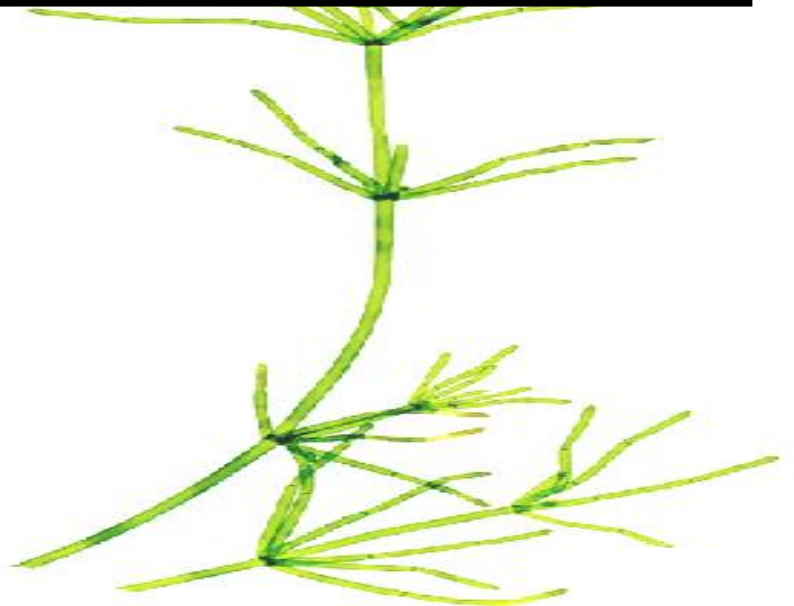


GREEN ALGAE



QUESTION

WHAT IS THE STUDY
OF ALGAE?

QUESTION

ANSWER

PHYCOLOGY

ANSWER

PHYCOLOGY

PHYCOLOGY

STUDY OF ALGAE

PHYCOLOGY

ALGAE



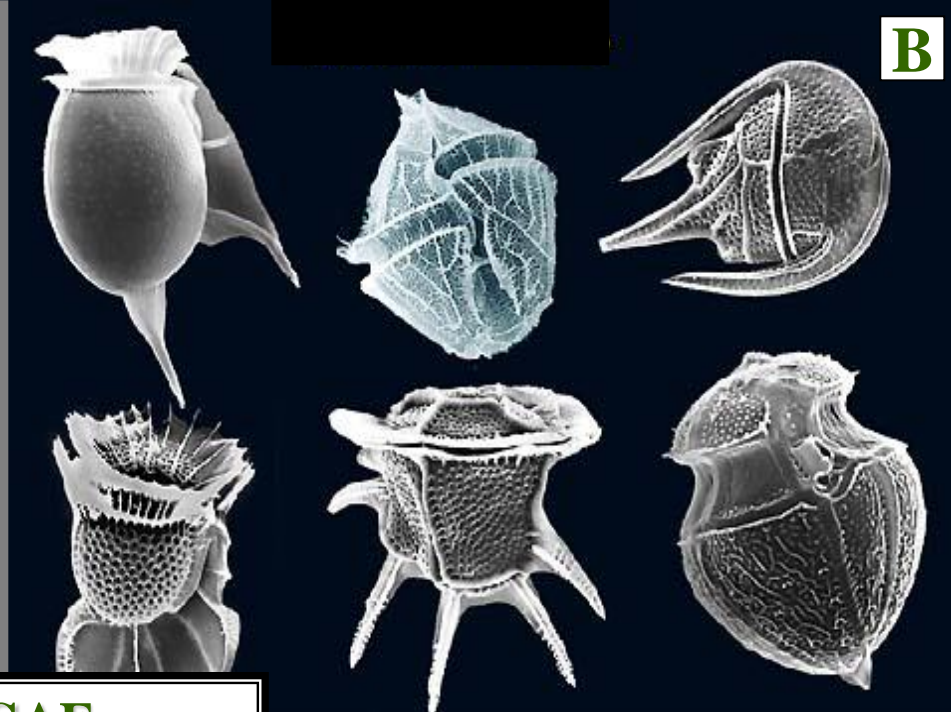
ALGAE

PHOTOSYNTHETIC

EUKARYOTES

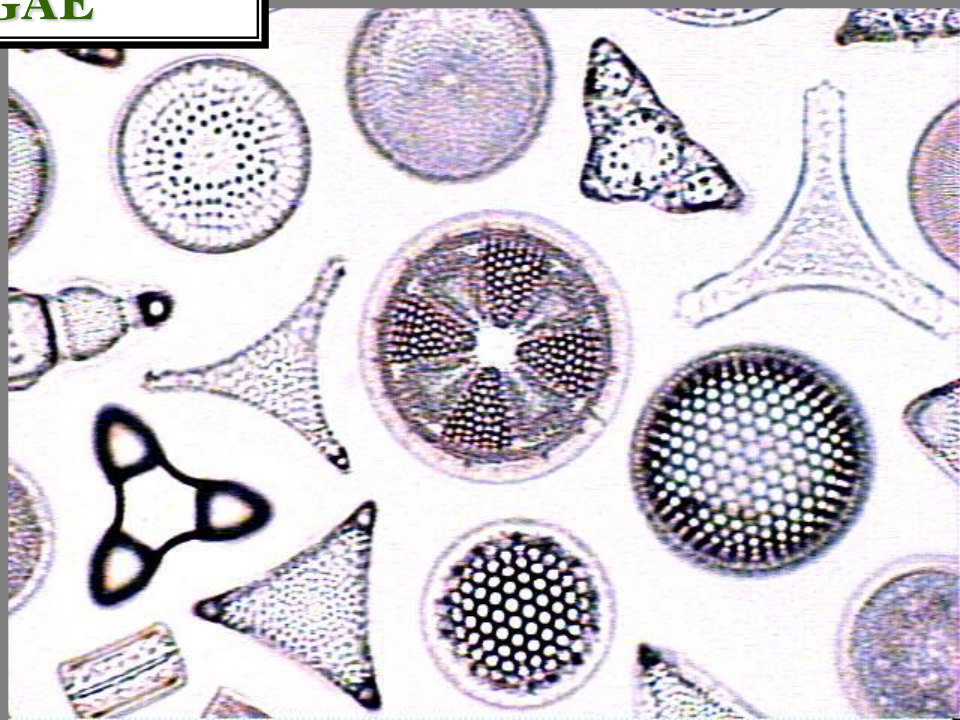
LACKING EMBRYO

ALGAE



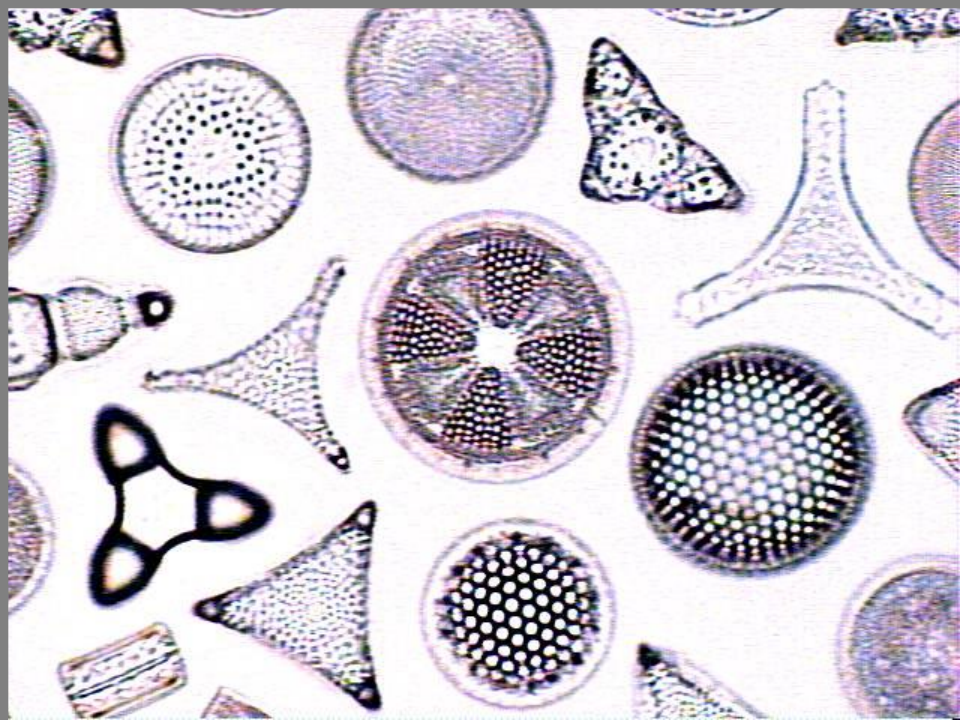
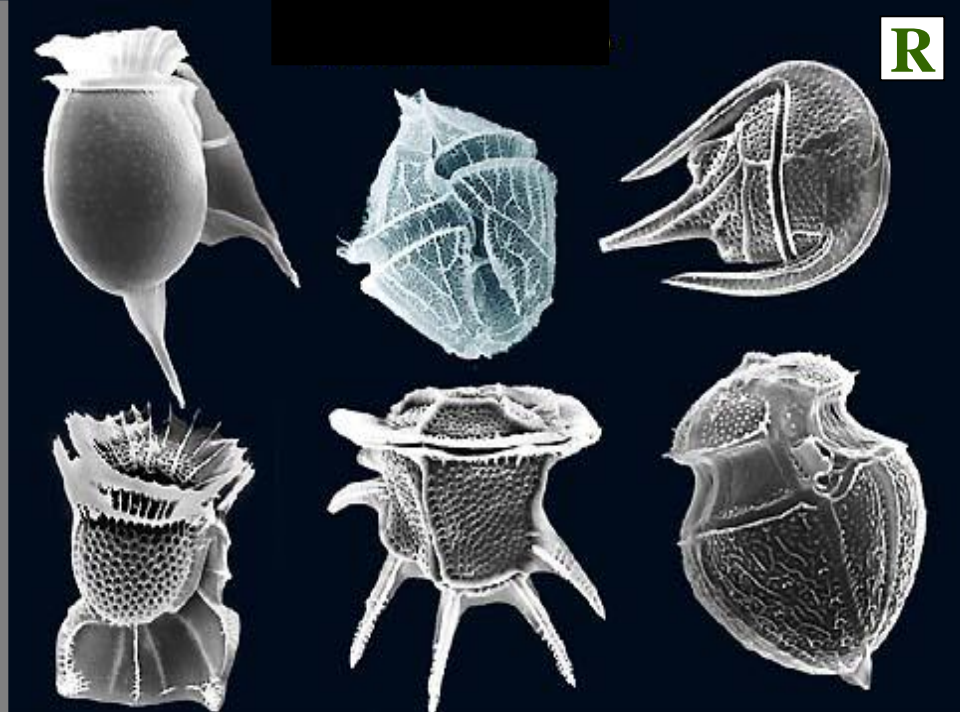
B

