North Eastern Fungus Study Group

Newsletter No 111 - Winter 2023

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NEXT ISSUE: The deadline for articles for the Spring newsletter is 26th April 2024
All contributions will be gratefully received!

Forthcoming Events

We have left more days available to allow for Pop Ups and requests from other organisations.

FORAY PROGRAMME 2024

(Pop up forays are to be encouraged , especially out of the September to early November main season .)
Meet at 10:30am for an 11.00 am start unless otherwise stated .

Sunday April 28th – Pow Hill, Derwent Reservoir.

Meet in the small car park at GR NZ007515. Just past the entrance road to the park. We will be looking for lichens and any fungi that are about. Red squirrels might be a bonus.
Tel: Jo Scott, 07413939729

Sun Sep 1st Mike Cruse Jesmond Dene , Newcastle
Sat Sep 7th Alan Simkins Lowna , nr Gillamoor , NYMNP
Sat Sep 14th Val Standen Chapman's Well , Lanchester

Thur Sep 19th- Sun Sep 22nd Grantown on Spey (3 nights)

Sun Sep 29th Doug McCutcheon Nenthead

Sat Oct 5th – Sun Oct 6th UKFD (Northern area probably Morpeth again or another town with foray site within walkable distance .) tbc

Thur Oct 10th – Mon Oct 14th Cortinarius Study Days (4 nights) tbc

Sat Oct 19th Alan Simkins Joint foray DWT Gateshead area tbc
Sat Oct 26th Val Standen Joint foray Durham University, Durham
Sat Nov 2nd Alan Simkins Cropton Forest
Sun Nov 3rd Rhona Sutherland Ryedale area tba
Sat Nov 9th Sally Pattison Seahouses tbc

POP UP FORAYS

In previous years we have had a number of forays from April to August that have been productive.

We thought it would be a good idea to leave this period for Pop Up forays. If you are out and about and find some interesting fungi that you think the group would like to see, arrange a Pop Up foray, give a couple of days or more notice.

Send me the details , mikecruse@live.com , and I will circulate to the whole group. There may be someone not living near the site who might fancy coming.

It could be just a morning, afternoon or full day, midweek or weekend. Choose your start time, whether to bring a packed lunch or not, parking arrangements etc.

I am happy to do the recording on CATE2, whether I attend or not, provided you supply the information below.

Fungi
Grid Ref for the site
Ecosystem (Mixed Woodland , Grassland etc .)
Associated Organism (Which plant , tree) if known
Medium (Grass , Litter , Soil , Stump , Fallen branch / log etc.)

Good Foraying .

Mike Cruse

So You Thought That You Knew All About Fomes Fomentarius?

We have grown up (in NEFSG terms) learning that the two big bracket fungi found on dead- dying birch trunks are either Piptoporus betulinus or Fomes fomentarius (the Hoof Fungus because it resembles the shape of a horse hoof).

Books say it is mainly seen on birch but can be found on other deciduous trees, although I had never seen it on any other trees than birch in the UK.

Fast forward to our 2023 visit to the Odenwald in Germany and I was fascinated to see several Fomes fomentarius growing on dead beech trunks -more commonly than on birch it seemed. In discussion with Bernhard he confirmed that Beech is a common substrate host for Fomes fomentarius in Germany.

Bernhard then described recent (last four years) research in Europe and some further afield eg Asia, Russia, Americas which has concluded that there are at least two and possibly more Fomes species present in Europe:

- Fomes fomentarius – in boreal or temperate habitats – usually on beech or birch substrates–larger pores(27-30 pores per centimetre)–larger spores basidiospores of 12-18 x 4-7 microns).
- Fomes inzengae–in southern, Mediterranean latitudes in Europe (but also recorded in the United Kingdom!) – on oak, sweet chestnut, hornbeam, poplar substrates – smallerpores(32-40 pores per centimetre) –smaller spores (bsidiosporesof10-12x 3.0-3.5 microns).

So should we use this new in formation to check out our commonly found (assumed) Fomes fomentarius? I suppose that there is no harm in doing so but the likelihood is that Fomes inzengae will not tolerate our UK climate. But there is always global warming to throw a spanner in the works.

P.S.If any one would like to see the detailed work on the above Bernhard sent me a copy of the relevant papers – so I can circulate it further.

