

AXILLARY BUD



NODE



STEM



LEAF



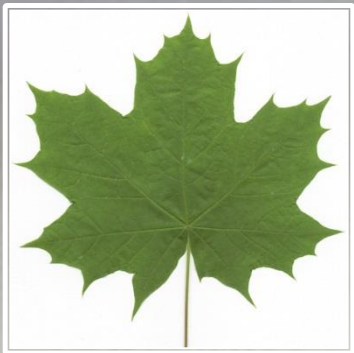
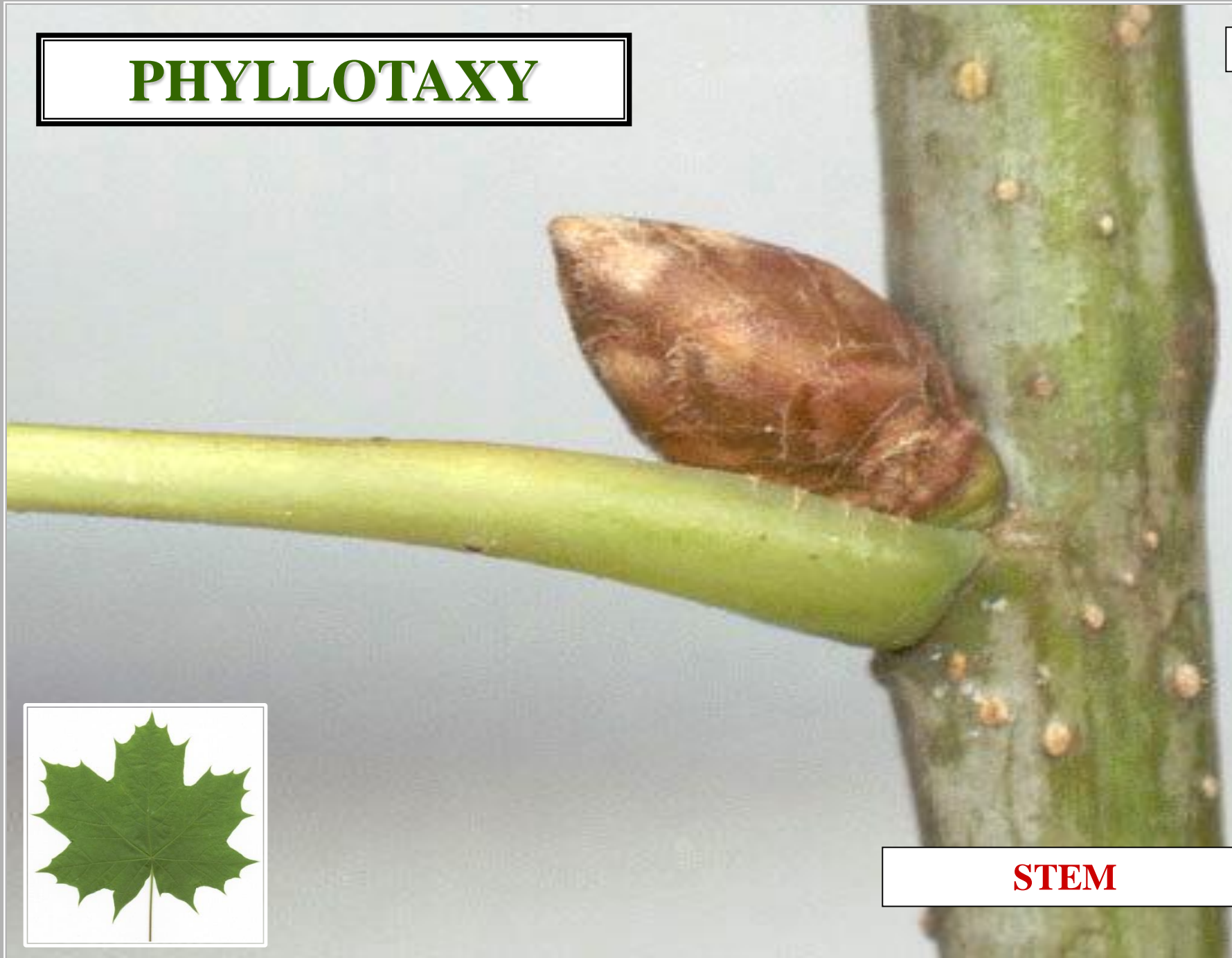
NODE





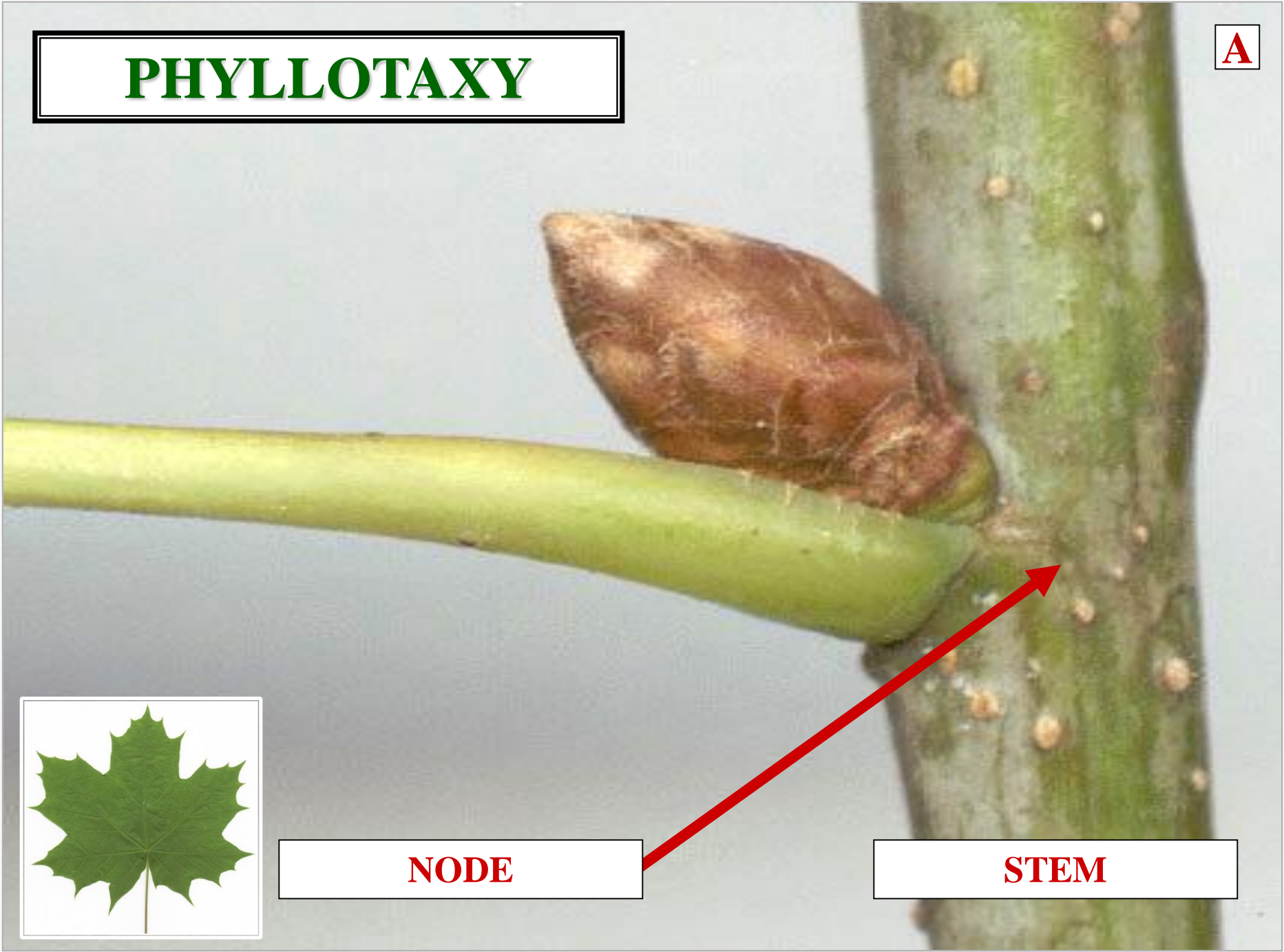
NODE
AXILLARY BUD
APPLIED

PHYLLOTAXY



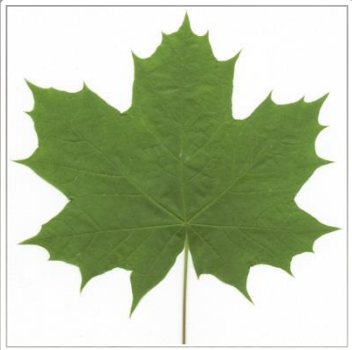
STEM

PHYLLOTAXY



NODE

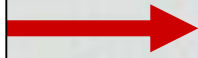
STEM



PHYLLOTAXY

LF

AXILLARY BUD



NODE



STEM



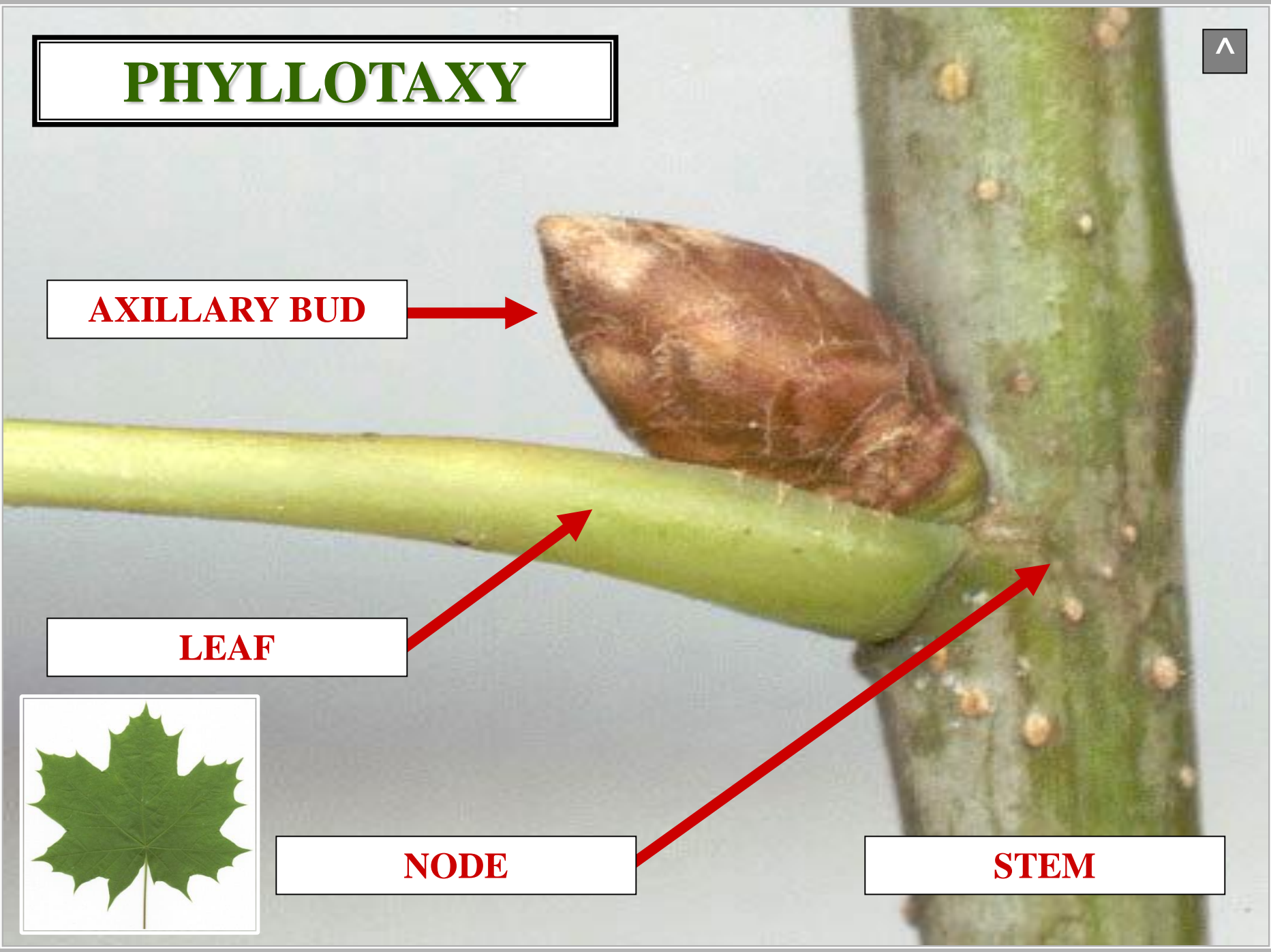
PHYLLOTAXY

AXILLARY BUD

LEAF

NODE

STEM



LEAF PHYLLOTAXY TYPES

LEAF PHYLLOTAXY TYPES

ALTERNATE

LEAF PHYLLOTAXY TYPES

LEAF PHYLLLOTAXY TYPES

**ALTERNATE
OPPOSITE**

**LEAF PHYLLLOTAXY
TYPES**

LEAF PHYLLOTAXY TYPES

ALTERNATE

OPPOSITE

WHORLED

LEAF PHYLLOTAXY TYPES

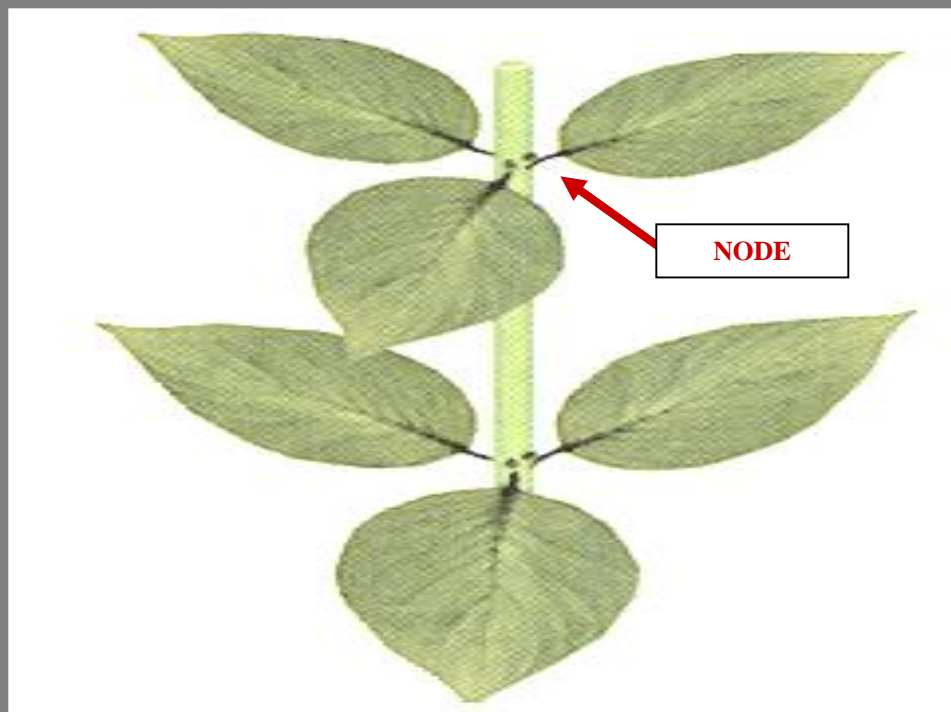
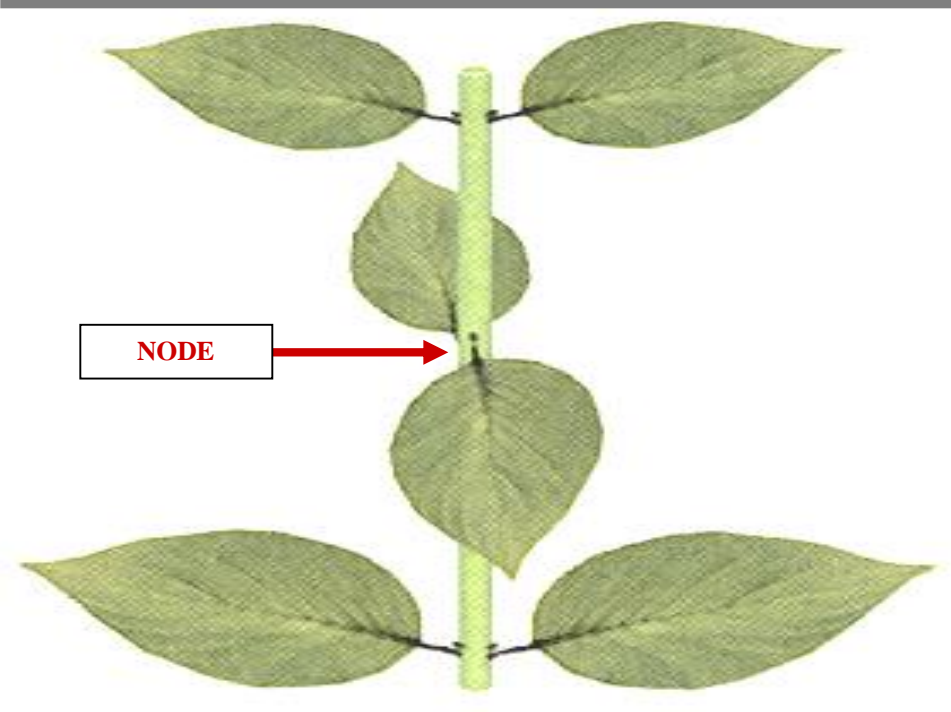
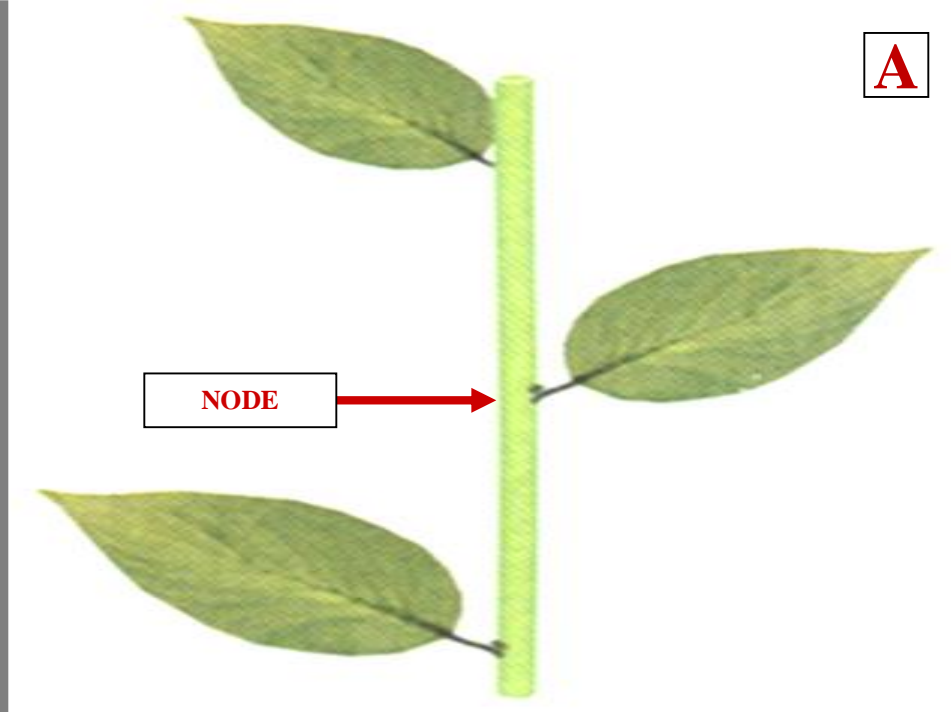
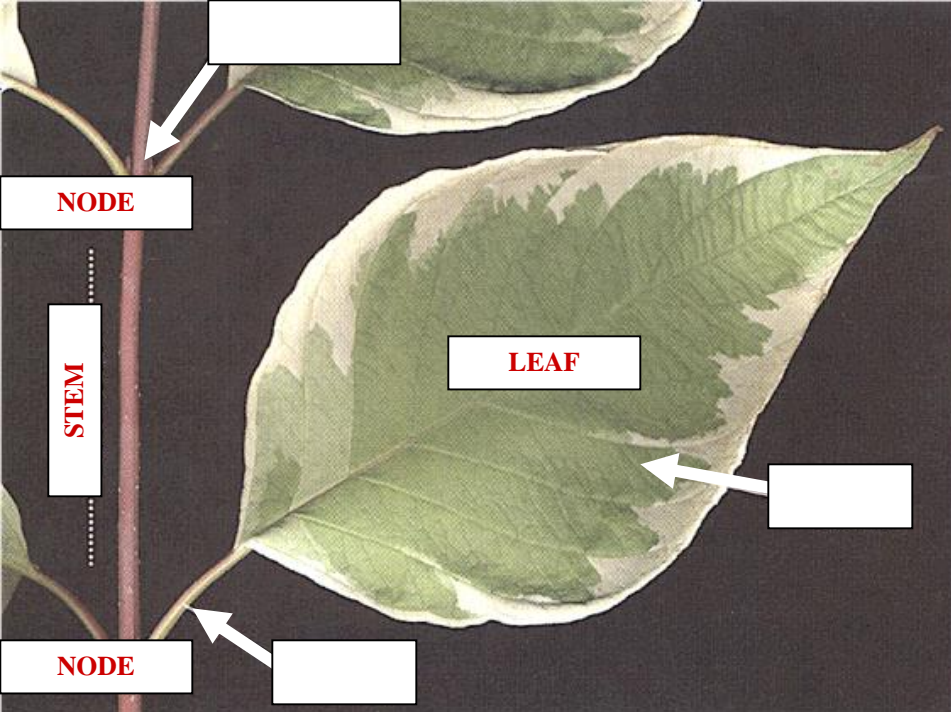
**ALTERNATE
PHYLLOTAXY**

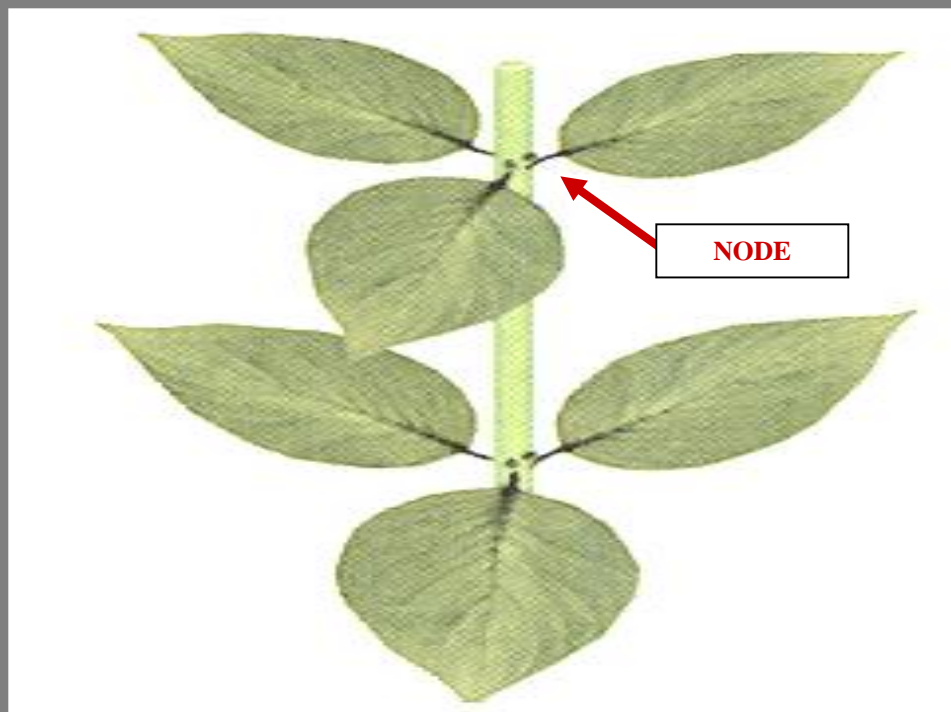
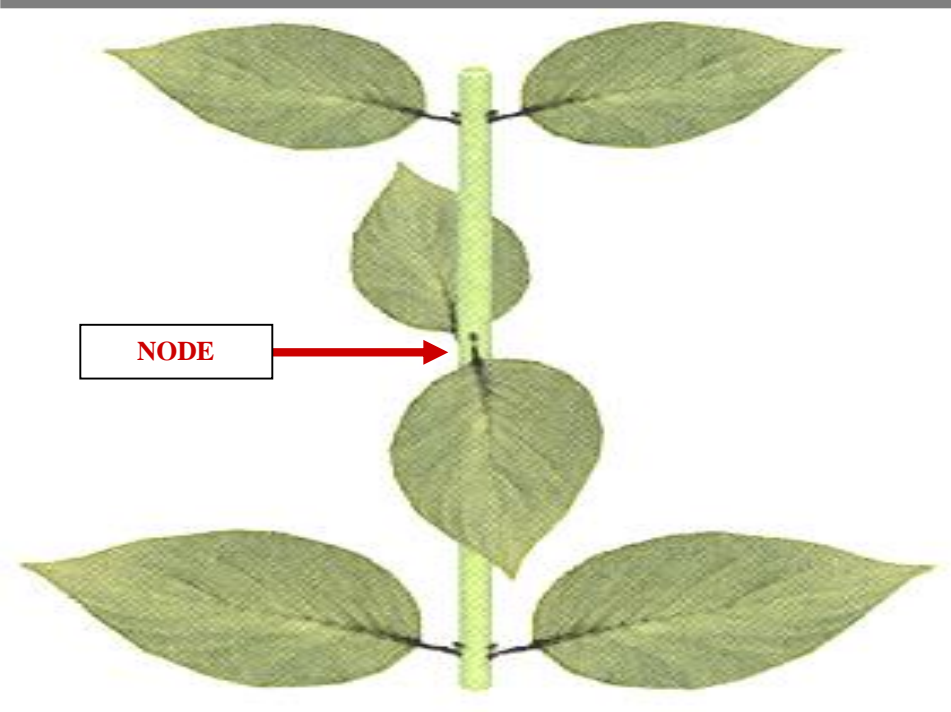
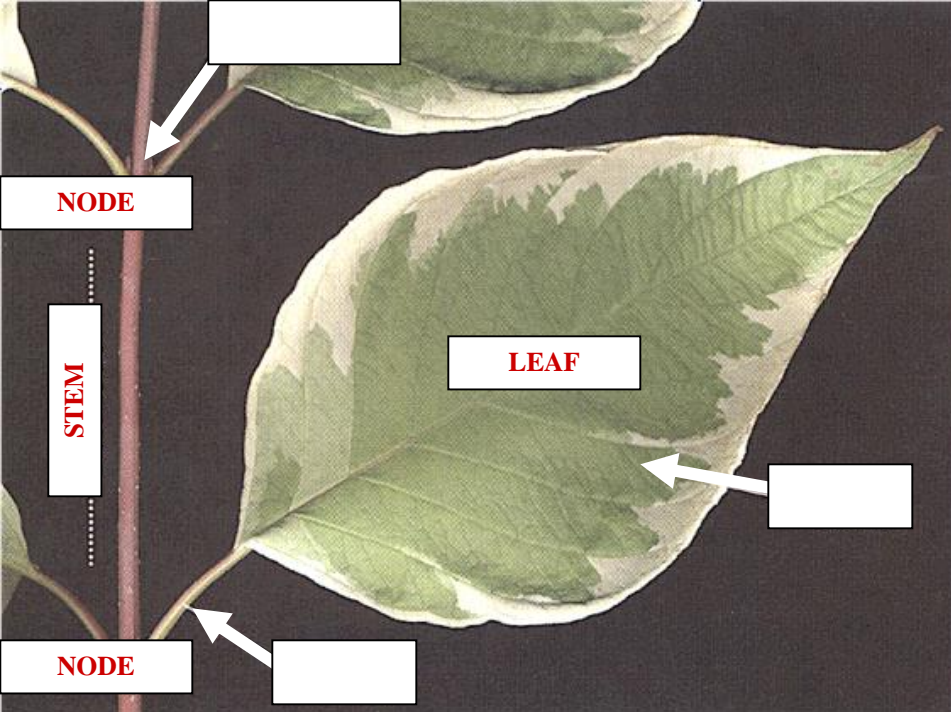


