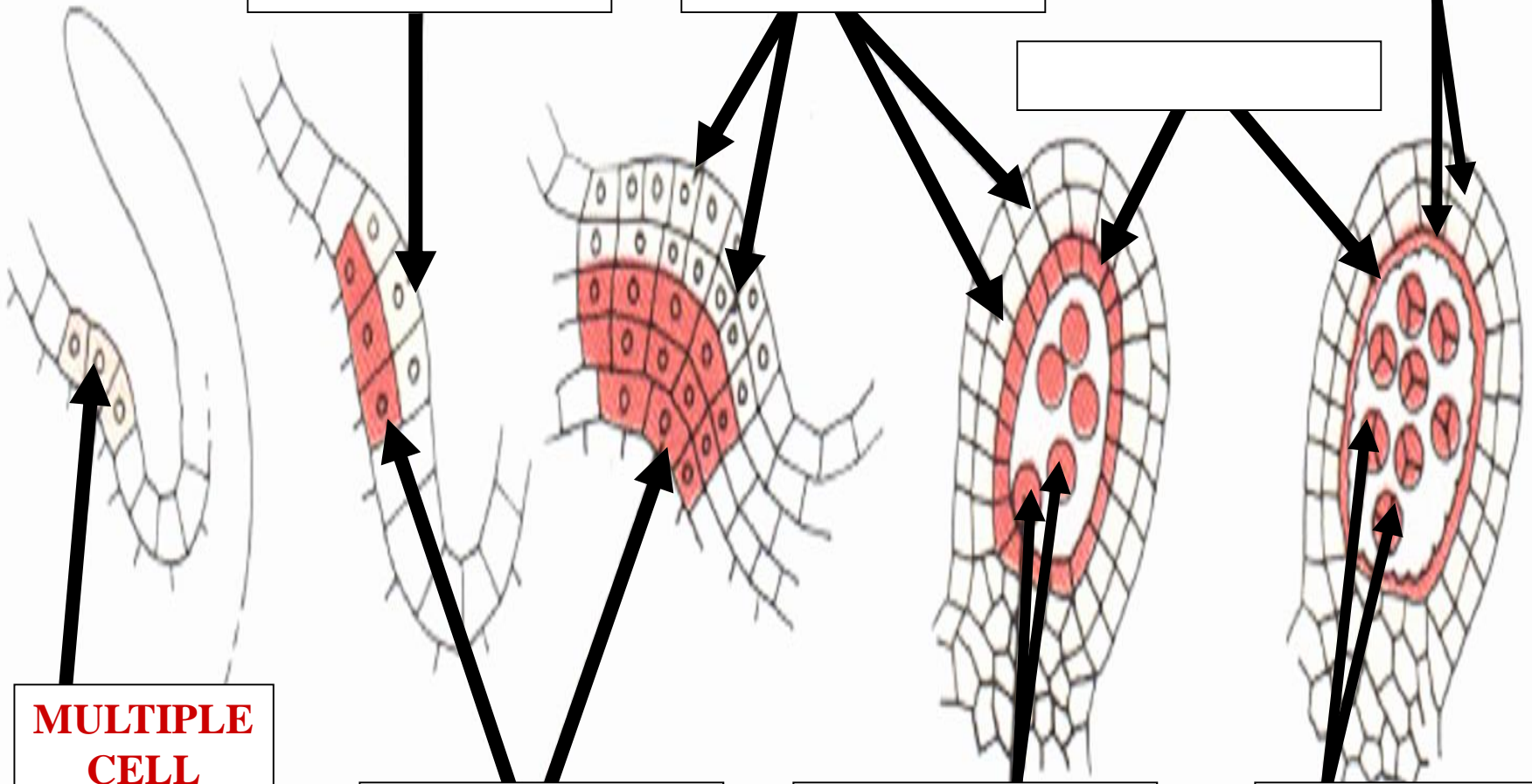
EUSPORANGIUM

L.S.

N

LARGE SIZE

THICK WALL



**MULTIPLE
CELL
INITIALS**

EUSPORANGIUM

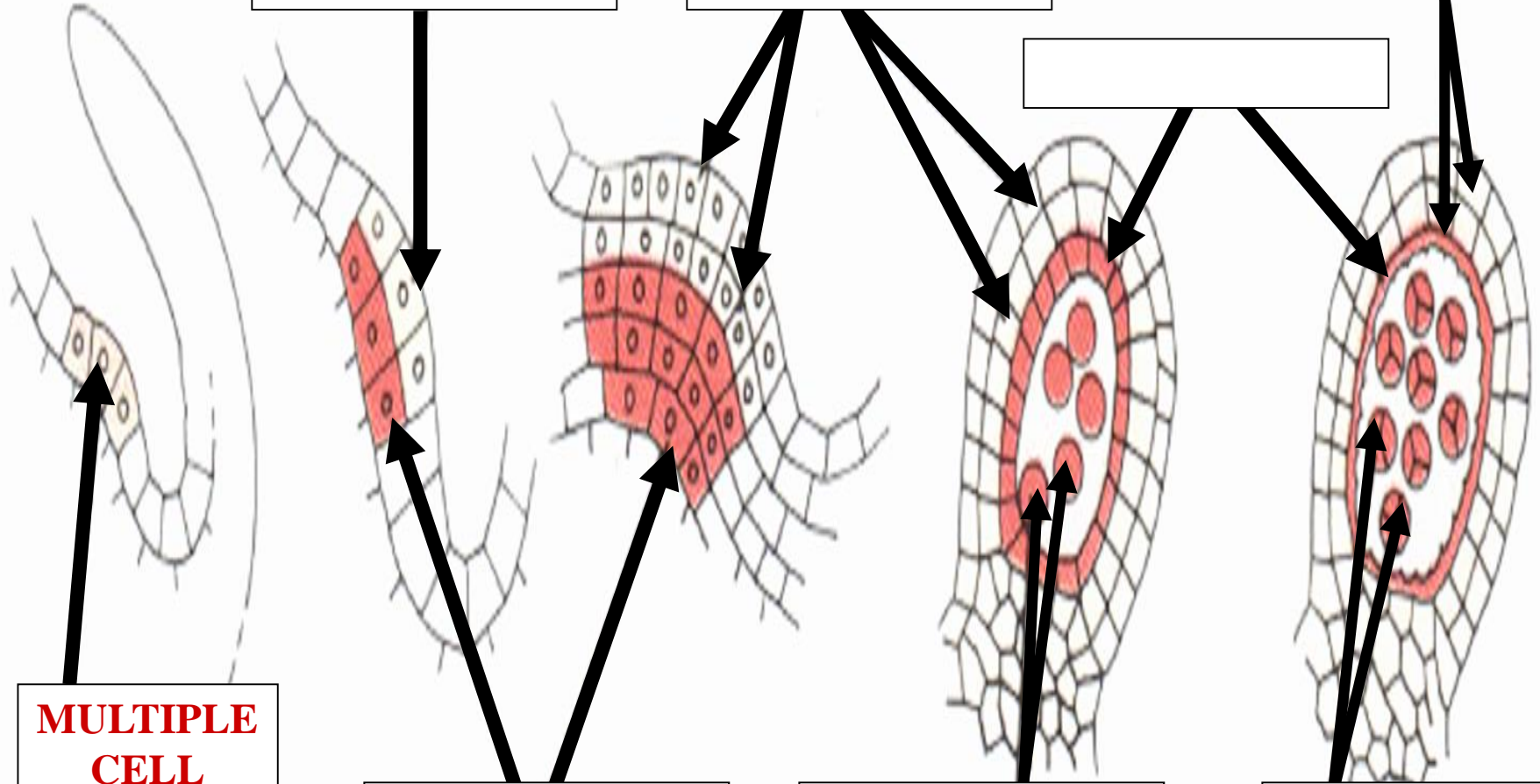
L.S.