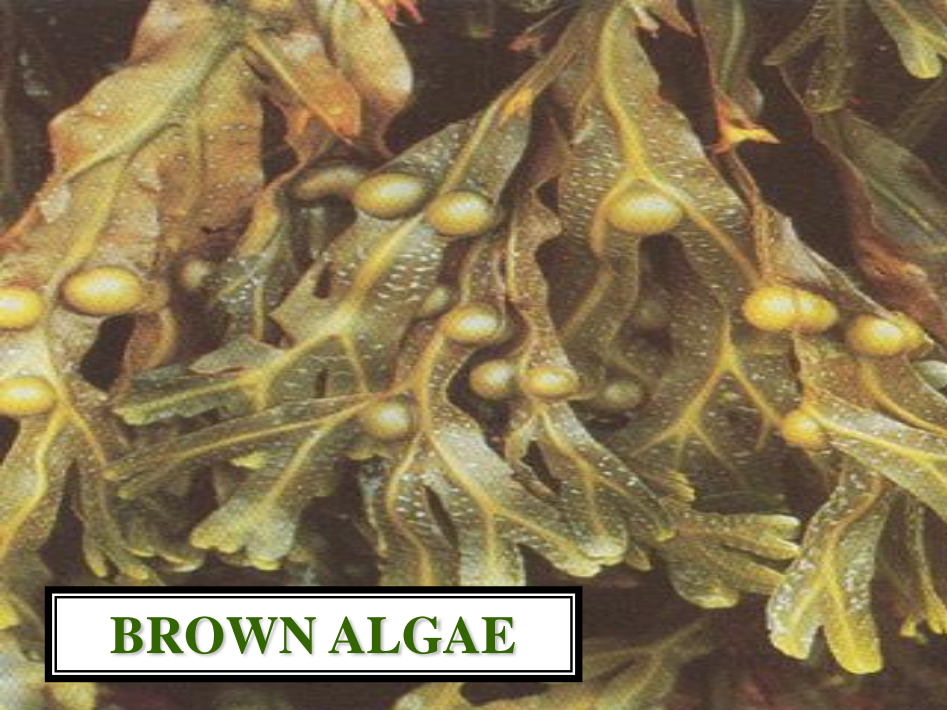
ALGAE





BROWN ALGAE





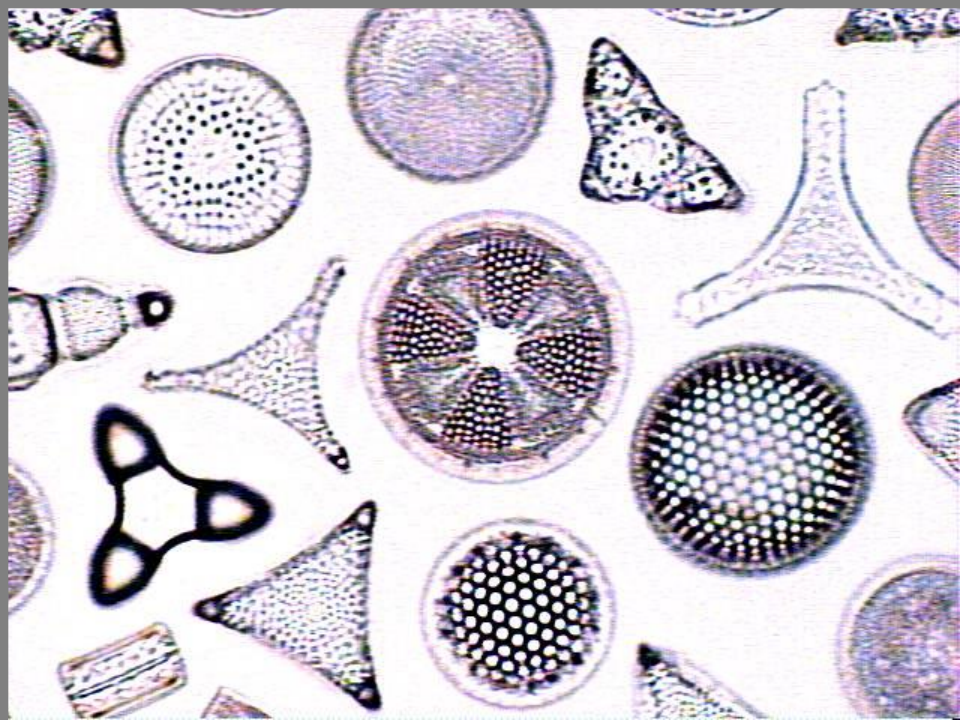
BROWN ALGAE

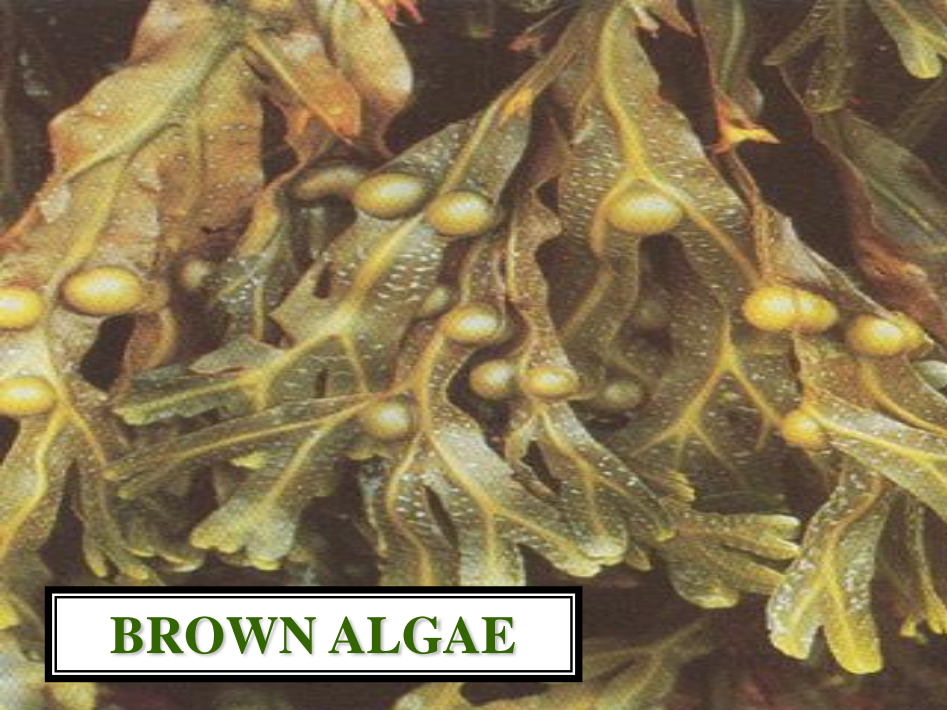


D

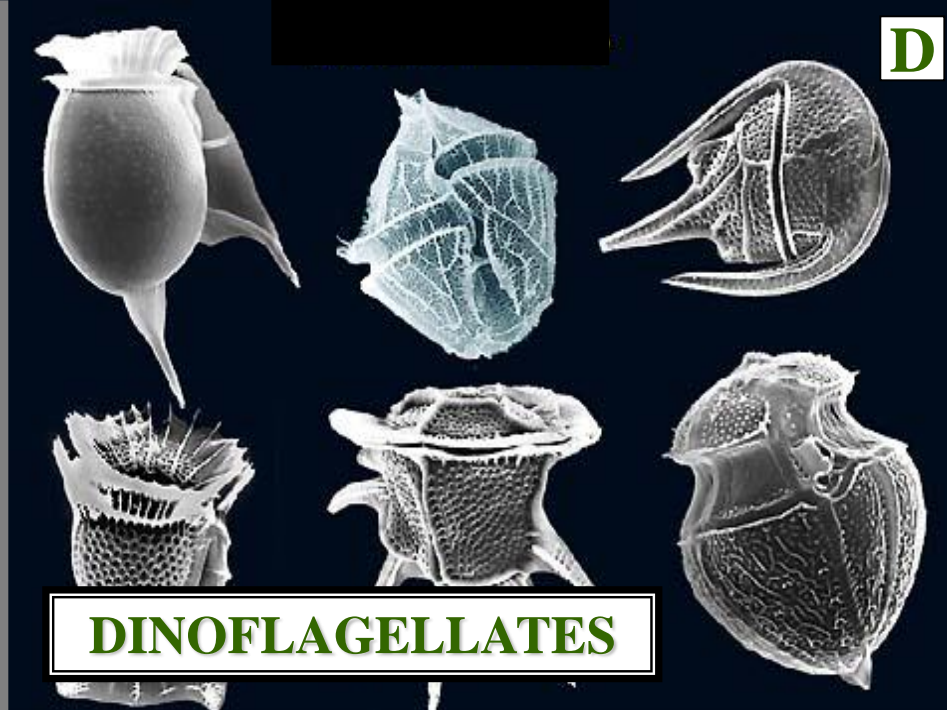


RED ALGAE





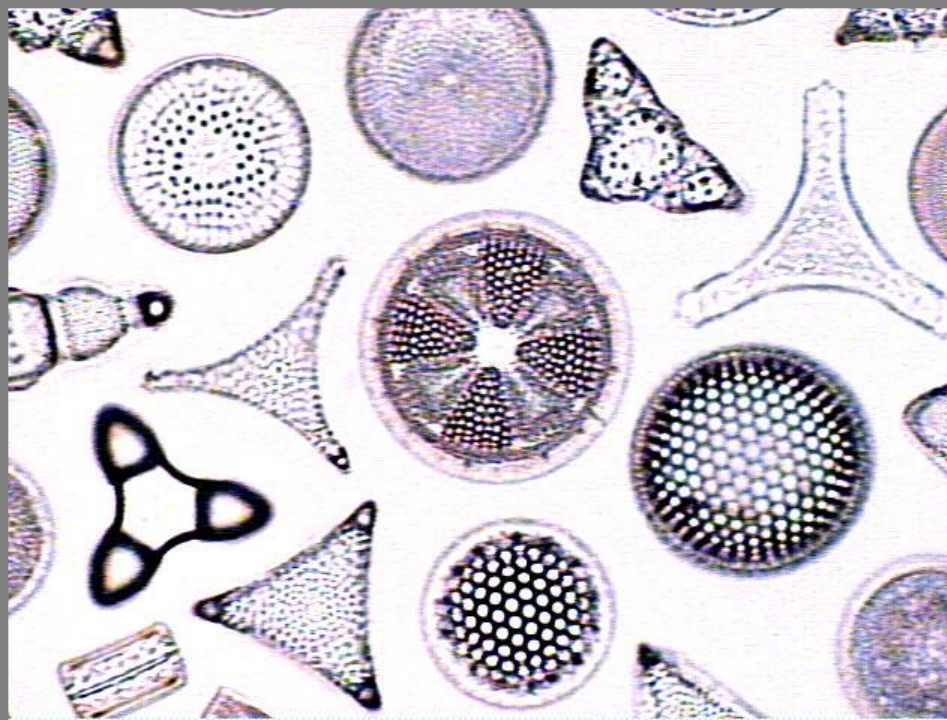
BROWN ALGAE

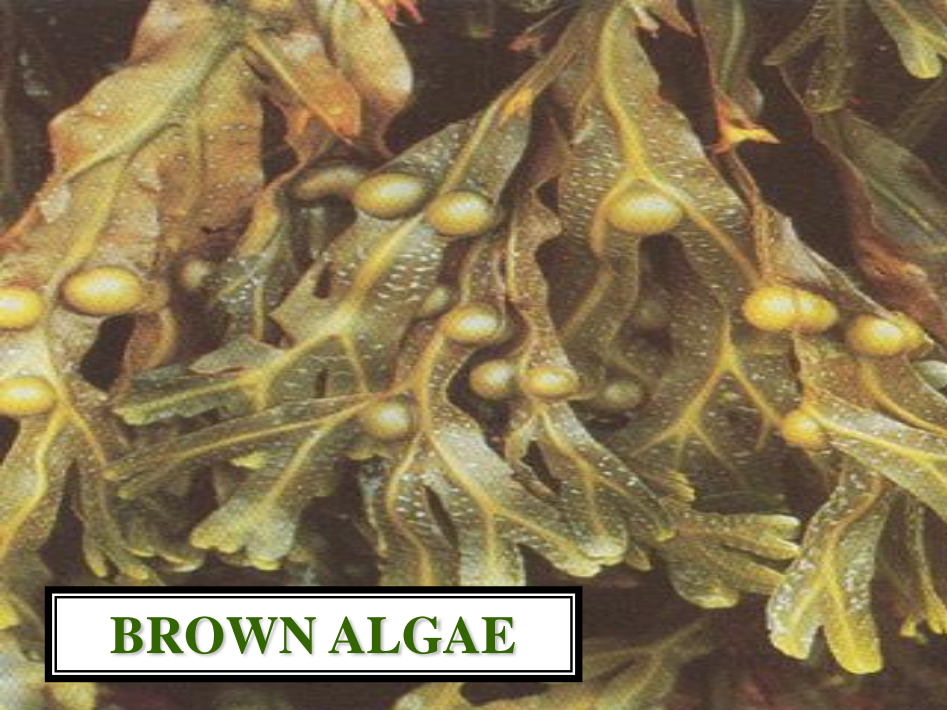


DINOFLAGELLATES

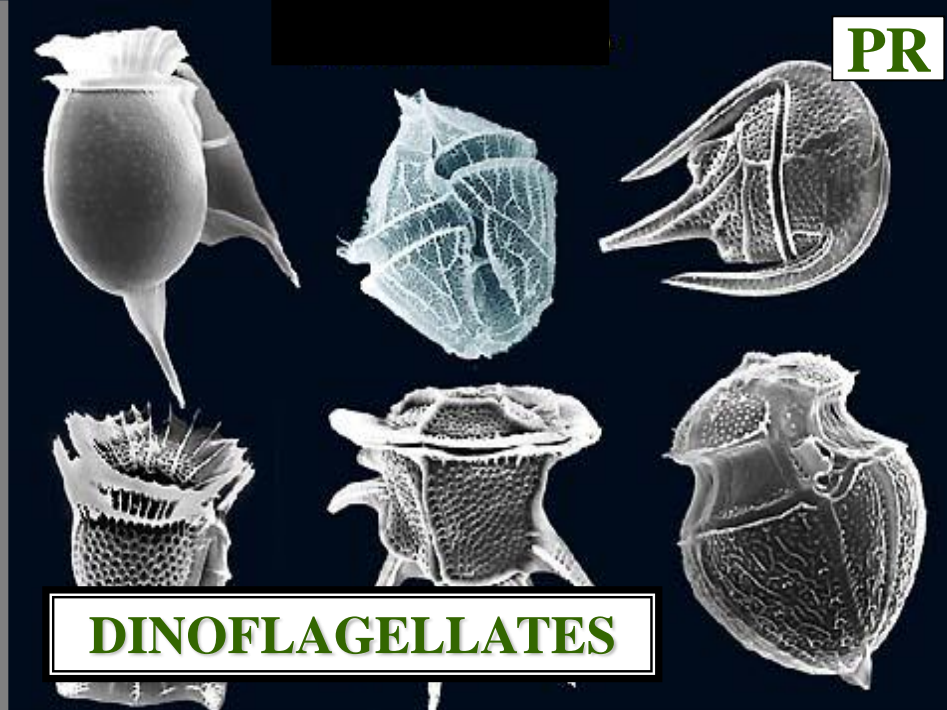


RED ALGAE





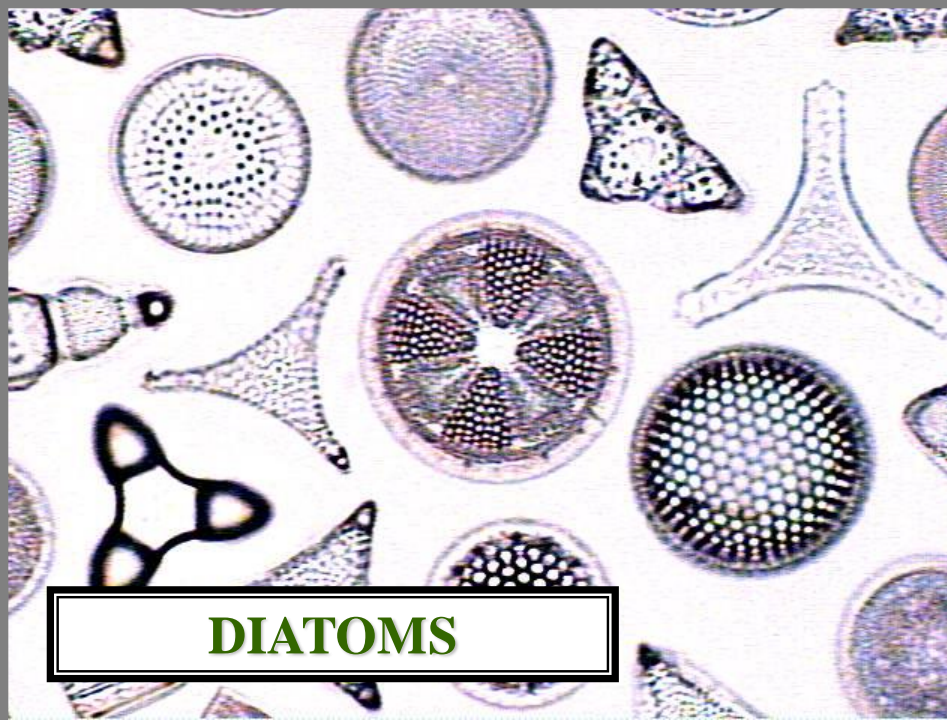
BROWN ALGAE



DINOFLAGELLATES



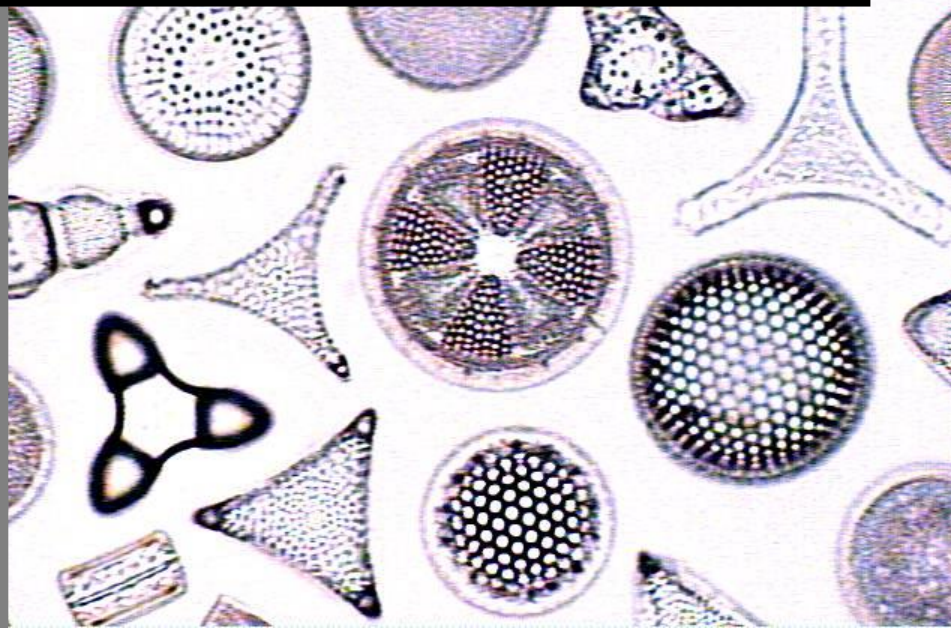
RED ALGAE