ALTERNATE PHYLLLOTAXY

**ONE
LEAF PER NODE**

ALTERNATE PHYLLLOTAXY





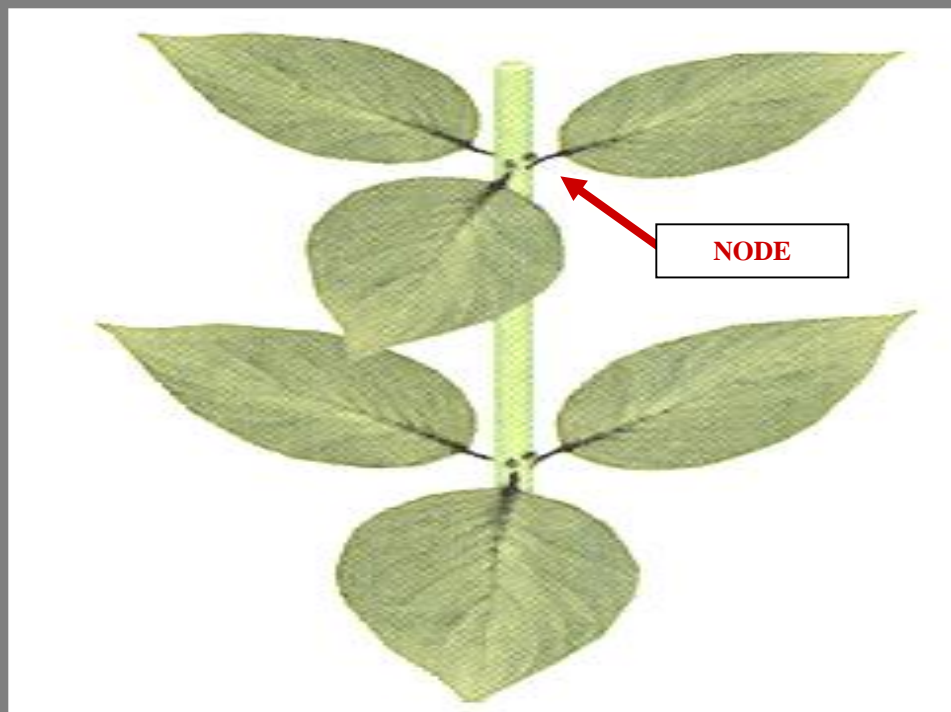
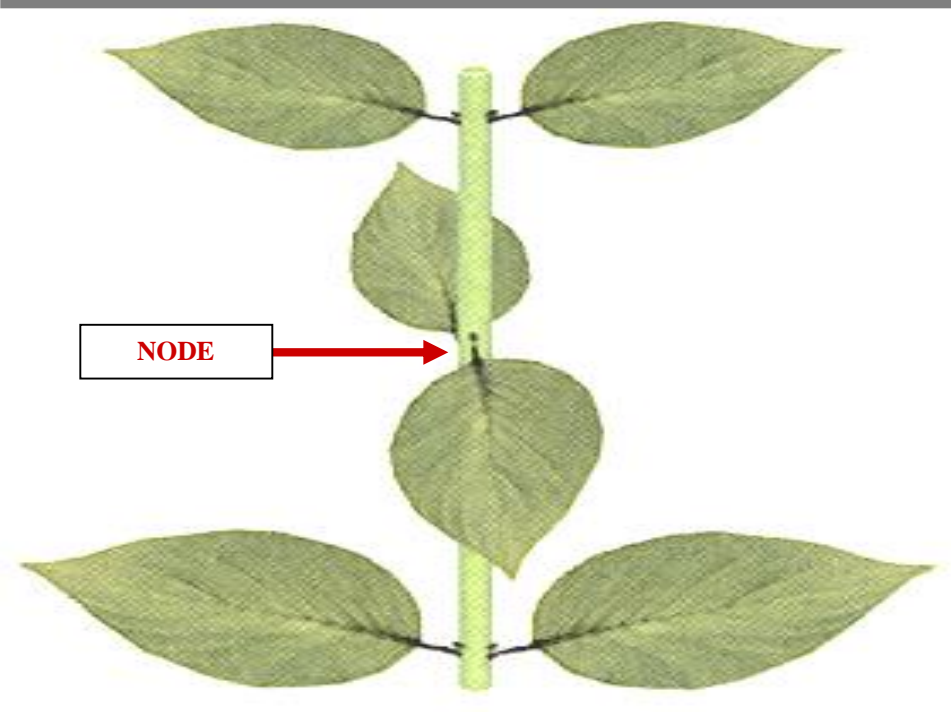
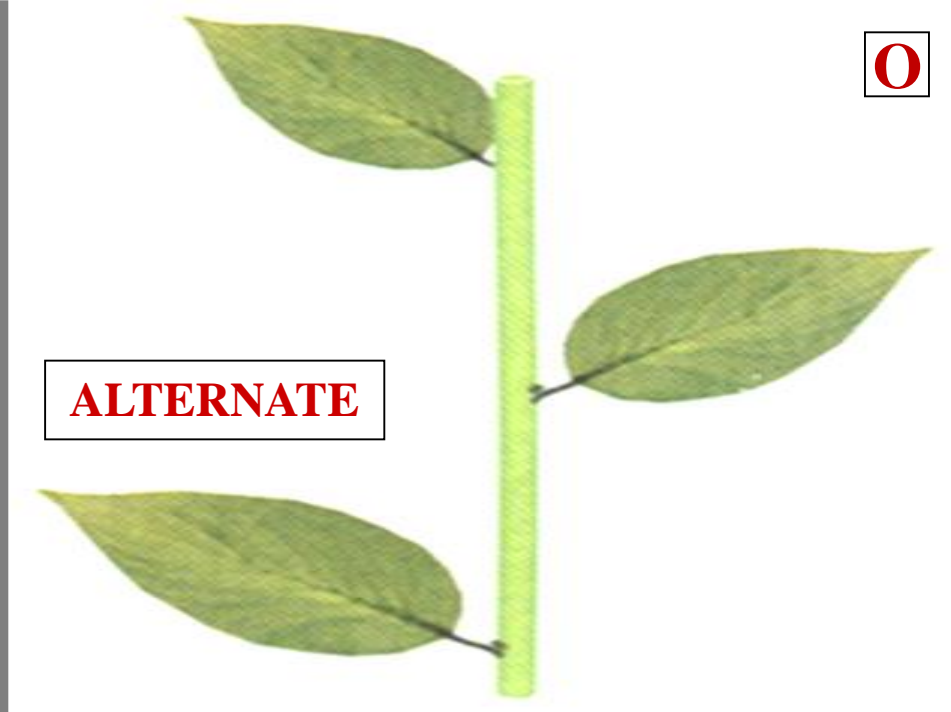
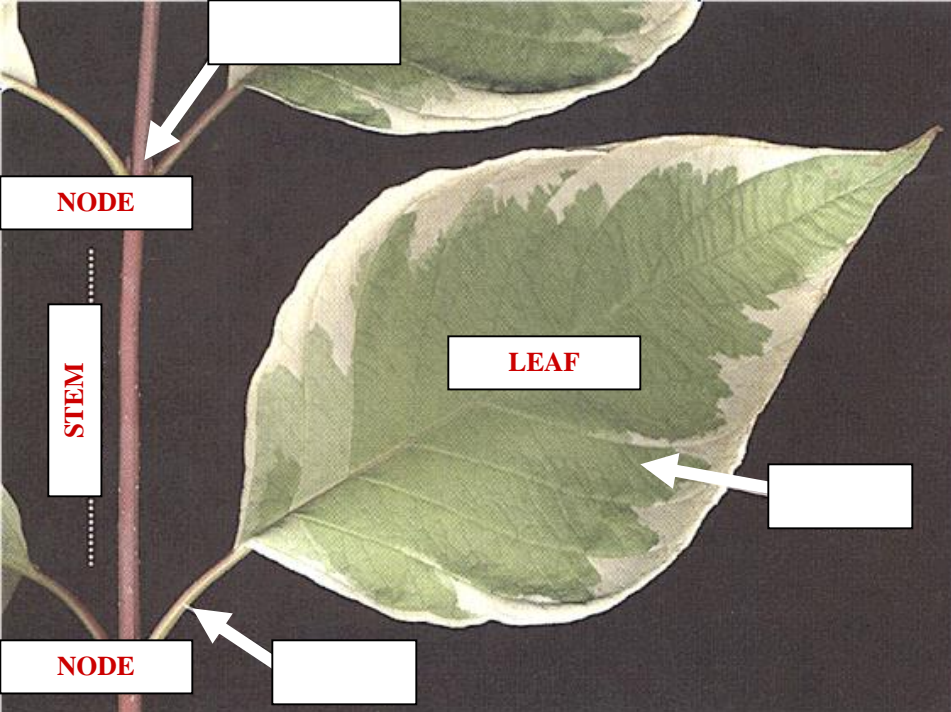
OPPOSITE PHYLLOTAXY

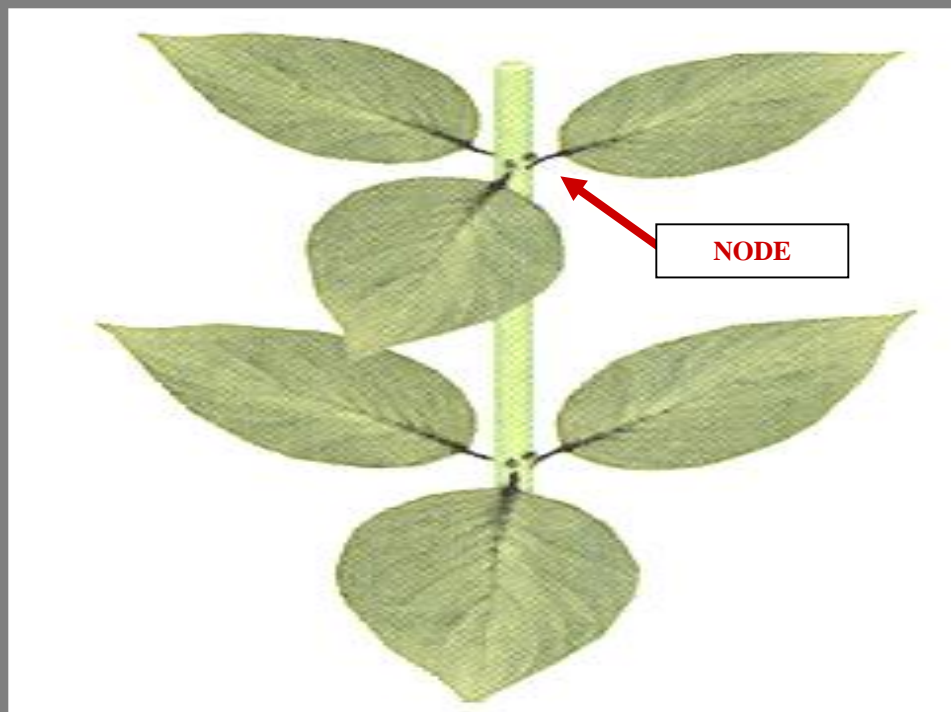
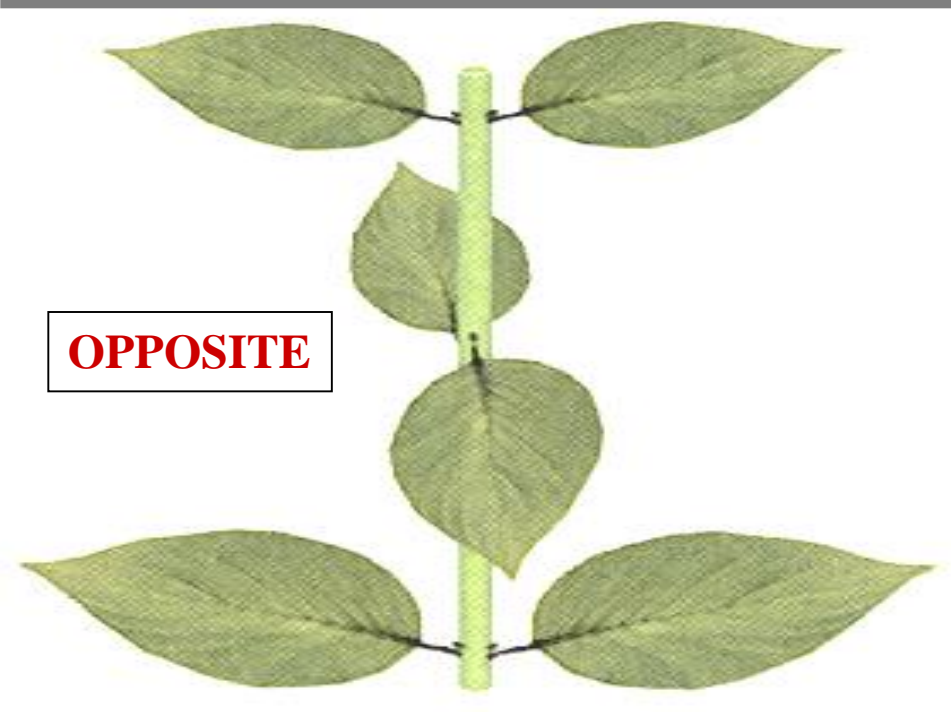
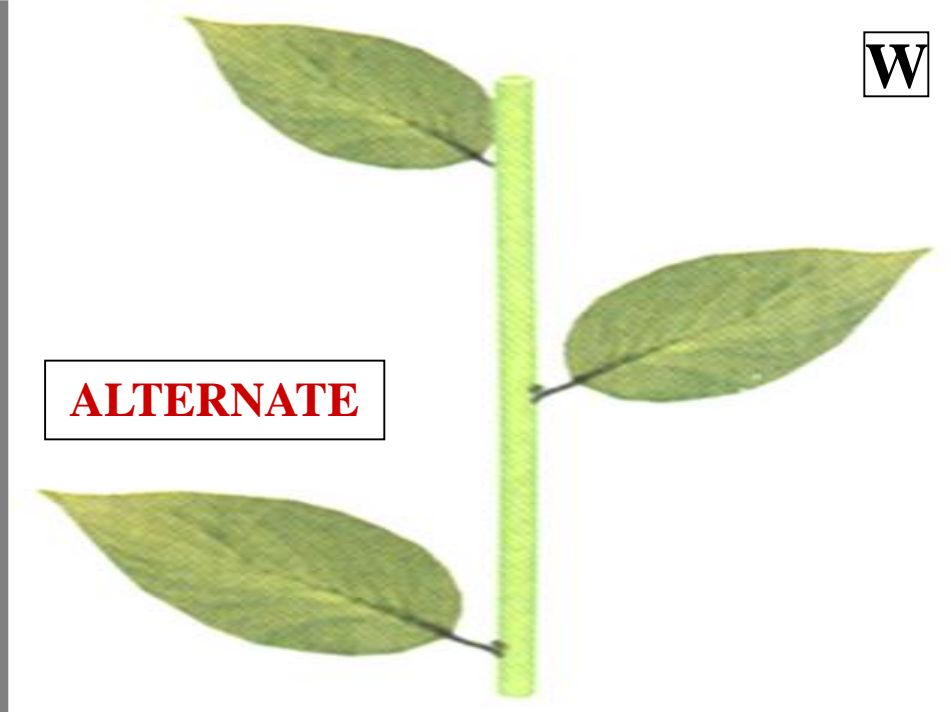
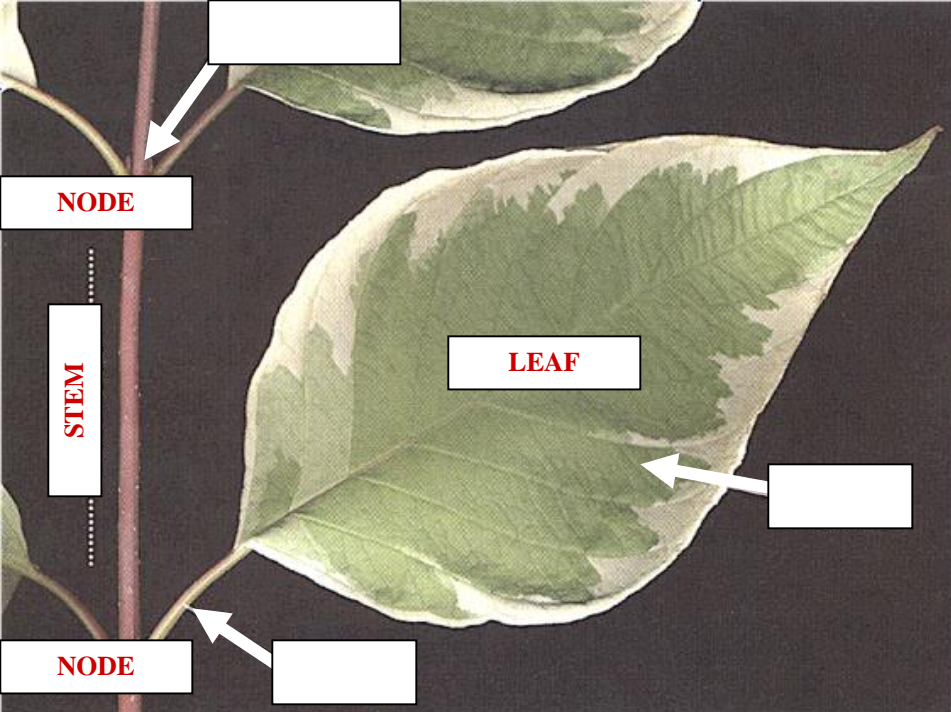


OPPOSITE PHYLLOTAXY

**TWO
LEAVES PER NODE**

OPPOSITE PHYLLOTAXY





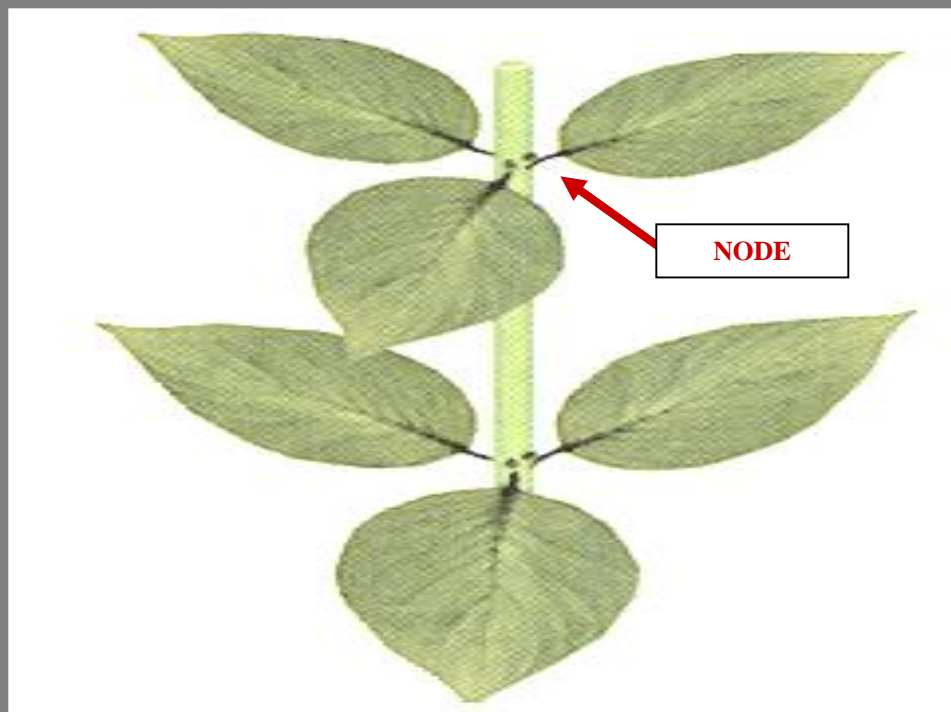
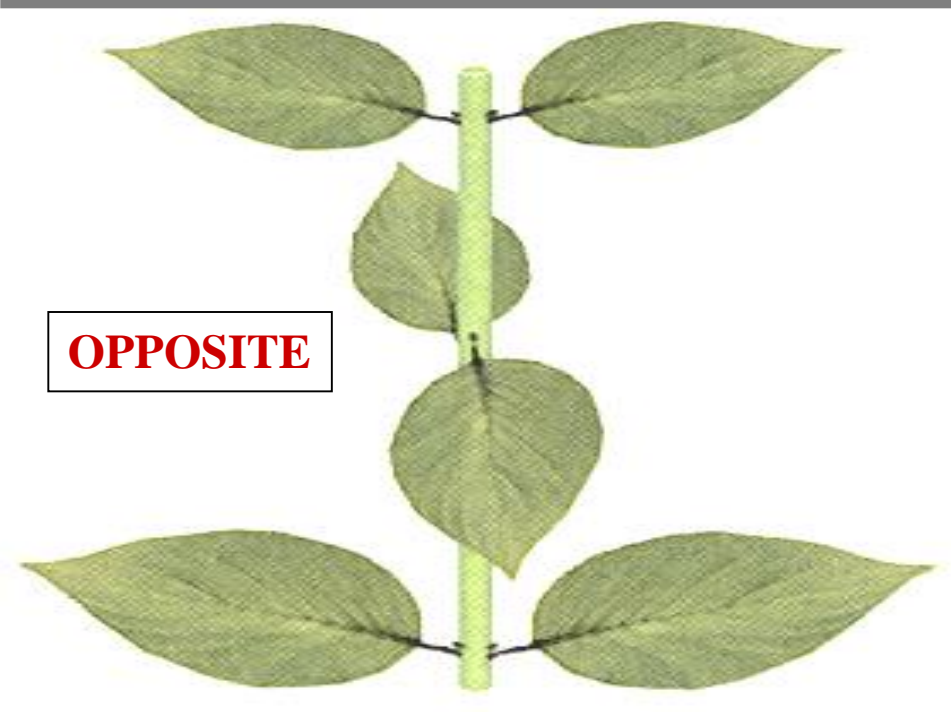
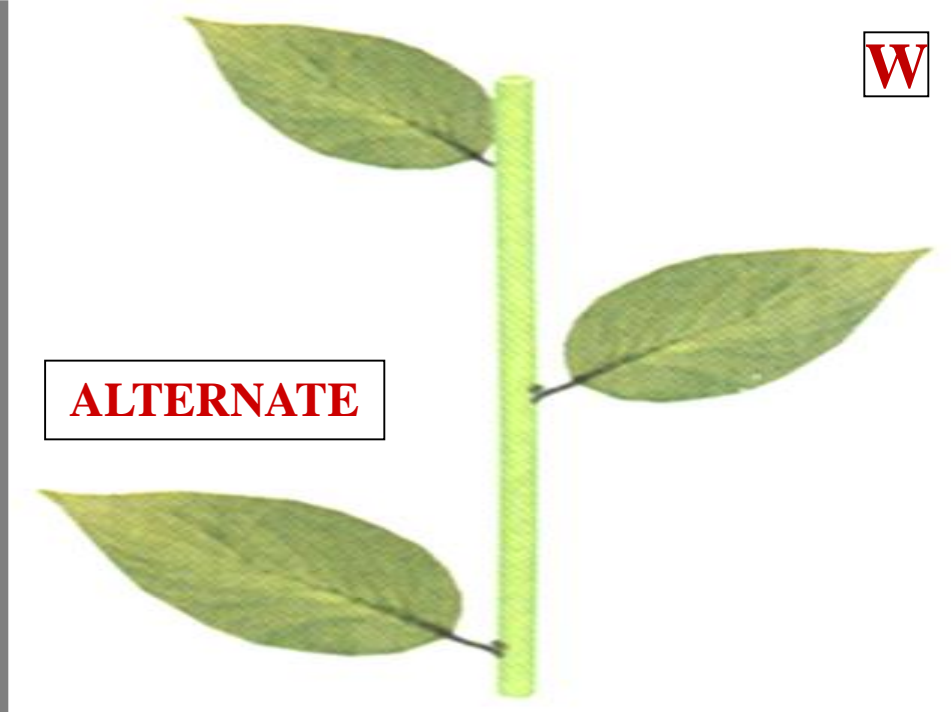
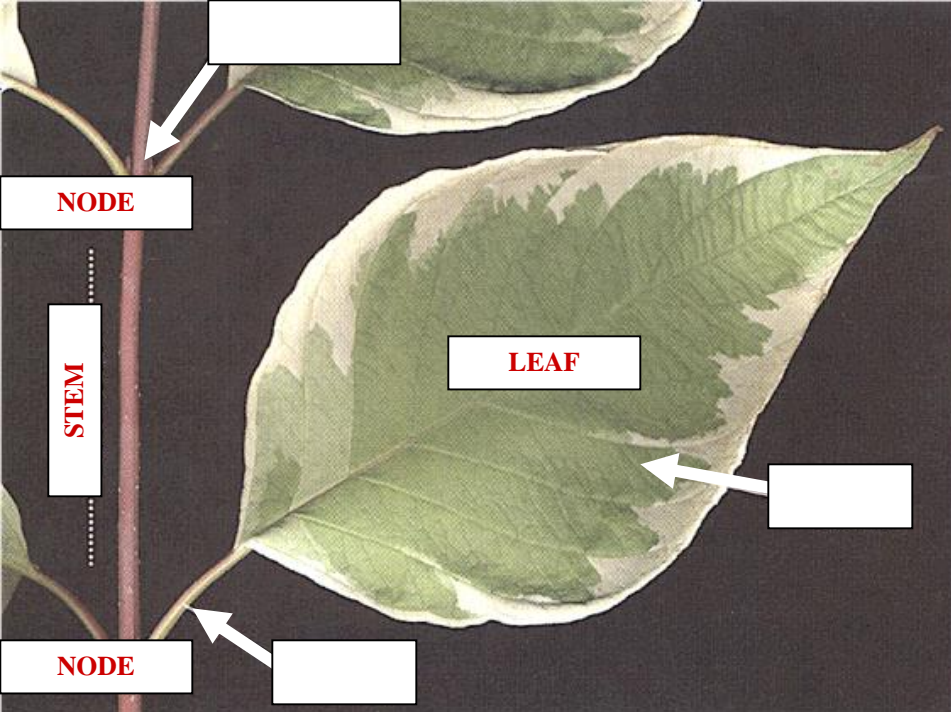
WHORLED PHYLLOTAXY

