

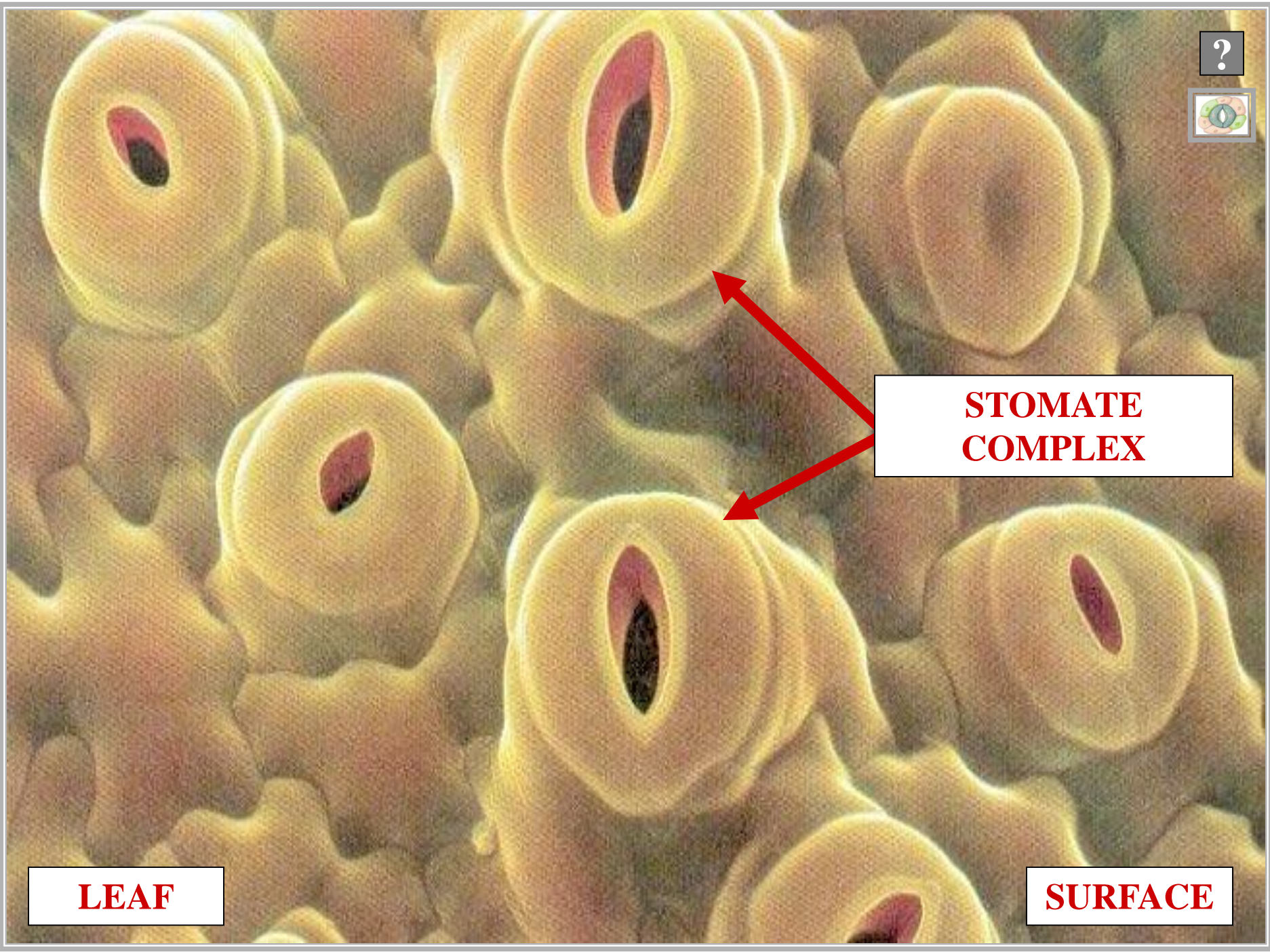
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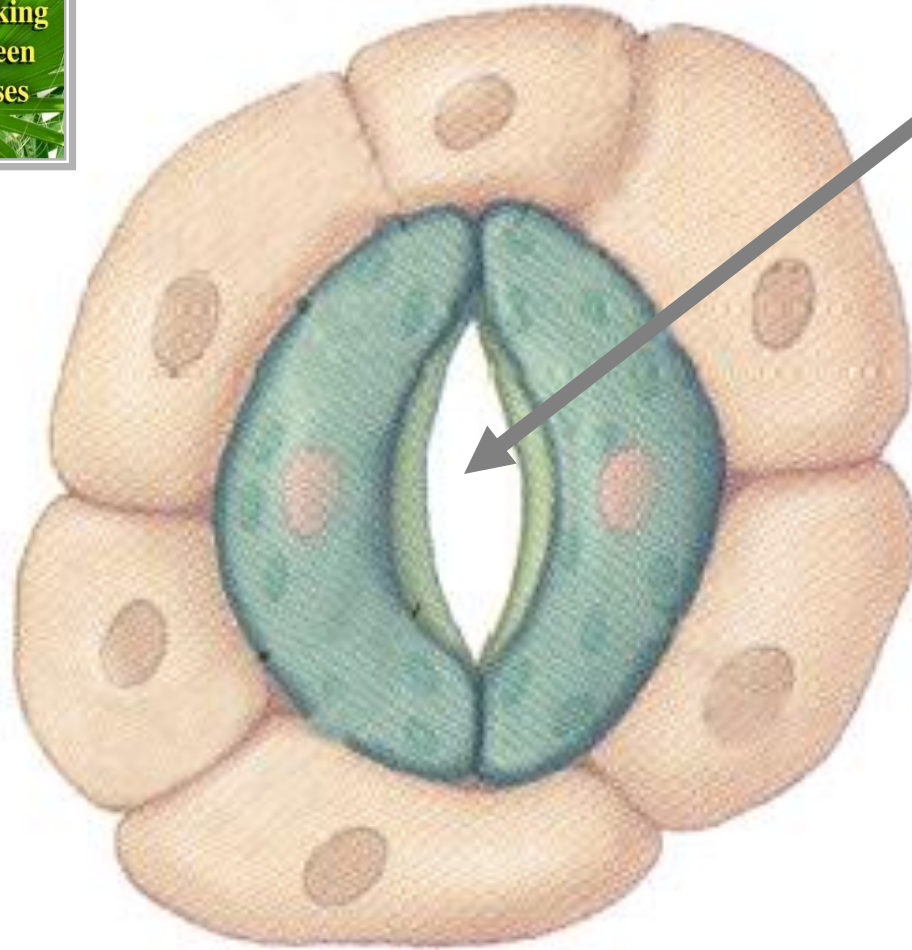
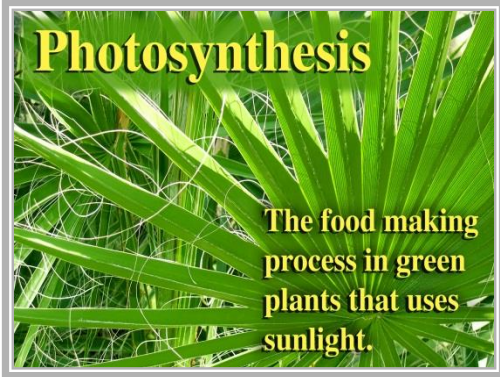
**STOMATE
COMPLEX**

LEAF

SURFACE



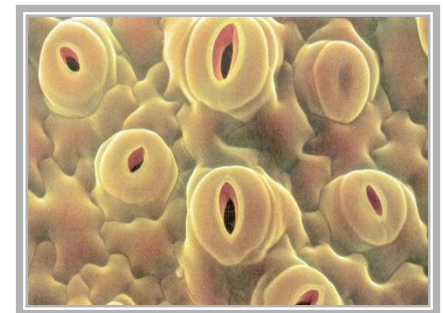
LEAF STOMATE COMPLEX



?

SURFACE

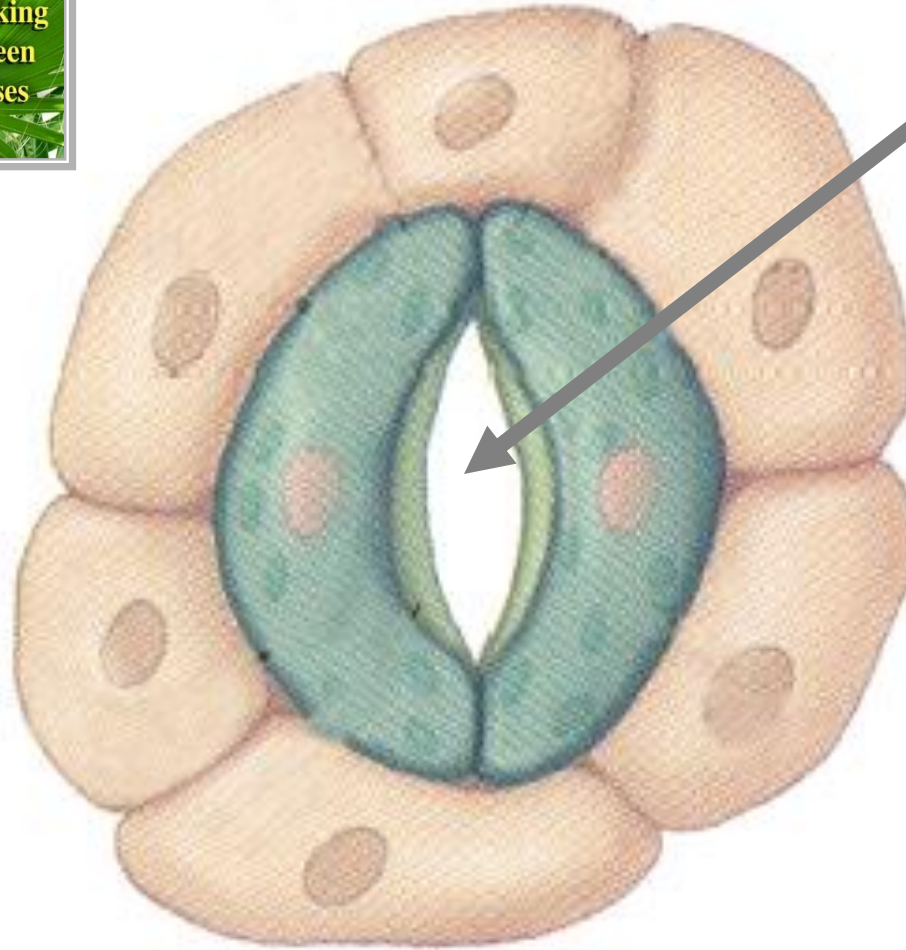
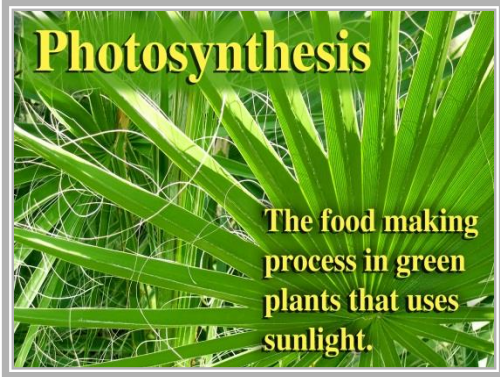
LEAF





LEAF

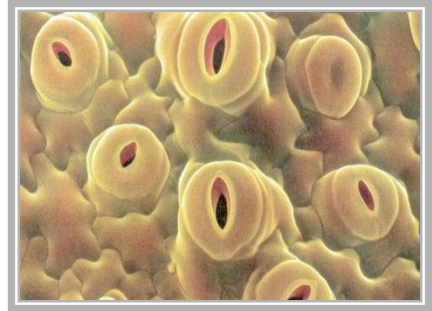
STOMATE COMPLEX



CO₂

SURFACE

LEAF





EPIDERMIS

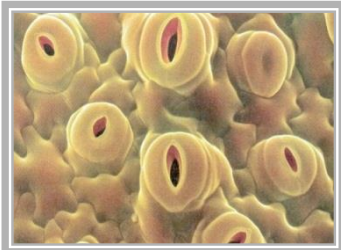
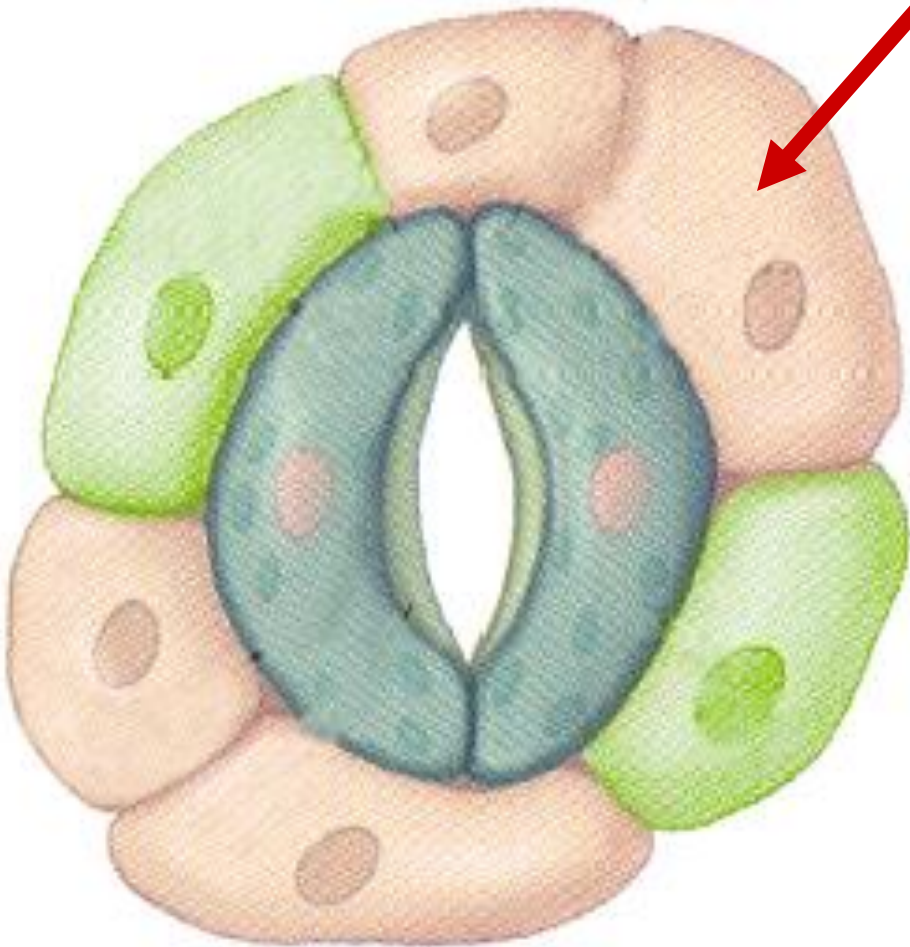
STOMATE COMPLEX