Alan Simkins

Fungi in amber forests
of northern Europe

Hans Halbwachs*

Abstract

Around 24–47 million years ago (hereafter Ma), during the Oligocene/Eocene epochs, vast forests existed in the Baltic and Bitterfeld (Germany) areas, which were a cradle of huge amber deposits. So-called amber trees produced copious amounts of resin, which often entombed a great diversity of organisms, predominantly insects. Under rare circumstances, fungi or fungal material also got preserved in the hardening material, which is often washed up along the Baltic coasts or is harvested industrially in Kaliningrad.

Most amberised fungi are small ascomycetes. Only a few macrofungi have so far been recovered. Interestingly, lichens proliferated mainly during the Oligocene and Eocene (ca. 23–43 Ma). The causes are probably multifarious and include favourable climates and diversely structured habitats. It remains to be seen whether more fungi will turn up in amber to close obvious gaps in fossil records.

Keywords

Fossils, Ascomycota, Basidiomycota, Lichens, Baltic, Bitterfeld, Oligocene, Eocene

Amber forests?

People may have heard of the 'Amber Room' in St. Petersburg, but who is familiar with 'Amber Forests'? Amber is known as a precious stone and many will know that it sometimes contains insect inclusions (Fig. 1).

Fig. 1. Minute insect inclusions in amber. Image by Brocken Inaglory (cc) [images tagged with (cc) have been made available through Creative Commons licensing - see Appendix].

Humans have used amber for at least 40,000 years (Upper Palaeolithic), for instance as jewellery, e.g. a find ascribed to the Neanderthal people from Isturitz in the French Pyrenees (Szmidt *et al.*, 2010). Moreover, molten amber has possibly been used as glue (Koller *et al.*, 2001). Above all, amber from the Baltic sea coasts have been traded in Europe, the Near East and Asia since prehistoric times (Palavestra *et al.*, 2006). During antiquity, philosophers became interested in plant and animal inclusions (King, 2006). Pliny the Elder was already on the right track about the true origin of amber: not petrified lynx urine, as was believed by some during these times, but "resinous matter produced by pine-like trees in northerly regions" (Denso, 1764–1765).

Amber also occurs in many other locations worldwide (Fig. 2) and originated from various deciduous trees and conifers (Krumbiegel and Krumbiegel, 1994).

The map includes copal deposits, a young amber. Young because the process to become true amber requires ten thousands to millions of years (Penney and Preziosi, 2010). Some deposits contain huge amber quantities. e.g., up to 400 tons per year of Baltic amber dating from the Eocene/Oligocene (24–47 Ma) were mined on the Samland peninsula close to Kaliningrad/Russia (en.wikipedia.org/wiki/Baltic_amber). Only vast amber forests produce such loads. These forests are characterised by their geological situation and the taxonomy of entrapped organisms. The Baltic and also the Bitterfeld (Thuringia/Germany) amber forests probably proliferated in areas rich in water with a warm

*Conservation and Research Department, Bavarian Forest National Park, Grafenau/Germany, hans.waxcap@online.de

