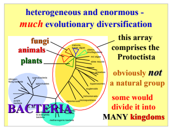
kingdom includes:
eukaryotic micro-organisms &
their immediate descendant groups:
all algae, seaweeds, slime moulds
"protozoa", and many others...
a kingdom *defined by exclusion*:
those eukaryotes that are not
animals (blastula)
plants (embryo)
fungi (spores, no cilia)
(so what kind of group is it? Natural?)



General characteristics

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- enormous size range: ~0.01mm to ~30m - *6 powers of 10*
- great cell-structure and life-cycle diversity
- perhaps >250,000 species
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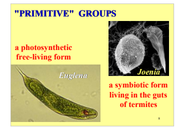

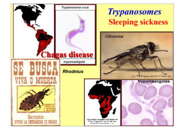

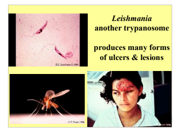

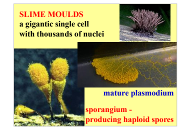

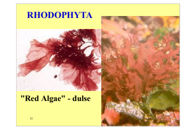

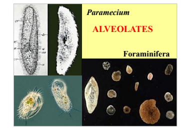

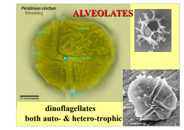

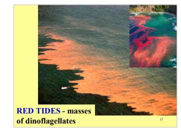

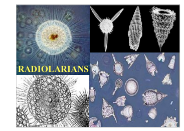

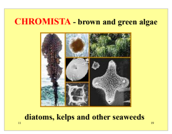

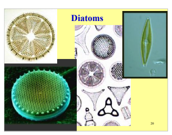

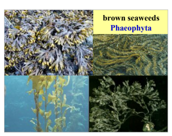

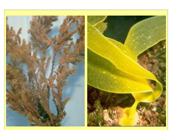

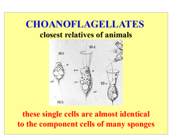

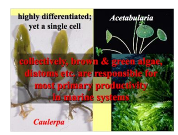

NEXT CLASS:

The Fungi - life by absorption

thanks to these web-sites for images

http://megasun.bch.umontreal.ca/protists/gallery.html
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http://www.micscape.simplenet.com/mag/wimsmall/smal3.html

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a kingdom ***defined by exclusion***:

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animals (blastula)

plants (embryo)

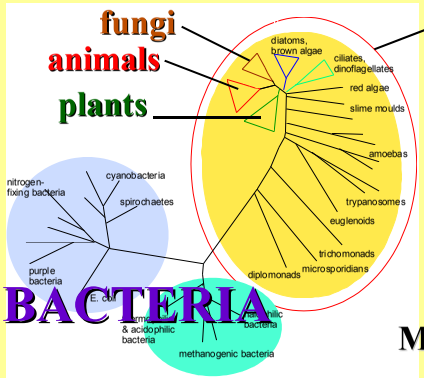
fungi (spores, no cilia)

(so what kind of group is it? Natural?)

Berkeley's way of arranging groups

but much convergence - not natural groups

heterogeneous and enormous - *much* evolutionary diversification



this array comprises the Protoctista

obviously ***not*** a natural group

some would divide it into MANY **kingdoms**

understanding of protoctist phylogenetic relationships is complex & uncertain

morphological analysis suggests 80+ distinctive basic types of structure, currently arranged into ~60 tentative 'lineages'

lineages show a great diversity of morphological complexity, but unclear if 'simple' forms are 'primitive' or 'degenerate'

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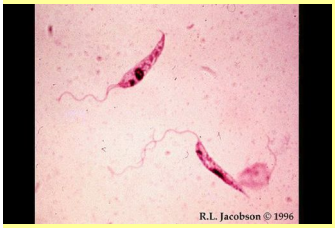
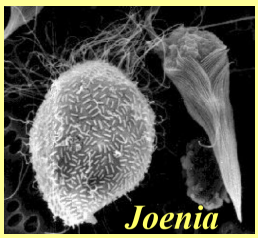


