

L F S G

Newsletter No. 28 Spring 2013

LEICESTERSHIRE FUNGI STUDY GROUP



Chairman's Notes

By Richard Iliffe

Welcome to this issue of our Newsletter which is designed by Robert Joyce. Many thanks to all who have contributed articles or photographs, and particular thanks to Rob for his skills and many hours of hard work as Editor.

The Group enjoyed another successful year in 2012. We arranged an entertaining series of indoor meetings, all held at the Unitarian Chapel in Leicester, which provided us with excellent facilities. Special thanks go to Tony Fletcher for opening and setting up the meeting rooms, providing tea and coffee, and for help with our projection equipment – tasks which it is easy to take for granted but which make a big contribution to the enjoyment and smooth running of our meetings.

The weather in the summer and autumn seasons was exceptionally wet which, contrary to expectations, was thought to inhibit many of the common species of fungi from fruiting. Maybe they were too busy growing and feeding. Later in the year there was a good flush of ground fungi and our well attended foray programme produced an exceptional number of rare species and new county records.

The year was otherwise relatively uneventful. Our membership increased slightly and we extend a warm welcome to those who joined during the year. We look forward to seeing you all during the 2013 foray season.

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PICTURE ABOVE:
"Plums and Custard"
By Rob Joyce



LEICESTERSHIRE FUNGI STUDY GROUP COMMITTEE 2012

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Roger Rixon	Dr Richard Rogers	Dr Peter Long	Michael Dobson	Rod Freer

Foray Records in 2012

By Tom Hering

This year did not yield quite such long lists of finds as did some recent years. Although 2012 was, on the whole, an unusually rainy year for England, the early autumn was actually rather dry, and our lists in September were generally short ones. Later on, things improved; our longest list was 64 species at Coleorton Wood on 14th Oct. But it was a rich season in terms of unusual finds. I can report 21 species new to Vice-county 55, and will not have room to comment on all of them. There were also quite a few finds of 'rarely-recorded' species.

First, some toadstools. *Russula cessans* was new; it occurred under pine at Cropston Waterworks. It has a purplish cap and a deep ochre spore-print. It is nationally uncommon and once figured on a provisional Red Data list. At Cropston we also had another pine *Russula*, *R. caerulea*, in the same place as in 2011. *Lactarius pallidus* (Pale Milkcap) under beech at Cropston was new; it has sticky, pale buff cap. Nationally, this fungus is not uncommon, and it is surprising we have never found it before. Blacksmith's Field on 28th Oct. yielded *Lepista ovispora* and *Tephrocybe inolens*, both new. They are dull-coloured fungi, and *L. ovispora* differs from other *Lepistas* in having a long thin stem and a thin-fleshed cap. A *Melanoleuca* found at Gilroes Cemetery (Oct.) agreed with *M. polioleuca* var. *langei*. The Basidiomycete Checklist treats this just as a variant of *M. polioleuca*, but the BMS list recognises it as a separate species, *Melanoleuca langei*, so I am calling it a new county record. On a visit to Burbage Wood in Aug., Richard recorded *Hypholoma fasciculare* var. *pusillum*; a first record that has been confirmed at Kew. In January Richard found *Crepidotus applanatus* (Flat Oysterling) at Grace Dieu. This record is a first for Leicestershire, though the fungus has appeared several times in Rutland.

Other Basidiomycetes: two new corticioid fungi were *Tubulicrinis subulatus* at Martinshaw Wood in April, and *Ceraceomyces sublaevis* at Grace Dieu on New Year's Eve. Our find of *Ischnoderma benzoinum* (Benzoin Bracket) at Coleorton was only our third; it occurs on conifer wood, and has a rubbery feel. The following are second records: *Hypochnicium bombycinum* at Grace Dieu (Dec.); *Mycoacia fuscoatra* and *Subulicystidium longisporum* (these three all corticioids) in Cloud Wood in April; and *Auriscalpium vulgare* (Earpick Fungus) at Fosse Meadows. This last is a very familiar fungus in many parts of the country, regularly found on forays, but obviously not common in Leicestershire.

There were also new records of Ascomycetes: - *Otidea cochleata* at Gilroes, and *Dermea cerasi* at Coleorton Wood. At Grace Dieu in May we recorded two more possible new species. Both were on damp dead wood; we tentatively called them *Hyphodiscus viridipilosus* and *Scutellinia kerguelensis*, and they been sent to Kew for confirmation. I should mention *Cristulariella depraehens*, a fungus that attacks sycamore, and causes the leaves to be covered with pale spots. Our find at Holly Hayes Wood in Sept. was only the second in the county.

"There were also new records of Ascomycetes"

Now to even smaller fungi, *Drechslera dematioidea* is a hyphomycete found on gorse at Blacksmith's Field, and *Periconia typhicola* was found on Reed-Mace at Gracedieu. In December Richard Rogers sent in a report of *Xanthoriicola physciae* growing on the lichen *Xanthoria* in Leicester University Botanic Garden and there were two new records of Myxomycetes – *Trichia decipiens* at Burbage Wood in March, and *Arcyria affinis* at Outwoods in Aug. Up to this year all our records of water moulds in stream water have been made by Roy Lemmon in Rutland. However this year Richard has been collecting them at Grace Dieu. He has produced three new county records - *Clavariopsis aquatica*, *Dendrospora erecta* and *Varicosporium elodeae*, as well as nine other species already known from Rutland. All in all, a productive year for new and interesting fungi.



Little Brown- Spored Toadstools

Conocybe

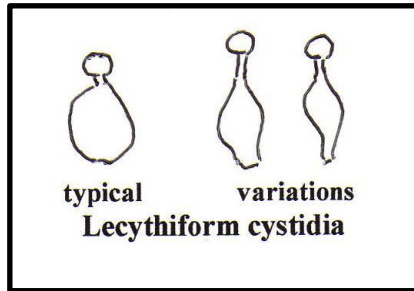
By Richard Iliffe

In the 2012 Newsletter I wrote about small white species, with the promise of a further article on 'little brown jobs'. I gave a talk to the Group in January this year covering many of these, but if printed out here it would take up far too much space. I will restrict this article to just one genus that gives me lots of trouble - *Conocybe*. This leaves lots of other small brown species to be covered in future Newsletters!

Most *Conocybe* have rounded-conical caps on a long slender stem, making them look a little 'top-heavy'. The spore print colour is yellowish brown to rusty-brown. There are a lot of them, none of them really common. Most of them grow on soil among grasses, though they can appear in leaf litter.

The cap cuticle (skin) of *Conocybe* is cellular, meaning the cells are round, oval or pear-shaped, not filamentous. If in doubt examine a thin scalp of the cap cuticle under a microscope and this will indicate whether or not you have a *Conocybe*. A few species have a distinct ring on the stem and some European authorities have included these in a genus called *Pholiotina*, but more about those later.

If confident that the species to be examined is a *Conocybe* the next step is to look at the stem. Under a hand lens it may appear hairy or velvety, particularly towards the top. Lay it dry on a glass slide and examine under a stereomicroscope at x20 or above, or use the lowest power of a compound microscope, usually x40. The apparent 'hairs' will be revealed as surface cells (stem cystidia). The more usual ones are of a shape described as lecythiform, or 'skittle-shaped', that is having a round base topped with a small spherical head, with a short neck separating them – see opposite.



Other types of stem cystidia can be clavate, flask-shaped or finger-like, possibly looking like hairs at low magnification. The identification keys usually ask if the stem cystidia are wholly lecythiform, or if they are a mix of lecythiform and others.

The next stage is to make a slide preparation and examine a squash of the gill margin under the compound microscope. It is recommended that preparations for all dark-spored species are mounted in a solution of ammonia (white spored species are best examined with a stain, such as congo red or cotton blue). The gill margin cystidia (cheilocystidia) of *Conocybe* are lecythiform (but not those included in *Pholiotina*). The diameter of the spherical head varies and the question usually asked in keys is whether these measure less or more than 5 microns in diameter (the minimum can be as low as 3 and the maximum is around 8).

Other features to check include the spore size, and whether spores are thin-walled or thick-walled.

To return to the *Pholiotina* group, the UK checklist still regards them all as *Conocybe* so our own list follows suit. Their cheilocystidia differ in that they are generally digitate (finger-like) to slender-clavate, and this may be the main reason for putting them into the different genus. The European authorities list a total of twenty-three *Pholiotina*, six of them having a ring on the stem, but only two of these are common locally. *Conocybe aporos* is usually recorded in the spring; *Conocybe arrhenii* is an autumn species and not found in spring.