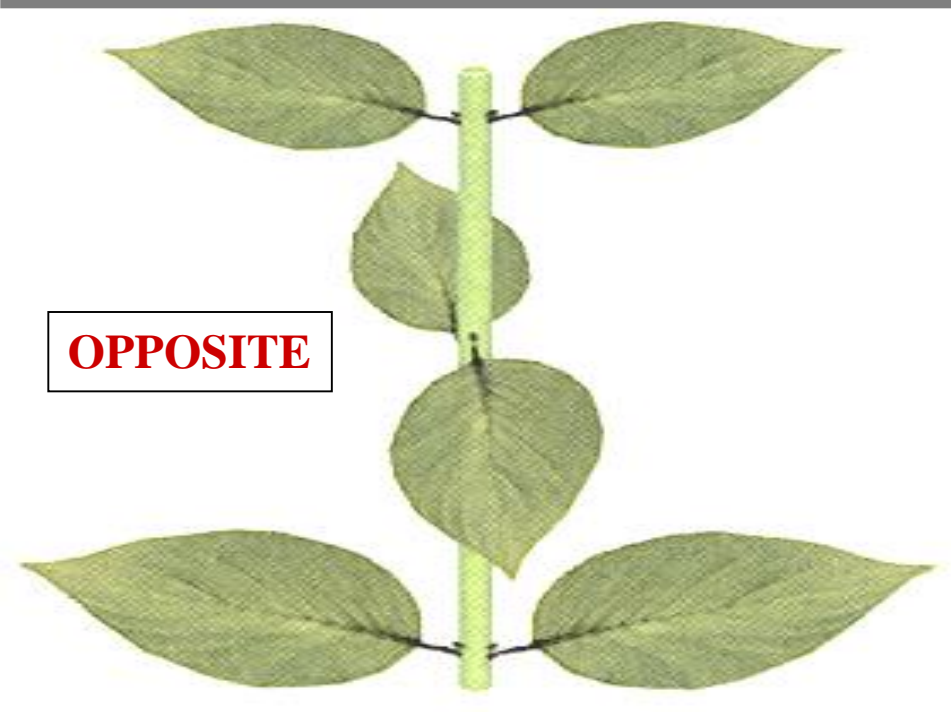
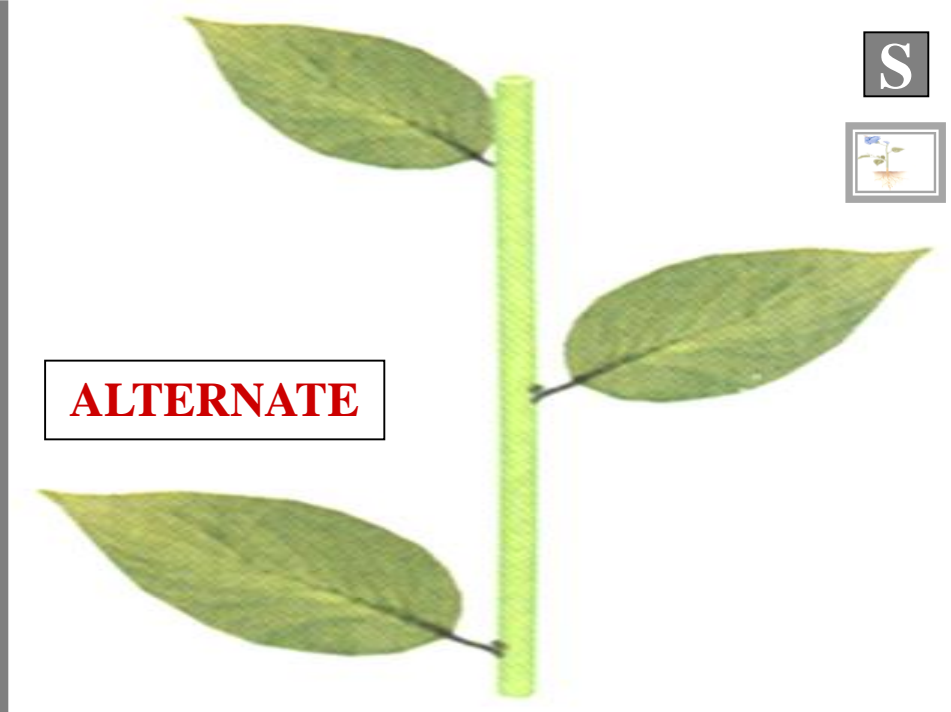
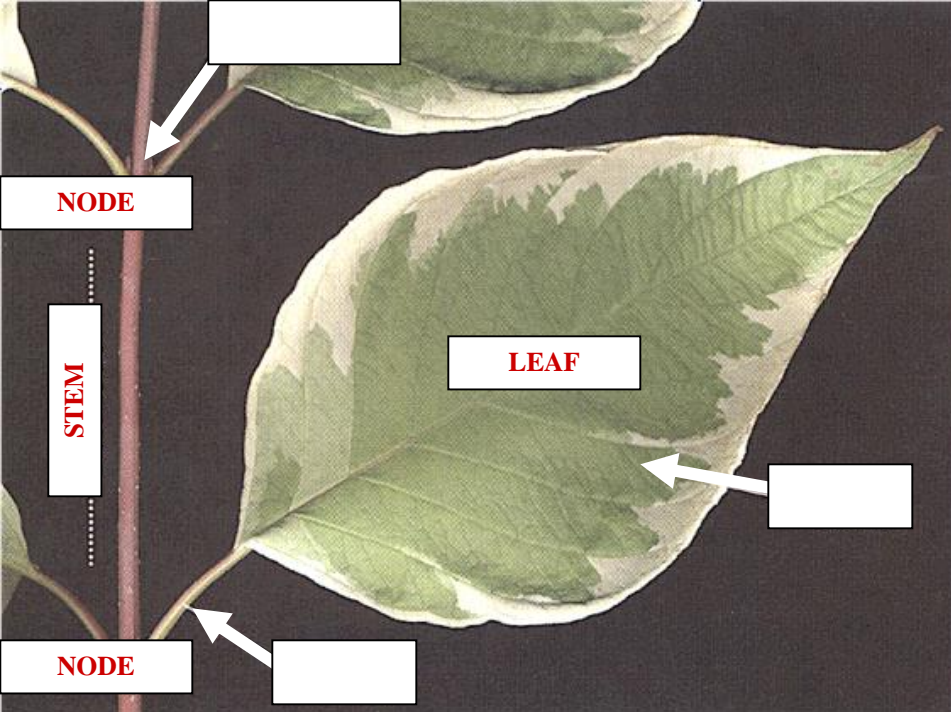


WHORLED PHYLLOTAXY

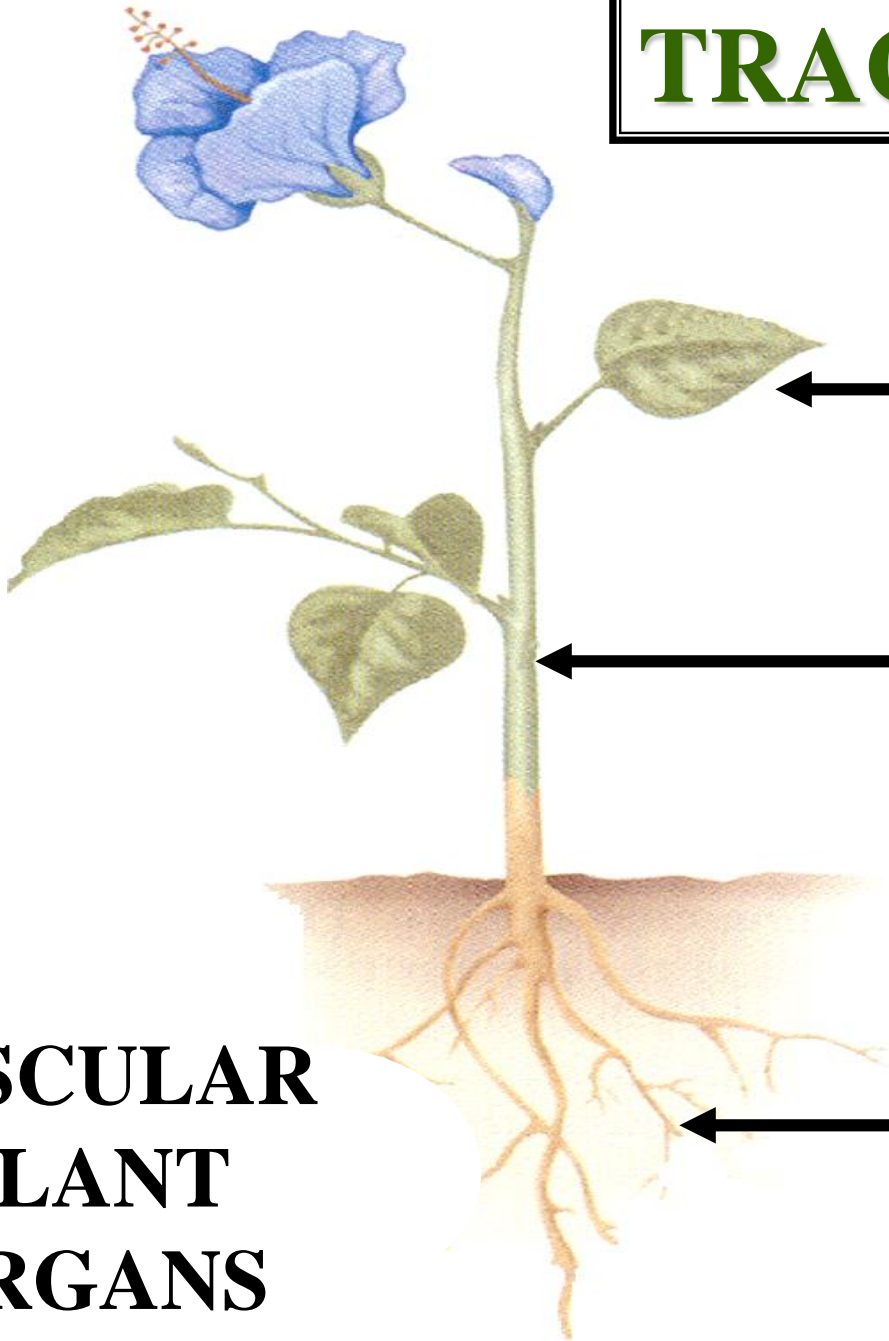
THREE OR MORE
LEAVES PER NODE

WHORLED PHYLLOTAXY





TRACHEOPHYTE



LEAF

STEM

ROOT

**VASCULAR
PLANT
ORGANS**

SPOROPHYLL

SPOROPHYLL



SPOROPHYLL

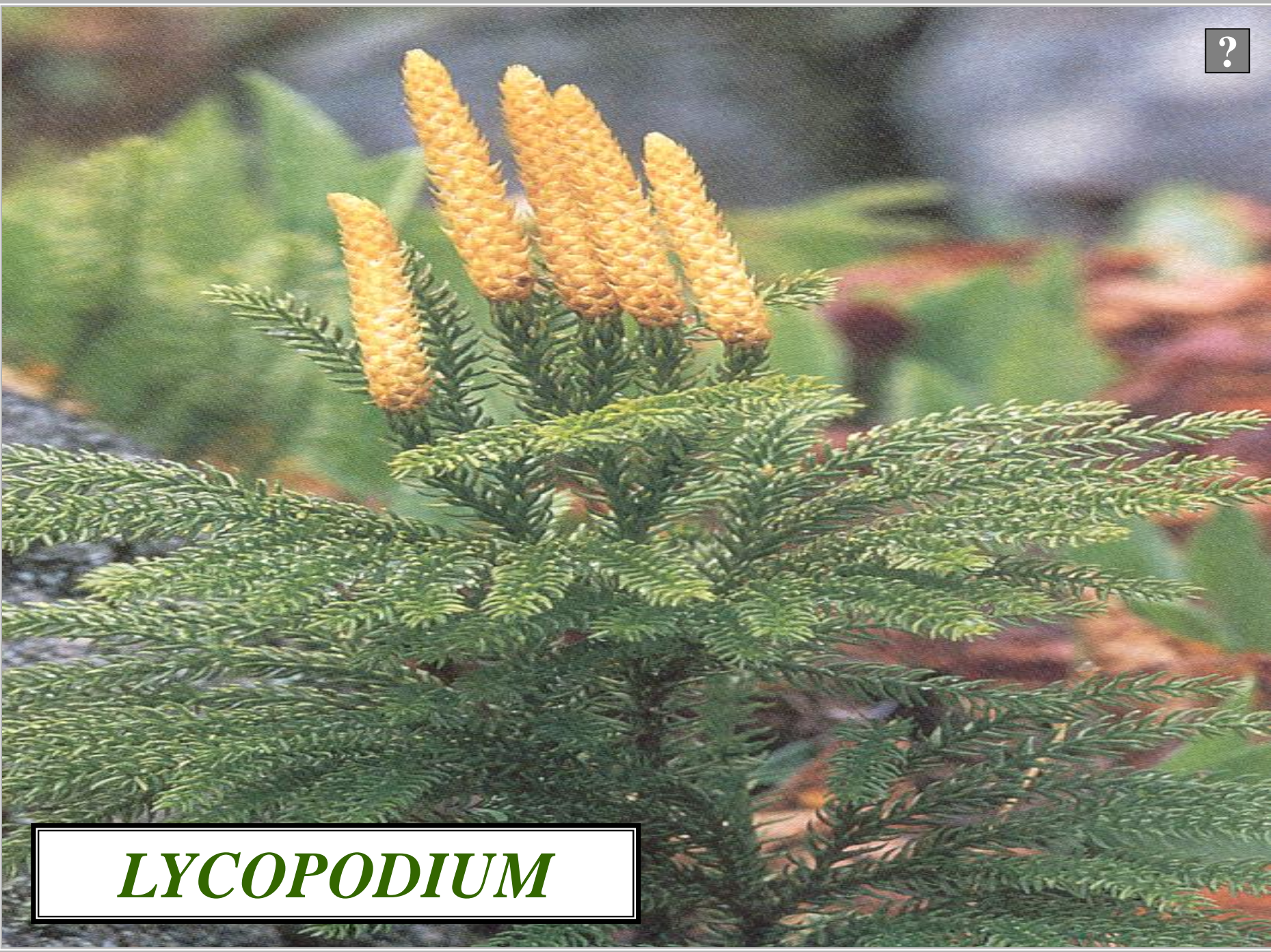
**SPORANGIUM
BEARING LEAF**

SPOROPHYLL

L

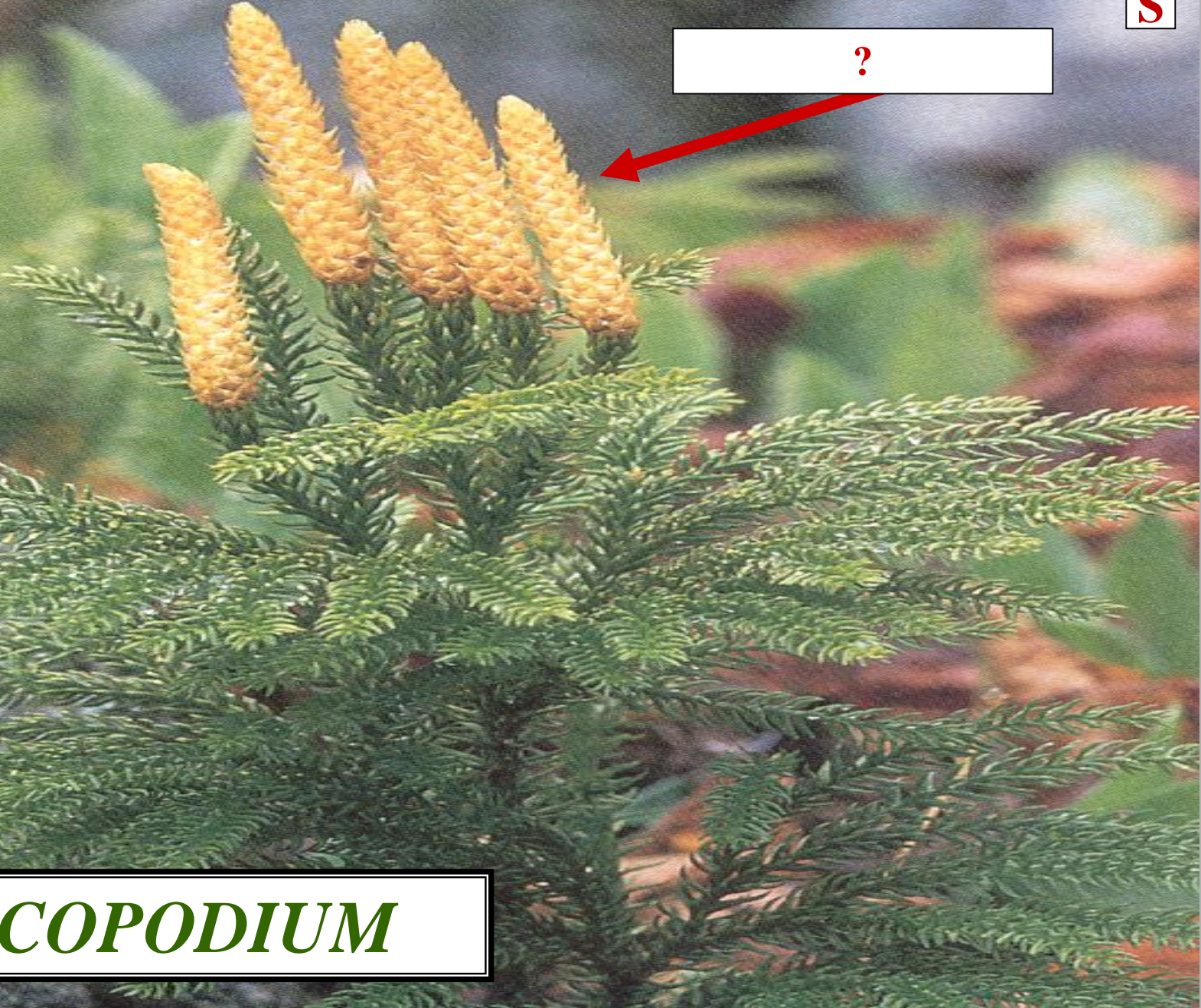


?



LYCOPODIUM

?



