

observed germinating through what eventually would become the germ pore of the dark cell. On-the-other-hand a number (<1%) of mature ascospores discharged onto the lid of axenic PCA cultures were seen to germinate in situ from the hyaline lower cell. These germ tubes (one/cell) emerged from various locations on the hyaline cell. Apinis and Chesters originally describe the hyaline cell as empty (devoid of protoplasm?) with the condensing protoplast restricted to the dark cell. This seems to be the case -- with germinations from the hyaline cell appearing to originate from the septum with the dark cell and then growing through the hyaline cell. All lid germinations took place in water droplets condensed on the lid and germ hyphae immediately began to produce the Cladorrhinum anamorph.

Still unresolved:

- 1) What triggers germ-pore germination of the thicker-walled dark cell? Perhaps a heat treatment of 60°C for 30 min. is required as Huang used for what he called Echinopodospora spinosa in Can. J. Bot. 52: 1849-1851 (1974) --now Apiosordaria spinosa, or perhaps a chemical treatment.
- 2) Only asci with 4 1-celled hyaline to faintly pigmented verruculose-spinose ascospores have been seen following the observation of many slide mounts. All later stages have been seen outside the ascus (on the Petri dish lid, agar surface, etc.). Since Ingold reported ascospore discharge only during a dark cycle (Ingold, C.T. & Marshall, B. 1963. Further observations on light and spore discharge in certain pyrenomycetes. Ann. Bot. 27: 481-491.), I suspect that I have missed the stages of ascospore ontogeny in the ascus because I have been viewing asci only during the light cycle. Originally I had the incubator set for continuous light but changed it to 12 light:12 dark when I became aware of Ingold's work. I need to examine asci further during the dark cycle. I am also aware that 1-celled hyaline to very faintly pigmented ascospores can be discharged onto the lid -- many have been observed there. In fact, after replacing a lid with a new lid following photos of ascospores on the original lid, I saw only 1-celled ascospores on the new lid a couple of hours later (still in the light cycle). It could be that ascospores can also carry out their final stages of maturity after discharge although I may have missed their more typical intraascal maturation during a dark cycle.

Addendum to ascospore ontogeny: Of note is the finding that ascospores mature outside the asci!! On 3 different occasions (involving both A40 and A41 isolates), I thoroughly examined ascospores on Petri dish lids of 14-19 day axenic PCA cultures. During this time, I had