

# CLASSIFICATION OF MICROBES

# MICRO-ORGANISMS

- Organisms of minute size.
- Can belongs to both plant and animal kingdom
- Have different structures- complex / simpler.
- Classifications may depend on their origin or structure or other characteristics.

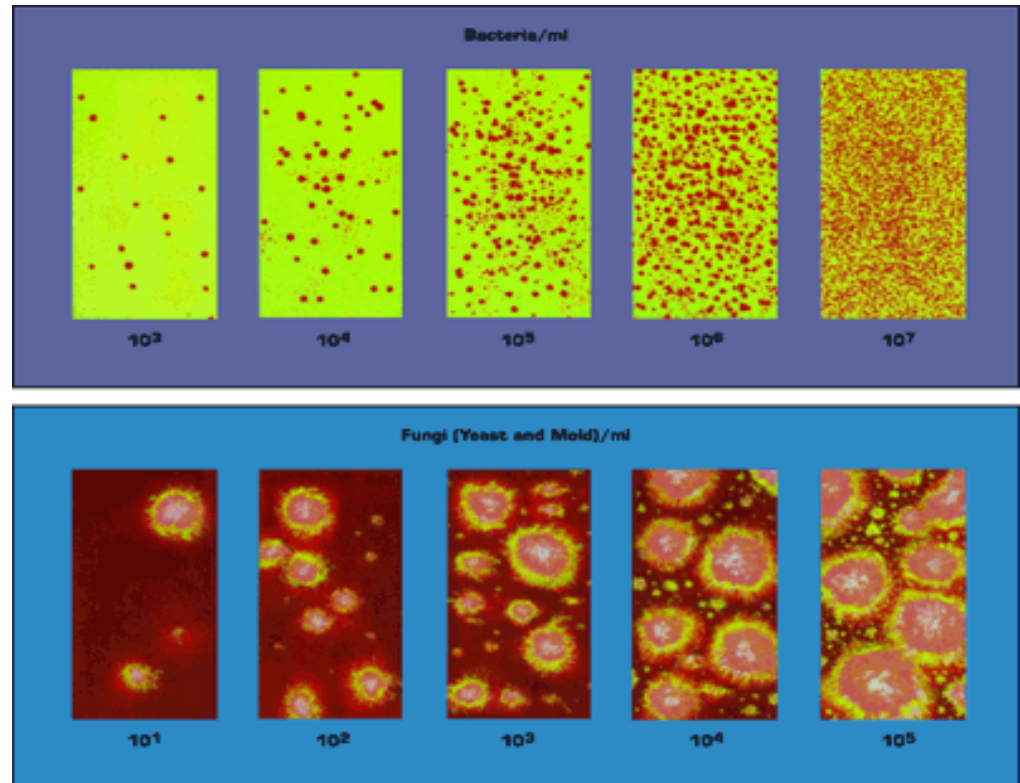
# STRUCTURES OF CELL

**Two different kind of cell structures in the living world.**

- **PROKARYOTIC CELLS:** Complex unit of structures, can be in both plants and animals.
- **EUKARYOTIC CELLS:** Simpler unit of structures, usually of bacteria and cyanobacteria.

# BASIC FIVE CATEGORIES

- Bacteria
- Fungi
- Algae
- Protozoa
- Virus



# CLASSIFICATION

## According to E.Haeckel

- Animalae : Those belongs to animal kingdom, perform active movements.
- Plantae : Those belongs to plant kingdom, capable to photosynthesize.
- Protist : Those belongs to both kingdom.

# CLASSIFICATION

## According to Aristotle

- Animalai : Ability of active movements.
- Plantae : Ability to photosynthesize.



# MICROBES OF INDUSTRIAL IMPORTANCE





# MOLDS

- Basic filament or the tissue :  
Hyphae.
- Interwined hyphaes : Thallus.
- Whole mass of thallus : Mycelium.



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# CHARACTERISTICS OF MOLDS

- **MULTICELLULAR AND FILAMENTOUS**
- Physiological : Related to their physical requirements.
- Cultural : Related to their appearance, texture and look.