Our Leicestershire and Rutland 2010 check-list includes twenty-seven different species of *Conocybe* (out of a UK list of sixty-seven, with even more recorded in Europe so still likely to be found here). Most of our local finds have only been recorded once or twice over a thirty year period, suggesting that they are either rare or difficult to identify. Only one species is regarded as locally common and this is *Conocybe tenera*, but even these records may be a little suspect as, until recently, the keys linked together four closely related species where the only way to separate them was by spore size. My own inclination with this group has usually been to take the obvious option and to record *Conocybe tenera*, rather than to list something that is very rare but difficult to prove!

Paul Cannon (CABI) has recently described a new genus of fungi for a pathogen of alfalfa and other forage legumes, which was also found in tests to be pathogenic to several crop plants, such as chickpea, broad bean, pea, cow pea and fava bean. The fungus was first described in 1955 as Volutella colletotrichoides, but was shown to have morphological and genetic characteristics that differed from other species of Volutella, so Paul called it Lectera, "...named after Dr Hannibal Lecter,...another aggressive organism with a liking for fava beans." Who says mycologists don't have a sense of humour?!

Geoffrey Hall

Fungi At Willesley

By Richard Iliffe

This was a joint foray with the Natural History Section of Leicester Literary & Philosophical Society. The day started with quite dense early morning fog which discouraged some from making the journey to this National Forest site near Donisthorpe. We had nevertheless a good attendance, and by starting time the sun had appeared and we all enjoyed a very productive morning. It was truly the season of 'mists and mellow fruitfulness'. Willesley was one of the very first planted sites in the National Forest and it is now over twenty years old. This is a sufficient period for the trees to have developed relationships with fungi; a process that can be surprisingly rapid - we noticed the first mycorrhizal fungi at Willesley within ten years of planting. Whether they come in on the roots of the planted trees or whether they arrive later as air-borne spores is open to debate.

There were some interesting species around the car park, including a little white one that I failed to identify so will quickly gloss over! As we moved along the path, under self-seeded scrubby birch and willow, specimens started to reach me in great numbers and the ageing memory had to work over-time. Two *Hebeloma* species were found close together; one group smelling of radish, which is usual with this genus, but the other group, which looked very similar, had a smell of rather pungent toilet soap. We had found the Veiled Poisonpie, *Hebeloma mesophaeum* and the less common Sweet Poisonpie, *Hebeloma sacchariolens*. This latter is said to smell of burnt sugar, though few of us had any idea what burnt sugar should smell like!

We found groups of the small white *Inocybe geophylla*, the White Fibrecap and, growing with it, the closely related form called the Lilac Fibrecap. Recently the 'authorities' have decided that this lilac variety is a true and separate species, but they have not explained why it almost always grows with groups of the white form so I have my personal reservations. Several little whitish *Mycena* species were recorded, often hard to tell apart to the naked eye. One of these was *Mycena vitilis*, known as the Snapping Bonnet because when the stem is pulled it is said to break with an audible crack. Experiments were successfully carried out! We also found one specimen of the Rosy Bonnet, *Mycena rosea*, which is quite large with a beautiful glossy pink cap and a thick white stem. A lovely cluster of the Girdled Knight, *Tricholoma cingulatum*, was found, growing under scrubby willow trees. The 'girdle' name is because it is the only species in this genus to have a ring structure on the stem. Rings are the remains of the skin or veil that protects the immature gills from slugs and insects. It can't be explained why some species have evolved this veil whereas so many others manage to survive without it. I have been told that *Tricholoma* are called Knights from some link with a German word for knights on horseback.

A small brown cup fungus, about half a centimeter diameter, was found in clusters on fallen oak twigs. It is known as the Brown Cup, *Rutstroemia firma*. We don't see it very often but here we found several collections within a short period. It had obviously found a niche among the oak litter, and conditions on the day must have been just right for it to fruit.

Before we moved away from the wide grassy rides within the planted area we came across two specimens of *Stropharia caerulea*, the Blue Roundhead. These were in prime condition for the keen photographers among the group. They have very slimy caps, which is a form of protection against slugs and insects, and they start a lovely turquoise blue then fade to deep cream as they mature. They are not good to eat, which is often the case with some of our most beautiful toadstools.

We moved into the old woodland; old being a relative term compared with the new planting. The site is believed to be ancient but as with many local woods it was clear-felled during the Second World War and has no trees more than 60 years old. This is ample time for trees to mature, die and fall, so we immediately started finding good wood inhabiting fungi, including small examples of *Flammulina velutipes*, the Velvet Shank. The beautiful shiny orange caps are another favourite of photographers. Several obscure species of *Cortinarius* were found in the wood, some of the young ones showing the protective cobwebby veil under the cap which gives them the name Webcaps. The scientific name for this veil is cortina, hence the generic name. Overall, however, the wood was a bit disappointing. It was so overgrown with bramble and other herbaceous undergrowth that access was difficult and we stayed on the rather unproductive main path. On emerging we instantly started finding good specimens along the woodland fringe, several of them on fallen wood. They included the attractive velvety brown *Pluteus umbrosus*, one of the so-called Shield fungi because of the raised central boss on the cap. Soon afterwards we found another large grey-brown Shield called *Puteus pouzarianus*. This was a new record for Leicestershire, too uncommon to have an English name. It is the only species of this genus to grow on conifer wood.

Although we spend most of our foray time searching for the typical mushrooms or toadstools it is an inescapable fact that the great majority of recorded fungi are the very small cup fungi. These are known as ascomycetes because they produce their spores in cigar-shaped tubes called asci. To appreciate many of them it is necessary to use a hand lens when their great beauty is revealed. We were very fortunate to find two species within the same genus, one relatively common and the other much less so. The first was the Yellow Disco, *Bisporella citrina*, which appears in groups of bright yellow discs about 2mm in diameter. Singly they would be overlooked but in groups of fifty or more, usually on old deciduous wood that has lost its bark, they are very striking. The second species was *Bisporella sulfurina*. It also appears as yellow discs, but in this case they are in small tight groups so that the individual cups are squashed together and distorted. It is also unusual in growing on dead blackened growths of another ascomycete fungus, so we had a fungus growing on a fungus. That in itself is worthy of note, but Ivan Pedley, with the sharp eyes of a lichenologist, spotted some tiny red spots on the same black fungus and these turned out to be the ascomycete *Nectria episphaeria*. The individual spots are spheres that measure only a fifth of a millimeter in diameter! This gives an indication of the careful observation required to see them - it is only the grouping of a hundred or more in a few square centimetres that attracts the eye.



Fungi At Willesley....continued.

By Richard Iliffe

It was in this same area that I picked up a small reddish conical species from the grass beside the path. After a lot of hard work at home it was determined as a new record for Leicestershire called *Conocybe mesospora*. Very satisfying for me, but not one of the most spectacular finds, and I did not comment on it at the time as I doubted my ability to name it. I had similar fears when I noticed several very small white *Coprinus* species growing on a mossy log. I thought they would turn out to be something quite rare but when I examined them under the microscope they were the common *Coprinellus disseminatus*, the Fairy Inkcap, which is another species beloved by photographers as it can grow in attractive dense clusters.

We were now approaching the end of the walk but we diverted slightly to inspect a small area of meadow grass where we were pleased to find groups of Clustered Brittlestem, *Psathyrella multipedata*. This is one of those fungi that appear occasionally in grassland when the conditions suit them, as they obviously did this year as we recorded it elsewhere at two other county locations.

With some relief my navigation skills got us back to the car park exactly on the predicted time. It had been several years since my last visit and the memory can play tricks! As we made our farewells it was evident that all had enjoyed the morning in this very attractive new county woodland.

Ash Dieback Disease and Hidden Species

By Geoffrey Hall

Ash dieback disease causes leaf loss and crown dieback in affected trees, and it may lead to death, especially of young trees which are highly susceptible. It has seriously affected a high percentage of ash trees in continental Europe, especially in Poland (where about 80% of trees are infected), and in Scandinavia (including Denmark, where about 90% of trees are infected) and the Baltic States. It was first recorded in Britain in February 2012, in a consignment of infected trees sent from a nursery in the Netherlands to a nursery in Buckinghamshire. Early reports in Britain were all from nurseries or recent plantings, and in June it was found in ash trees planted at a car park in Leicestershire that had been supplied by a nursery in Lincolnshire. The first report from established woods was in October 2012 from woods in East Anglia belonging to the Woodland Trust. Its extent in the wider environment was unknown at that time, so extensive surveys were undertaken, which show that it is present throughout Britain at 323 sites (at 19 December 2012), and that most infections in established woods are in the East and South of England.