DIATOMS



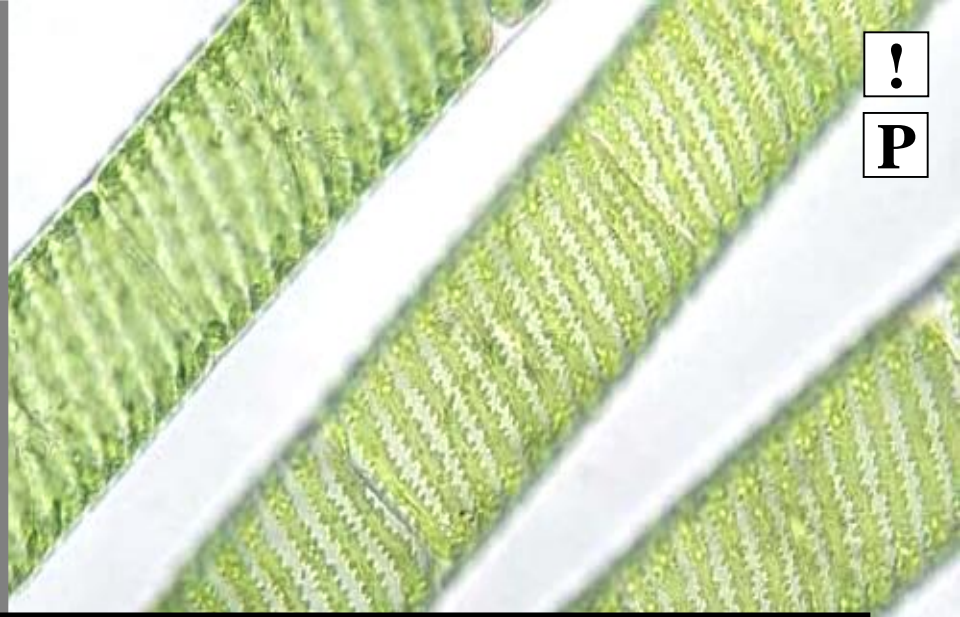
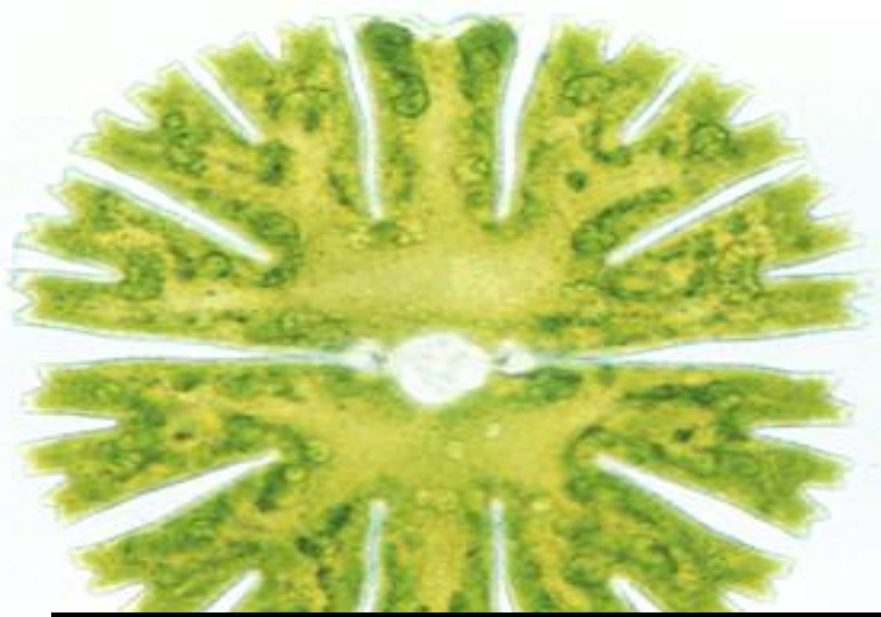
KINGDOM: PROTISTA





GREEN ALGAE
HISTORICALLY ASSIGNED
KINGDOM: PROTISTA

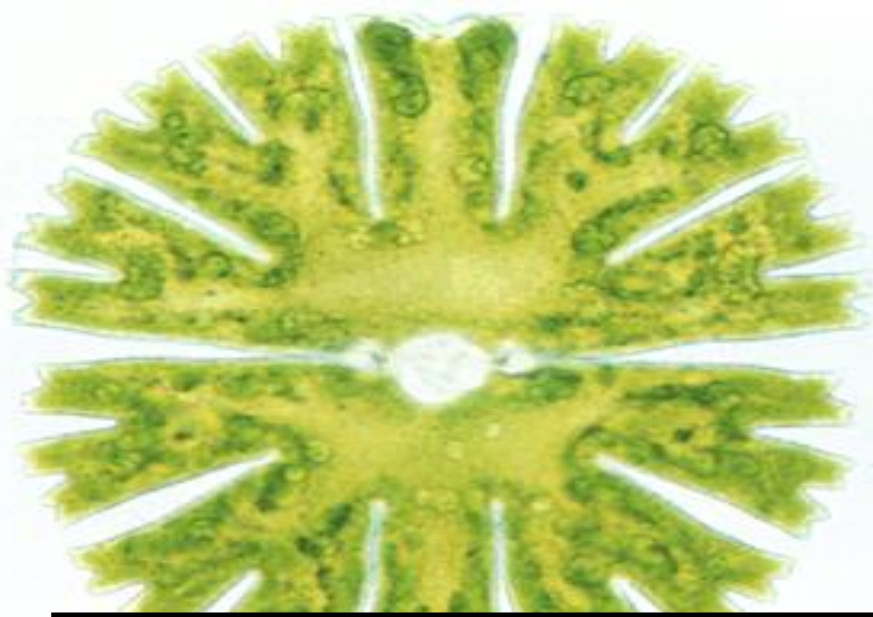




!
P

GREEN ALGAE



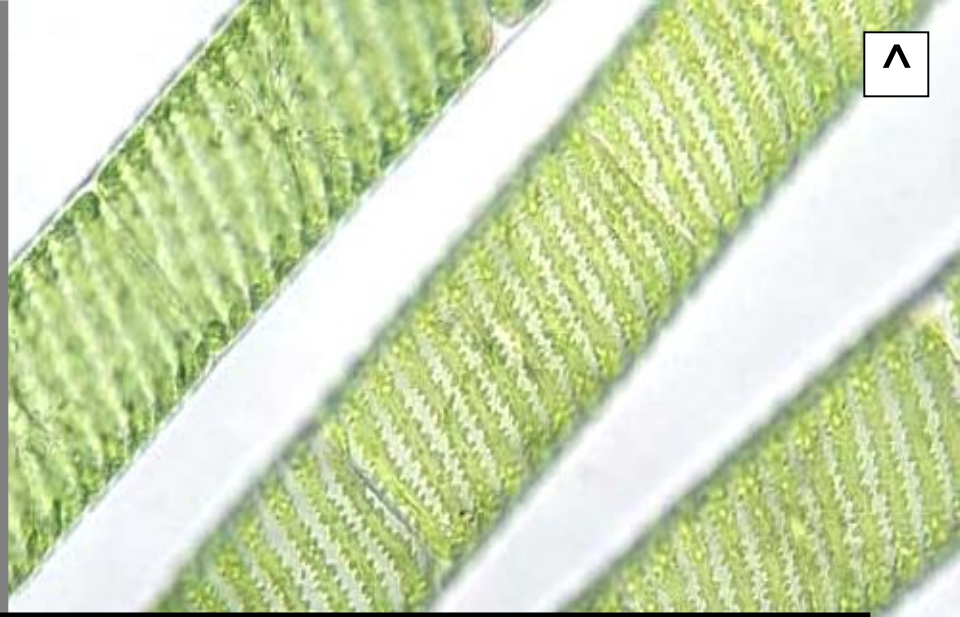
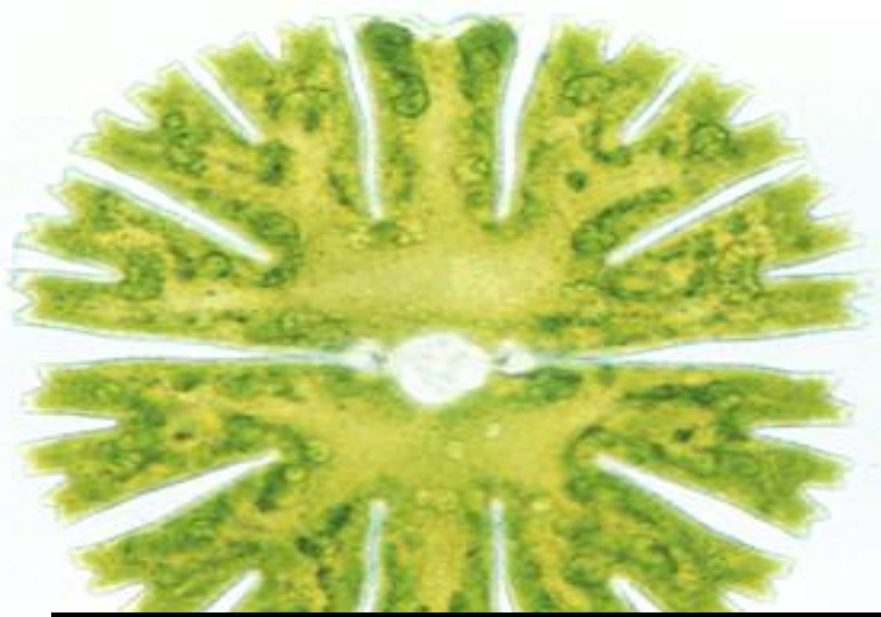


i

A

~1 PSYN PIGMENTS

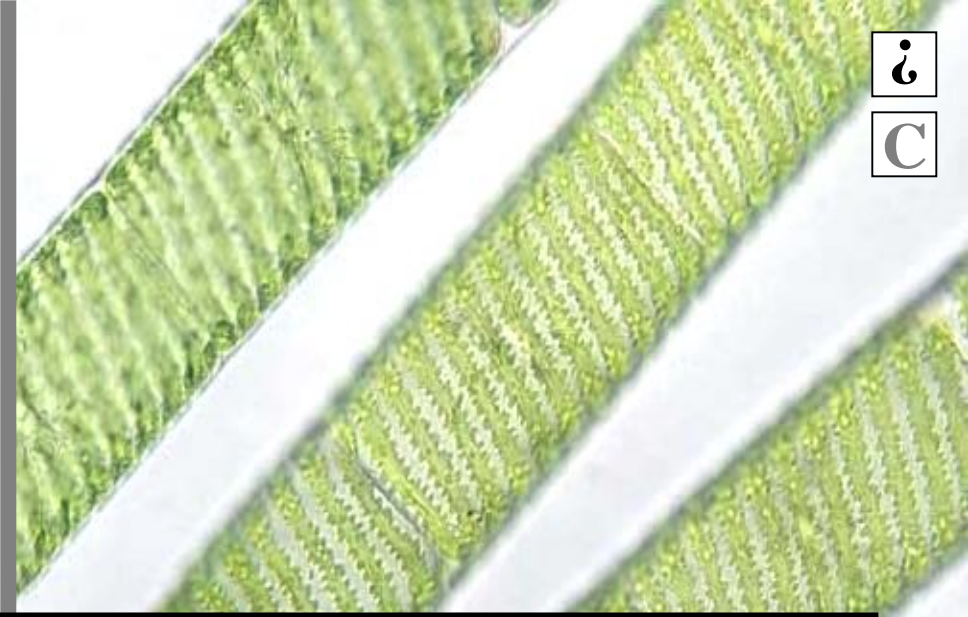
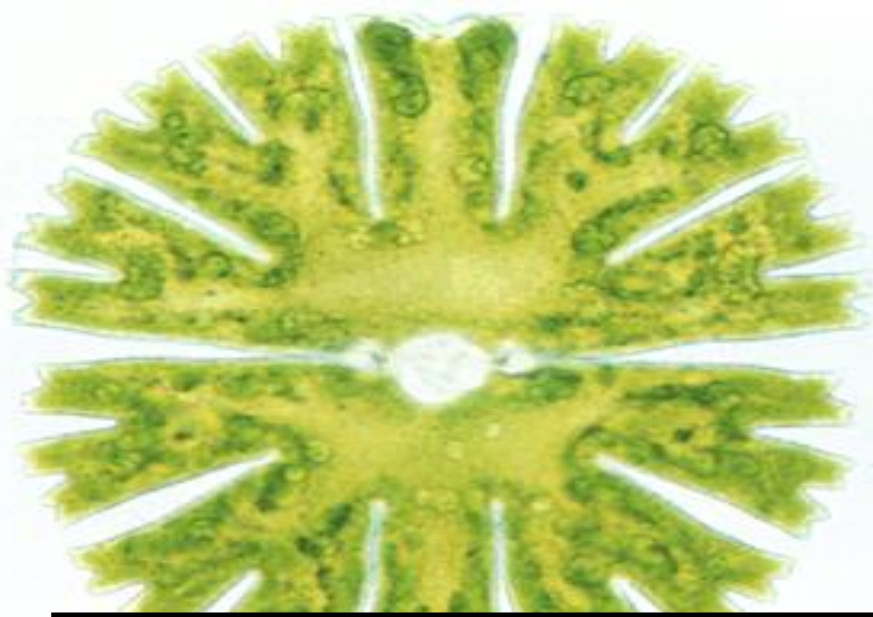




^

CHLA & B

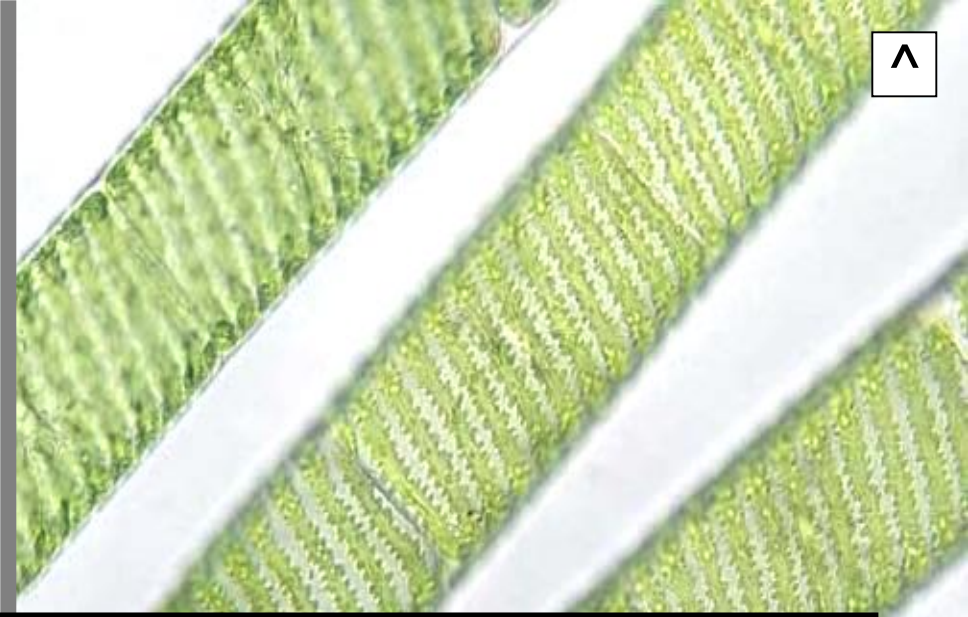
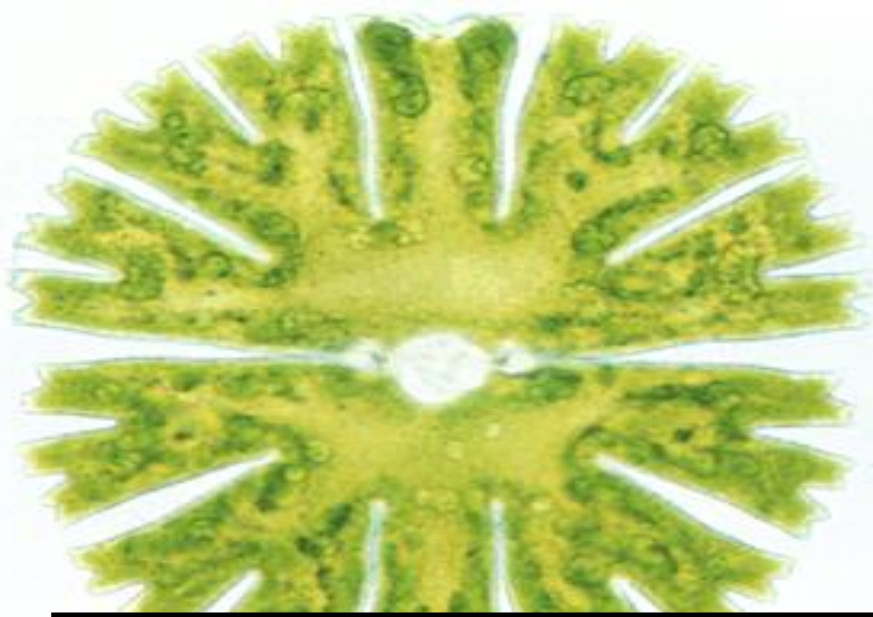




