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Field Mycology

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Field Mycology

Vol. 24(2) May 2023

CONTENTS

Editorial 38

Fungal Portrait No. 94: Two burnt site specialists: *Hebeloma anthracophilum* & *Pholiota carbonaria* – Geoffrey Kibby 39

Hygrophorus marzuolus new to Britain – John Bingham 41

Observations of Hertfordshire fungi in 2022 – Kerry Robinson 43

Antrodia carbonica and beginner's luck – Jo Weightman 46

Hydropodia subalpina a peculiar agaric in ordinary disguise – Richard Fortey 47

When *Russula* species crack up – Penny Cullington 49

Further cracks in the cuticle – Mario Tortelli & Geoffrey Kibby 51

Edgcumbe Park - Cornwall's most important waxcap grassland? – Richard Penny 54

Galerina esteveraventosii new to Britain - Andy Overall 57

Thaxterogaster monaensis recently described from Anglesey - Charles Aron 59

Mycena dasypus rediscovered after 30 years - Penny Cullington 61

Readers' Finds 66

Notes and Records - Alick Henrici 69

New Books

Edible Fungi of Britain and Northern Europe – Jens H. Petersen 72

Front cover: *Verpa conica,* Hounslow Heath, London, 2023. Photograph © Andy Overall.

Back cover: *Melanophyllum haematospermum* growing in profusion on a compost heap in Kent. Photograph © Geoffrey Kibby.

EDITORIAL

How to be a successful invader

In a paper published on bioRxiv.org (Wang *et al*., 2023) the authors show why the dangerously toxic Death Cap, *Amanita phalloides* has been so successful in spreading across California and other parts of North America where it has been the cause of a number of deaths. They state "We discovered death cap mating is controlled by a single mating-type locus (*A. phalloides* is bipolar), but the development of homokaryotic mushrooms appears to bypass mating-type gene control. Ultimately, sporulation is enabled by nuclei able to reproduce alone as well as with others, and nuclei competent for both unisexuality and bisexuality have persisted in invaded habitats for at least 17 but potentially as long as 30 years. The diverse reproductive strategies of invasive death caps are likely facilitating its rapid spread, revealing a profound similarity between plant, animal and fungal invasions".

In a nutshell it means the fungus is not reliant on sexual reproduction but can on occasion reproduce all on its own. Since its introduction in eastern North America, probably in the 1930s when there was a massive tree planting scheme, often using saplings imported from Europe, it has spread rapidly in both eastern and western North America although some authors suspect that it might actually be native to parts of western North America (Pringle & Vellinga, 2006).

An unusual case of infection in a man by a common fungus

The journal *Medical Mycology Case Reports* presents a case of infection by *Chondrostereum purpureum* in a 61-year-old man in Kolkata, India, possibly the first of its kind by this fungus (Dutta & Ray, 2023). Common everywhere in Britain, it causes a disease of fruit trees and other plants called silver leaf disease but has not been implicated in human infection before.

The man was admitted to hospital having suffered from a cough, fatigue and a hoarse voice for about three months. He was a plant mycologist so had been working with various fungal species on plants. Scans revealed the presence of an abscess in his neck obstructing his airway. and genetic sequencing identified the fungus.

He was prescribed daily antifungal medicine for two months and two years later is described as "absolutely fine" and the infection has not returned.

Fungal infections in humans by larger fungi are not new. *Schizophyllum commune* for example has been involved in cases in people over the years but almost always the patients already had a compromised immune system or were already at serious risk of fungal infection. But the man in question had no previous history of any serious illness.

Professor Elaine Bignell, of the MRC Centre for Medical Mycology speculated that he may have been exposed to unusually high concentrations of spores in his work or that he "might have some sort of genetic immunodeficiency that we don't know about". She stressed however that there was no cause for alarm…

A competition

Readers are invited to send in photographs of fungi for use as a cover shot for Field Mycology. The photo deemed the best by our editors will win its photographer the book reviewed in this issue on p. 72. The photograph must be able to be cropped to a vertical format as seen on this issue's cover and be of high resolution.

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Geoffrey Kibby

Fungal Portrait: 94

Two burnt site specialists: *Hebeloma anthracophilum* & *Pholiota carbonaria*

Geoffrey Kibby

Fig. 1. *Hebeloma anthracophilum* on a burnt site in Epping Forest, Essex, October 2020. Photograph © Geoffrey Kibby.

When a site gets burned either by an accidental forest fire or by a deliberate burn-off to clear the area a whole suite of fungi almost immediately start to make their presence felt. These range from tiny ascomycetes to quite large agarics. With the latter this often occurs a year or two after the fire. A good sign that a site might be productive is if the moss *Funaria hygrometrica* has colonised the area, but fungi can appear even after just a few months.

The two species illustrated here, *Hebeloma anthracophilum* and *Pholiota carbonaria* are two of the larger agarics to be found on such occasions and at first sight are deceptively similar in appearance.

Hebeloma anthracophilum Maire (Fig. 1)

This species reaches about 5 cm across, is usually bicoloured with an ochraceous tawny to reddish brown centre and a much paler, cream margin. The cap can be very viscid-tacky when moist. The gills are adnate-emarginate and dull clay. Its stem is white above dull ochraceous brown below and the surface is fibrillose-floccose to pruinose at the apex. Its odour is slightly cocoa-like while the taste is mild to bitter.

Its spores are approximately 10.0–12.6 x 4.6–7.3 µm, amygdaloid in shape and frequently with a loosening perispore. Cheilocystidia are simple, cylindric to slightly clavate. The species appears to be exclusively found on burnt ground,

usually in forests with *Fagus*, *Carpinus*, *Castanea* or *Quercus*. *Hebeloma birrus* is very similar and may also occur on burnt ground but has slightly shorter spores averaging around 10 µm long and often reaches up to 7 cm across the cap and is rather taller in stature.

H. anthracophilum is generally an uncommon species although widespread across the whole of Britain.

Pholiota carbonaria (Fr.) Singer (Fig. 2)
syn. *P. highlandensis*, *P. brunnescens* sensu Orton non orig.

Much commoner than *Hebeloma anthracophilum*, this is another species exclusive to burnt ground, often appearing in very large troops. Its caps vary from 2–8 cm across, are usually fairly uniformly brownish orange and can be very viscid when wet, sometimes with remnants of whitish veil at the margin. The gills are dull yellowish becoming more reddish brown as the spores mature. Its stems are whitish above, more rust-brown at the base and somewhat squamulose with an indistinct ring-zone towards the apex. Its odour is indistinct and the taste is mild.

Microscopically it has ellipsoid-ovoid spores with rather thick walls and a small germ pore. Its cheilocystidia are fusiform-lageniform with a long neck, easily distinguishing it from the *Hebeloma* should there be any doubt.

The name *P. highlandensis* has been used extensively for this species but according to Indexfungorum *P. carbonaria* is validly published and has clear priority in terms of date published. Peter Orton recorded as British the related North American species *P. brunnescens* but in a paper by Matheny *et al.* (2018) they demonstrated that when sequenced Orton's collections were just large specimens of *P. carbonaria* (there referred to as *P. highlandensis*).

The two collections of the *Hebeloma* and the *Pholiota* shown here were growing side by side on the same patch of burnt ground in Epping Forest, October 2020 and could easily be mixed up if attention was not given to their subtle macroscopic differences of gill colour, uniformity of cap colour, etc. In 2021 only one or two fruitbodies could be found and none in 2022. Such sites rarely lasting for long.

Reference

Matheny, P.B. *et al.* (2018). Revision of pyrophilous taxa of *Pholiota* described from North America reveals four species—*P. brunnescens*, *P. castanea*, *P. highlandensis*, and *P. molesta*. *Mycologia* 110(6): 997–1016.

Fig. 2. *Pholiota carbonaria* on burnt soil, Epping Forest, October 2020. Photograph © Geoffrey Kibby.

Hygrophorus marzuolus new to Britain

John Bingham*

The Wyre Forest has a long history of fungal recording principally undertaken by Carleton Rea, past president of the British Mycological Society (BMS). Rea produced a list of 1,395 fungi for the forest, recorded over a period of 35 years between 1888 and 1923. He published his list in a paper entitled *The Fungi of Wyre Forest* (Rea, 1923). Over recent years I have added a few more species to Rea's list but as yet have not reached Rea's total, my personal list being just over 800 species.

On 19th January 2022 whilst wandering through the oak woodland at Longdon Wood in the Shropshire portion of the Wyre Forest I found a troop of seven agaric fruitbodies (Fig. 1). They were all dark coloured, some almost black, quite robust and firm with white gills and caps 4–10 cm across. There was no distinctive odour, just faintly pleasant. They were growing on a steep bank under Oak (*Quercus petraea* x *Q. robur* = *Q.* x *rosacea*) on bare soil and leaf litter with occasional patches of mosses, scattered heather, *Calluna vulgaris* and bilberry, *Vaccinium myrtillus* nearby. I first considered the possibly of them being a form of *Tricholoma saponaceum*, but closer examination added to my confusion; clearly not *Tricholoma* but as to what they were I had no idea. Several photographs were taken in situ for future reference.

A few specimens were collected but I failed to get a positive identification despite consulting numerous books. A *Hygrophorus* species did seem a possibility. Images were posted on the BMS Facebook pages and *Hygrophorus marzuolus* was suggested as a possible name by Nicolas Schwab. Whilst it did appear to fit this species it was not known in Britain, so I had my doubts still. Also, the soil types were given as calcareous not acid like the Wyre Forest both in Breitenbach & Kränzlin (1991) and in Courtecuisse (1995). The species is illustrated in Geoffrey Kibby's field guide (Kibby, 2020) as a species not yet recorded in Britain, presumably in anticipation of its possible discovery here.

I contacted Martyn Ainsworth at the Royal Botanic Gardens Kew, who asked for dried speci-

Fig. 1. A small troop of *Hygrophorus marzuolus* found in the Wyre Forest, 19 January, 2022. Photograph © John Bingham.

mens for DNA sequencing. It took some time for the results to come back but on 25th January 2023 Martyn confirmed the fungus was indeed *H. marzuolus*, a species not recorded before from Britain. It has been filed at Kew as *H. marzuolus*, K-M000265126 and added to the Checklist of British Basidiomycota (Ainsworth & Henrici, 2023).

