

Epichloë in Wyre

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Photos 1 and 2. *Epichloë* sp. on *Agrostis canina* in Longdon, 21 July 2010



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During the summer months it is sometimes possible to find strange white or orange growths on grass stems in Wyre. They occur in short sections, about 2 to 4cms. in length and sometimes quite large areas of grass can be infected (see photo 1).

This is a fungus from the Phylum Ascomycota, a species of *Epichloë* from the family Clavicipitaceae, which is an obligate systemic parasite of living grasses. It can be endophytic - that is, colonise the tissues of healthy plants without there being any visible symptoms. (In fact most plants have endophytic fungi associated with them). The grass can only be seen to be infected when the spore-bearing part of the fungus emerges from the grass cuticle. This stroma or mycelium cushion produces firstly asexual spores and later sexual spores. At first the stromata are colourless but as they grow older they turn bright orange.

There are at least 6 species of *Epichloë* fungi in the UK, all of which can cause 'choke' disease which prevents the grass from flowering and fruiting. *Epichloë* produces toxic alkaloids similar to that produced by ergot which can have a serious effect on cattle and sheep. Usually both partners benefit from this symbiotic relationship. The plant provides a substrate for the fungi to develop and the toxicity of the fungi helps to protect the plant from herbivorous insects.

There is a fascinating relationship between this fungus and a fly species. Each *Epichloë* species has 2 mating types of which are self-incompatible and which must be cross fertilised to produce fruitbodies. One species of anthomyiid fly *Botanophila (Phorbia) phrenione* is involved to aid this process through the transfer of fungal spermatia (which pass intact through the gut) from one type to the other during oviposition. The fly may initially be attracted to the fungi by its smell to feed on the stromata before ovipositing. It then shows unusual behaviour by walking in a spiral path around the stroma whilst dragging its abdomen and depositing a trail of faecal material which contains viable conidia which spermatize the receptive hyphae. When the fly larvae hatch they feed on this tissue, but evidently this does not outweigh the benefits of cross fertilisation.

This is a great example of mutualistic relationships between fungus, plant and fly!

Thanks to Ted Blackwell for correspondence about these fungi.

REFERENCES

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