i
C

~2 PSYN PIGMENTS

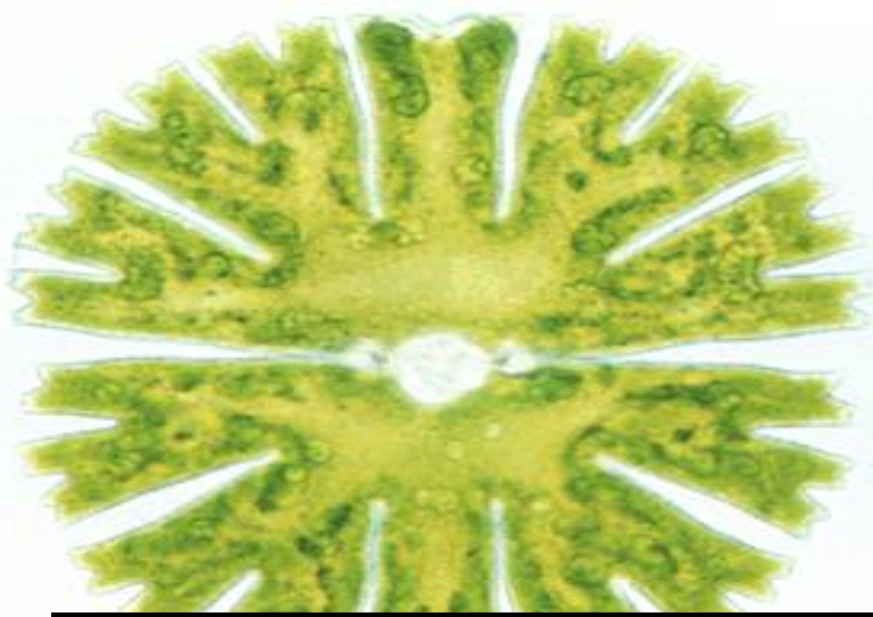




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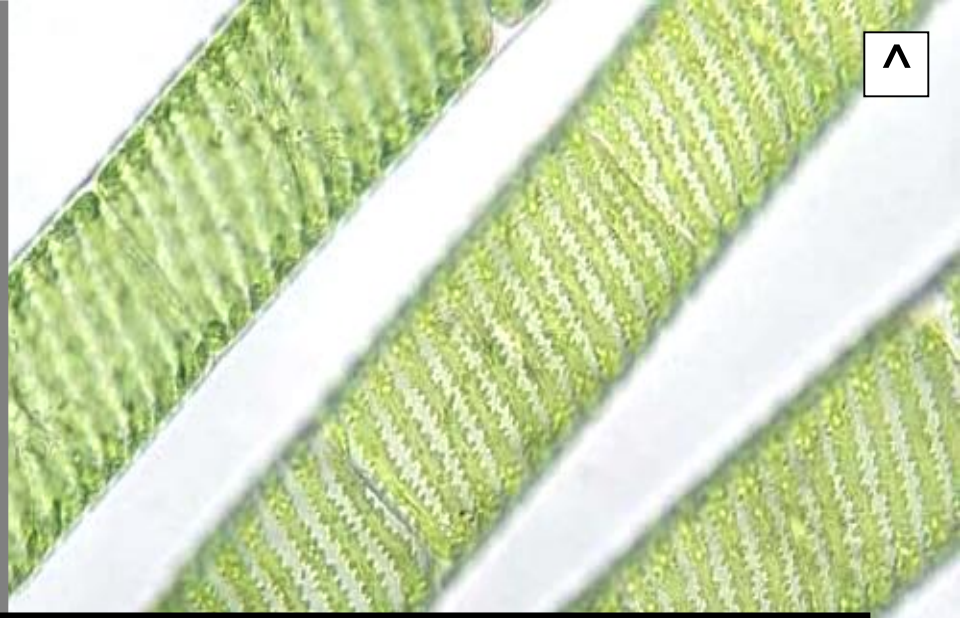
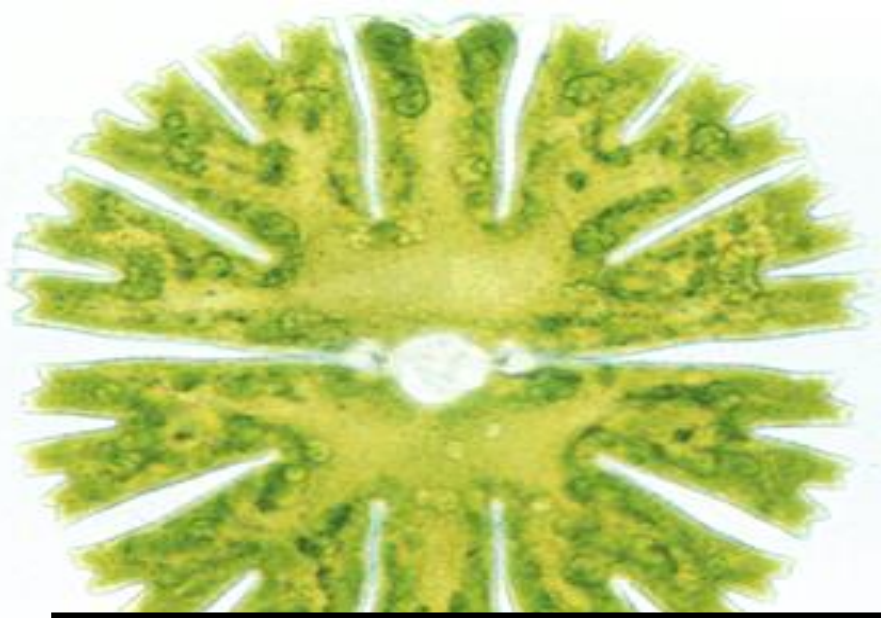
CAROTENOIDS



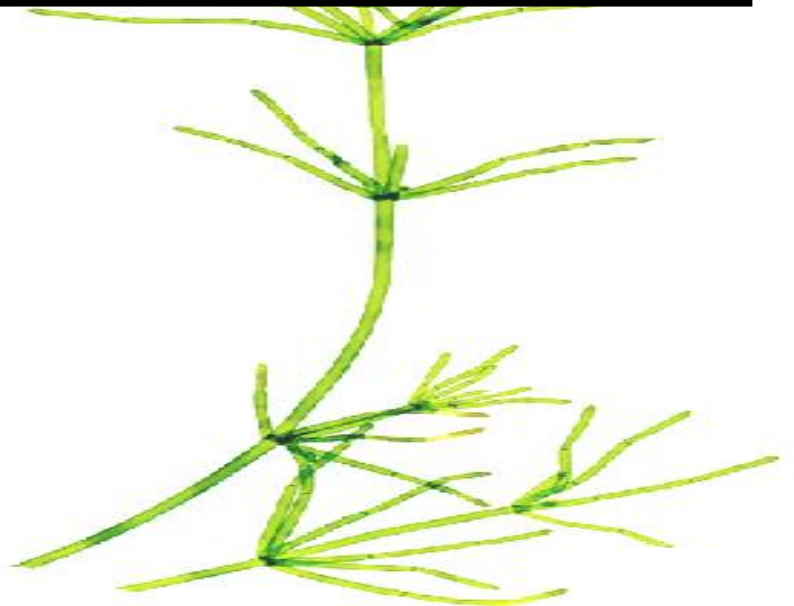


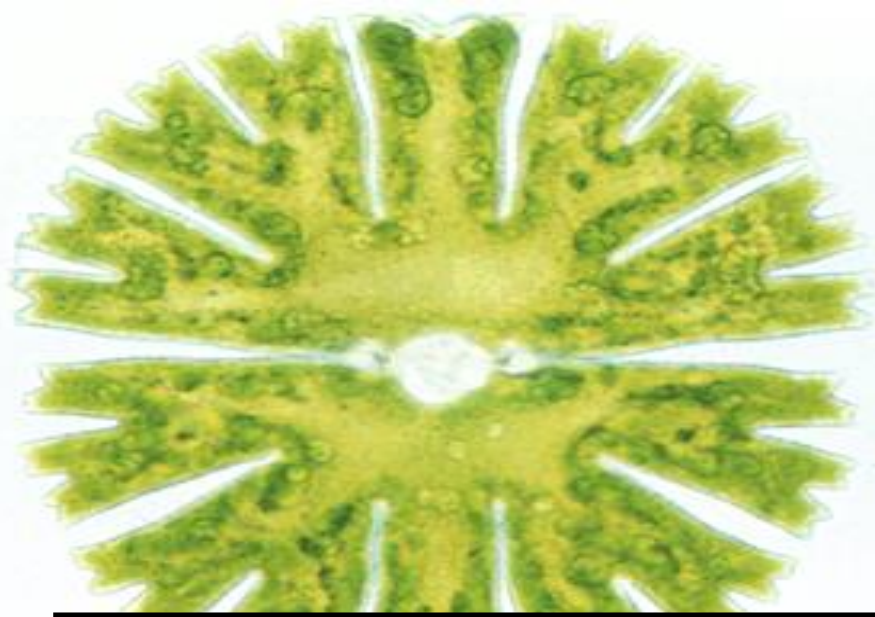
CELL WALL





CELLULOSE

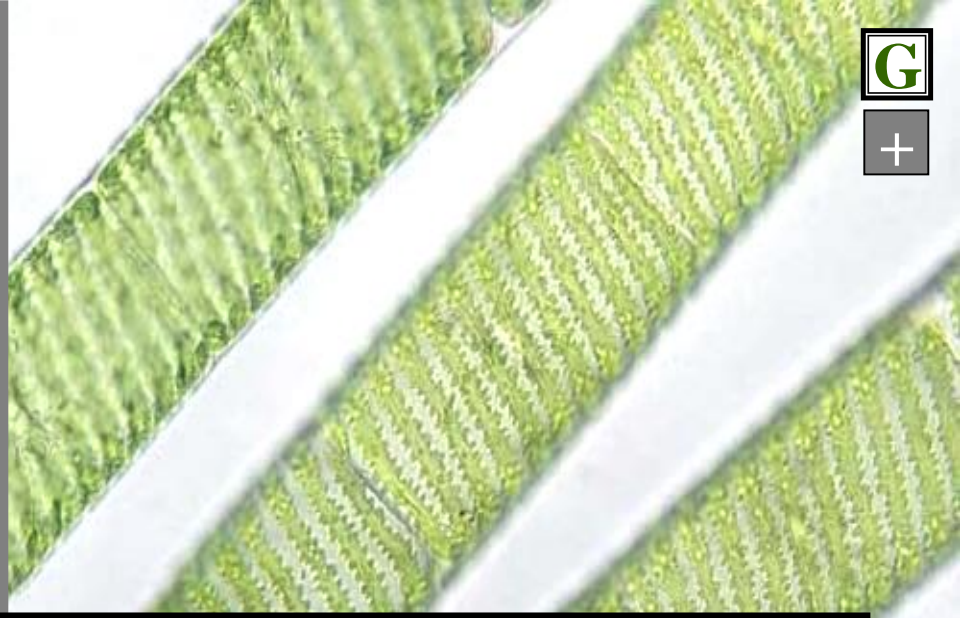
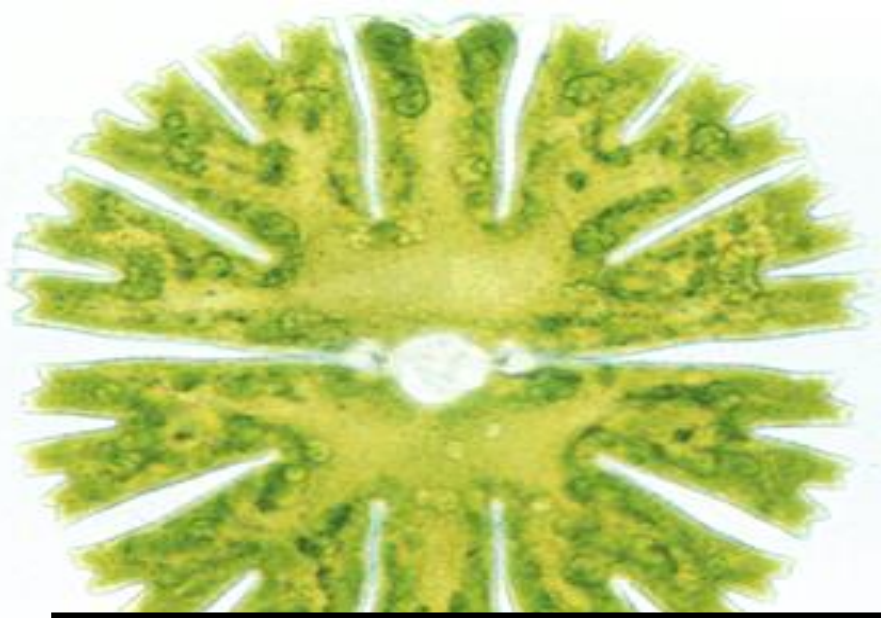




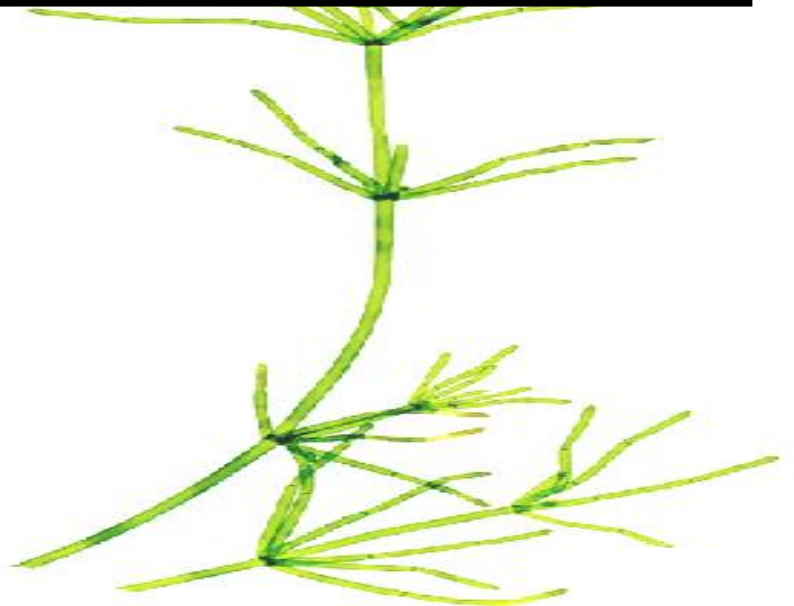
i
S

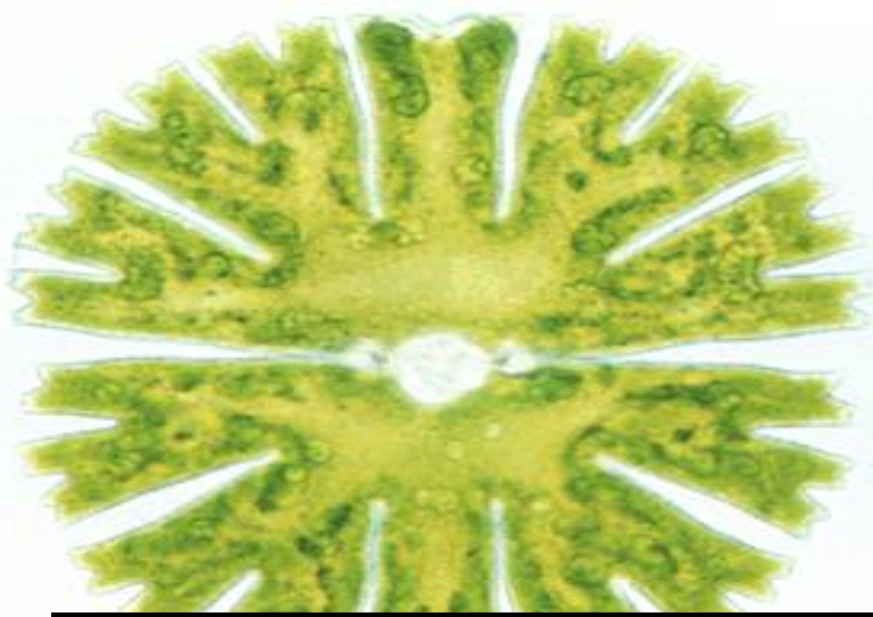
FOOD RESERVE





STARCH





SS

+

GREEN ALGAE



CHLOROPHYTA CHARACTERS SUMMARY

PRIMARY PSYN PIGMENTS: **CHL A & CHL B**
SECONDARY PSYN PIGMENTS: **CAROTENOIDS**
CELL WALL COMPOSITION: **CELLULOSE**
FOOD RESERVE: **STARCH**