ULTRASTRUCTURE

LEAF STOMATE COMPLEX

VEGETATIVE CELL

G



SURFACE

LEAF

GUARD CELL

STOMATE COMPLEX

GUARD CELL



REGULATES STOMA SIZE

STOMATE COMPLEX

GUARD CELL

STOMATE COMPLEX

GUARD CELL



REGULATES STOMA SIZE

CHLOROPLASTS PRESENT

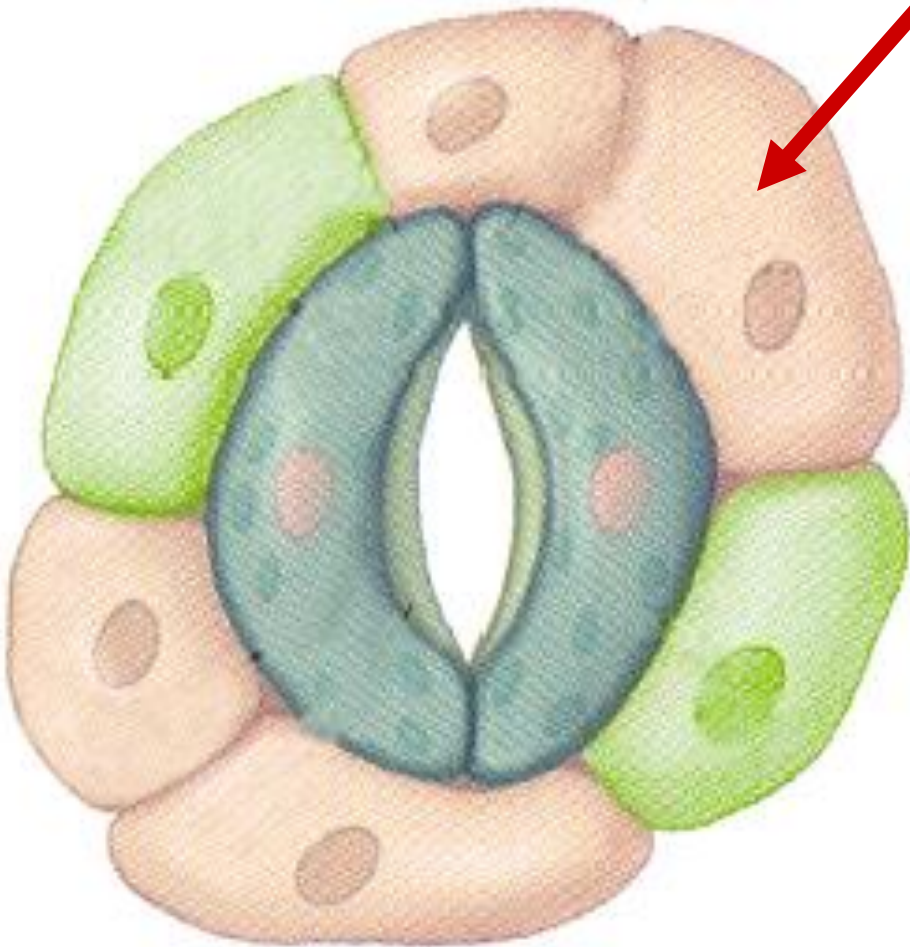
STOMATE COMPLEX

GUARD CELL

LEAF STOMATE COMPLEX

VEGETATIVE CELL

G



SURFACE

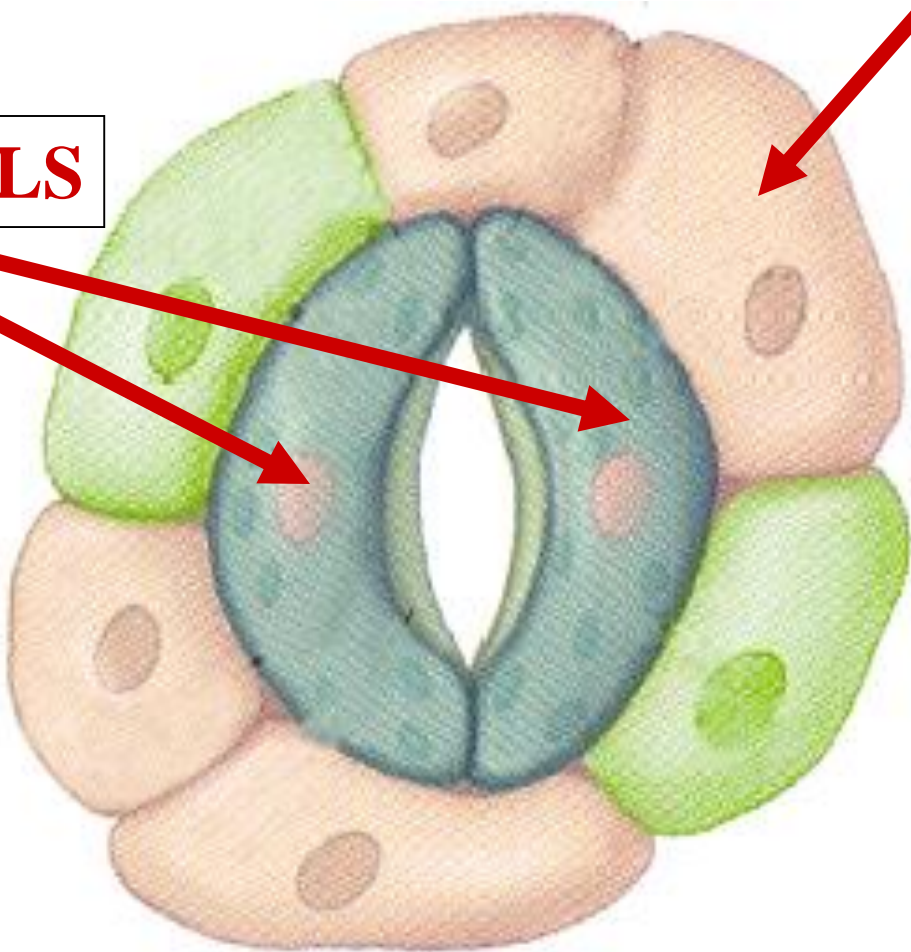
LEAF

LEAF STOMATE COMPLEX

VEGETATIVE CELL

C

GUARD CELLS



SURFACE

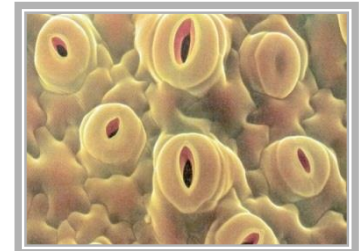
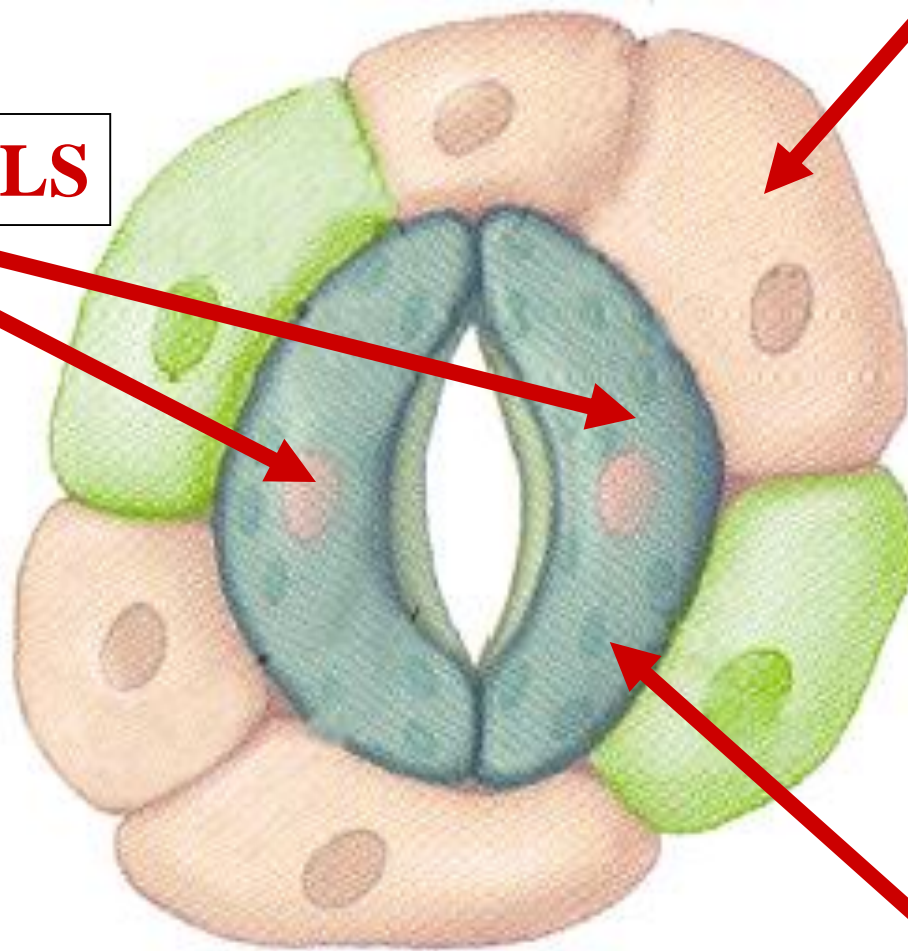
LEAF