# PHYSIOLOGICAL CHARACTERISTICS

- Moisture requirement – Less than yeast, bacteria. Below 14 – 15 % moisture is not favorable.
- Temperature Requirement – Three types
  - Mesophile : 25 - 30°C
  - Psychrotrophic : -5 to -10°C
  - Thermophile : Above 40°C.
- Oxygen Requirement : Aerobic in nature.
- Food Requirement : Both simpler and complex food.
- Inhibition : have the inhibiting capability.

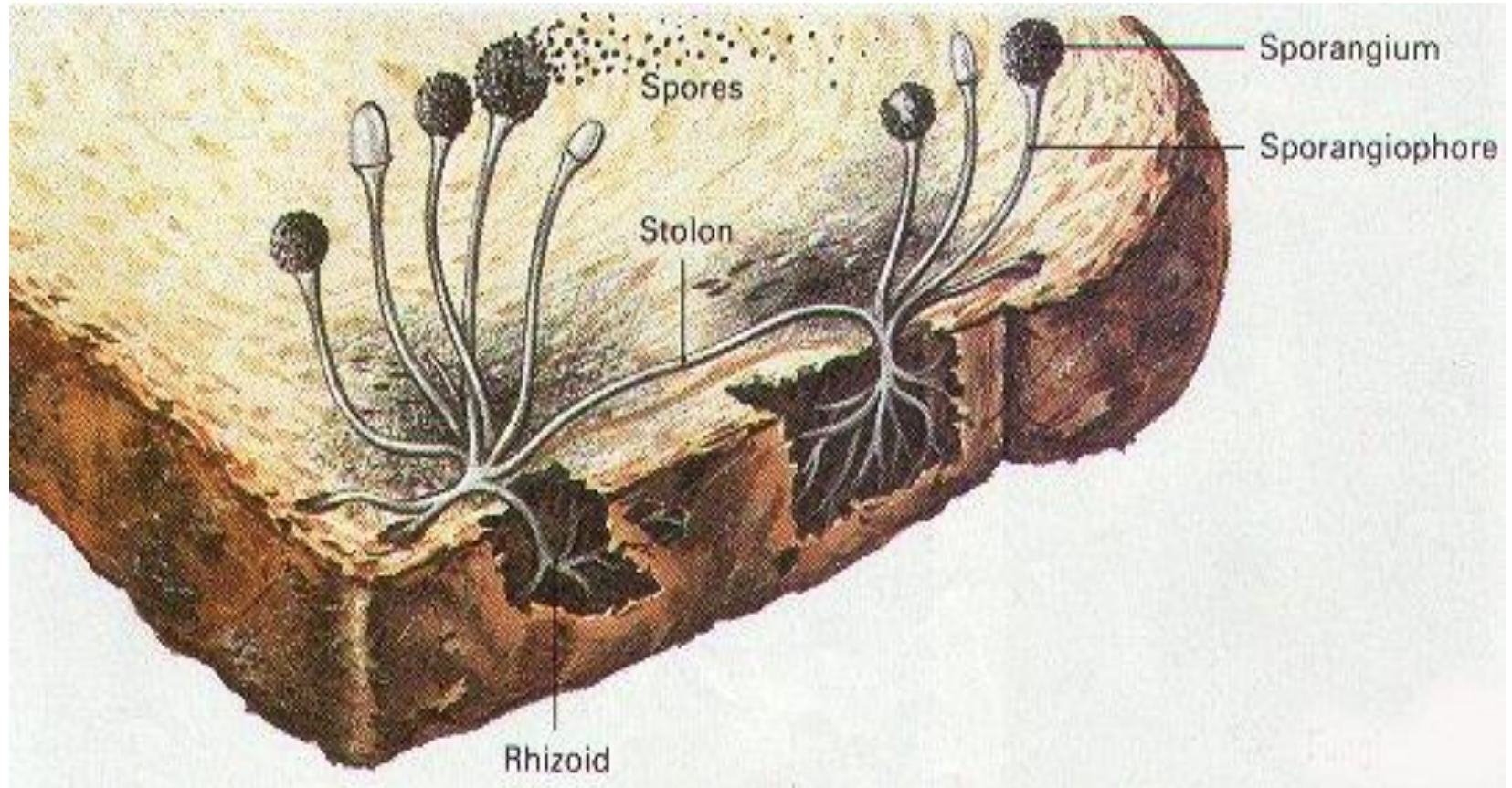
# CULTURAL CHARACTERISTICS

- Gross appearance which indicates its class or the orders.
- Some are loose and fluffy, while others are compact.
- Some look velvety, some dry and powdery, wet or gelatinous.
- Some are restricted in size while others are not.