CHLOROPHYTA CHARACTERS SUMMARY

KINGDOM: PLANTAE



CHARACTERS

SUMMARY

PRIMARY PSYN PIGMENTS: CHL A & CHL B

SECONDARY PSYN PIGMENTS: CAROTENOIDS

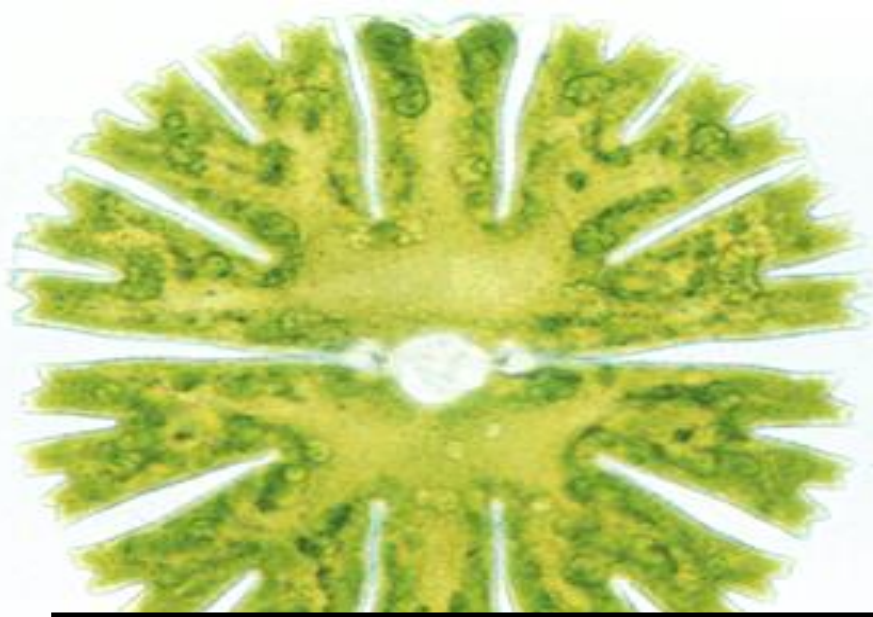
CELL WALL COMPOSITION: CELLULOSE

FOOD RESERVE: STARCH

KINGDOM: PLANTAE

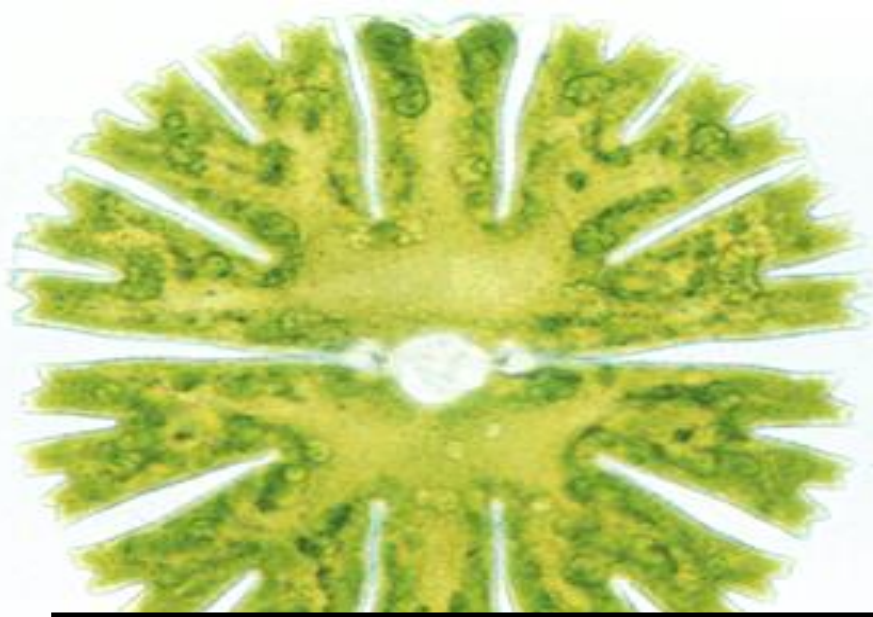
CHARACTERS

SUMMARY



GREEN ALGAE



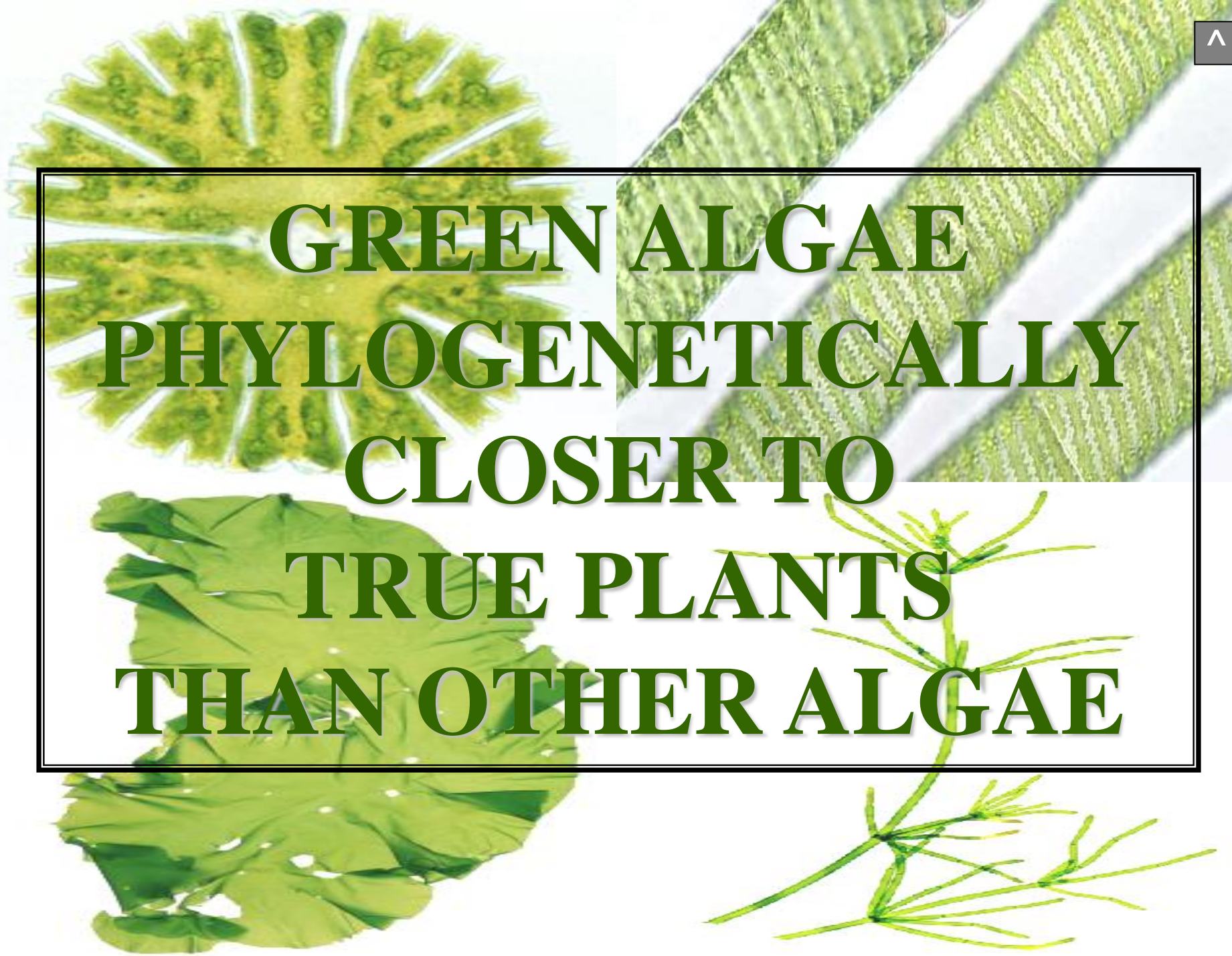


KINGDOM: PLANTAE





**GREEN ALGAE
PHYLOGENETICALLY
CLOSER TO
TRUE PLANTS
THAN OTHER ALGAE**





DIVERSITY

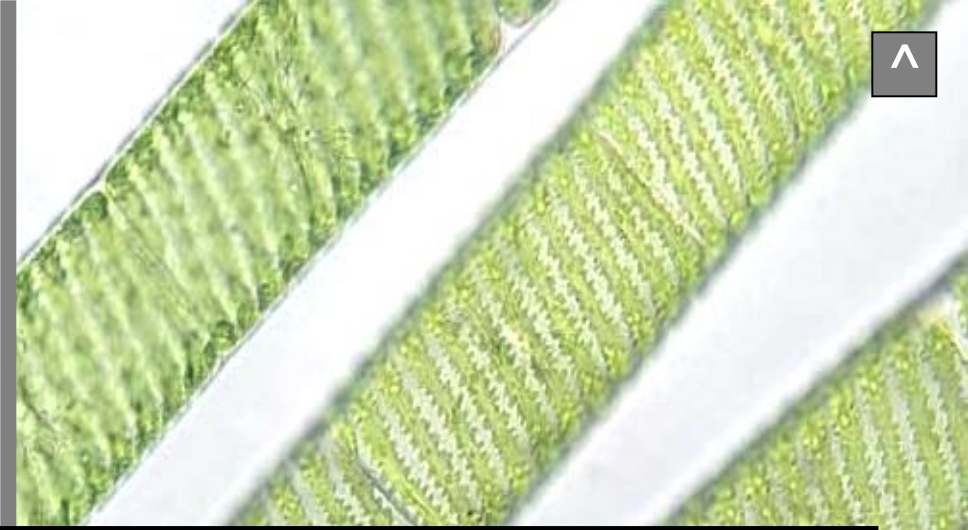
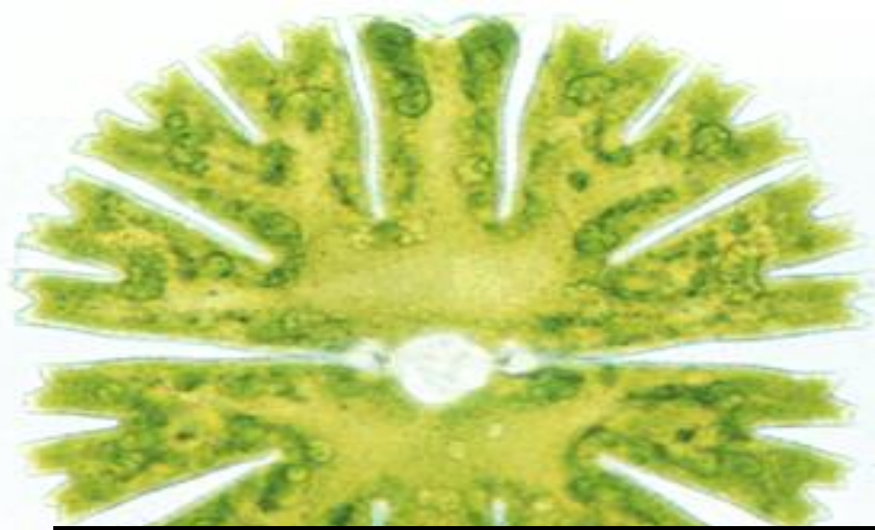
~17,000 SPECIES

EARTH

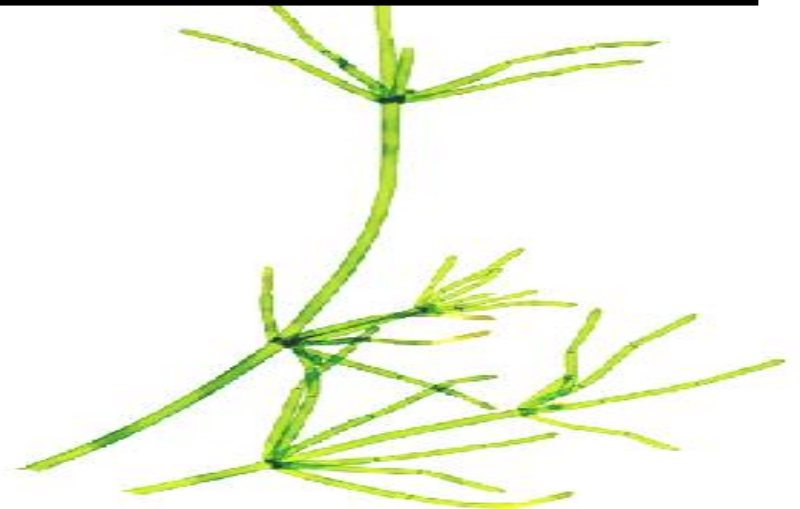
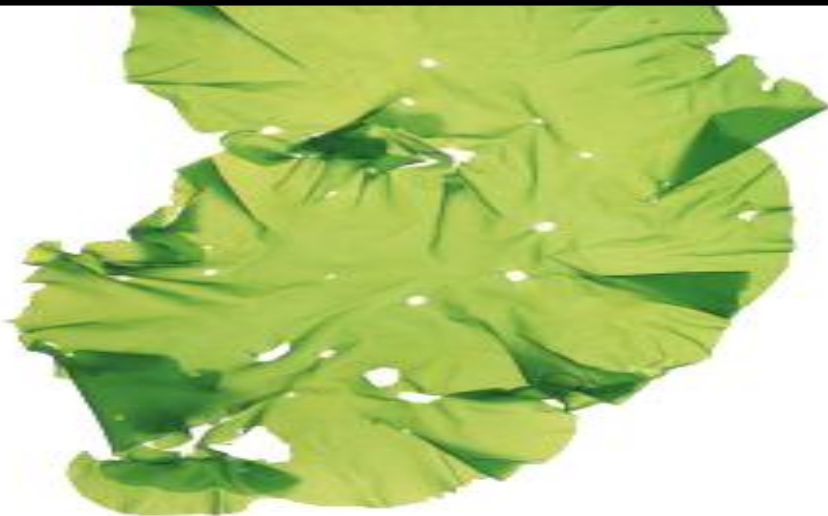