R



LARGE SIZE

THICK WALL



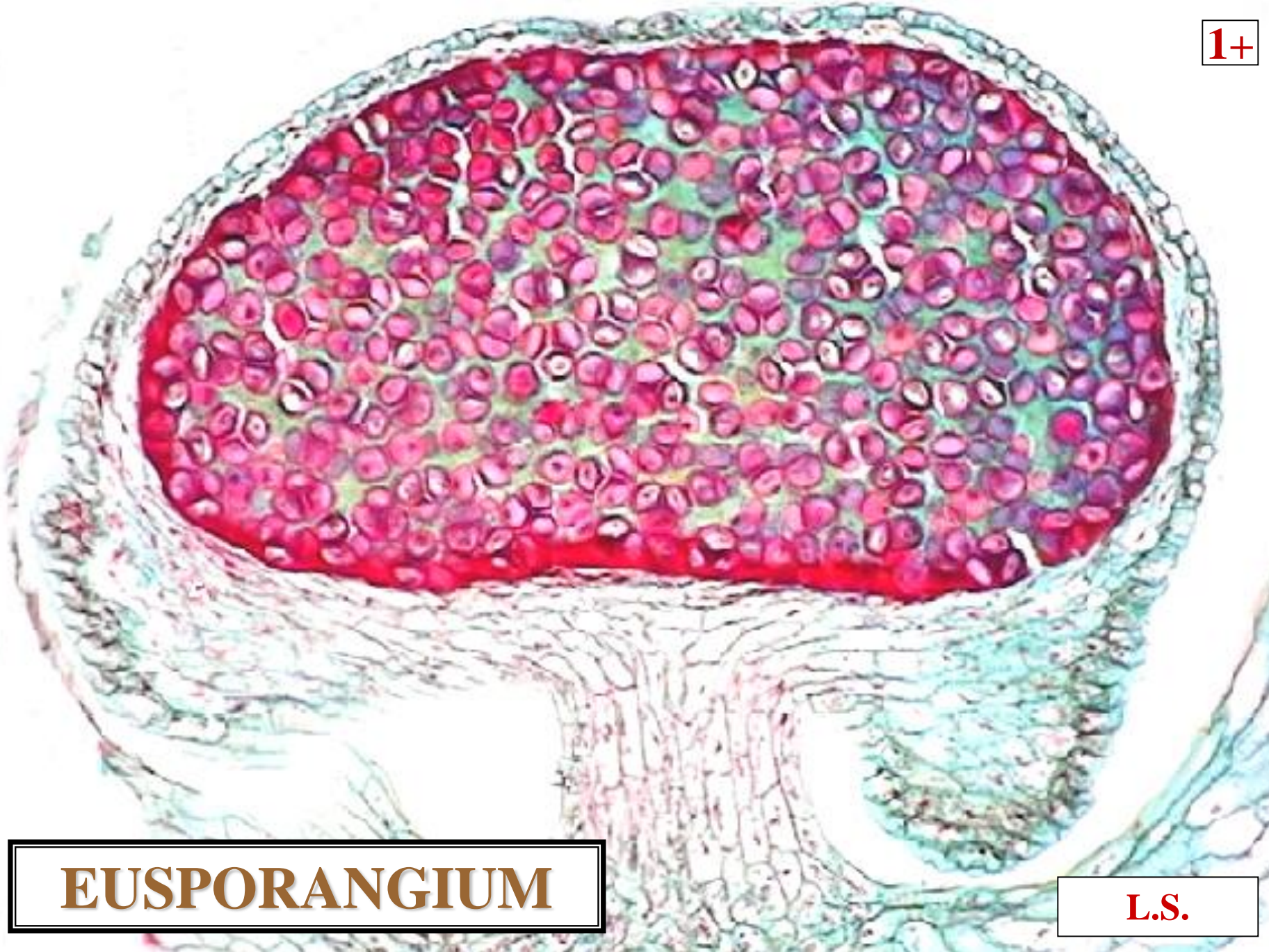
MULTIPLE
CELL
INITIALS

NUMEROUS
SPORES

EUSPORANGIUM

L.S.

1+



EUSPORANGIUM

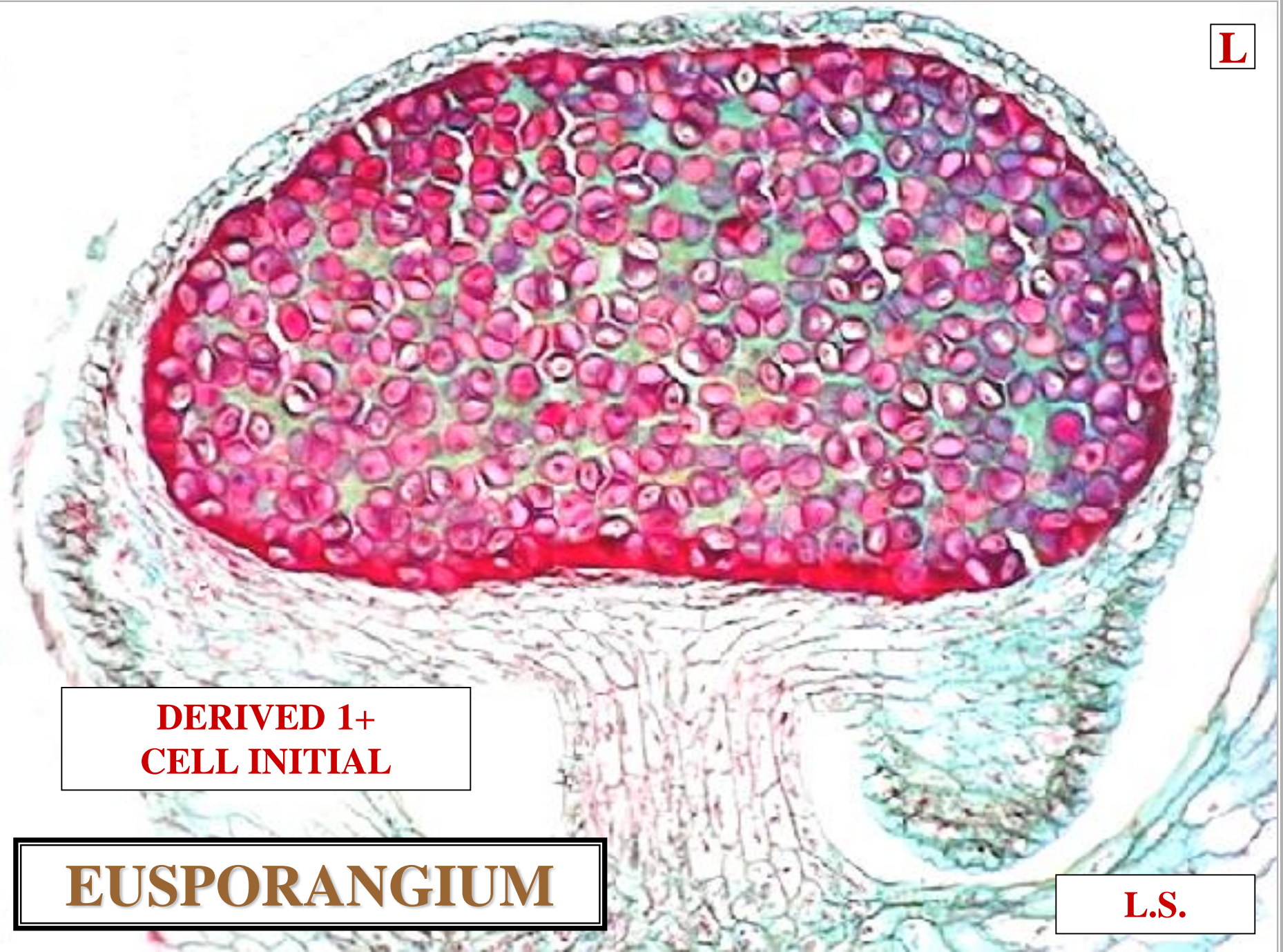
L.S.