# MOLD OF INDUSTRIAL IMPORTANCE

- MUCOR
- ZYGORRHYNCHUS
- RHIZOPUS
- ABSIDIA
- THAMNIDIUM
- ASPERGILLUS
- PENICILLIUM
- TRICHOTHECIUM
- GEOTRICHUM
- NEOROSPORA
- SPOROTRICHUM
- BOTRYTIS
- CEPHALOSPORIUM
- TRICHODERMA
- CLADOSPORIUM
- MONASCUS
- ENDOMYCES

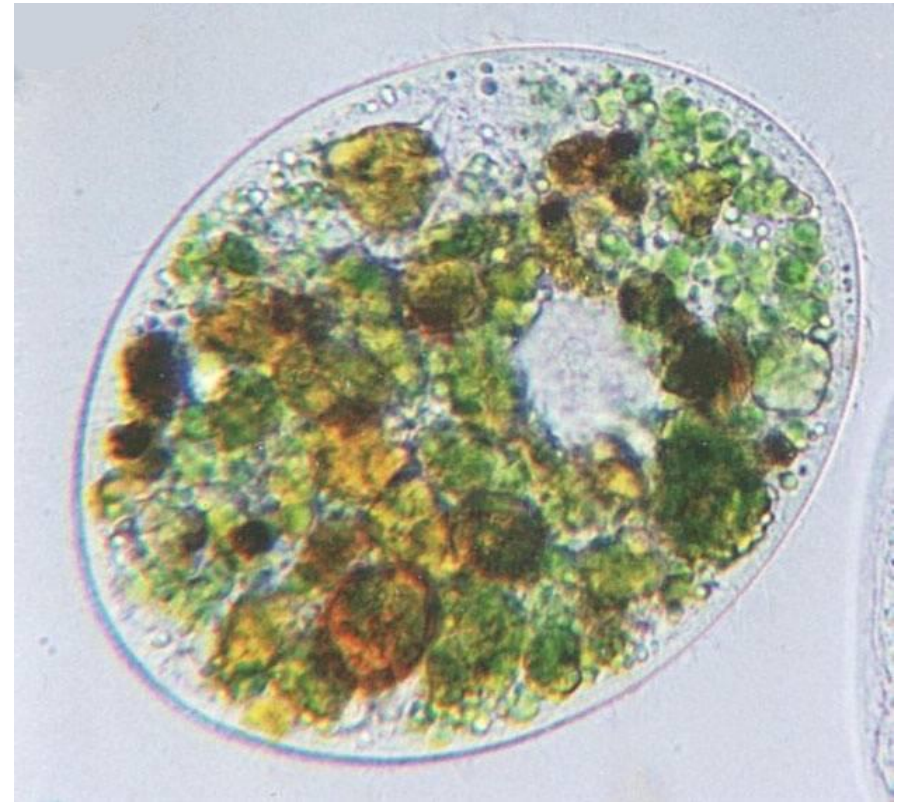
# MOLD FORMATION





# YEAST

- NON FILAMENTOUS AND UNICELLULAR
- Most popular organism used for food bakery



# CULTURAL CHARACTERISTICS

- Young yeast are moist and slimy.
- Some are whitish, some creamy and some pinkish.
- Some changes with age, become dry and wrinkled.
- Can be oxidative, fermentative or both.
- Can be called the wild yeast also.



# YEAST CLASSIFICATIONS

- According to their growth pattern.
  - 1) Oxidative : Grows as film on the surface of the liquid.
  - 2) Fermentative : Grows throughout the liquid.
- Wild Yeast – Used one for reuse.

