Microscopy - Chapter 1

Lecture 5

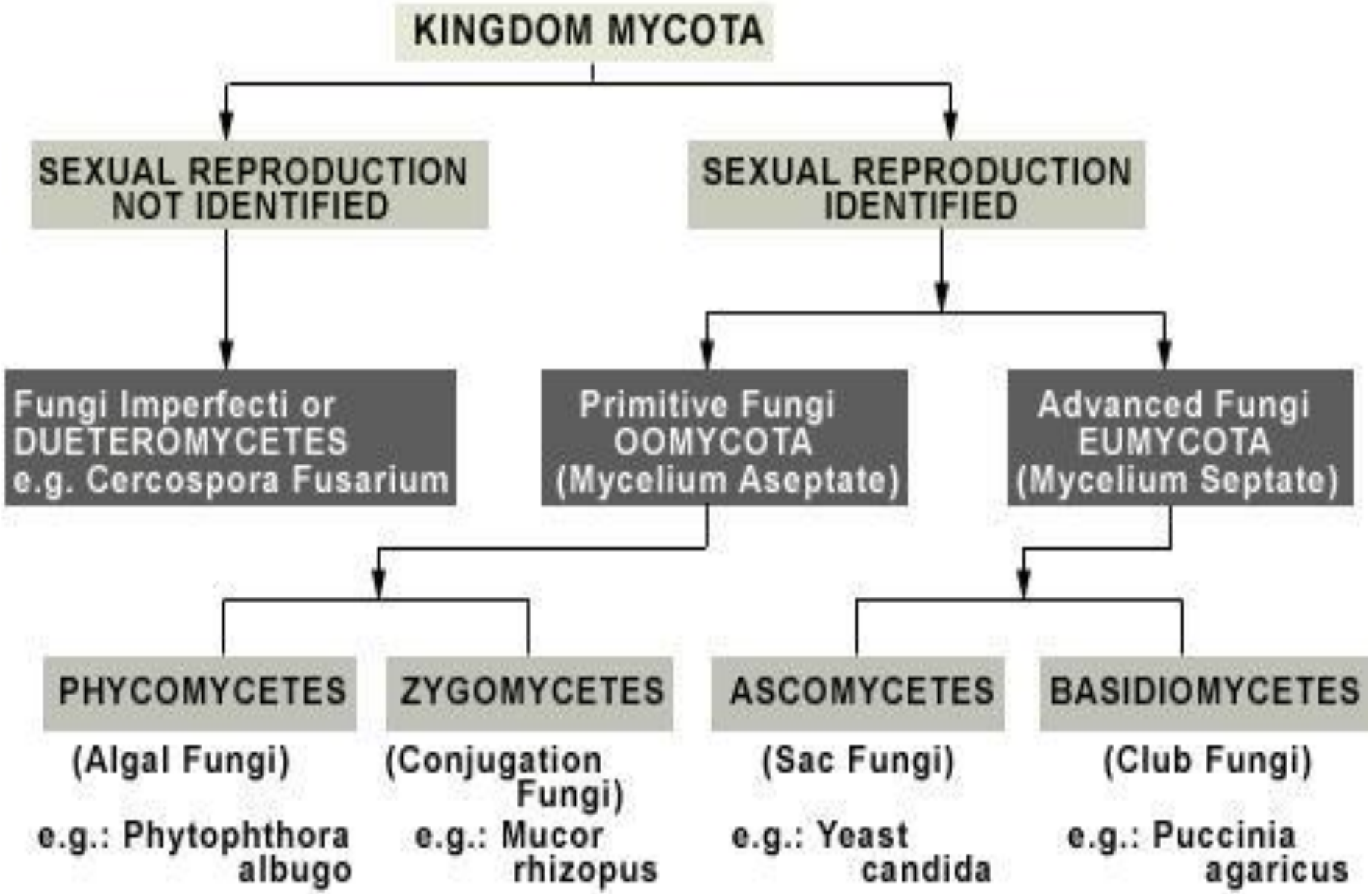
Fungal Morphology (Part 1)

Fungal Categories

Groups of Fungi

- (Actinobacteria 1 -1.5 µm)
- Oomycetes 1.5 – 2.5 µm, clear, colorless, aseptate
  - Zygomycetes (zoospores)
- Deuteromycetes 2 – 2.5 µm (Fungi Imperfecti)
- Ascomycetes > 2 µm, (septate)
- Basidiomycetes > 3 µm, septate

There are many different ways in which fungi can be taxonomically classified.



From Tutorvista

The Characteristics of Fungi

Hyphae:

- Uniform diameter all the way along the strand (beneficial fungi).
- Strands may branch and branch can be a different diameter.
- Vesicles are about the only structures inside hyphae.
- The hyphae do not shred, get wispy, or fragment.
- Ends of hyphae are usually sharp breaks.
- Not crystalline in appearance, rarely curled.

