

ASCOMYCOTA DIVERSITY

1. *Saccharomyces cerevisiae* asexual structures – make a slide and observe budding cells under the compound scope.
2. *Saccharomyces cerevisiae* sexual structures – make a slide and observe under the compound scope for asci and ascospores. How many ascospores do you see per ascus?
3. *Ascobolus* – pluck out a single ascocarp and observe under the dissecting scope. Make a thin longitudinal slice and mount in Tween+EtOH, observe under the compound scope. Squash the slice and observe again. Make sure you can find the asci and ascospores.
4. *Morchella* – observe the edible morels. Where do you think the hymenium is found?
5. *Tuber* – observe the edible truffles. Where do you think the hymenium is found?
6. *Lobaria* lichen – Observe the lichen body, notice why it is classified as a foliose lichen.
7. *Lobaria* slides – View a slide under the compound scope. Make sure you can find the two symbionts and where they are located in relation to each other. What do you think the photosynthetic symbiont is?
8. *Letharia* – make sure you can find the asexual and sexual (apothecia) parts of the lichen.
9. *Cladonia* wreath – One of the uses for lichen in Denmark.
10. *Cladonia* – make sure you can find the asexual and sexual (apothecia) parts of the lichen
11. *Xanthoria* – observe the crustose type lichen. Make sure you can find the apothecia. How do you think they can grow on pure rocks?
12. *Sclerotinia* – observe the sclerotium under the compound scope.
13. *Cystotheca* (on oak) & *Phyllactinia* (on *Calycanthus* = spicebush) – Make a thin cross section of the young oak stem, mount in Tween+EtOH and observe the *Cystotheca* conidia under the microscope. Pluck out several black flecks (cleistothecia) of *Phyllactinia* on the lower leaf surface of the spicebush. Mount them in Tween+EtOH and observe the structures. What do you think is the function for those projections? Now squash the specimens lightly and find the ascospores. If you are lucky, you can find intact asci.
14. *Neurospora crassa* asexual structures – remove the lid and observe the lid of the petri plate under a compound scope to find the conidia.
15. *Neurospora crassa* sexual structures – Find good and large perithecia under the dissecting scope, prick them out and mount in Tween+EtOH. Observe the overall structure of the perithecia. If you don't see a neck, your specimen is too young. Squash the perithecia and make sure you can see asci and ascospores.
16. *Xylaria* & *Daldinia* – observe the fruit body of these fungi under a dissecting scope. Can you find the perithecia? Do not dissect the specimens.
17. *Claviceps* in frames – Observe the black sclerotia (resting structures) and the stroma that grows out of the sclerotia in favorable conditions.
18. *Claviceps* slides – observe the slides under a compound scope. Make sure you can find the perithecia and ascospores.
19. *Eurotium* (sexual state of *Aspergillus*) – Observe under the dissecting scope to find the asexual structures (conidiophore and green conidia) and the sexual structures (round cleistothecia). Make a mount of a couple of cleistothecium in Tween+EtOH, squash and find the asci and ascospores under the compound scope.
20. *Aspergillus* – make a radial slice of the plate and find some young conidiophores. Gather a few young ones and make a slide with Tween+EtOH. Observe how the spores are attached to the conidiogenous cells and how they are attached to the conidiophores.
21. *Penicillium* – Observe the moldy orange under the dissecting scope. Grab a plate from the cheese hood and make a slide of young conidiophores (like you did above for *Aspergillus*) and make sure you can compare and contrast between these two genera.

22. *Sporomiella* – the pseudothecium is embedded in the agar. Pluck some of these structures out and mount them in WATER. Observe the pseudothecium – how many asci can you find in each? Squash the pseudothecium – how many ascospores are in each? How many fragments does each ascospore break into? Remove the slide from the scope, wait about 20 minutes and observe again. Can you spot the inner wall breaking out? What do you notice about the spacing of the spores now?