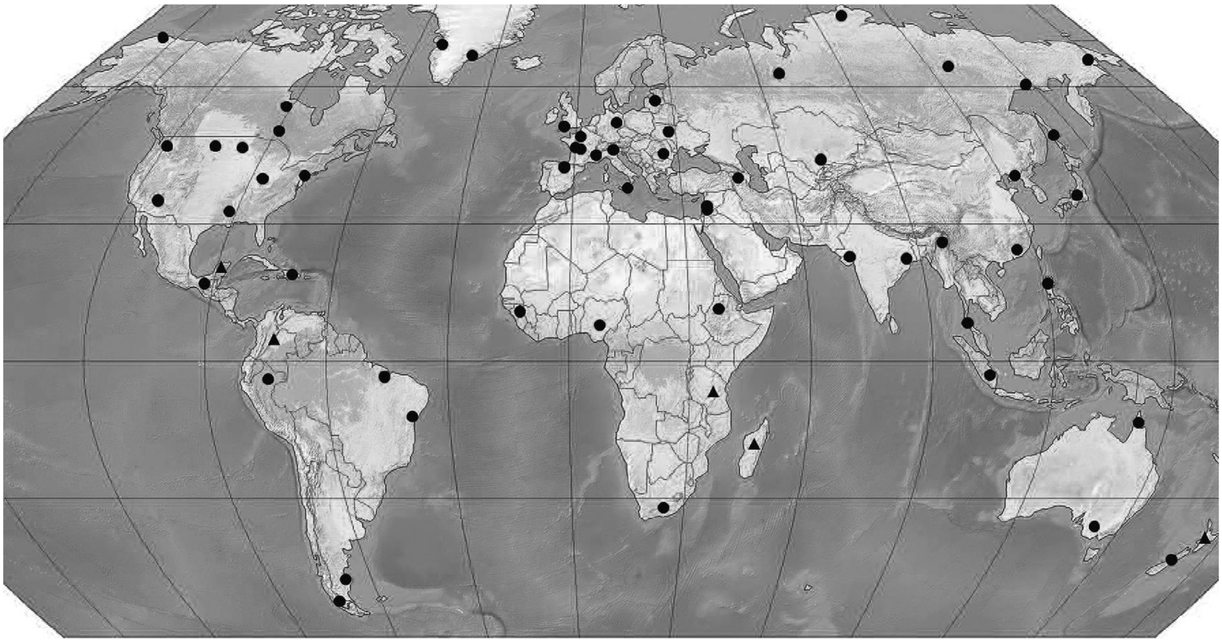

Fig. 2. Worldwide deposits of amber (•) and copal (▲). Sources Krumbiegel and Krumbiegel (1994), Gomez *et al*. (2002); World map: Ktrinko (cc).

and humid climate, as inclusions of non-biting midges (*Chironomidae*) would suggest (Schlee and Glöckner, 1978) (Fig. 3).

Fig. 3. Everglades/Florida: this is how one may picture the Baltic and Bitterfeld amber forests; historical photograph of 1972, Fred Ward (cc).

Although the amber forests in the Samland and Bitterfeld grew during the same time window (Palaeogene), morphological and physicochemical investigations suggest that the amber-producing trees were not the same (Wolfe *et al.*, 2016). The Baltic amber trees are attributed to the five-needled pine family (Dolezych *et al.*, 2011), resembling the extant *Pinus strobus* (Weymouth pine) (Fig. 4A), while the Bitterfeld counterpart was probably an umbrella-pine (Wolfe *et al.*, 2016), like *Sciadopitys verticillata* from Japan (Fig. 4B).

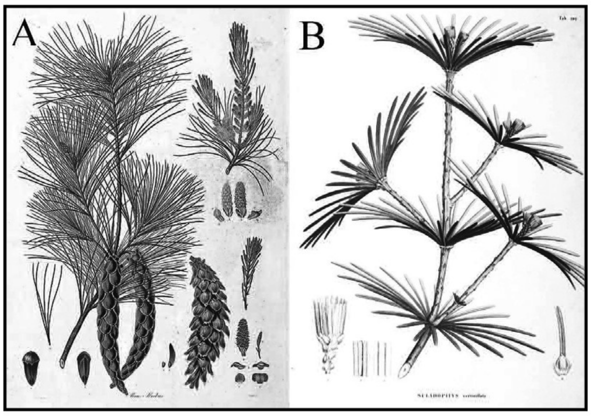

Fig. 4. A – *Pinus strobus* (engraving by Aylmer Bourke Lambert 1761-1842); B - *Sciadopitys verticillata* (lithograph by Philipp Franz von Siebold 1870).

Amber may not only contain insects, but also bacteria, protozoans, nematodes, plant fragments including pollen, more rarely molluscs, amphibia, reptiles, bird feathers, mammalian hairs, and, indeed, sometimes fungi (Poinar Jr, 1992). The latter must have been abundant when considering that fungus gnats are the third most common trophic group in Baltic amber (Weitschat and Wichard, 1998). Be it a gnat, tree pollen or fungi, the next section reveals how organisms end up in amber.

