Whittaker classified livings on the basis of following points:

A. On the Basis of Nucleus

Prokaryotic

→ Monera

(*Bacteria*, cyno bacteria, Blue-green Algae)

(SSC Junior Engineer 29.01.2018)

Autotropic

→ Cell Wall is present

Eukaryotic

→ Protista

→ Unicellular Eukaryotic – Protozoa

(*Amoeba*, Euglena, paramecium)

(SSC MTS 07.08.2019)

→ Eukaryotic Multicellular

Animal	**Plant**	**Fungi**
Heterotropic (Consumer)	Autotrophic (Producer)	Saprophytic (Decomposer)
	(RRB Group-D 24.10.2018)	

→ Amoeba takes its food by engulfing.

Kingdom Monera:

- These organisms do not have a defined nucleus or organelles, nor do any of them show multi-cellular body organization.
- *Prokaryotic type* cell type is found, which means *nucleus is found in scattered form.*

  (RRB Group-D 22.09.2018, 09.10.2018)
  (SSC CPO 24.11.2020)
- Some of them have cell walls while some do not(mycoplasma).
- The mode of nutrition of organisms in this group can be either by autotrophic (Photosynthetic or chemosynthetic)or heterotrophic(majorly)
- Example- bacteria, blue-green algae

  (SSC Tax Assist. Exam. 11.12.2005)

  cyanobacteria & mycoplasma.

  (SSC GD 22.04.2012)
  (SSC CHSL Pre, 22.03.2018)

  Cynobacteria is biofertilizer
- Bacteria are the sole members of the Kingdom Monera.
- unicellular *prokaryotic* microoraganisms

  (SSC CHSL 19.03.2020)

The outermost layer found in the cell envelope of the bacterial cell called **Glycocalyx**

(SSC CGL Pre. 2022, 02.12.2022 Shift-3)

- Bacteria are grouped under four categories based on their shape:

  1. the spherical Coccus (pl.: cocci)
  2. the rod-shaped Bacillus (pl.: bacilli), Eg: Bacillus anthracis

  (RRB JE 25.05.2019)

  3. thecomma-shaped Vibrium (pl.: vibrio) and
  4. the spiral Spirillum (pl.: spirilla)
- Bacterium is capable of withstand extreme heat, dryness and toxic chemicals, hot springs, deep sea, thermal vents and ice in Antarctica this indicates that it is possibly able to form *Endospores.*

  (RRB ALP 10.08.2018)
  (RRB Group-D 04.12.2018)
- Mesosome: it is the respiratory sites in bacteria

  (RRB JE 14.12.2014)
- Three parts of bacterial flagellum is **Filament, hook and basal body**

  (SSC CGL 01.12.2022, 09.12.2022)
- Bacterial cell (do not have **Mitochondria**

  (SSC CHSL 10+2 DEO & LDC 02.11.2014, 09.11.2014)

Kingdom Protista:

- This group includes many kinds of **unicellular eukaryotic organisms.**

  (RRB Group-D 13.12.2018)

- Some of these organisms use appendages, such as hair-like cilia or whip-like flagella for moving around.
- Their mode of nutrition can be autotrophic or heterotrophic.
- Examples are unicellular **diatoms, gonyaulax (red tides)** , Amoeba , **euglena** (exhibits both the *characteristics of a plant and animals)*

(SSC CGL 03.08.2015)

slime moulds, protozoans

(RRB Group-D 27.09.2018, 06.12.2018), (SSC MTS 07.08.2019) (SSC CPO 10.11.2022)

- ***Plasmodium*** is the kind of Protista which shows multiple fission.

(RRB ALP 10.08.2018) (RRB Group-D 11.10.2018)

Kingdom Fungi:

These are heterotrophic eukaryotic organisms.

Non chlorophyllous (so do not perform photosynthesis), nucleated, non-vascular

(SSC (10+2) 10.11.2013) (SSC Junior Engineer 23.01.2018)

The cell wall is made up of (tough complex sugar)chitin. No mechanisms for locomotion.

(RRB ALP 13.08.2018 (RRB Group-D 28.09.2018) (SSC MTS 25.07.2022)

Ex. Penicillium, Aspergillus, Agaricus, yeast and *mushroom (It is the fleshy, spore-bearing fruiting body of a fungus.)*

(SSC CHSL Pre, 22.03.2018) (RRB ALP 21.08.2018) (SSC CPO 2022, 10.11.2022 Shift-3) (RRB JE 24.05.2019)

Penicillin is extracted from **fungus**

(SSC SO (Audit) Exam. year 1997)

Yeast is a **Fungus.**

(SSC CGL Tier-I (CBE) Exam.04.09.2016)

Scavengers of earth

(SSC MTS 16.02.2014, 19.08.2019)

Yeast produces carbon dioxide gas during respiration

Entomopathogenic: kind of fungi depends exclusively on insects for their food

(RRB JE 27.06.2019)

Alfa toxins are produced by fungi

(SSC CGL Tier-I Exam 16.08.2015)

Deuteromycetes is commonly known as imperfect fungi because only the asexual or vegetative phases of these fungi are known.