The causative agent was isolated from infected ash trees in Poland and was described as a new species, *Chalara fraxinea*, an imperfect conidial fungus¹. Pure cultures of *C. fraxinea* produced the teleomorph, *Hymenoscyphus albidus* (Ascomycetes; Helotiaceae)², which has been known in Europe since 1851. It is a harmless saprotrophic species that grows on ash leaf litter, fruiting on the leaf rachis (the central part that bears the leaflets). It is widespread throughout Europe and is also present in Britain. There have been two records in Leicestershire between 1950 and 2011: one from a fallen ash leaf at Buddon Wood in 1977 (specimen in Herb. LSR), and another from an ash petiole in Burbage Wood in 1991.

Further studies of *H. albidus* using molecular biological techniques showed the existence of 2 subgroups; one contained harmless saprotrophs, and the other aggressive pathogens³. The two subgroups could not be distinguished morphologically by colour, size or texture. Although the ascospores of subgroup 2 were significantly longer than those of subgroup 1, spore measurements from both subgroups overlapped considerably making it difficult or impossible to assign a given specimen to one of the subgroups based on ascospore measurements alone. The subgroups were clearly distinguished by DNA sequence analysis, which also showed that there was no evidence for hybridization among the two species.

Because of these differences, a new species was created for the ash dieback pathogen, *Hymenoscyphus pseudalbidus*. It was also found by DNA analysis in 30-year old herbarium specimens in Switzerland that had been originally determined as *H. albidus*. The asexual stage of *H. albidus* is so far unknown, but is likely to be very similar to *C. fraxinea*. So far, neither *C. fraxinea* nor *H. pseudoalbidus* have been reported in Britain, and the disease is only known from symptoms on affected ash trees.



Ash Dieback Disease and Hidden Species...continued.

By Geoffrey Hall

This new species is an example of a "cryptic species", a phenomenon which has been found in other fungal genera and also in protozoa, insects, fish, amphibians and even mammals. A cryptic species is one that is reproductively isolated from another species with which it is morphology identical. In evolutionary terms, a speciation event has occurred, and genes no longer flow between populations of the two species, but the evolution of the new one has not progressed to a point where easily recognizable morphological changes have taken place in it, so that the two species can be distinguished from each other visually. Together they form a "cryptic species complex". In some fungi, several cryptic species have been found among morphologically very similar isolates⁴. This is an important development in fungal taxonomy, since, before the advent of molecular methods, a variant based on pathogenicity was more likely to have been called a *forma specialis*, rather than a new species.

However intriguing this development is for the taxonomist, it had a big effect. Trade bodies had been asking for a ban on imported ash trees since 2009, but the Government was reluctant to act because *H. albidus* had been reported in 45 vice-counties and was considered to be established in Britain. The Government only acted when the new species, *H. pseudoalbidus*, was identified as the source of the disease. On 29 October 2012, emergency legislation was passed to restrict (i) the import of ash plants, seeds and trees into Great Britain to prevent any more accidental introductions, and (ii) their movement within the country to prevent their spread within Britain. *C. fraxinea* is now a quarantine pest under national emergency measures.

But how will we in the LFSG detect either fungus if we find it in the field, as we don't have access to a pocket DNA sequencing kit, and it is impractical to infect ash seedlings to establish pathogenicity? Should we record finds as 'the *Hymenoscyphus albidus* – *H. pseudoalbidus* species complex'? I think that, practically, until *P. pseudalbidus* is reported in Britain, we have to assume that the specimens we find are *P. albidus* and record them as such, and ensure that we keep voucher specimens.

Some useful website links for further information and to some videos that show how to recognise the disease in the field are as follows.

Forestry Commission Chalara Page: <http://www.forestry.gov.uk/chalara>

The Woodland Trust Ash Dieback Page: <http://treedisease.co.uk/threats-to-our-trees/ash-dieback/>

Chalara fraxinea (Chalara Ash die-back) - A brief history: http://www.youtube.com/watch?v=Xf8fil_DWOM

Life cycle and symptoms: <http://www.youtube.com/watch?v=y1GpuflkBto&feature=plcp>

How to identify Chalara ash dieback in the field: <http://www.youtube.com/watch?v=8sl7hgFZ-4g&feature=youtu.be>

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3. Queloz V, Grünig C, Berndt R, Kowalski T, Sieber TN, Holdenrieder O (2011). Cryptic speciation in *Hymenoscyphus albidus*. For. Pathol. 41: 133-142.
4. Grünig, C. R.; Duo, A.; Sieber, T. N.; Holdenrieder, O., 2008: Assignment of species rank to six reproductively isolated cryptic species of the *Phialocephala fortinii* s.l. *Acephala applanata* species complex. Mycologia 100, 47–67.



Ash Dieback Disease and Hidden Species...continued.

By Geoffrey Hall



Orange circles= Recently planted site
Red circles= Wider environment

Distribution Map of Confirmed Infections,
courtesy of the Forestry Commission



Fruiting bodies of *Hymenoscyphus albidus* from an
article by the Cotswold Fungus Group



Chalara fraxinea in laboratory culture. ©O.
Holdenrieder, ETH, Zürich.

Report on foray to Burbage Wood September 2012

By Richard Iliffe

This location is close to my home, so I made a couple of scouting trips during the week prior to the visit. I found very little, so it was with very low optimism that I welcomed a dozen members of the Group in the car park and led them into the wood.

My concerns were unfounded - sharper eyes than mine were soon finding a good mix of fungi, some of them so tiny that I would never have found them myself. After two hours foraging, followed by several hours work at home, I was able to prepare a very interesting list of species for what was a relatively early-season foray. Many of the finds were on fallen mossy logs, some of them too rotten to be identified but, from the history of the wood, they would have been a mix of oak, elm, birch and ash. The wood also has a dense hazel understorey in parts, with just the occasional rowan tree.

One of our first finds was a small *Crepidotus mollis*, which is not common locally. It is known as the Peeling Oysterling because the cap skin peels off as one complete film. Shortly afterwards we found an old oak stump with masses of the tiny white Oak Pin, *Cudoniella acicularis*. We then started ticking off some common woodland species, such as the Blusher, *Amanita rubescens*, the two Deceivers, *Laccaria amethystina* and *L. laccata*, and a couple of Boletes, *Boletus cisalpinus*, which is the new scientific name for the familiar Red-cracking Bolete, and *Boletus porosporus*, the Sepia Bolete, which is less common.

“We recorded 44 species of which 12 were either uncommon or of special interest”

We found three *Russula* species; *R. atropurpurea* and *R. ochroleuca*, and an unfamiliar brown one which was collected and taken home. Surprisingly it lost the brown colours and became olive-green overnight, when it was identified as *Russula heterophylla*, the Greasy Green Brittlelegill, which is reported to be common though we don't see it very often. Another gilled toadstool that always causes head-scratching was *Megacollybia platyphylla*, the Whitelaced Shank, which can be mistaken for *Pluteus cervinus*, the Deer Shield. We did indeed find this latter species shortly afterwards, but not looking at all typical and we thought it might be a *Melanoleuca*. It was not resolved until checked at home with a microscope. We found two other *Pluteus* species close by, both growing on the same moss covered fallen trunk. One was small and brown and it was identified as *P. podospileus*; untypical as it should have had a stem with blackish spots near the base but on this collection the stems were pure white. It was only after microscope checks of the cap cuticle and the skin of the stem base that the species was confidently identified. The second one was larger and had an attractive cinnamon brown colour. It proved to be *P. phlebophorus*. Both of the latter were good finds as we have few records of them locally.

Among the bracket fungi we found a couple of *Polyporus* species; *P. leptcephalus*, which used to be called *P. varius*. Among the identification features are the chestnut colour, the size of the pores on the underside, which are only just visible to the naked eye, and the black base to the stipe, which gives it the name of Blackfoot Polypore. The second species was the uncommon *Polyporus tuberaster*, the Tuberous Polypore, so-called because it is said to grow from a tuber-like sclerotium in the substrate. This one measured some 12cm across the cap, which is quite large for the species. It has an attractive radial pattern of flaky scales on the upper surface.