Inclusions

There are two basic mechanisms by which inclusions are, in most cases, formed. Fresh resin flow is a fairly sticky business; everything that lands

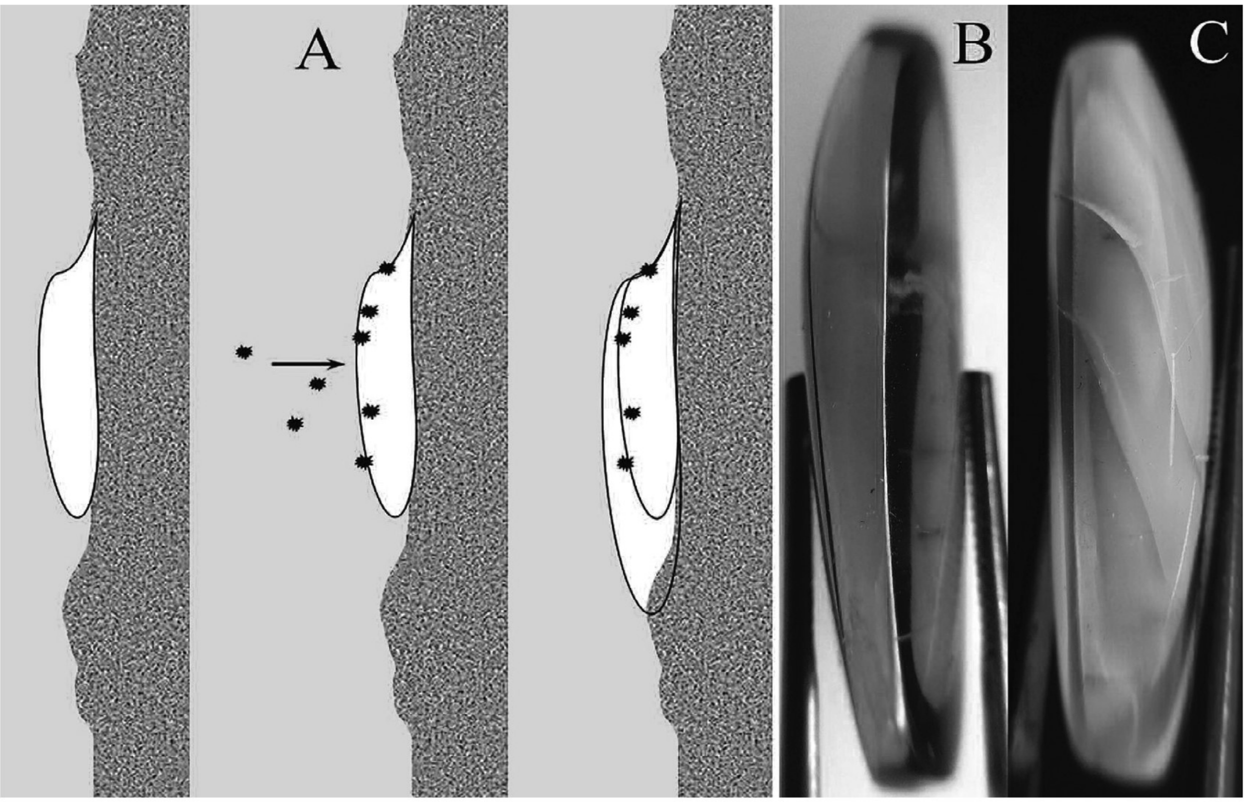

Fig. 5. A – A resinous tear appears, aerial plankton gets stuck and succeeding resin tears engulfs the particle; B – Polished amber; C – The same piece under UV-light, the layers become visible (images by the author).

on it will be trapped. However, resin does not flow steadily but rather in pulses, so that biological matter is entrapped in resin layers (Krumbiegel and Krumbiegel, 1994) (Fig. 5, 6).

Another cause of entrapment involves copious quantities of highly fluid resin that runs down

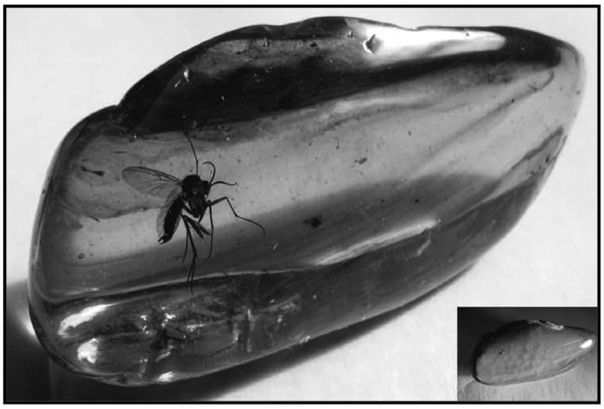

Fig. 6. A fungus gnat (*Mycetophilidae*), included in polished Baltic amber. Inset: shows the same specimes under UV-light, demonstrating the typical fluorescence of true amber. Image: Zacharie Grossen (cc).

the tree trunk or trickles to the ground. In this way, the resin can fill up cavities and entrap incidentally present biological material, including fungi (Penney and Green, 2010).