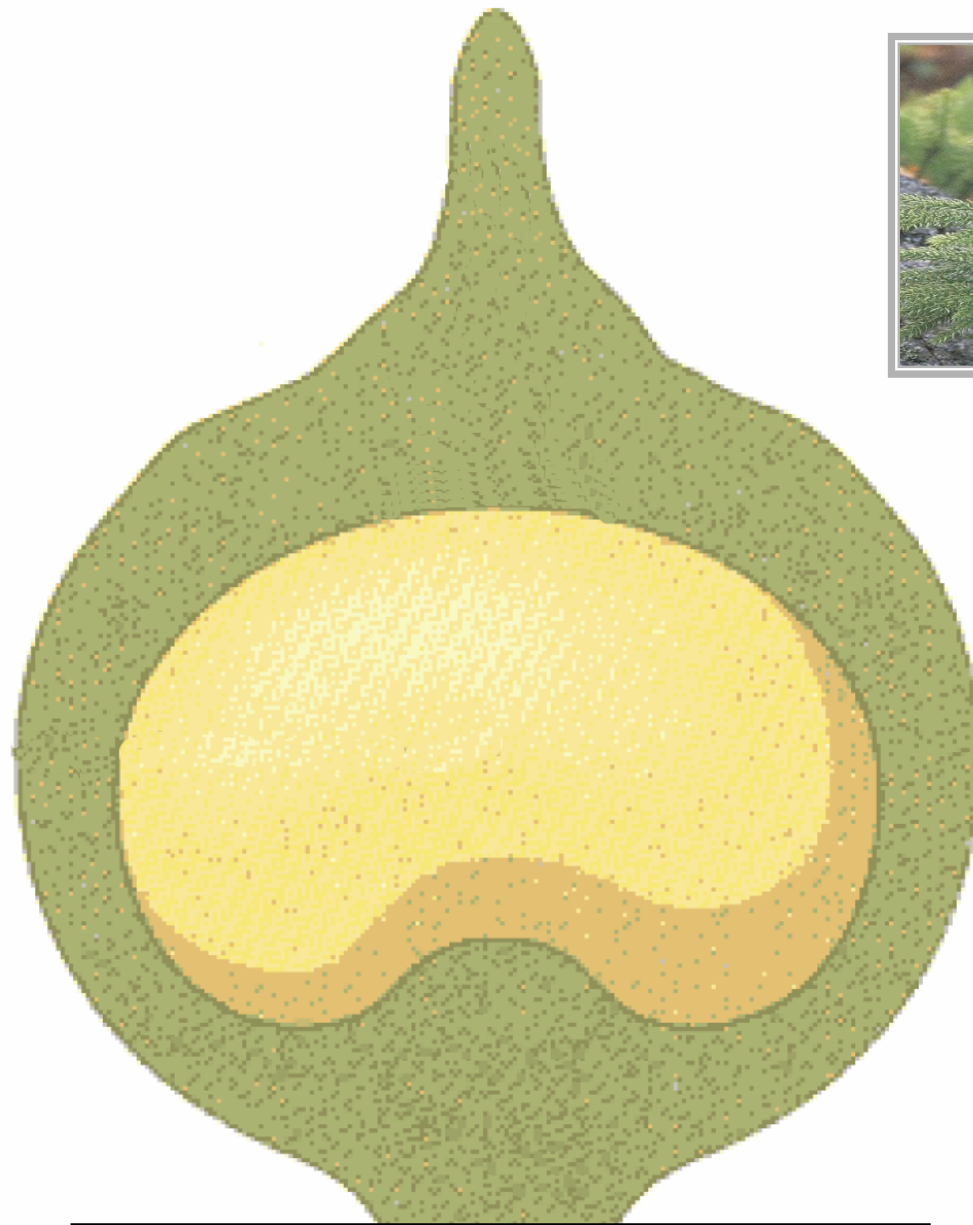
LYCOPODIUM



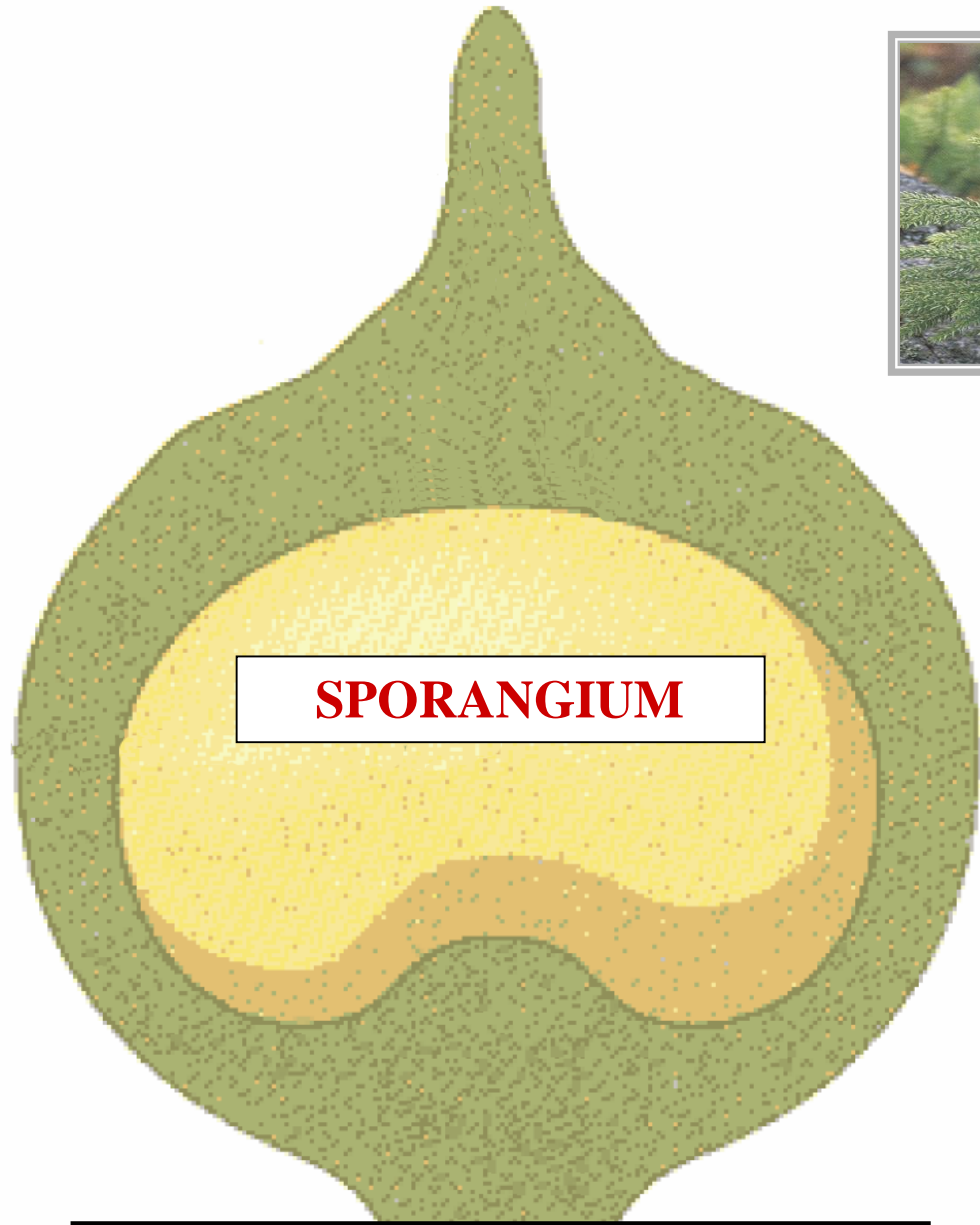
STROBILUS



LYCOPODIUM



SPOROPHYLL



SPORANGIUM

SPOROPHYLL

SPORANGIUM

SPORANGIUM



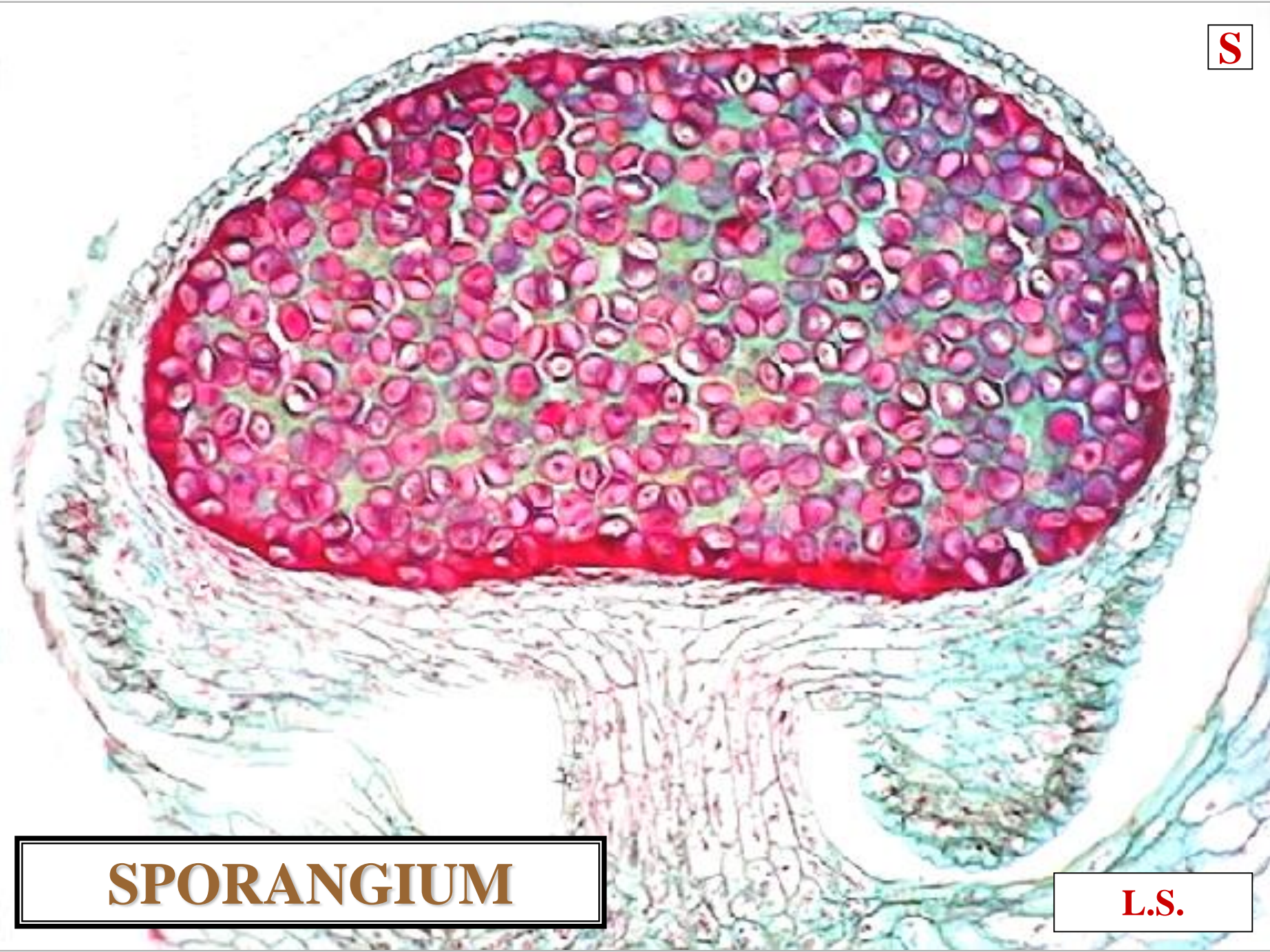
SPORANGIUM

SPORE

PRODUCING STRUCTURE

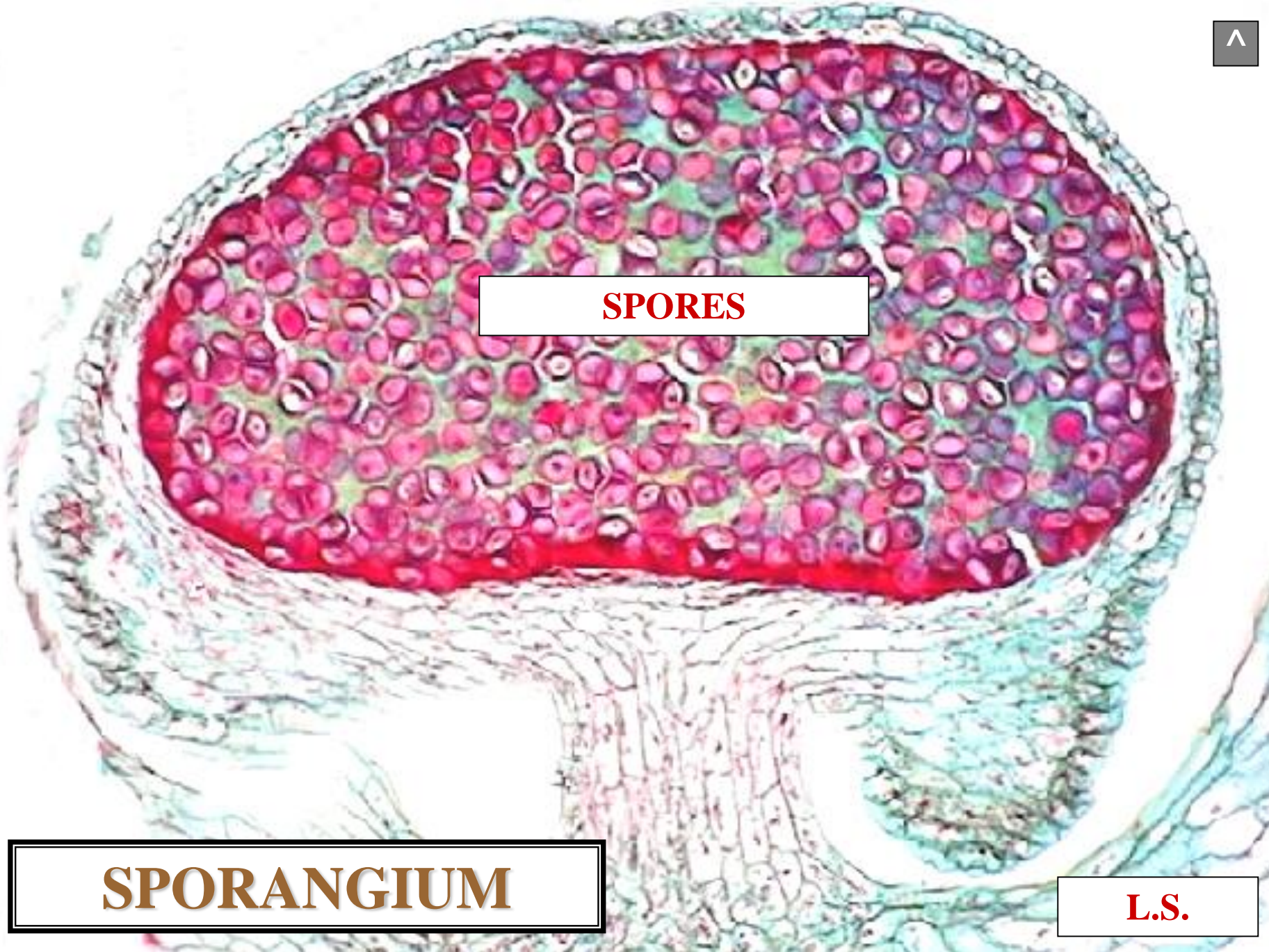
SPORANGIUM

S



SPORANGIUM

L.S.



SPORES

SPORANGIUM

L.S.




EUSPORANGIUM

VS

LEPTOSPORANGIUM



EUSPORANGIUM

A lush tropical forest scene with dense green foliage and a prominent orange flower. The text is overlaid in the center.

**EUSPORANGIUM
KNOWN TO MOST
VASCULAR PLANTS**

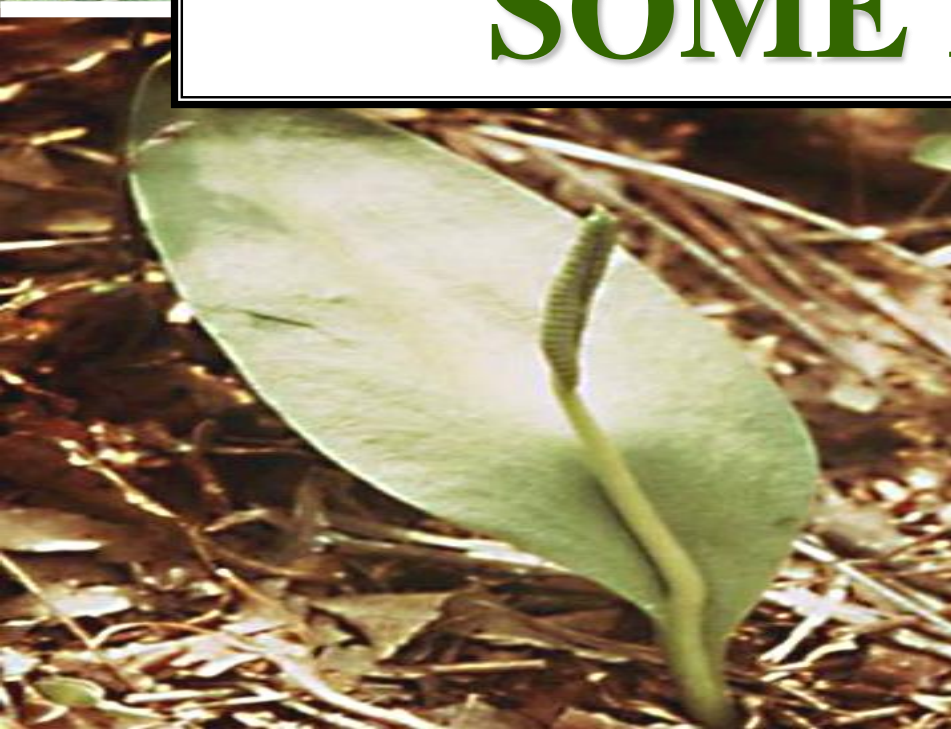


LYCOPHYTES





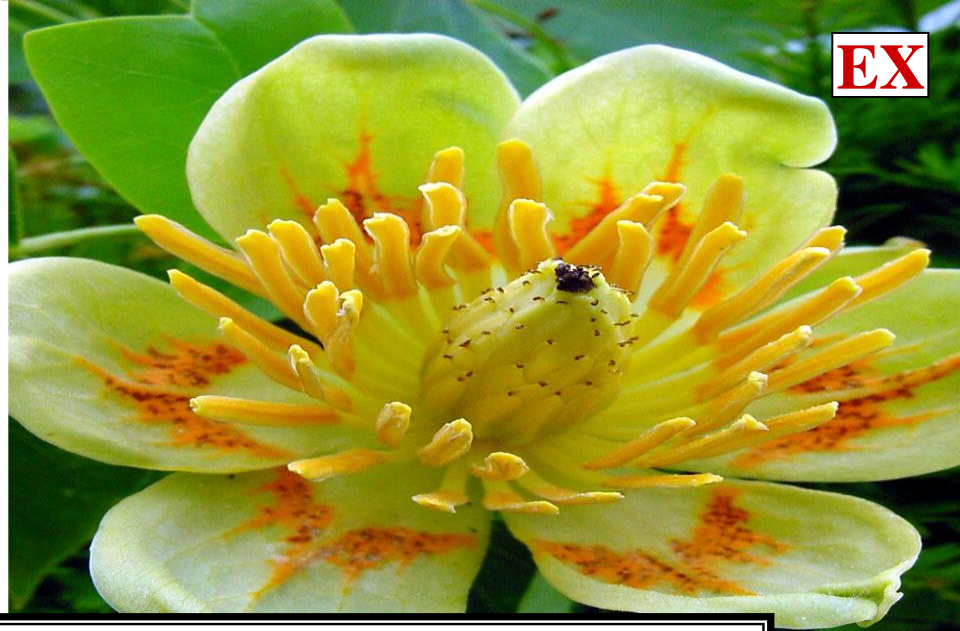
SOME FERNS





GYMNOSPERMS





ANGIOSPERMS



EXCEPTION



EUSPORANGIUM

EXCEPTION

“ADVANCED FERNS”

EXCEPTION



E
AB

“ADVANCED FERNS”



EUSPORANGIUM: ABSENT



EUSPORANGIUM: ABSENT



“ADVANCED FERNS”

EUSPORANGIUM: ABSENT



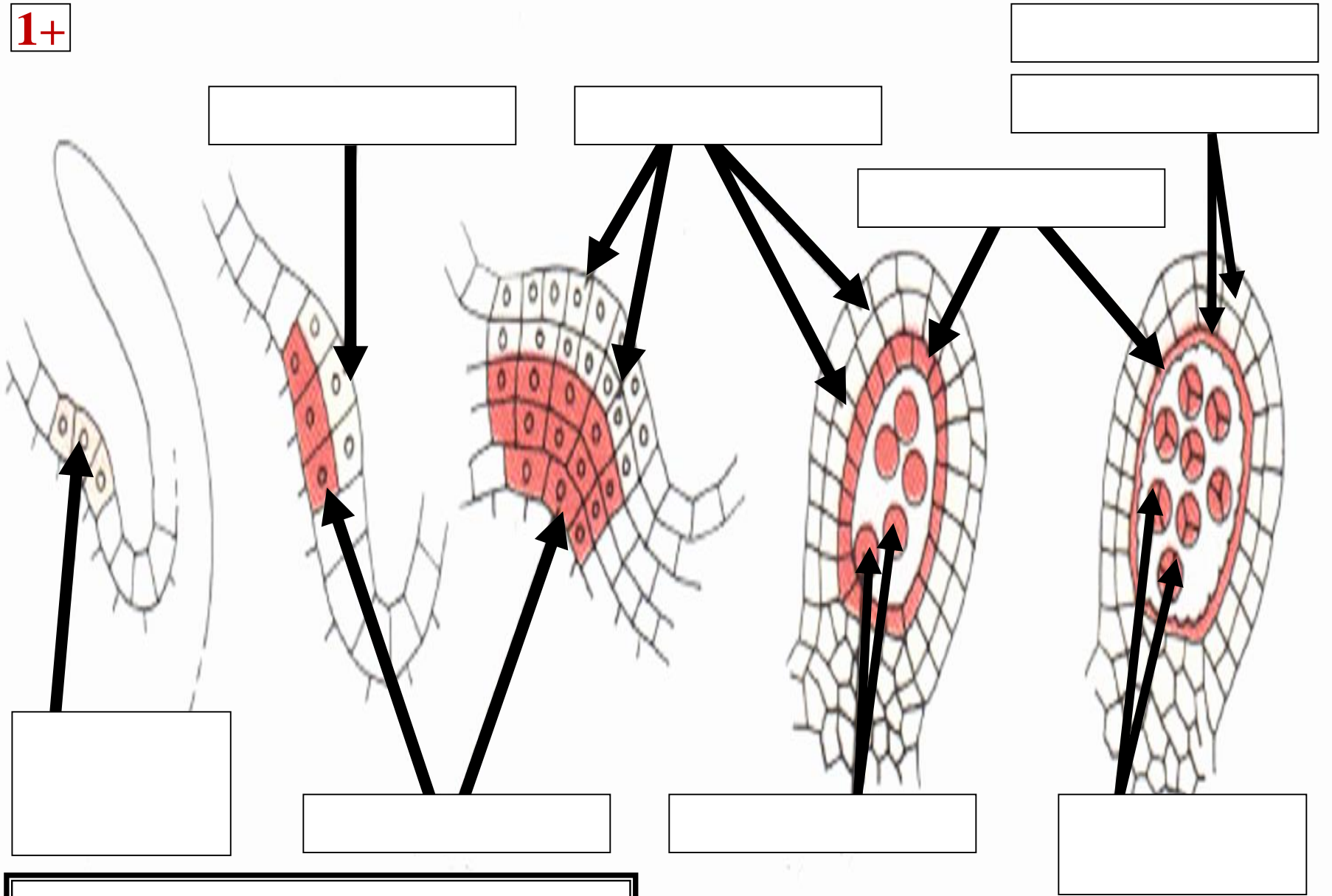
EUSPORANGIUM: ABSENT





EUSPORANGIUM CHARACTERS

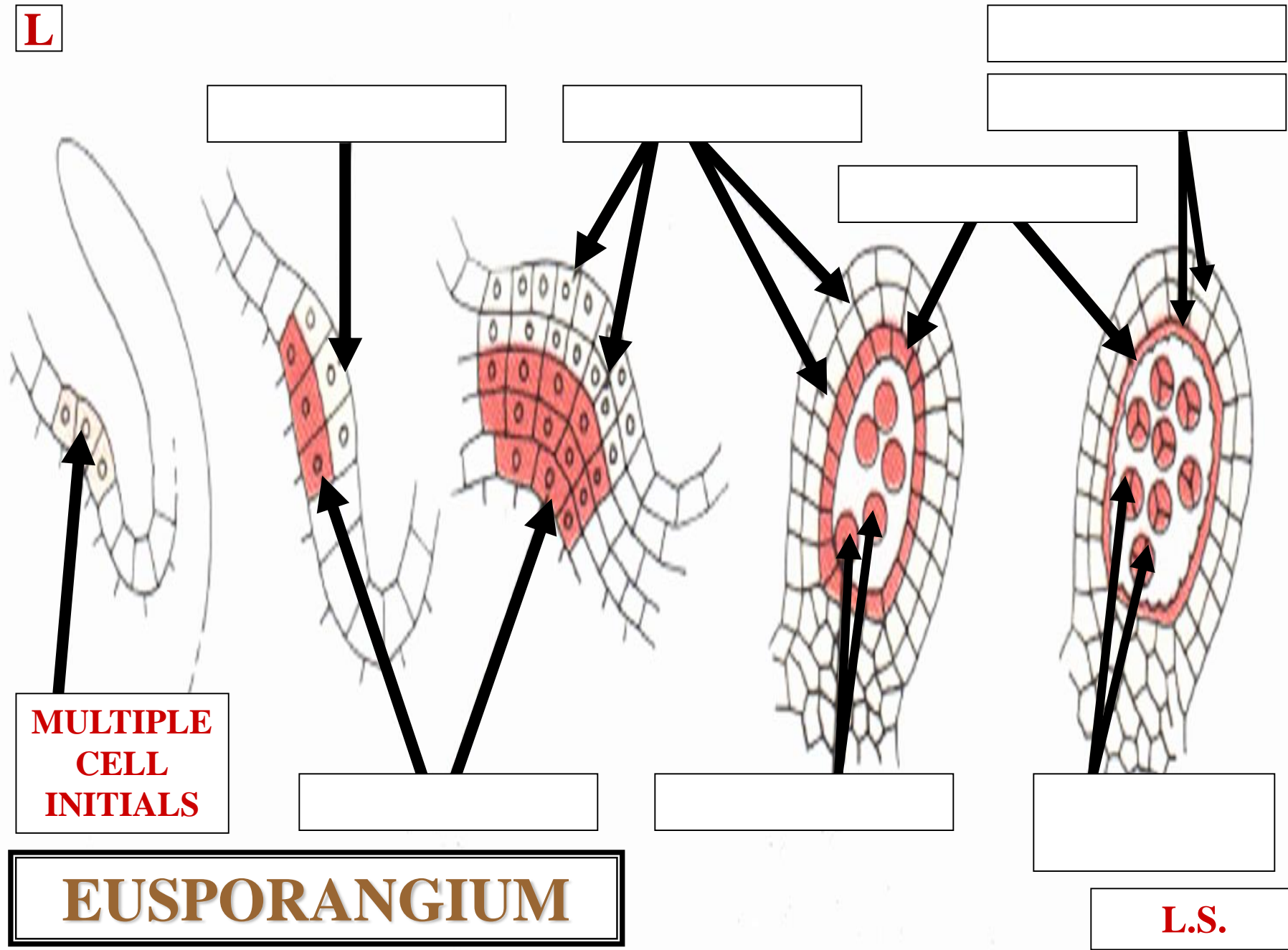
1+



EUSPORANGIUM

L.S.

L



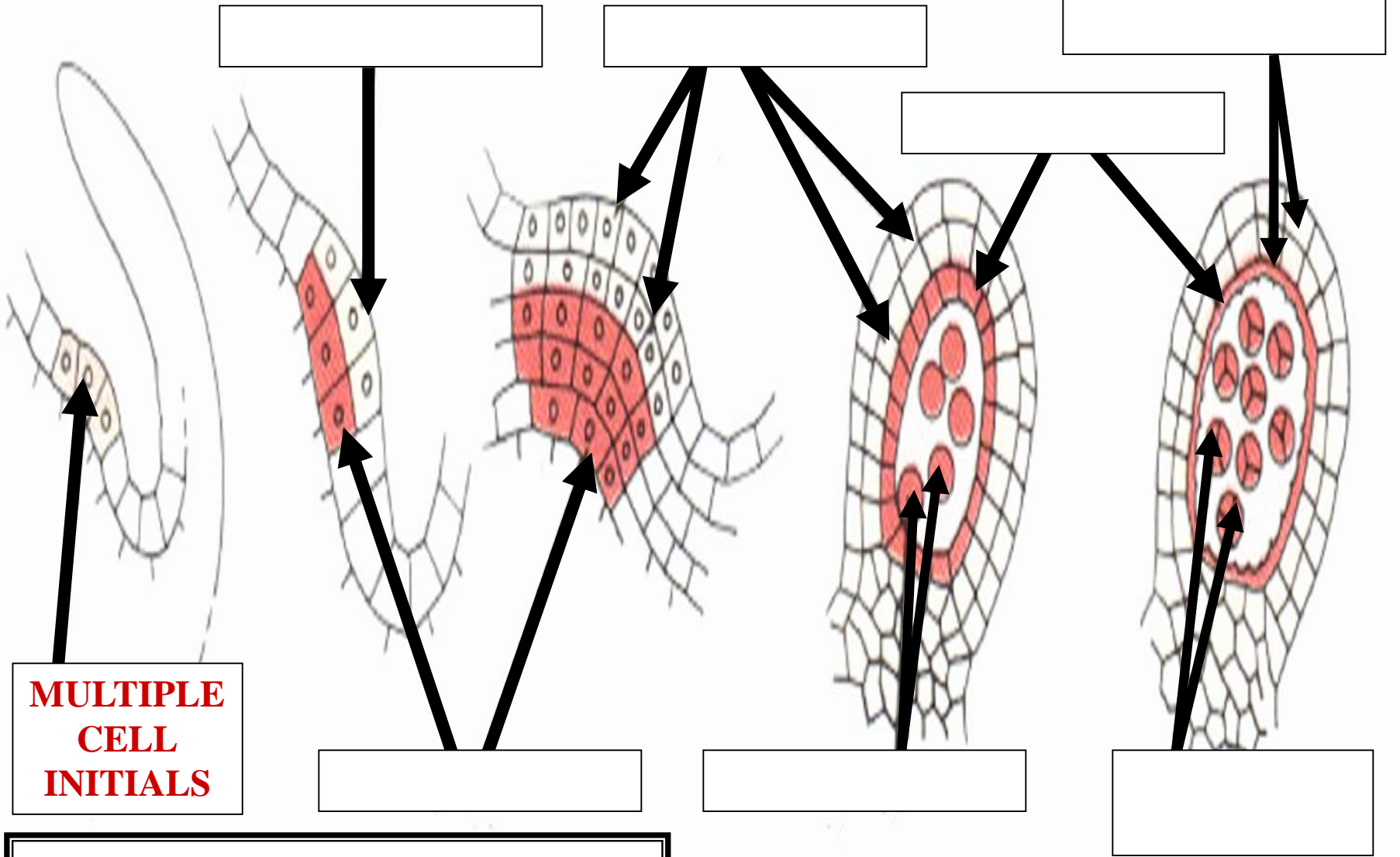
**MULTIPLE
CELL
INITIALS**

EUSPORANGIUM

L.S.