Another Polypore that always attracts interest is the Beefsteak Fungus, *Fistulina hepatica*. This was noticed about fifteen feet up an oak trunk but it was only a reddish bud, less than the size of a walnut. There was some debate about whether it could have been some other growth form, such as one of the slime moulds. Fortunately somebody found a long stick and prodded it off, and there was no longer any doubt. The last find of the morning was also a Polypore, this time the Shaggy Bracket, *Inonotus hispidus*, spotted growing as a cluster of three high up on an ash trunk. We also recorded *Laetiporus sulphureus*, Chicken of the Woods, but the specimen was old and falling apart. Of more interest was a cluster of tiny scarlet ascomycetes growing on the surface of the decaying bracket. These were thought to be some kind of *Nectria* species, possibly *Nectria peziza*. They looked sufficiently interesting to send to Kew, where the identification was confirmed and the material added to the herbarium collection. This was not only a new county record but the first national record of this species growing on Chicken of the Woods.

This last may have been the most interesting find of the morning, but it was run a close second by a cluster of tiny yellowish caps, only about 12mm across, most of them having a central pimple, or papilla. The spores turned out to be purple-black which suggested either *Hypholoma*, *Stropharia* or *Psilocybe*, and it took much puzzling to eventually decide that they were some form of *Hypholoma*. No species described in the literature fitted these little caps, but they had yellow-greenish closely spaced gills, not unlike those of Sulphur Tuft, and after some thought this prompted me to taste them. They were very bitter, which is one of the characters of *Hypholoma fasciculare*. This led to a search on the internet for some variant of that species, and they were tentatively identified as *Hypholoma fasciculare* var. *pusillum*. The find was discussed with specialist mycologist Alick Henrici and he confirmed the identification and passed the dried specimens to the fungal herbarium at Kew. The defining characters were the clustered growth form, the very small size, and the papillate caps. Unfortunately it did not occur to me to take a photograph before the material was dried for a permanent specimen.

To summarise, we recorded 44 species of which 12 were either uncommon or of special interest, including two species where the records were nationally important. Not a bad morning's work. Many thanks to the enthusiastic Group members who found them all.



New Lount Foray Report

By Richard Iliffe

This site is one of our favourites and usually attracts our highest attendance. This morning, however, the weather was cool with quite dense fog and only a few keen members braved the conditions.

Rob Joyce had volunteered to lead the foray and he chose to take us up to the higher ground on this former colliery site. This proved to be a good decision as we soon emerged above the fog and spent the rest of the morning in bright sunny conditions. The rising path took us through some scrubby birch trees and we found a number of *Lactarius torminosus*, the Woolly Milkcap. Some were well past their best but others were in good condition. When fresh they are a pale pink colour with concentric ring markings, and they are densely woolly around the margin. The next species we recorded was *Lactarius glycosmus*, the Coconut Milkcap. These were found among mosses just as we emerged from under the birches. The attractive smell of dessicated coconut confirmed the identification.

Rob now led us onto an area of open grassland that we have seldom visited in the past. To call it grassland is something of a misnomer as much of the site is covered with dense mosses and we were soon rewarded with some unusual and uncommon species. One that I collected and identified at home was *Parasola miser*. Formerly a *Coprinus* these small species with whitish grooved caps have been separated into the new genus *Parasola*. The reference books told me that this was a species that grows on dung and I recalled that the area where it was found was scattered with rabbit pellets. I felt confident that some of these were buried and were supporting these little toadstools. Another species new to me was an attractive trumpet-shaped grey species. This was *Arrhenia rickenii* and it was only the second county record, the first also found at New Lount in 2011 by Peter Smith.

There was a small copse of alder trees in the centre of the grassy area and here we found *Naucoria eschariodes*, a small and slender cream coloured species that is commonly found with alder trees. Under these same trees was a scattered group of a medium sized pale coloured *Entoloma*. They had a pronounced boss, or umbo, in the centre of the cap but they defied all attempts to identify them to species, not an uncommon experience when working on *Entoloma*!

A little farther down the slope a group of small conical dark brown species was found under some mixed trees. These turned out to be *Naucoria salicis* but as the scientific name suggests this one associates with willow trees, and not with alder like most others in that genus. Nearby was a loose group of *Inocybe*, recognized by their fibrous conical caps. These were *Inocybe curvipes*, a species that sometimes has curved bent stems but this may not be a very reliable identification feature and most of these had straight stems. The rather unusual fat cystidia on the gills led to the identification. Another *Inocybe* was collected from under birch scrub. Painstaking work with the latest keys led to the name *I. fuscidula*. This species can be rather variable and it is now thought to be a complex of several species.

The photographers among the group were anxious to re-find one of the specialities of the site *Macrotypophula fistula*, the Pipe Club. We eventually found a few good specimens and we also came across its smaller relative *M. juncea*, the Slender Club. Both of these tend to appear quite late in the autumn season. Another target species for this site is the Dark Cub, *Clavaria greletti*, and Rob was delighted to find just one good specimen after some patient searching. New Lount is one of the few known locations in the UK for this very rare species. This was almost the final find of the foray but on the way back to the car park I spotted a group of unknown white species and collected them. They had a pungent smell and it was with some surprise that I discovered at home that they were a white form of the Chicken Run Funnel, *Clitocybe phaeophthalma*.

Our final species count for the morning exceeded sixty, many of them uncommon and requiring confirmation with a microscope so a number could not be named on site. After an unpromising foggy start New Lount once again proved to be one of our most exciting foray venues.



Arrhenia rickenii



C.greletii at New Lount

Why are Fungi Important?

By Richard Iliffe

Prepared from a note issued by the British Mycological Society to publicise fungi and to mark UK Fungus Day which is to be held this year on Sunday 13th October:

Without fungi there would be no fertile soil, no plant life, no herbivores, no carnivores and no humans. Every plant in our gardens, every crop plant in our fields and every tree in our woodlands and forests has a fungus associated with it. Fungi began their partnership with plants over 600 million years ago, with interactions between early land plants and fungi enabling plant colonization of the earth. Nowadays, over 90% of terrestrial plants obtain their nutrients and water from soil through symbiotic fungi associated with their roots. These same fungi offer protection from pathogens and allow plants to colonize polluted sites. Furthermore, fungi are the main garbage disposal agents of the natural world, breaking down dead plants and animals and releasing accessible nutrients which are utilized by other organisms for growth.

There is a tremendous variety of fungi in nature, many of them microscopic, but some produce the well known macro fruit bodies termed mushrooms and toadstools. Certain fungi are highly nutritious and are a major food for many soil animals and small mammals in nature. Cultivated mushrooms are the most valuable horticultural crop sold in the UK. Fungi are also hugely important in human food production, including yeast (yes, it's a fungus) in bread, beer, wine and Marmite. They are used in the fermentation process that produces soy sauce, and compressed fungal material is used in some meat substitutes, such as Quorn.

It is fungi that develop the fragrance and flavour of 'blue cheese', as well as the texture of Camembert; and most cheese production these days uses a fungal enzyme, instead of rennet, to coagulate the curds. Less obvious is that chocolate would not taste the same without fungi, which break down the outer coating of the coco bean to impart the characteristic flavour; they also make the acidity regulator citric acid used in soft drinks and pharmaceuticals. Almost unrecognized are the anaerobic chytrid fungi that enable herbivorous animals to thrive on the plants they eat; without fungi – no meat, no milk, no wool, no leather!

Everyone knows about the antibiotic penicillin, but perhaps not that it is produced by a fungus. Fungi produce many other 'wonder drugs', including other antibiotics, the statins that control cholesterol (the most widely used pharmaceuticals in the developed world), and cyclosporine which prevents transplant tissue rejection. Fungi also contribute to the production of steroid contraceptives and anti-inflammatories, some industrial chemicals, and bioethanol – an alternative to fossil fuels!

"Editor Notes"

The Group Library is held at the Leicestershire Museums Collections Resources Centre at Barrow on Soar. To arrange a visit to borrow or return a book please contact Carolyn Holmes

A quick thanks to everyone who has written an article or submitted a photograph to this years newsletter.

As always any feedback on this newsletter or submissions for future editions are welcome and the same goes for the LFSG website at www.leicsfungi.btck.co.uk.



Altar Stones and Blacksmith's Field Foray 2012

By Richard Iliffe

Altar Stones:

The reserve has habitats that favour two different groups of fungi, those of unimproved grassland, found around the exposed rocks of the high ground, and a less specific habitat of more organic soil with coarse grasses and scrubby thorn trees on the lower ground surrounding the exposed rocks. The number of species recorded on the site is quite reasonable for a small area. With one exception all are relatively common and typical of the two habitats mentioned.

The exception is *Lyophyllum semitale*, an uncommon species, new to VC 55 and with only 26 previous records in the UK fungal records database. It has been recorded in various habitats; coniferous woodland, deciduous woodland on acid soil and, in complete contrast, a number of records are from calcareous grassland. The records are thinly distributed throughout the UK, including several in the Scottish highlands. At Altar Stones we found it growing on soil among bracken. It is a medium sized brown mushroom with no obvious distinguishing features.