Leishmania
another trypanosome

produces many forms
of ulcers & lesions

"PRIMITIVE" GROUPS

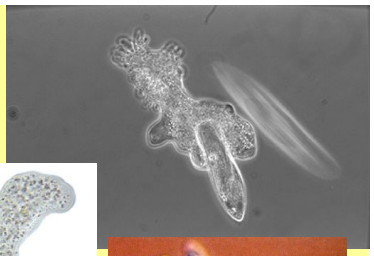
a photosynthetic
free-living form



a symbiotic form
living in the guts
of termites

8

Rhizopod amoebas



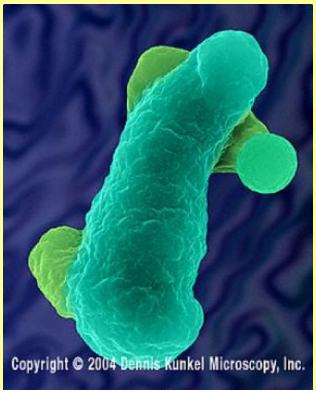
free-living on bacteria
or pathogens on fish & shellfish

11

12

skin
lesions

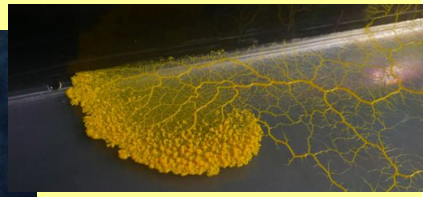
Entamoeba
histolytica



11

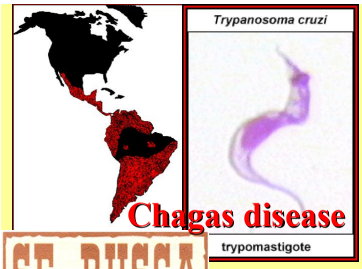
SLIME MOULDS

a gigantic single cell
with thousands of nuclei



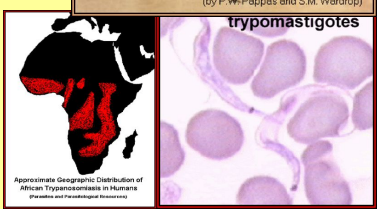
mature plasmodium

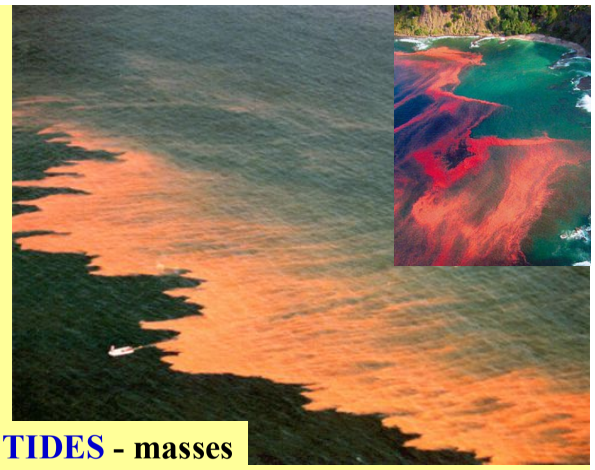
sporangium -
producing haploid spores



Rhodnius

Trypanosomes
Sleeping sickness





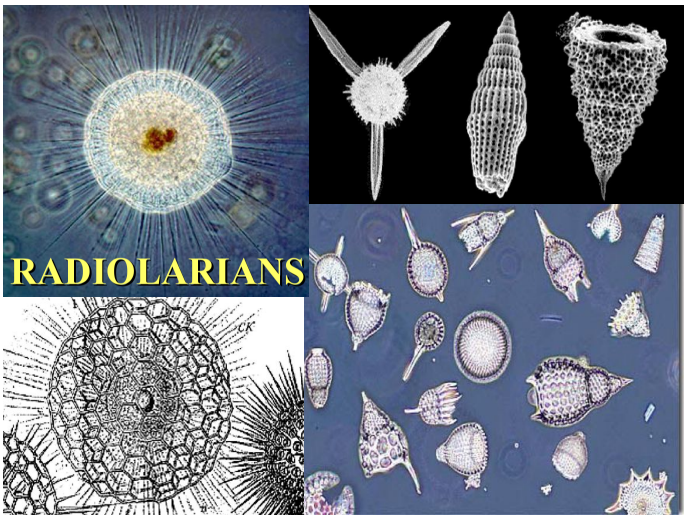
RED TIDES - masses of dinoflagellates

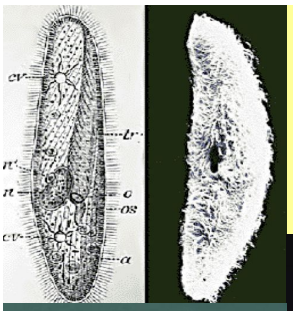
17

RHODOPHYTA

"Red Algae" - dulse

11



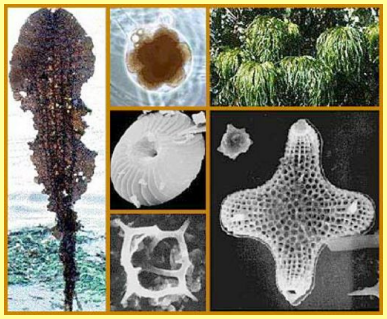


Paramecium