T

LARGE SIZE



**MULTIPLE
CELL
INITIALS**

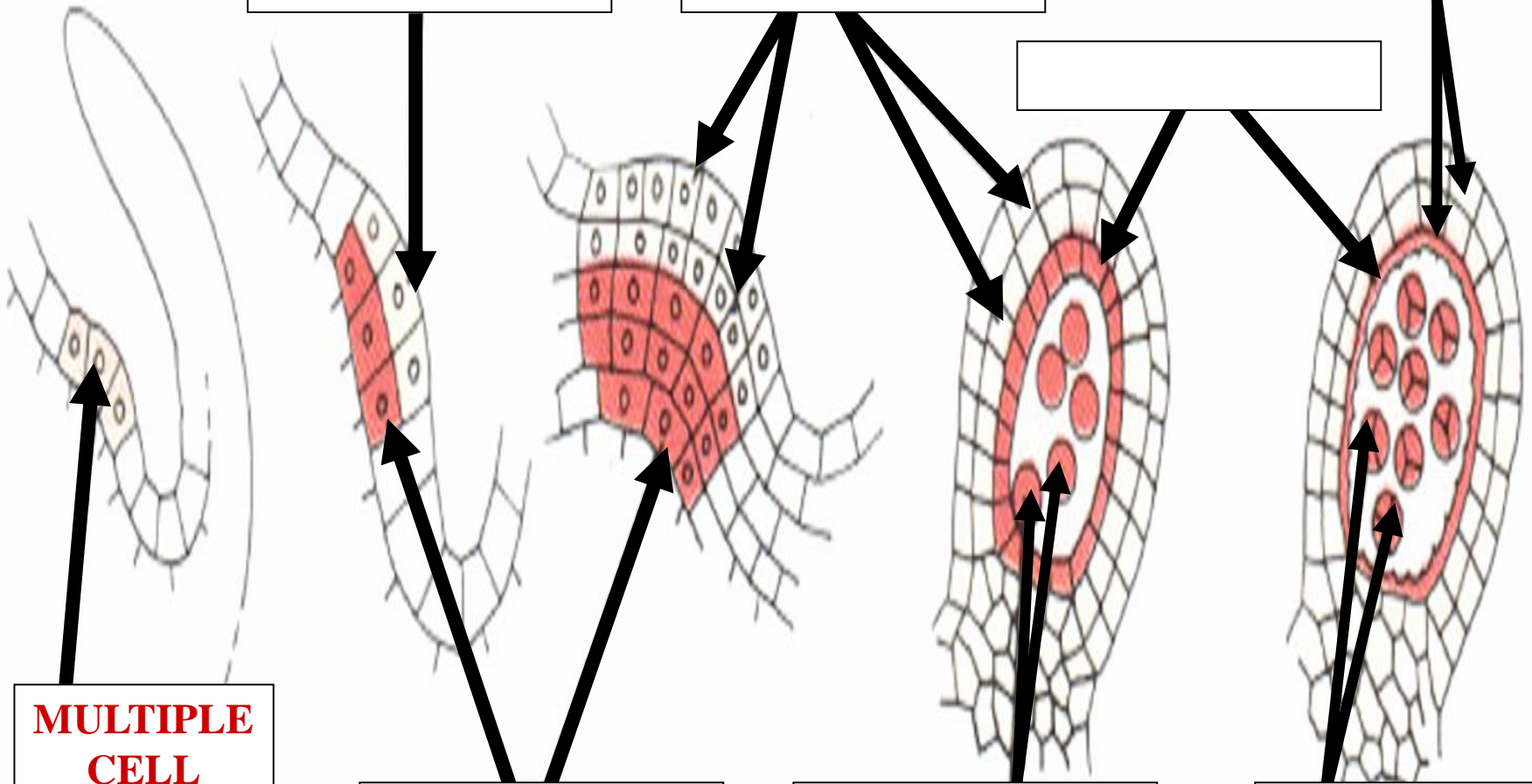
EUSPORANGIUM

L.S.

N

LARGE SIZE

THICK WALL



**MULTIPLE
CELL
INITIALS**

EUSPORANGIUM

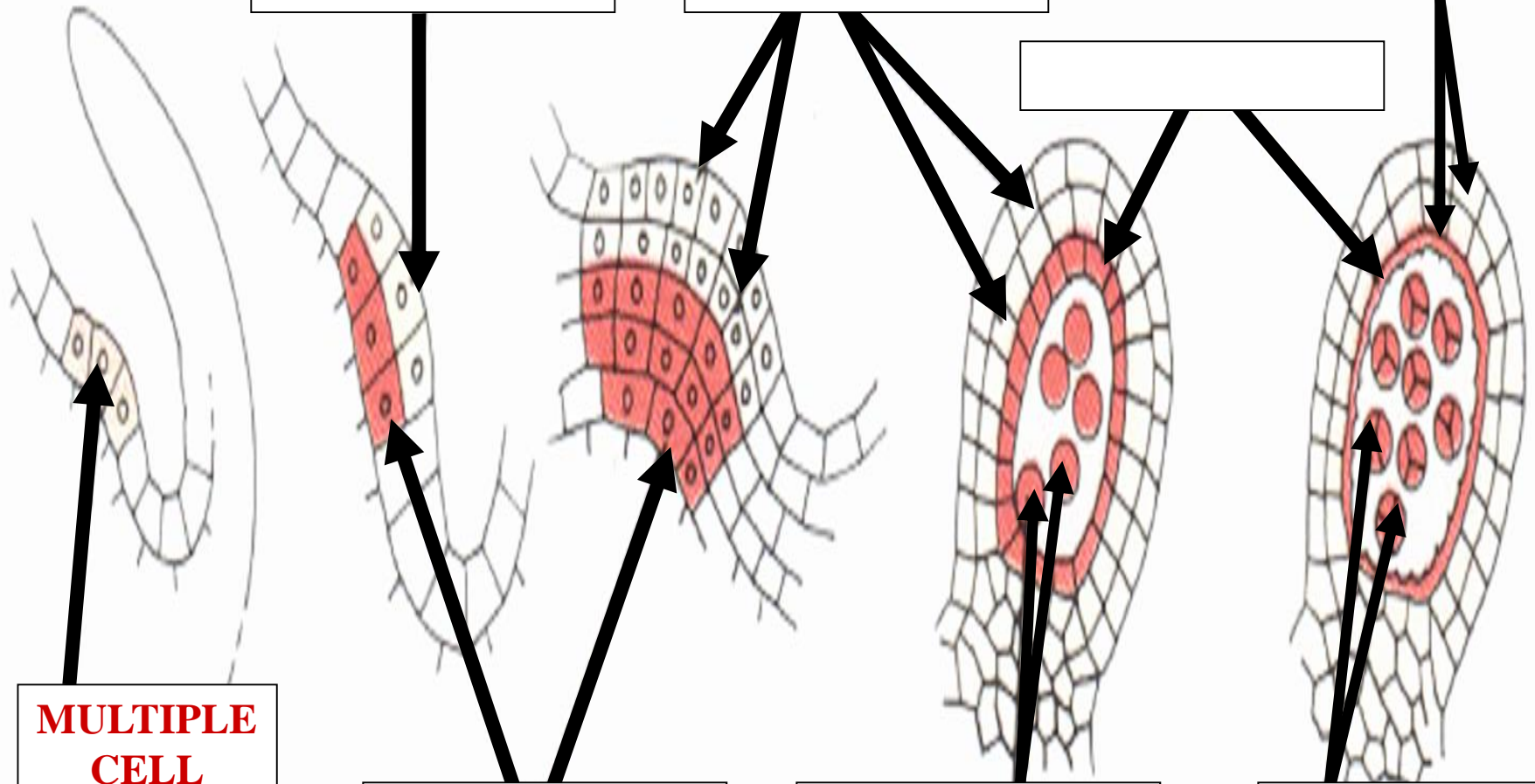
L.S.

R



LARGE SIZE

THICK WALL



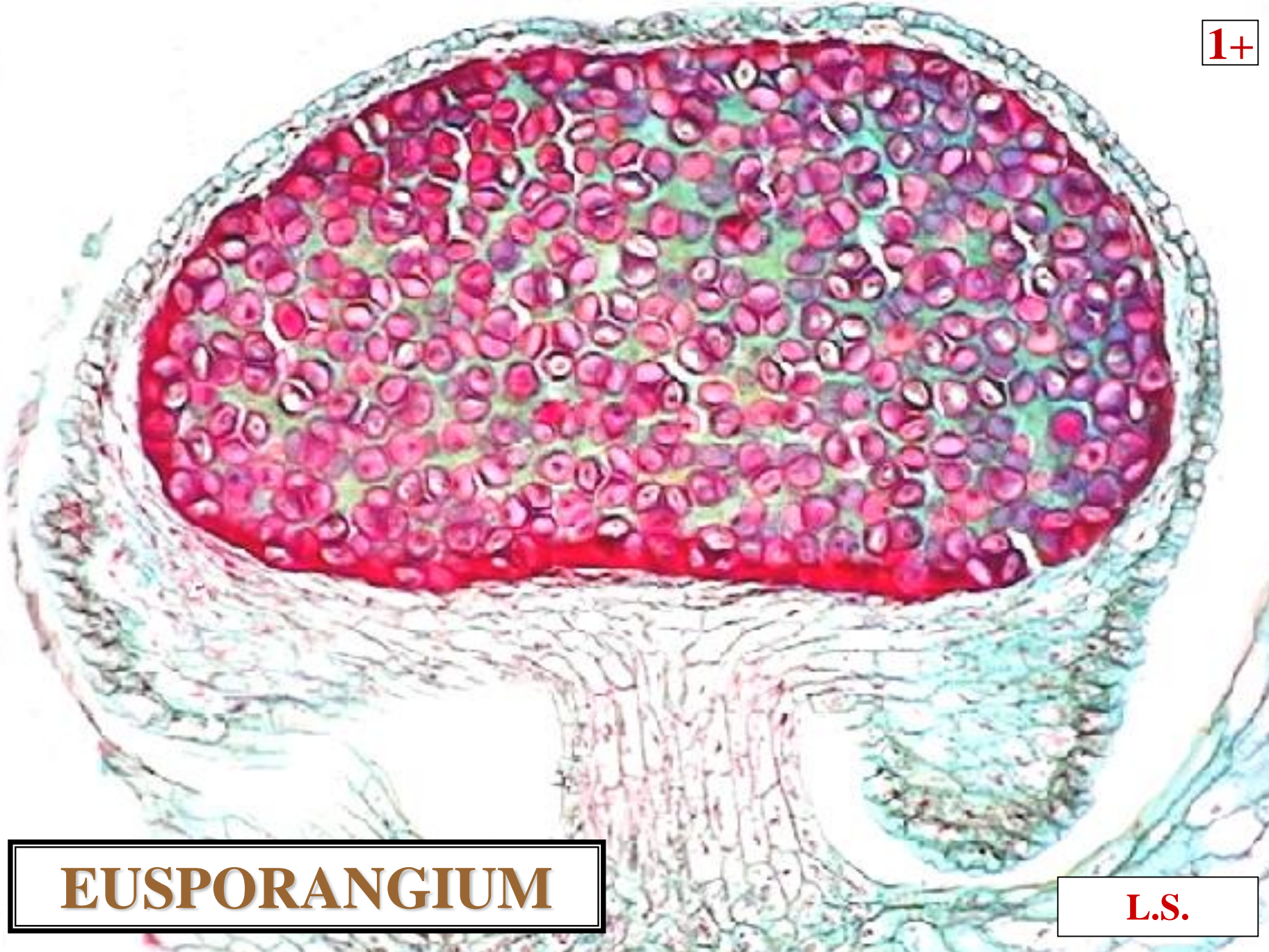
**MULTIPLE
CELL
INITIALS**

**NUMEROUS
SPORES**

EUSPORANGIUM

L.S.

1+



EUSPORANGIUM

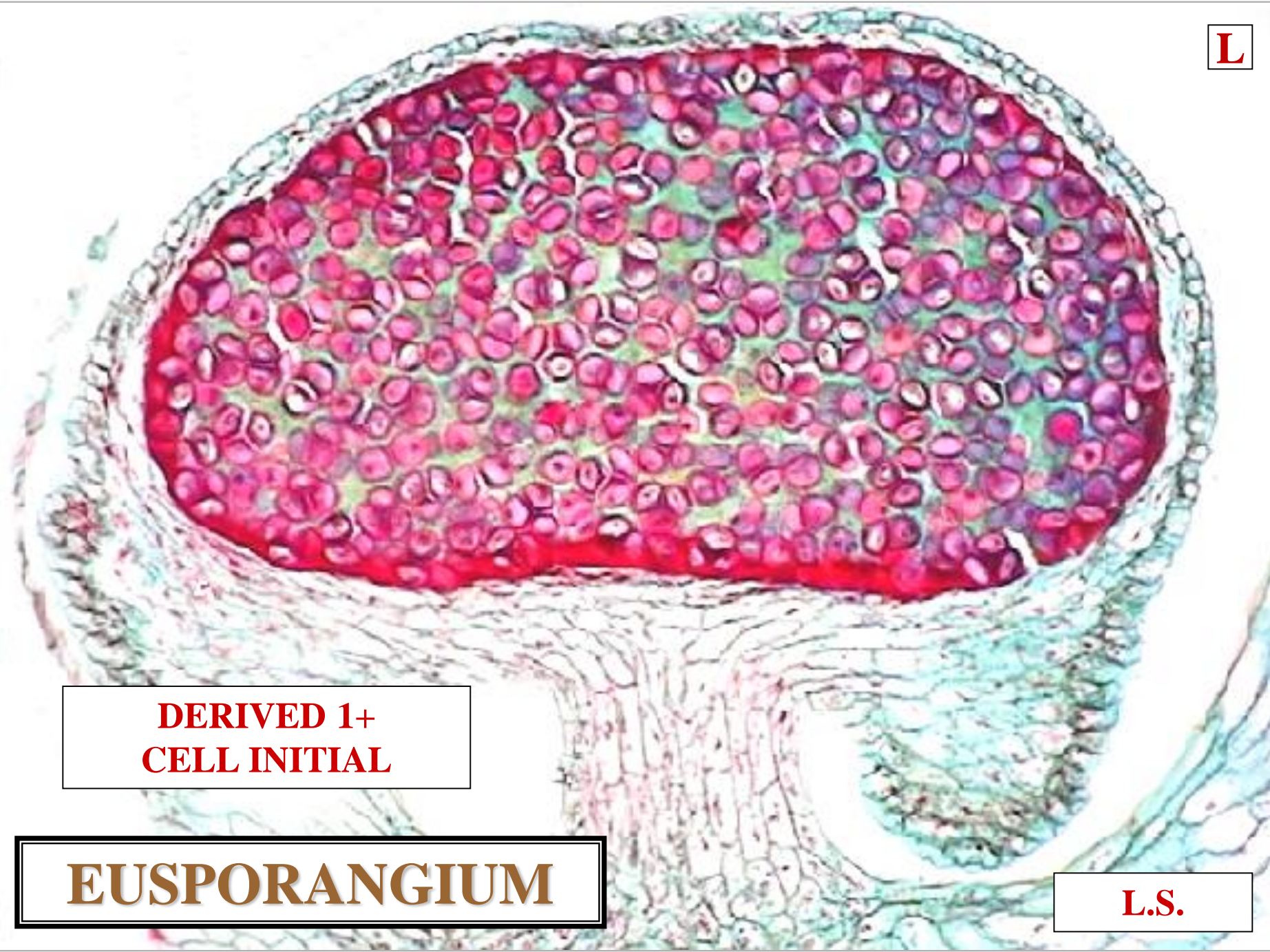
L.S.

L

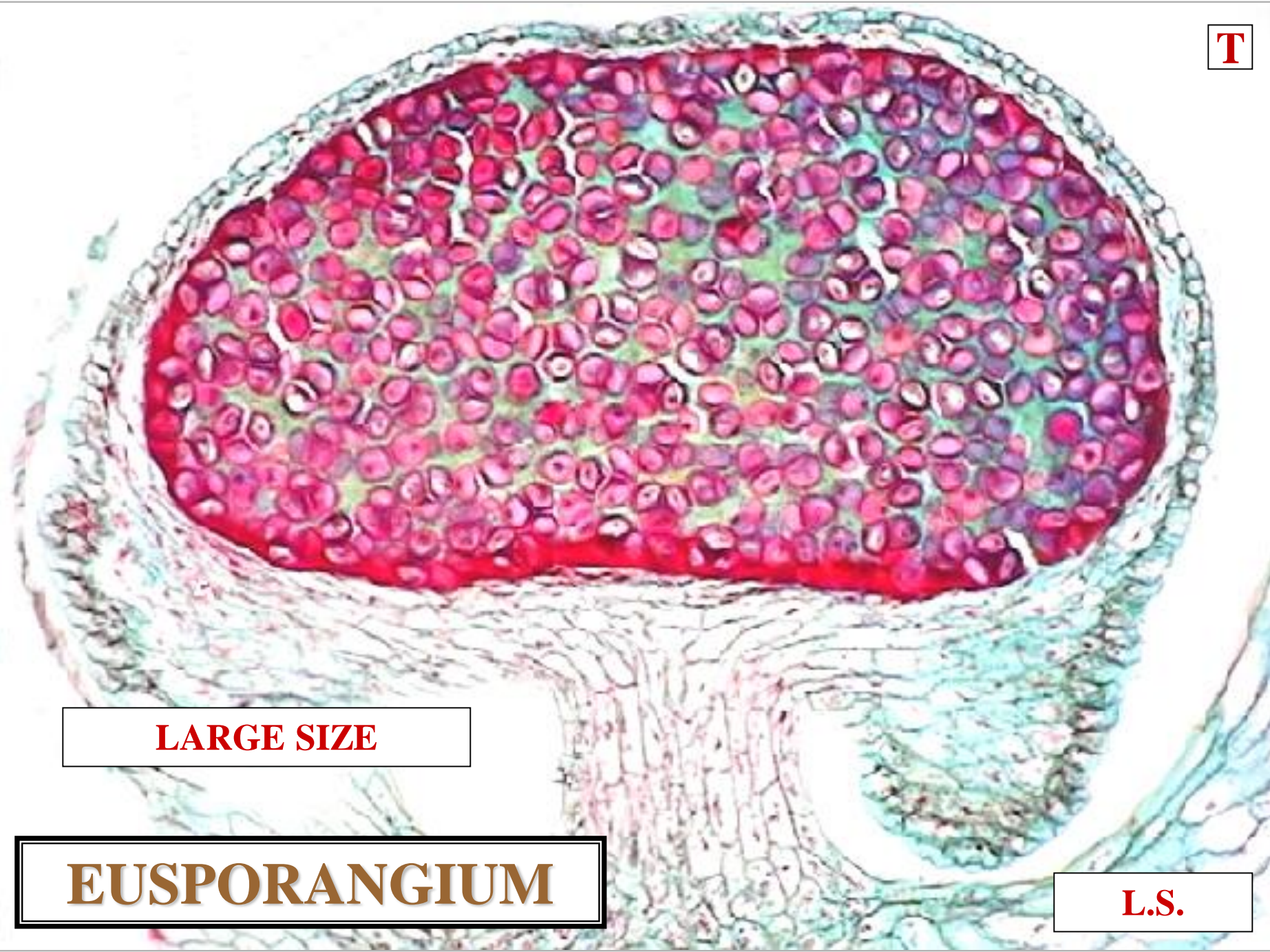
**DERIVED 1+
CELL INITIAL**

EUSPORANGIUM

L.S.



T

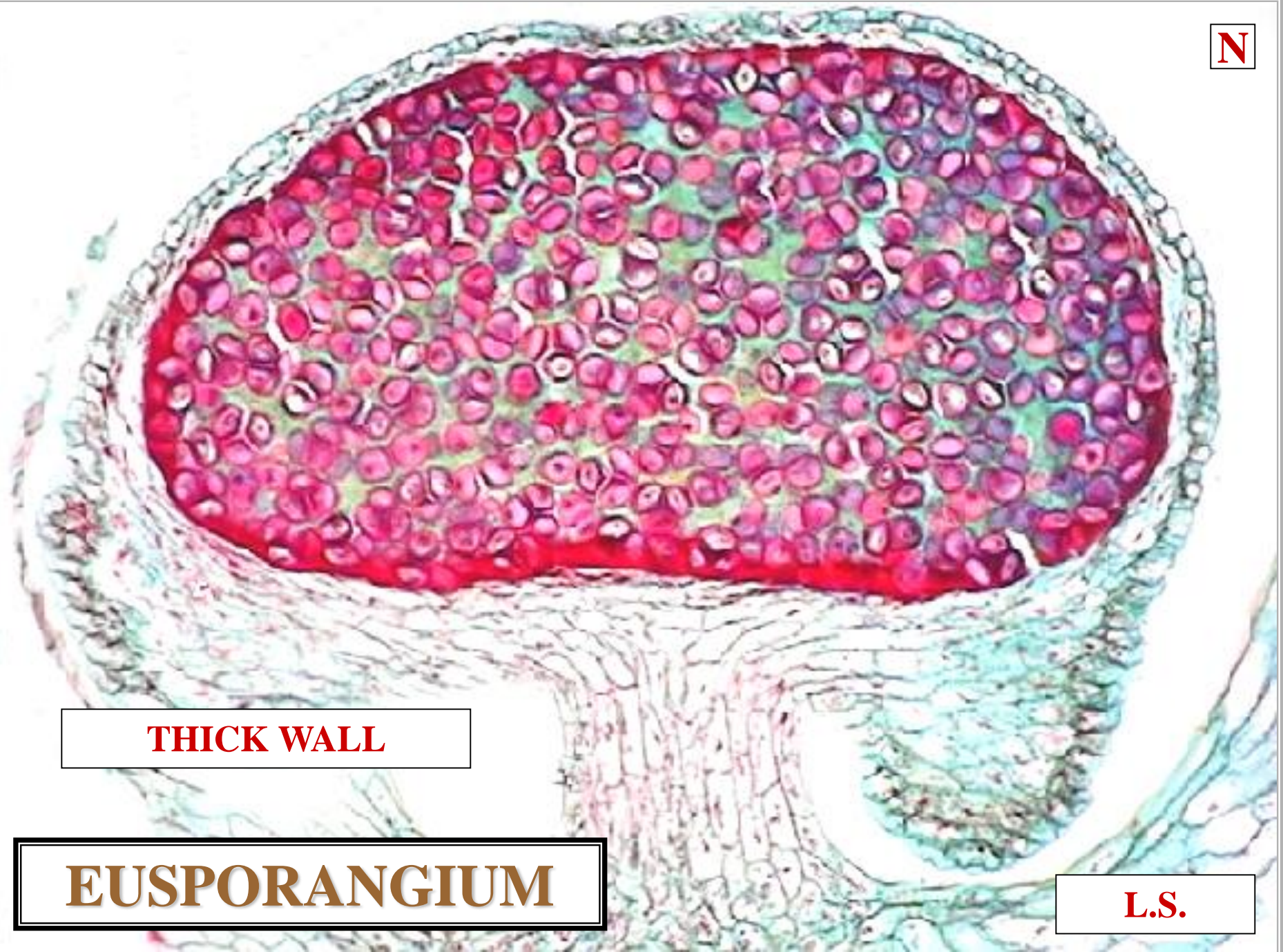


LARGE SIZE

EUSPORANGIUM

L.S.

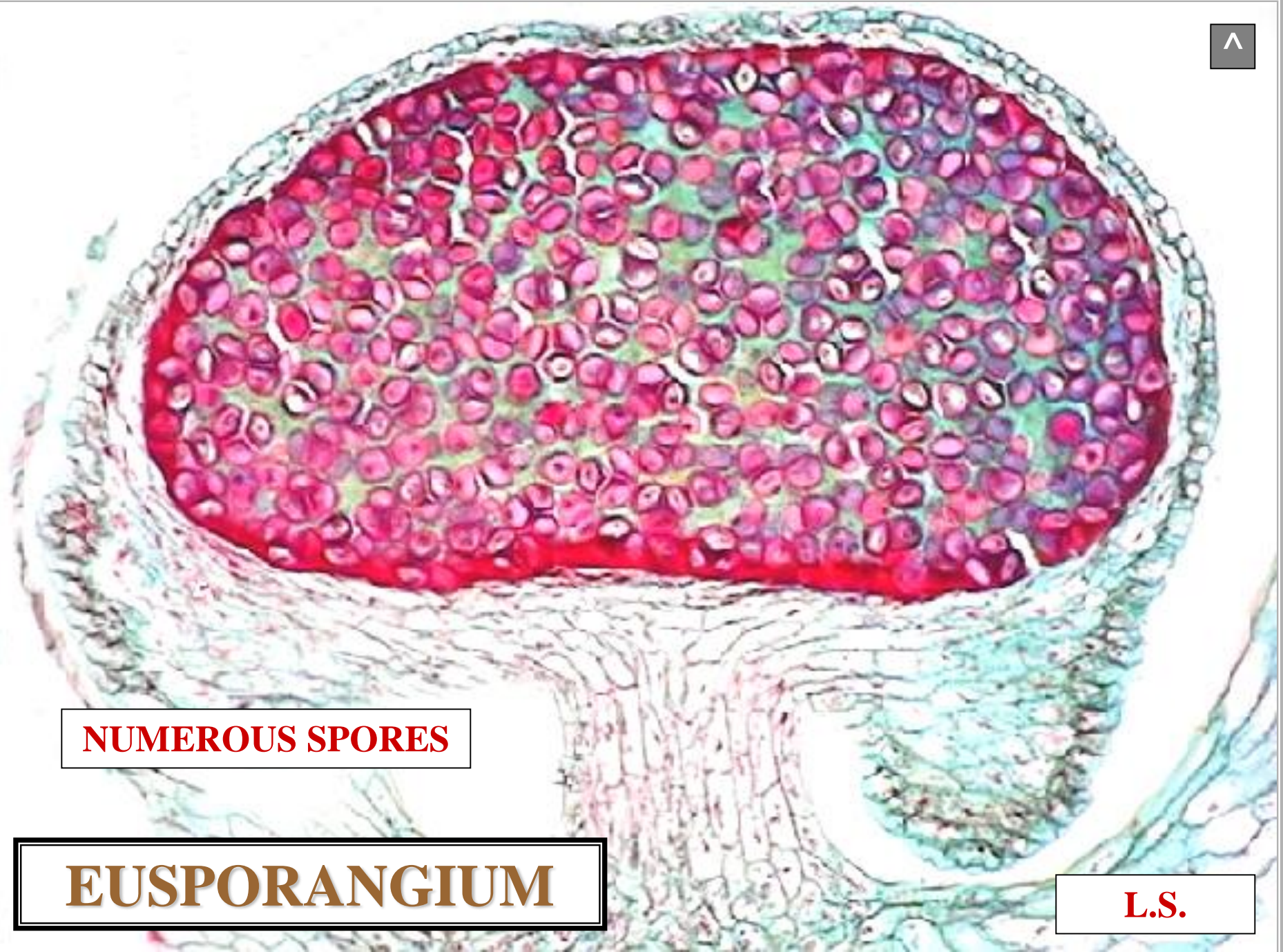
N



THICK WALL

EUSPORANGIUM

L.S.



NUMEROUS SPORES

EUSPORANGIUM

L.S.



