

Copper in Fruiting Body Development of *Coprinus cinereus*

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The model homobasidiomycete *Coprinopsis cinerea* grows best at 37°C, but, normally, it produces fruiting bodies only at moderate temperatures around 25-28°C. Light is needed to induce fruiting and also for fruiting body maturation. Cultures kept after fruiting induction predominantly in the dark form structures with an extended stipe and an underdeveloped cap (so-called “etiolated stipes”). In a day/night rhythm, caps develop further, basidia are formed, in which karyogamy and meiosis occurs and of which the basidiospores bud off. Besides light, fruiting body development in basidiomycetes has been repeatedly linked to enzymes belonging to the group of phenoloxidases, in particular the multi-copper containing laccases. However, their roles in fruiting remain unclear.

In attempts to induce laccase production in liquid standing cultures at 37°C, to our surprise we found unusual initiation of fruiting body development. However, the abundantly formed primordia did never develop into mature fruiting bodies but into large-sized etiolated stipes, both in dark and in light. Laccase under these conditions was not detected in the medium but bound to the fruiting initiating mycelium. Moreover, enzyme production and etiolated stipe formation correlated with an increase from pH 5.5 to a slightly alkaline pH. Ammonium was found to be produced and nitrate reductase activity has enzymatically been shown. Under normal fruiting conditions, addition of copper to cultures enhances fruiting initiation in time and number.

To further unravel the potential involvement of laccases in fruiting as well as of proteins influencing ammonia secretion, we are studying expression of corresponding genes during vegetative growth and fruiting body development.

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