L

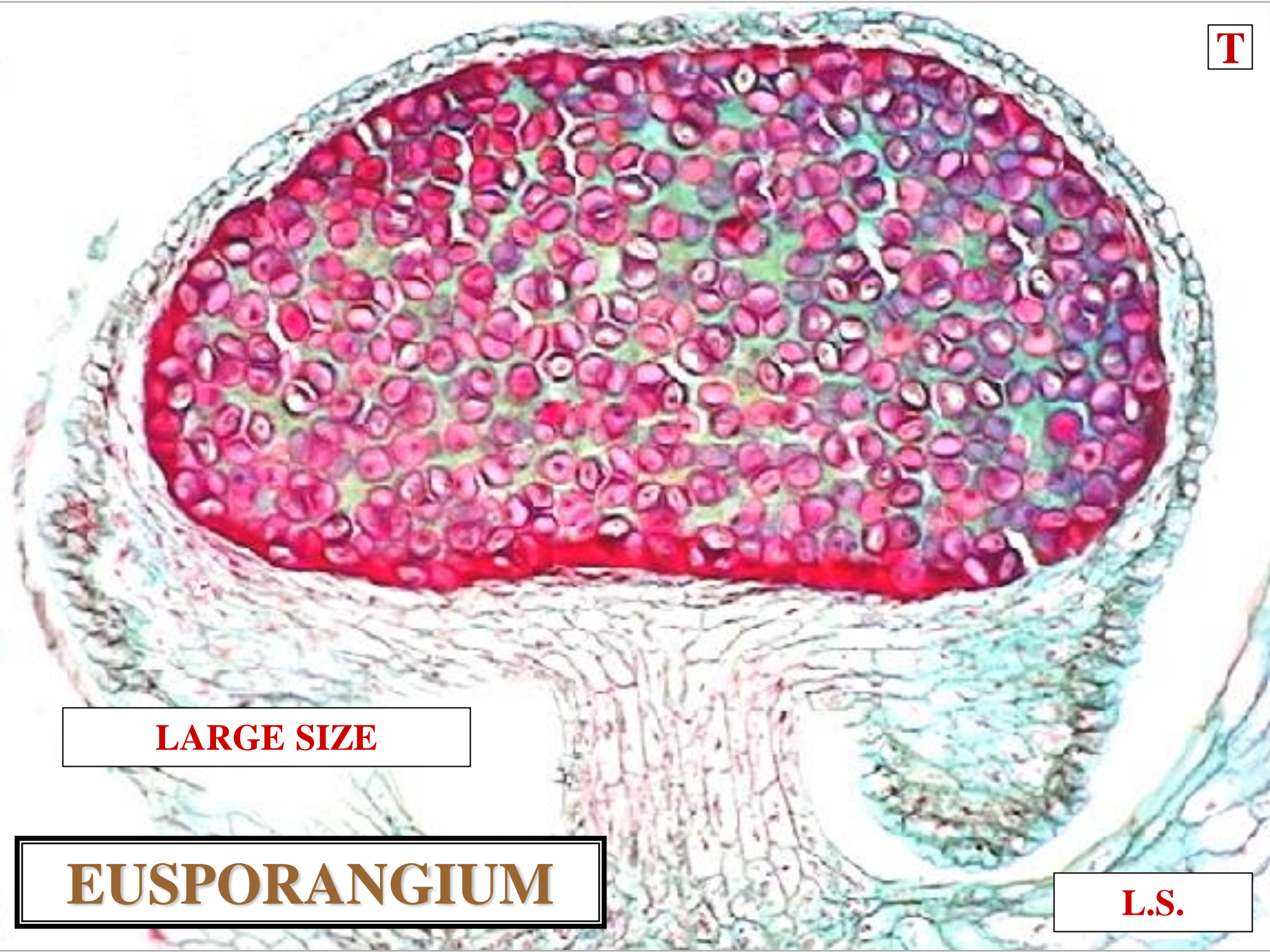
**DERIVED 1+
CELL INITIAL**

EUSPORANGIUM

L.S.



T

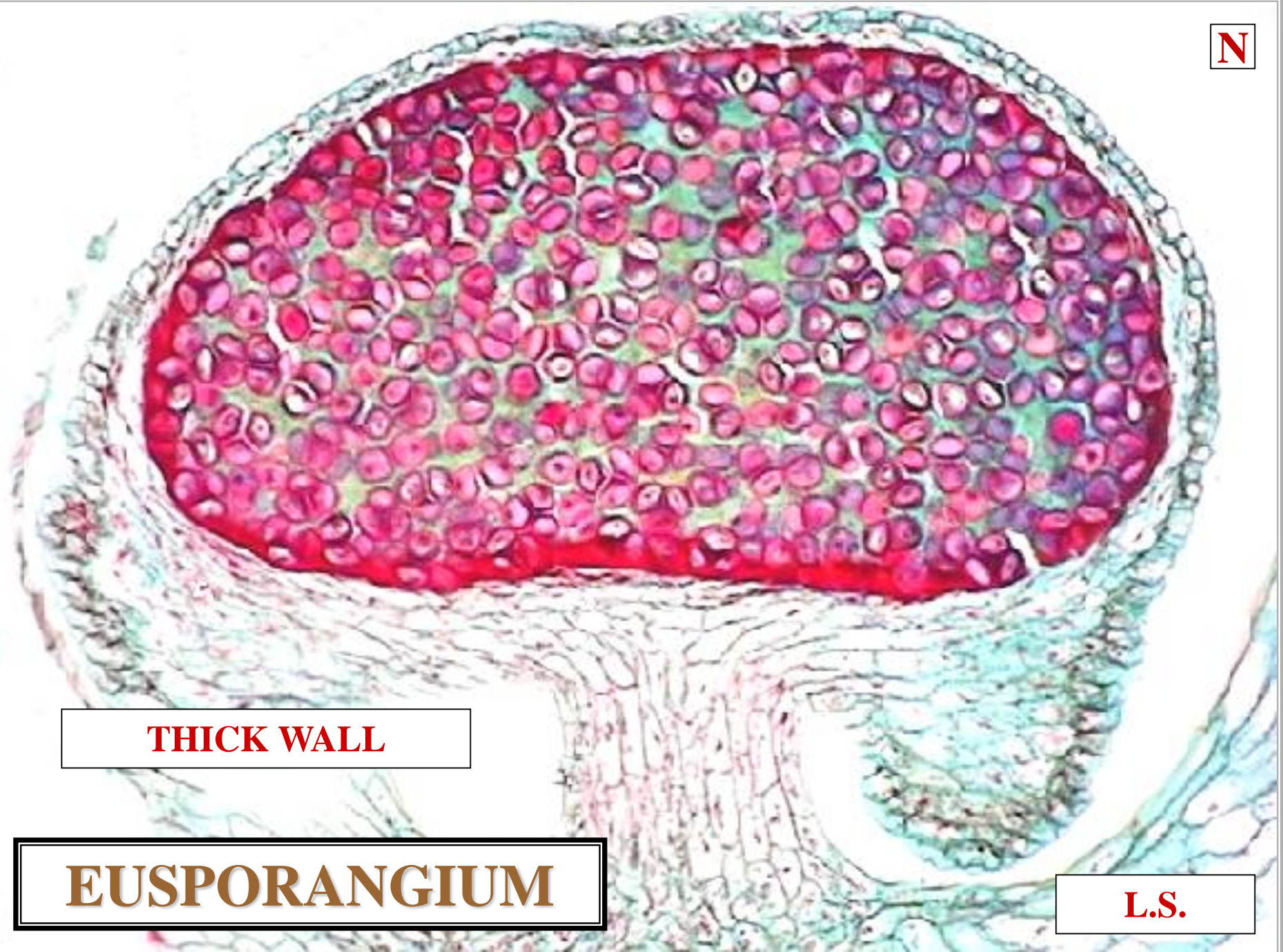


LARGE SIZE

EUSPORANGIUM

L.S.