Andy Overall in Field Mycology (Overall, 2004) describes finding the fungus in Spain, where it is commonly known as the March Mushroom. It fruits under conifers, often *Pinus* at high elevations. It is associated with melting snow and fruiting is initiated under snowbanks in March and April. He describes it as "exploding up through the loose soil around the pines… they tend to rise up beneath patches of moss…. hard to find… just bursting through the soil and plant litter".

It appears *H. marzuolus* typically grows under conifers but also occasionally under broadleaved trees as was the case in the Wyre Forest. Courtecuisse (1995) states it is rare everywhere and mentions it as associated with deciduous as well as coniferous trees on calcareous soils.

Perhaps it is a rare native species in this country with a restricted distribution to more acid oak woodlands to the west of Britain. Overlooked perhaps due to its appearance in late winter or very early spring months when field mycologists are not often out looking for larger fungi. It was particularly rewarding, despite my initial misgivings, to learn that this was a new British species, especially as it was a large agaric in an atypical habitat. I'm sure Carleton Rea would have approved.

Acknowledgements

Thanks to Martyn Ainsworth and Alona Biketova for providing DNA sequencing and analysis. Also to Nicolas Schwab and several other persons on BMS Facebook for encouragement and suggesting names for th fungus.

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Fig. 2. Close up of *H. marzuolus*, Longdon Wood, Wyre Forest. Photo © John Bingham.

Observations of Hertfordshire fungi in 2022

Kerry Robinson*

Winter is the time of year when I reflect on the autumn foray lists for my county and, as I suspected, it was a poor season for mycorrhizal fungi. It is now over forty years since I started looking for and recording fungi in my area. The few remnants of ancient woodland were once covered in troops of fruitbodies. Now, like all other groups in the natural world the fungi have declined. Climate change has seen increasingly dry springs and high temperatures in summer. Autumn records have recently been dominated by single specimens, instead of large troops. Species totals still appear good, but only because the local fungus society has increased its knowledge of groups of fungi. Woods are under increasing pressure from the large numbers of people using them and foragers emulating TV chefs and over-collecting plants and edible fungi. The photograph taken in the autumn of 1983 of *Clitocybe nebularis*, the Clouded Agaric (Fig 1) , shows how abundant common species used to be. I haven't seen a sight like this for over twenty years.

On a more positive note there were a few new county records and some rarely recorded species. In my first weeks of retirement I spent some time in my local wood, the Weston Hills, Baldock. Here I was rewarded with three interesting records, two new to the county.

Firstly, *Hemimycena mauretanica* var *mauretanica* (Fig 2), a small, all white *Mycena*-like species, with very few gills growing on an old fallen hawthorn leaf.

On another outing I was searching old very wet silverweed leaves (*Potentilla anserina*), hoping to find *Gnomonia comari* (restricted to this species and to strawberries) which I didn't. What I did find were some whitish cream cups around 0.3 mm across with long white hairs. Under the microscope I soon realised this was a basidiomycete. The hairs had long whip-like ends and the middles were covered in crystals. Spores were 7–8 x 4.5–5 µm; this fitted well with *Flagelloscypha orthospora*.

Lastly, from the Weston Hills was *Tomentella umbrinospora* a lovely orange-brown corticioid

Fig. 1. An extraordinary fruiting of *Clitocybe nebularis* from 1983. Photograph © Kerry Robinson.

Fig. 2. *Hemimycena mauretanica* var. *mauretanica*, Weston Hills, Baldock, Herts. Photograph © Kerry Robinson.

growing on an old beech log. I had the first British record for this in 1995 from Royston Heath, Fox Covert reserve, both records from the same type of habitat: beech trees on calcareous soil.

A favourite wood of mine is Astonbury woods, Stevenage. It has a good variety of habitats and never fails to yield something interesting. A jelly fungus with a pinkish grey tinge formed a thin covering on a fallen deciduous branch, this was *Saccosoma farinacea* (formerly*Helicogloea*) (Fig. 3), rarely collected although it was the second Herts record, previously from Balls Wood, Hertford.

Two interesting discomycetes were found on a rare wet morning in June, both growing together on an old nettle stem. Firstly the noticeable orange pustules of *Laetinaevia carneoflava* which looks very much like *Callorina neglecta*, and is usually found in January or February. Microscopically their spore sizes overlap, the paraphyses being the key separating feature: in *L. carneoflava* they are finely filiform and much branched, whereas in *C. neglecta* they are swollen at the apices.

Growing close to this and much harder to see was the rare *Diplonaevia bresadolae* Fig. 4). The fruitbodies develop within the host tissue and break through producing cream to pinkish discs with white ragged margins.

Still with cup fungi an interesting *Hymenoscyphus*-like species grew on an old *Rubus* stem. The almost stalkless clusters of white fruitbodies turned reddish brown on bruising. I remember collecting something that looked the same and sending it to Kew in 2008. At that time there was no name for it, but they did have several similar collections. So I sent it to Peter Thompson who told me it was now called *Pseudohelotium haematoideum* (Fig 5).

Another find also identified by Peter was *Calospora arausiaca* on a dead attached oak twig. It's a black pyrenomycete confined to oaks and with distinctive large spores and that has perithecia in small groups on a black stroma.

One last interesting find was two fresh specimens of *Battarrea phalloides* appearing on the 20th August, found on different locations along the road bank by rotten deciduous stumps on the road to Roxley Court, Willian, nr Letchworth Herts, despite the record breaking summer temperatures of 40º C.

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Fig. 3. *Saccosoma farinacea*, a jelly fungus found on a fallen deciduous branch. Photograph © Kerry Robinson.

Fig. 4. *Diplonaevia bresadolae*, its ragged cups breaking through the substrate. Photograph © Kerry Robinson.

Fig. 5. *Pseudohelotium haematoideum* on an old *Rubus* stem. Photograph © Kerry Robinson.

Antrodia carbonica and beginners luck

Jo Weightman*

It is mid January 2023. A lady interested in the natural world in a general way is out walking her dog in Wapley Hill Wood in north-west Herefordshire and her attention is taken by startlingly white patches on several stumps. At this point more experienced but perhaps lazy field mycologists who know a problem when they see it might have preferred to avert their eyes, white crusts not being everyone`s passion. Our lady, however, goes home and searches online for an answer for 'white patches on wood' and arrives at *Antrodia carbonica*. Most fortunately the article she lit upon did say that this is a rare species in Britain so she contacted the Herefordshire Fungus Survey Group (HFSG) and the story reached me.

I read up this species of *Antrodia* and then, full of dismissive thoughts and armed as advised with Melzer's reagent, I met up with my correspondent and was guided to the first stump. Having said my cautionary bit about how many 'white patches' there are in woodlands, I applied a drop of the Melzer's in the full expectation of a nil result. But no. The spot went black in two seconds! The encrustation on the second stump gave the same result. Close examination showed a purple leaching at the edge of the stain. By the next day when I returned, having forgotten in my excitement to get a good grid reference, the purple tones were more distinct.

Back home the sample I had taken failed to drop spores and I could not find any under the microscope. The squash did however have the same purple-black amyloid reaction with iodine. I sent it off to Kew and Martyn Ainsworth very kindly examined the collection, succeeded in finding spores and confirmed the identification.

This fungus was first found in Britain in 2011 and 2012 in Oxfordshire by Richard Fortey (2013). A search of both old and current FRDBIs shows that further finds have been made in Hampshire and Devon. This collection makes the tenth known find in the UK and the first in the Borders. I understand from Martyn that this species has been moved to *Amyloporia* and in a further move to *Lentoporia*.

The host stumps were on the lower edge of a south-facing Douglas Fir, *Pseudotsuga menziesii* plantation on Wapley Hill but the previous crop is unknown. The stumps were all of windblown trees, well rotted and in good light. I searched for further examples both within the dark forest and higher on the slope but in vain.

The resupinate fruiting bodies were 15–20 cm long, about 1 cm thick and beginning to develop tiers of short knobby brackets like those in the pachymeres form of *A. xantha*. The pores were large.

A thrilling introduction to mycology for the finder. My thanks to Martyn Ainsworth for confirming the find and his correspondence on the subject and to the finder for contacting the HFSG.

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Antrodia (now *Lentoporia*) *carbonica* showing the blue reaction to Melzer's solution. Photo © Jo Weightman

Reference

Fortey, R. (2013). The poroid *Antrodia carbonica* new to Britain. Field Mycol. 14(3): 77–79.

Hydropodia subalpina, a peculiar agaric in ordinary disguise

Richard Fortey*

In a recent number of Field Mycology Penny Cullington and colleagues reported puzzling species that they assigned to *Hydropus* (though not to any known species) – itself a genus which is not frequently encountered on the average autumnal foray (Cullington, *et al*., 2023). This note records another species that has been referred to this genus, which may present a puzzle to mycologists who have never encountered it before. It took me a while to determine it, not least because it seemed to combine features of several better-known genera, and was not macroscopically striking: not so much a 'little brown mushroom' as a smallish, greyish-brownish one.

This inconspicuous agaric might have been passed by had it not been growing in my own piece of Chiltern woodland. I have been recording all the species from this four-acre patch of ancient, semi-natural beech woodland in south Oxfordshire for the last 12 years, and have described its history and natural history in some detail (Fortey, 2016). It has already yielded some interesting 'firsts' one of which—*Byssosphaeria schiedermayriana*—was described in these pages (Fortey *et al*., 2012). In November, 2022, several small fungi growing next to somewhat decayed, small fallen beech branches attracted attention because they were then about the only species present in the wood: 5–7 centimetres tall, with a bistre-brownish flattened pileus lacking a distinct umbo, and not translucently striate. The slender (< 5 mm), rather even stipe was pale, with longitudinal fibrils and a somewhat strigose base where next to the wood (Fig.1). No conspicuous smell or taste. The white, sinuate lamellae (with many lamellules) had slightly undulating margins, and had a greyish cast to them, which suggested one of the more slender *Lyophyllum* or *Tephrocybe* species at first sight, or possibly the more gracile collybioids in *Gymnopus*. *Mycena* also merited consideration. Since *Lyophyllum* and some *Mycena* species in particular can have distinctive spore shapes a collection was made for microscopic examination.