~500 GENERA

EARTH



MOST DIVERSE ALGAE PHYLUM





DISTRIBUTION



COSMOPOLITAN

EARTH



HABITAT



AQUATIC



AQUATIC



TERRESTRIAL



TERRESTRIAL



AQUATIC HABITATS



MARINE



MARINE



FRESHWATER



FRESHWATER

PHYTOPLANKTON



PHYTOPLANKTON

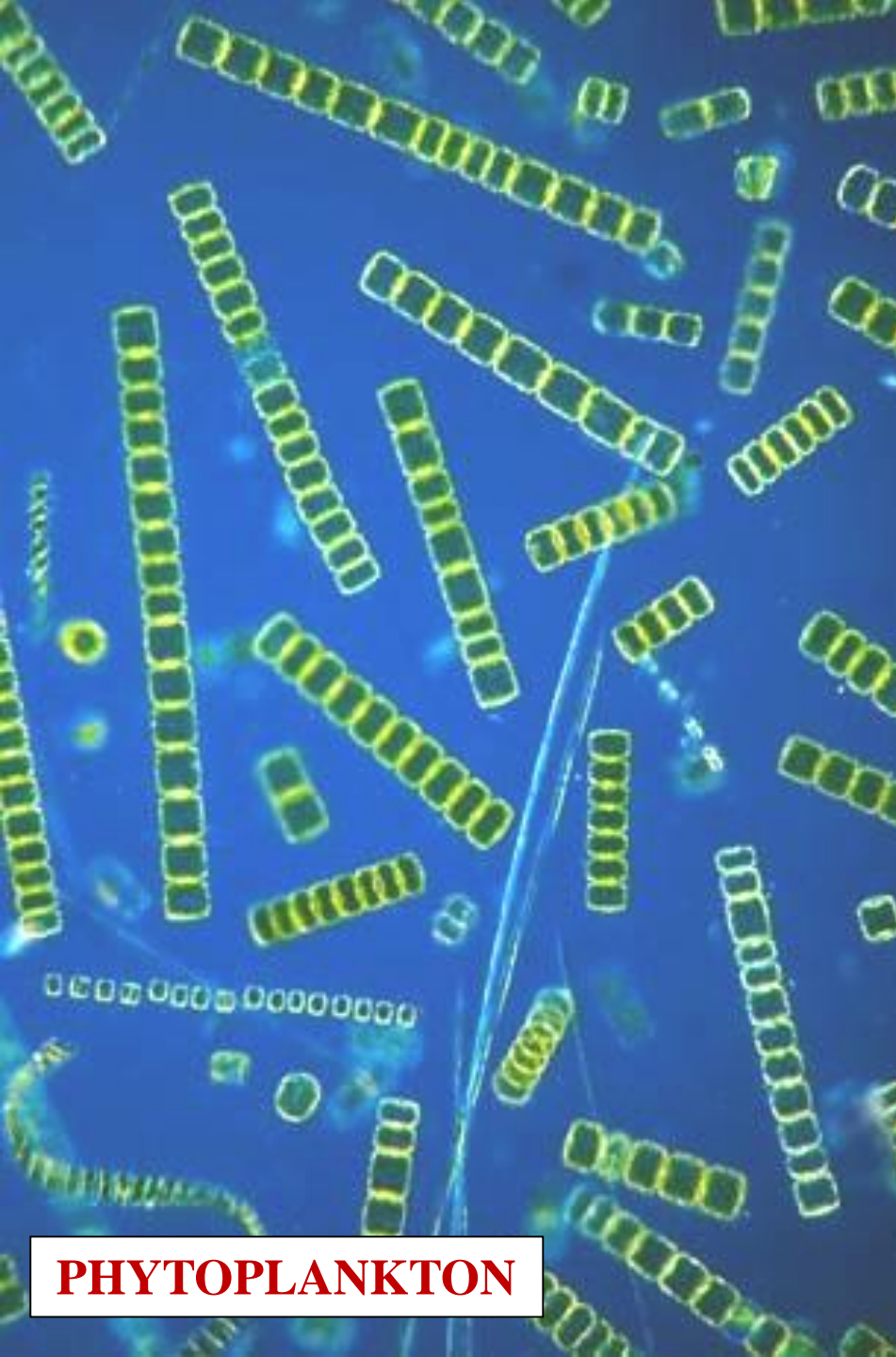
FREE-FLOATING

OR

FREE-SWIMMING

GREEN ALGAE

PHYTOPLANKTON



PHYTOPLANKTON



B



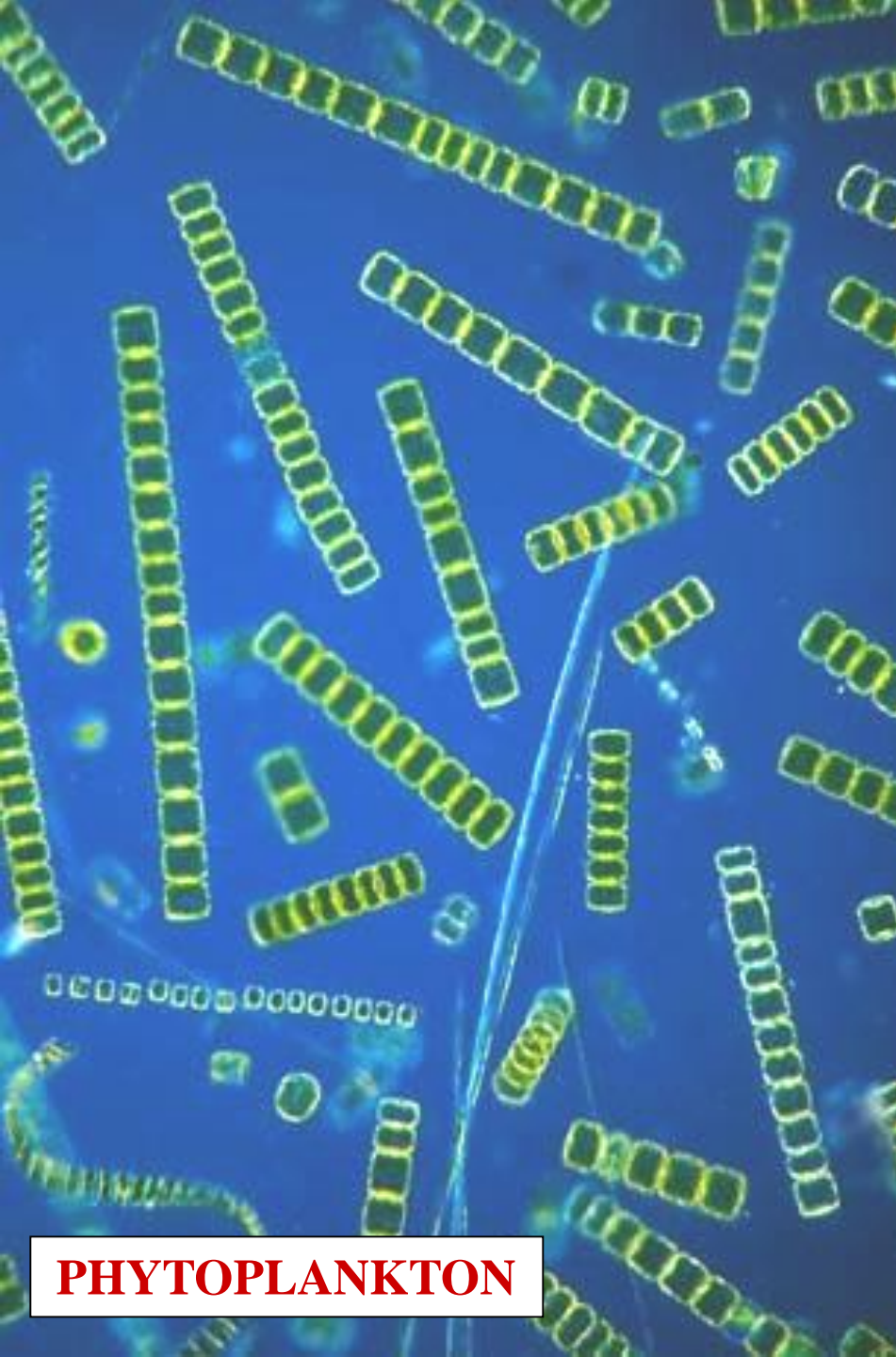
BENTHIC



BENTHIC

**BOTTOM DWELLING
GREEN ALGAE**

BENTHIC



PHYTOPLANKTON



BENTHIC



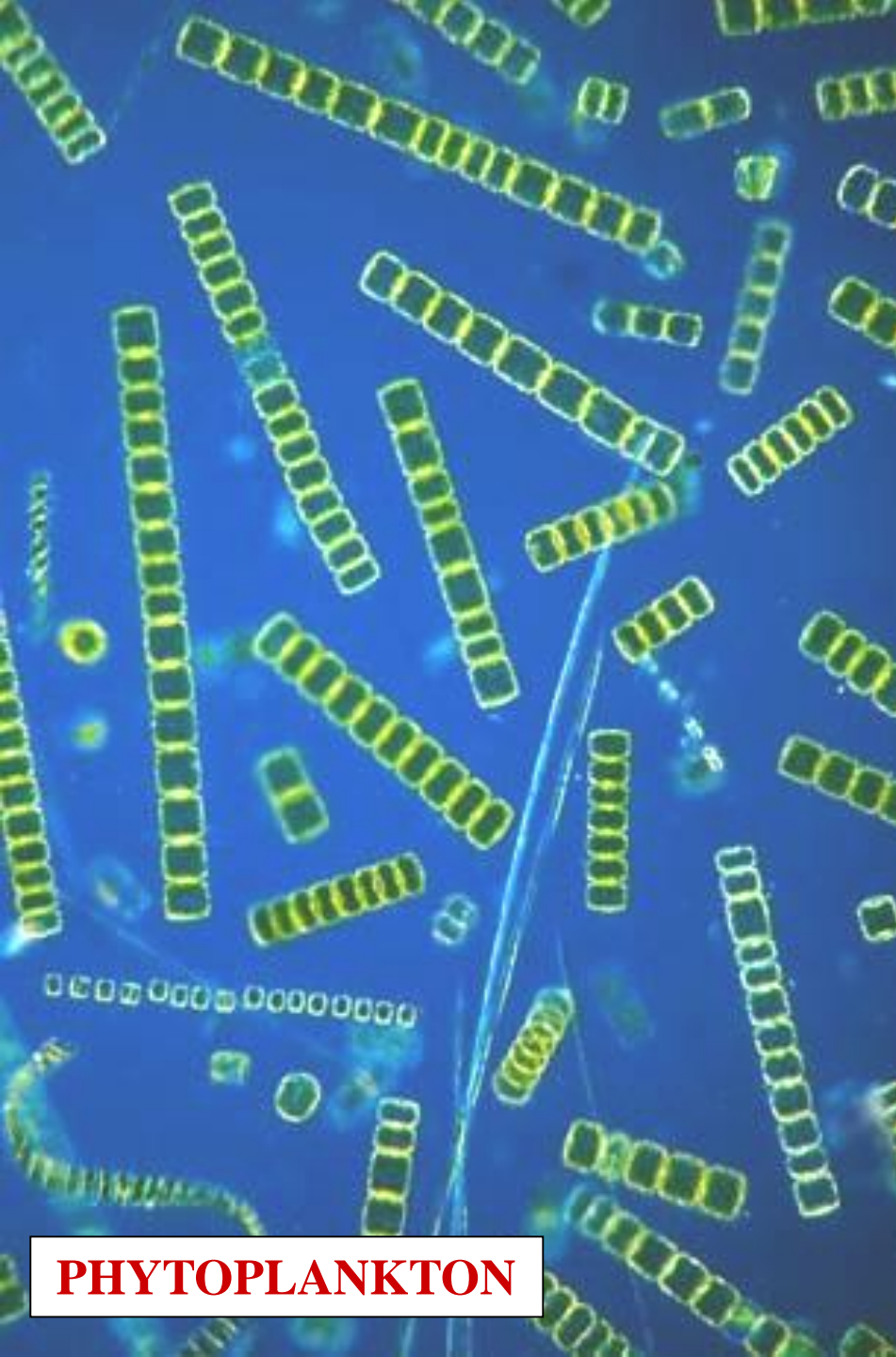
EPIPHYTE



EPIPHYTE

**GREEN ALGAE
GROWING
UPON A PLANT**

EPIPHYTE



PHYTOPLANKTON



BENTHIC



EPIPHYTE

TERRESTRIAL HABITATS

EPILITHIC



EPILITHIC

**ROCK SUBSTRATE
GREEN ALGAE**

EPILITHIC



EPILITHIC

E



EPIPELIC



EPIPELIC

**SOIL SUBSTRATE
GREEN ALGAE**

EPIPELIC



EPI LITHIC

EPI PELIC



C

CRYOPHYTIC



CRYOPHYTIC

**SNOW SUBSTRATE
GREEN ALGAE**

CRYOPHYTIC

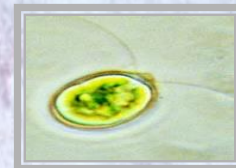


EPI LITHIC

EPI PELIC



CRYOPHYTIC





FOSSIL RECORD



**~900
MILLION YEARS**

PRECAMBRIAN





UNICELLULAR CHLOROPHYTA EVOLVE





CHLAMYDOMONAS



~550

MILLION YEARS



CAMBRIAN

MULTICELLULAR CHLOROPHYTA EVOLVE





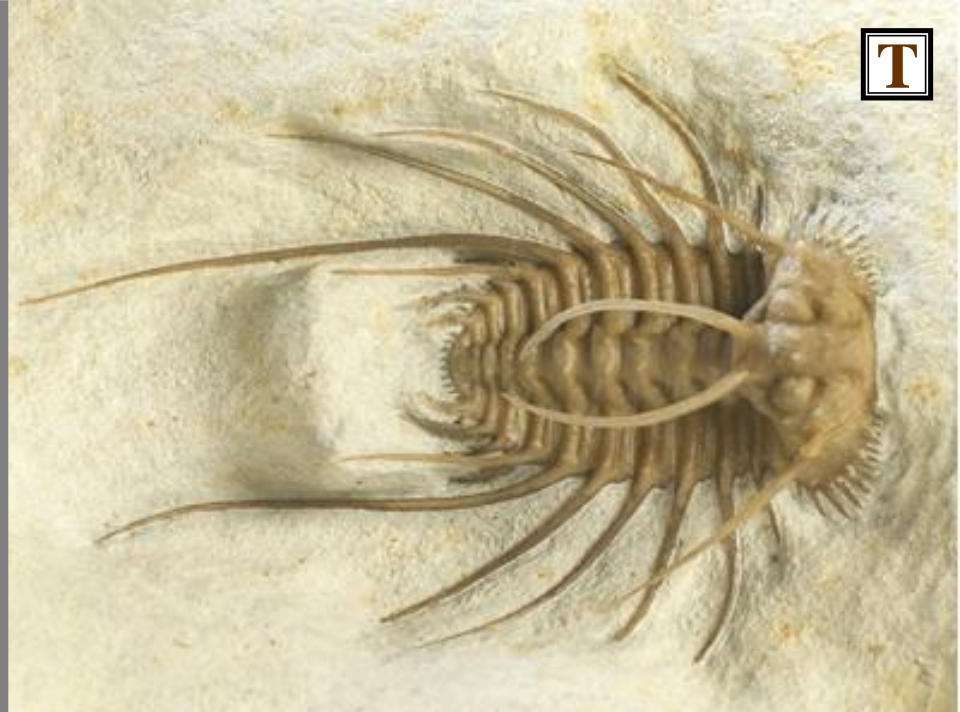
PALEOPORELLA

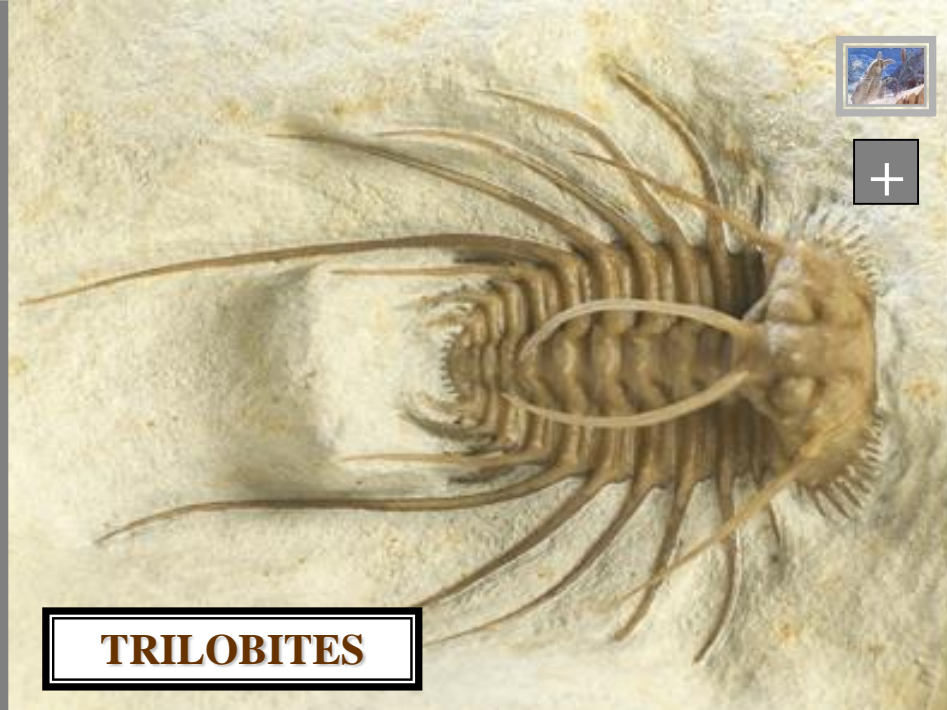


PALEOPORELLA ~ CODIUM



CAMBRIAN







CAMBRIAN

TRILOBITES



CHLOROPHYTA CLASSIFICATION



Common potato



Eggplant



Habanero pepper



Tomato



Morning glory



Sweet potato



Maple



Sunflower



Pea



Corn



Grass



PLANTAE



PHYLUM = ?



