

HYPOXYLON

in Britain and Ireland

3. *Hypoxylon* other than the *H. rubiginosum* group

Roy Anderson*

Following on from the two previous issues of Field Mycology this third and final article on *Hypoxylon* in Britain and Ireland deals with species having rounded, hemispherical or pustulate stromata. These include many of the more familiar species which occur on birch, beech, oak and ash.

The taxonomy of these species has seen fewer changes in recent years than the *H. rubiginosum* group dealt with in Article 2. However, a major difference from earlier treatments is the current separation of *Hypoxylon* with papillate ostioles (so-called annulate species - *H. cohaerens*, *H. cohaerens* var. *microsporium* and *H. multiforme*) into a new genus *Annulohypoxylon*. This was mentioned briefly in Article 1 and the new names are listed at the end of that article. The only other change is to the name of the hemispherical species confined to ash. This is now *H. intermedium* but was formerly *H. fraxinophilum* in Dennis (1981) and Ellis & Ellis (1997).

The non-annulate species, i.e. those with umbilicate ostioles, form the larger group and comprise *H. fuscum*, *H. fragiforme*, *H. howeanum* and *H. intermedium*. All have small, characteristically rounded or hemispherical fruiting bodies.

Hypoxylon fuscum (Fig. 1) is ubiquitous in Britain and Ireland on hazel (*Corylus avellana*) but in some areas can be frequent also on common alder (*Alnus glutinosa*) and birch (*Betula* spp.), all trees belonging to the family Betulaceae. It is normally strongly rounded to hemispherical but individual stromata may coalesce occasionally and form a broader, more effused mass. Colour is variable, ranging from a dark purplish brown to bay-brown and does

not seem to be host-related. I have recorded a curious variety on planted grey alder (*Alnus incana*) in Ireland (Fig. 2). This has smaller spores (average length 11 µm) than the form on common alder and hazel (average length 12.5-13 µm) and has different KOH-extractable pigments. Pigment colours are greyish violet or deep purple rather than the orange-brown colour of the common form. A variety with purplish pigments has been recorded on *Alnus* and *Betula* in France and Germany and is under investigation but whether it should be regarded as a separate species is unclear (Fournier & Magni 2003). I would be interested to hear from anyone who has found *Hypoxylon fuscum* with atypical purplish pigment colours in Britain.

One of the commonest hemispherical *Hypoxylon* is *H. fragiforme* (Fig. 3) which is normally found on beech. This is nearly ubiquitous on its preferred host across the British Isles but falls away sharply towards the extreme west. As well as beech I have seen it (rarely) on oak, downy birch (*Betula pubescens*) and sycamore (*Acer pseudoplatanus*). The stromata are regularly hemispherical and a deep reddish-brown to orange-brown when fresh. The KOH-extractable pigments are clear orange. The superficially very similar *Hypoxylon howeanum* (Fig. 4) is common in Britain on hazel but can be pretty plurivorous and grows also on ash, alder, birch, horse chestnut, sweet chestnut, oak and hawthorn. This species is much rarer in Ireland and is recorded only from the east coast. I have seen it on hawthorn once or twice but not hazel. The KOH-extractable pigments are orange, like *H. fragiforme*. So, how can one tell them apart if the two, as sometimes happens in Europe,

*Belvoir View Park, Belfast BT8 7BL, N. Ireland roy.anderson@ntlworld.com

Vol 9 (3)

occur on the same host? This requires examination of the spores. In *H. howeanum* spores are 7-9 μm long whereas in *H. fragiforme* they range from 11-13.5 μm long. Host preference in Britain is reasonably distinct but should not be relied upon. *Hypoxylon fragiforme* appears not to have been recorded from hazel, for instance, and there appear to be no records of *H. howeanum* on beech.

Much less common than the previous two is *Hypoxylon intermedium* (Fig. 5) which grows exclusively on ash. The hemispherical stromata are a dull fawn colour with flesh-coloured to violet tints but with distinctive ostioles which are conspicuously ringed paler than the rest of the surface. The stromata usually grow on old fallen ash branches, often overgrown by grass, but in the west they may develop on dead standing timber. The KOH-extractable pigments are a distinct greenish yellow.

