



REVISION SHEET • BIOLOGY

Biological Classification

Comparison of the Five Kingdoms

Monera • Protista • Fungi • Algae • Plantae

NEET UG

Target Batch

Class XI

NCERT Units 1 & 2

22 Taxa

8 Comparison Points

5 Kingdoms

One Table Each

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SCAN TO VISIT

01 Kingdom Monera

Archaeobacteria · Eubacteria · Mycoplasma

02 Kingdom Protista

Chrysophytes → Protozoans

03 Kingdom Fungi

Phycomycetes → Deuteromycetes

04 Plantae — Algae

Rhodo · Phaeo · Chlo

05 Plantae — Embryophytes

Bryophytes → Angiosperms

01

Kingdom Monera

Prokaryotes · Unicellular · Nucleoid, no true nucleus

NOTE

Most abundant micro-organisms; found in every habitat on earth.

GROUP / TAXON	COMMON NAMES	EXAMPLES	HABITAT	CELL WALL & STRUCTURE	REPRODUCTION	FLAGELLA	STORED FOOD
Archaeobacteria	Halophiles Thermoacidophiles Methanogens	Methanogens	Extreme habitats — salty areas, hot springs, marshy areas; gut of ruminants (cows, buffaloes)	Non-cellulosic (polysaccharide + amino acid); different cell wall structure → survive extremes	—	—	—
Eubacteria	True bacteria Blue-green algae / Cyanobacteria	<i>Nostoc</i> , <i>Anabaena</i>	Soil, hot springs, deserts, snow, deep oceans, fresh water, marine, terrestrial; in / on other organisms	Non-cellulosic (polysaccharide + amino acid); rigid cell wall. Cyanobacteria have a gelatinous sheath	ASEXUAL Fission; spores in unfavourable conditions SEXUAL Primitive type of DNA transfer	Flagellum present if motile	—
Mycoplasma	—	<i>Mycoplasma</i>	Pathogenic in animals and plants	Completely lack a cell wall	—	—	—

CLASS NOTES

02

Kingdom Protista

Eukaryotic · Unicellular · Primarily aquatic

NOTE

Primarily aquatic. Forms the link between plants, animals and fungi.

GROUP / TAXON	COMMON NAMES	EXAMPLES	HABITAT	CELL WALL & STRUCTURE	REPRODUCTION	FLAGELLA	STORED FOOD
Chrysophytes	Diatoms Golden algae (desmids)	Diatoms, Desmids	Fresh water and marine environments	Two thin overlapping shells fitting together like a soap box ; embedded with silica	ASEXUAL & SEXUAL Cell fusion and zygote formation	—	—
Dinoflagellates	—	<i>Gonyaulax</i>	Mostly marine	Stiff cellulose plates on the outer surface	SEXUAL Cell fusion and zygote formation MULTIPLICATION Very rapid	2 — one longitudinal, one transverse, in a furrow between the wall plates	—
Euglenoids	—	<i>Euglena</i>	Mostly fresh water, in stagnant water	Absent — protein-rich layer called pellicle	SEXUAL Cell fusion and zygote formation	2 — one short, one long	—
Slime Moulds	—	—	Decaying twigs and leaves	Absent in plasmodium; spores possess true walls	SPORES Formed at the tips of fruiting bodies	—	—
Protozoans	Amoeboid Flagellated Ciliated Sporozoans	<i>Amoeba</i> , <i>Entamoeba</i> , <i>Trypanosoma</i> , <i>Paramoecium</i> , <i>Plasmodium</i>	Fresh water, sea water, moist soil; aquatic; many are parasites	Absent. Marine amoeboids have silica shells on the surface	SEXUAL Cell fusion and zygote formation SPOROZOANS Infectious spore-like stage	Flagellated → flagella; Ciliated → cilia	—

CLASS NOTES

03

Kingdom Fungi

Eukaryotic · Heterotrophic · Chitin cell wall

NOTE

Cosmopolitan — occur in air, water, soil and on animals and plants. Prefer warm and humid places.

GROUP / TAXON	COMMON NAMES	EXAMPLES	HABITAT	CELL WALL & STRUCTURE	REPRODUCTION	FLAGELLA	STORED FOOD
Phycomycetes	Bread mould Parasitic fungi on mustard	<i>Mucor</i> , <i>Rhizopus</i> , <i>Albugo</i>	Cosmopolitan — air, water, soil, on plants and animals; warm, humid places	Chitin and polysaccharides	ASEXUAL Zoospores (motile) or aplanospores (non-motile), produced endogenously in sporangium SEXUAL Zygosporangium by fusion of gametes — isogamous, anisogamous or oogamous	Zoospores are motile	—
Ascomycetes	Sac-fungi Morels Yeast Truffles	<i>Penicillium</i> , Yeast (<i>Saccharomyces</i>), <i>Aspergillus</i> , <i>Claviceps</i> , <i>Neurospora</i> , Morels, Truffles	Saprophytic, decomposers, parasitic, coprophilous (on dung)	Chitin and polysaccharides	VEGETATIVE Fragmentation, fission, budding ASEXUAL Conidia produced exogenously on conidiophores SEXUAL Ascospores produced endogenously in asci, within ascocarps	—	—
Basidiomycetes	Mushrooms Bracket fungi Puffballs Rust fungus Smut	<i>Agaricus</i> , <i>Ustilago</i> , <i>Puccinia</i>	In soil, on logs and tree stumps; in living plant bodies as parasites	Chitin and polysaccharides	VEGETATIVE Fragmentation ASEXUAL Spores generally not found SEXUAL Plasmogamy by fusion of somatic cells → karyogamy → meiosis in basidium → 4 basidiospores exogenously	—	—
Deuteromycetes	Imperfect fungi	<i>Alternaria</i> , <i>Colletotrichum</i> , <i>Trichoderma</i>	Decomposers of litter; saprophytes and parasites	Chitin and polysaccharides	ASEXUAL Conidia SEXUAL Absent / unknown	—	—