LEPTOSPORANGIUM



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



L
P

“ADVANCED FERNS”



LEPTOSPORANGIUM: PRESENT



LEPTOSPORANGIUM: PRESENT



“ADVANCED FERNS”

LEPTOSPORANGIUM: PRESENT

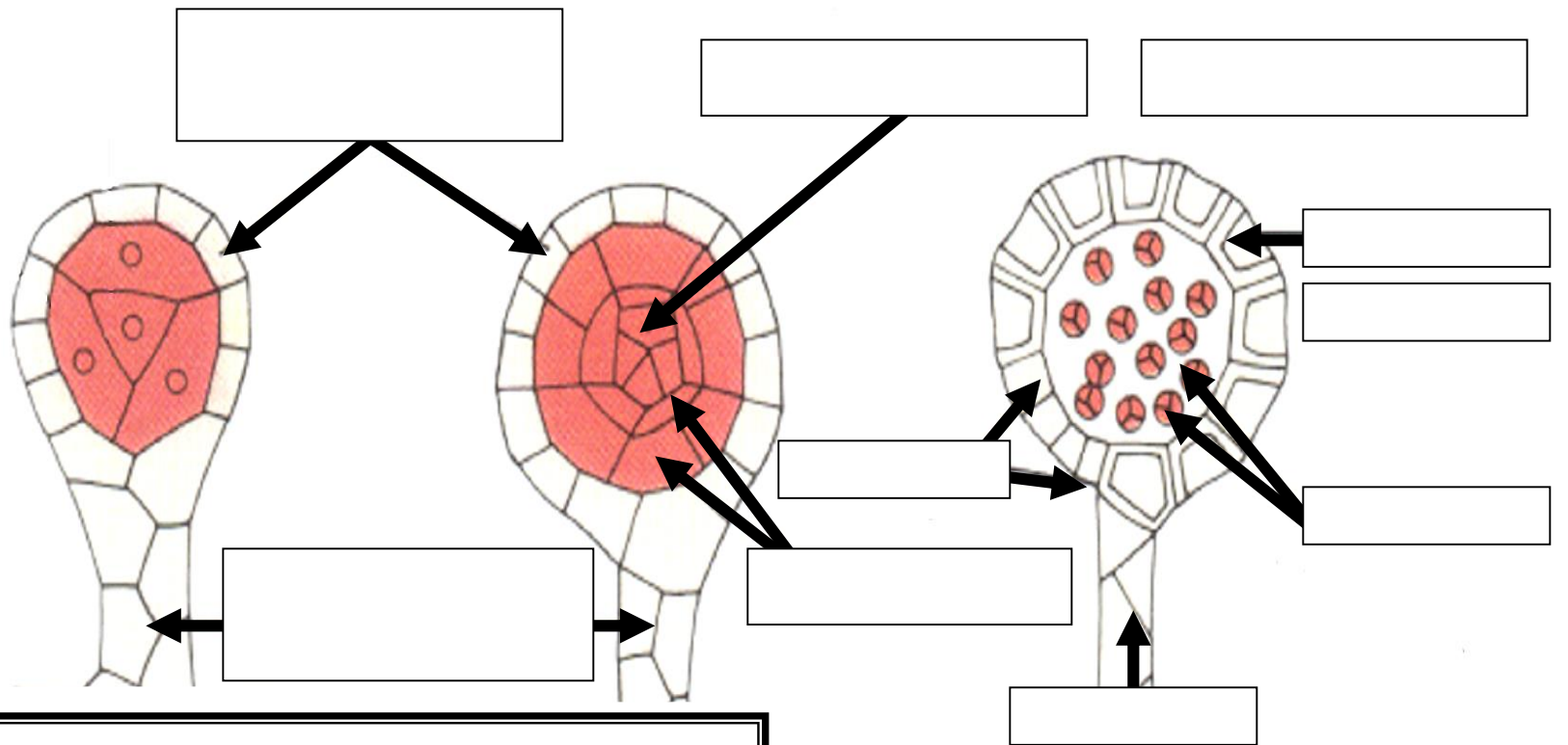
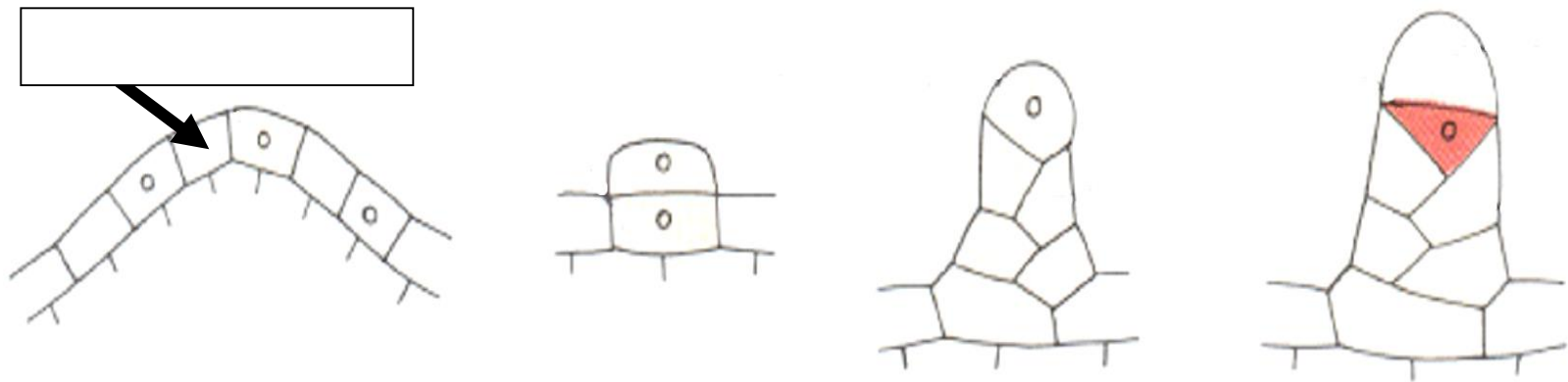


LEPTOSPORANGIUM: PRESENT





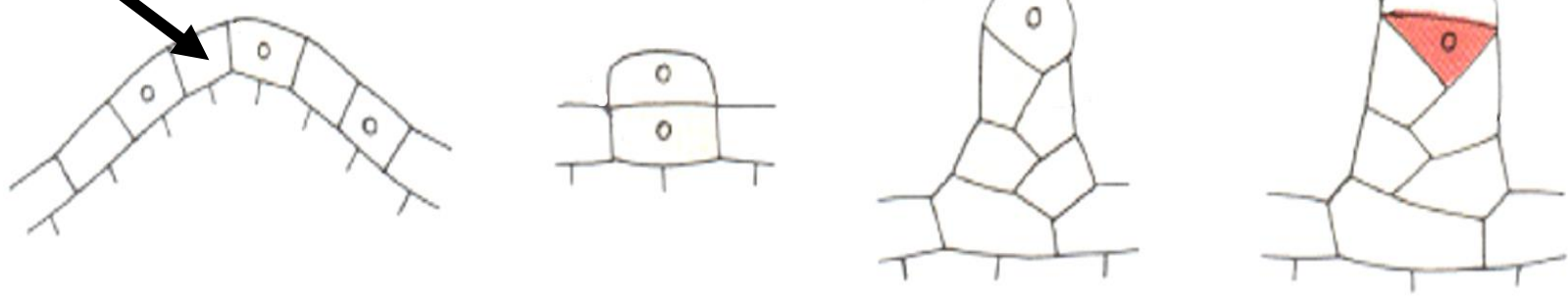
LEPTOSPORANGIUM CHARACTERS



LEPTOSPORANGIUM

L.S.

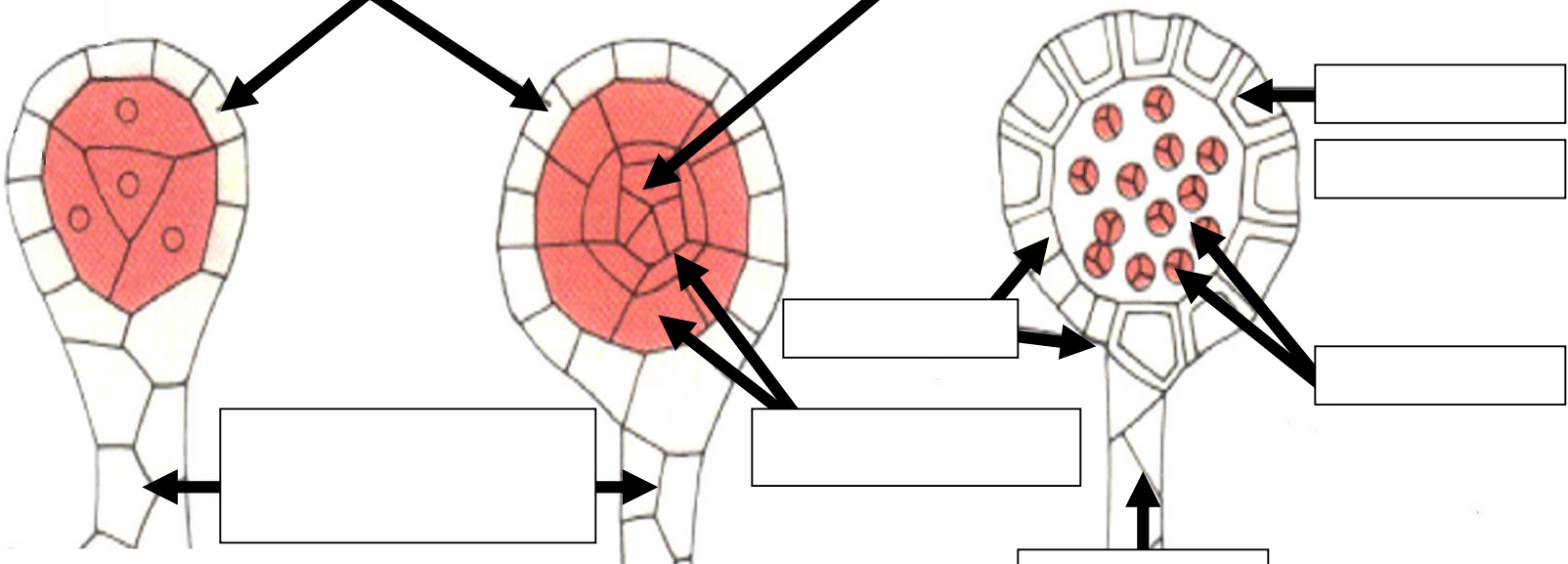
CELL INITIAL



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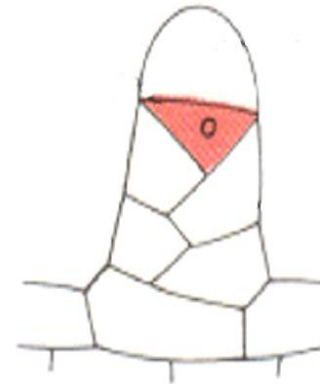
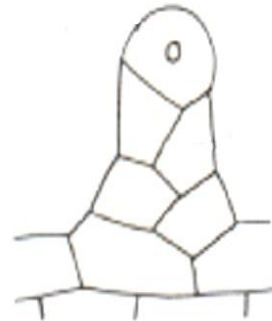
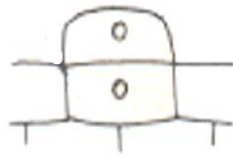
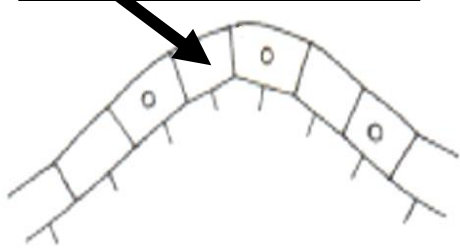
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LEPTOSPORANGIUM

L.S.

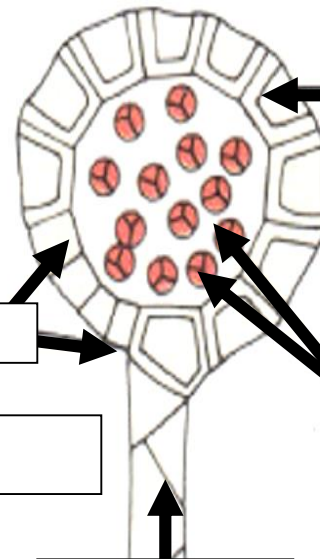
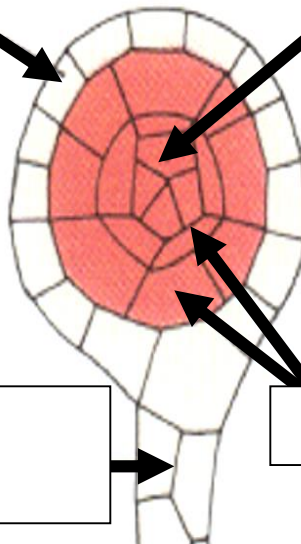
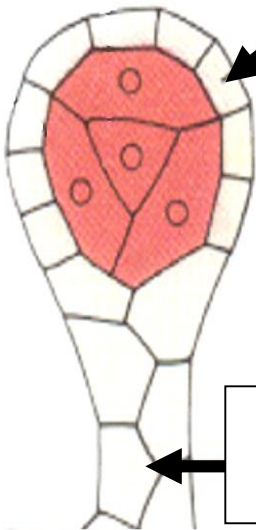
CELL INITIAL



[]

[]

SMALL SIZE



[]

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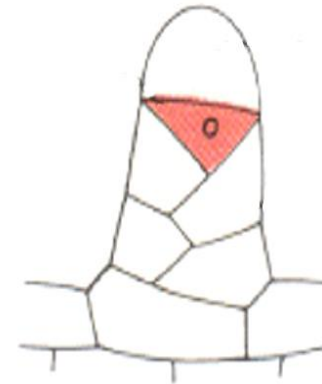
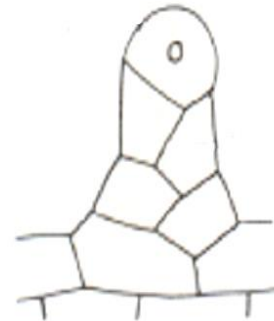
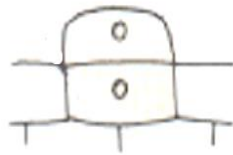
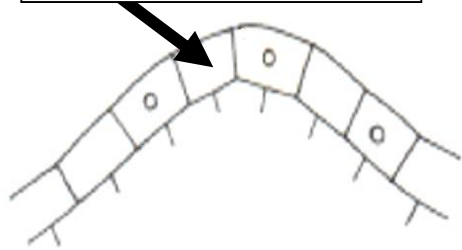
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LEPTOSPORANGIUM

L.S.

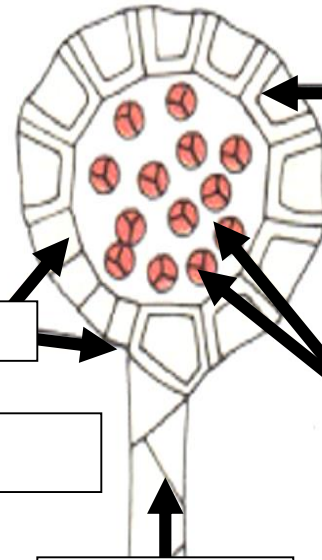
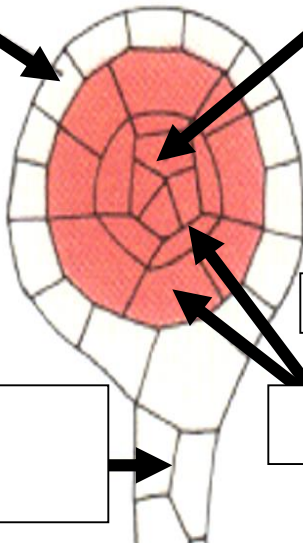
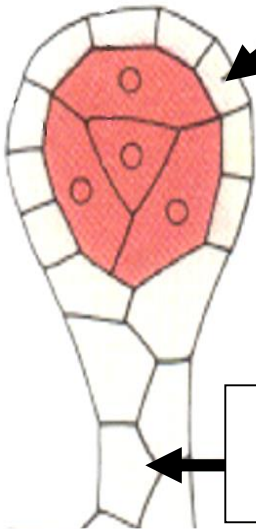
CELL INITIAL



[Empty box]

[Empty box]

SMALL SIZE



[Empty box]

THIN WALL

[Empty box]

[Empty box]

[Empty box]

[Empty box]

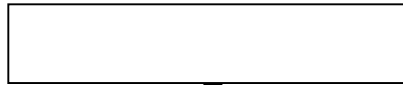
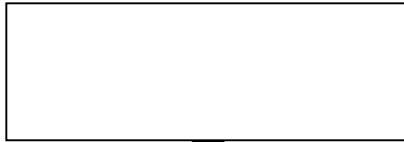
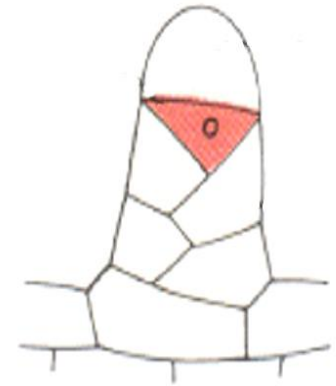
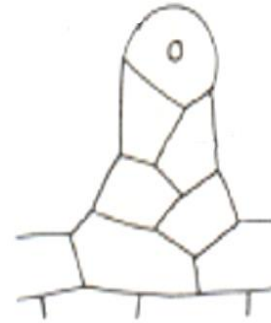
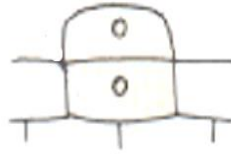
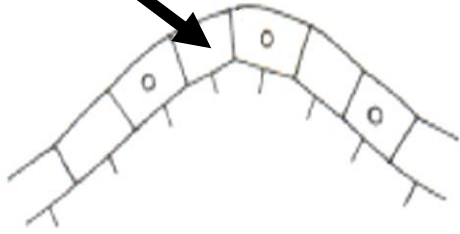
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LEPTOSPORANGIUM

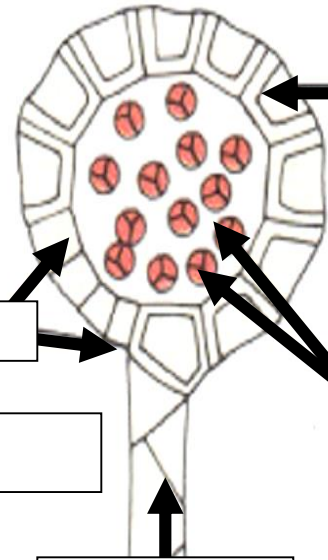
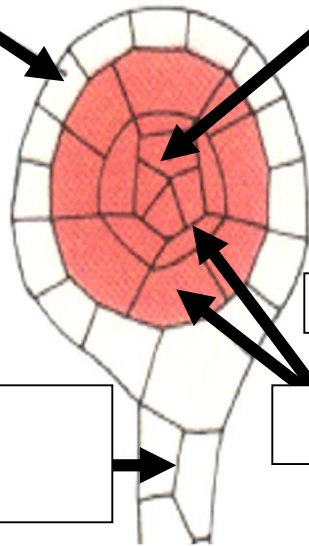
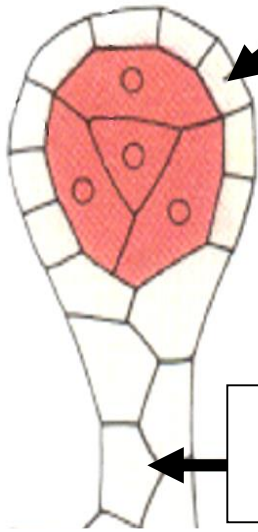
L.S.



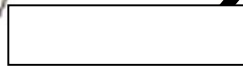
CELL INITIAL



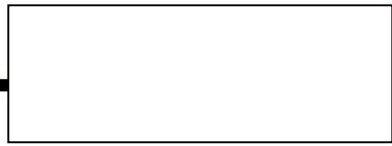
SMALL SIZE



THIN WALL

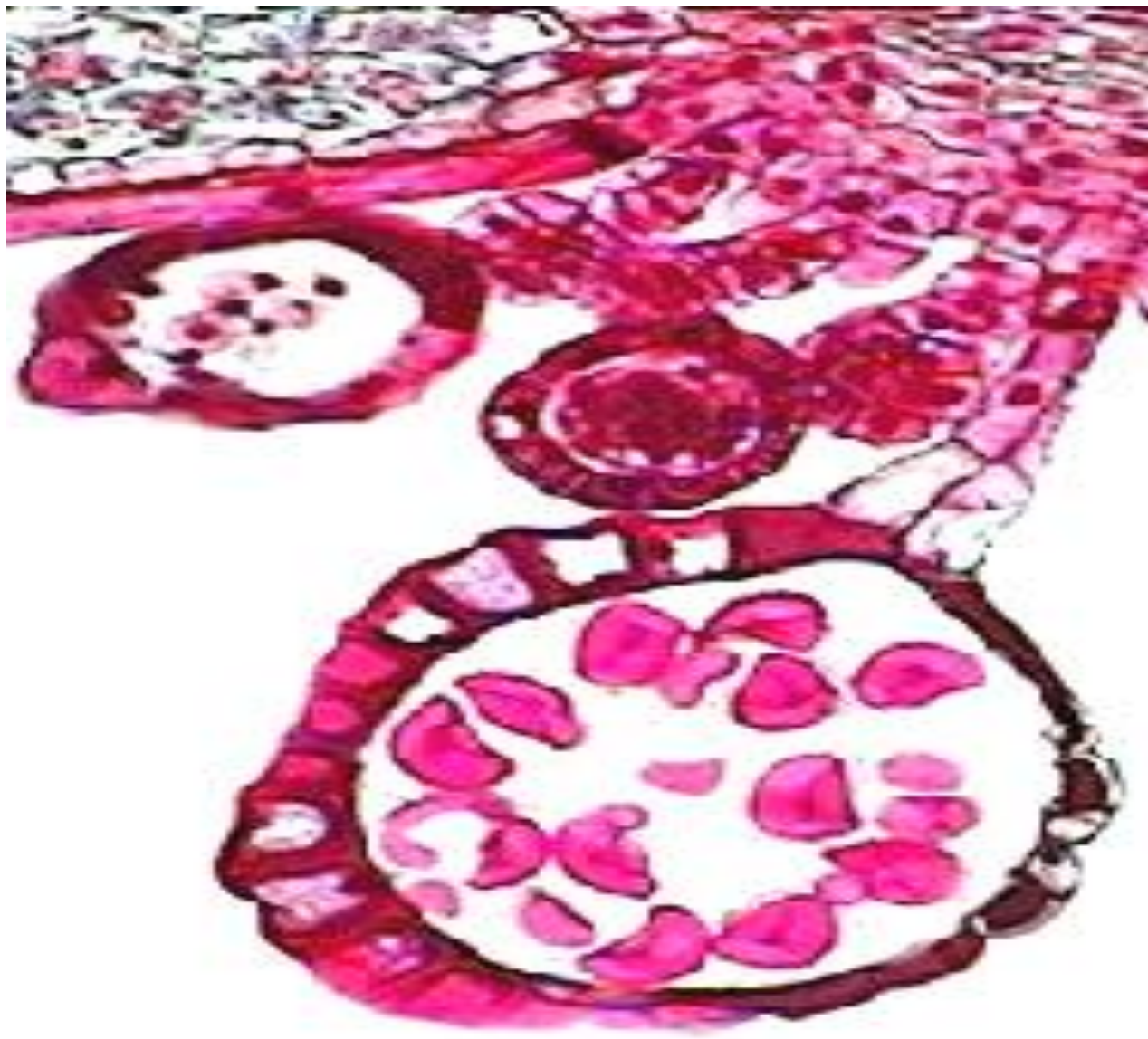


FEW SPORES



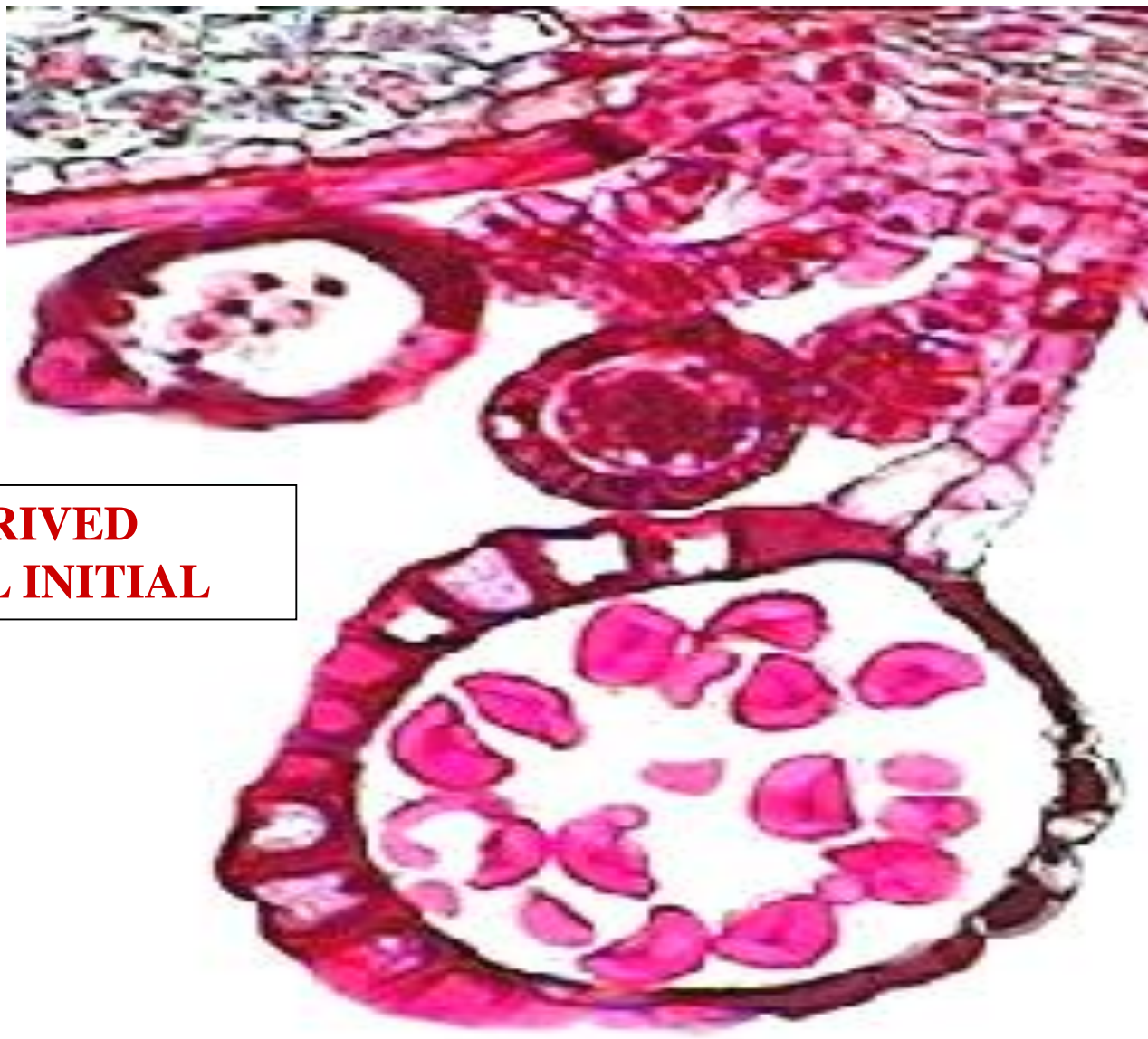
L.S.