LEAF STOMATE COMPLEX

VEGETATIVE CELL

S

GUARD CELLS



SURFACE

LEAF

**CHLOROPLASTS
PRESENT**

STOMA

STOMATE COMPLEX



STOMA

STOMATE PORE

STOMATE COMPLEX

STOMA

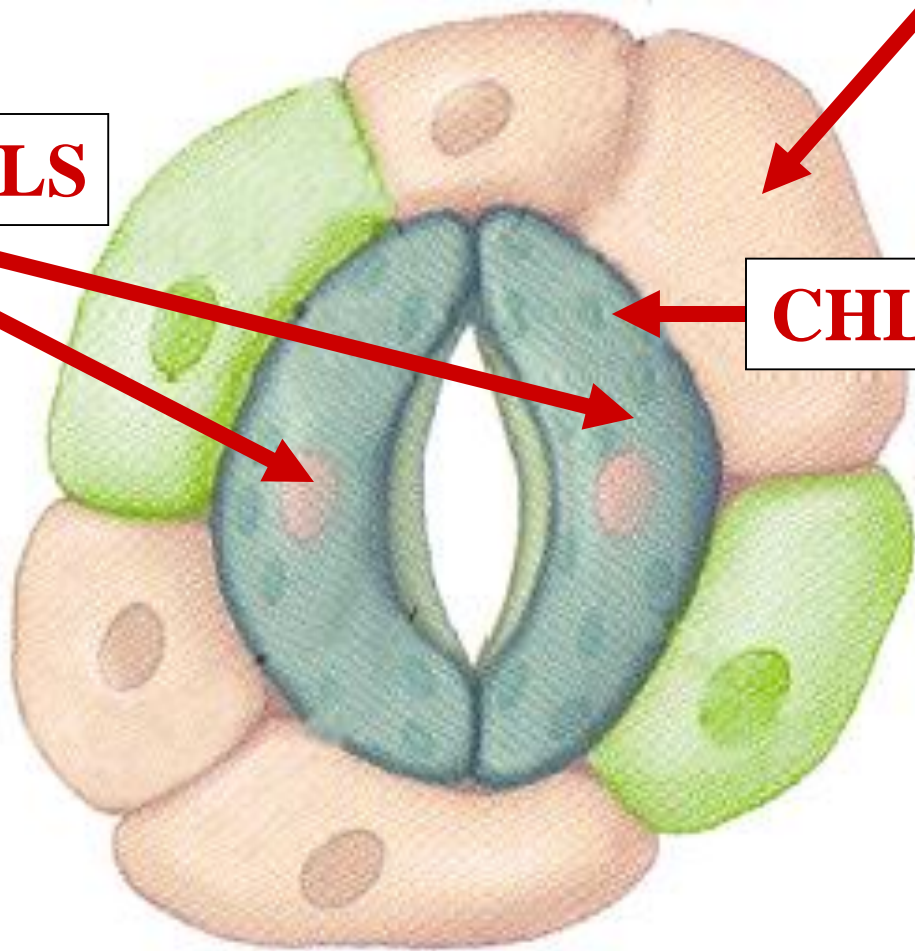
LEAF STOMATE COMPLEX

VEGETATIVE CELL

S

GUARD CELLS

CHLOROPLAST



SURFACE

LEAF

LEAF STOMATE COMPLEX

VEGETATIVE CELL

S

GUARD CELLS

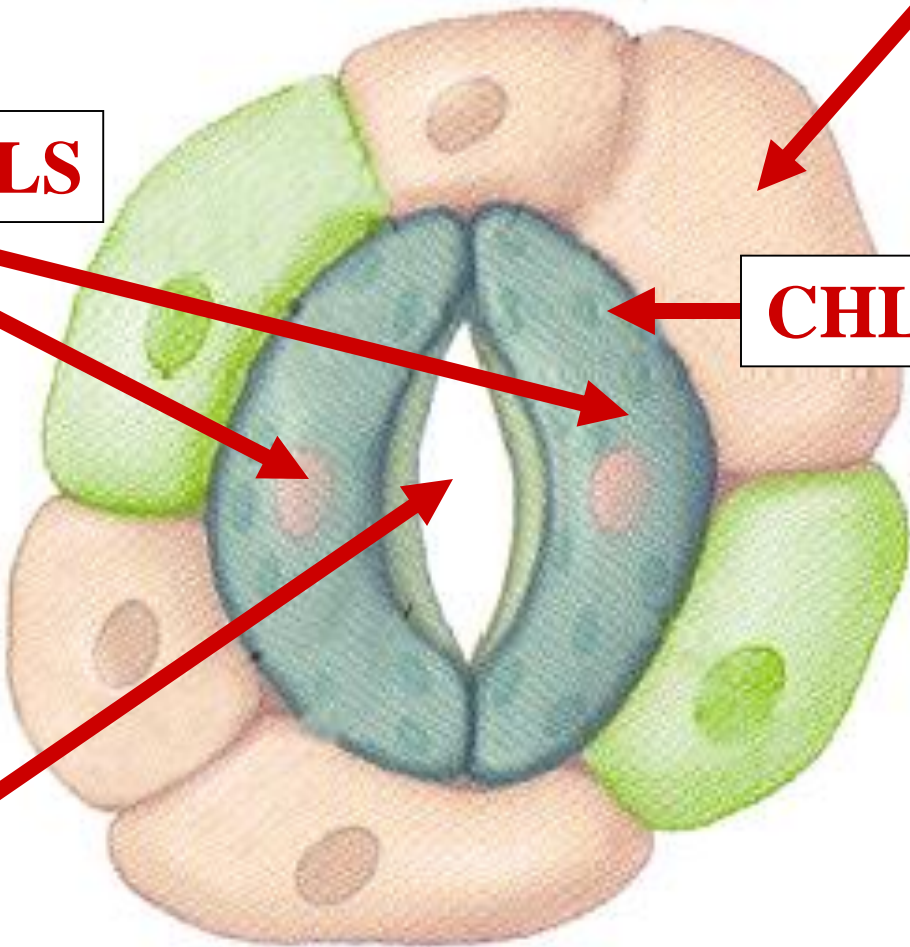
CHLOROPLAST



STOMA

SURFACE

LEAF



SUBSIDIARY CELL

STOMATE COMPLEX SUBSIDIARY CELL



ASSOCIATED WITH GUARD CELLS

**STOMATE COMPLEX
SUBSIDIARY CELL**

STOMATE COMPLEX SUBSIDIARY CELL



ASSOCIATED WITH GUARD CELLS

SHAPE DIFFERS FROM GUARD CELL

**STOMATE COMPLEX
SUBSIDIARY CELL**

STOMATE COMPLEX SUBSIDIARY CELL



ASSOCIATED WITH GUARD CELLS

SHAPE DIFFERS FROM GUARD CELL

CHLOROPLASTS PRESENT

STOMATE COMPLEX SUBSIDIARY CELL

LEAF STOMATE COMPLEX

VEGETATIVE CELL

SC

GUARD CELLS

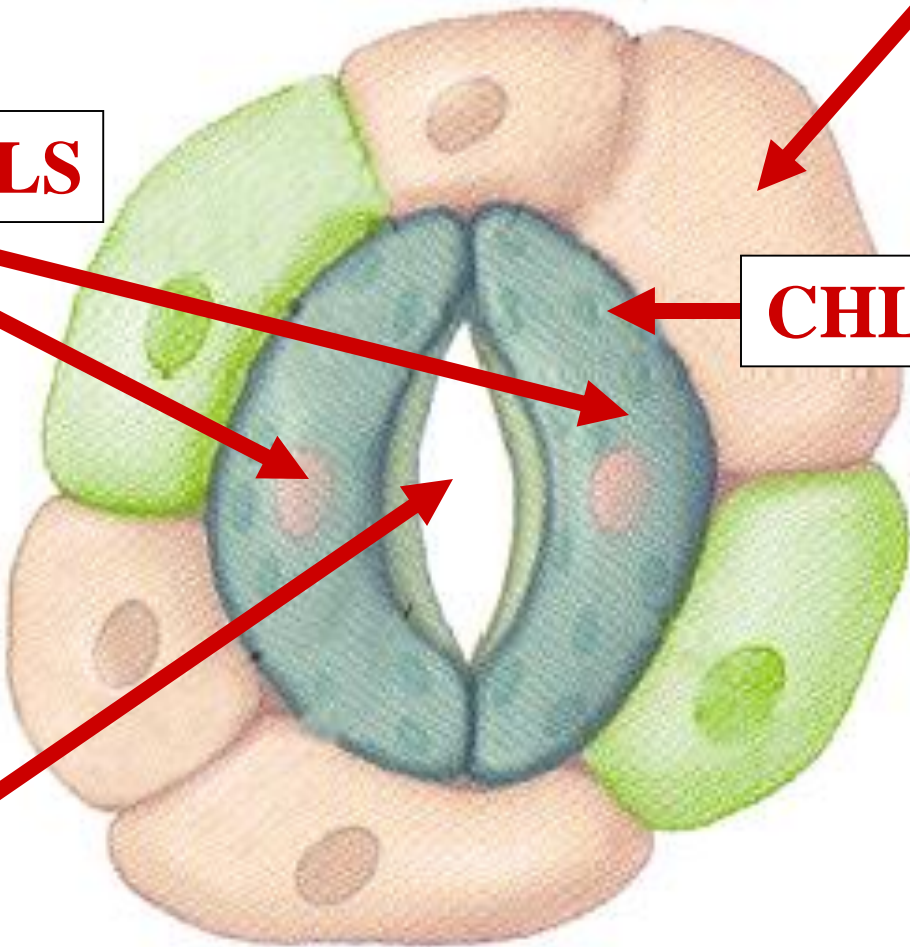
CHLOROPLAST



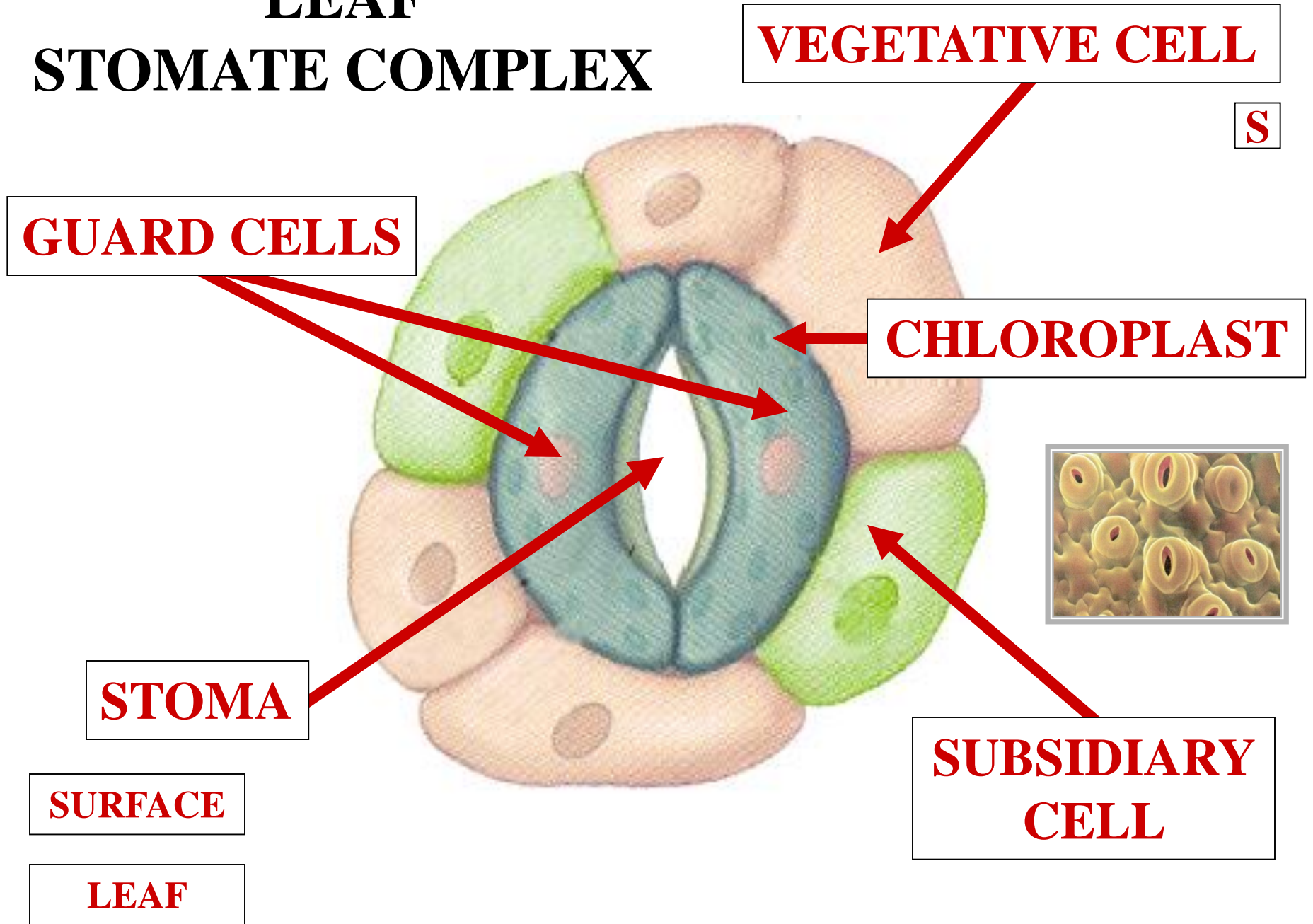
STOMA

SURFACE

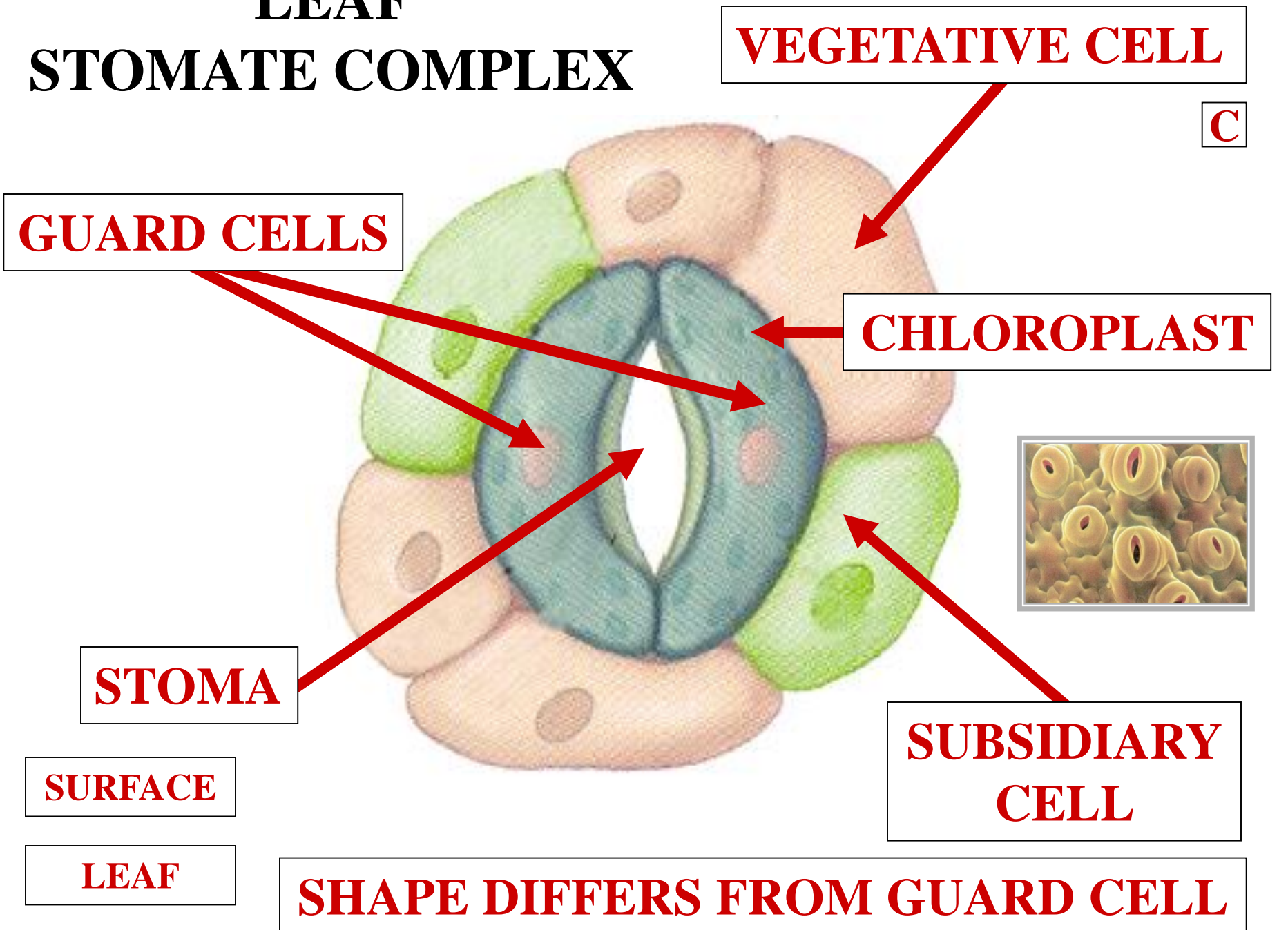