Finally we come to the genus *Annulohypoxylon* and its three species. These have more spreading, flattened and pustulate stromata sometimes covering moderate areas. The ostioles are much more noticeable than in *Hypoxylon* and raised well above the surrounding surface (papillate). *Annulohypoxylon cohaerens* (Fig. 6) is a fairly common saprotroph of beech. The flat-topped pulvinate stromata are noticeably constricted (under-cut) at the margins. Young stromata appear initially as yellowish fawn velvety pustules, which then change to a reddish brown colour, which fades with age to a brown-tinged dull black. An important character is that the KOH-extractable pigments change with age. Young stromata yield reddish violet (vinaceous) pigments whereas mature stromata produce a greenish brown (olivaceous) colour.

Annulohypoxylon minutellum (Fig. 7) was originally considered to be a variety of *A. cohaerens* (as *A. cohaerens* var. *microsporum*) but differs in preferred host which is oak. The KOH-extractable pigments are reddish violet or purplish in mature stromata i.e. similar to those of immature *cohaerens* though distinct from the greenish-brown of mature *H. cohaerens*. The ascospores are smaller, as the varietal epithet

microsporum suggests (7-9 μm long compared to 9-12 μm long in *H. cohaerens*). There are only 12 records on FRDBI suggesting that it is comparatively rare in Britain but I suspect it has been overlooked or confused with *A. cohaerens*. In Ireland it is widespread, if very local, in old oak woods. A further distinction between *H. cohaerens* and *H. minutellum* lies in the size of timber on which they develop. I have observed *H. cohaerens* mainly on fallen trunks or large branches of beech, but not on smaller branches. *A. minutellum*, on the other hand, seems to occur on small or medium-sized oak branches (7-20 cm in circumference) but not on main trunks.

The last species to be dealt with is *Annulohypoxylon multifforme* (Fig. 8). This vies with *Hypoxylon fuscum* and *H. fragiforme* in having the greatest number of records on FRDBI (>2000). The usual host is birch but it has been recorded frequently on alder and much more rarely on beech, hazel, oak, or even exotic timber such as *Nothofagus obliqua* (Drum Manor, Co. Tyrone). The stromata again change colour during development, being initially a yellow-fawn colour when at first erumpent through bark. They may then either go through a greyish phase as the perithecia develop, or else turn chestnut to brownish before reaching the dull black of maturity. Stromata are fairly large with distinct to very distinct perithecial mounds, and lack a constriction around the base (in material I have seen at any rate). Pigments are a dull brown, though sometimes with an orange tint.

To draw all this together I conclude with a key to *Hypoxylon/Annulohypoxylon* in Britain and Ireland. This works only for the known British species but should help beginners get acquainted with the group. Please remember that it assumes the presence of mature fruiting bodies. Check maturity by slicing diagonally with a sharp blade. Blackish liquid will well up from the perithecia in living material but dead or very young material will lack free liquid. All of the species in this account mature in early spring though fresh stromata may occur more widely, from autumn to late spring.



Fig. 1. Brownish stromata of *Hypoxylon fuscum* on hazel bark at Murlough Bay, Down. Photo © Roy Anderson.



Fig. 2. A form of *Hypoxylon fuscum* with purple KOH-pigments growing on grey alder (*Alnus incana*) bark at Oxford Island, Co. Armagh. Photo © Roy Anderson.

Vol 9 (3)



Fig. 3. Mature stromata of *Hypoxylon fragiforme* growing on beech bark, Barnett's Park, Belfast. Photo © Roy Anderson.



Fig. 4. Stromata of *Hypoxylon howeanum* on bark of hawthorn at Slieve Patrick, Down. Photo © Roy Anderson.



Fig. 5. *Hypoxylon intermedium* on bark and heartwood of an ash branch at Glensheskin Forest, east Cork. Photo © Roy Anderson.



Fig. 6. Mature stromata of *Annulohypoxylon cohaerens* on beech bark at Larchfield House, Down. Photo © Roy Anderson.



Fig. 7. *Annulohypoxylon minutellum* on bark of an oak branch at Blarney Castle, mid Cork. Photo © Roy Anderson.

Vol 9 (3)



Fig. 8. Developing stromata of *Annulohypoxylon multiforme* on bark of birch at Brantry Lough, Armagh. Photo © Roy Anderson.