LEPTOSPORANGIUM



LEPTOSPORANGIUM

L.S.



**DERIVED
1 CELL INITIAL**

LEPTOSPORANGIUM

L.S.



SMALL SIZE

LEPTOSPORANGIUM

L.S.



THIN WALL

LEPTOSPORANGIUM

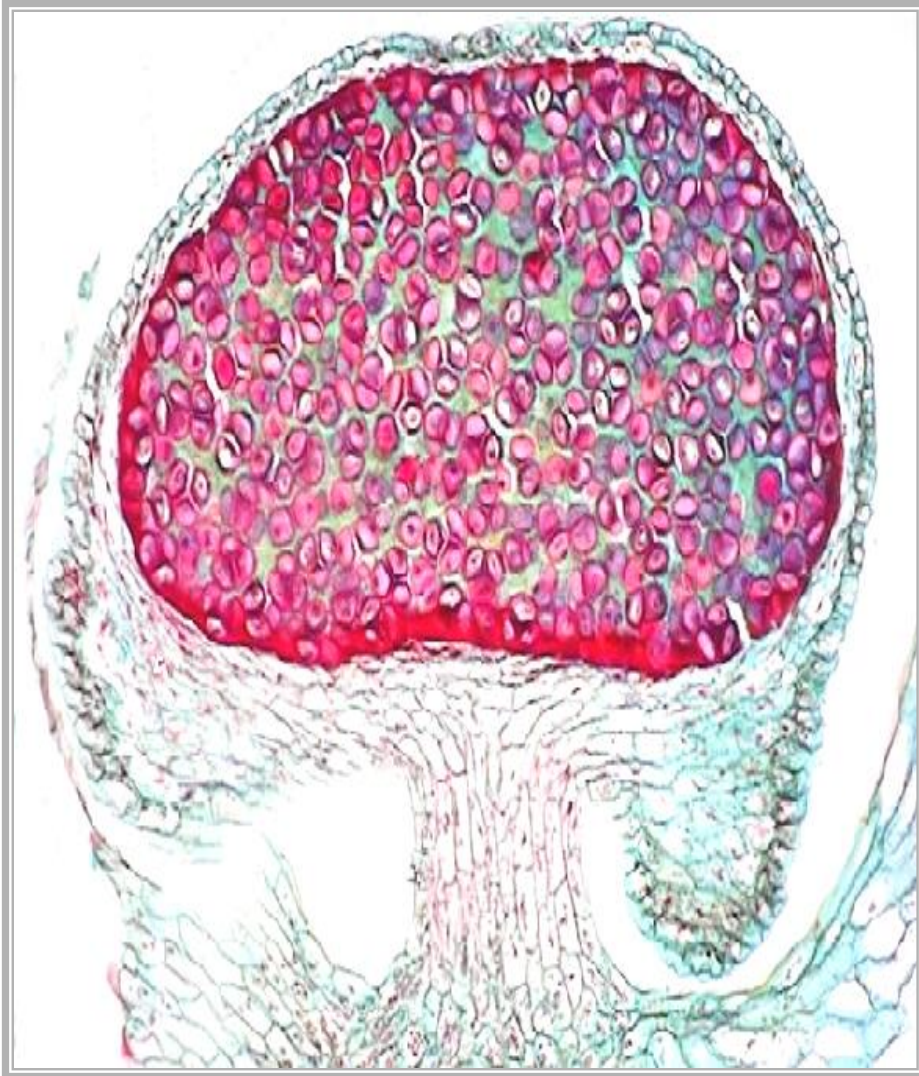
L.S.



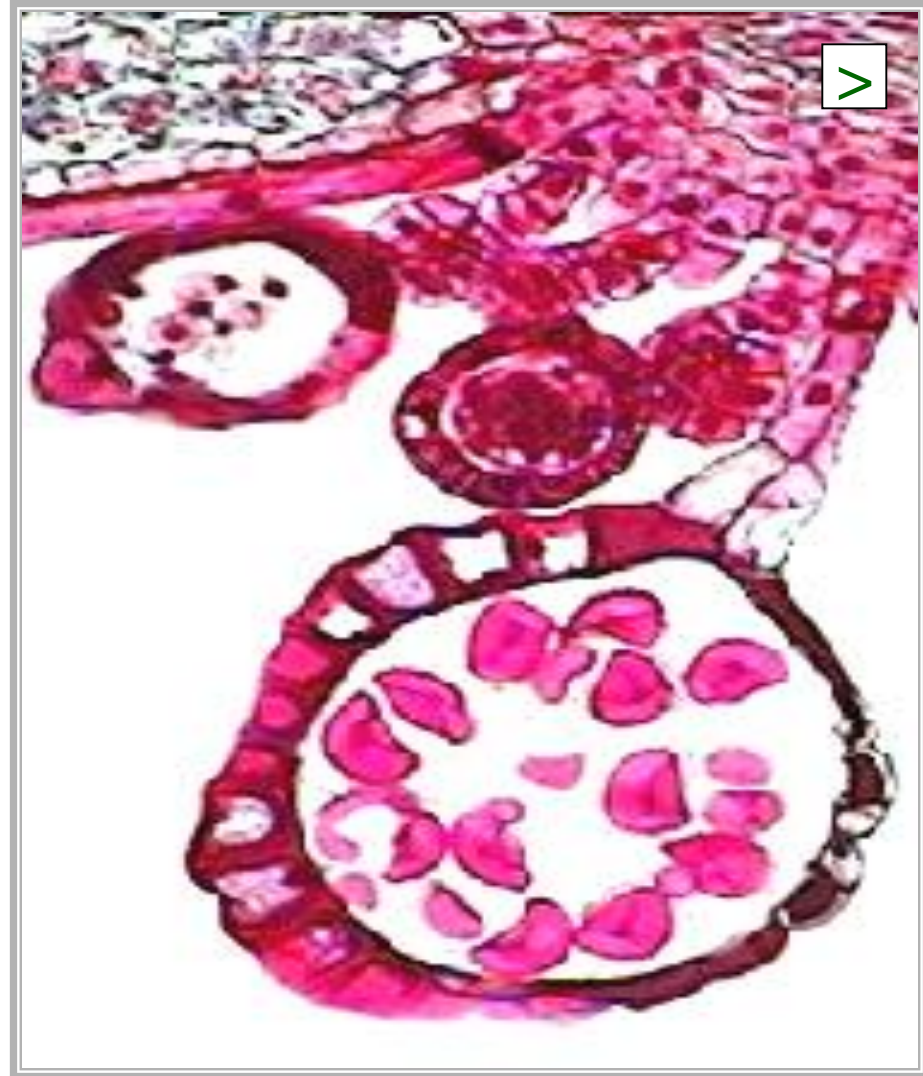
FEW SPORES

LEPTOSPORANGIUM

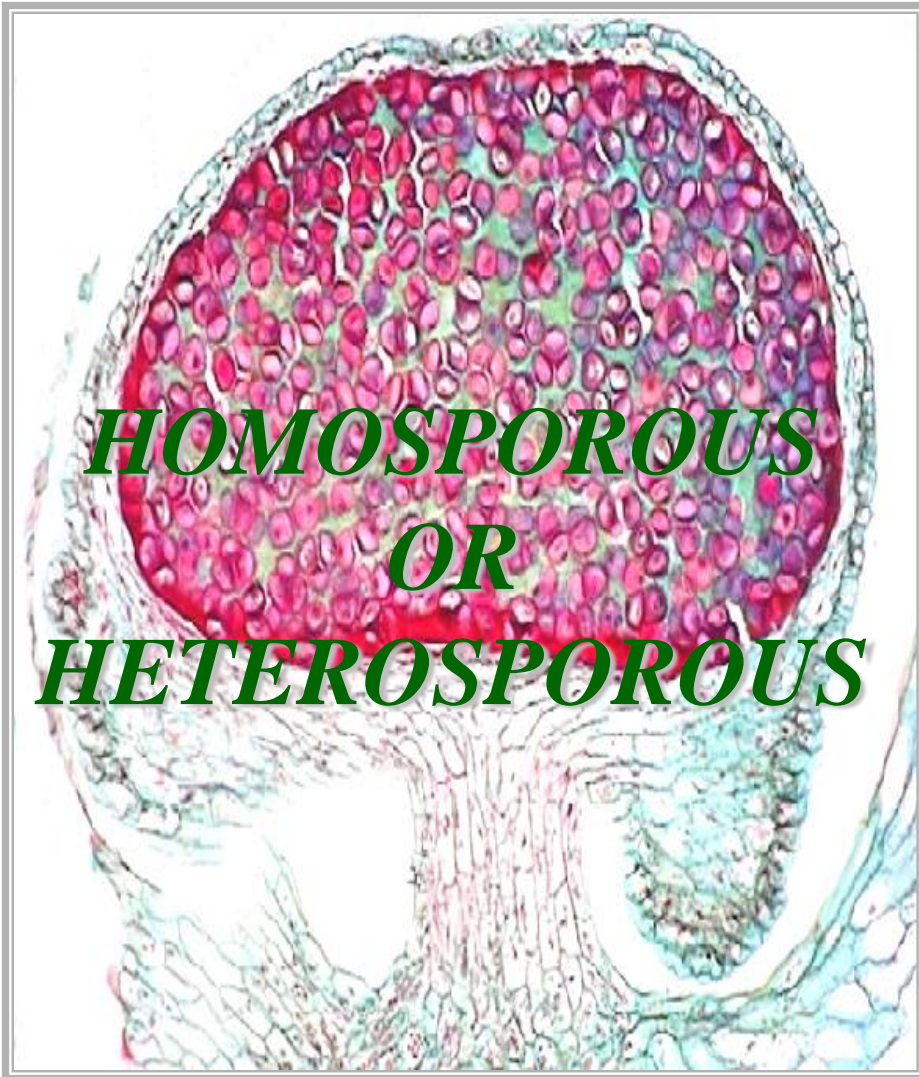
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EUSPORANGIUM

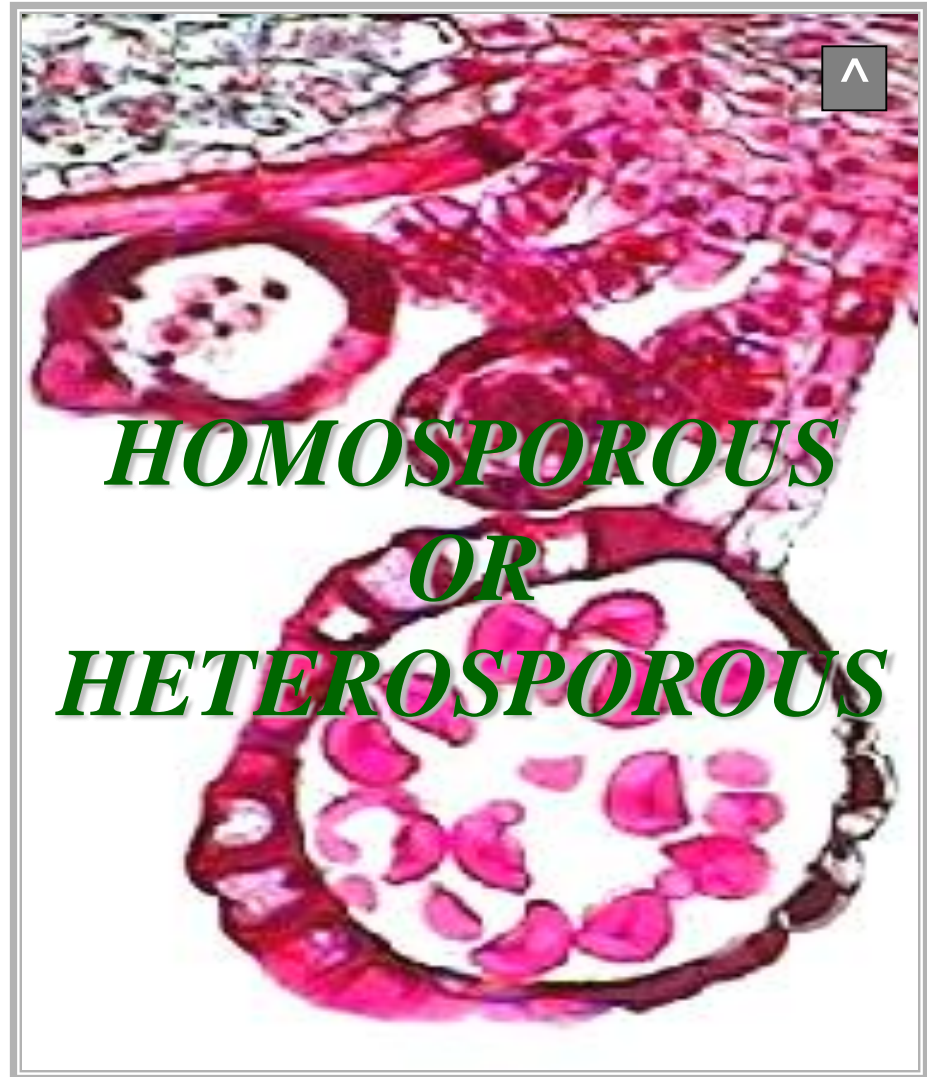


LEPTOSPORANGIUM



***HOMOSPOROUS
OR
HETEROSPOROUS***

EUSPORANGIUM



***HOMOSPOROUS
OR
HETEROSPOROUS***

LEPTOSPORANGIUM



HOMOSPOROUS VS HETEROSPOROUS

HOMOSPOROUS

HOMOSPOROUS



HOMOSPOROUS

1 SPORANGIUM FORM

HOMOSPOROUS



HOMOSPOROUS

1 SPORANGIUM FORM

1 SPORE FORM

HOMOSPOROUS

L



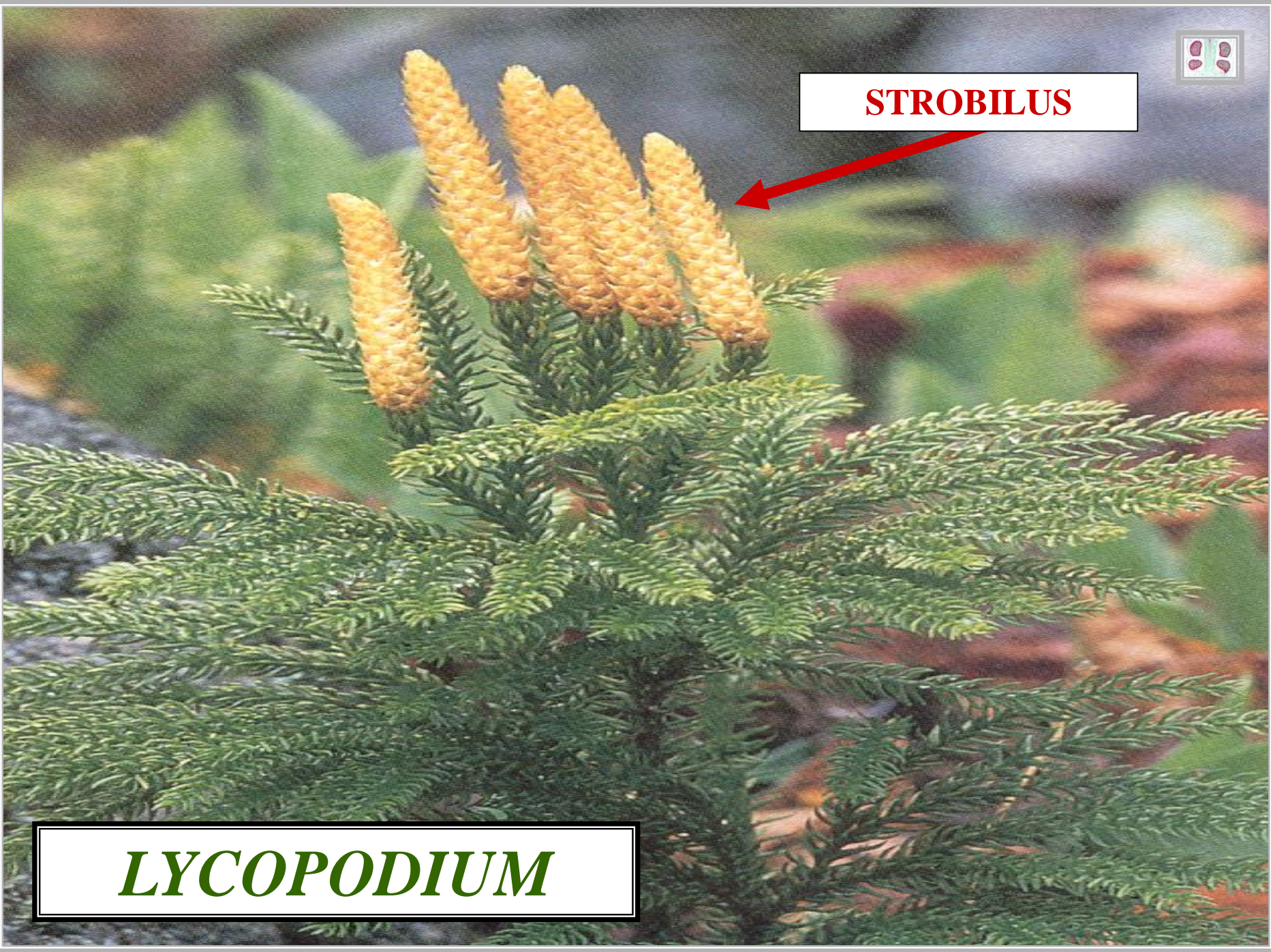
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STROBILUS

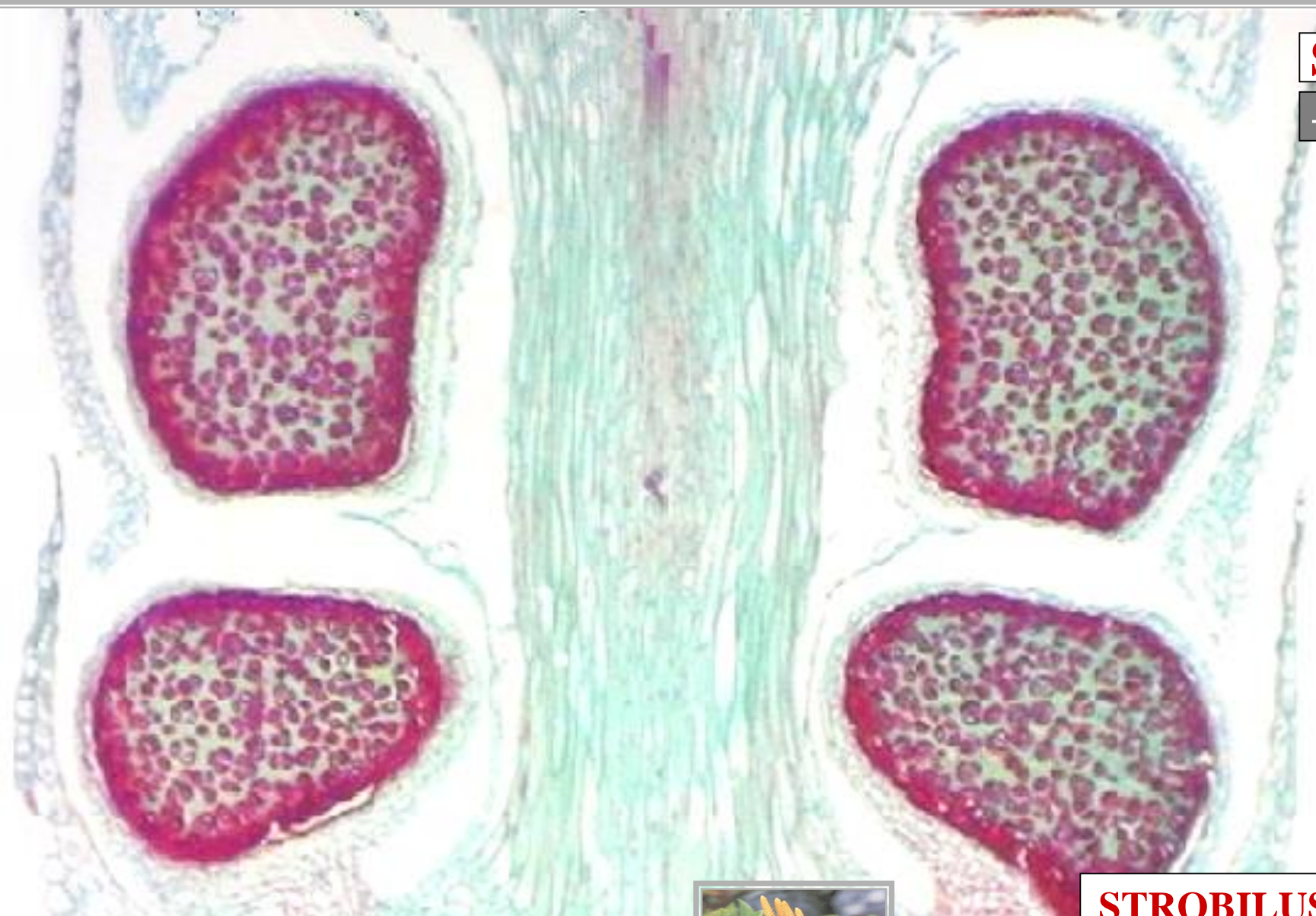


LYCOPODIUM



S

+



LYCOPODIUM



STROBILUS

L.S.



SPORANGIUM



STROBILUS

LYCOPODIUM



L.S.

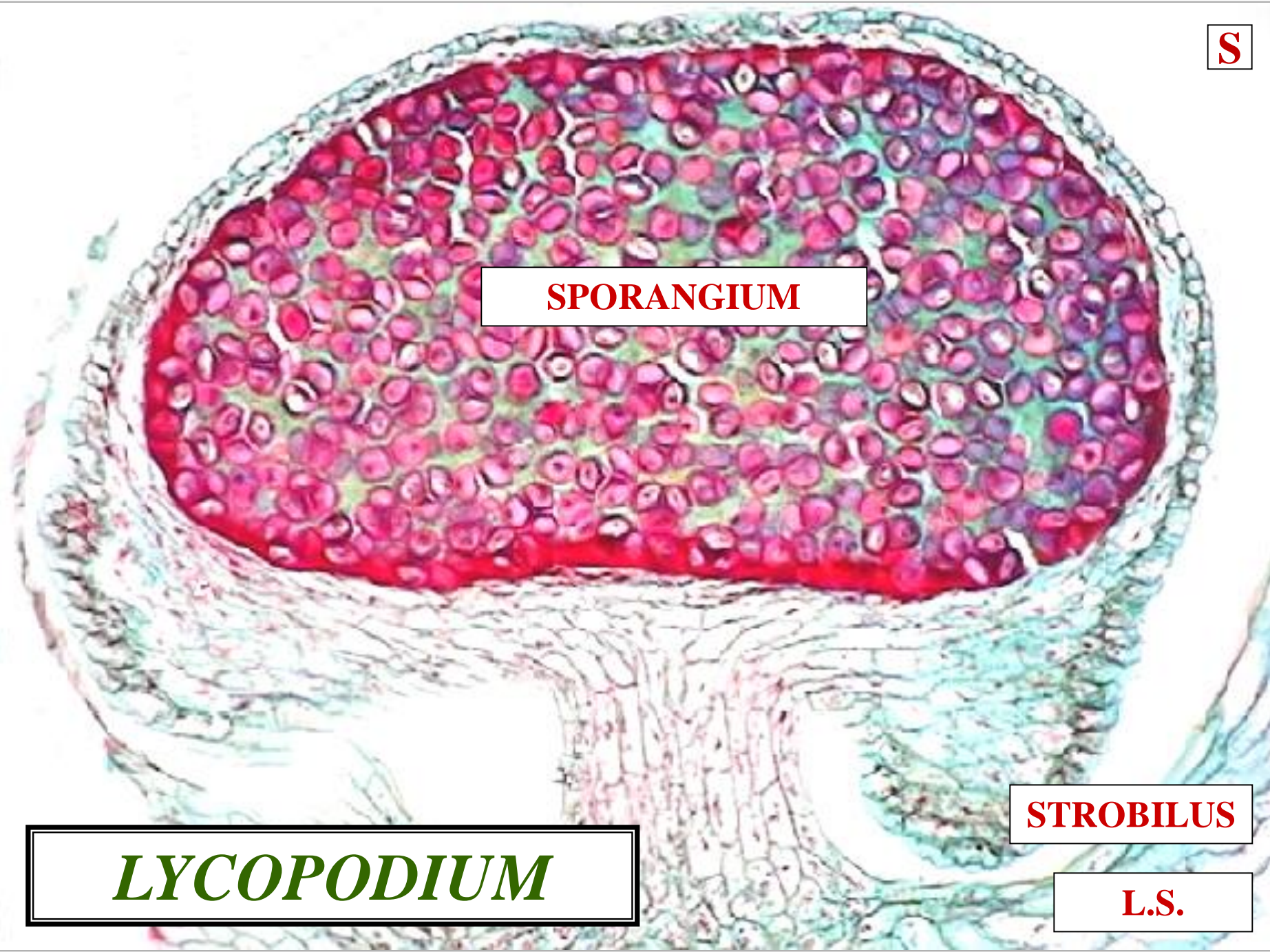
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SPORANGIUM

STROBILUS

L.S.