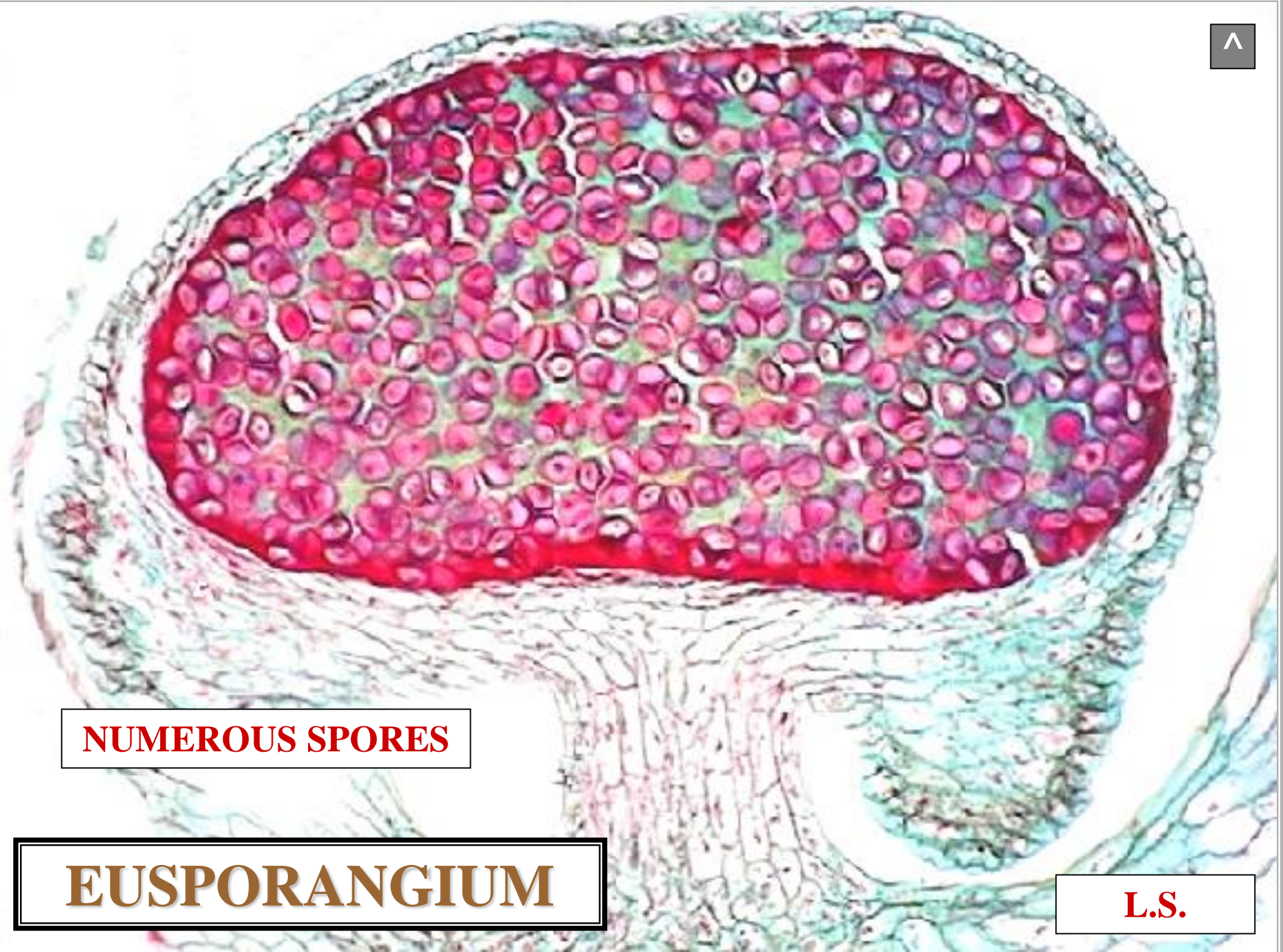
N



THICK WALL

EUSPORANGIUM

L.S.



NUMEROUS SPORES

EUSPORANGIUM

L.S.



LEPTOSPORANGIUM



**LEPTOSPORANGIUM
KNOWN ONLY TO
“ADVANCED FERN”**



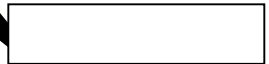
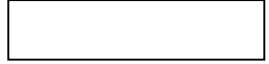
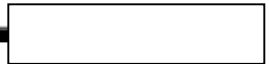
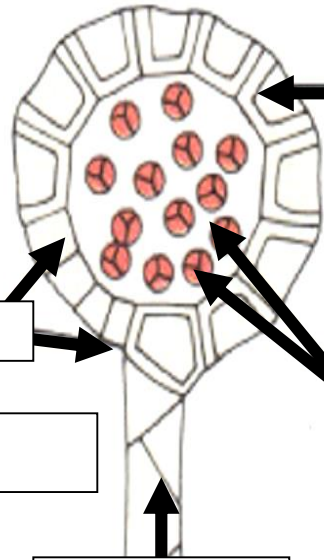
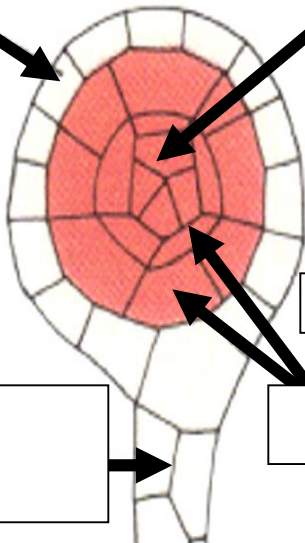
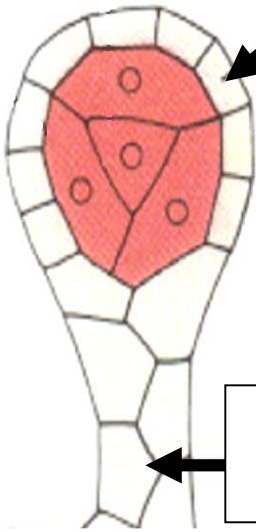
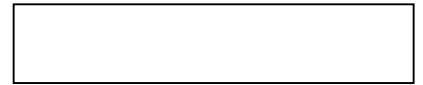
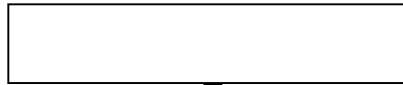
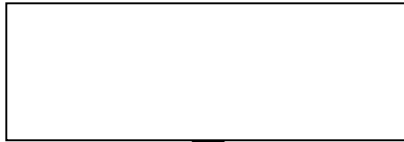
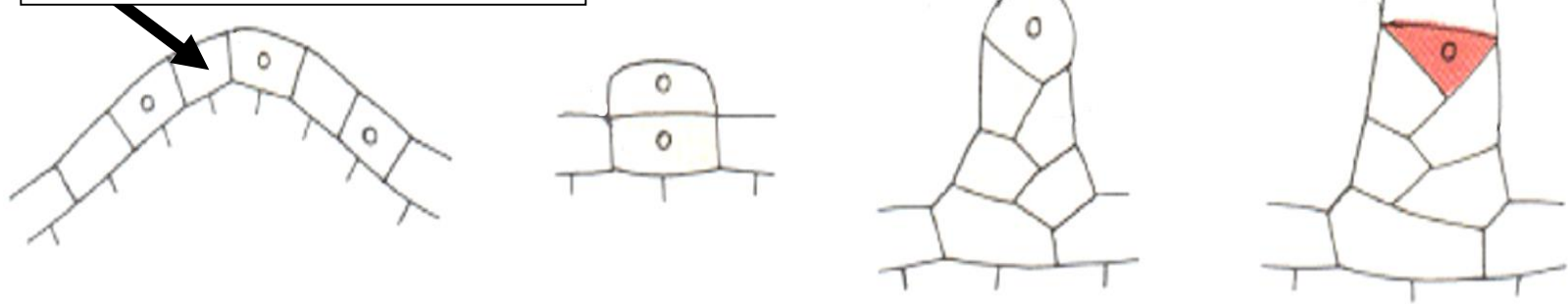
“ADVANCED FERNS”