LEAF



LEAF STOMATE COMPLEX



LEAF STOMATE COMPLEX



VEGETATIVE CELL

C

GUARD CELLS

CHLOROPLAST

STOMA

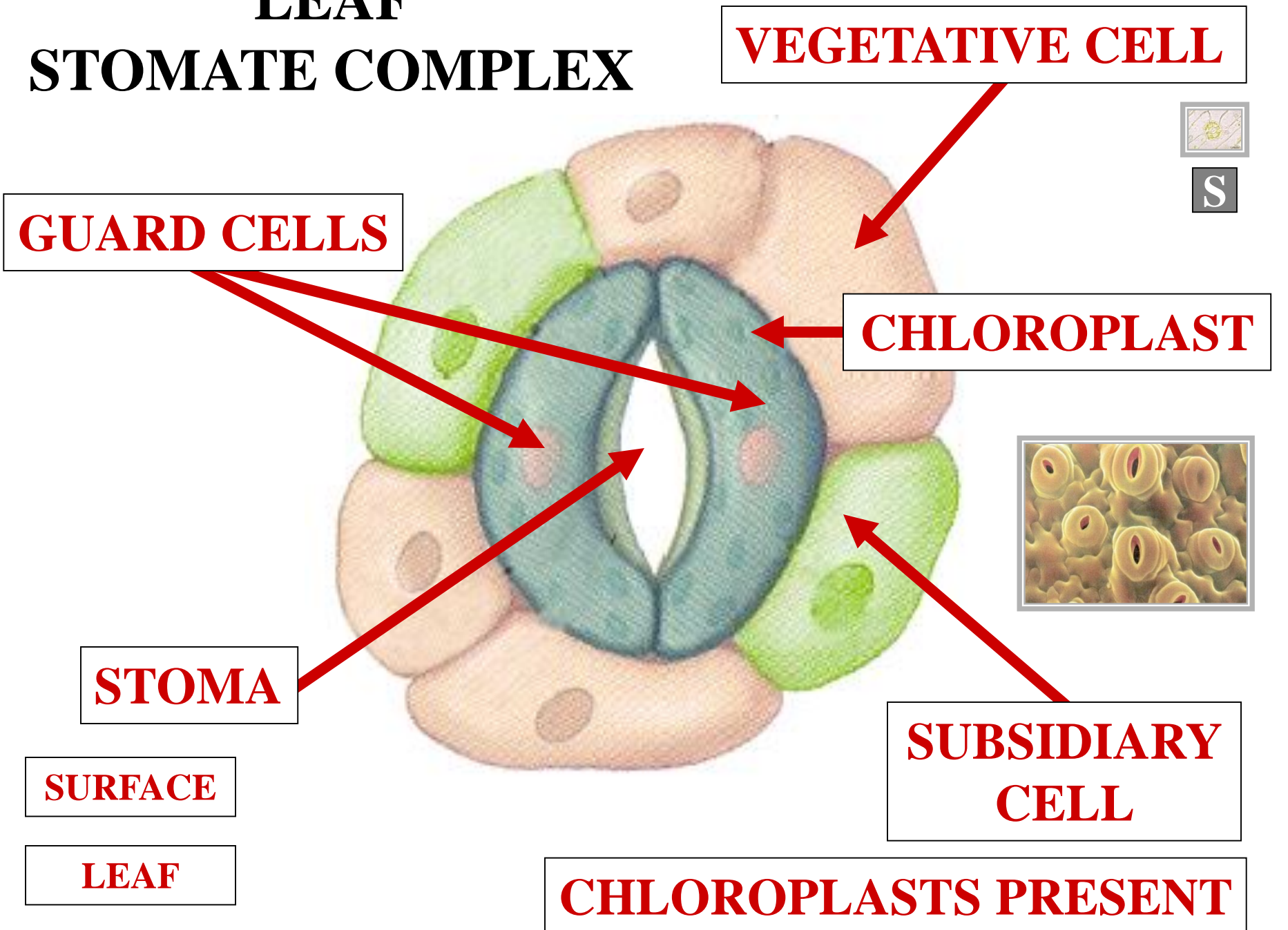
SURFACE

LEAF

SUBSIDIARY CELL

SHAPE DIFFERS FROM GUARD CELL

LEAF STOMATE COMPLEX



VEGETATIVE CELL

GUARD CELLS

CHLOROPLAST

STOMA

SURFACE

LEAF

SUBSIDIARY CELL

CHLOROPLASTS PRESENT



S



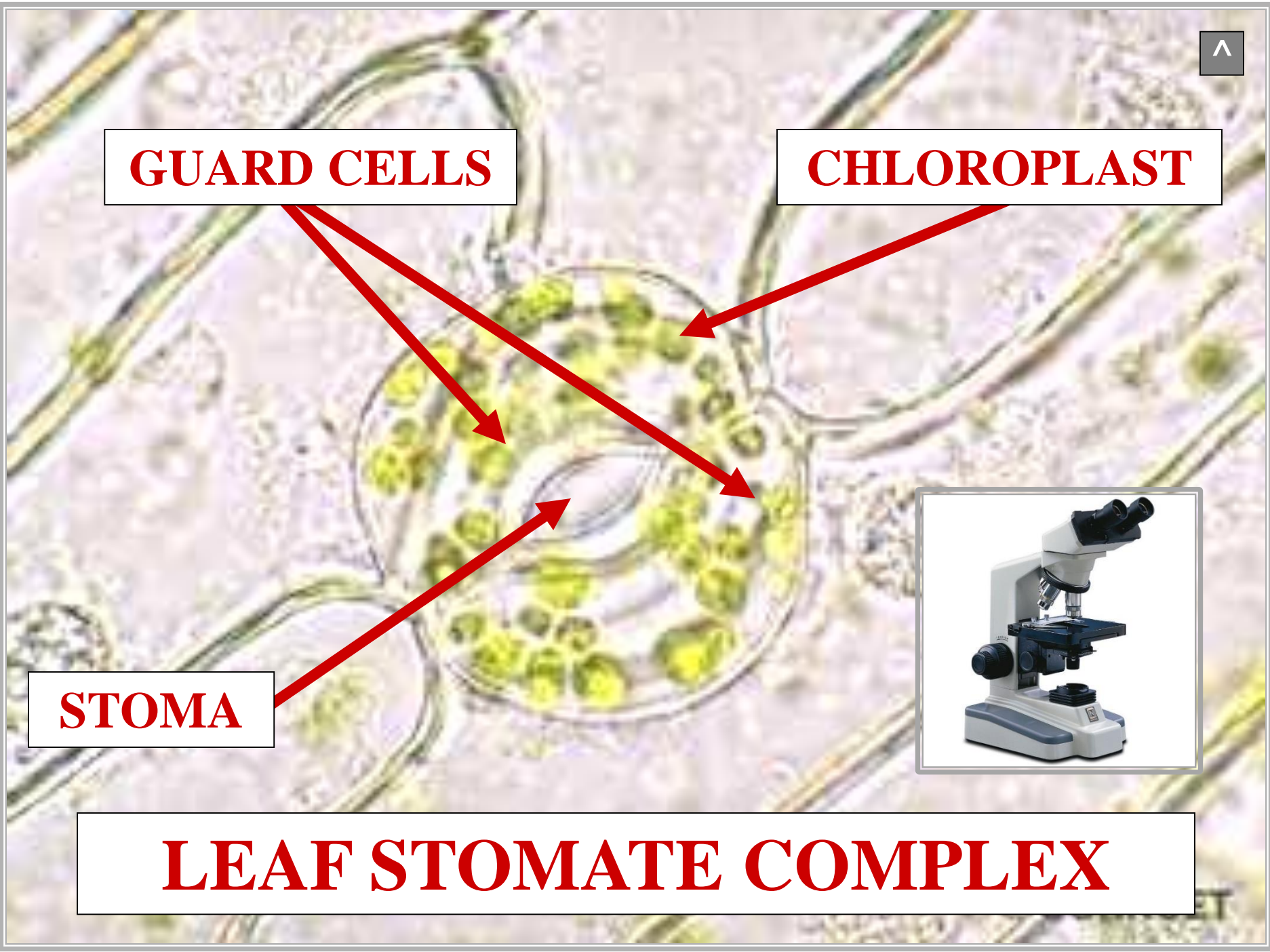


GUARD CELLS

CHLOROPLAST

STOMA

LEAF STOMATE COMPLEX



STOMATE DEVELOPMENT TYPES

**STOMATE
DEVELOPMENT
TYPES**

MESOGENOUS

**STOMATE
DEVELOPMENT
TYPES**

**STOMATE
DEVELOPMENT
TYPES**

**MESOGENOUS
PERIGENOUS**

**STOMATE
DEVELOPMENT
TYPES**

**STOMATE
DEVELOPMENT
TYPES**

MESOGENOUS

PERIGENOUS

MESOPERIGENOUS

**STOMATE
DEVELOPMENT
TYPES**

MESOGENOUS



**STOMATE
DEVELOPMENT
MESOGENOUS TYPE**

**SUBSIDIARY CELLS & GUARD CELLS
DERIVED FROM SAME INITIAL**

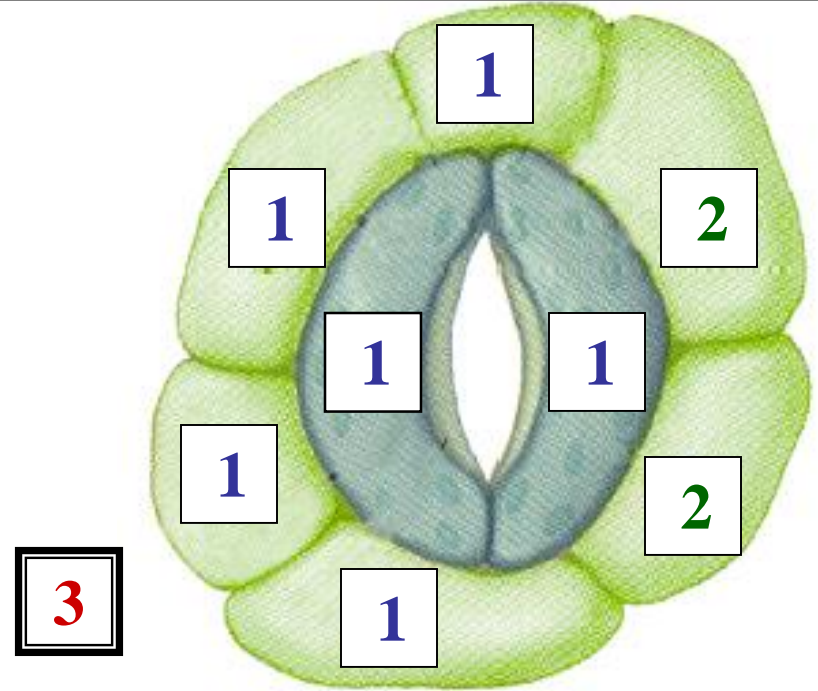
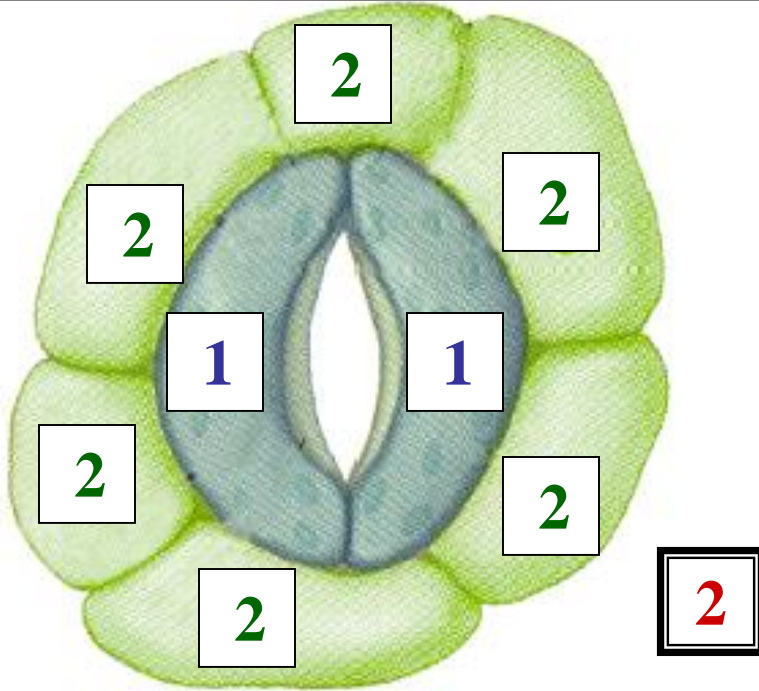
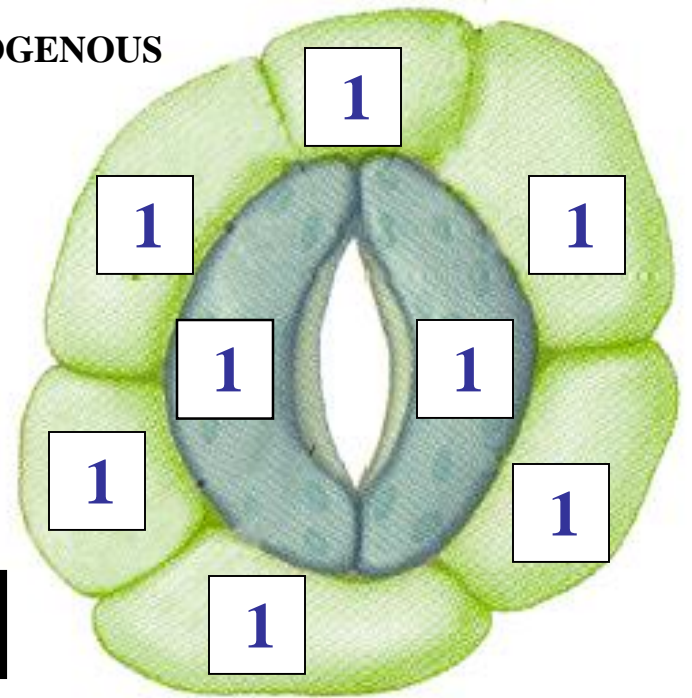
**STOMATE
DEVELOPMENT
MESOGENOUS TYPES**