LYCOPODIUM



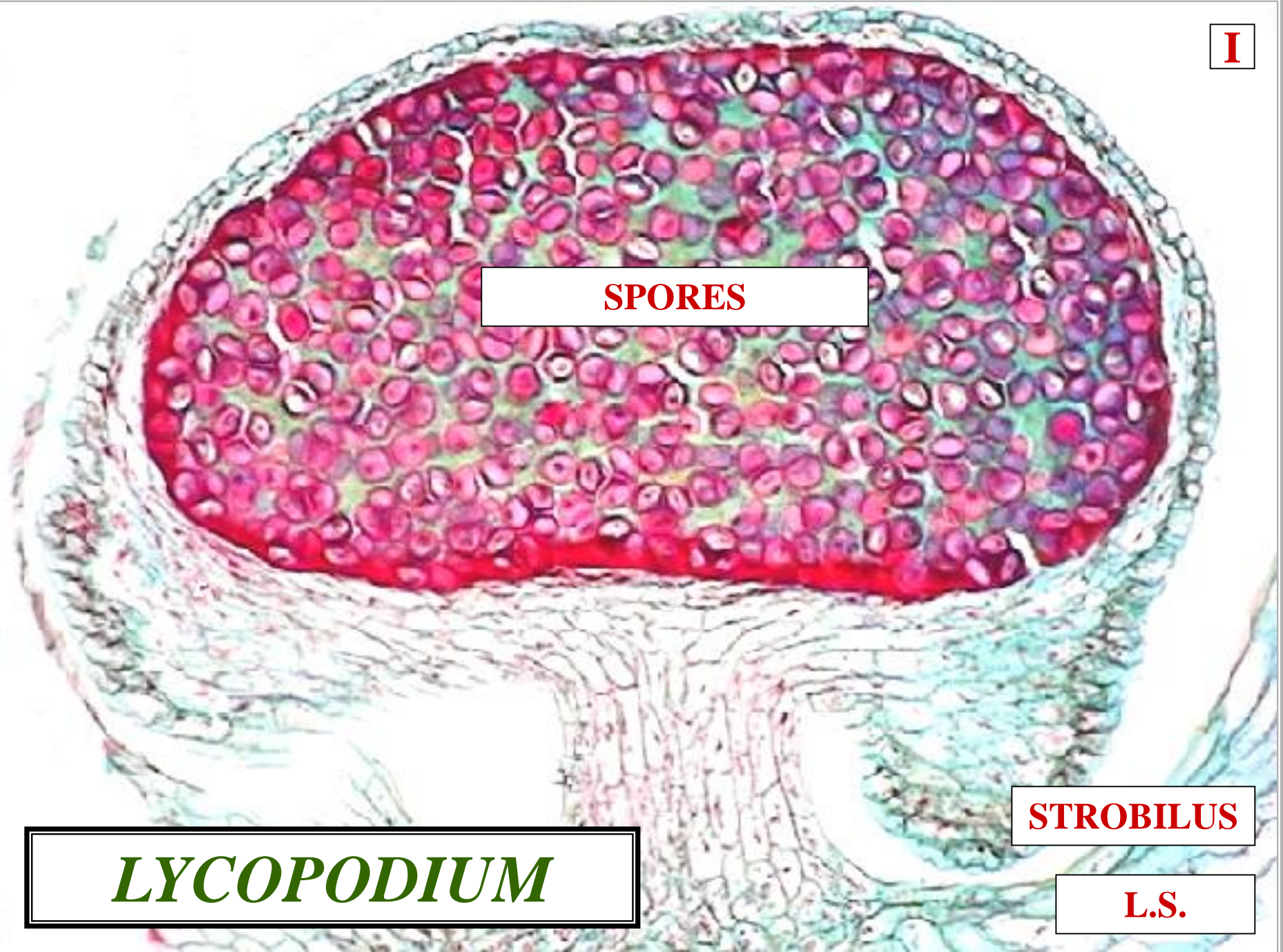
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SPORES

STROBILUS

LYCOPODIUM

L.S.



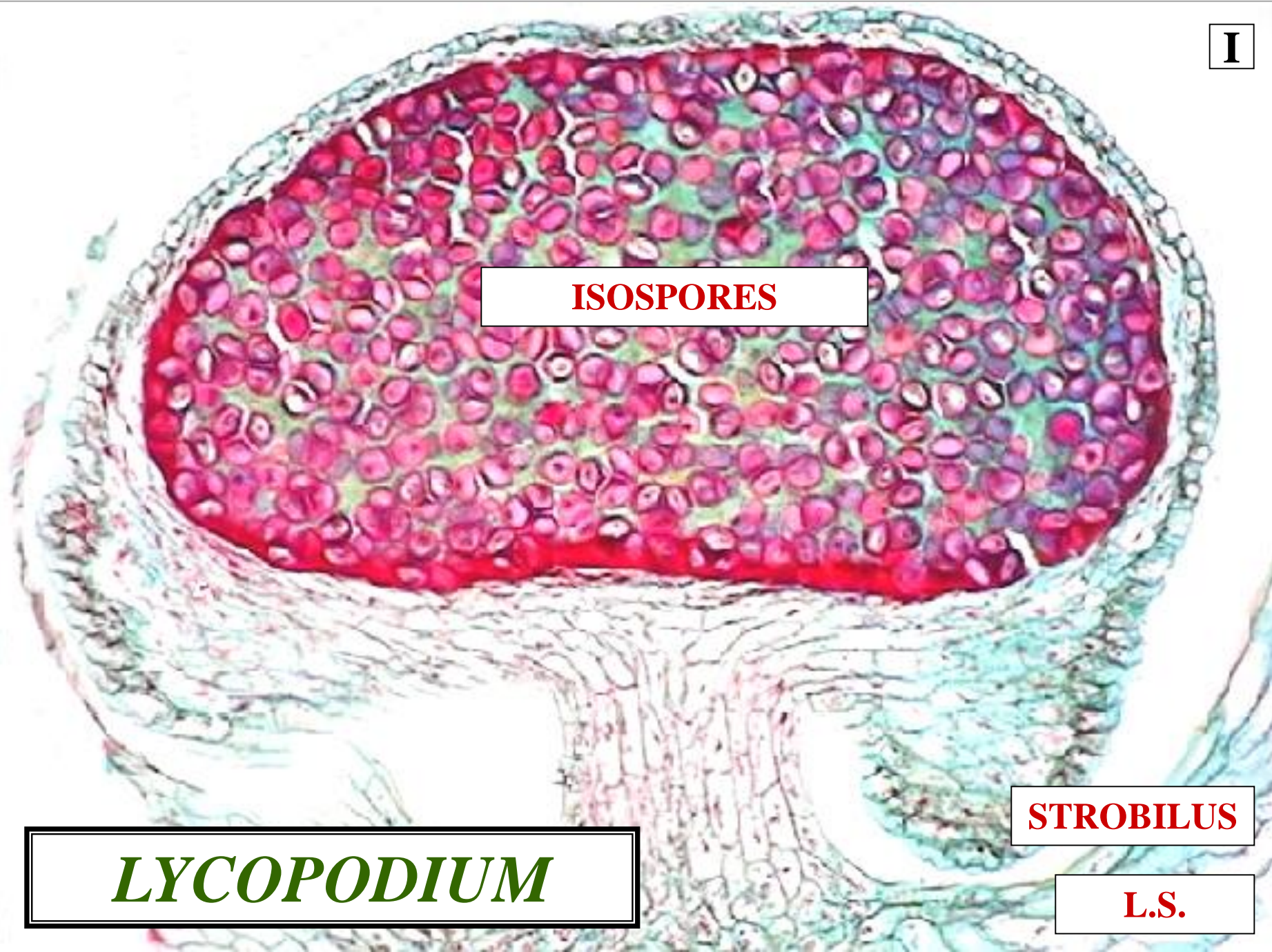
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ISOSPORES

STROBILUS

LYCOPODIUM

L.S.



ISOSPORES



ISOSPORES

EQUAL SIZE

ISOSPORES

**SPOROPHYTE
STROBILUS**

LYCOPODIUM

M

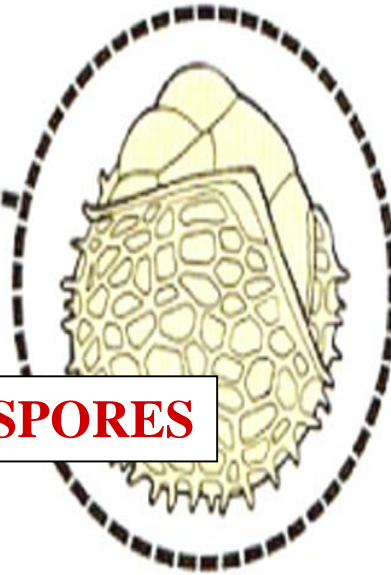
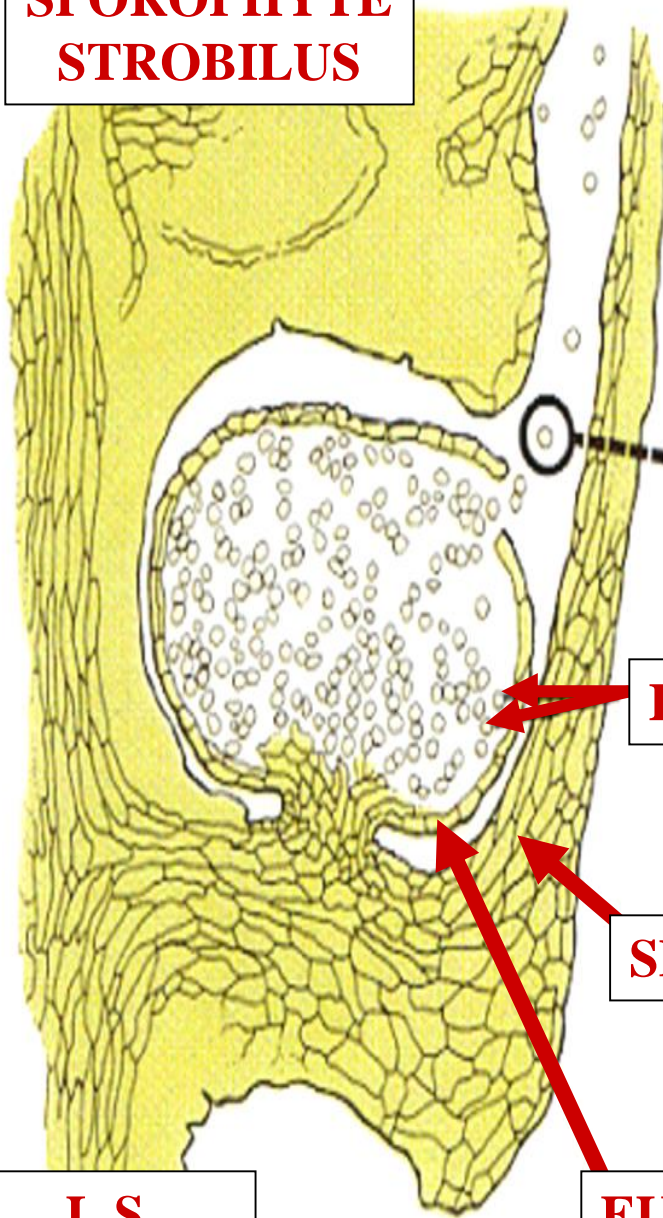
ISOSPORE

ISOSPORES

SPOROPHYLL

L.S.

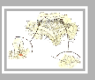
EUSPORANGIUM



**SPOROPHYTE
STROBILUS**

LYCOPODIUM

?



MITOSIS

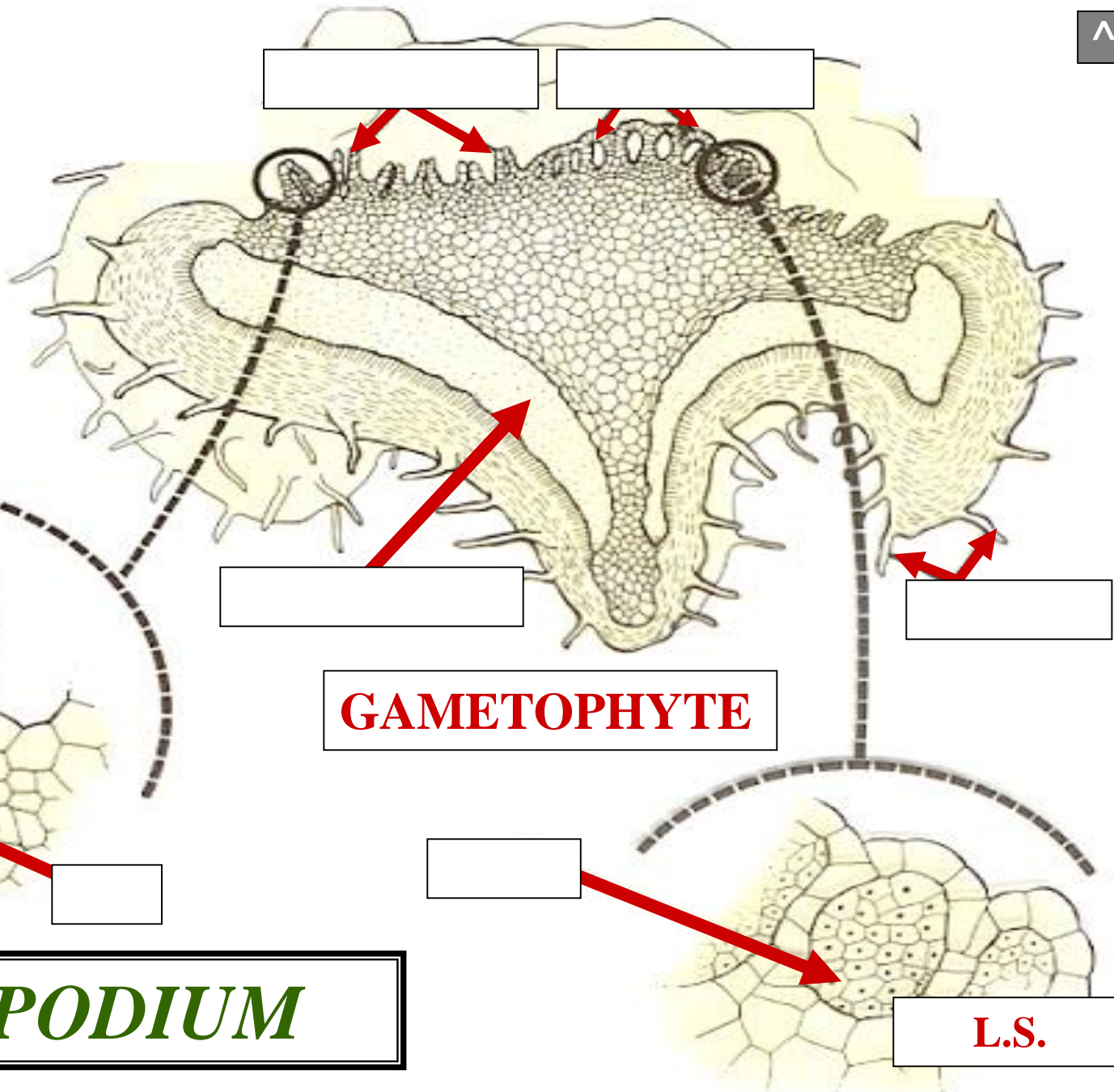
ISOSPORES

SPOROPHYLL

L.S.

EUSPORANGIUM





EXOSPORIC GAMETOPHYTE

**EXOSPORIC
GAMETOPHYTE**



**EXOSPORIC
GAMETOPHYTE**

**GAMETOPHYTE
MATURES OUTSIDE
SPORE WALL**

**EXOSPORIC
GAMETOPHYTE**

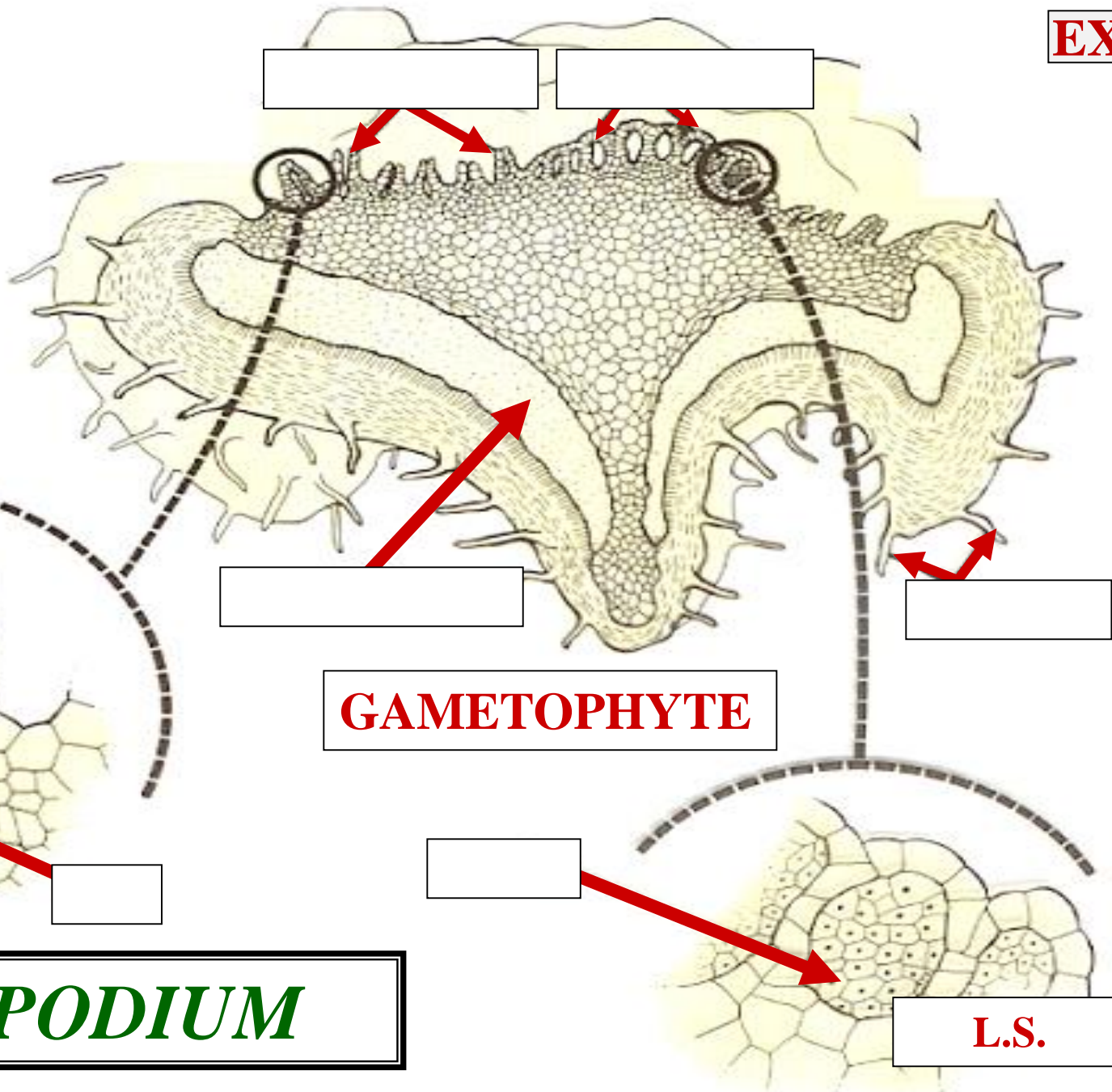
**EXOSPORIC
GAMETOPHYTE**



**GAMETOPHYTE
BISEXUAL**

**EXOSPORIC
GAMETOPHYTE**

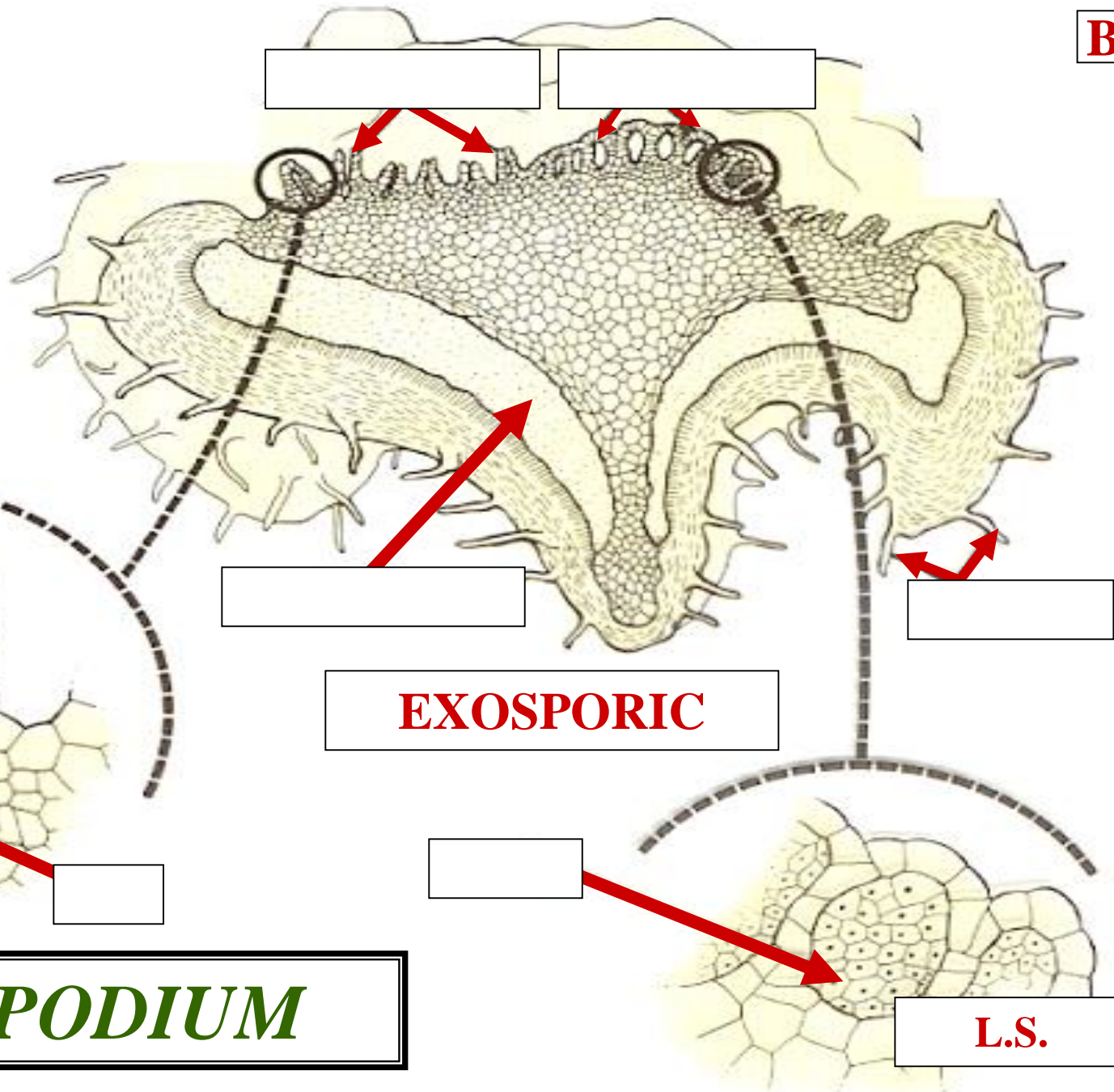
EX



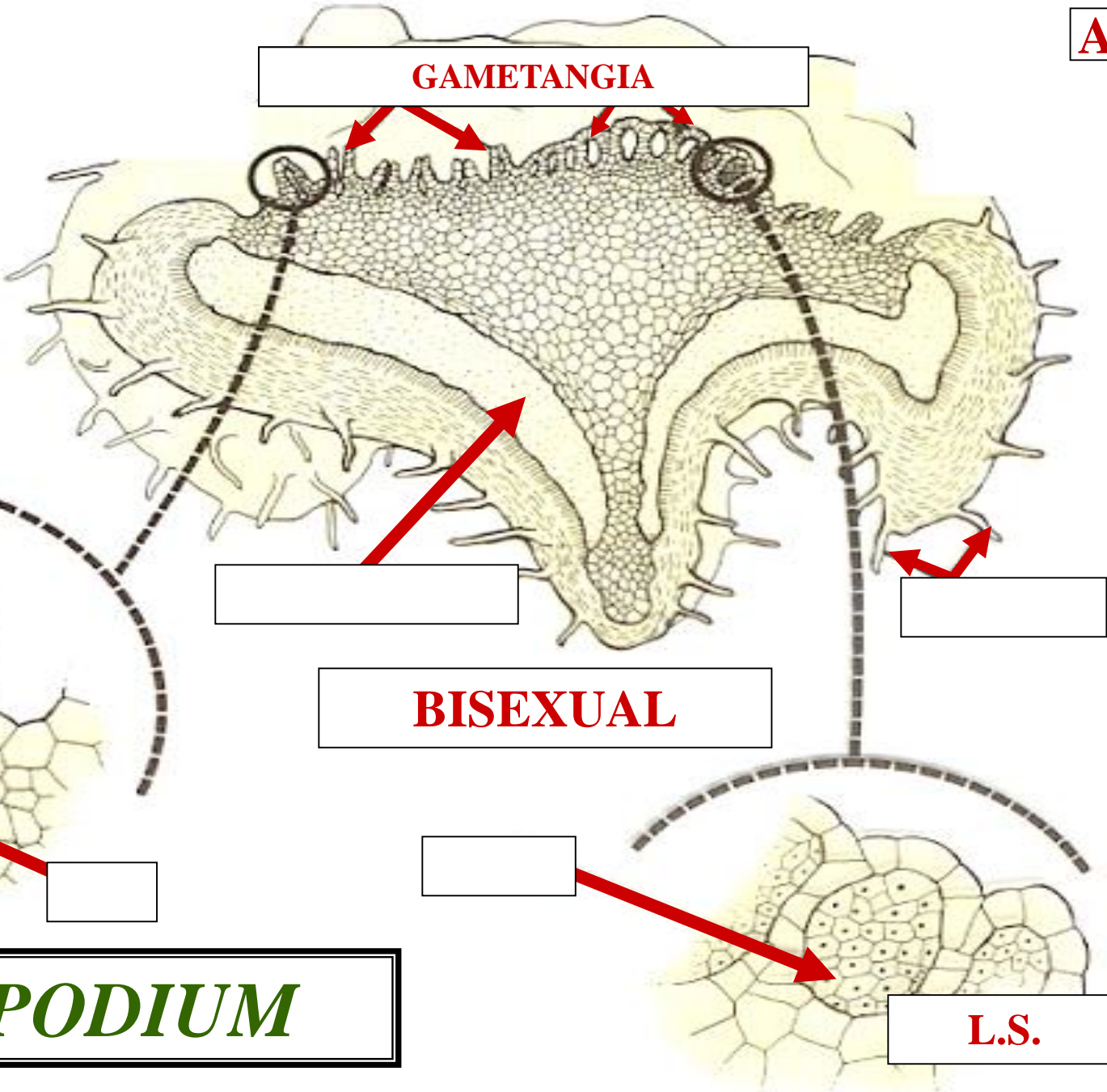
LYCOPODIUM

L.S.

B



A



GAMETANGIA

BISEXUAL

L.S.

LYCOPODIUM