LEPTOSPORANGIUM CHARACTERS

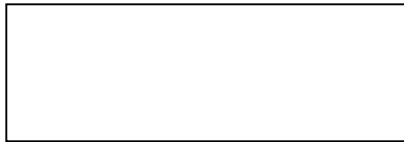
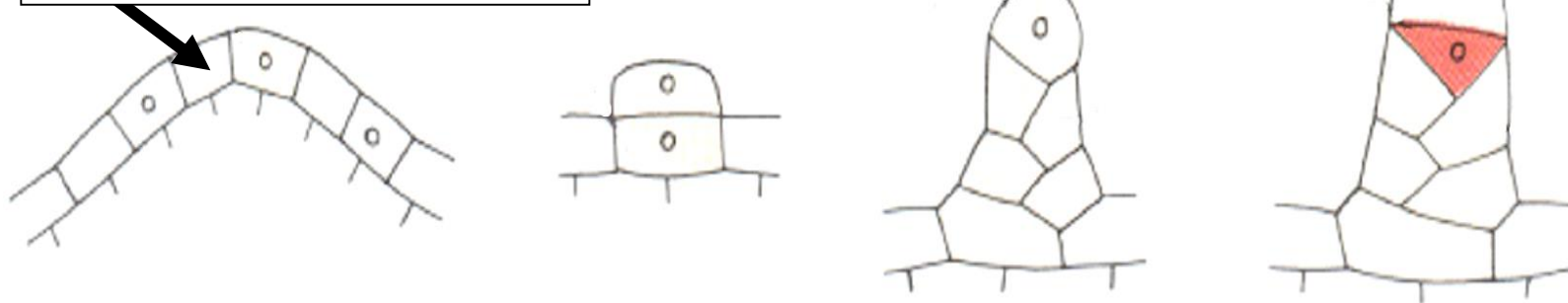
SINGLE CELL INITIAL



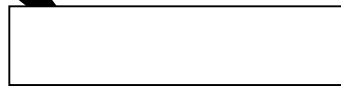
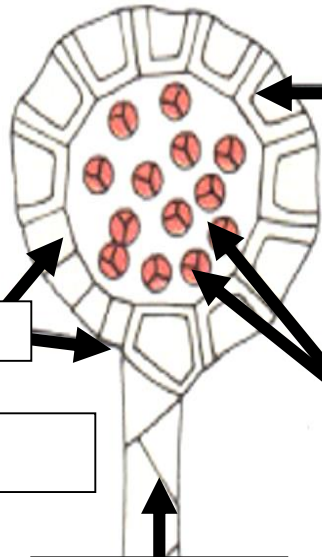
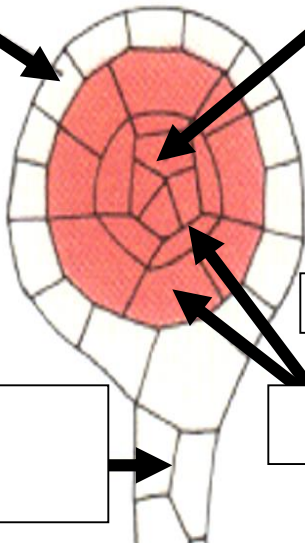
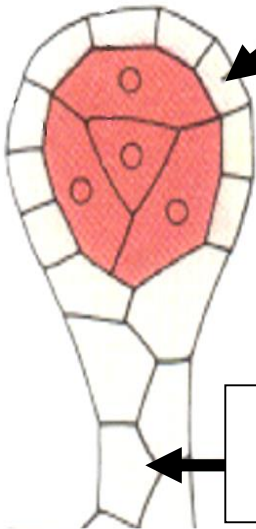
LEPTOSPORANGIUM

L.S.

SINGLE CELL INITIAL



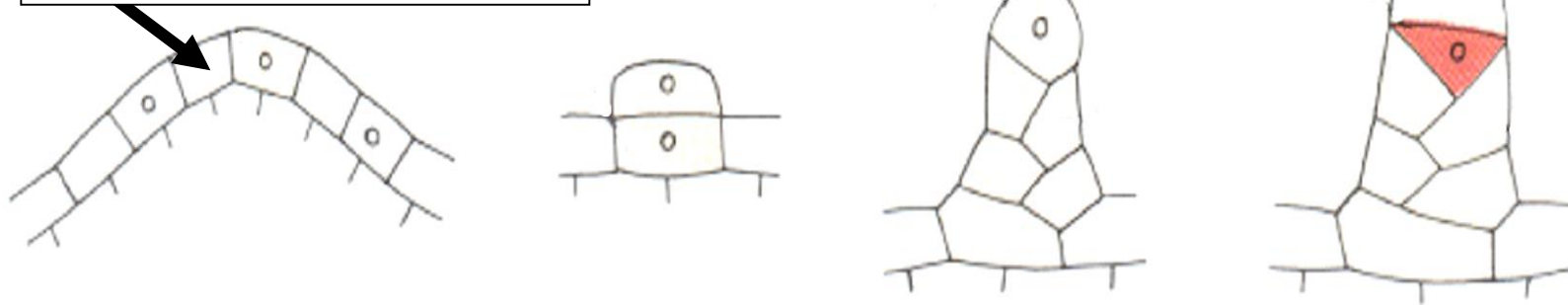
SMALL SIZE



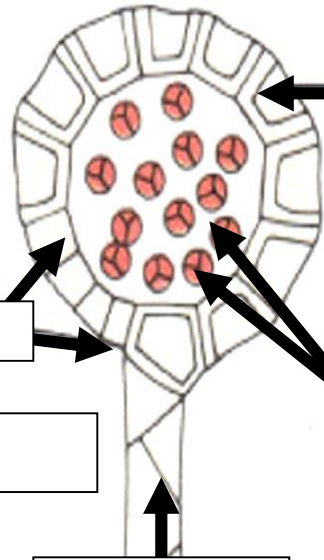
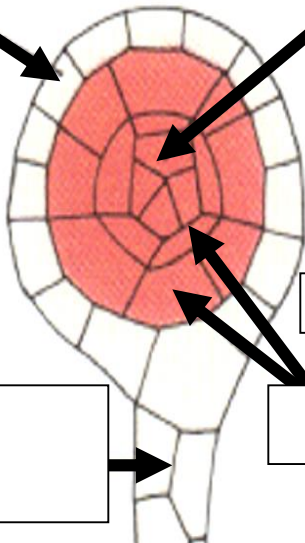
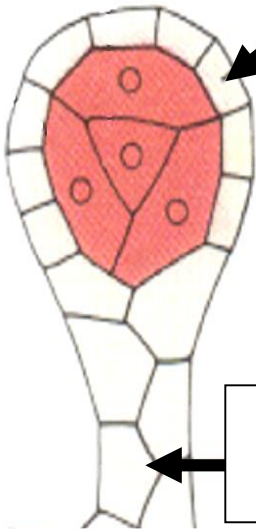
LEPTOSPORANGIUM

L.S.

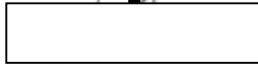
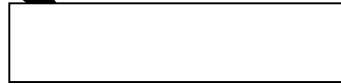
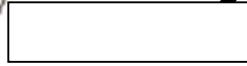
SINGLE CELL INITIAL



SMALL SIZE



THIN WALL

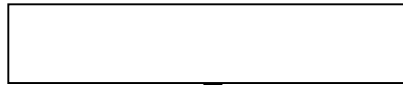
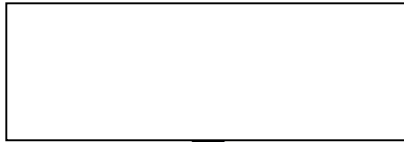
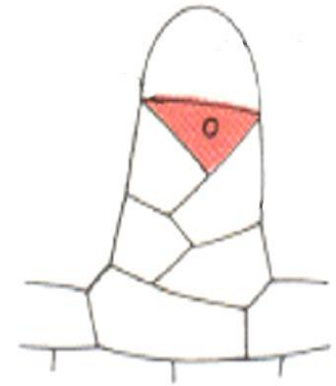
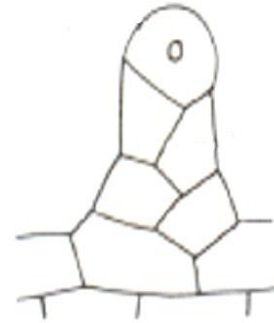
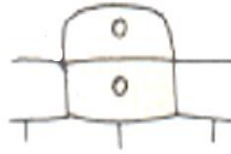
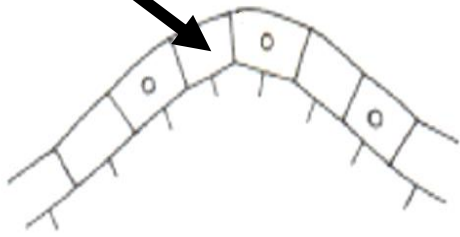