Blacksmith's Field

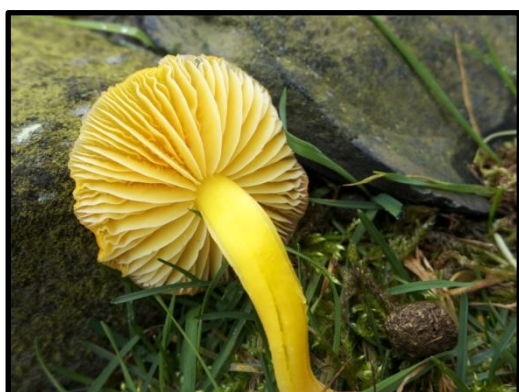
The list of species is longer and more varied, reflecting the habitats on the reserve which broadly divide into semi-improved grassland and surrounding areas of coarser grassland and scrubby woodland. We recorded three species that were new to the VC55 list, which is an unusual achievement on one site after 30 years of recording by our Group. Two were formerly placed in the genus *Lyophyllum* (which is a very difficult genus with few distinguishing characters). One has now been re-classified as *Lepista ovispora* and is quite uncommon, with only 34 records in the national database. It has a thin distribution over the Midland counties, plus a few in Scotland. The specimen was sent to the Mycology Section at Kew for confirmation and they have retained it in their herbarium.

The second is now known as *Tephroclype inolens* and this is rare, with only 16 widely scattered records on the national database, including a few in the Welsh borders, others in Lincolnshire, one in Scotland and the remainder in the southern counties of England. The first clue to *Tephroclype* is usually the rancid mealy smell but this one lacks any smell, as suggested by the specific name.

The third new record was a brownish micro-fungus, regarded as a plant pathogen and called *Drechslera dermatioidea*, found growing on coarse grass leaves. This has only 14 previous records on the national database so is either rare or, more likely, overlooked because it is so obscure. Most of the previous records were found on various types of dead vegetation, including grasses.

As a general comment, the more common fungi have hundreds of records on the national database. Any species with less than 100 can be regarded as uncommon. Another problem is that distribution figures must be regarded as indicative only - most of the uncommon records arise from a skilled mycologist happening to be in the right place at the right time. In our case we had Tom Hering, who collected all the species noted above, not knowing what any of them were at the time they were collected. Most were uninteresting grey-brown 'mushrooms' so no in-situ photographs were taken.

The *Hygrocybe* species (waxcaps) recorded at Blacksmith's Field are worthy of comment. We recorded only a few different species but they were in quite large numbers and widespread over the central area of grassland, which was dotted with striking white, yellow, orange and red fruit-bodies. If the recent grazing continues these should increase, and other vulnerable waxcaps may appear in the future



Examples of *Hygrocybe* growing at Altar Stones, *Hygrocybe ceracea* (R Joyce)

WORDSEARCH

Find Twenty-Four Species of fungi in the grid below. However, the clues are given as their common names whilst in the grid they are hidden in their Latin form! Happy hunting!

E	A	A	Y	T	L	I	B	R	E	A	I	R	T	S	O	M	A	A	C	C	E	F	A	A
A	N	S	C	O	A	S	L	H	K	C	O	U	A	S	T	U	R	C	H	O	R	H	S	I
D	I	O	O	E	C	E	T	A	H	I	A	S	T	T	D	N	M	I	L	R	A	H	Y	R
U	R	L	P	G	C	E	H	Q	F	N	S	I	A	P	S	I	I	T	O	D	L	F	E	A
J	A	U	R	E	A	H	T	T	A	O	F	S	E	E	I	R	L	A	R	Y	U	X	D	C
A	B	V	I	A	R	R	Y	A	W	C	S	N	C	T	L	T	L	P	O	C	C	Y	S	S
L	A	I	N	S	I	R	F	L	R	E	E	T	N	O	U	I	A	E	P	E	I	L	E	U
U	N	R	U	T	A	A	C	N	C	B	A	H	A	O	D	C	R	H	H	P	C	A	D	M
C	N	E	S	R	A	E	Y	U	O	Y	T	D	L	U	E	A	I	A	Y	S	S	R	I	A
I	I	B	C	U	M	H	E	R	N	C	R	T	I	T	S	M	A	N	L	M	A	I	O	T
R	C	Y	O	M	E	L	O	M	H	O	S	G	M	T	U	R	M	I	L	I	F	A	L	I
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L	N	G	H	X	N	N	O	S	R	R	T	S	O	L	O	C	T	A	O	S	P	R	I	C
U	A	O	I	H	A	U	R	L	O	O	E	O	L	U	W	S	T	I	D	O	Y	P	N	S
C	C	E	L	A	C	D	Y	R	E	L	A	I	I	U	T	E	N	B	E	E	H	H	A	A
I	O	A	F	N	A	A	O	R	T	N	Y	O	S	G	T	F	T	M	S	D	A	A	M	T
R	R	E	W	X	Y	L	A	R	I	A	H	Y	P	O	X	Y	L	O	N	A	N	D	A	C
U	S	U	T	A	E	R	T	S	O	S	U	T	O	R	U	E	L	P	T	O	F	R	E	W
A	S	U	T	U	L	O	V	N	I	S	U	L	L	I	X	A	P	A	H	Y	A	E	N	I
D	A	L	D	I	N	I	A	C	O	N	C	E	N	T	R	I	C	A	E	E	H	T	I	I

Fly Agaric

Blushing Bracket

Shaggy Inkcap

Cep

Beefsteak Fungus

Sulphur Tuft

Candlesnuff

Death Cap

Jelly Ear

Wood Blewit

Blackening
Waxcap

Liberty Cap

Brown Rollrim

Collared
Earthstar

Oyster
Mushroom

Shaggy Parasol

Scarlet
Caterpillarclub

Coral Spot

King Alfred's Cakes

Honey Fungus

Amethyst Deceiver

Fool's Funnel

Common Earthball

Dead Man's Fingers



The Corticioid

Fungi

By Tom Hering

To start with, I should explain the kind of fungi I am talking about. They are Basidiomycetes, but they have no elaborate fruit-body; they typically produce their basidia in a flat layer on the surface of the substrate, which is most often rotting wood. When I am foraging in a woodland, I repeatedly turn over logs and fallen branches, to see what might be on the underside. Sometimes there is nothing to find, but quite often there are long sheets of a white fungus, providing abundant material for me to take home and study. There are two general points to be made about this kind of fungus. Firstly, it is not just colonising the surface of the wood. Usually the mycelium of the fungus has been growing inside the wood for a long period (months or even years) before coming out on the surface to fruit. Secondly, many of them form their spores on the underside of logs, where they are very unlikely to be dispersed by air currents. When one considers that most other Basidiomycetes, such as agarics and bracket fungi, have elaborate structures to ensure that their spores get airborne, this is very surprising. It has often been suggested that small soil animals, like springtails and mites, have an important role in redistributing the spores and helping them to find new substrates. This may well be so, but it is difficult to find positive proof.

There is no wholly appropriate name for this kind of fungi. Some mycologists refer to them as 'the Resupinates' – but this adjective merely means 'flat on the substrate' and would also cover some polypores like *Phellinus ferreus*, which have no bracket, but form a layer of pores directly on the wood surface. The alternative name 'the Corticioids' reflects the fact that in the nineteenth century most of these fungi were lumped together in a huge genus called *Corticium*. This has now been greatly split up (about 75 genera in Britain, and more worldwide). Even the concept of a single family Corticiaceae to encompass all these fungi has become obsolete, since it is now recognised that they are not all closely related to each other. DNA studies have shown that some are related to polypores, some to boletes, others to various agarics or club-fungi, while many remain still to be studied. But it is still convenient to group all fungi of this form together in a single book for identification.

The two most comprehensive books so far still include 'Corticiaceae' in their titles:- *Corticiaceae of Northern Europe*, by L. Ryvarden et al. (1982-8, in parts), and *Corticiaceae s.l.*, by A. Bernicchia and S.P. Gorjón (2010). Both are in English. Unfortunately the first of these (a valued possession of mine) is now out of print, and the second is expensive. Both these books cover only fungi with pale spores. The spore-print is usually white, though some members of the genus *Peniophora* have a pinkish spore-print. There are a few fungi of similar form with brown spores, such as *Coniophora* and *Tomentella*; these must be looked for in other books. An alternative to the above books is the online version of Mycokey, which covers most kinds of basidiomycetes and some ascomycetes. It costs about £30.

