Classification of Fungi :-

Proposed By

Alexopolus and Mims (1979)

Kingdom - MYCETEAE

Divisions: (3)

1. Gymnomycota

Sub-Divisions (2)

1. Acrasiogymnomycotina
Soma is myxamoeba Followed by pseudoplasmodium & Finally turn into sporocarp
Single class:
1. Acrasiomycetes

2. Plasmodiogymnomycotina
- Soma is myxamoeba with foliose pseudopodia or true plasmodium
- Two classes:
  1. Protosteliomycetes
  2. Myxomycetes

2. Mastigomycota

Sub-Divisions (2)

1. Haplomastigomycotina
(Zoospore Uniflagellate)
Three classes:
1. Chytridiomycetes (posteriorly uniflagellate zoospores)
2. Hyphochytridiomycetes (Aquatic fungi with anteriorly uniflagellate cells)
3. Plasmodiophoromycetes (parasitic fungi with non cellular multinucleate thalli)

2. Diplomastigomycotina
(Zoospore Biflagellate, meiosis gametangial)
One class:
1. Oomycetes (mycellium coenocytic cell wall madeup of glucans & cellulose in Leptomytales cellwall madeup of chitin)

3. Amastigomycota

Sub-Divisions (4)

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(saprobic/parasitic/predatory fungi, mycelium coenocytic, asexual reproduction by sporangiospores, sexual reproduction by gametangial copulation)
Two classes:
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2. Ascomycotina
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1. Ascomycetes (asexual reproduction by conidia, ascocarp present)
Five sub classes:
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2. Plectomycetidae (soma filamentous, ascoma cleistocarpous)
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5. Loculoascomycetidae (soma filamentous, asci bitunicate formed in ascostromata asci unitunicate perithecoid ascomata)

3. Basidiomycotina
(Saprobic/parasitic/symbiotic fungi, meiospores are basidiospores, born on basidium)
One class
1. Basidiomycetes (soma mycelial with long dikaryotic phase)
Three sub classes:
1. Holobasidiomycetidae (basidia non-septate)
2. Phragmobasidiomycetidae (basidia longitudinally or Transversely septate)
3. Teliomycetidae (basidiocarp absent)