Key to the British and Irish species of *Hypoxylon* and *Annulohypoxylon*

- 1 Stromata small, to 1 cm, rounded to hemispherical2
- Stromata much larger, either pulvinate and flat-topped or more broadly effused and flattened.....6

- 2 Bright red-brown to orange-brown when fresh, brown to black when old3
- Not bright red- or orange-brown when fresh5

- 3 Spores long (11-13.5 µm); pigments orange; mainly on beech;*Hypoxylon fragiforme*
- Spores shorter (< 10 µm)4

- 4 Stromata regular, hemispherical; ostioles inconspicuous, umbilicate; spores averaging 7.5 µm long; pigments **orange**; plurivorous but rare on beech;*Hypoxylon howeanum*
- Stromata more flattened, pulvinate to effused; ostioles minutely papillate; spores averaging 9 µm long; pigments **orange to red**; confined to beech?, seemingly very rare*Hypoxylon rutilum*

- 5 Fawn-coloured with hints of reddish or purplish; ostioles conspicuous, area around them paler than the context; pigments **greenish yellow**; exclusively on ash*Hypoxylon intermedium*
- Colour darker, purplish-brown or bay-brown; ostioles inconspicuous; pigments **orange-brown**; on hazel, birch and alder*Hypoxylon fuscum*

- 6 Ostioles inconspicuous, level with surface of stromata or slightly depressed (umbilicate), sometimes surrounded by a greyish ring7
 - Ostioles conspicuous and raised above surface of stromata (papillate).....11
- 7 Stromata very large, effused, up to 70cm long; in long narrow plates on the underside of logs; colour bright pink-purple to purplish-brown when fresh; perithecial mounds usually conspicuous; pigments **greenish brown***Hypoxylon macrocarpum*
 - Stromata less than 10cm long; colour if with purple tones, darker, less conspicuous and perithecial mounds flattened, inconspicuous8
- 8 Colour dark purplish-brown; flat, irregular in shape; perithecial mounds inconspicuous; mainly on ash; stromata annual; pigments **orange***Hypoxylon petriniae*
 - Colour orange-brown to rust-coloured; stromata often perennial, new growth on top of last year's growth; pigments orange or rarely red.....9
- 9 Perithecial mounds inconspicuous; ostioles ringed with black giving spotted appearance (hand lens!); stromatal margins black; pigments **orange***Hypoxylon subticinense*
 - Perithecial mounds conspicuous; ostioles and stromatal margins orange-brown to rust.....10
- 10 Stromata medium-sized, to 8cm; perithecial mounds conspicuous to very conspicuous; plurivorous; spores averaging 10µ m long; pigments **orange***Hypoxylon rubiginosum*
 - Stromata very small, to 1.2 cm; perithecial mounds conspicuous to inconspicuous; ostioles minutely papillate(!); very rare, confined to beech?; spores averaging 9 µm long; pigments **orange to red**
*Hypoxylon rutilum*
- 11 Stromata not or only slightly constricted at margins; on birch or alder; dull black when mature; perithecial mounds very conspicuous; pigments **dull brown**.....*Annulohypoxylon multiforme*
 - Stromata constricted (under-cut) at margins; on beech or oak; brownish to red-brownish when mature; perithecial mounds inconspicuous to conspicuous; pigments different12
- 12 On beech; spores averaging 10 µm long; pigments **greenish brown**
*Annulohypoxylon cohaerens*
 - On oak; spores averaging 7.5 µm long; pigments **purplish to red-violet**
*Annulohypoxylon minutellum*

References

- Dennis, R. W. G. (1981) *British Ascomycetes*. J. Cramer. Vaduz.
 Ellis, M. B. & Ellis, J. P. (1997). *Microfungi on land plants. An identification handbook*. 2nd Edn. Richmond Publishing Ltd., Slough.
 Fournier, J. & Magni, J.-F. (2003). *Pyrenomycetes from south-western France*.
<http://www.pyrenomycetes.free.fr>.

Competition winner

In issue 9(2) page 64 Jonathan Revett challenged readers to correctly identify ten species of *Geastrum*. The first correct entry received was from Carol Hobart. Our congratulations to Carol on her skill in puzzling out this difficult group. Her prize of a pack of mushroom playing cards is on its way!