STOMATE DEVELOPMENT TYPES

 = CELL INITIAL

MESOGENOUS



PERIGENOUS



**STOMATE
DEVELOPMENT
PERIGENOUS TYPE**

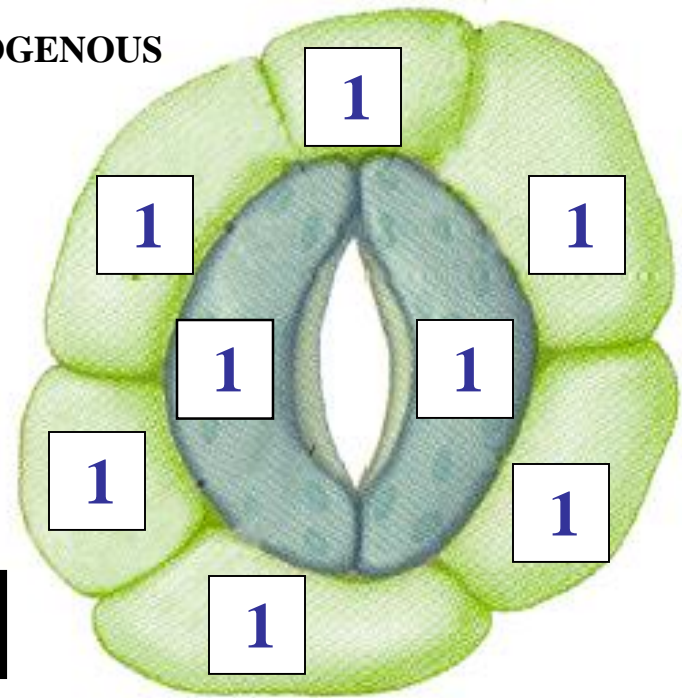
**SUBSIDIARY CELLS & GUARD CELLS
DERIVED FROM DIFFERENT INITIALS**

**STOMATE
DEVELOPMENT
PERIGENOUS TYPES**

STOMATE DEVELOPMENT TYPES

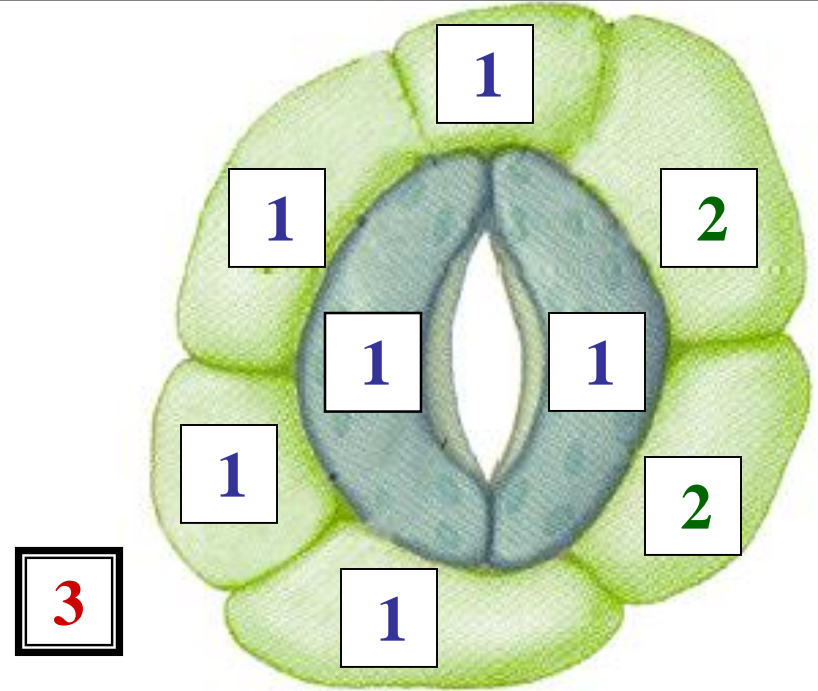
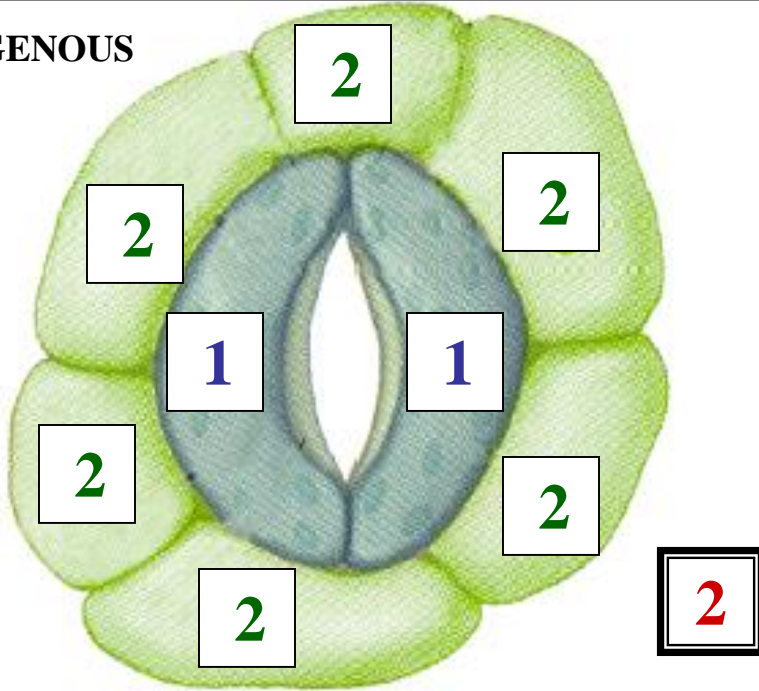
 = CELL INITIAL

MESOGENOUS



^
M

PERIGENOUS



MESOPERIGENOUS



**STOMATE
DEVELOPMENT
MESOPERIGENOUS TYPE**

**SOME SUBSIDIARY CELLS DERIVED FROM
GUARD CELL INITIAL**

**STOMATE
DEVELOPMENT
MESOPERIGENOUS TYPES**



**STOMATE
DEVELOPMENT
MESOPERIGENOUS TYPE**

**SOME SUBSIDIARY CELLS DERIVED FROM
GUARD CELL INITIAL**

**SOME SUBSIDIARY CELLS DERIVED FROM
DIFFERENT INITIAL**

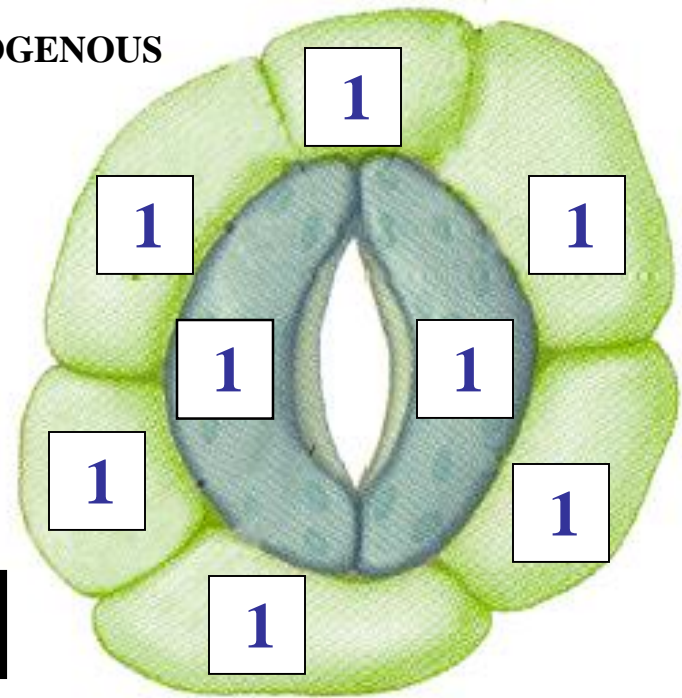
**STOMATE
DEVELOPMENT
MESOPERIGENOUS TYPES**

STOMATE DEVELOPMENT TYPES

 = CELL INITIAL

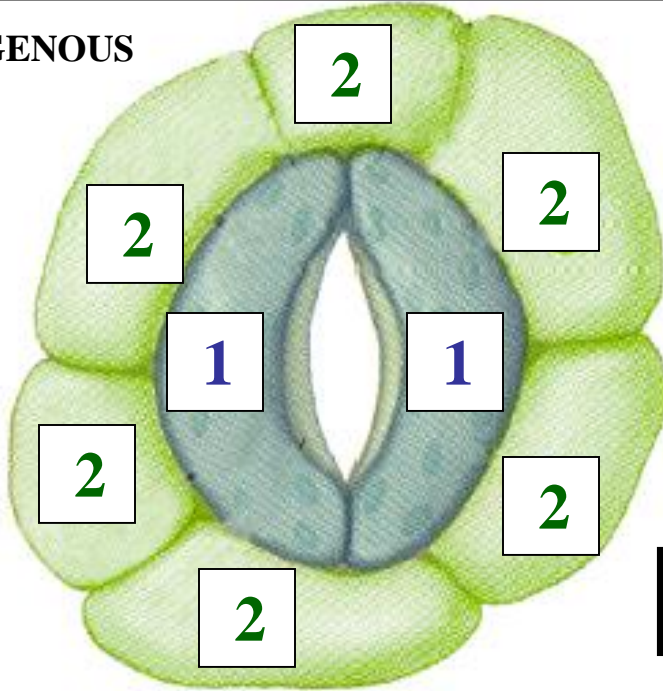
MESOGENOUS

 1



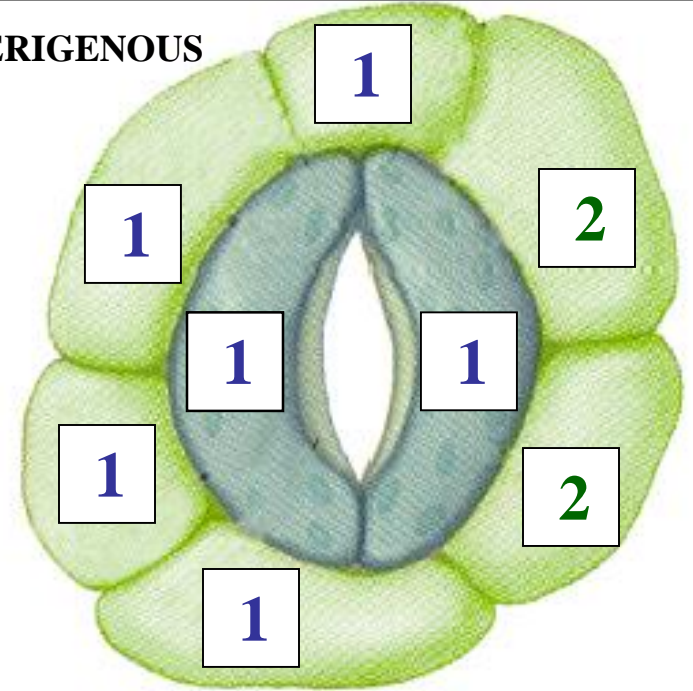
PERIGENOUS

 2



MESOPERIGENOUS

 3



STOMATE TYPES

STOMATE TYPES

ANOMOCYTTIC

STOMATE TYPES

STOMATE TYPES

ANOMOCYTTIC
DIACYTTIC

STOMATE TYPES

STOMATE TYPES

ANOMOCYTTIC

DIACYTTIC

PARACYTTIC

STOMATE TYPES

STOMATE TYPES

**ANOMOCYTTIC
DIACYTTIC
PARACYTTIC
ACTINOCYTTIC**

STOMATE TYPES

STOMATE TYPES

ANOMOCYTTIC

DIACYTTIC

PARACYTTIC

ACTINOCYTTIC

ANSIOCYTTIC

STOMATE TYPES

STOMATE TYPES

ANOMOCYTTIC

DIACYTTIC

PARACYTTIC

ACTINOCYTTIC

ANSIOCYTTIC

TETRACYTTIC

STOMATE TYPES

ANOMOCYTIC

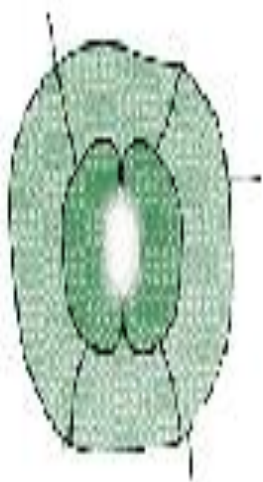
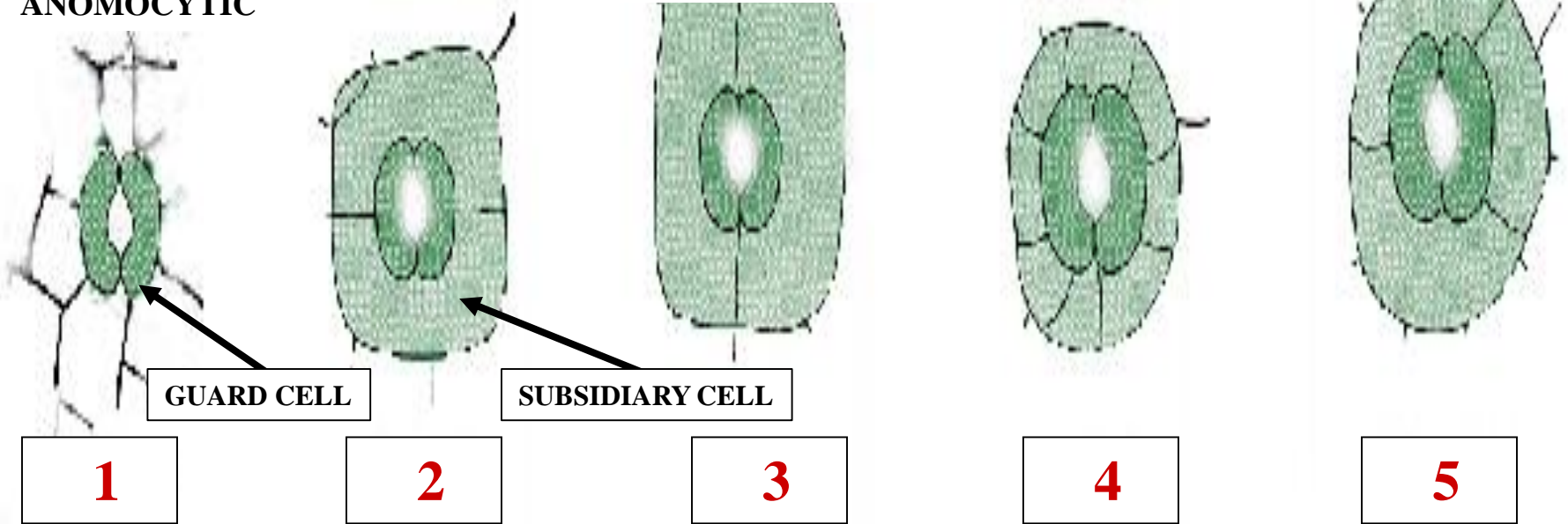
**STOMATE TYPE
ANOMOCYTTIC**



NO SUBSIDIARY CELLS

**STOMATE TYPE
ANOMOCYTTIC**

ANOMOCYTIC



6

ANGIOSPERM STOMATE TYPES

DIA CYTIC

**STOMATE TYPE
DIACYTIC**

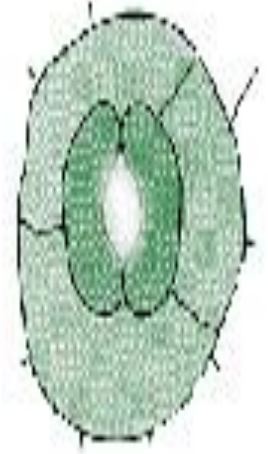
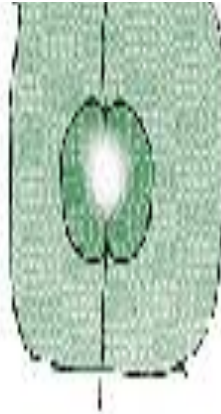
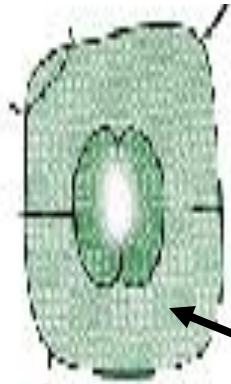
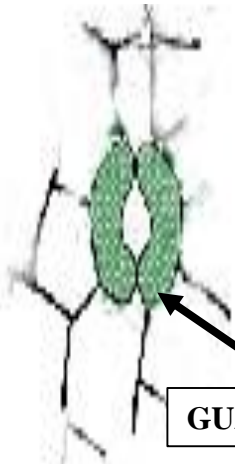