CLASS = ?



ORDER = ?

EMBRYOPHYTE



FAMILY = ?

TAXONOMIC STANDARD ENDINGS





Common potato



Eggplant



Habanero pepper



Tomato



Morning glory



Sweet potato



Maple



Sunflower



Pea



Corn



Grass



PLANTAE



PHYLUM = PHYTA



CLASS = ?

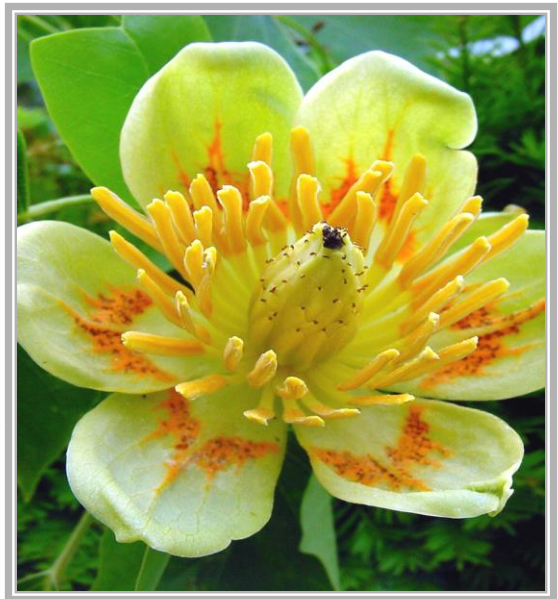


ORDER = ?

EMBRYOPHYTE



FAMILY = ?



**TAXONOMIC
STANDARD ENDINGS**



Common potato



Eggplant



Habanero pepper



Tomato



Morning glory



Sweet potato



Maple



Sunflower



Pea



Corn



Grass



PLANTAE



PHYLUM = PHYTA



CLASS = OPSIDA



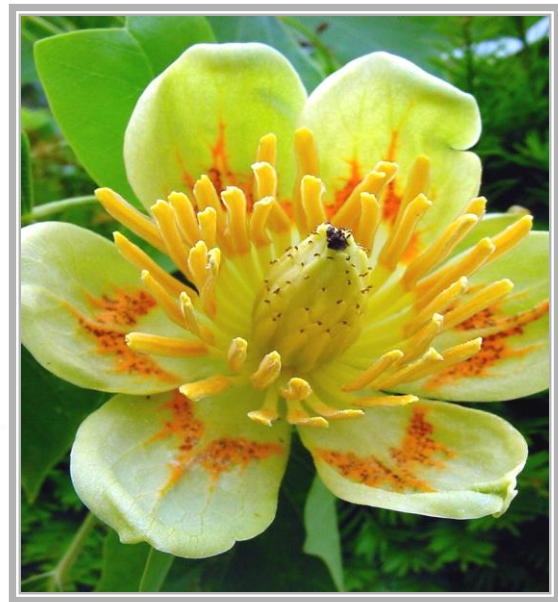
ORDER = ?

EMBRYOPHYTE



FAMILY = ?

TAXONOMIC STANDARD ENDINGS





Common potato



Eggplant



Habanero pepper



Tomato



Morning glory



Sweet potato



Maple



Sunflower



Pea



Corn



Grass



PLANTAE



PHYLUM = PHYTA



CLASS = OPSIDA



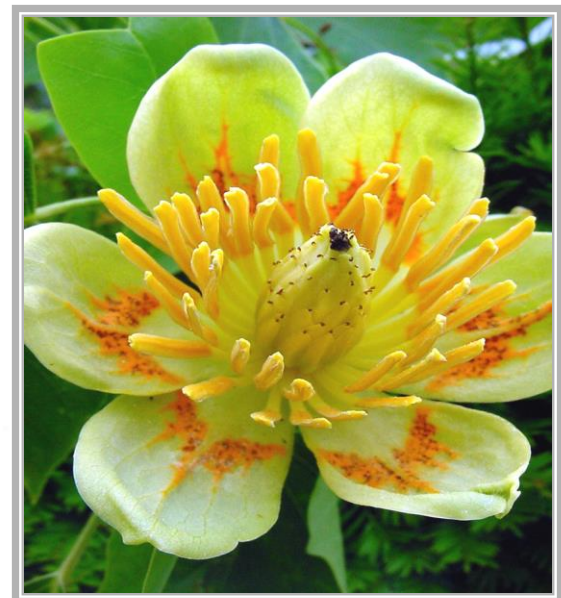
ORDER = ALES

EMBRYOPHYTE



FAMILY = ?

TAXONOMIC STANDARD ENDINGS





Common potato



Eggplant



Habanero pepper



Tomato



Morning glory



Sweet potato



Maple



Sunflower



Pea



Corn



Grass



PLANTAE



PHYLUM = PHYTA



CLASS = OPSIDA

+

EX

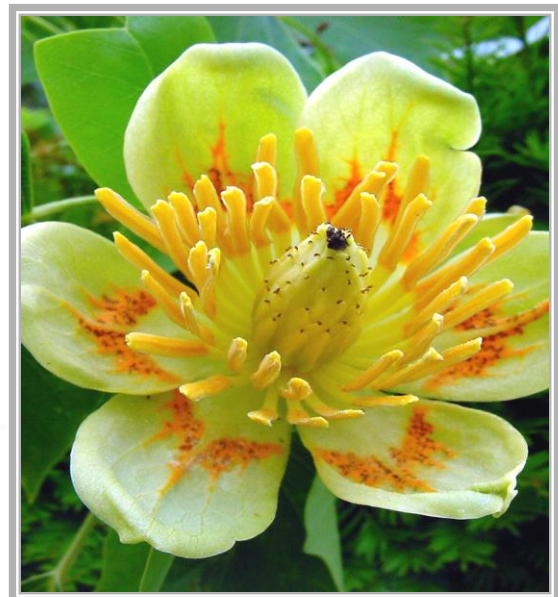


ORDER = ALES

EMBRYOPHYTE



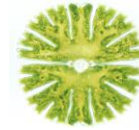
FAMILY = ACEAE



**TAXONOMIC
STANDARD ENDINGS**

GREEN ALGAE TAXONOMIC STANDARD ENDINGS

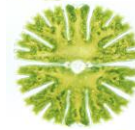
EXCEPTION



PLANTAE



PHYLUM = **PHYTA**



CLASS = **OPSIDA**

+

P



ORDER = **ALES**



FAMILY = **ACEAE**

ALGAE



**TAXONOMIC
STANDARD ENDINGS**

GREEN ALGAE TAXONOMIC STANDARD ENDINGS

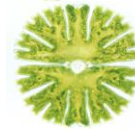
EXCEPTION



PLANTAE



PHYLUM = **PHYTA**



CLASS = **PHYCEAE**



ORDER = **ALES**



FAMILY = **ACEAE**

ALGAE



**TAXONOMIC
STANDARD ENDINGS**

CHLOROPHYTA

CLASSES

**CHLOROPHYTA
CLASSES**

CHLOROPHYCEAE

**CHLOROPHYTA
CLASSES**

CHLOROPHYTA CLASSES

**CHLOROPHYCEAE
ULVOPHYCEAE**

CHLOROPHYTA CLASSES

CHLOROPHYTA CLASSES



CHLOROPHYCEAE

ULVOPHYCEAE

CHAROPHYCEAE

CHLOROPHYTA CLASSES

VASCULAR PLANT EVOLUTION

VASCULAR PLANT EVOLUTION

“L”

CYANOPHYTA

ENDOSYMBIOTIC
THEORY

CHLOROPHYTA

PHYCOPLAST ABSENT
PHRAGMOPLAST ABSENT
FLAGELLA APICAL

PHYCOPLAST PRESENT
PHRAGMOPLAST ABSENT
FLAGELLA APICAL

PHYCOPLAST ABSENT
PHRAGMOPLAST PRESENT
FLAGELLA SUBAPICAL

ULVOPHYCEAE

CHLOROPHYCEAE

CHAROPHYCEAE

?

?

?

VASCULAR PLANT EVOLUTION

VASCULAR PLANT EVOLUTION

E

CYANOPHYTA

ENDOSYMBIOTIC
THEORY

CHLOROPHYTA

PHYCOPLAST ABSENT
PHRAGMOPLAST ABSENT
FLAGELLA APICAL

ULVOPHYCEAE

PHYCOPLAST PRESENT
PHRAGMOPLAST ABSENT
FLAGELLA APICAL

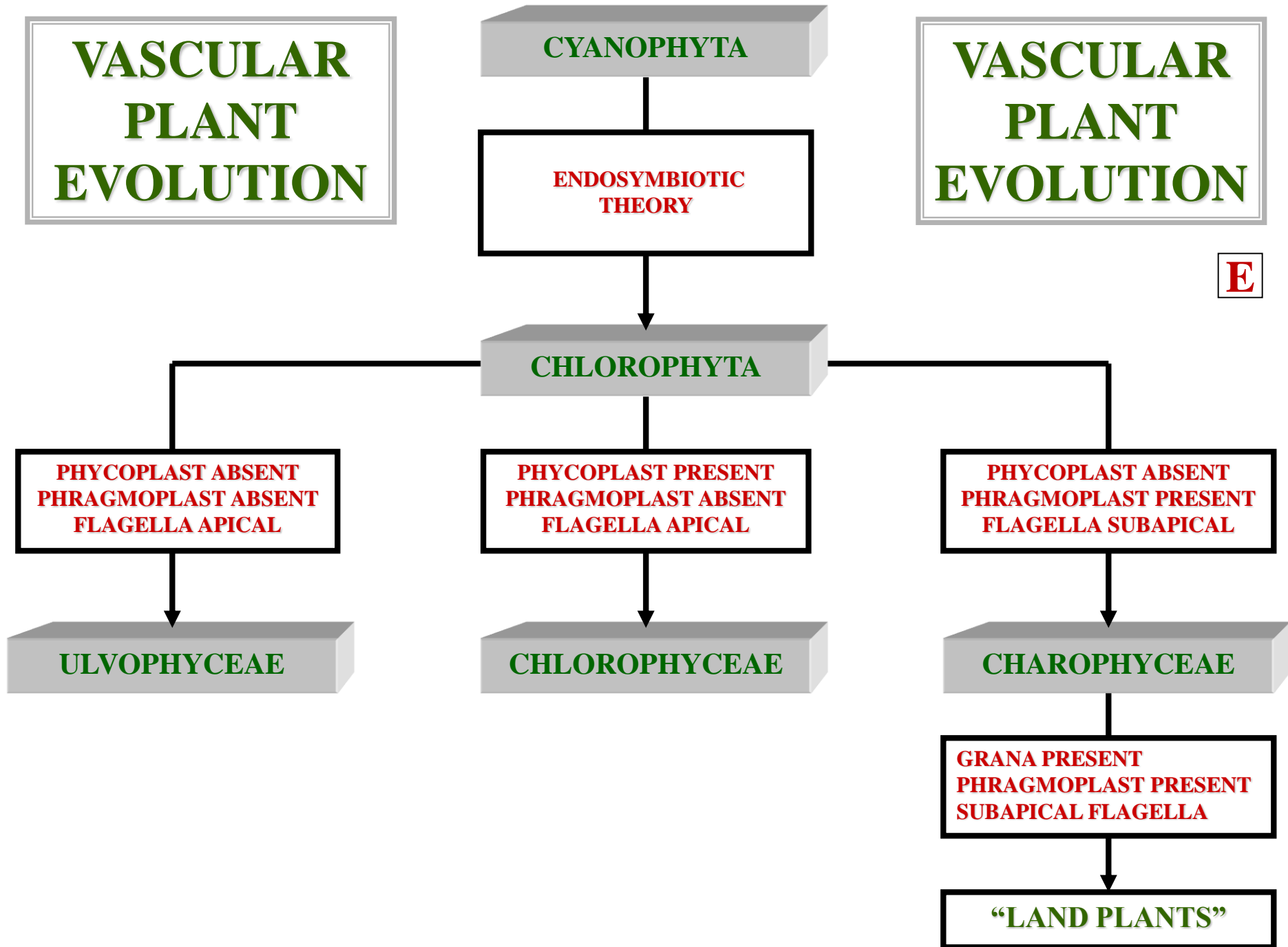
CHLOROPHYCEAE

PHYCOPLAST ABSENT
PHRAGMOPLAST PRESENT
FLAGELLA SUBAPICAL

CHAROPHYCEAE

GRANA PRESENT
PHRAGMOPLAST PRESENT
SUBAPICAL FLAGELLA

“LAND PLANTS”



VASCULAR PLANT EVOLUTION

VASCULAR PLANT EVOLUTION

E

CYANOPHYTA

ENDOSYMBIOTIC
THEORY

CHLOROPHYTA

PHYCOPLAST ABSENT
PHRAGMOPLAST ABSENT
FLAGELLA APICAL

ULVOPHYCEAE

PHYCOPLAST PRESENT
PHRAGMOPLAST ABSENT
FLAGELLA APICAL

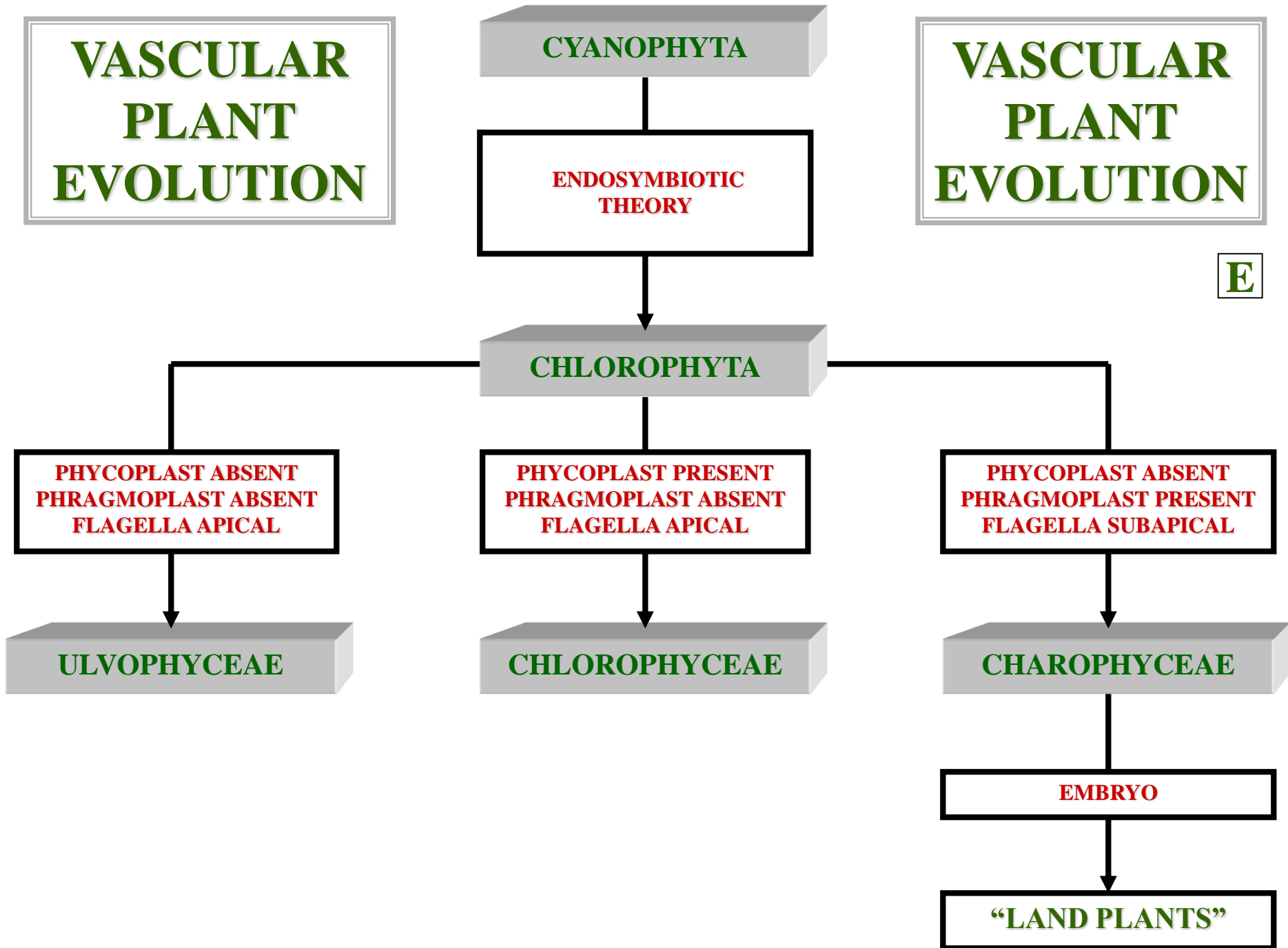
CHLOROPHYCEAE

PHYCOPLAST ABSENT
PHRAGMOPLAST PRESENT
FLAGELLA SUBAPICAL

CHAROPHYCEAE

EMBRYO

“LAND PLANTS”