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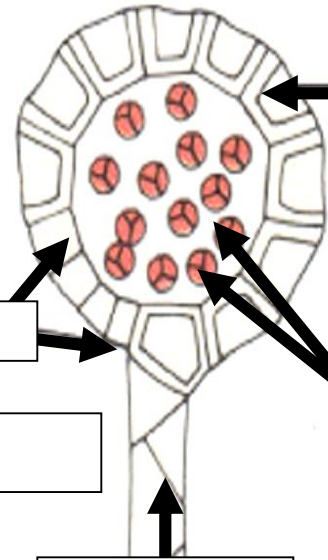
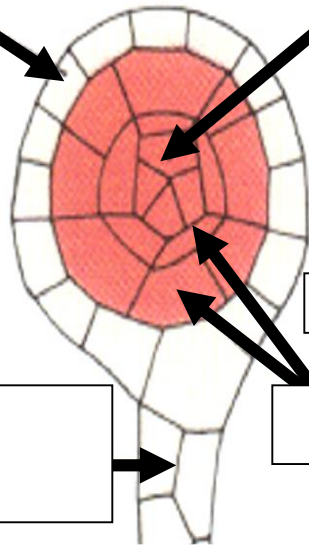
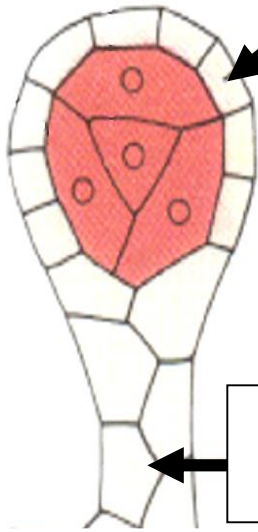
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SINGLE CELL INITIAL