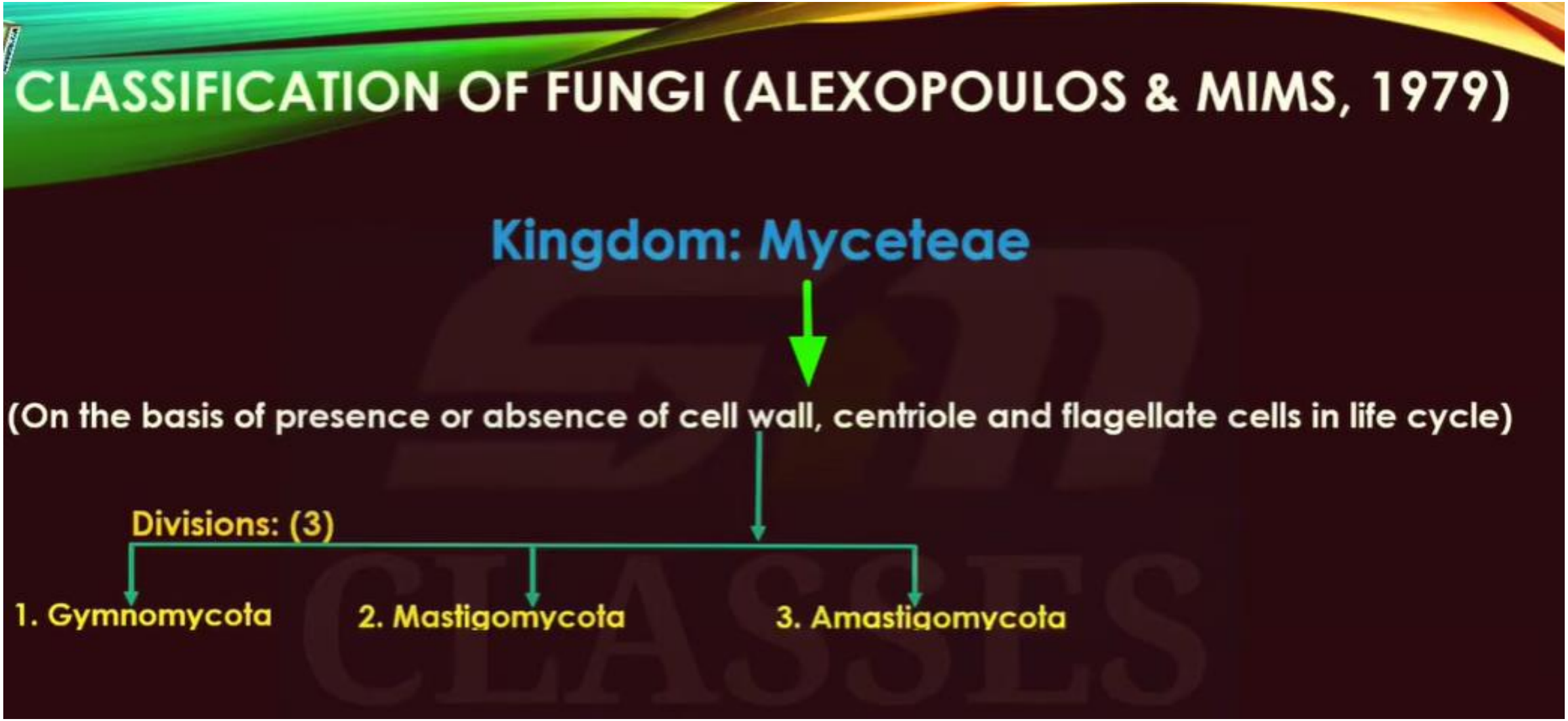
4. Duteromycotina
(Saprobic/parasitic/predatory/symbiotic fungi sexual reproduction absent
One Form class
1. Duteromycetes (parasexual cycle present, asexual reproduction by conidia)
Three sub classes:
1. Blastomycetidae (soma consisting of yeast cells with or without pseudomycelium)
2. Coelomycetidae (true mycelium, conidia produced in pycnia or acervulus)
3. Hyphomycetidae (true mycelium, conidia produced on conidiophores)

Reference: Introductory Mycology by CJ Alexopoulos & CW Mims

Myceate

- Achlorophyllous
- Heterotrophs
- Acellular, unicellular or mycelial thalloid
- Chitinous cell wall
- Food reserve – glycogen and oil droplets

CLASSIFICATION OF FUNGI (ALEXOPOULOS & MIMS, 1979)



CLASSIFICATION OF FUNGI (ALEXOPOULOS & MIMS, 1979)

Kingdom: Myceteae

(On the basis of presence or absence of cell wall, centriole and flagellate cells in life cycle)

Divisions: (3)

1. Gymnomycota

- Plasmodial slimy organisms.
- Lack cell wall.
- Phagotrophic nutrition,
- E.g. Dictyostelium

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- Includes fungi with absorptive nutrition, unicellular or filamentous, mycelium coenocytic.
- Asexual reproduction typically by zoospores.

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- Asexual reproduction typically by zoospores.

3. Amastigomycota

- Centriole absent
- Spindle pole bodies functioning during cell division
- Flagellated cells not produced during life cycle

CLASSIFICATION OF FUNGI (ALEXOPOULOS & MIMS, 1979)

Division: 1. Gymnomycota

Sub-Divisions (2)

1. Acrasiogymnomycotina

Sub-division : Acrasiogymnomycotina

Class - Acrasiomycetes :

a) Popularly known as cellular, amoeboid slime molds.

b) Most abundantly found in upper layers of humus in well established deciduous forests and as well as in soils.

c) Flagellated cells absent.

d) Myxamoebae aggregate to form a pseudo-plasmodium.