Very few of these fungi can be confidently identified in the field – you nearly always need to take them home and use a microscope. As for techniques of collection – the task is simple; you need to carry a sharp knife. It is useful to determine, if possible, the tree species, as many corticioids are confined to hardwoods or to conifers, and some are more strictly selective than that. I aim to get at least 2 square centimetres – this should be enough for me to make several slides, if necessary. Experience has taught me that it is not worth while collecting corticioids that are growing on the end grain (difficult to collect, and they tend to break up).

“ ‘the Corticioids’ reflects the fact that in the nineteenth century most of these fungi were lumped together in a huge genus called Corticium ”

For microscopic examination, I mount a very small amount of material – a needle-point – on slide in either Meltzer's iodine or in ammoniacal Congo Red (both are good mountants). A satisfactory preparation should enable me to see if spores are present, and allow observation of the other features mentioned below. It is important not to waste time on poor material. If I bring in five specimens from the field, I usually find that only two or three of them are in a condition to allow identification.

A good specimen will produce a heavy spore-print if left on a glass slide overnight in a moderately moist atmosphere. If the specimen produces no spores, and they cannot be easily found on a microscope mount, one would be well advised to abandon the specimen and work on something else. The spores are very important for identification. They come in a variety of shapes and sizes, but many are elongate with a curve. This shape is called allantoid (or, less technically, sausage-shaped). Spores of this shape are also common in the polypores, but don't seem to occur at all in agarics.

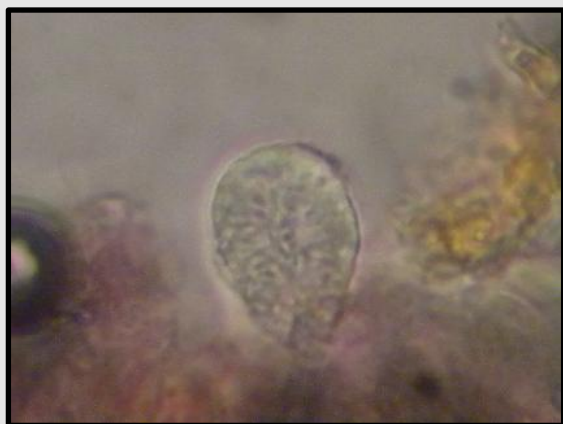


Allantoid spores of *Peniophora quercina*.

The Corticioid Fungi...continued.

By Tom Hering

The majority of corticioid fungi also have cystidia. Sometimes these stand proud of the general height of the basidial layer, and can be spotted with a hand-lens. There is a great variety of types of cystidium – unicellular or multicellular, thick-walled or thin-walled. Many of them are encrusted with crystals. The picture shows a remarkable encrusted ball, which is the characteristic cystidium of *Peniophora lycii*.



Cystidium of *Peniophora lycii*.

Cystidia are tremendously helpful for identification, but quite a high proportion of these fungi do not have any. Then one is dependent on accurate determination of spore size, and the size and shape of basidia. These may be of several shapes, including the parallel-sided and closely packed ones of *Peniophora*, the vase-shaped ones with a slight 'waist' half way up, as in *Hyphoderma*, or short, stubby and thumb-like ones, as in *Botryobasidium*.



Basidia of a *Botryobasidium*

It does seem amazing that so many species (over 200 are known in Britain) can be distinguished on the basis of so few characters. I find the illustrations in the Ryvarden book (above) very helpful in deciding whether I have finally 'nailed' my specimen. Similar illustrations (mostly the work of the late John Eriksson) occur in the online version of Mycokey.

We now know of about 60 species of these fungi in Vice-County 55, many of them with just one or two records. But I am sure there are many more to be found. Every time I turn over a log, I think 'this might be a new county record. You never know!'

"Amazing Plants"

12th January – 14th April 2013 at Charnwood Museum, Queen's Park, Granby Street, Loughborough, LE11 3DU (check website for opening times). The exhibition will then move to Market Harborough followed by Snibston Museum in 2014.

This new exhibition explores the powerful relationships between people and plants, showcasing the Leicestershire collection of botanical materials including the stories of local plant collectors.

Geoffrey Hall

Using a Microscope to Examine Fungi

Evening Meeting December 2012

By Richard Iliffe

Occasionally we hold a meeting that covers so many different aspects of fungi that it seems worth keeping a record and making it available to members who were not able to attend. I thought our final meeting of 2012 fell into that category, so here are some of the subjects we discussed.

The meeting was presented by Tom Hering and myself, using two microscopes, one of which had a digital camera attached with a link to a TV monitor to give an enlarged, though slightly fuzzy, image of what was set up on the microscope. We had no fixed agenda, hoping that subjects of interest would arise from questions posed by members, but we both had a few dried specimens as 'back-up'. This was just as well as the weather prior to the meeting was very cold and the few fresh specimens that members brought in were frost damaged and barely recognisable. Some Wood Blewit specimens were a dark chocolate brown colour, and one large and 'out of season' Blue Stalk *Lepista saeva* was rock-solid and covered with frost, glistening like a crystallized fruit.

The first question received was about hydrating dried specimens for examination. The answer given was that the complex methods described in some books, using specially prepared chemical solutions, are not necessary for our purposes. Soaking a small piece of dried tissue in water for about 3 minutes is all that is required. This was illustrated by a preparation made from a specimen that was at least fifteen years old. The comment was made that care is needed when dissecting dried material as it is very brittle and may fly about when cut with a blade or scalpel. The desired fragment may be lost for ever!

Chemistry There were several queries and comments about stains and other chemicals. We discussed ammonia, which is a gas in the natural state. Some of us, myself included, wrongly label our bottles of ammonia NH_3 , when it should really be represented as a solution of ammonia in water known chemically as ammonium hydroxide (i.e. $\text{NH}_3 + \text{H}_2\text{O} = \text{NH}_4\text{OH}$). This is commonly used in preparations for examination under the microscope, particularly of the dark-spored species. The product is readily available from chemists as 'household ammonia'. Avoid the alternative soapy form which has a milky appearance. Ammonium hydroxide releases ammonia gas to the atmosphere so it gradually becomes weakened and loses effectiveness. As a guide, if it still smells strong and pungent it should perform satisfactorily. Take care when checking – a big sniff of a strong solution can be a painful experience!

Another chemical that we occasionally use as a stain when examining the cap cuticle of *Russula* species is sulphuric acid H_2SO_4 . Many years ago it could be purchased from a local chemist, with certain safeguards. Today it is usually very difficult to acquire and has to be ordered from an authorised supplier, specially packaged, and delivered by courier as it cannot be sent through the post. Surprisingly, however, it can be readily obtained in a 91% solution from B & Q where it is sold as a drain cleaning product under the name 'One Stop'. The product must be treated with great care as it is a very hazardous substance. There are guidelines for the use of sulphuric acid in the examination of fungi (copies available on request). Sulphuric acid absorbs water from the atmosphere and it becomes diluted over time. Care should be taken to ensure that the cap is sealed as tightly as possible after each use.

I next worked on one of the few fresh specimens available on the evening; the ever present Common Bonnet *Mycena galericulata*, and I demonstrated how to take a tiny sliver from a gill margin, mount it in liquid stain and squash it on a glass slide under a cover slip. Firm pressure, using the eraser on the end of a pencil, combined with a slight rotating action, opens the squashed tissue and, with a degree of good fortune, this separates out the distinctive marginal cells (cheilocystidia) so that their shape and any warts or decoration can be examined. In this case they were clavate cells with warts and lots of wiggly outgrowths, as illustrated in the opposite sketch, conclusively identifying the specimen.



Tom had brought in an unknown *Inocybe* to work on and he prepared a slide to show the thick-walled cystidia on the gill margin. These cystidia are known as metuloids and often, as in this case, they are topped by clusters of crystals giving a very distinctive appearance. They are found in many *Inocybe* species and can also occur in other of the brown or black-spored genera, such as *Psathyrella* and in at least one *Galerina* species.

Left: *Inocybe pusio* ch.cystidia

Using a Microscope to Examine Fungi
Evening Meeting December
2012...continued.
By Richard Iliffe

The subject of 'clamps' came up in discussion and Tom made a quick preparation showing a clamp under the microscope for members to look at.