**TWO
PERPENDICULAR
SUBSIDIARY CELLS**

**STOMATE TYPE
DIACYTIC**

ANOMOCYTIC

DIACYTIC



GUARD CELL

SUBSIDIARY CELL

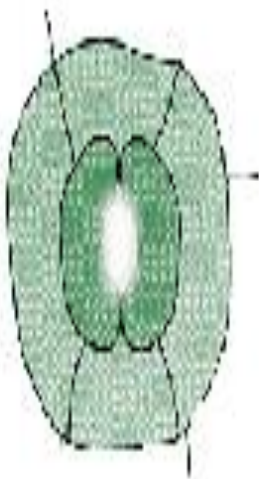
1

2

3

4

5



6

ANGIOSPERM STOMATE TYPES

PARACYTIC

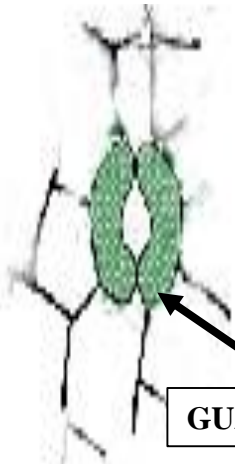
**STOMATE TYPE
PARACYTIC**



**TWO
PARALLEL
SUBSIDIARY CELLS**

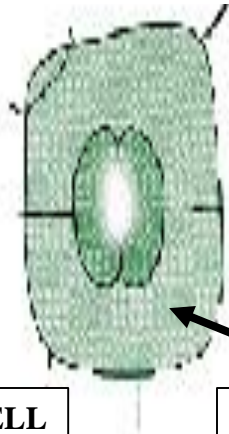
**STOMATE TYPE
PARACYTIC**

ANOMOCYTC



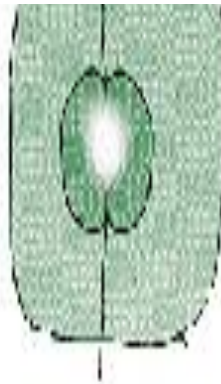
1

DIACYTIC

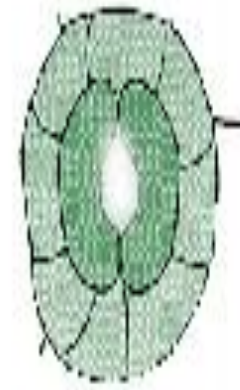


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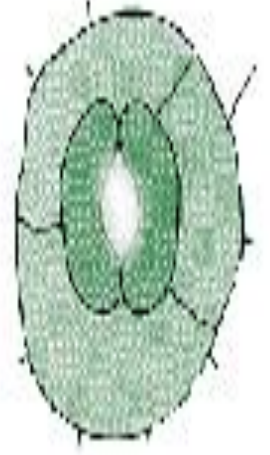
PARACYTIC



3



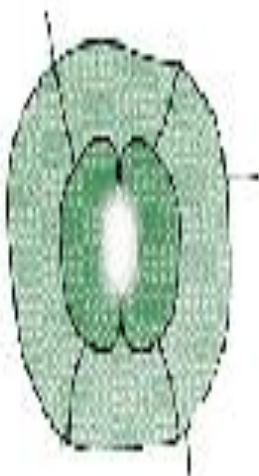
4



5

GUARD CELL

SUBSIDIARY CELL



6

**ANGIOSPERM
STOMATE
TYPES**



ACTINOCYTTIC

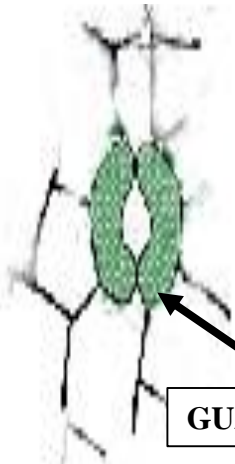
**STOMATE TYPE
ACTINOCYTTIC**



**RADIAL
SUBSIDIARY CELLS**

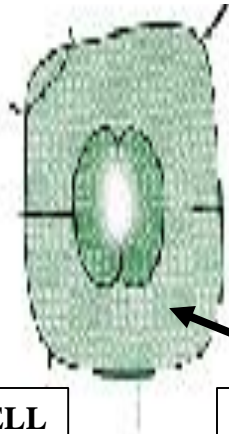
**STOMATE TYPE
ACTINOCYTTIC**

ANOMOCYTC



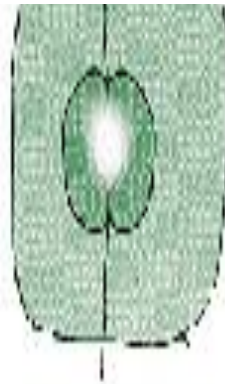
1

DIACYTC



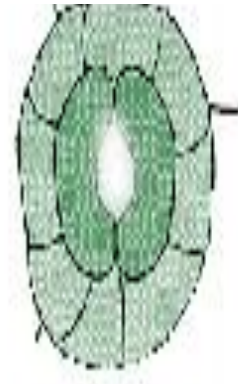
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PARACYTC

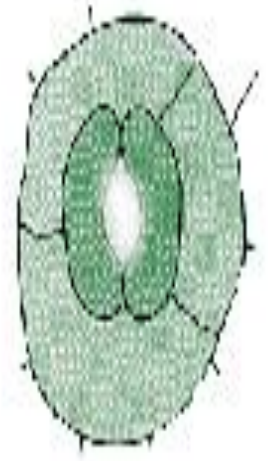


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ACTINOCYTC



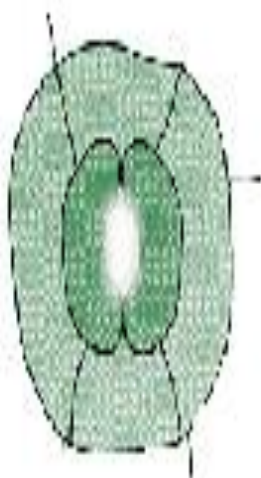
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5

GUARD CELL

SUBSIDIARY CELL



6

ANGIOSPERM STOMATE TYPES



ANISOCYTTIC

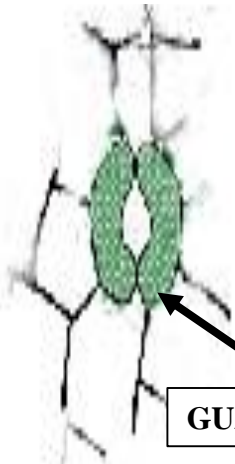
**STOMATE TYPE
ANISOCYTYC**



**THREE
UNEQUAL SIZED
SUBSIDIARY CELLS**

**STOMATE TYPE
ANISOCYTYC**

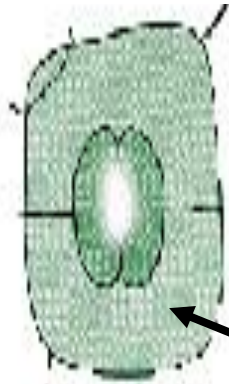
ANOMOCYTC



GUARD CELL

1

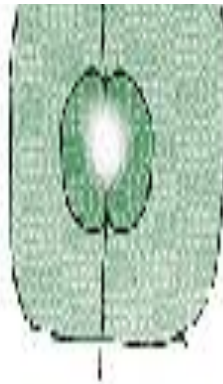
DIACYTC



SUBSIDIARY CELL

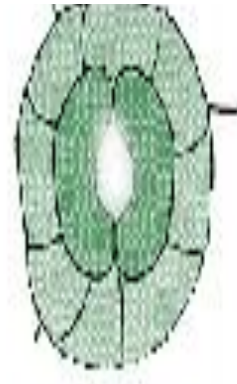
2

PARACYTC



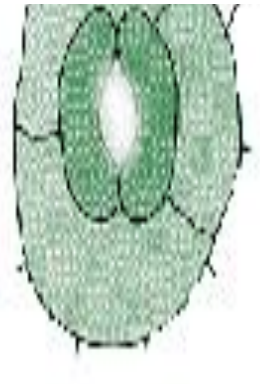
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ACTINOCYTC

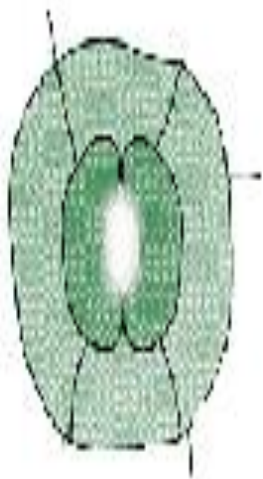


4

ANISOCYTC



5



6

ANGIOSPERM STOMATE TYPES

TETRA CYTIC



**STOMATE TYPE
TETRACYTIC**

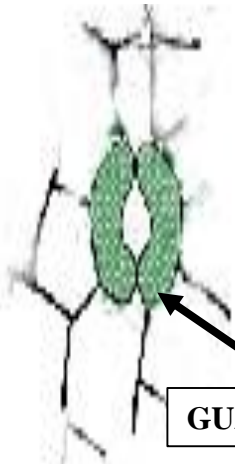
TWO LARGE

TWO SMALL

SUBSIDIARY CELLS

**STOMATE TYPE
TETRACYTIC**

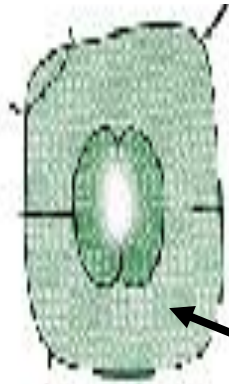
ANOMOCYTC



GUARD CELL

1

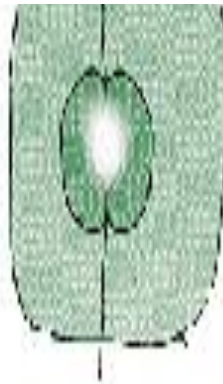
DIACYTC



SUBSIDIARY CELL

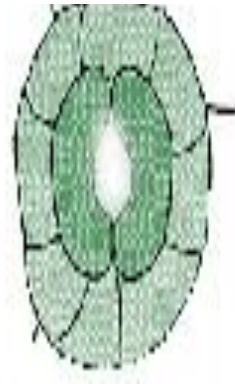
2

PARACYTC



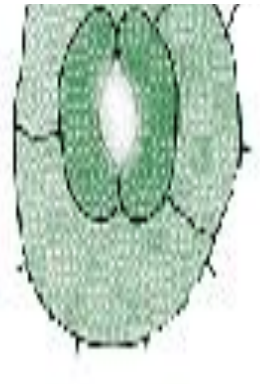
3

ACTINOCYTC



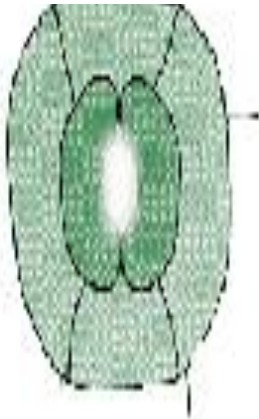
4

ANISOCYTC



5

TETRACYTC



6

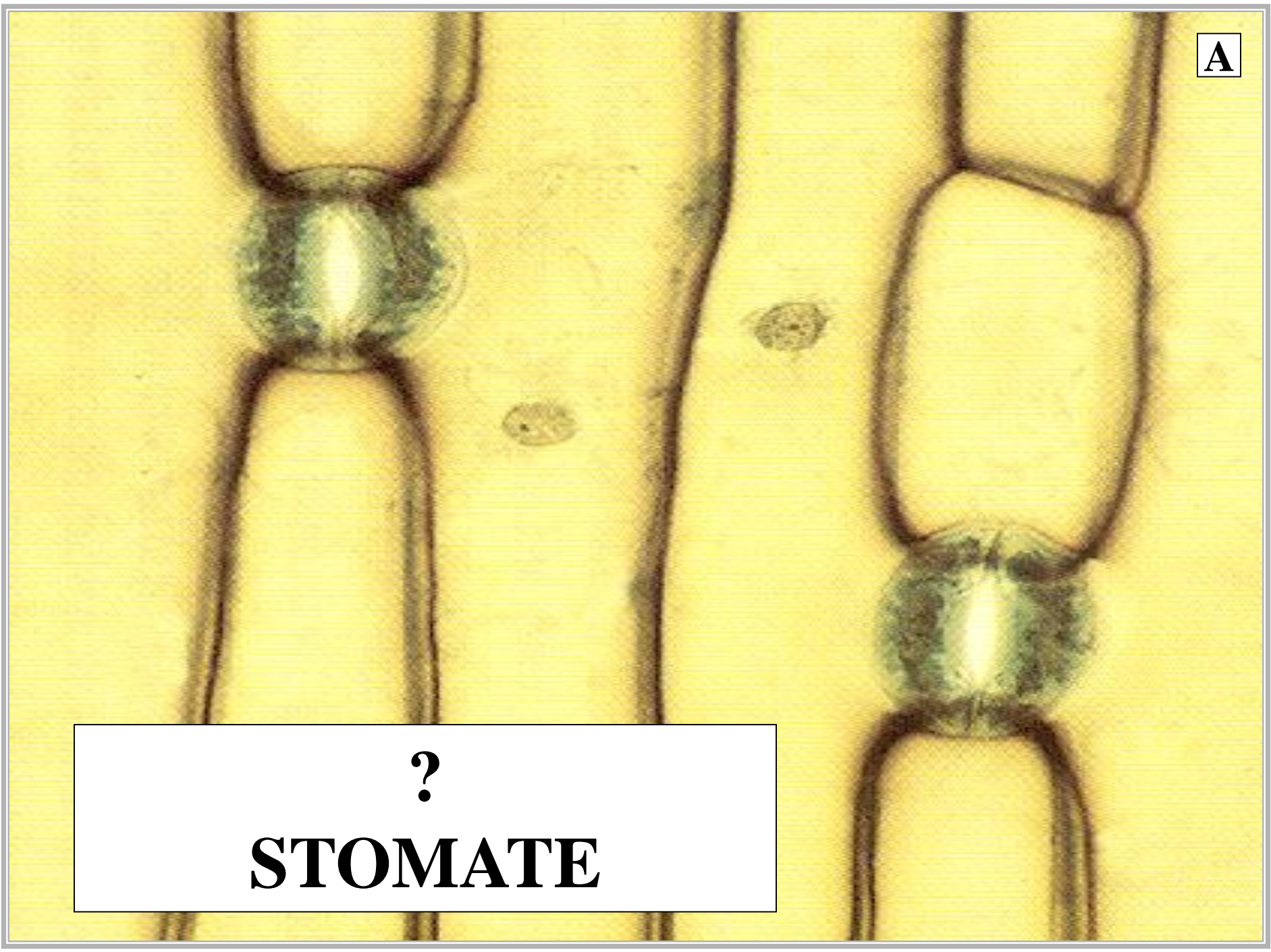
ANGIOSPERM STOMATE TYPES



A

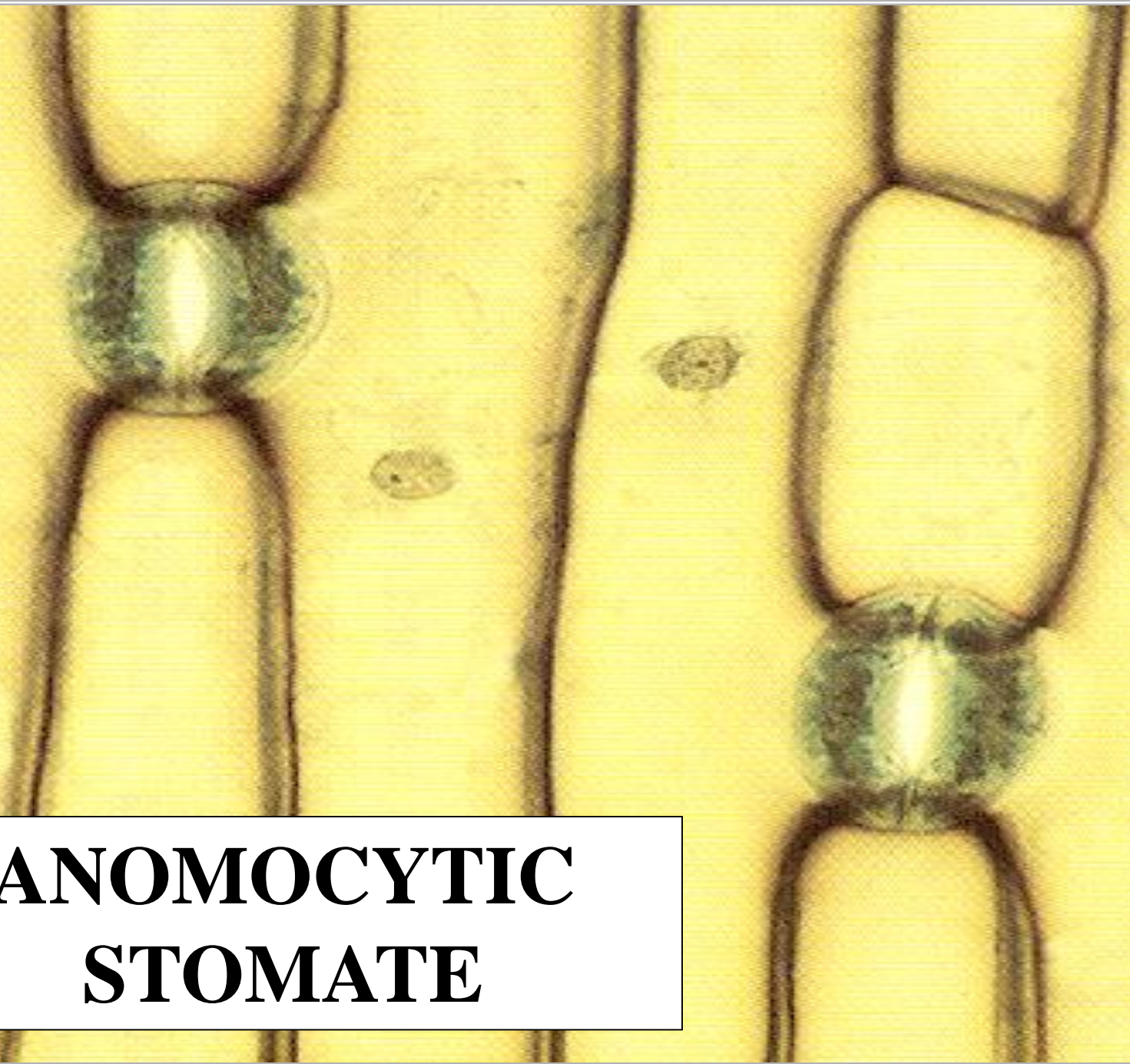
?

STOMATE





**ANOMOCYTTIC
STOMATE**



A close-up photograph of a large, white magnolia flower with a prominent yellow stamen and a red pistil, surrounded by green leaves. The background is dark and out of focus.

