



FUNGI

7/22/87, rvsd 9Aug93, 10Aug94, 3/12/97, 3/11/98, 2Aug 99, 8Aug 01, 28Mar02, 2Aug02, 11Aug04, 8Aug05, 10Aug08, 9Aug10, 12Aug11, 23Nov15
 TFC, 2nd Ed, p302-338, Boyd, 2nd, pp 844-851, Campbell, 2nd, p. 589-, Black, 2nd, 300-307, TFC 7th: 331-343, 8th: 334-345
 Black's 6th: 308-314, Bauman 2nd: 357-368, 623-644, 3rd: 353-363, 625-650

FUNGI: hyphae [threads], **mycelium** (thallus [green shoot] = body of fungus) (p 354)

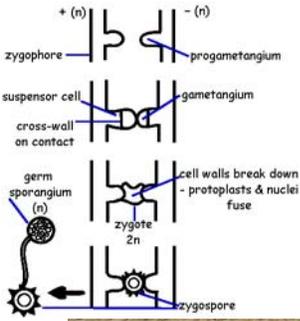
saprophytic [rotten, a plant]: imbedded in decaying organic matter, secrete hydrolytic enzymes which decompose by hydrolysis. Then absorb released nutrients

conidia [dust]: asexual spores vs sexual repro. (P 356)

Some fungi are **dimorphic**: (629) filamentous at RT, yeast-like at 37°C (nB: *Candida*)

Cell walls composed of **chitin**, polymer: β 1,4 N acetyl glucosamine

Yeast reproduce asexually by budding Sexual reproduction by haploid, dikaryotic, then diploid phases.



PHYLA:

[OOMYCOTA: (water molds, now in Protista) Flagellated asexual spores & gametes: **eggs and motile sperm examples:** water molds, potato blight, downy mildew of grapes and sugar beets, ich on tropical fish.]

ZYGOMYCOTA: [join, fungus] (p 362) (Bread molds) (only 600 species) = conjugation fungi

gametangia of opposite mating types join, form zygosporangium, meiosis, then **sporangium**

example: *Rhizopus nigricans*, black bread mold (can be opportunistic pathogen)

ASCOMYCOTA: (p 363) [Sac fungi] (30,000 species) one "sex" produces ascogonium, the other and antheridium, they fuse, dikaryotic hyphae form ascocarps (fruit cups of cup fungi), produces **ascus** through meiosis, then mitosis producing 8 spores.

Claviceps purpurea (ergot) Dec 1691, Salem MA 8 girls "bewitched," witch trials led to 19 executions.

examples: Dutch Elm Disease, *Neurospora*, *Penicillium notatum* (+ *camemberti*, *roquefortii*), Chestnut blight, yeast, *Aspergillus* (aflatoxin), *Candida*, *Trichophyton* (athlete's foot), Histoplasma., morels

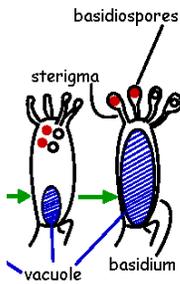
BASIDIOMYCOTA: (p 365)[club fungus] 25,000 species The **True Mushrooms**

mushrooms: form heterokaryon of opposite mating types, in mushroom, fertilization occurs in basidia, followed by meiosis which produces four spores.

examples: Genera: *Amanita*, *Coprinus*, *Agaricus*. *Cryptococcus*: opportunistic infection, esp AIDS pts

DEUTEROMYCOTA: [second, fungus] 25,000 species

so-called imperfect fungi, (second or 'other' fungi)



FUNGAL DISEASES: Three main categories of **mycoses** [fungal condition]: (table, p 364)

superficial feed on keratinized tissue which keratinase digests. (See Tinea below)

dermatomycosis superficial mycosis. Especially prevalent in tropics

subcutaneous (can spread to lymph vessels)

systemic opportunistic mycoses usually only in immunosuppressed or debilitated patients (leukemia, diabetes). Notably:

mucormycosis [mucous, moldy, musty] caused by *Rhizopus* or *Mucor* in individuals under immunosuppressive drugs etc.

Stachybotrys toxic mold, grows on cellulose, releases toxins to air.

headaches, sore throats, hair loss, flu symptoms, diarrhea, fatigue, dermatitis, general malaise, psychological depression.

Specific examples:

Histoplasmosis (p. 637, 638) *Histoplasma capsulatum* (more than 75% in Ohio Valley have been infected) Usually minor respiratory disease

Aspergillosis p 637 systemic &/or respiratory, can be life threatening, treat with amphotericin B

Candidiasis p 642, 644 by *C. albicans*: low pH usually prevents: thrush, vulvovaginal (curd-like discharge, burning, painful intercourse), treat with nystatin (p. table 643)

Pneumocystic pneumonia in AIDS patients: *Pneumocystis jiroveci* (*carinii*), p. 641

Tinea (ringworm) (p 648) [tinea = moth larva, worm]: (Often *Trichophyton* sp.) Grow on keratin

Tinea capitis [head] ringworm of the scalp

Tinea cruris [groin] "jockitch"

Tinea pedis [foot] athlete's foot

Treatment:

clean & dry! Non-prescription: tolnaftate, undecylenic acid or Zn undecylenate.

Prescription drugs: miconazole or clotrimazole