This prompted an explanation of what clamps are, which took us into the deep waters of micro-biology to describe how fungal hyphae grow. The mushrooms and toadstools that we enjoy arise from a much larger organism comprising a mass of densely aggregated filaments, called hyphae, looking rather like cotton-wool and permeating the substrate, be it rotten wood, fallen twigs, soil, manure, rotting fruit or almost any other living substance. These fungal hyphae grow only at the extreme tips, pushing forward under considerable hydrostatic pressure and extending by continually adding new cells. Each cell is separated from the next by a disc-like membrane (a septum, plural septa) which has a small aperture at the centre so that cytoplasm, nutrients, and small particles can pass from cell to cell. Cells in most basidiomycete fungi typically have two nuclei, usually indicated as 'positive' and 'negative', or types 'a' and 'b', rather than male and female. In species having hyphae with only 'simple' septa the nuclei in the penultimate cell divide and a pair move into the new cell as it develops, with a septum closing behind them. In many species however the process can differ; before the two nuclei in the end cell divide one moves into a 'loop' or 'bypass' created in the cell wall. The two nuclei then divide, with one pair moving forward into the new cell and the nucleus in the 'loop' moving back to pair with the nucleus left behind, with a new septum forming immediately and separating off the new cell. The 'loop' then seals itself off, leaving behind what we see as a clamp. Less easy to explain is that such species often have some septa with clamps and others without them; maybe this reflects an evolutionary change from one type to the other?

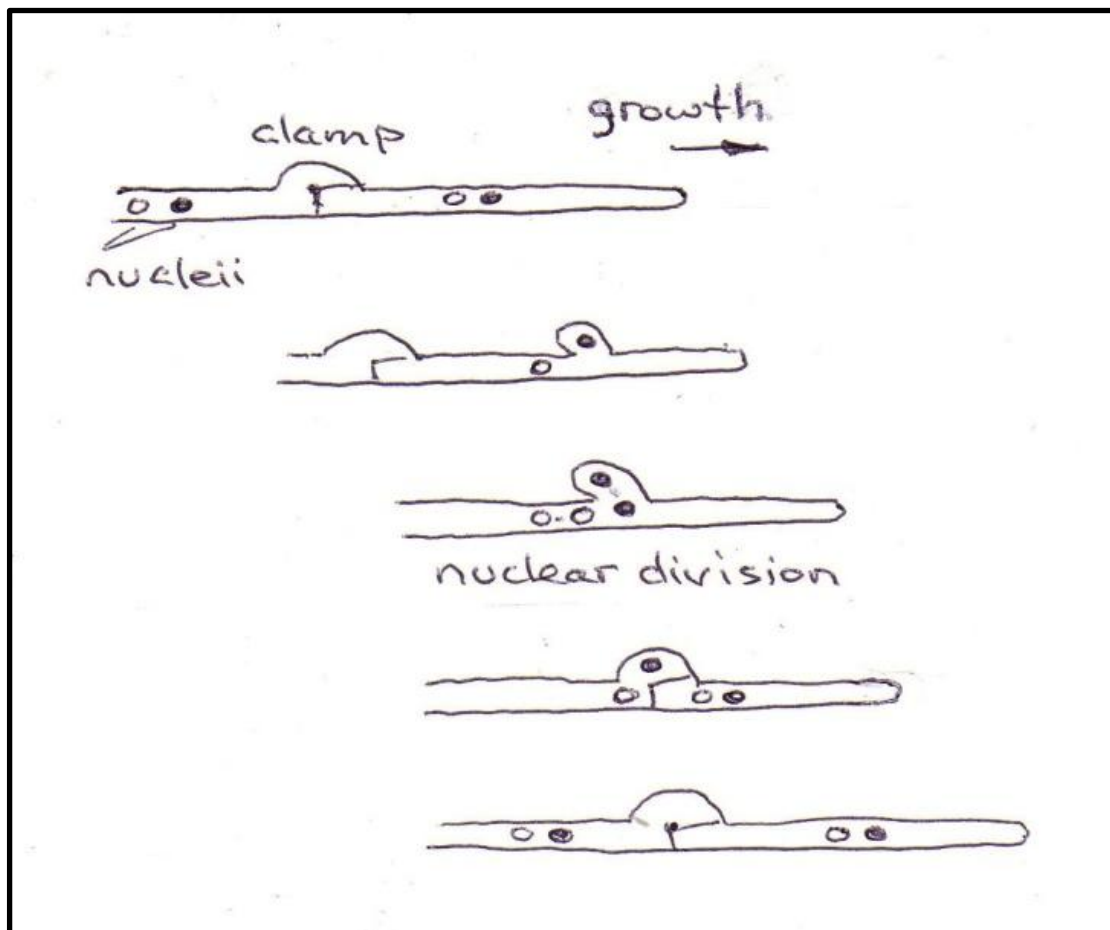


Diagram of clamp formation (with acknowledgements to 'The Biology of Fungi' by C.T.Ingold)
Note that the cell length relative to the width is considerably greater than shown.

Using a Microscope to Examine Fungi

Evening Meeting December 2012...continued.

By Richard Iliffe

Myxomycetes: As I had been unable to find any good fresh fungi I brought two dried myxomycete specimens to the meeting and was able to prepare specimens for the microscope. Commonly known as slime moulds, myxomycetes are strange organisms that cross the boundary between animals and fungi, having some features common to both of these Kingdoms. They are now thought to be closely related to the protozoa. They first appear as a mass of slime, sometimes coloured, but usually colourless, and can be overlooked at this stage. The slime comprises a mass of amoeba-like cells (i.e. having the characteristics of some primitive animals). As they are capable of movement the slime spreads over the substrate, usually soil or wood, or other vegetation, dead or living. The individual cells feed on the algae, bacteria and microfungi on the surface of the substrate. When mature and ready to fruit the individual slime cells accumulate, either into one mass or, in other cases, into a group of many tiny spheres. They rest in this semi-fluid stage for a short time and then ripen to form fruit-bodies producing masses of spores – each spore capable of germinating into a new living amoeba-like cell. At the sporing stage they have features in common with fungi and they are usually studied by mycologists. There several hundred different slime moulds on the British list, comprising a number of distinctive groups or families separated by features like the method of growth, the final spore producing structures, and the spore colour. I brought two different dried specimens to the meeting representing the genus *Trichia*, which usually have yellow spores, and *Arcyria*, which have crimson-red spores.

I first demonstrated *Trichia contorta*, collected last October at Market Bosworth Country Park. When found, on a rotting wood fragment, there were hundreds of tiny white spheres, each about 2mm diameter. As the days passed they turned bright yellow, then a rich chestnut colour. After about a week they reached their final form of hard-shelled brown spheres containing masses of spores. The microscope preparation showed spherical warty spores (very similar to those of other myxomycetes so of little help with identification). We need to examine the elaters, which are filaments that fill the space inside the fruit body and help to retain the spores in position. In *Trichia* they are covered in a series of helical markings which vary slightly depending on species. In some they form continuous threads, like cotton wool, with very few obvious ends. In the species demonstrated the elaters are in short lengths, with one or both ends coming to a sharp point.

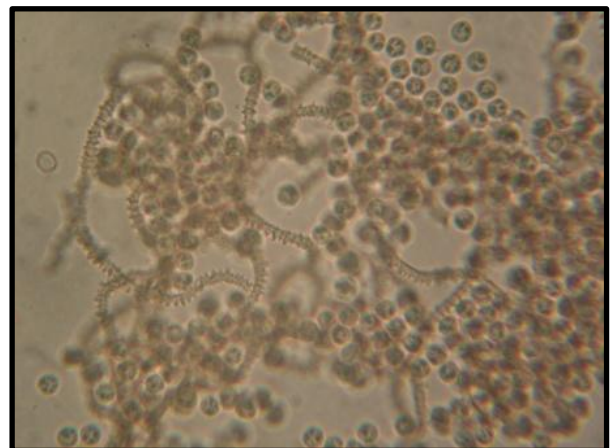
These characters conclusively identify this species as *Trichia contorta* (see opposite).

My second myxomycete was *Arcyria denudata*, collected at Cademan Wood last November. Members of this genus are relatively easy to recognize when fresh as they appear as groups of bright pink spheres, usually on short stalks. When ripe each one produces pink 'cottonwool-like' clusters of filaments called the capillitium, carrying spores of the same colour. In this species each capillitium mass is loosely cylindrical and quite firmly attached to the stalks (see opposite).

In other species the capillitium may detach easily and blow away, leaving residual empty shallow cups on the stalks. In *Arcyria* the elaters have few loose ends and have distinctive irregular warty bands round them, described as 'cog-like', very different from the spirals of *Trichia* (see opposite)

We also found time to look at a few recently published books and field guides. Most of these have been covered elsewhere in a separate article by Rob Joyce. Also on show was 'Funga Nordica'. This is the most comprehensive and up-to-date key available for identifying European Agarics and Boletes. It is an essential possession for anybody wanting to do serious identification work on the Basidiomycetes. The latest edition, published in two volumes, comes at a relatively high cost - approaching £100. Please ask if you wish to see a copy of the first edition before deciding to buy.