The white inamyloid spore print was perhaps expected, but what was unexpected was the shape of the spores – distinctly allantoid, often with a well-defined apiculus. No *Mycena* or *Lyophyllum/Tephrocybe* species has spores like these. Being up to 10 µm long they resembled those of no *Gymnopus* species in either size or shape (Fig. 2). The tips of prominent, bottle shaped cheilocystidia (almost *Psathyrella* shape) projected from the hymenium into which they were deeply 'rooted'. When baffled (as I was), leafing through the standard keys to see if a match can be found is a useful recourse, and eventually the *Hydropus* option was lighted upon in *Funga Nordica*. This proved easier than expected because only one species had spores of the right size and shape – *Hydropus subalpinus* – and it keyed out first in the genus, since it was different in several respects from its congeners. It was new to the Fungus Survey of Oxfordshire, which has been surveying for more than thirty years, and had only a handful of other records on the FRDBI: a good find, if not a spectacular one. The species seems to be rather rare in Britain.

The published photographs and drawings of this species show variation in cap colour. Our specimens are darker and greyer than the examples figured by Ludwig (2001) in the first part of his *Pilzkompendium*, which have a distinct yellowish tint, and a similar mushroom is illustrated by Kibby in the second part of his descriptive series (2020). Photographic illustrations in Læssøe and Petersen's (2019) splendid monograph show a paler colour in general though a young fruitbody is even darker than the Oxfordshire material. Given the peculiarities of the microscopic features it seems unlikely that more than one taxon is involved here, and that some variation in cap colour is related to local conditions and moisture levels. Interestingly, Læssøe and Petersen (2019) indicate that *H. subalpinus* is not uncommon in the "nemoral zone"; presumably this applies to continental Europe. An association with beech (*Fagus*) is

always mentioned.

When the voucher of the specimen was sent to Kew, Martyn Ainsworth who kindly drew my attention to a recent paper by Consiglio *et al*. (2021) revising species that had been referred to *Hydropus* using new molecular evidence. It seems that the singular microscopic features of *H. subalpinus* are reflected also in the genomic signature, sufficiently to merit its accommodation in a separate genus *Hydropodia*. This means that the most up-to-date name for my modest find is now *Hydropodia subalpina*. 2022 seems to have been a good year for *Hydropus* and its (new) allies. Penny Cullington tells me (in litt. 2023) that she found *Hydropodia subalpina* also in the adjacent, Buckinghamshire part of the Chiltern Hills, and, like me, had to wrestle with its determination.

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Fig. 1. H*ydropodia subalpina*, formerly in the genus *Hydropus*. Photographs © Richard Fortey.

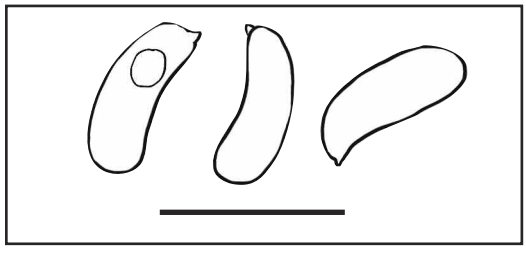

Fig. 2. Allantoid spores of *H. subalpina*. Scale bar = 10 µm.

When *Russula* species crack up…

Penny Cullington*

This article was prompted by the collection of a remarkable *Russula* singleton found at Naphill Common, Buckinghamshire last October during a visit by the Bucks Fungus Group. My granddaughter handed me a brown capped mushroom about 7 cm across found under mixed deciduous trees which stopped me in my tracks (Fig. 1): the genus was not in doubt but its unusual combination of deep brown cap colour and disrupted texture was utterly unfamiliar. A couple of photos were taken and it was set up for a sporeprint at home and after working through the day's finds I was able to give it some time and thought. However, still at a loss I sent the photos to Geoffrey Kibby and Mario Tortelli for help, receiving an interesting reply from MT who had recently come across two *Russula* species having caps with this same unusual tessellated cuticle (i.e. broken up into a patchwork with underlying flesh revealed beneath) He thought it unlikely that the Naphill find was some new exotic species but far more likely that this phenomenon was the result of extreme weather conditions during early autumn. His hypothesis was that the unusually hot dry days followed by sudden sharp falls in temperature had been sufficient to rupture the cap cuticle of these mushrooms, the surface of which then becoming markedly split as they matured and expanded.

I established that the sporeprint was white, then examining the spores in detail realised they were extremely small and rather narrow for the genus, putting me in mind of *Russula heterophylla* – a species having notably small spores. Despite the specimen looking nothing like my concept of that species – one I thought I knew well (see Fig. 2 for a typical example of *R. heterophylla* with green smooth cap) – and bearing in mind MT's suggestion that it might be something quite common, I tried testing the stem and gill

Fig. 1. *Russula heterophylla* showing unusual tessellated cracking of the cuticle. Naphill Common, Bucks, October 2022. Photograph © Penny Cullington.

Fig. 2. The typical greenish form of *R. heterophylla* with uncracked cap and showing its strong $FeSO_4$ reaction. Photograph © Penny Cullington.

surface with a crystal of ferrous sulphate. The instant strong salmon reaction on both surfaces was all the confirmation needed: this surely had to be either *R. vesca* or *R. heterophylla*, the only two UK species to have this $FeSO_4$ reaction, and the small spore size eliminated *R. vesca*.

Checking the cuticle in Cresyl blue, I searched but failed to find not only the 'crins' (long pointed hairs present in the cap cuticle of *R. heterophylla* though far less noticeable than in *R. vesca*) but also other distinctive catenate cells typical of the species. Now feeling somewhat sceptical I assumed three possibilities: 1 - the crins were present but I'd missed them, 2 - they were absent because this was genuinely an unknown species after all, or 3 – something, presumably the extreme weather conditions, had seriously affected the cuticle cells resulting in the cap's odd appearance.

A month later a similar specimen turned up at another Bucks Chiltern site, Turville Heath, under *Tilia*, and this time I made sure a visual record of the $FeSO_4$ crystal reaction was made (Figs. 3 and 4). This was clearly a case to be solved by molecular sequencing, so a sample from the Naphill Common specimen was sent to Eric Janke. Combining with Aberystwyth University—funded in part by a BMS grant—he was able to confirm that the sequence matched *R. heterophylla* 99.7%, thus adding weight to MT's hypothesis and pointing to my observation 3 being the most likely explanation. For more on this topic read the next article in this issue.

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Fig. 3. A second collection of *R. heterophylla* with a cracked cap. Turville Common, November 2022. Photograph © Penny Cullinton.

Fig. 4. The same specimen as in Fig. 3 showing the intense $FeSO_4$ reaction of the gills and stem. Photograph © Penny Cullington.

…Further cracks in the cuticle

Mario Tortelli* & Geoffrey Kibby**

When Penny Cullington told us of her strange *Russula* find with the cracked cap (see previous article) our immediate reaction was "we have some of those too!". This spurred us on to consider the several species which we know to exhibit this phenomenon.

Perhaps the best known is the fairly common *Russula virescens* where the cracking of the cuticle is an important identificatory feature of the species (Fig. 1). Although unusual weather patterns were suggested as a likely cause of the cracking in Penny's collections of *R. heterophylla* this does not seem to be the case in *R. virescens* where the cap seems to crack in all weathers. Most likely the cracking reflects an inherent weakness in the cuticular hyphae resulting in cracking as the cap expands. Examination of the cuticle reveals an abundance of swollen, balloon-like cells subtended with very slender, pointed cells, entirely lacking the interwoven narrow hyphae of many other species and which help to maintain the integrity of the cuticle. This is reminiscent of the similar cellular structure of the cuticle in species of *Agrocybe*, many of which also readily crack.

Russula cutefracta (Fig. 2) is easily confused with *R. virescens* when in its green colour form (it can also be purple). It was described by Cooke in 1881 and although some authors regard it as just an extreme form of *R. cyanoxantha* we regard it as a good, independent species. The cracking here is harder to explain than in *R. virescens* as the cap cuticle is composed of slender, interwoven filiform cells. Along with the type variety it shares the essentially negative or even greenish reaction with $FeSO_4$, making it easy to separate from *R. virescens* which stains pale salmon-pink.

Much rarer, with just three collections in Kew's fungarium, and very easy to confuse with the *R. cutefracta* is *Russula anatina.* This species is usually in shades of greenish grey to sage green, sometimes flushed pinkish lilac or ochre and very frequently becomes tessellated. A good photo can be seen in Sarnari (1998) on page 337. Although its cuticle cells are not as swollen as in *R. virescens* they are appreciably more so than in *R. cyanoxantha*, perhaps explaining their tendency to pull apart forming the fine cracks often seen in *R. anatina*. Its $FeSO_4$ reaction is pinkish rust and its spores are dark cream.

Fig. 1. *Russula virescens* showing its typical tessellated cap surface. Photograph © Mario Tortelli.

Fig. 2. *Russula cyanoxantha* var. *cutefracta* with the outermost layer of the cap cuticle breaking up. Photograph © Geoffrey Kibby.

The three species mentioned above are each in a different groups of *Russula*: sect. *Virescentinae*, sect. *Heterophyllae* subsect. Cyanoxanthinae and sect. *Heterophyllae* subsect. *Griseinae* respectively. but the cracking phenomenon occurs in other sections also.

In section *Tenellae* subsection *Rhodellinae* is found *Russula melzeri* (Fig. 3), a rather rare, diminutive species with a beautiful deep red cap which is minutely tessellated (you may need a hand lens). Found under deciduous trees including beech, hornbeam and sweet chestnut its cuticular hyphae are composed of chains of numerous short cells originating from very swollen basal cells. Rather like those of *R. virescens* this cellular structure appears to facilitate the regular cracking in this species.

Subgenus *Incrustatula* Section *Lilaceinae* is distinguished by its species all possessing fuchsinophile hyphae, i.e. long hyphae which, when treated with carbol fuchsin reveal an outer coating encrusting the hyphae which breaks up into irregular droplets (Fig. 4).

Fig. 3. *Russula melzeri* consistently has a minutely cracked cap. Photo © Geoffrey Kibby.