2. Plasmodiogymnomycotina

Sub-division : Plamodiogymnomycotina

Class - Protosteliomycetes :

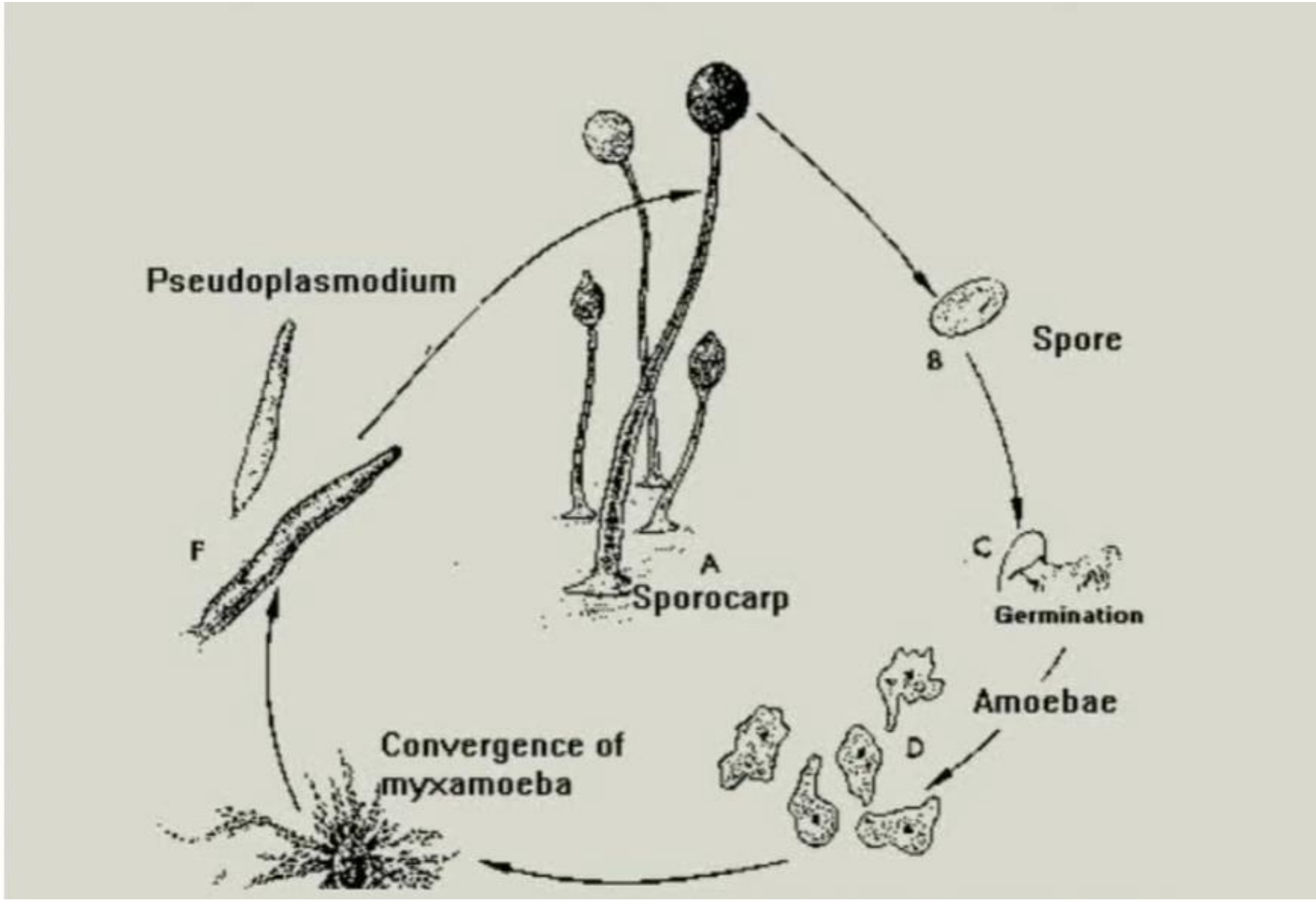
a) Primitive slime molds, mostly found in soil, dung, humus, dead wood, tree bark and plant remains.

b) Myxamoebae do not aggregate prior to fruiting.