VASCULAR PLANT EVOLUTION

VASCULAR PLANT EVOLUTION

CYANOPHYTA

ENDOSYMBIOTIC
THEORY

CHLOROPHYTA

PHYCOPLAST ABSENT
PHRAGMOPLAST ABSENT
FLAGELLA APICAL

ULVOPHYCEAE

PHYCOPLAST PRESENT
PHRAGMOPLAST ABSENT
FLAGELLA APICAL

CHLOROPHYCEAE

PHYCOPLAST ABSENT
PHRAGMOPLAST PRESENT
FLAGELLA SUBAPICAL

CHAROPHYCEAE

EMBRYO

EMBRYOPHYTES



VASCULAR PLANT EVOLUTION

VASCULAR PLANT EVOLUTION

CYANOPHYTA

ENDOSYMBIOTIC THEORY

CHLOROPHYTA

PHYCOPLAST ABSENT
PHRAGMOPLAST ABSENT
FLAGELLA APICAL

PHYCOPLAST PRESENT
PHRAGMOPLAST ABSENT
FLAGELLA APICAL

PHYCOPLAST ABSENT
PHRAGMOPLAST PRESENT
FLAGELLA SUBAPICAL

ULVOPHYCEAE

CHLOROPHYCEAE

CHAROPHYCEAE

CHAROPHYCEAE
EVOLVED
EMBRYOPHYTES

EMBRYO

EMBRYOPHYTES



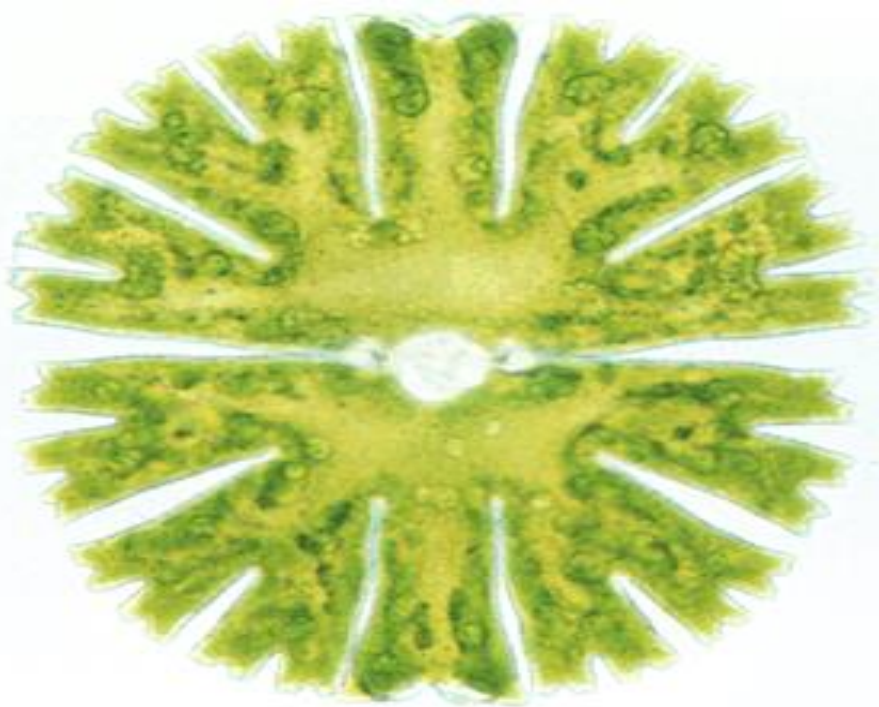


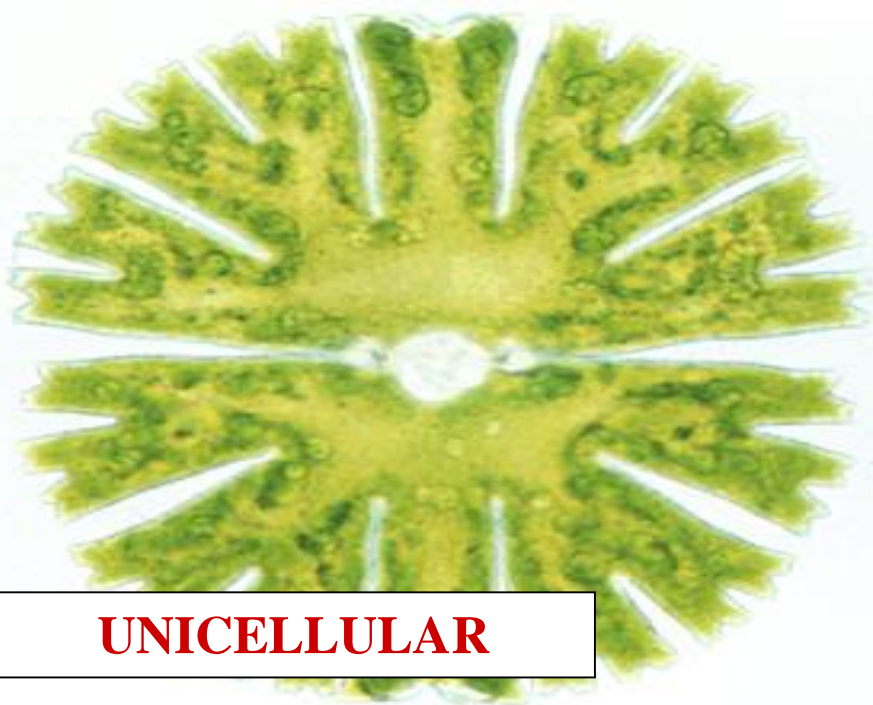
CHLOROPHYTA

GENERAL CHARACTERS



CHLOROPHYTA GROWTH FORMS





UNICELLULAR



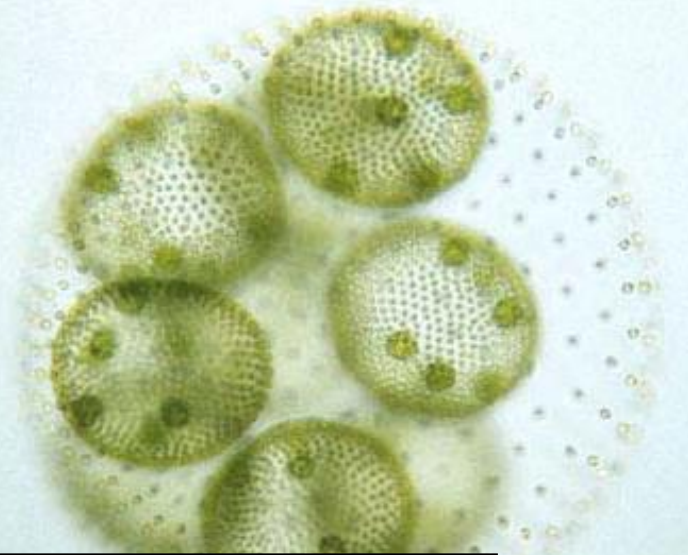


MICRASTERIAS



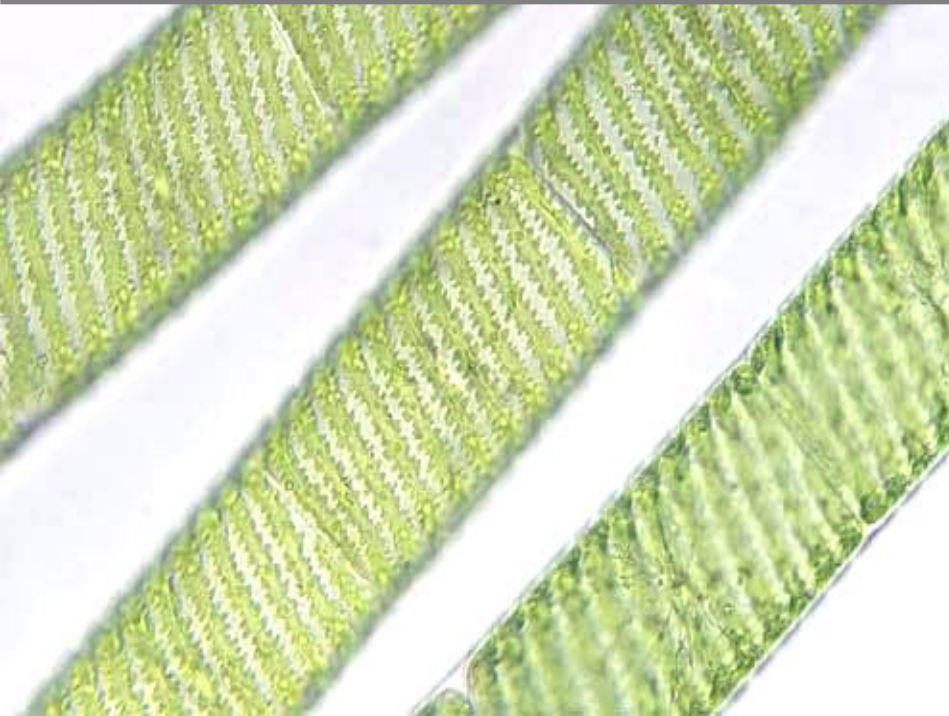


MICRASTERIAS



V

COLONIAL

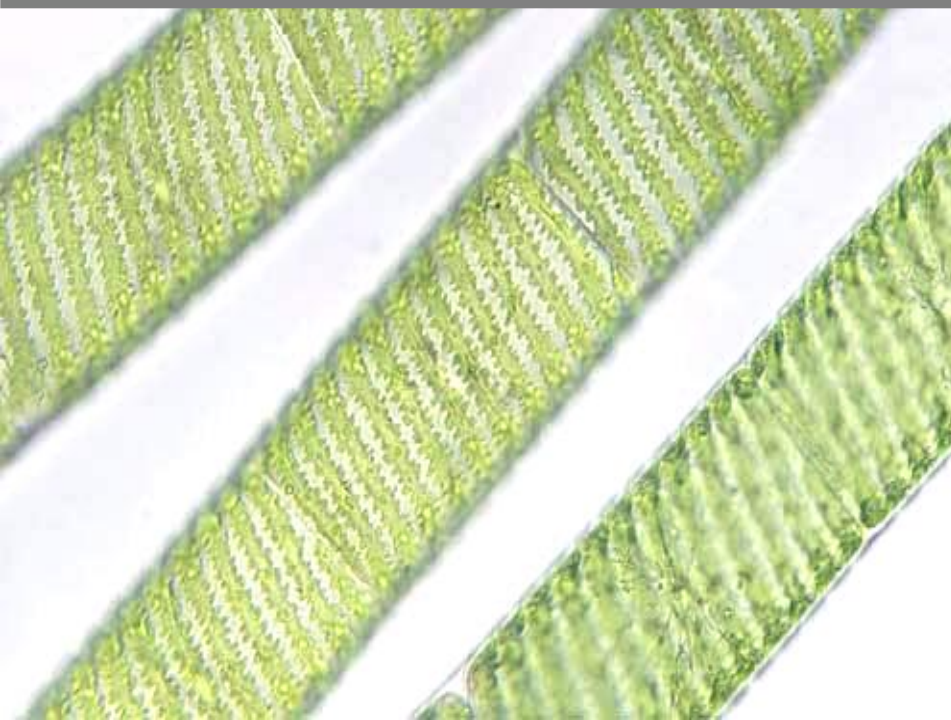




MICRASTERIAS



VOLVOX

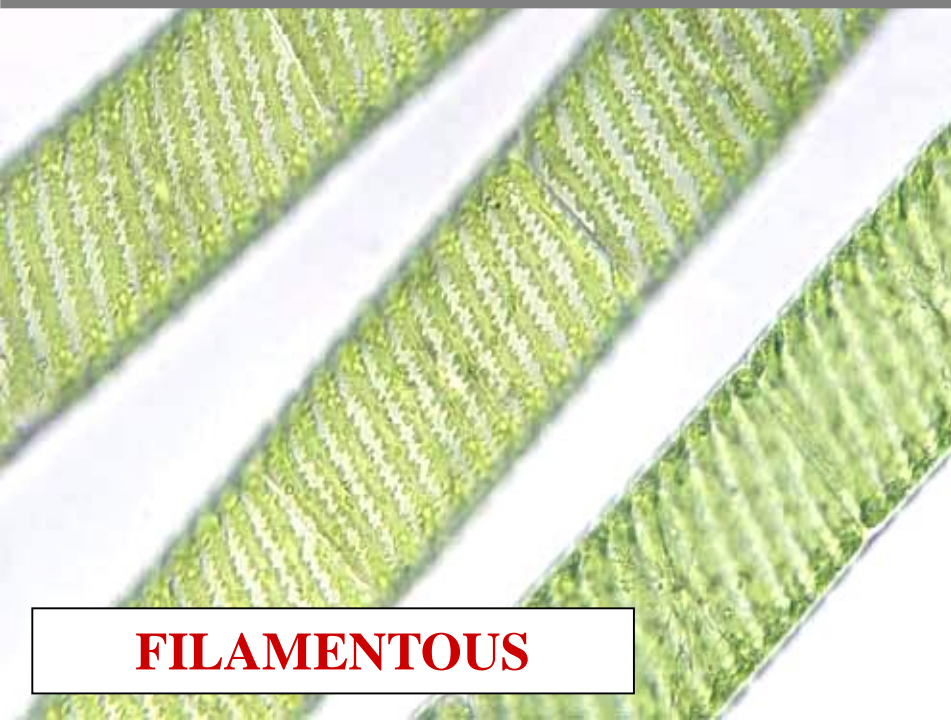




MICRASTERIAS



VOLVOX



FILAMENTOUS





MICRASTERIAS



VOLVOX



SPIROGYRA





MICRASTERIAS



VOLVOX



SPIROGYRA



MEMBRANOUS



MICRASTERIAS



VOLVOX



SPIROGYRA



ULVA