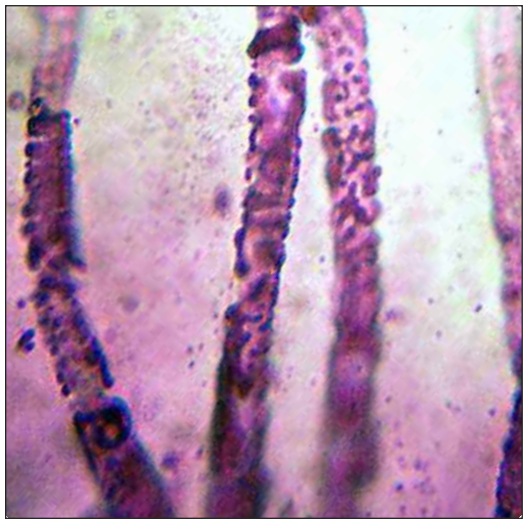

Fig. 4. Fuchsinophile hyphae typical of species in section *Lilaceinae* and all other species of subgenus *Incrustatula*.

One of the more beautiful species in this section is *Russula lilacea* (Fig. 5), a rather rare species of deciduous woodlands, especially under hornbeams (*Carpinus*). It has a faded lilac to pinkish purple, distinctly matt cap surface, which, rather like that of *R. melzeri* is minutely granular-tessellated. Using a hand lens is recommended for these species where the cracking is extremely fine and easily missed. The cuticle of this species is a mixture of filamentous hyphae and the long fuchsinophile hyphae described on p. 52.

It is difficult to understand why this and related species crack so readily, perhaps the hyphae are mostly arranged in a vertical palisade which facilitates their pulling apart. Vertical cross-sections of the cuticle might help to reveal if this is the case.

These are all species which regularly crack but others may do so in unusual weather conditions. Hot weather which dries the cuticle, followed by wet weather which causes rapid swelling of the underlying tissues and subsequent cracking is one probable cause and the authors would be interested in seeing photographs of other species exhibiting unusual cracking.

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Fig. 5. The rare *Russula lilacea* has a matt and minutely cracked cap best observed with a hand lens. Photograph © Mario Tortelli.

Edgcumbe Park - Cornwall's most important waxcap grassland?

Richard Penny*

A short ferry trip across the Tamar from Plymouth brings you to the Cornish coast at Edgcumbe Park- the start point for many a coastal walk. I'd noticed the odd waxcap here and there in passing but it wasn't until virtually falling over a single *Hygrocybe spadicea* waxcap (Fig. 1) in November 2020 (a red data book and Section 41 species, and the first Cornish record for 20 years) that I knew I should take the site more seriously.

The ferry alights on the doorstep of Edgcumbe Country Park, an estate with over 860 acres. This includes a deer park of around 257 acres granted by Henry VIII in 1515, and we can be pretty sure of continuous unimproved pasture ever since (and probably long before) for these fields. In fact the fallow deer still grazing here are the descendants of the original herd. Sheep have also traditionally been grazed, along with regular mowing of grass and bracken, with no use of pesticides.

Waxcap habitat here is predominantly acid grassland with one neutral grassland hay meadow, set amongst woodland and gardens. Beds of Springy Turf-moss (*Rhytidiadelphus squarrosus*), a good indicator for waxcap potential, are frequent and widespread.

Fig. 1. The uncommon *Hygrocybe spadicea* showing its yellow gills which contrast with the date-brown cap. Photograph © Richard Penny.

The north facing slopes of the deer park alongside Maker Church car park are a good convenient place to start. I have noted *Gliophorus psittacinus*, *G. irrigatus*, *Cuphophyllus flavipes, C. fornicatus, C. virginea*, *C. russocoriaceus*, *C. pratensis* (incl. var *pallidus*), *Hygrocybe acutoconica, H. aurantiosplendens, H. cantharellus, H. ceracea, H. chlorophana, H. coccinea, H. conica, H. glutinipes, H. insipida, H. mucronella, H. punicea, H. reidii, H. splendidissima, H. quieta* and *Porpolomopsis calyptriformis*.

In addition are *Ramariopsis robusta*, *Clavulinopsis corniculata*, *C. helvola*, *C. luteoalba*, *Clavaria flavipes*, *C. fumosa*, *C. fragilis*, *C. incarnata*, *Cordyceps militaris*, and earth tongues *Geoglossum fallax*, *G. cookeianum*, and *Trichoglossum hirsutum*.

The waxcap assemblage extends down to the fabulous 'church folly' viewpoint to the north east. The sandstone plateau however is more heavily sheep grazed and is much less species rich. The south facing slopes do hold occasional CHEGD species, and until later in the season, but do not compare in abundance to the north facing. At least that was what I thought until 2 October last year when I unexpectedly came across the stupendous sight of 1000+ *Hygrocybe spadicea* on the south (and SE & SW) facing side, including its very rare var. *albifolia* (Fig. 2), confirmed by waxcap expert David Boertmann. What a start to the season! A great example of how it's so easy to mistakenly assume little of interest, and of the huge value of these ancient grasslands even where botanical diversity (and mossiness) isn't that great. Creeping thistle, white clover and bent grass are frequent in these south facing patches and it isn't an area I would have targeted for a mycological survey.

A field not currently in use as deer park, but part of it historically, known as Barrow Field, holds another good variety of species. The very rare *Gliophorus europerplexus*, associated with old parkland, was found here in 2020 (very

Fig. 2. *Hygrocybe spadicea* var. *albifolia*, possibly the first record in Britain of this rare variety. Photograph © Richard Penny.

annoyingly by my wife, while showing her around). *Hygrocybe spadicea* is also occasional here. Above this is the cricket pitch, a superabundant treasure trove of colourful waxcap species and an amazing colourful spectacle well into December and including frequent *Clavulinopsis umbrinella*, *Clavaria fumosa*, *Porpolomopsis calyptriformis* (the Ballerina waxcap), *Cuphophyllus flavipes*, *H. punicea* and *Gliophorus irrigatus*. The hay meadow, with frequent hay rattle, (*Rhinanthus minor*) holds good numbers of *Porpolomopsis calyptriformis*.

The main house looks out over a tree-lined pasture sweeping down to the Cremyll ferry dock and Plymouth. Although quite heavy footfall and use for various parkland events compromise the slope, there remain frequent waxcaps on the upper slopes but with somewhat less species diversity. However one day the nationally scarce Golden Gilled Bolete, *Phylloporus pelletieri* turned up here (again discovered by my wife!). The garden lawns themselves are also of great interest in places, being frequently cut, again without use of pesticides or fertilisers. CHEGD species are frequent in the lawns, and another highlight last year, while showing the Cornwall Fungus Recording Group around, was the discovery of *Neohygrocybe ovina* (Fig. 3) on a particularly rich, north facing bank.

I have informed Natural England of the importance of the site, and they have visited and plan further surveys. It would be fantastic to utilise the expertise of their Field Unit ecologists to get an "official" CHEGD list.

The JNCC guidelines (2018) for assessing national importance of waxcap grasslands give a threshold for each of 5 different grassland fungi groups, known as the "Waxcap assemblage": Clavarioids (corals and clubs), *Hygrocybe* s.l. (waxcaps), *Entoloma* (pinkgills), Geoglossoids (earth tongues) and Dermolomoids (crazed caps). This is known as the CHEGD list.

The thresholds are C- 7 species, H- 19, E- 15, G- 5, D- 3. Any site meeting 1 or more of these thresholds might be eligible for SSSI notification.

Fig. 3. *Hygrocybe ovina* showing the red staining of the gills and blackening of the fruitbodies. Photo © Richard Penny.

I have to date recorded 13 Clubs and corals (Fig. 4), 26 Waxcap species, 1 Pinkgill (due to lack of Entoloma identification skills rather than lack of species), 3 Earthtongues, and 1 *Dermoloma*, making Edgcumbe already easily of SSSI quality and the best waxcap site known in Cornwall.

So, all in all a fantastic waxcap grassland site with lots of potential for more finds.

List of species recorded

Clavariaceae

Clavulinopsis corniculata
Clavulinopsis umbrinella
Clavaria flavipes
Clavaria fragilis
Clavaria incarnata
Clavaria fumosa
Clavaria luteoalba
Clavaria helvola
Clavaria acuta
Clavulinopsis laeticolor
Clavulina coralloides
Ramariopsis robusta
Ramariopsis subtilis

Hygrophoraceae

Cuphophyllus flavipes
Cuphophyllus fornicata
Cuphophyllus pratensis
(& var *pallidus*)
Cuphophyllus russocoriaceus
Cuphophyllus virgineus
Gliophorus irrigatus
Gliophorus europerplexus
Gliophorus psittacinus
Hygrocybe acutoconica
Hygrocybe aurantiosplendens
Hygrocybe cantharellus
Hygrocybe ceracea
Hygrocybe chlorophana
Hygrocybe coccinea
Hygrocybe conica
Hygrocybe glutinipes
Hygrocybe insipida
Hygrocybe intermedia
Hygrocybe mucronella
Hygrocybe punicea
Hygrocybe quieta
Hygrocybe reidii
Hygrocybe spadicea
(& var. *albifolia*)
Hygrocybe splendidissima
Neohygrocybe ovina
Porpolomopsis calyptriformis

Entolomataceae

Entoloma porphyrophaeum

Geoglossaceae

Geoglossum cookeianum
Geoglossum fallax
Trichoglossum hirsutum

Tricholomataceae

Dermoloma cuneifolium

Boletaceae

Phylloporus pelletieri

Lycoperdaceae

Lycoperdon utriforme

Fig. 4. A selection of the varied club fungi found at the site. Photograph © Richard Penny.

Acknowledgments

My thanks to Pauline Penna and Paul Gainey of Cornwall mycology group for their interest (and microscope confirmation for some *Clavariaceae* and Earth tongues). Sean Cooch, Rob Large and Andy McLay of Natural England for advice on species identification and assessment. Chris Burton and Nick Butcher of Edgcumbe Park management for allowing me access to survey and interest in the results. And of course my wife.

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Galerina esteveraventosii new to Britain

Andy Overall*

On January 2nd 2023 a small, red-brown, gilled mushroom (Fig. 1), was observed fruiting in small groups amongst moss in an open scrubby area, close to the sea, off Winchelsea Beach which is part of the Rye Harbour Nature Reserve in East Sussex.

Having photographed and collected a small number, I obtained a spore deposit, observed the spores and then the cheilocystidia beneath my microscope. The results had me decide that this was most likely the same fungus that I had observed and collected in exactly the same spot back in November 2019. I have seen it during most years since then. That collection was determined at the time as *Galerina tibiicystis* and deposited in the Kew Fungarium. Sequencing/re-examination should occur before that collection is actually redetermined and recurated.