**STOMATE TYPE
TAXONOMICALLY
USEFUL WITH
ANGIOSPERMS**



STOMATE LEAF DISTRIBUTION

DICOTS



D

STOMATE LEAF DISTRIBUTION



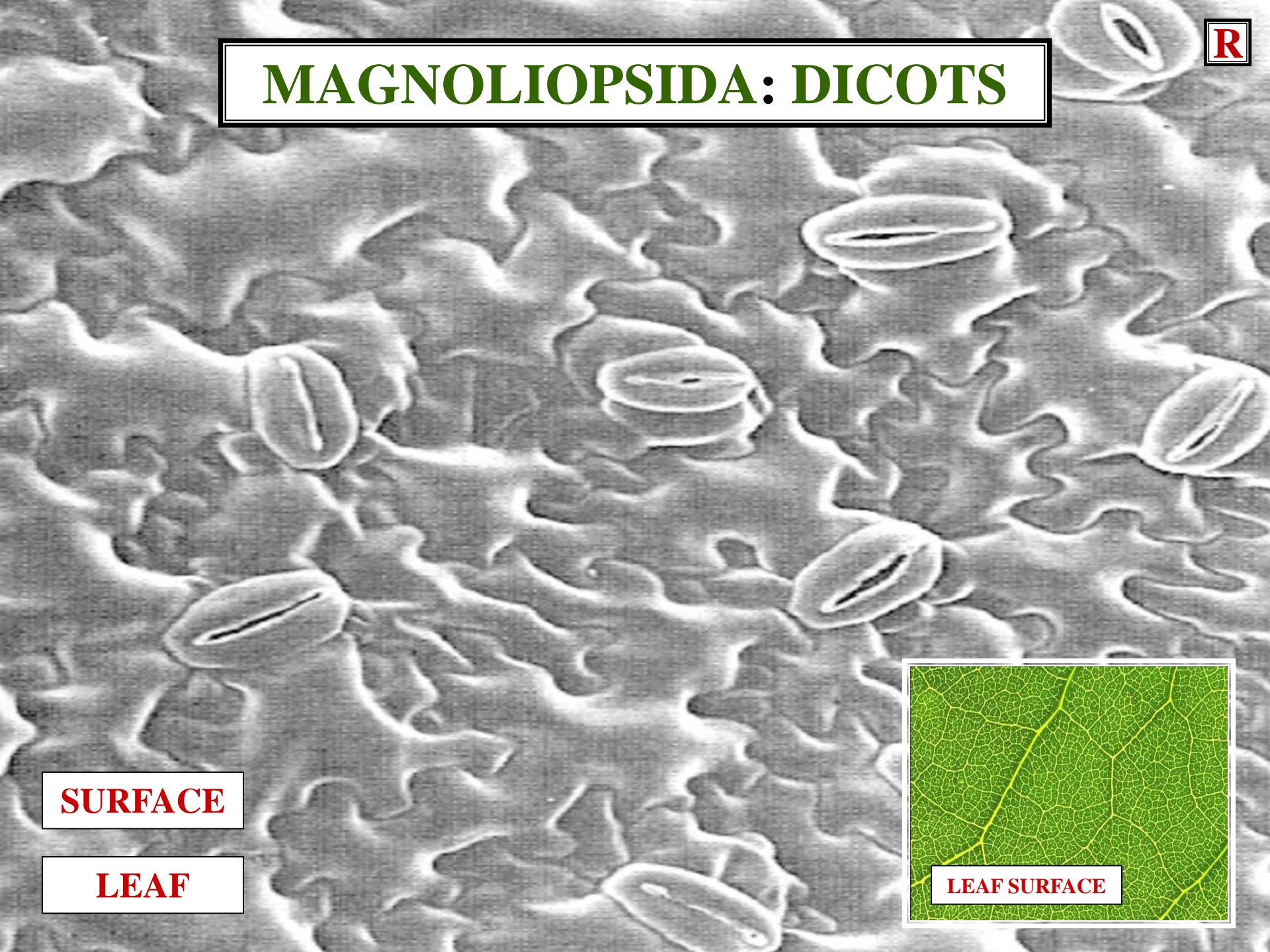
MONOCOTS



DICOTS

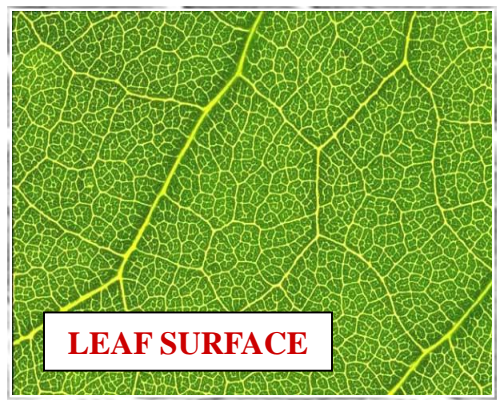


MAGNOLIOPSIDA: DICOTS



SURFACE

LEAF



LEAF SURFACE

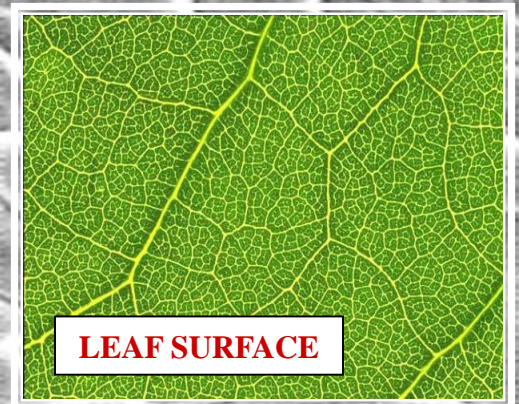
MAGNOLIOPSIDA: DICOTS



RANDOM STOMATE DISTRIBUTION

SURFACE

LEAF



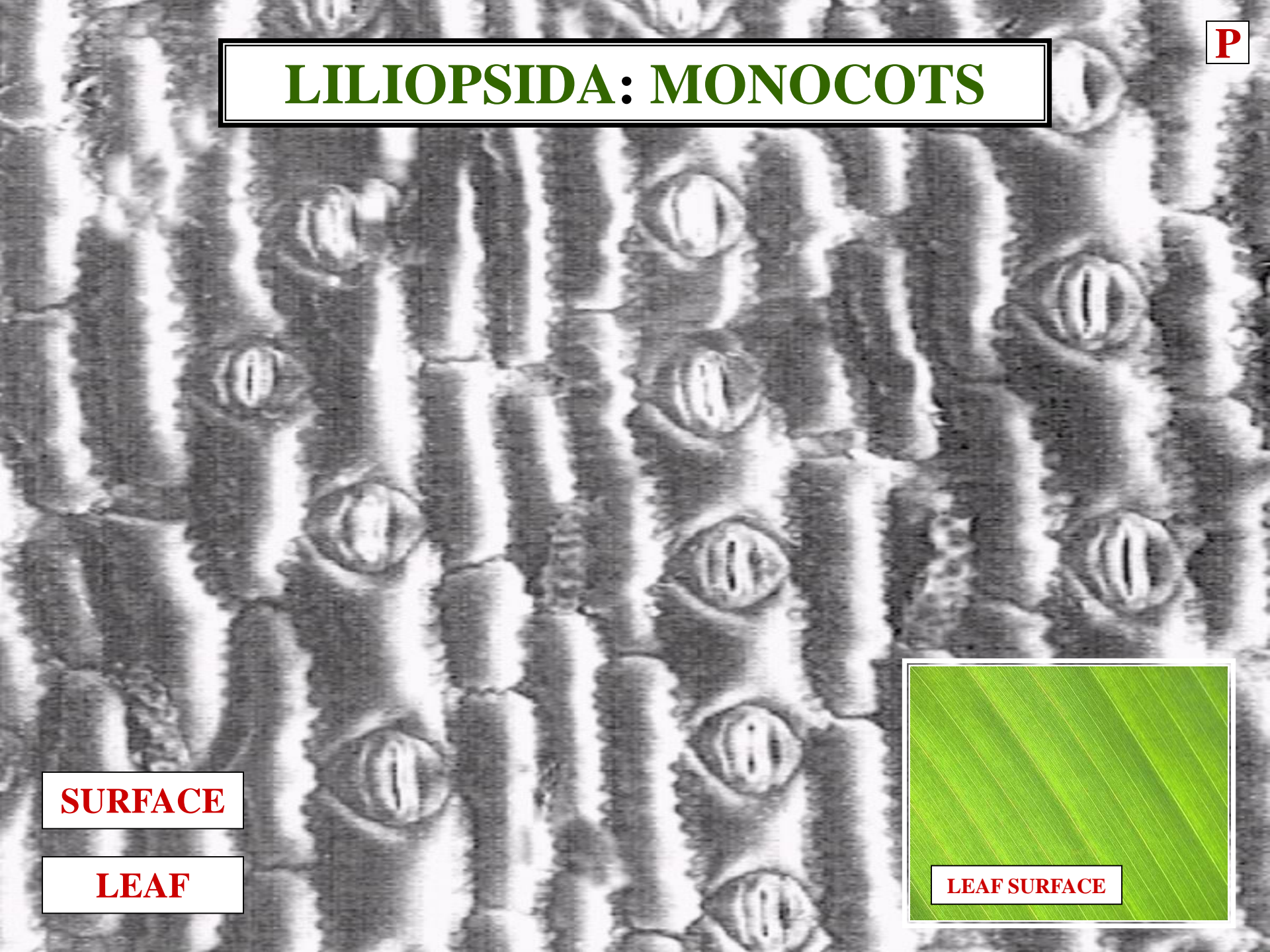
LEAF SURFACE



MONOCOTS



LILIOPSIDA: MONOCOTS



SURFACE

LEAF



LEAF SURFACE



LILIOPSIDA: MONOCOTS

PARALLEL STOMATE DISTRIBUTION

SURFACE

LEAF



LEAF SURFACE

EPIDERMIS

TRICHOMES

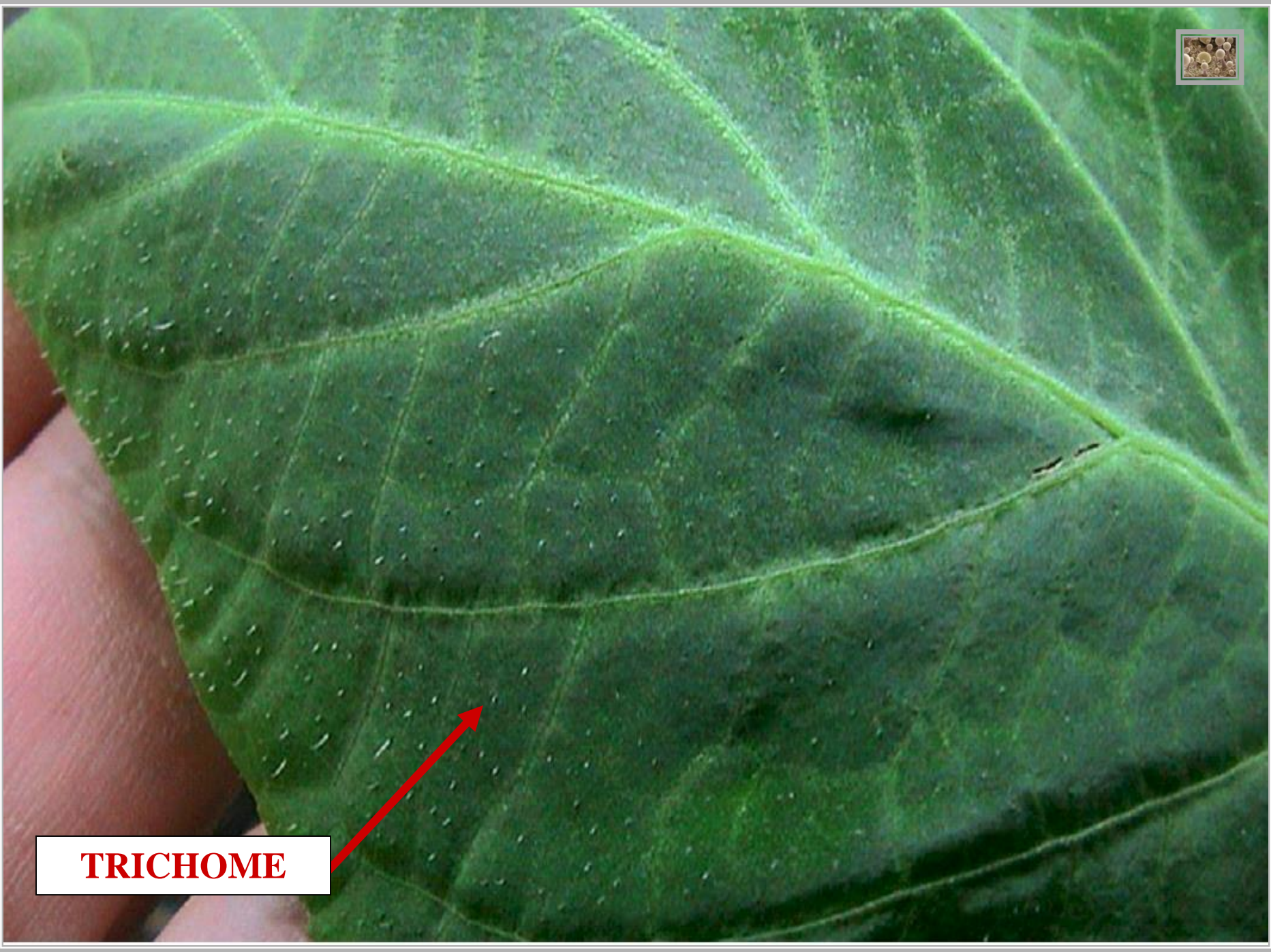
TRICHOME



PLANT TRICHOME

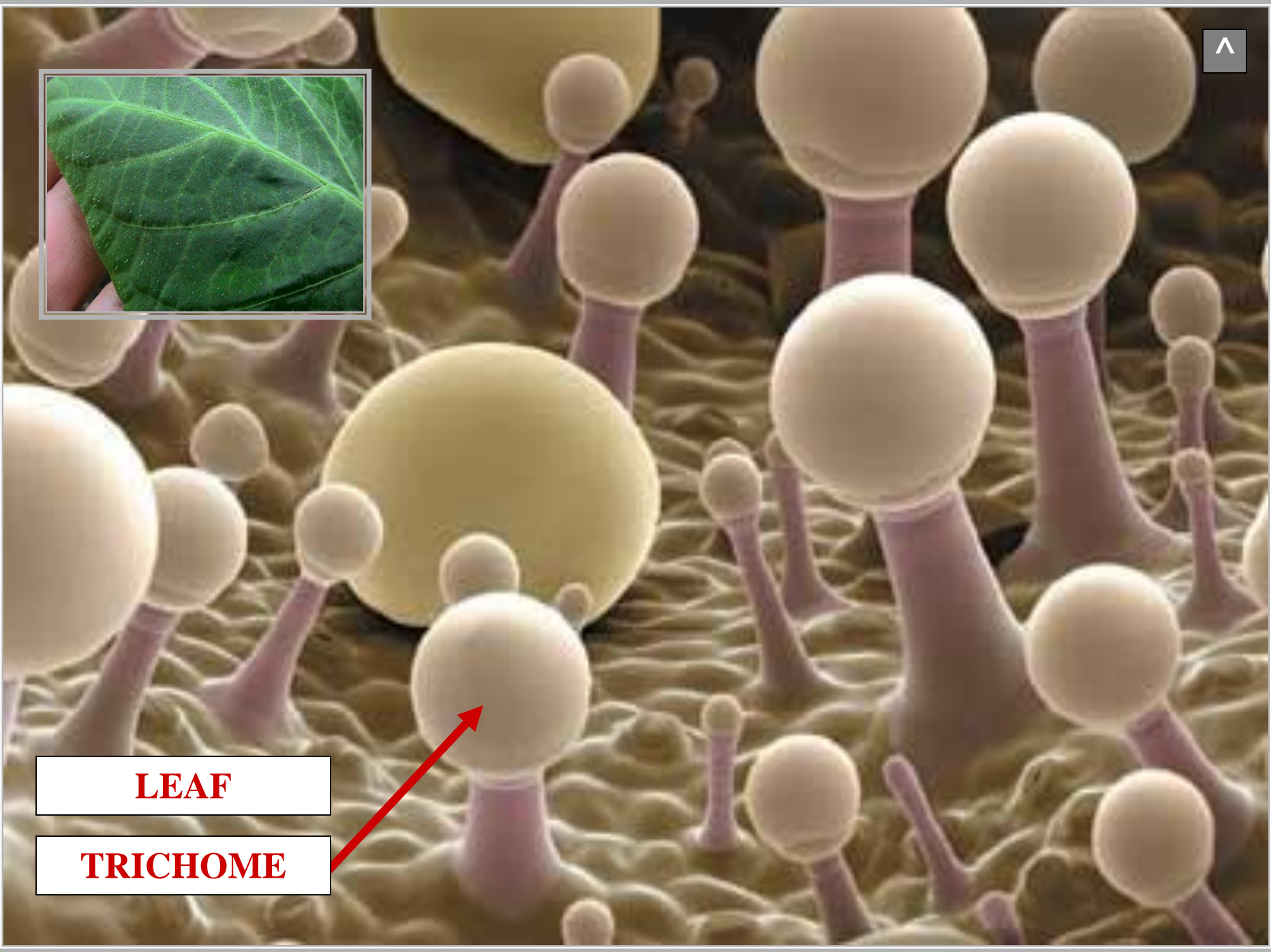
PLANT HAIR

PLANT TRICHOME



TRICHOME





LEAF

TRICHOME



TRICHOME TYPES

UNICELLULAR TRICHOME

UNICELLULAR TRICHOME



CONSIST ONE CELL

UNICELLULAR TRICHOME

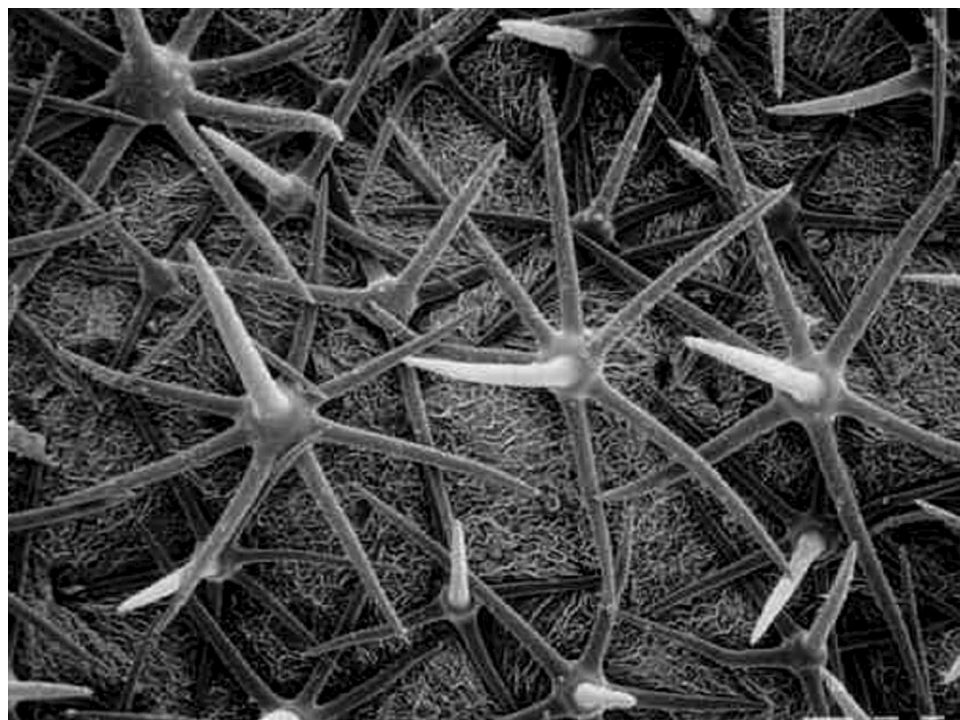
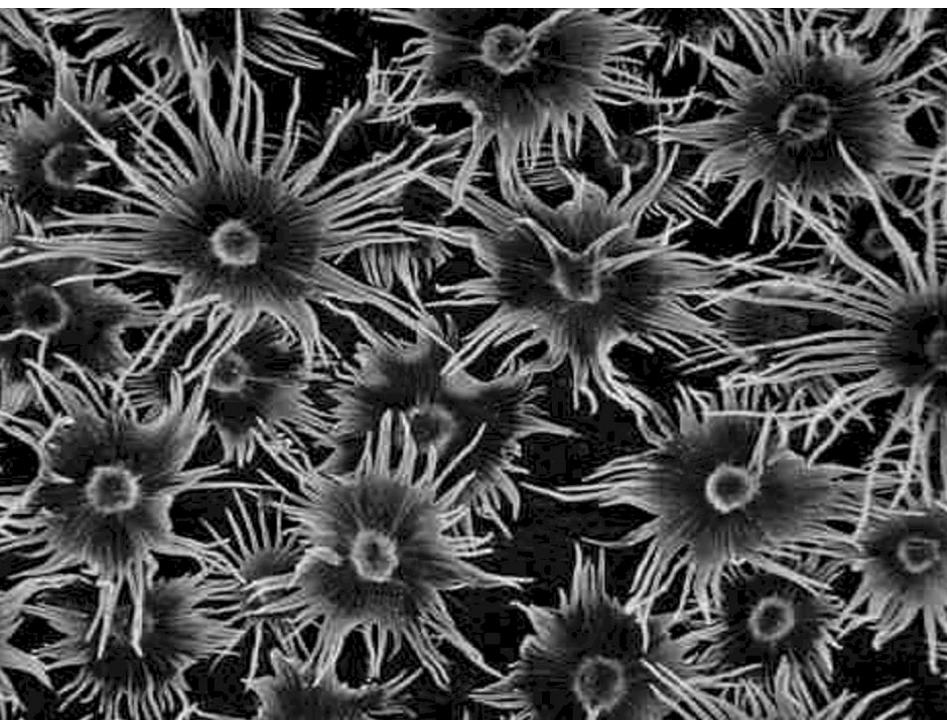
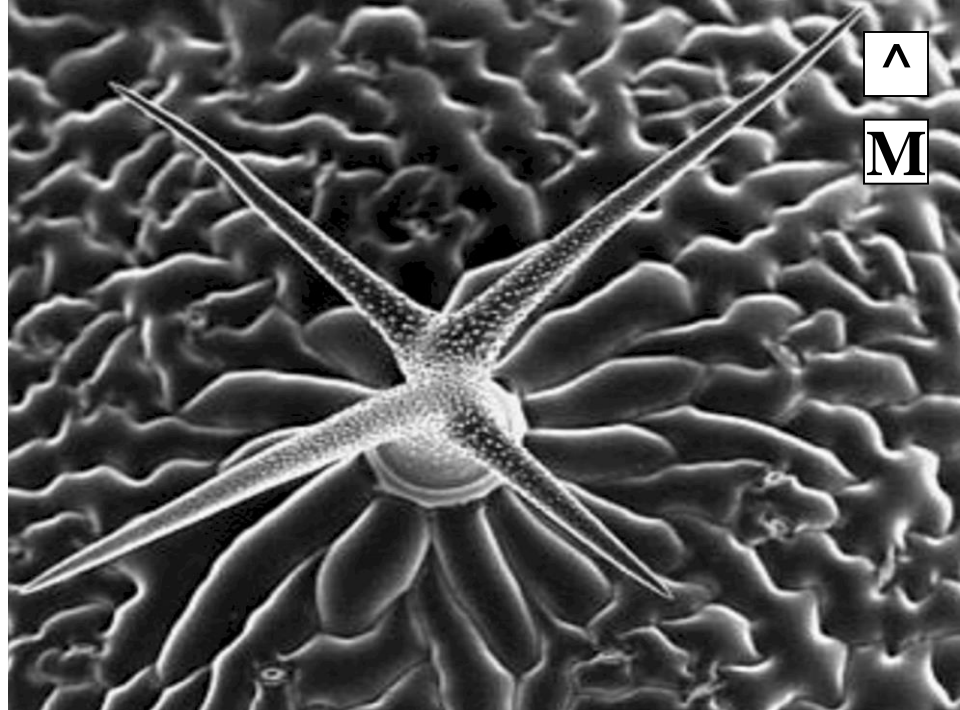
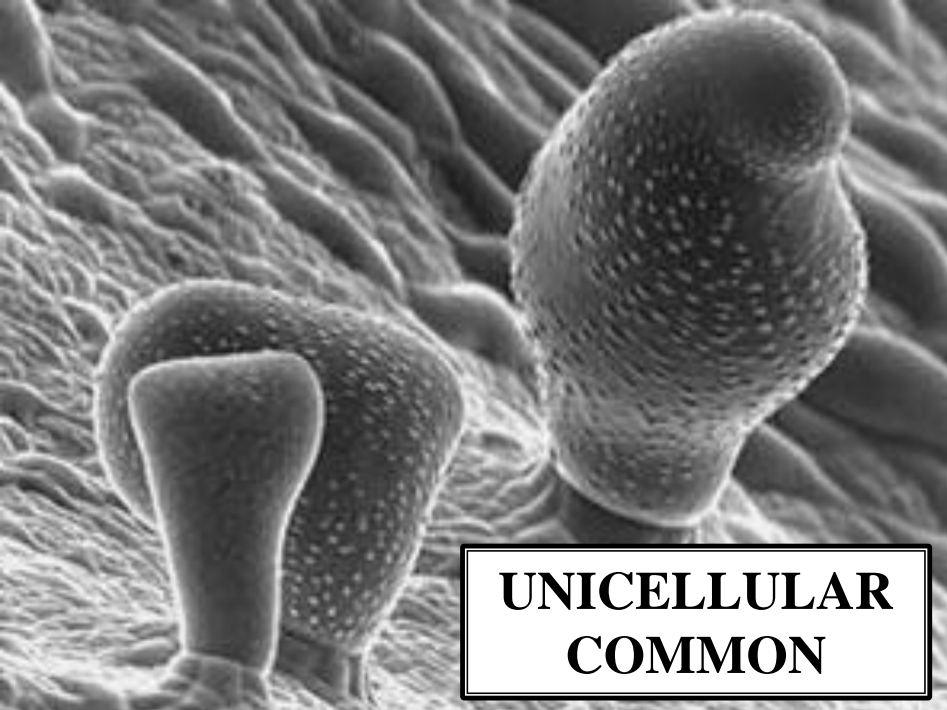
UNICELLULAR TRICHOME