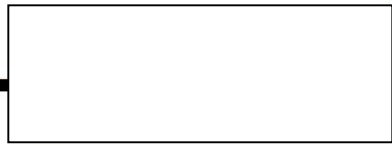
SMALL SIZE



THIN WALL

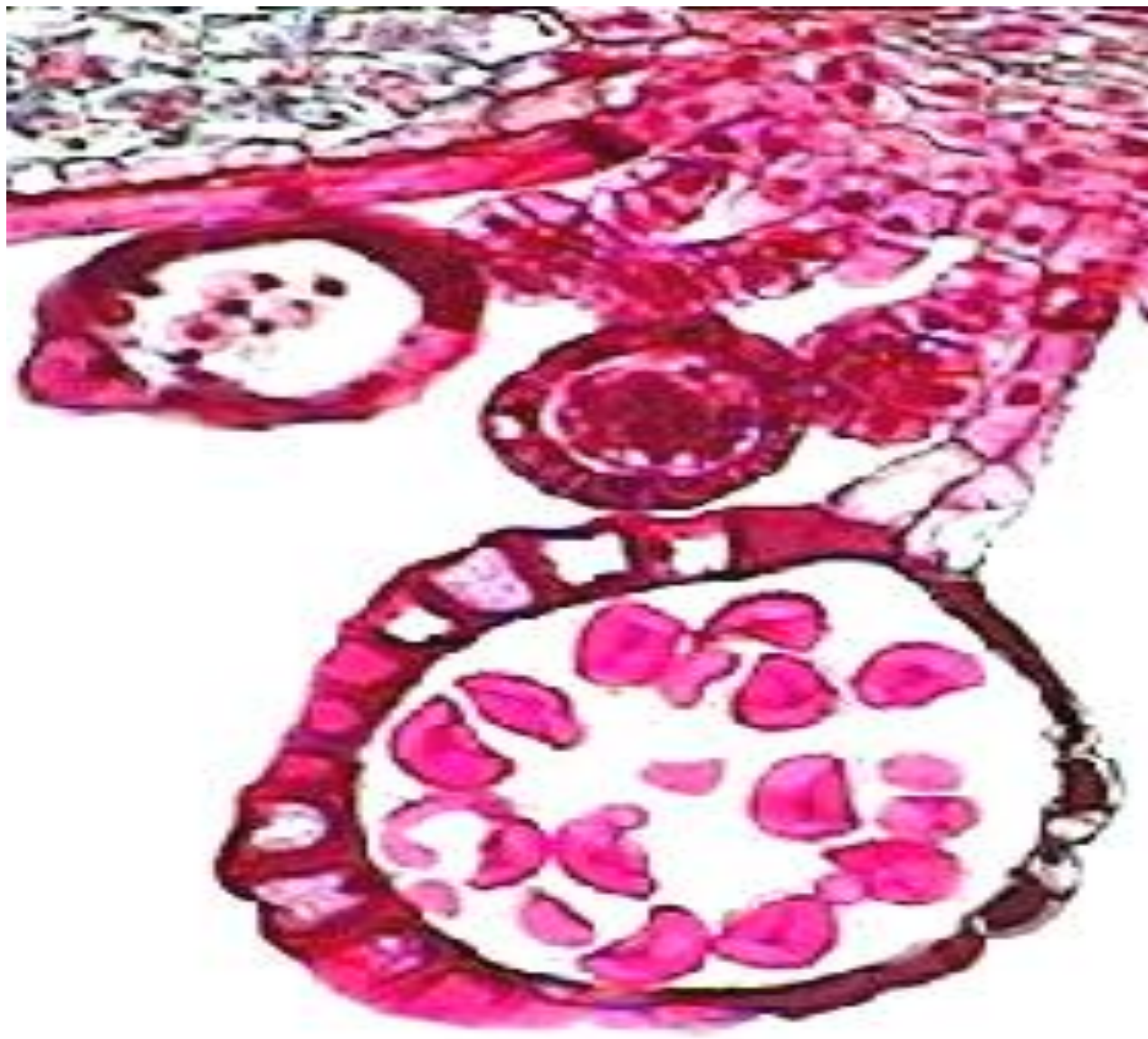


FEW SPORES



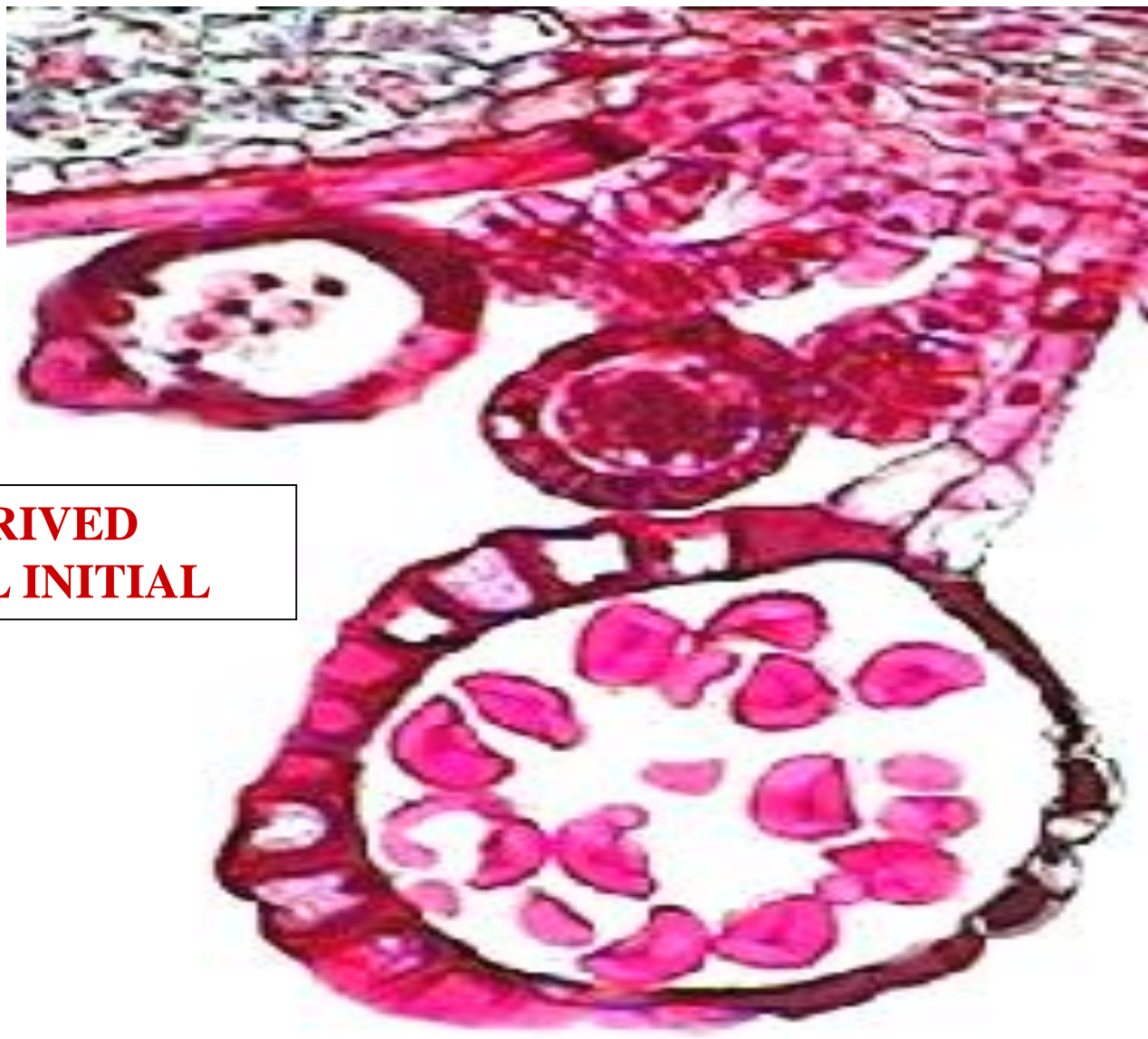
LEPTOSPORANGIUM

L.S.



LEPTOSPORANGIUM

L.S.



**DERIVED
1 CELL INITIAL**

LEPTOSPORANGIUM

L.S.



SMALL SIZE

LEPTOSPORANGIUM

L.S.



THIN WALL

LEPTOSPORANGIUM

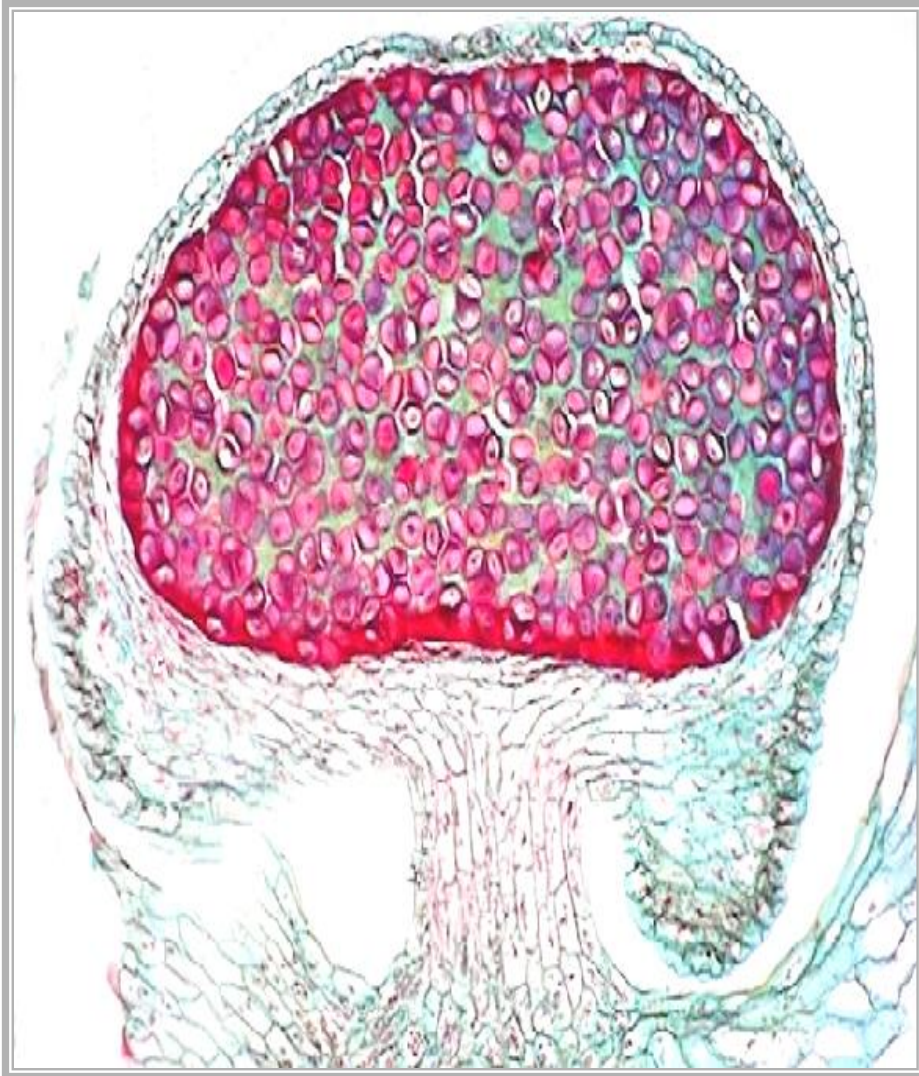
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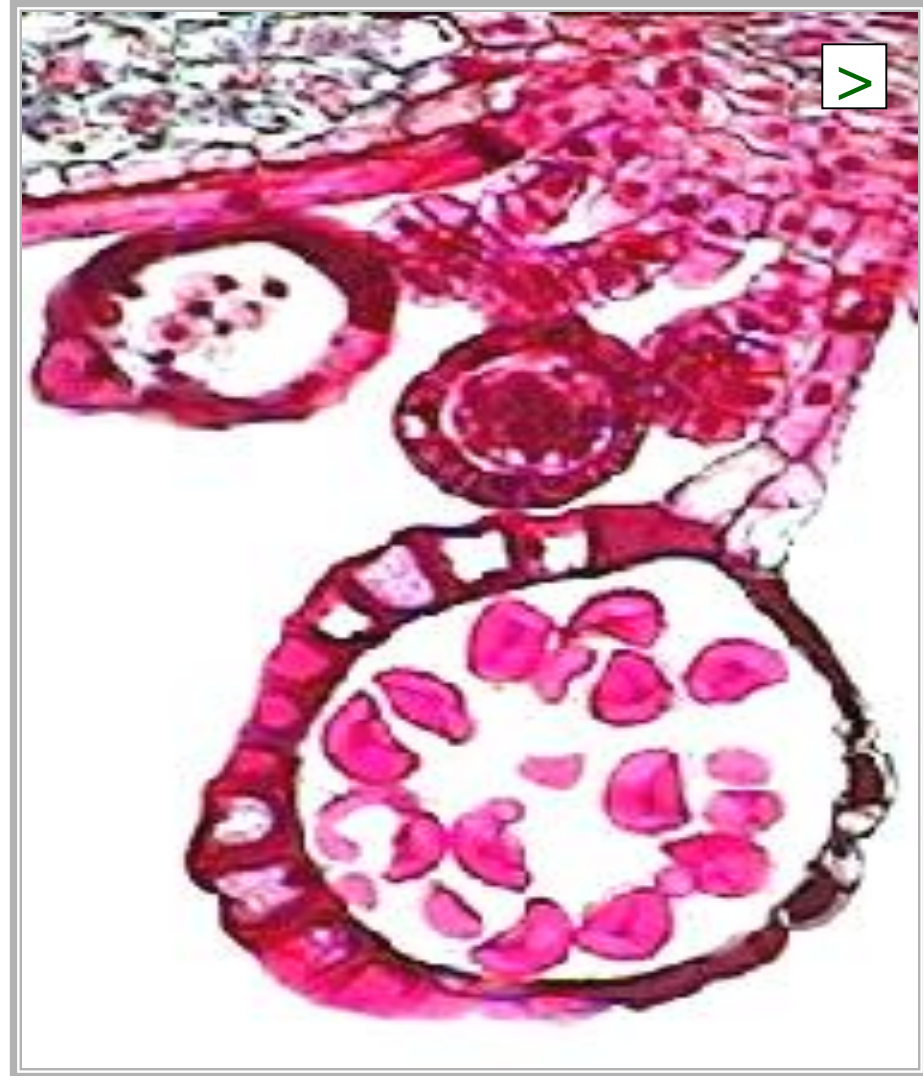
FEW SPORES