I decided to send the recent collection for DNA sequencing and some months later I was informed by David Harries, who had very kindly offered to recheck my DNA samples and then send them onto the Sanger Lab, Aberystwyth University for sequencing, that the DNA extraction and sample, gave a good barcode sequence and that it was a 99.8% match with that of the holotype of *Galerina esteveraventosii*. This species was recently described in 2021 from the Balearic Islands, Spain and on Farsund in Norway (Siquier *et al.*, 2021).

Galerina esteveraventosii belongs in stirpe *Marginata* and differs from related taxa by having a slender build, a stem which darkens from the base up, a fugacious ring and by spores that are sometimes calyptrate and having a small germ pore, smaller than germ pores found in related taxa of this group. In addition and I think most importantly, this species possesses pleurocystidia (mostly similar to the cheilocystidia) which are absent in most species of *Galerina*.

Unfortunately I neglected to photograph pleurocystidia in my collection, as I wasn't really

Fig. 1. *Galerina esteveraventosii*, in moss at Winchelsea Beach, Rye Nature Reserve, E. Sussex. Photo © Andy Overall.

looking for them, also caulocystidia, which can also be found on other *Galerina* species, which on this species are on the upper half of the stem. So I think a lesson is there to always check, even if a particular genus is known to not have these or other microscopic features.

Details of the Rye Harbour Nat. Res. Collection

Galerina esteveraventosii Siquier, Olariaga, Salom & Høil.

Etymology: named after mycologist Fernando Esteve-Raventós

Overall Habit naucorioid.

Cap 14–25 mm, convex, applanate, dry to lubricous, red-brown when moist, yellow-buff when dry. Margin translucently striate when moist, when very young often with white velar fibrils.

Gills adnate to marginate, initially yellowish brown then ferruginous brown, edge whitish, fimbriate.

Stem 45–55 x 3–5 mm, cylindrical, fistulous in age, initially honey coloured in upper half becoming progressively darker brown to reddish brown or even blackish. Base with white mycelium and adhering plant material. Ring fugacious, often leaving only remnants.

Flesh thin, honey brown to darker brown in lower half.

Smell nothing significant.

Taste not tested.

Microscopic Details

Spores ellipsoid, warty, wrinkled, not or very slightly calyptrate, with small germ pore (7.1)S7.6–8.8(-10.5) x (5.3-)5.6–6.1(-6.7) µm. Strongly dextrinoid in Melzer's reagent, yellow-ochraceous in water (Figs 2 & 3).

Basidia 4-spored with basal clamps.

Cheilocystidia (37-)43–65 × 5.0–9.9(-11.5) µm with long cylindrical neck and broadened base. Neck straight to sinuous with subacute, subcapitate or capitate apices (Fig. 3).

Pleurocystidia not observed but occur in this species. **Caulocystidia** likewise but occur in the upper half of stem.

Habitat: open, mossy, short grass, scrubby area, close to the sea, where various other fungi occur, such as *Agaricus litoralis*, *Lepista saeva* and *Tulostoma brumale*.

Acknowledgements

My thanks to the BMS support for barcoding, David Harries for checking my samples and Caron Evans at the Sanger Lab, Aberystwyth University for the sequencing.

• 27 Fairlight Gardens, Fairlight, Hastings, TN35 4AY

Reference

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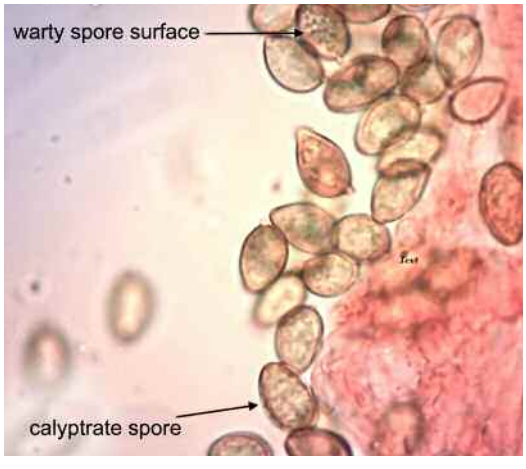

Fig. 2. spores of *G. esterveraventosii*, some of which show the warty surface and others that are calyptrate, i.e. with their outer wall separating away from the inner wall (arrowed). Photo © Andy Overall.

Fig. 3. One spore showing its small germ pore along with a sinuous cheilocystidium. Photo © Andy Overall.

Thaxterogaster monaensis recently described from Anglesey

Charles Aron*

During a recent conversation with Alick Henrici he mentioned *Thaxterogaster monaensis*, newly described from Cae Brych, on Anglesey as a result of sequencing work at Kew, and queried whether I knew anything about it. At first I was mystified, especially as the genus was completely new to me. However, the find was from Cae Brych Forestry, a name I have coined for one of my favourite hunting grounds on Anglesey and the collection was made in 2014 when I was actively collecting there.

This area of conifer plantation is close to Lligwy Woods, visited by the BMS during October 2017. The next step was to trace the find back to a specimen I had sent to Kew. I recalled an exceptionally productive foray I had at the above locality on 22nd November 2014. It was a beautiful morning and fungi were abundant and diverse, unusually so for so late in the year (see Fig. 1). I made a number of interesting finds some of which were unidentifiable *Cortinarius* species. However, there was one small, orangey *Myxacium* that I was reasonably confident about and named *Cortinarius vibratilis*. I had dried this and sent it to Kew with the accession number 3701. I contacted Martyn Ainsworth and he confirmed that this was indeed the specimen that had been sequenced and renamed as *Thaxterogaster monaensis*, new to science and known only from the type locality (see Liimatainen *et al*, 2022a). A brief description of the find is given below, based on the photograph I was able to retrieve (Fig. 2).

Cap 23 mm, broadly umbonate, viscid. Margin slightly striate and crenulated. Brownish orange, paler at the margin.

Stipe 28 x 10 mm, widening downwards, base somewhat radicant. Pallid with a rusty veil zone towards the apex.

Fig. 1. A selection of fungi collected from Cae Brych Forestry, 22/11/2014. *Thaxterogaster monaensis* is in the top right hand corner of the box. Photo © Charles Aron.

The fungus was found in an area of spruce plantation close to a ride, which has been exceptionally productive for all kinds of larger fungi. Intermixed with the spruce there are occasional birches, sallows and beech.

The genus *Thaxterogaster* was erected by the German mycologist, Rolf Singer (1951) to accommodate the secotial fungi, *Thaxterogaster magellanicum* and *T. violaceum*. *Secotium magellanicum* Thaxter was the first species placed in this new genus and hence the genus was named after him.

In their monumental work on *Cortinarius*

(Liimatainen *et al.*, 2022b) *Thaxterogaster* is one of ten genera adopted in their new classification. It contains some taxa that would have formerly been placed in *Myxacium* or *Phlegmacium*.

The original description of *T. monaensis* made from the dried material from 2014 is reproduced below.

"Diagnosis (all characteristics from a dried specimen): Pileus 1 cm diam., brown. Stipe 2–5 cm long, 0·1–0·2 cm thick at the apex, cylindrical. Context not recorded. Universal veil not recorded. Odour not recorded. Basidiospores 7·5–8·5 × 4·5–5·5 µm, somewhat broadly ellipsoid to somewhat broadly amygdaloid, finely verrucose. Basidia 4-spored, hyaline, with hyaline granules/crystals. Lamellar trama hyphae hyaline, with hyaline granules/crystals. Preparation full of hyaline oil drops in 5% KOH. ITS sequence (GenBank OP295482, ex holotype) distinct from other members of *Thaxterogaster* and with less than 98.5% similarity to the closest known species, *T. ultimus*. Ecology and distribution: In mixed forests. So far known from United Kingdom, Wales. Specimen examined: United Kingdom, Wales, Anglesey, Cae-brych Forestry, mixed forest, 22 Nov. 2014, C.E. Aron 3701 (IB isotype). GenBank OP295482. Etymology: This species was named after the locality of the type specimen, Anglesey, which is Ynys Môn in Welsh and comes from the Latin name Mona.

Notes: *Thaxterogaster monaensis* is a small species in *Thaxterogaster* sect. *Vibratiles*. The closely related *T. ultimus* has more amygdaloid and relatively narrower spores, 7·5–9 × 4·5–5 (–5·5) µm".

Fig. 2. *Thaxterogaster monaensis* (bar = 1cm). Photo © Charles Aron.

Acknowledgments

Many thanks to Alick Henrici for alerting me to *Thaxterogaster monaensis* and to Martyn Ainsworth for sending me the type description.

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Mycena dasypus rediscovered after 30 years

Penny Cullington*

This article started out with an entirely different ending planned and was originally entitled '*Mycena pinocchioides* – new to science'. In that form it had reached the stage of being laid out in Field Mycology format, sent to me for checking, also to Alick Henrici and Martyn Ainsworth for a final vetting prior to publication. That was as far as it got…

The story

In October 2017 when visiting Burnham Beeches, the Buckinghamshire Fungus Group explored an area known as The Mire. It was here amongst *Sphagnum* and damp mossy vegetation that I first found good numbers of a small fairly nondescript *Mycena*. Though field characters were unremarkable, at home I soon discovered that the cheilocystidia certainly were not! These were extremely elongated lageniform, swollen at the base but with a long, thin, almost cylindrical lanceolate narrow extension. Though I'd not seen the like of these cells within the genus previously, I hoped that this unusual character would lead to an easy determination. Not so. Nothing I could find in the literature I had available came close – I was none the wiser (Figs 1–5).

A couple of weeks later I attended an informal *Mycena* workshop in the Forest of Dean tutored by Thomas Læssøe, a recognised authority on the genus. I was able to collect fresh samples to show Thomas; however after examining them and checking through both volumes of the Robich (2003, 2016) monograph he also drew a blank. There being no material left worth retaining, it was not until October 2019 when the species reappeared in the same location that my research continued.