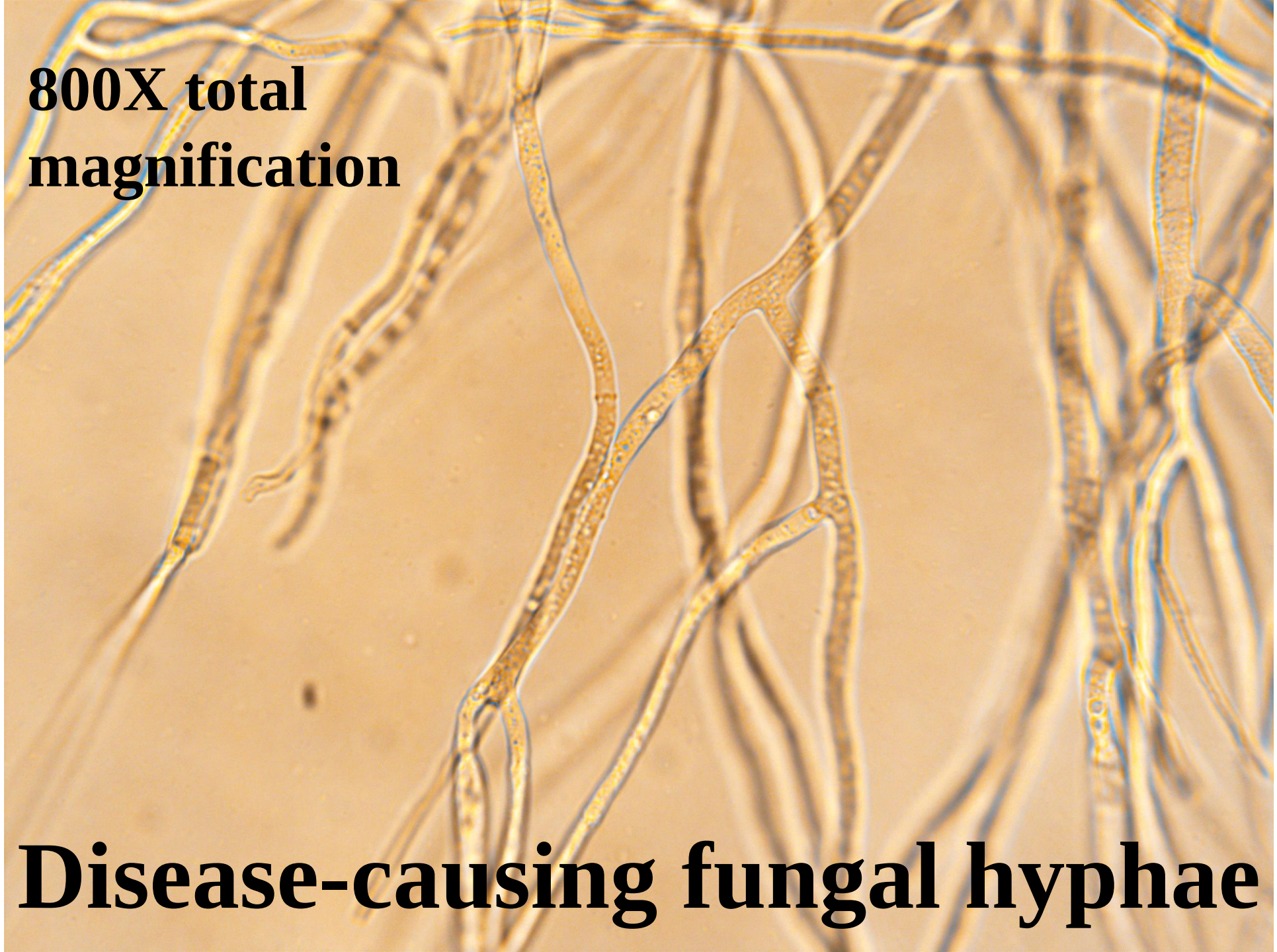
Characteristics of Beneficial Fungi

- **Color:** Colored in some way, compare color of the hyphae to the sample background.
- **Diameter:** Beneficial fungi have diameters wider than 2.5 - 3 micrometers. A few exceptions (Rhizoctonia).
- **Cross-walls:** Uniform distance between septa indicate beneficial fungi, Clamp connections ALWAYS indicate beneficial fungi (Basidiomycetes).
- **Oxalic acid crystals:** Beneficial fungi make oxalate crystals to store charged nutrients.

Characteristics of Disease-causing, or not-so-wonderful, Fungi

Hyphae are more-or-less uniform diameter but the hypha may be lumpy, bumpy, with bubbly cytoplasm. Big clumps, or wefts, of hyphae.

- **Diameter:** Most disease-causing fungi have diameters narrower than 2 - 2.5 micrometers.
- **Color:** Clear, colorless; compare to background color.
- **Cross-walls:** Adventitious septa at best, usually no discernable cross-walls, no clamp connections.
- **Oxalic acid crystals:** None.
- **Spores:** Chlamydospores, sporangia, conidia common.



Disease-causing fungal hyphae

Anything to note about the samples?

Consider the list we have been using for the bacterial examples, and repeat for all the following examples, and samples you will be viewing.

Bacteria? Actinobacteria?

Beneficial fungi / Diseases fungi (oomycetes)?

Protozoa?

Nematodes?

Aggregates? Humics? Fulvics? Background color?