LEPTOSPORANGIUM

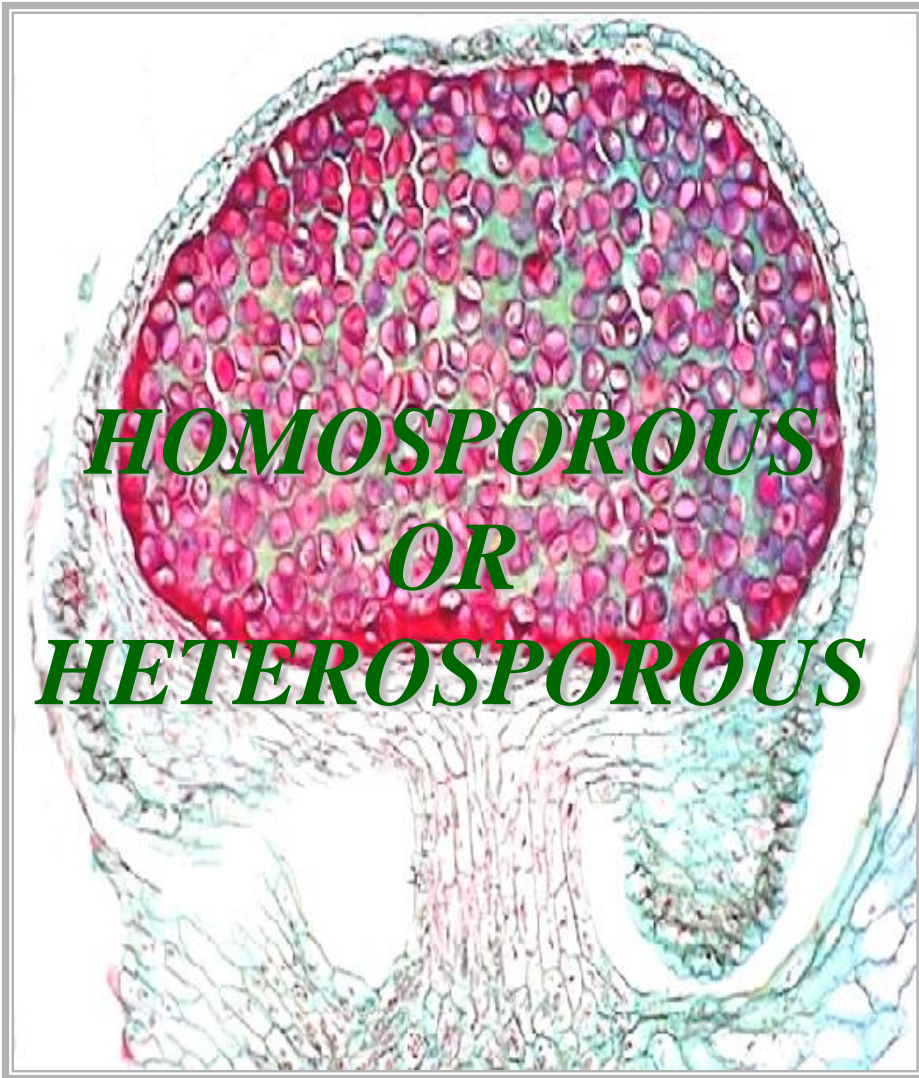
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EUSPORANGIUM

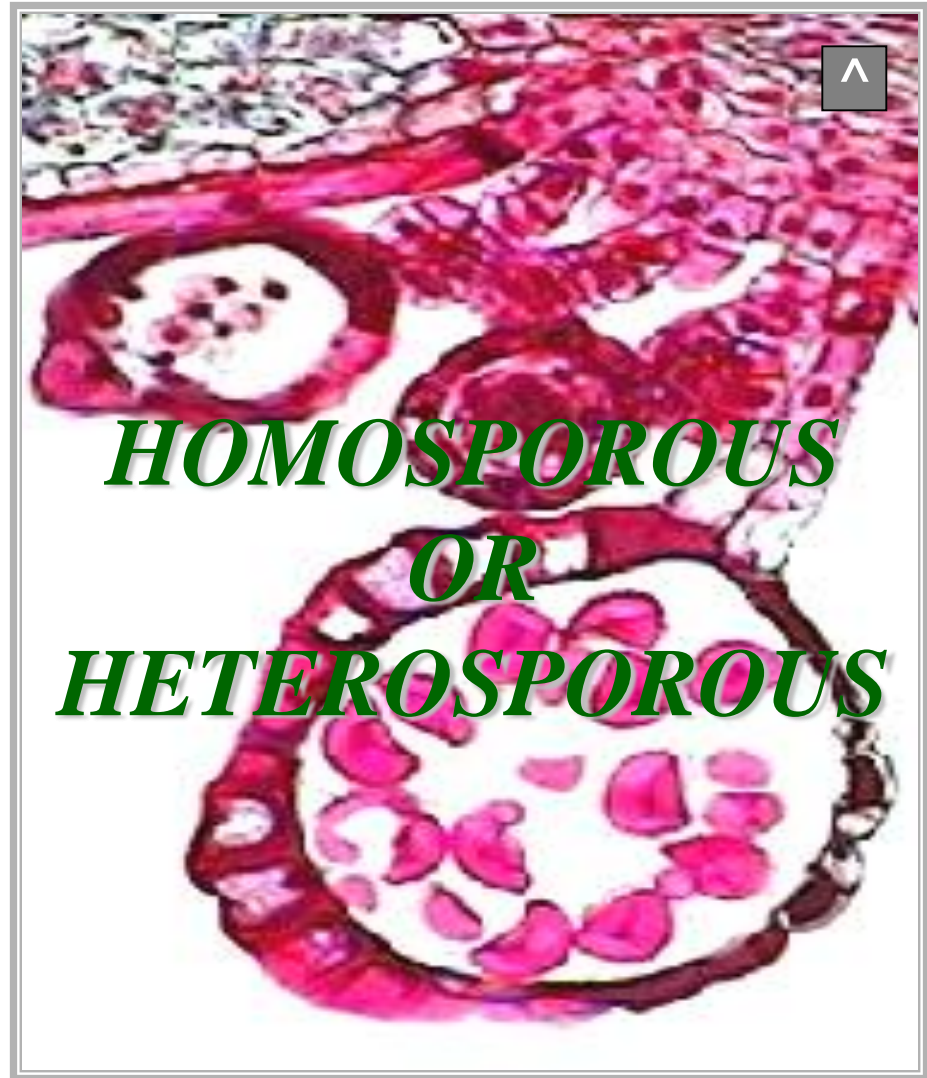


LEPTOSPORANGIUM



***HOMOSPOROUS
OR
HETEROSPOROUS***

EUSPORANGIUM



***HOMOSPOROUS
OR
HETEROSPOROUS***

LEPTOSPORANGIUM