In the meantime I had acquired the excellent monograph authored by Aronsen and Læssøe (2016), and in autumn 2019 I decided to email them my latest photos together with the description and recently acquired sequence to ask for their opinion. They responded wondering if I could possibly have been mistaken in assuming that these remarkable cells on the gill edge were cystidia, suggesting that they might instead be the coarse hyphal ends of a parasitic fungus simulating cystidia. Their feeling was that this

Fig. 1. *Mycena dasypus*, Burnham Beeches, Buckinghamshire, October 2017. Photograph © Claudi Soler.

Fig. 2. *M. dasypus*, October 2019. Photograph © Penny Cullington.

Fig. 3. *M. dasypus*, close up of cap showing its sulcate surface. November 2020. Photograph © Penny Cullington.

Mycena, possibly from section *Polyadephia*, was close to the little known *M. dasypus* Maas Geest. & Læssøe, described from Surrey (1992) from similar habitat and also somewhat similar in appearance. Though the apparently scanty holotype material of this rare species held at RBG Kew reportedly had a fungal infection, they doubted if there'd been any attempt to sequence it as yet and that a comparison of the DNA of my Burnham Beeches *Mycena* and the Kew *M. dasypus* might well be a worthwhile exercise. As it turned out this was almost prophetic.

Whilst fully respecting A&L's knowledgeable view that the remarkable cells I was seeing were possibly not true cystidia, I remained convinced that they must be so. The fact that subsequent collections – every autumn from 2019 to 2022 – showed these possibly unique cystidia as a constant feature surely disproved their theory, moreover it seemed unlikely that Læssøe would not have spotted any such fungal contamination on his initial examination of the material in 2017. Two further matching sequences from my collections in 2019 and 2020 were obtained, kindly

prepared and analysed by Eric Janke with Brian Douglas and processed by Aberystwyth University supported by the BMS and City of London Corporation – owner/managers of Burnham Beeches. Neither matched anything on GenBank. The sequences placed the species on its own away from any other published *Mycena* sequence apart from a root associate from an Australian soil sample – not linked to any published species. At this stage no exploration had been made of the Kew material of *M. dasypus*: sequencing work at Kew was stretched to full capacity with a long waiting list limited to prioritised collections – the situation compounded at the time by Covid 19 lockdown issues. I doubted if a request for testing *M. dasypus* then would have met with approval.

Looking at the type description of *M. dasypus* (no image of which existed) yes there appeared to be clear macro similarities between the two species (as indeed there are between many species in this genus) but there were to my mind significant differences. All collections of our Mire species had been found attached to *Sphagnum* whereas *M. dasypus* had been found on twigs/woody debris of *Pinus* and *Quercus*. Yes, both trees grow around the edge of the Mire but in my opinion not near enough to the vicinity of the fungus to be of influence. Then of course there was the issue of those remarkable cystidia mentioned above and not apparently present in *M. dasypus*, but there was an intriguing note below the description explaining how two specimens had apparently been 'invaded by a parasitic fungus whose coarse fungal ends, sticking out on all sides, simulating cheilocystidia and caulocystidia'. Maybe a warning light should have flashed in my mind at this point because this seemed to tally with A&L's initial suggestion that these cells were not cystidia as I thought. Something odd was clearly going on with this mushroom – the similarity between the shape of my cystidia and their observation of possible contamination surely had to be more than a coincidence? Nevertheless, bearing in mind that many species in this genus have very similar microcharacters to each other (and I was still and am still utterly convinced that these cells were and are indeed cystidia) I remained of the opinion that there was no reason why there should not be more than one species having such cystidia and the fact that the specific *Sphagnum* substrate differed from that described for *M. dasypus* for me was sufficient confirmation that this was indeed an undescribed *Mycena*.

So it was that in January 2023, whilst recognising that not all members of this genus had yet been sequenced, I set about preparing to publish with my chosen name, *Mycena pinocchioides*. (Pinocchio was a wooden puppet, the eponymous Disney film character created by the Italian Carlodi. Whenever Pinocchio told lies he found that his nose grew ever longer, the reference to his name being indicative of the remarkable elongated cystidia of this *Mycena* and not of his unfortunate dishonest trait!)

Description of the Burnham Beeches collection

(not "M. pinocchioides" as it turns out but in fact *M. dasypus* now proven).

A rather small nondescript dull whitish *Mycena* found in *Sphagnum* in Burnham Beeches, Buckinghamshire, with amyloid spores and remarkably extended lanceolate cheilocystidia.

Cap 4–10 mm wide, broadly campanulate, sulcate, translucent-striate, glabrous, pale beige at centre with pinkish tinge then gradually dull white towards margin. **Gills** 12–18 reaching the stem, adnate, white, gill edge concolorous. **Stem** 20–80 x 1–2 mm, cylindrical, pruinose at the apex then gradually more glabrous below, white at the apex then gradually darker to grey-brown towards the base where attached to the substrate with white fibrils. **Smell** indistinct. **Taste** not known. **Sporeprint** white.

Basidia 4-spored. **Spores** (7-)8–9(-9.5) x 3–4.5 µm, Q av = 2.3-2.7, pip-shaped, amyloid (Fig. 5). **Cheilocystidia** 50–60(-70) x (9-)10(-11) µm, forming a sterile band, smooth, markedly lageniform, the wider lower section (often with pedicel below it) narrowing abruptly to an elongated to lanceolate extension, occasionally forking, 2 µm wide at the apex. (Occasionally a few secondary pyriform to spherical cystidia were found, 17.5 x 12.5 µm, with short scattered brush cells in top half, Fig. 4. arrowed in red, the 'normal' cheilos of a *Mycena*.) **Pleurocystidia** not seen. **Caulocystidia** present near the stem apex, similar to cheilocystidia.

Habitat gregarious amongst *Sphagnum* and general vegetation in The Mire. Autumn fruiting.

The fly in the ointment

On receiving the draft article to check, Martyn

Fig. 4. Cheilocystidia of *M. dasypus*. Note: the numerous small globules seem to be conidia from an infecting fungus. The real spores are arrowed. Note also the rounded brush-cell arrowed in red. October 2017. Photograph © Penny Cullington.

Fig. 5. Spores of *M. dasypus*. October 2019. Photograph © Penny Cullington.

Ainsworth noticed the tiny conidia-like spores which appeared to be plentiful together with the cystidia (see Fig. 4), these clearly different from the genuine *Mycena* spores seen in Fig. 5 (a few of which are also visible in Fig. 4). Here was possibly further evidence pointing to an infecting fungus and Martyn was rightly concerned that this needed further investigation. It now became critical to obtain a sequence from the Kew collections of *M. dasypus* as this would go some way to clarify the situation. Even if we were unable to resolve the issue over what was apparently infecting the gills or whether the elongated cells were genuine cystidia, it would at least reveal if the sequence from the Burnham Beeches *Mycena* was a match to that of *M. dasypus* or not.

The sequencing of *M. dasypus* collections

The collections were moved to the head of the sequencing queue, the work kindly undertaken by Alona Biketova: the first, (the holotype 1991, Esher Common) consisting of very scant material, the second (the paratype 1991, Epping Forest) consisting of a decapitated stem only, and a third collection (1992, Kew Gardens) which had been identified by Thomas Læssøe. There was a problem. At Alona's first attempt the 1991 collections both failed and the 1992 collection yielded a sequence quite different from that of our *Mycena* but inexplicably matched that of a *Melanotus* / *Deconica*! The mystery deepened!

Martyn then investigated the three collections together with all attached notes etc., concluding that the third collection was "a normal amyloid-spored *Mycena* and not a brown-spored agaric",

that all three collections appeared to be conspecific, and furthermore he discovered mention of some differing opinions over the cystidia prior to the protologue being finally written up – it was clear that Læssøe and Maas Geesteranus favoured the fungal contamination theory, this backed up by the relegation of *M. dasypus* in Læssøe's joint monograph to one of a series of notes on species too poorly known to justify inclusion in the main text, despite the fact that he co-authored the species.

Meantime Alona together with colleague Frances Pitsillides attempted further sequencing using a different method. Two failed yet again but surprisingly a short sequence was at last derived from the headless paratype which proved a 99% match to Janke's sequence of our *Mycena* sp., now held at Kew. Bingo! At last here was proof positive that *Mycena dasypus* had been rediscovered after a thirty year lapse though I will admit that I was sad to see the final nail banged home into poor Pinocchio's coffin.

This story – something of a mycological 'cold case' – is not quite concluded: DNA testing is still ongoing on the three original collections in an attempt to tie up all loose ends, and there remains the mystery of those conidia present in the gill squash of many of my microphotos. I suspect argument over the cystidia will rattle on but I remain convinced that they are the genuine article, remarkable though they be. At least now we have a fuller picture of this intriguing little *Mycena* – one that is apparently unmistakeable when the gill edge and stem are examined and hopefully will now be recognised in more areas (though it is not mentioned in any key). It is so plentiful when it fruits at Burnham Beeches that it's hard to believe it can be that rare, and we now know a bit more about the variety of habitat and substrate in which it might occur.

The moral of the tale

If there be one it is surely that one shouldn't count one's chickens before they hatch. Even more apposite: 'The show isn't over till the fat lady sings!' This particular fat lady was about to sing the praises of *Mycena pinocchioides* from the rooftops and was only just prevented in the nick of time!

Thanks

Many people have played their part in this story and I'm grateful to all of them: Claudi Soler took the first photo in The Mire in 2017 (though he can't recall doing so!). Thomas Læssøe examined the first collection and later together with Arne Aronsen gave valued help and advice. Eric Janke, supported by Brian Douglas, has now prepared three of my collections for sequencing by Aberystwyth University, in turn supported by BMS funding. City of London Corporation and the Burnham Beeches team have supported throughout. Derek Schafer has examined a collection in support of my theory concerning the cystidia. Geoffrey Kibby also examined a collection and has supported in various editing and mycological roles. Finally Martyn Ainsworth together with Alona Biketova and Frances Pitsillides have given expertise and time as well as shown remarkable patience and perseverance. Without their contribution this species might possibly have remained in obscurity.

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Editorial footnote

As this issue was about to go to press Martyn Ainsworth at Kew informed us that a collection by Alick Henrici of a mysterious agaric has now been sequenced and is yet another specimen of *Mycena dasypus*.

It was found by Alick in Kew, growing on buried roots under *Pinus peuce* in November 2020. He at first thought it was a *Mycena*, then changed his mind and suspected it was instead a *Marasmiellus*. His first guess however was correct and he even noted that it had "unusually long cheilocystidia and a hairy stem". The specific epithet *dasypus* means hairy foot and is also derived from a Greek word for a hare.