(SSC MTS 26.07.2022)

The sexual reproductive organs of aspergillus are antheridium and ascogonium

(SSC CGL Pre, 29.08.2016)

Animal kingdom can be divided into two part.

Bread mould is a spore producing plant

(SSC Junior Engineer 23.01.2018)

Predaceous fungi that eat nematods.

Rhizopus also known as *Bread mould* or pin mould and aspergillous is known as blue mould

(RRB Group-D 05.12.2018)

Some economic importance of fungi:

- **Yeast :** used in making bread, acts as a catalyst for fermentation

(RRB NTPC 06.04.2016)

uses in the fermentation process for formation of alcohol

(SSC CGL Tier-I (CBE) Exam.28.08.2016) (SSC CGL Pre, 28.08.2016, 09.09.2016)

The yeast which used in the manufacture of alcoholic beverages is cerevisiae **Yeast** breaks down the food material outside the body and then absorb it

(SSC MTS 27.10.2021)

Saccharomyces is a popular kitchen ingredient commonly called 'sugar eating fungus

(SSC CGL 17.08.2021)

Yeast is reproduces by budding

(RRB Group-D 09.10.2018)

Fermentation is a process of decomposition of an organic compound by **enzymes .**

(SSC CGL T-1 24.02.2002)

- *Trichoderma harzianum* fungus is also used as fungicide

(RRB NTPC 29.04.2016)

- In *1927*, **Alexander flaming** discovered first antibiotic penicillin (a group of antibacterial drugs that attack a wide range of bacteria) from ***Penicillium*** *is a saprophytic fungus*

(SSC SO 1997), (SSC CHSL Pre, 08.09.2016), (RRB ALP 22.01.2019) (RRB JE 24.05.2019) (SSC CGL 24.02.2002, 11.06.2019), (SSC MTS 05.05.2002, 27.02.2011, 07.08.2019,18.07.21), (RRB NTPC 28.03.2016, 31.03.2016, 02.04.2016, , 10.01.2021, 01.02.2021, 03.03.2021,07.04.2021), (SSC CPO 16.03.2019, 10.11.2022)

An antibiotic is **a** chemical synthesised by a microorganism against another micro-organisms .

(SSC SO (Audit)Exam. 10.12.2006)

Kingdom Plantae

Kingdom Plantae includes all eukaryotic chlorophyll-containing organisms commonly called plants

A few members are partially heterotrophic such as the insectivorous plants or parasites.

Bladderwort and Venus fly trap are examples of insectivorous plants and *Cuscuta* is a (stem)parasite respectively.

The plant cells have an eukaryotic structure with prominent chloroplasts and cell wall mainly made of cellulose.

Plantae includes algae, bryophytes, pteridophytes, gymnosperms and angiosperms.

Life cycle of plants has two distinct phases – The diploid sporophytic and the haploid gametophytic – that alternate with each other. The lengths of the haploid and diploid phases, and whether these phases are free–living or dependent on others, vary among different groups in plants. This phenomenon is called **alternation of generation.**

KINGDOM ANIMALIA

This kingdom is characterised by heterotrophic eukaryotic organisms that are multicellular and their cells lack cell walls.

They directly or indirectly depend on plants for food. They digest their food in an internal cavity and store food reserves as glycogen or fat.

(SSC CGL Pre. 2022, 01.12.2022 Shift-2)

Their mode of nutrition is holozoic – by ingestion of food. They follow a definite growth pattern and grow into adults that have a definite shape and size. Higher forms show elaborate sensory and neuromotor mechanism. Most of them are capable of locomotion. The sexual reproduction is by copulation of male and female followed by embryological development.

Animal kingdom

Includes multicellular organisms without cell walls holozoic eukaryotes, also known as ***Metazoa***

(RRB NTPC 30.12.2020)

Amylase Enzyme which is present in all members of the animal kingdom except Protozoa

(SSC CGL Tier-I (CBE) Exam.27.08.2016)

Note:-

- "Squid" the animal has three hearts.
- Luciferase enzyme has been used by scientists of Massachusetts Institute of technology to induce plants to give off dim light.

Vertebrate	Non Vertebrate
→ It also called chordate or vertebrate	→ Non-chordate or invertebrate
→ Heart located in upper part	→ Heart located in lower part
→ have notochord *(SSC MTS 21.08.2019)*	→ do *not have notochord* *(SSC (10+2) Exam 21.10.2012)*
→ Well developed vertebrate found.	→ Undeveloped vertebrate found
→ **Eg:** (Mammals, Aves, pisces, Amphibian, Reptilia)	→ **Eg:** (Porifera, coelentrata, platyhelminthes, *Arthropods,* Aschelminthes, echinodermata, mollusca) *(RRB NTPC 30.12.2020, 21.03.2021)*