ALVEOLATES

Foraminifera

CHROMISTA - brown and green algae



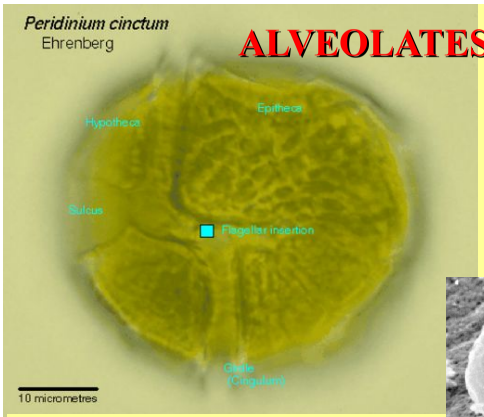
diatoms, kelps and other seaweeds

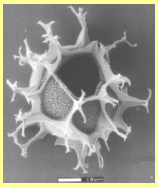
11

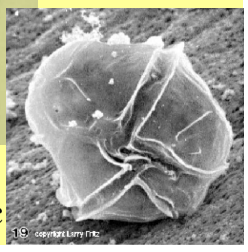
19

Peridinium cinctum Ehrenberg

ALVEOLATES





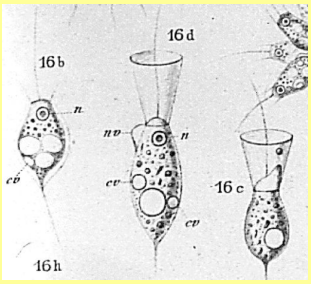


dinoflagellates
both auto- & hetero-trophic

19

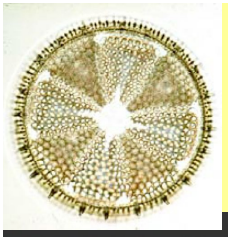
CHOANOFLAGELLATES

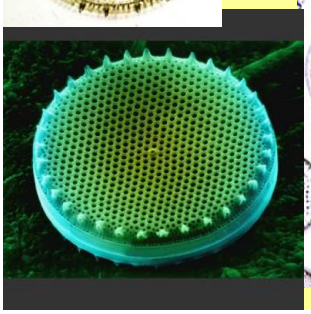
closest relatives of animals

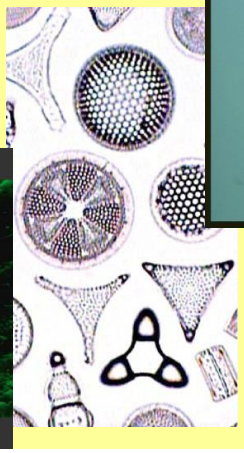


these single cells are almost identical to the component cells of many sponges

Diatoms

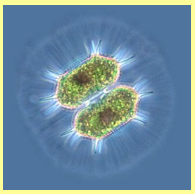






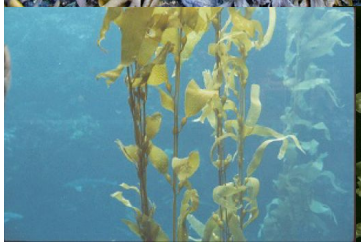
GREEN ALGAE

- closest relatives of plants



brown seaweeds

Phaeophyta



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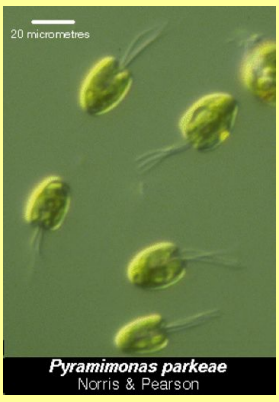

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