Class - Myxomycetes :

a) True slime molds, distributed world wide, found on moist soil, decaying wood and dung.

b) Sometimes fruiting bodies are conspicuously coloured.


Pseudoplasmodium
F
A
Sporocarp
B
Spore
C
Germination
Amoebae
D
Convergence of
myxamoeba

CLASSIFICATION OF FUNGI (ALEXOPOULOS & MIMS, 1979)

Division: 2. Mastigomycota

- Includes fungi with absorptive nutrition, unicellular or filamentous, mycelium coenocytic.
- Asexual reproduction typically by zoospores.

CLASSIFICATION OF FUNGI (ALEXOPOULOS & MIMS, 1979)

Division: 2. Mastigomycota

Sub-Divisions (2)

1. **Haplomastigomycotina**
   (Zoospore Uniflagellate)
   Three classes:
   1. Chytridiomycetes
   (posteriorly uniflagellate zoospores)
   2. Hyphochytridiomycetes
   (Aquatic fungi with anteriorly uniflagellate cells)
   3. Plasmodiophoromycetes
   (parasitic fungi with non cellular multinucleate thalli)

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2. Diplomastigomycotina
(Zoospore Biflagellate, meiosis gametangial)

One class:

Class - Oomycetes :

a) Found in a variety of habitats, majority are aquatic.
b) Live parasitically on algae, water molds, aquatic insects and other animals and plants.
c) Mycelium is well branched, filamentous and coenocytic.
d) Cell wall contains cellulose.
e) Zoospores are biflagellate, having one whiplash and another tinsel type flagellum.
f) Many members produce non-motile conidia.
g) Flagellated gametes absent.
h) Fertilization caused by fertilization tube.

CLASSIFICATION OF FUNGI (ALEXOPOULOS & MIMS, 1979)

Division: 3. Amastigomycota

- No motile cells
- Single celled to mycelial
- Septate or aseptate mycelium
- Haplohaplointic-haploid life cycle with zygotic meiosis

CLASSIFICATION OF FUNGI (ALEXOPOULOS & MIMS, 1979)

Division: 3. Amastigomycota

Sub-Divisions (4)

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(saprobic/parasitic/predatory fungi, mycelium coenocytic, asexual reproduction by sporangiospores, sexual reproduction by gametangial copulation)

2. Ascomycotina

(Saprobic/symbiotic/parasitic fungi, meiospores are ascospores formed in ascus)

3. Basidiomycotina

(Saprobic/parasitic/symbiotic fungi, meiospores are basidiospores, born on basidium)

4. Duteromycotina

(Saprobic/parasitic/predatory/symbiotic fungi sexual reproduction absent

DIVISION – AMASTIGOMYCOTA

Nutrition absorptive, motile structures are absent

Sub-division : Zygomycotina

Class - Zygomycetes :

a) Mostly terrestrial in habitat, living in soil or on decaying plant or animal material.

b) Some are parasites of plants, insects and small insects, while others form symbiotic relationships with plants.

c) Mycelium coenocytic, forming septa only where gametes are formed.

d) Perfect stage condition is zygospore.

Class - Trichomycetes :

a) These fungi are parasitic, found within the digestive tract of living arthropods and guts of earthworms.

b) The hosts of Trichomycetes include marine, freshwater and terrestrial arthropods.

c) Asexual reproduction takes place by trichospores, sporangiospores, arthrospores or amoebiod cells.

d) Sexual reproduction takes place by biconial zygospores.