# PHYSIOLOGICAL CHARACTERISTICS

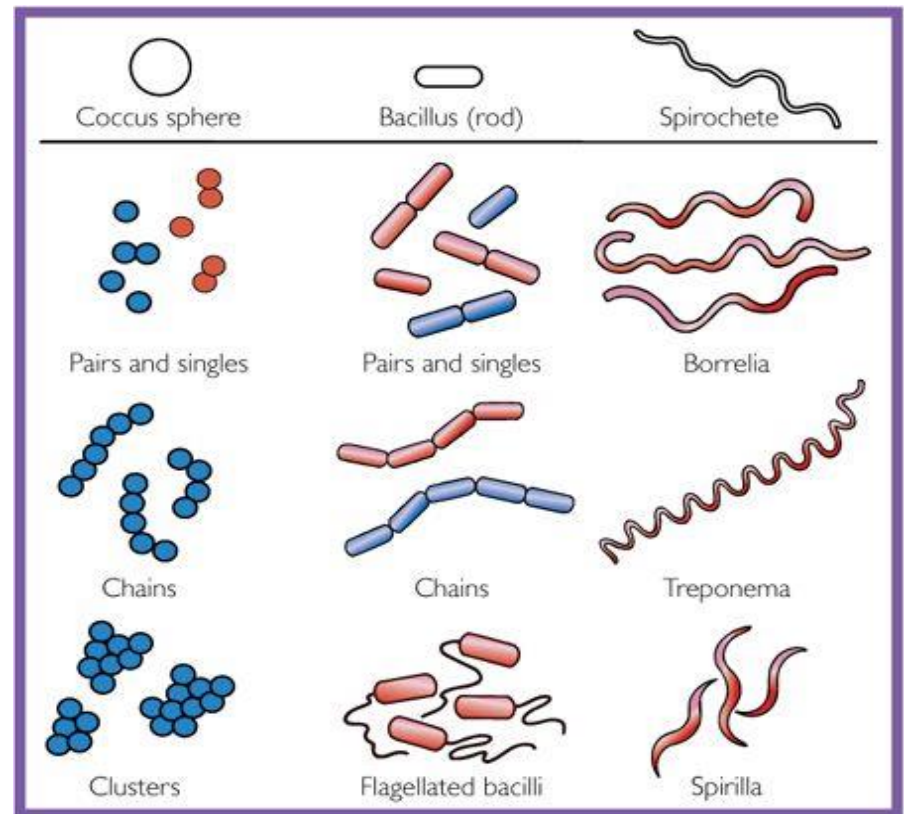
- Require plenty of water/moisture to grow
- Water activity (a ) : According to concentration of solutes, higher conc. , lesser the growth
- Optimum temperature required is 25-30°C, maximum required is 35-47°C and minimum is 0°C or lesser.
- Sugars are the best source of energy for them.

# YEAST OF INDUSTRIAL IMPORTANCE

- Genus Schizosacchromyces
- Genus sacchromyces
- Genus kluyveromyces
- Genus pichia
- Genus zygosacchromyces
- Genus hansenula
- Genus debaryomyces
- Genus hanseniaspora

# BACTERIA

- Surrounded by a capsule that increases its resistance against adverse conditions.
- Can be various shape and structures.



# CULTURAL CHARACTERISTICS

- Pigmented bacteria causes discolourization on surfaces of food.
- Their growth leads to formation of films over the surfaces of liquids.
- Growth of bacteria makes the food unattractive

# PHYSIOLOGICAL CHARACTERISTICS

- Growth & activity of bacteria brings about chemical changes in food.
- Require more moisture than yeast and mold.
- Hydrolyses protein to amino acid and fats to fatty acid.
- Temperature requirement varies from very high to very low resistance.

# BACTERIA OF INDUSTRIAL IMPORTANCE

- Lactic acid forming bacteria – lactics.
- Acetic acid forming bacteria – acetics.
- Butyric acid forming bacteria – butyrics.
- Propionic acid forming bacteria – propionics.
- Proteolytic bacteria
- Lipolytic bacteria.
- Saccharolytic bacteria.
- Pectinolytic bacteria
- Thermophilic bacteria
- Thermoduric bacteria
- Psychrotrophic or psychrotrophs.
- Halophilic
- Osmophilic
- Pigmented bacteria
- Slime forming bacteria
- Gas forming bacteria

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**YOUR SUCCESS**

**YOUR DREAMS**

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