Readers' Finds

Lactarius aurantiacus

Rice Wood, Kent, October 2022. Photograph © Geoffrey Kibby.

This lovely group was found by Tony Witts in shady, mixed deciduous woodland on calcareous soil. *Lactarius aurantiacus* is a rather infrequent species in Britain and is usually easily distinguished by its bright orange colouration. Its latex is white, unchanging and ± mild to taste. It can have a rather oily or rubbery smell rather like *Lepiota cristata* or *Lactarius quietus*.

This may in fact be a collective species and *L. mitissimus*—which is usually synonymised with it—may be a good species in its own right, several authors regarding them as separate species.

Clitopilus abprunulus

Badgin Wood, Kent, October 2022, Photo © Mario Tortelli

This small area of forest, with large amounts of hornbeam and oak on calcareous soil has produced a number of rarities and some species new to Britain. On this particular occasion, Mario Tortelli, Geoffrey Kibby and Claudi Soler were conducting a survey of the fungi there. A quantity of large specimens of *Clitopilus* were found scattered throughout the woodland. GK was struck both by their size (5-10 cm across) and the odd habitat; he was used to finding the common *C. prunulus* on more acidic soils. Luckily he had recently been made aware of a second species recently described from North Macedonia and with a paratype collection recorded from Norbury Park in Surrey: *C. abprunulus*. It tends to have the stem placed more eccentrically than in *C. prunulus* (see photo opposite), and have caps ranging from distinctly greyish to white. Microscopically the cells of the lamellar trama are noticeably inflated and its spores are slightly smaller than in *C. prunulus*. A specimen was collected for sequencing and the resulting sequence agreed closely with the sequence from the holotype.

Russula nuoljae

Nethy Bridge, Scotland, September 2022, Photo © Mario Tortelli

The two photos above, left and right are, surprisingly, the same species: *R. nuoljae*. This species, recently added to the British list, is a member of the *R. xerampelina* species complex, sharing with other members of that group the dark green reaction to $FeSO_4$ (see the stem of the centre specimen) and the shellfish-like odour which develops as it ages.

Cap colour in many of the species in this complex is almost useless, the same species may range from red to purplish red, dull pink or olivaceous to almost leaf green. Detailed microscopy and if possible sequencing is required to be absolutely sure of what species you have. *R. nuoljae* has turned out to be rather common in this part of Scotland, preferring damp, wet, to almost swampy woodlands with a mix of conifers and birch. It has undoubtedly been identified previously under a variety of names [for example, in my *Russula* book it was mistakenly referred to as *R. gilvescens* – Ed]. Both the above collections were confirmed via sequencing. The species has also been recorded in northern England but it is uncertain how widely distributed the species is in England although field observations suggest it is primarily a northern species.

Thaxterogaster subpurpurascens
Mousells Wood, Buckinghamshire, October 2022
Photograph © Mario Tortelli

Following an organised morning foray at Mousells by the Bucks Fungus Group a small group stayed behind to have lunch and continue searching for fungi. Several small groups of a fairly large '*Cortinarius*' were found under beech on calcareous soil. They were easily placed in the group of species around *C. purpurascens* (now transferred to the genus *Thaxterogaster* as *T. purpurascens*) distinguished by their flesh bruising deep violaceous blue. However, they did not appear to be *T. collocandoides*, the commonest species found in broadleaved woodland in southern England. This is usually darker, more violaceous overall with a clavate and not marginate basal bulb. Nor did they seem to be *T. purpurascens* itself which normally has a quite distinctive marginate bulb and flesh strongly discolouring violet (see FM 16(1): 3–4 for more details on this group). The basal bulb here was only weakly marginate and the interior flesh of the stem stained rather poorly. These features agreed well with *T. subpurpurascens* which up until then was considered as only doubtfully British with only one, unconfirmed specimen in Kew's fungarium collected from under oaks, more likely to be the common *T. collocandoides* which is frequently found with oak.

Specimens were collected and spores later measured as the three species all have slightly different spore sizes and the measurements here agreed with the preliminary diagnosis of *T. subpurpurascens*—cue general excitement all round! The material was dried and sent to Alvalab in Spain for sequencing and the resulting sequence was given to Kare Liimatainen at Kew for comparison with his extensive database of *Cortinarius* sequences. Kare confirmed the identification of *T. subpurpurascens* making this the first British collection backed up by sequenced voucher material.

Notes and Records

Alick Henrici[1]

By the time you are reading these notes the fourth and final volume of your editor's *Mushrooms & Toadstools of Britain and Europe* (Kibby, 2023) will have been published. If you thoughtfully preordered a copy it should already be with you. This is a major milestone in the long and winding road of British fungal recording and it demands acknowledgement.

We are now remarkably well off for fungal identification literature compared to what was available when I took up the subject forty years ago. Then there was really only Lange & Hora (1963) under the title *The Collins Guide to Mushrooms and Toadstools*, the 700 or so species covered therein being all that the general public could be expected to want to know about. Luckily in my case this was very soon followed by the more extensive coverage in Roger Phillips' Mushrooms (1981), followed up by the translation that Phillips commissioned of Moser's keys to Agarics and Boleti, published in 1983. This ruffled a few feathers at the time; the brief species descriptions it gave were considered to risk a general lowering of fungal identification from the days when it was largely the domain of the knowledgable and learned possessors of Kühner & Romagnesi (1953). Incidentally Phillips' preface to Moser pays tribute to Geoffrey Kibby, listed as editor, "whose help and enthusiasm has been a constant inspiration".

By contrast today we have the incomparable FTE = *Fungi of Temperate Europe* (Læssøe & Petersen, 2019) to guide us to a plausible genus for all our more baffling finds. And now a quick flick through the pages of the relevant genus in Kibby usually reveals only a few plausible candidates. With luck a slide showing spores and cystidia will eliminate most of these. The knowledge that almost every known British agaric is in there somewhere lends support to the view that identification should be easy. We all know it doesn't quite work like that, but at least it's easier than it used to be. And I can't be the only one constantly turning to the Kibby books for species I know perfectly well but whose names I have forgotten, or remember only the names they had ten years ago.

Much more about *Hydropus*

The last issue of FM contained a very interesting article (Cullington *et al*., 2023) on the attempt to track down a *Hydropus* species. In this issue another *Hydropus* is discussed (by Richard Fortey, see p.47) under its new name *Hydropodia subalpina*. The earlier article provides a good illustration of where the DNA revolution has got to, and how much further it still has to travel before any area of fungal taxonomy settles down.

When the checklist (CBIB, 2005) came out it listed four British *Hydropus* species. All are illustrated in Kibby Vol.2 and three of them also in FTE. There has also been one alien (*H. sphaerosporus*) identified from a single collection in the Kew Palm House. Treatment in CBIB followed Watling & Turnbull (1998). Before then Orton had followed Kühner in treating *Hydropus* as a section of *Mycena*. He wrote (Orton, 1988) that the blackening type species *Hydropus fuliginarius* appeared worthy of generic rank, but having never seen this "I am not prepared to pronounce finally on the stature or scope of *Hydropus*". This was in a paper reporting *H. trichoderma* new to Britain following a Surrey collection in 1982. Singer however had already raised Kühner's section to a genus in 1948 and by the fourth (1986) edition of his *Agaricales* had listed over a hundred species there, mostly tropical or southern temperate, and nearly all describe by Singer himself.

The following is a summary of the four currently recognised British species, for simplicity all here listed in *Hydropus*, as by Læssøe in *Funga Nordica*, where eight species are recognised, though he remarks that "the genus is in all likelihood polyphyletic", with the phylogeny awaiting investigation of its "huge tropical diversity":

• *H. floccipes* is by some way the least uncommon of the four species with 40+ collections in K, mostly from southern England, about half of these contributed by Nick Legon, who also contributed a 'profile' of this species to *The Mycologist* (Pegler & Legon, 2001). As Fortey notes, it is easily identified (once you've got to *Hydropus*) by the unusual spore shape. Once more I praise FTE, not only for presenting a

'wheel' (p.176) displaying the range of choice for mycenoid genera, but also for actually including on the wheel a drawing of what is clearly a spore of this very species.

• *H. subalpinus* and *H. scabripes* are clearly quite uncommon with only around 15 collections each in K (though possibly under-recorded from looking too like *Mycena* and thus difficult).

• *H. trichoderma* is much less securely known in Britain. There are only two collections in K, and there is a footnote in FN suggesting it is part of a complex with *H. scabripes*: occasional awkward intermediates are sometimes found. Curiously Watling and Gregory place this species alone in a section *Hydropus* and the other three all in a section *Floccipes*.

• There are also four collections in K merely listed as *Hydropus* sp. awaiting further investigation, though they may have to wait a long time. Two of these are clearly conspecific, collected a week apart and ten miles apart in Kent, one by me and one by Mariko Parslow who sent hers to an acknowledged expert (Vladimir Antonin), to whom it was also unfamiliar.

What the DNA now shows

Readers are urged to look back at the phylogenetic tree presented by Cullington *et al*. on p.9 of the last issue of FN which they may not have examined in detail if at all. Firstly it shows that even just the European species are spread over at least five different species-level clades. Secondly, as the authors stress, their new unnamed species is clearly the only British one with a good claim to be a genuine *Hydropus* species. Thirdly at least four of the sequenced collections included in this tree have clearly been wrongly named, sitting far from the others so named. The genus *Mycopan*, already used in Kibby Vol.2 for *H. scabripes* of CBIB, shows up in a tight group of seven collections near the top of the tree (with *H. trichoderma* close by as expected). But the only collection named as *Mycopan scabripes*, sitting snugly in the middle of the *Hydropus sensu stricto* clade, has clearly been misidentified.

The tree also shows that a species *H. moserianus*, described by Bas from Dutch dunes and listed in *Funga Nordica* only from Norway, has also been found in Japan with exactly matching DNA. There is clearly much more to be learnt about *Hydropus*. It also shows that all the new genera are clearly necessary. If the former broad *Hydropus* were to be maintained it would have to also include *Clitocybula*, a genus that for many now includes *Megacollybia* (see below). From now on we should be using not only *Mycopan* (as by Kibby) and *Hydropodia* (as by Fortey), but also

Fig. 1. *Megacollybia platyphylla*, a contender for the agaric placed in the most genera. Photograph © Mario Tortelli.