CONSIST ONE CELL

COMMON

UNICELLULAR TRICHOME



MULTICELLULAR TRICHOME

MULTICELLULAR TRICHOME



CONSIST TWO OR MORE CELLS

MULTICELLULAR TRICHOME

MULTICELLULAR TRICHOME



CONSIST TWO OR MORE CELLS

LESS COMMON

MULTICELLULAR TRICHOME

MULTICELLULAR TRICHOME

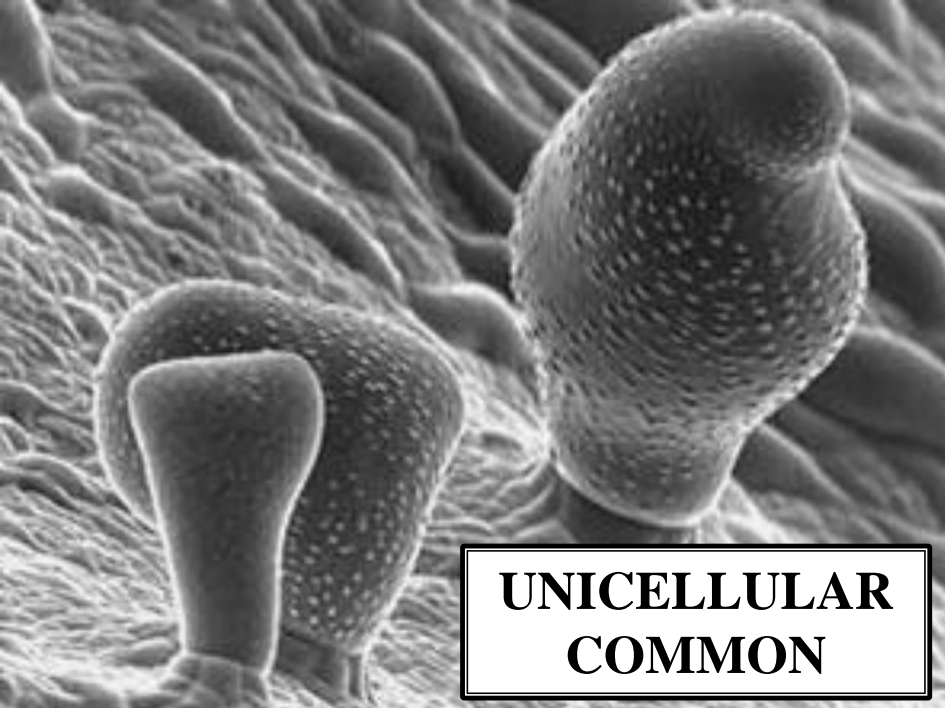


CONSIST TWO OR MORE CELLS

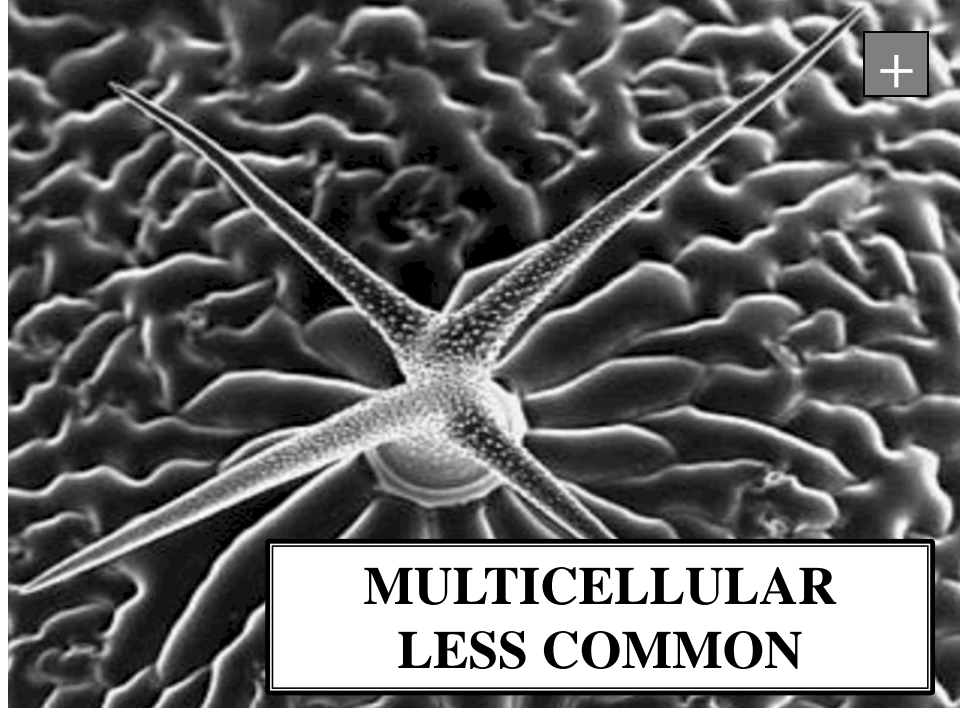
LESS COMMON

HIGHLY DIVERSE

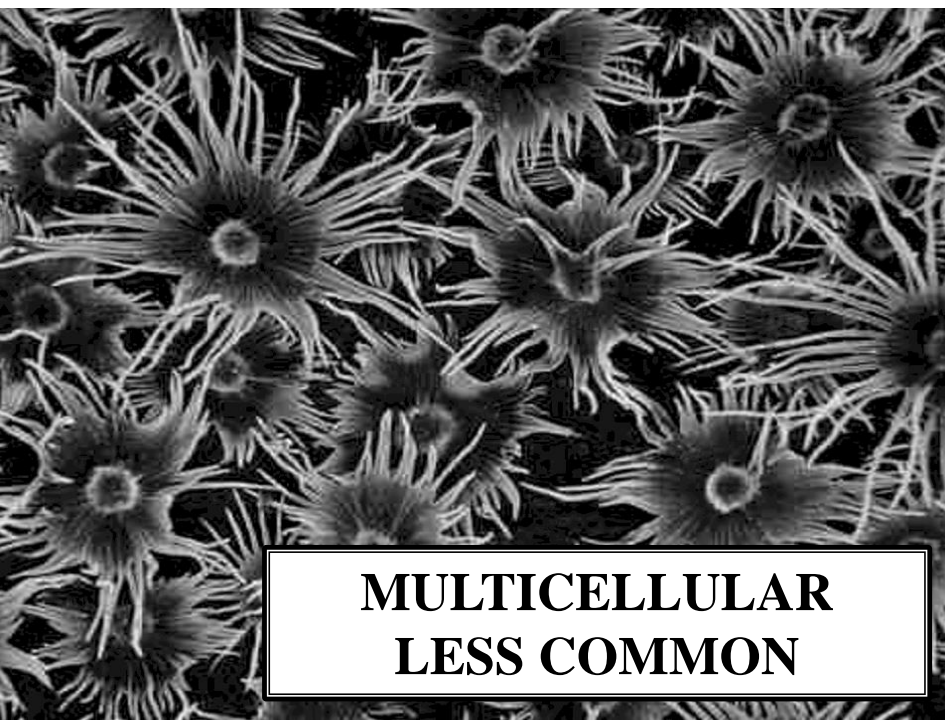
MULTICELLULAR TRICHOME



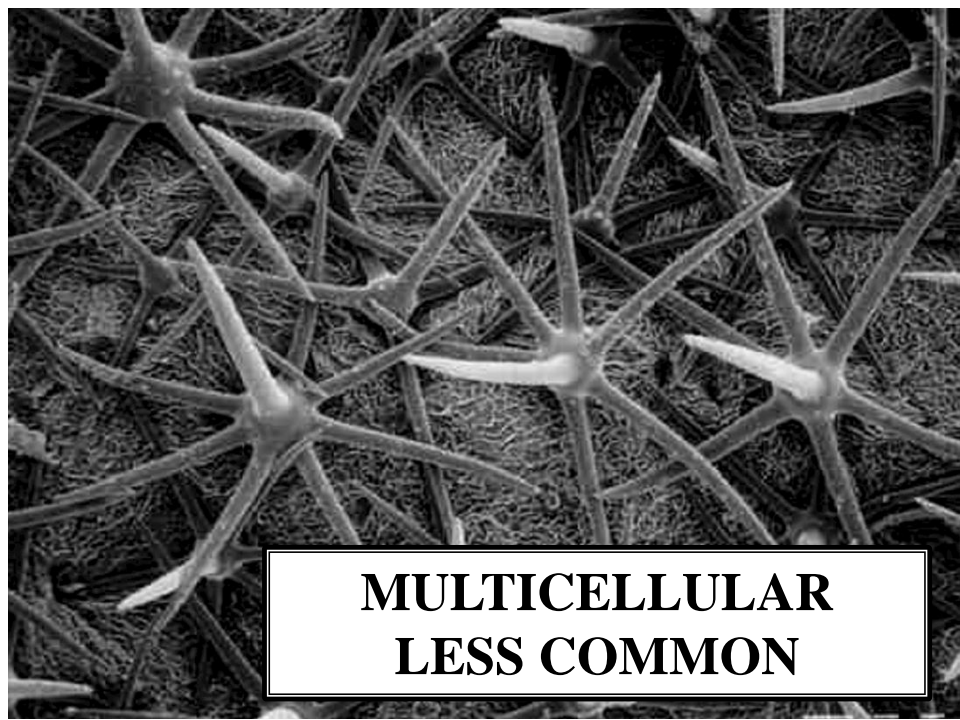
**UNICELLULAR
COMMON**



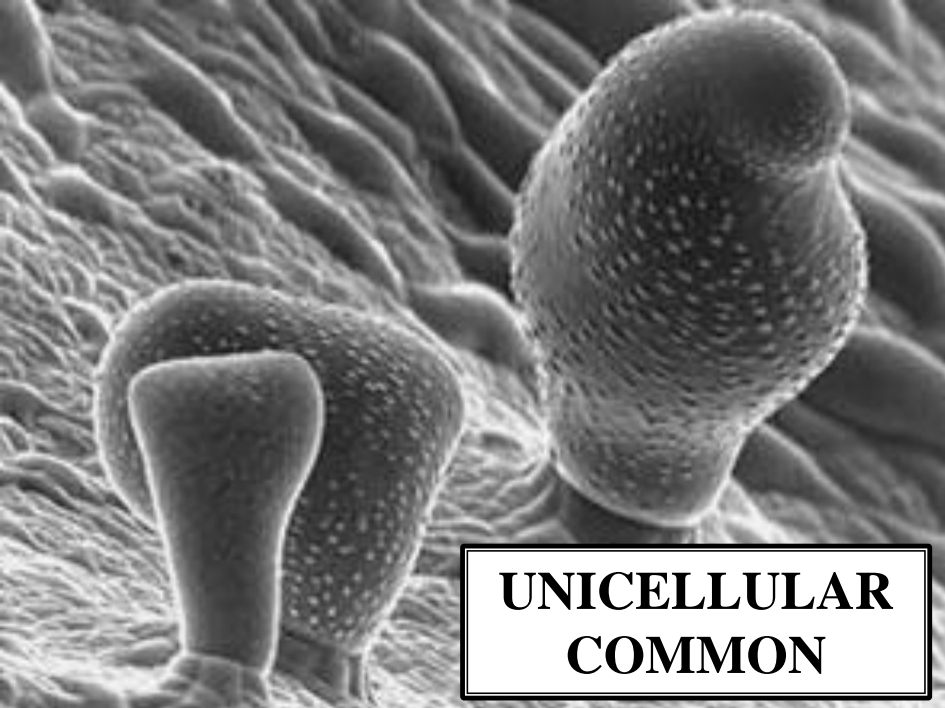
**MULTICELLULAR
LESS COMMON**



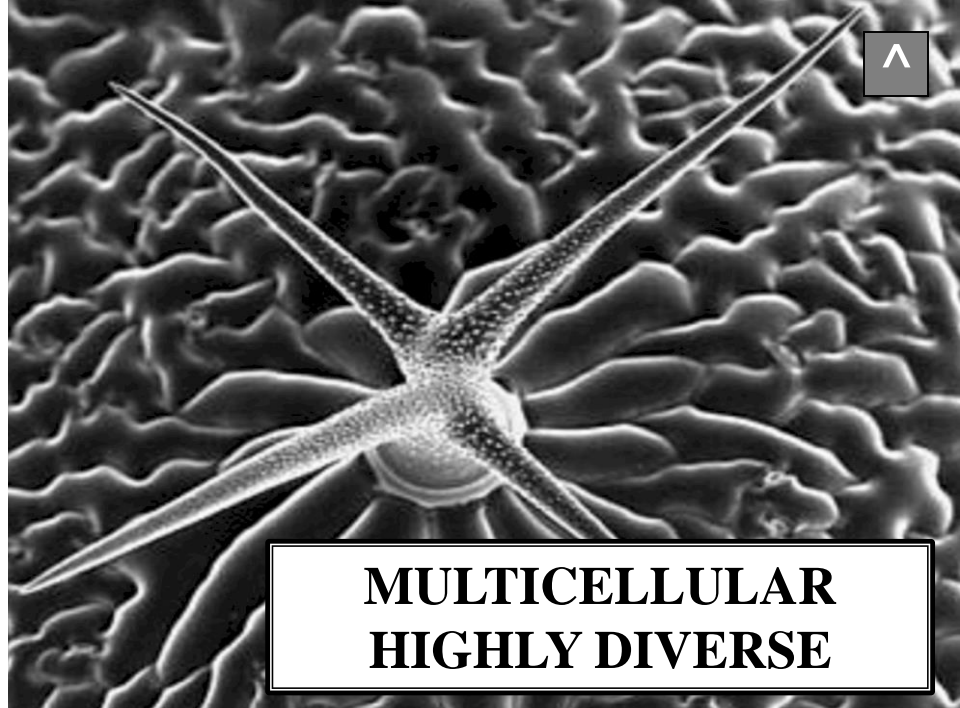
**MULTICELLULAR
LESS COMMON**



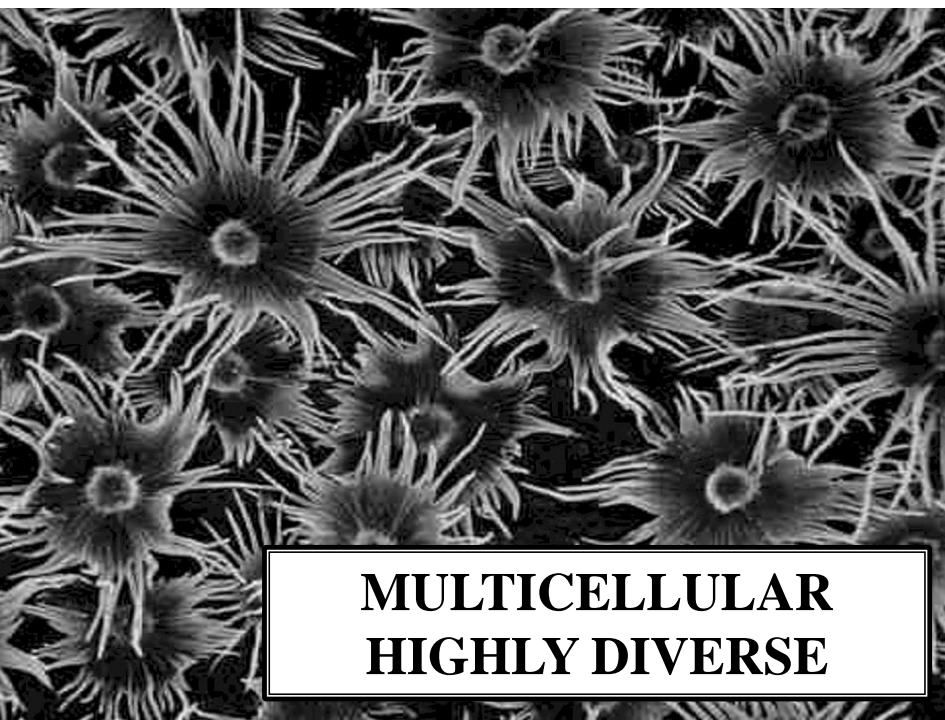
**MULTICELLULAR
LESS COMMON**



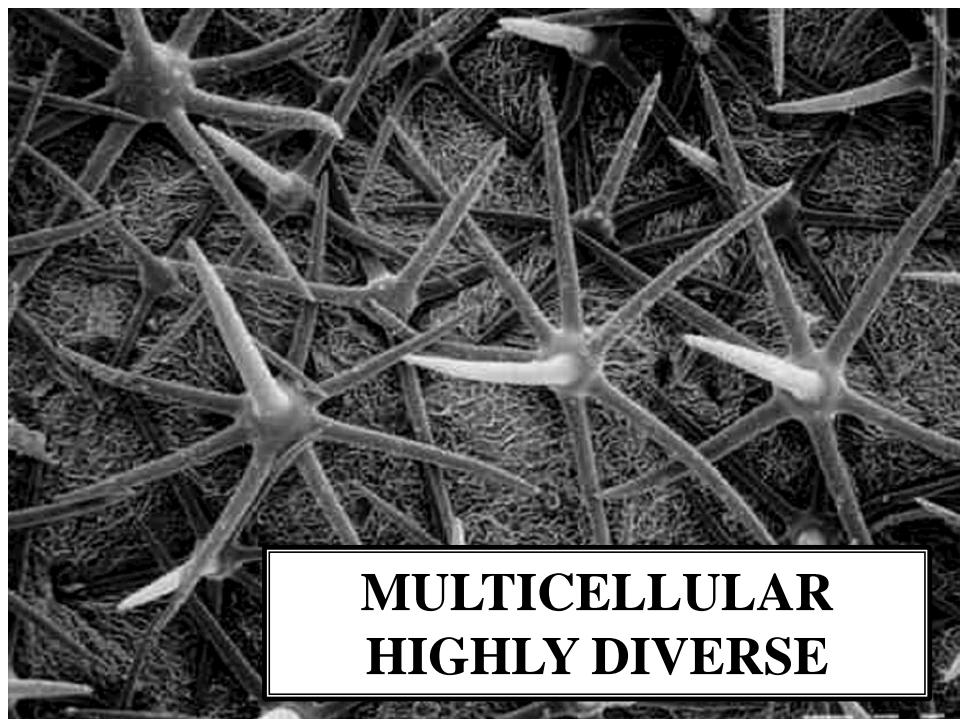
**UNICELLULAR
COMMON**



**MULTICELLULAR
HIGHLY DIVERSE**



**MULTICELLULAR
HIGHLY DIVERSE**



**MULTICELLULAR
HIGHLY DIVERSE**

TRICHOME MULTICELLULAR TYPES

**TRICHOME
MULTICELLULAR
TYPES**

DENDROID

**TRICHOME
MULTICELLULAR
TYPES**

**TRICHOME
MULTICELLULAR
TYPES**

DENDROID

PELTATE

**TRICHOME
MULTICELLULAR
TYPES**

**TRICHOME
MULTICELLULAR
TYPES**

DENDROID

PELTATE

STELLATE

**TRICHOME
MULTICELLULAR
TYPES**

DENDROID



TRICHOME

MULTICELLULAR

DENDROID

TREE-LIKE

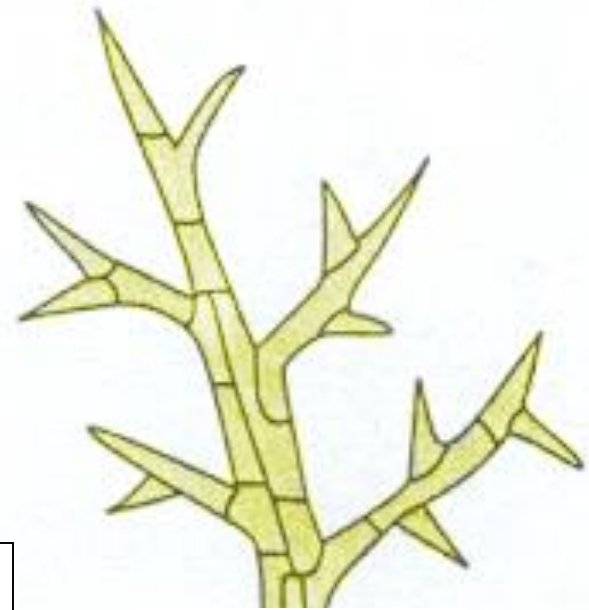
MULTICELLULAR TRICHOME

TRICHOME

MULTICELLULAR

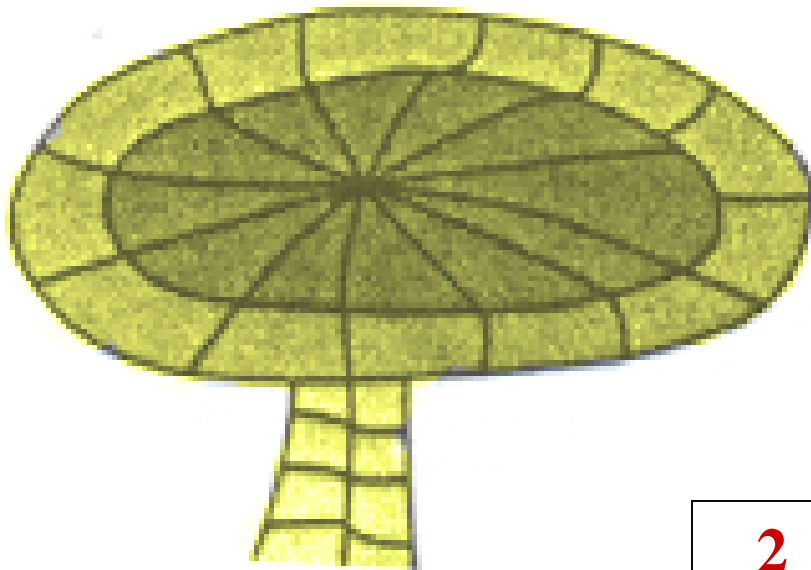
DENDROID

MULTICELLULAR TRICHOMES

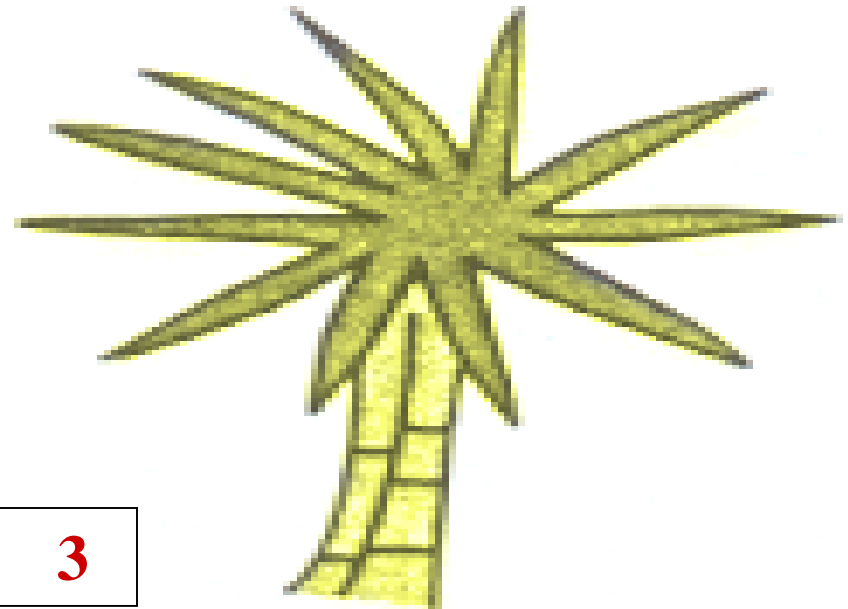


1

DENDROID

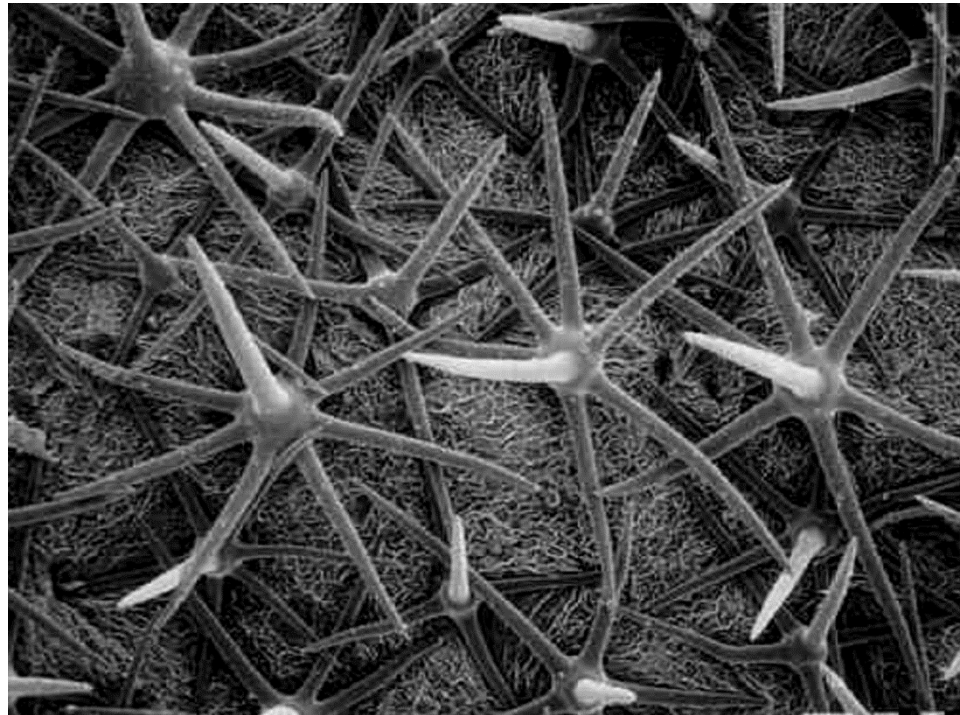
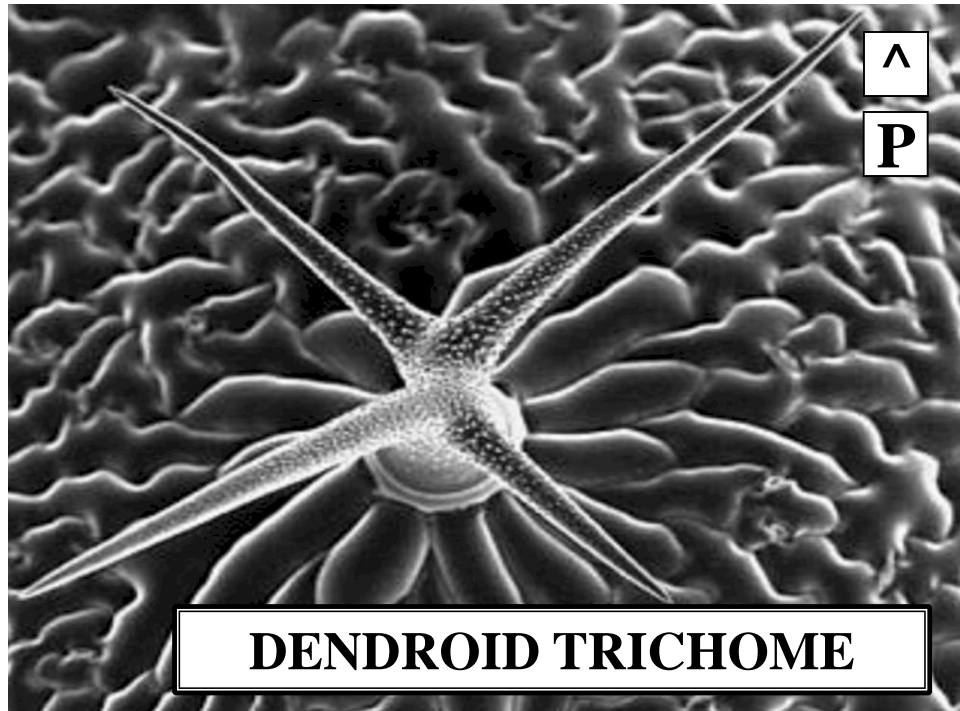


2



3

MULTICELLULAR TRICHOMES



PELTATE



TRICHOME
MULTICELLULAR
PELTATE

UMBRELLA-LIKE
MULTICELLULAR TRICHOME

TRICHOME
MULTICELLULAR
PELTATE