CLASS NOTES

04

Kingdom Plantae — Algae

Thallophyta · Chlorophyll-bearing · Mostly aquatic

NOTE

Classified by pigments, stored food and flagella — the three most-asked comparison points.

GROUP / TAXON	COMMON NAMES	EXAMPLES	HABITAT	CELL WALL & STRUCTURE	REPRODUCTION	FLAGELLA	STORED FOOD
Rhodophyceae	Red algae	<i>Porphyra</i> , <i>Polysiphonia</i> , <i>Gelidium</i> , <i>Gracilaria</i>	Mostly salt water; some fresh and brackish water. Warmer areas — from well-lighted surfaces to great ocean depths	Cellulose, pectin and poly sulphate esters	VEGETATIVE Fragmentation ASEXUAL Non-motile spores SEXUAL Oogamous, by non-motile gametes	Absent	Floridean starch
Phaeophyceae	Brown algae Kelps	<i>Laminaria</i> , <i>Fucus</i> , <i>Dictyota</i> , <i>Ectocarpus</i> , <i>Sargassum</i>	Marine habitats; brackish and salt water. Rare in fresh water	Cellulose and algin — cellulosic wall covered outside by a gelatinous coating of algin	VEGETATIVE Fragmentation ASEXUAL Biflagellate zoospores SEXUAL Isogamous, anisogamous or oogamous	2 , unequal, lateral (zoospores & pyriform gametes)	Mannitol, laminarin
Chlorophyceae	Green algae	<i>Volvox</i> , <i>Ulothrix</i> , <i>Spirogyra</i> , <i>Chlamydomonas</i> , <i>Chara</i> , <i>Chlorella</i>	Fresh, brackish and salt water; moist stones, soils and wood; in association with fungi and animals (sloth bear)	Rigid wall — inner layer of cellulose , outer layer of pectose	VEGETATIVE Fragmentation ASEXUAL Flagellated zoospores in zoosporangia SEXUAL Isogamous, anisogamous or oogamous	2–8 , equal, apical	Starch, stored in pyrenoids (protein + starch); oil droplets

CLASS NOTES

05

Kingdom Plantae — Embryophytes

Bryophyta · Pteridophyta · Gymnosperms · Angiosperms

NOTE

Cellulose cell wall and starch throughout — the differences lie in habitat, motility of gametes and seed habit.

GROUP / TAXON	COMMON NAMES	EXAMPLES	HABITAT	CELL WALL & STRUCTURE	REPRODUCTION	FLAGELLA	STORED FOOD
Bryophytes	Liverworts Mosses Peat moss	<i>Marchantia</i> , <i>Funaria</i> , <i>Sphagnum</i> , <i>Polytrichum</i>	Moist, shaded, humid localities — hills, bare rocks and soil, banks of streams, marshy ground, bark of trees, woods	Present (cellulose)	VEGETATIVE Fragmentation of thalli; gemmae in gemma cups (liverworts). Fragmentation and budding in secondary protonema (mosses) SEXUAL Biflagellate antherozoids fuse with the egg cell in the archegonium	Biflagellate antherozoids	Starch
Pteridophytes	Horsetails Ferns	<i>Selaginella</i> , <i>Equisetum</i> , <i>Salvinia</i> , <i>Psilotum</i> , <i>Lycopodium</i> , <i>Dryopteris</i> , <i>Pteris</i> , <i>Adiantum</i>	Cool, damp, shady places; also sandy-soil conditions	Present (cellulose)	ASEXUAL Spores produced meiotically in sporangia on sporophylls / strobili SEXUAL Antherozoids carried by water to the archegonium → zygote on the prothallus	Antherozoids flagellated / motile — need water	Starch
Gymnosperms	Giant redwood tree	<i>Pinus</i> , <i>Cycas</i> , <i>Cedrus</i> , <i>Ginkgo</i> , <i>Sequoia</i>	Terrestrial	Present (cellulose)	SEXUAL Micro- and megaspores in male and female strobili; pollen carried by air currents ; pollen tube discharges male gametes into the archegonia	—	Starch
Angiosperms	Flowering plants Monocotyledons Dicotyledons	<i>Wolffia</i> , <i>Eucalyptus</i> , Bladderwort, Venus fly trap, <i>Cuscuta</i>	A wide range of habitats	Present — mainly cellulose	SEXUAL Pollen and ovules borne in flowers; seeds develop enclosed inside fruits	Motile stages absent	Starch



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