Pseudohydropus for *H. floccipes*.

Further notes on the effects of the DNA revolution

I mentioned above the rather obscure genus *Clitocybula*, intruding among the various species assigned to *Hydropus*. The checklist claims there is a single collection in K of *C. lacerata*, the type and only species of the genus to have ever been recorded in Britain. Also an illustration by Cooke. I have my doubts. These could well have been optimistic misidentifications of *Clitocybe* species. DNA shows it to be close to (congeneric with?) *Megacollybia*. Indeed *Funga Nordica* reduces that familiar genus to a synonym of *Clitocybula*, though it is retained by both Kibby and FTE [Following the phylogenetic study by Antonin *et al*. (2019) – Ed.]. The very well known *M. platyphylla* has always been a problem for taxonomists. Without citing all the details I assure readers that in date order undoubtedly eminent mycologists have also assigned this unfortunate species to the following: *Agaricus*, *Collybia*, *Marasmius*, *Lyophyllum*, *Tricholoma*, *Tricholomopsis*, *Gymnopus*, *Oudemansiella* and indeed *Hydropus* itself. Most of the details are listed in CBIB, and all in *Index Fungorum*, except that by Kühner to *Hydropus*, which failed as he omitted to cite the basionym. Readers who collect an interesting mushroom in good condition and still have no idea what genus it belongs to can take comfort. Maybe eventually DNA will have it all sorted. Meanwhile they are in good company!

How many books do I need?

Some thoughts provoked by being given a single small agaric to identify, collected last year on 12 March uner a pine, thought to have come from a cone, but not examined microscopically. Should be easy. All the books give variants of the same story: just four species to consider: three *Strobilurus* in Spring, one *Baeospora* in Autumn. One of the *Strobilurus* is only on *Picea*, the two on *Pinus* are clearly distinguished by the shape of the cystidia. I made a slide which revealed large numbers of 'extraordinarily small' spores (so described by Watling in the British Fungus Flora Vol.8). So it was in fact *Baeospora myosura*.

I amused myself by looking up this species in all my books that cover it, 12 of them, surely too many. One has no seasonal information. Nearly all find space to mention the possible confusion with *Strobilurus* and their Spring/Autumn difference. None allow Autumn to extend to March. Two just say 'autumn', one rashly adds 'not as early as Spring'. One getting nearer has 'late summer, autumn and early winter'. The two that come nearest are Kühner & Romagnesi 'Oct.–Feb.' and Phillips 'autumn to late winter'. Distribution is generally agreed to be 'widespread', but frequency runs in British texts from 'never common' to 'fairly common' while FTE has 'common' and the Swiss book 'rare'.

Most note that the cones are often buried. Some books only mention *Pinus* as a host. While this is the commonest, there is no need to get excited by finds on other hosts. In Kew Gardens I have also found it under *Picea*, *Cedrus* and *Tsuga* (helped by the identificaion labels). Only one of my 12 sources (the Dutch F.A.N. Vol.4) records that is also known 'very rarely' on wood rather than cones.

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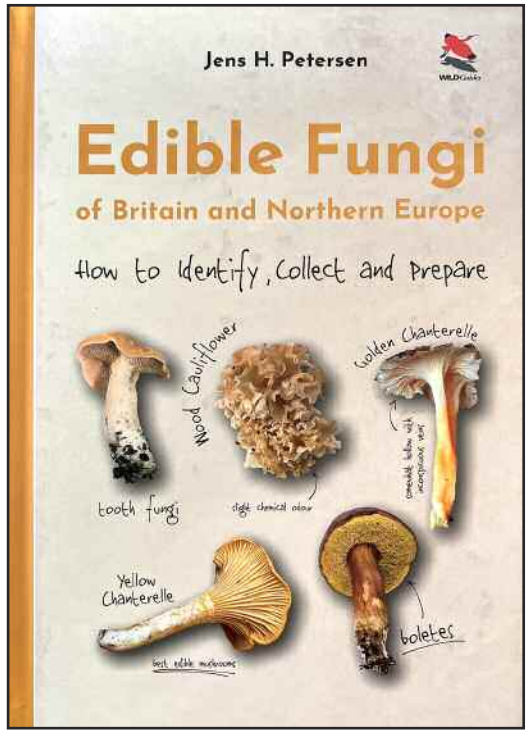
New Books

Edible Fungi of Britain and Northern Europe

Jens H. Petersen, 2023
Princeton University Press
ISBN: 978-0-691-24519-5
List price is £17.95 but usually available at around £14.95 from book dealers
153 pp. 25 x 18 cm



This book is a translation of a Danish original and is by one of the authors of the well known 2-volume *Fungi of Temperate Europe* reviewed in FM 21(1). The quality of text, photography and mycological knowledge shown in those volumes has been carried over into this book.

It begins with an introduction to fungi in general; what they are, how they live and their rôle in the ecosystem. It goes on to discuss and illustrate different habitats and has a useful chart of when to find some of the more important edible species, although in these times of global warming fungi in Britain seem to be ever more unreliable in their fruiting.

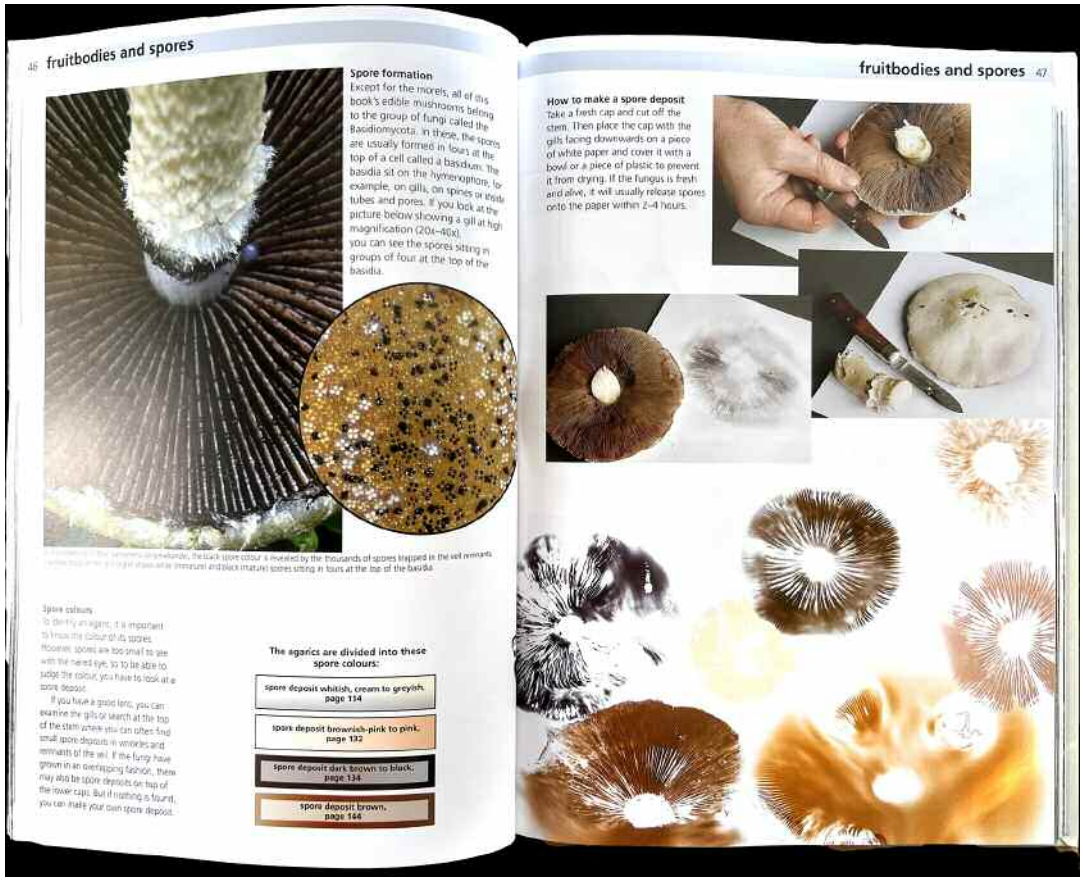
There is then a very essential chapter on poisonous fungi with their important key characters illustrated along with some excellent guidelines on collecting and avoiding problems. The British Mycological Society's Code of Conduct is presented along with mention of the laws around endangered species - both of which any aspiring mycophagist would be well advised to become aquainted with.

Basic collecting equipment and collecting techniques are covered, along with methods of preparation and cooking, with some suggested recipes. Preserving and drying fungi is also discussed and illustrated.

There is a beautifully illustrated section on fruitbodies and spores with a stunning close up photo of a tiny *Mycena* where even the individual hyphae forming its stem are visible!

The book continues with chapters on the various groups of fungi: morels, polypores, boletes, agarics, etc, with the most popular edibles. These are often compared with any toxic lookalikes, usually with enlarged details of essential characteristics.

The range of species covered is quite extensive and includes species which are perhaps not so



familiar as edibles to British readers such as *Lactarius torminosus*. Although a fiercely acrid species when uncooked it is a popular edible in Eastern Europe when salted and then cooked. The method for salting fungi is given on p.41.

There is a general, pictorial key to the primary mushroom groups and even the inside covers are utilised. The inside front provides a quick illustrated guide to the groups as well as a visual glossary, while the inside back cover gives lists of species found in particular habitats along with a 'mini index' of where in the book to find them. A fuller index is of course also provided.

As is common with many mushroom guides some basic colour symbols are used to indicate edibility, toxicity, whether they are really good edibles or just acceptable, etc.

Jens is well known for his beautiful photographs of fungi and every page here is a demonstration of his skill and artistry. The mix of beautiful in situ photos along with close up photos of individual fruitbodies and often macro shots of smaller characters all help to ensure a correct identification. The layout of the book is a lesson in clarity, presenting information in a clear, concise and helpful manner. Notes on poisonous species are presented in bold red text to highlight their dangers and to rapidly draw the attention of the reader.

The book represents excellent value even at its full price but even more so at the reduced price available from most online book dealers. If you are thinking of venturing into the world of eating wild fungi then you could not pick a more informative and well illustrated guide.

Geoffrey Kibby

Field Mycology

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