We managed to cram a lot of discussion into this meeting, thanks in no small measure to the enthusiasm of the members who braved the cold wintry conditions to be there.



Suggested Reading Material

By Robert Joyce

There is an abundance of mycology related books and publications both in and out of print (note that websites such as Amazon and Ebay often have out of print books). This can be a bit confusing for the amateur mycologist – which are the best books to buy and why? Here are some of the books I would recommend to start or include in your library. Please note that prices shown here are a rough guide or the price stated on the book – shop around for bargains!

The first book that you will need is a good field guide. There are several on the market and I think they fit into two categories, pocket size which is a comfortable size to take out into the field and larger more complete field guides that are simply too heavy to haul out on long forays but are useful at home. The best ones include:

“Collins Complete British Mushrooms and Toadstools” by Paul Sterry and Barry Hughes. A good pocket size field guide containing extensive details on species including over 1500 photographs to help start the identification process in the field. Reasonably priced at around £17.

“Pocket Nature Fungi” by Shelley Evans and Geoffrey Kibby. Another pocket sized field guide with excellent photographs and concentrated points depicting key features of fungi. Price in book £9.99.

“Mushrooms” by Roger Phillips. A larger format for this guide but is worth getting for the detailed photographs and comprehensive descriptions of species. All photographs show species at various growth stages and cut specimens to show key features not often shown in other guides. Price in book at £18.99.

“Collins Fungi Guide” by Stefan Buczacki, Chris Shields and Denys Ovenden. Another larger field guide which is thicker due to it containing extensive information about each species. This includes a large number of obscure species not covered in other field guides. Unfortunately this makes the book a bit too heavy to use out in the field. There are excellent watercolours containing beautiful detailing. Recently published the information on new specimen names is up to date. A must to have on the shelf at home but more expensive priced at £35.

As well as field guides there is an abundance of general reading books on mycology covering a wide variety of topics from folklore, photography and cooking. If you are interested in fungi folklore then I would recommend the following:

“There is an abundance of mycology related books”

“Magical Mushrooms, Mischievous Molds” by George W, Hudler. An American published book which explores the relationship between fungi and humans. Containing chapters on fungi diseases, fungi as medicine, wood decay, pathogens of food crops, fungi and insects, and symbiotic relationships with plants, it gives the reader an interesting overview of how fungi relates to us and affects us daily. Available on websites such as Amazon at around £20.00

“Slayers, Saviors, Servants and Sex – An Expose of Kingdom Fungi” by David Moore. Another American publication with an unusual title. It is an interesting read covering in detail topics related to fungi such as the great plague of “St. Anthony’s Fire of the Middle Ages”, Irish Mass Migration to America due to potato blight, the discovery of penicillin and antibiotics, and how fungi works as an ecosystem. This is a scarcer book and I last saw it on Amazon priced at around £32 which is quite expensive for a paperback. If you ever see a cheap copy it’s worth a buy.

“Fungi” by Paul Starosta and Christian Evans. Printed in Italy, this is a very rare coffee table book, with standard content but outstanding photographs. I have approximately forty books on the subject on fungi and none of them have the same photography presentation as this book. The photographer has taken each of his incredibly close up images in front of a pure black background which helps to pull the image out further still. These pictures capture the beauty and wonder of these fantastic organisms we study, a factor that I personally feel gets forgotten at times.

“Mushroom Miscellany” by Patrick Harding. Unlike the last two books mentioned which are purely text based, this book combines text with photographs and wonderful sketches/diagrams. These also include prints of artwork and paintings depicting fungi from historical documents. This ties in really well with chapters that cover every area of mushroom folklore. An excellent coffee table book for the general reader. Price in book £15.99.



Suggested Reading Material...continued.

By Robert Joyce

Other general coffee table reads include the following:

“Fungi” by Peter Roberts and Brian Spooner. A really comprehensive guide to everything mycological, published in the ‘New Naturalist’ series and being an up to date version of the old favourite in this series written by John Ramsbottom. Perhaps aimed more at the serious enthusiast but a good read nevertheless.

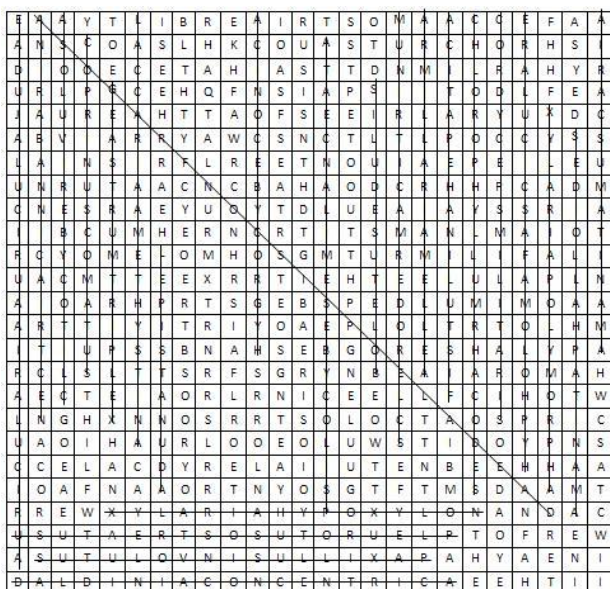
“From Another Kingdom – The Amazing World of Fungi” published in paperback by the Royal Botanic Garden, Edinburgh in 2010. A guide to what fungi are, comprising articles on the various types written by national expert and illustrated by excellent photographs contributed by UK field mycologists. A really special coffee table type book aimed at the general reader. Priced at £25.

‘Mushrooms’ by Peter Marren, published by ‘British Wildlife’ in 2012. This is the first guide in a new wildlife series to be published by British Wildlife. It is very absorbing and beautifully written book explaining in simple language what fungi are, and how and where they grow, with excellent notes on the various families. As much for the general naturalist as for the specialist, priced at £25.

Finally as a photographer I would recommend the following books for those interested in taking images of fungi:

“Photographing Fungi in the field” by George McCarthy. Published as a hardback in 2001 this is an older book but has some invaluable advice on how to photograph mushrooms and toadstools. The first part of the book deals with descriptions and stories about many types of fungi. The second part deals with the actual photography guide. There are plenty of tips to be picked up from this section on the photography process and techniques. It should be noted that some of this is out dated now as it refers to film based cameras. However, the sections on compositions, exposure, gardening and lighting all with various photographs to demonstrate points are worthwhile. Also it is worth adding that the photographs are outstanding and even without an interest in photography are worth viewing. Unfortunately a rare book these days and prices for it can vary considerably. Worth tracking down though.

WORDSEARCH ANSWERS



Fly Agaric

Blushing Bracket

Shaggy Inkcap

Cep

Beefsteak Fungus

Sulphur Tuft

Candlesnuff

Death Cap

Jelly Ear

Wood Blewit

Blackening
Waxcap

Liberty Cap

Amanita muscaria	Brown Rollrim	Paxillus involutus
Daedaleopsis confragosa	Collared Earthstar	Geastrum triplex
Coprinus comatus	Oyster Mushroom	Pleurotus ostreatus
Boletus edulis	Shaggy Parasol	Chlorophyllum rhacodes
Fistulina hepatica	Scarlet Caterpillarclub	Cordyceps militaris
Hypholoma fasciculare	Coral Spot	Nectria cinnabarina
Xylaria hypoxylon	King Alfred's Cakes	Daldinia concentrica
Amanita phalloides	Honey Fungus	Armillaria mellea
Auricularia auricula-judae	Amethyst Deceiver	Laccaria amethystina
Lepista nuda	Fool's Funnel	Clitocybe rivulosa
Hygrocybe conica	Common Earthball	Scleroderma citrinum
Psilocybe semilanceata	Dead Man's Fingers	Xylaria polymorpha



PHOTOGRAPHS

A collection of photographs taken from last years's fungi season.



Purple Brittlegill, *Russula atropurpurea* (R Joyce)



Arcyria denudata at Cademan Wood (R Iliffe)



Weeping Widow with droplets, *Lacrymaria lacrymabunda* (R Joyce)



Mitrophora semilibera at Grace Dieu (R Joyce)



Crystal Brain Fungus, *Exidia nucleata* (R Joyce)



Hygrocybe reidii. Growing at Blacksmith's Field (R Joyce)