

The ascus - a sac-like structure that contains meiotic spores of Ascomycetes (comparable to the basidium in Basidiomycota). When spores are actively discharged asci are elongate with an opening at the apex.

ascus types: operculate vs. inoperculate, epigeous and hypogeous

Discomycetes (cup fungi) - construction of an apothecium (cup), parts of apothecium: asci, paraphyses, exipulum

Operculate discomycetes (almost all the really large ones); characters used to distinguish them: gross morphology (shape, color, etc), ascus shape (amyloidity of tips), paraphysis types, exipulum types

Peziza (many species) (Pezizaceae), on soil. burnt soil, old carpets, many may be mycorrhizal

Sarcosphaera crassa (Pezizaceae) - large purplish, on soil, probably mycorrhizal

Otitidia - a curled cup, often partially buried, probably mycorrhizal

Sarcoscypha coccinea - intensely red moderately size cup on wood in early spring

Aleuria (Humariaceae) - the orange peel fungus, on soil

Scutellina (Humariaceae) the eyelash fungus; small bright red with "eyelashes on margin", on wood

Anthrocobia (Humariaceae) and *Pyronema* (Ascobolaceae) brightly colored small cups always in burned areas

Rhizina undulate (Helvellaceae) - large, brown, wrinkled, post-fire plant-parasitic species

Morels and relatives (see O'Donnell tree):

Morchella (Morchellaceae) - the true morel, conic, sponge-like - found in the spring. Some species common in burned areas, all on soil, ecology controversial: parasite/saprobe/mycorrhizal?

Gyromitra (Discinaceae) more globose or irregular and brain-like than *Morchella*; spores with 2 or more oil-droplets inside. Some like *G. esculenta* contain monomethylhydrazine

Helvella (Helvellaceae) - more saddle-shaped than *Gyromitra*, spores typically more broadly elliptical than *Gyromitra* and with a single oil droplet. Our most common species *H. lacunosa* could be very easily confused with *Gyromitra*.

Tuber (Tuberaceae) - true truffles, hypogeous and ectomycorrhizal

Inoperculate discomycetes - many small to miniscule cups, many lichenized

Leotia (Geoglossaceae) jelly babies

Earthtongues (Geoglossaceae) *Geoglossum*, *Microglossum*, *Trichoglossum*

Many tiny cup fungi - *Bisporella citrina* bright yellow, 2-celled spores, on wood; *Mollisia* spp. - little gray cups with elongate spores- many species are habitat specific.

Perithecial ascomycetes - construction of a perithecium, definition of stroma (sterile tissue in which the perithecia are embedded)

Xylariaceae - **Black stroma** with imbedded perithecia

Xylaria - Stag horn fungus, deadman's fingers, on wood (sometimes buried); white asexual stage first,

Hypoxylon - usually flat black crust on wood, but *Hypoxylon thouarsianum* is hemispherical and will key out as *Daldinia* in Arora. Differs from *Daldinia* in having a distinctly pimply surface, and in being less zonate in x-section. Spore size is different too: 15.0-21.0 x 4.5-6.0

Daldinia - cramp balls, black with concentric rings (alternating black brown) in cross-section, on wood, and in having a relatively smooth surface. spores 12-17 X 6-11 μm in *D. grandis*

References

Mushrooms Demystified does pretty well with everything listed above. For the smaller cup fungi turn to:

Breitenbach, J. and F. Kranzlin. 1984. Fungi of Switzerland : volume 1 Ascomycetes Lucerne, Switzerland: Verlag Mykologia. .

Source of the tree in powerpoint

O'Donnell, K., E. Cigelnik, N.S. Weber, and J.M. Trappe. 1997. Phylogenetic relationships among ascomycetous truffles and the true and false morels inferred from 18S and 28S ribosomal DNA sequence analysis. *Mycologia*, **89**. 48-65.