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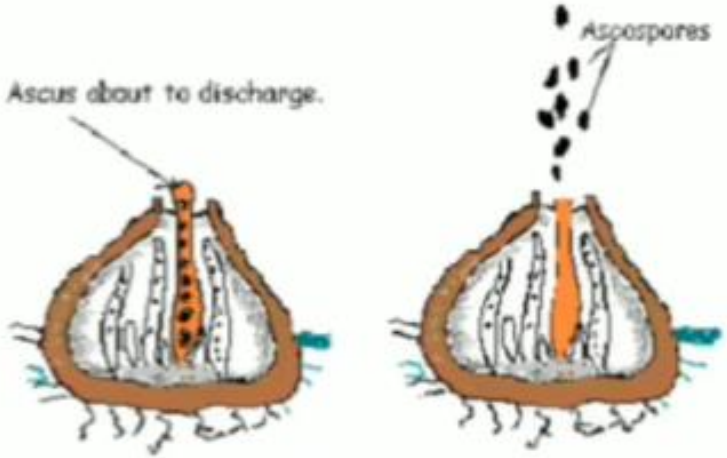
Reference: Introductory Mycology by CJ Alexopoulos & CW Mims

Sub -division : Ascomycotina

Class - Ascomycetes :

- **Also called cup fungi / Sac Fungi**
- **Septate mycelium**
- **Fruiting body- Ascocarp is formed**
  1. Cleistothecium (Closed): *Erysiphe*
  2. Perithecium (Thin opening): *Claviceps*
  3. Apothecium (Cup shaped): *Peziza*
- **Ascus act as zygote**
- **Undergo meiosis and form 4 or 8 ascospores**



Neurospora crassa fruiting body

Example: *Neurospora* (Red mould); *Penicillium* (Blue mould); *Aspergillous*

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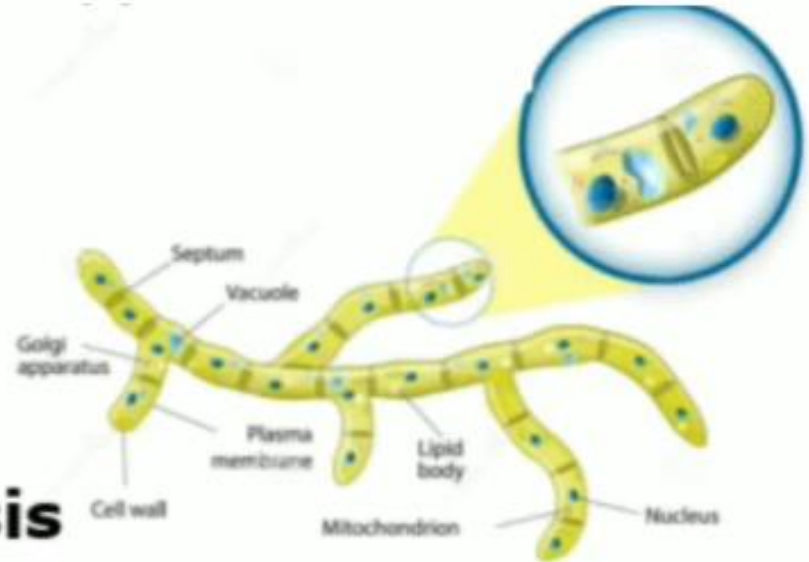
Sub-division : Basidiomycotina

Class - Basidiomycetes :

- **Club fungi**
- **Mycellium septate**
- **Fruiting body – Basidiocarp**
- **Basidium act as zygote undergo meiosis and form haploid basidiospores.**



Example: *Puccinia, Ustilago, Agaricus* (Gill Fungi)

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Deuteromycetes

Deuteromycetes are an artificial group of fungi, of which there exist approximately fifteen thousand species, often referred to as “fungi imperfecti” because their only known reproductive mechanism is asexual.

Deuteromycetes—also known as Deuteromycota, Deuteromycotina, fungi imperfecti, and mitosporic fungi—are fungi that are unable to produce sexual spores and are therefore placed in their own separate phylum. The deuteromycetes are commonly called fungi imperfecti, that is, “imperfect fungi,” a term accepted by many mycologists.

THANK YOU