Most inclusions are not readily and clearly visible. With smaller inclusions, e.g. in the case of microfungi, searching is quite cumbersome and requires a technical approach. Amber is usually covered by a weathered crust which needs to be removed first in order to see anything. At least one side of the raw amber is ground, e.g. with abrasive paper or is ‘drummed’, which requires a rotary drum in which amber samples are superficially smoothed using wood pieces and abrasives (www.ambertop.de/trommeln.html). Both methods permit an optical inspection. Given that something interesting is detected, the amber pieces then need to be polished and, if microscopic investigations are required, cut into thin slices in advance. Often, samples are brittle and need to be embedded at first in synthetic resin (Penney and Green, 2010). Microfossils (pollen, spores, conidia, etc.) can be isolated with less effort with solvents and embedded in a resinous medium on microscopic slides (Halbwachs, 2019a).

All this appears to be overly demanding, but the effort now and then pays off, as the next section will show.

Fungi in amber

Unfortunately, even larger fungi are mostly short-lived and anything but robust. The chances of ending up as amber inclusion are rather slim, because sufficient resin quantities need to be exuded during a short time period (decomposition quickly sets in!) (Labandeira, 2014). An additional bottleneck is the fact that resin production is most proliferous at the beginning of the growing season (Labandeira, 2014), while most macrofungi tend to fructify towards the end of the season, even in subtropical forests (Chacón and Guzmán, 1995). Microfungi seem to be better off, particularly ascomycetes (Fig. 7)

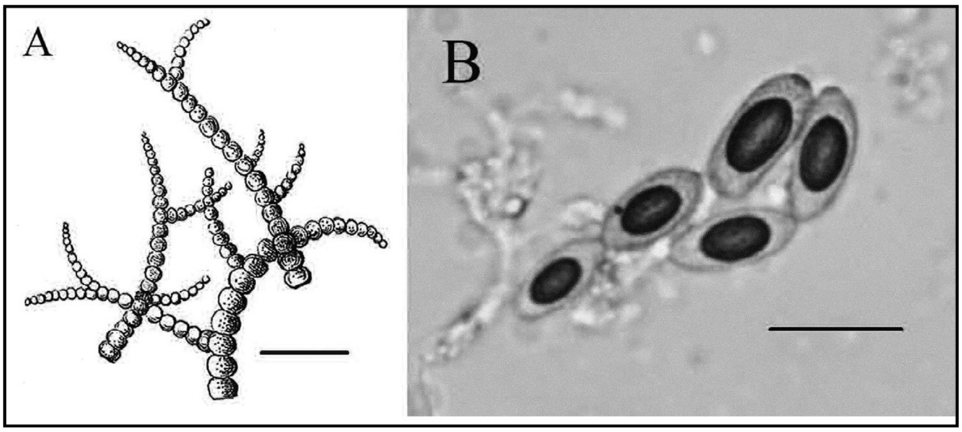

Fig. 7. A – A sooty mould, described in the 19th century as *Sphaerophorus moniliformis* (Menge, 1858), later on identified as *Capnodium* sp. (Schmidt *et al.*, 2013), Baltic Miocene (37–45 Ma), bar = 50 µm; B – Ascospores in Baltic amber (*Pezizaceae*?), image by Author, bar = 10 µm.

In a first comparison between Bitterfeld and Baltic amber, the latter turned out to be richer in fungal diversity (Table 1).

Table 1. Comparison of major fungal groups that have been found in amber of the Palaeogene in northern Europe, to date (Halbwachs, 2019b).

Group	Baltic	Bitterfeld
Ascomycetes	20	6
Basidiomycetes	10	0
Lichens	81	97

This result will have to be substantiated in a follow-up study using a larger sample size. Still, the explosive diversification of lichens during the Palaeogene in northern Europe is remarkable (Halbwachs, 2019b) (Fig. 8).

What caused the extreme proliferation is not known in detail. In the only slightly younger Dominican amber (Miocene, 15–20 Ma), this phenomenon is not observed. It may be due to a climate effect (Halbwachs, 2019b). The amber forests in northern Europe spread under temperate-subtropical conditions, whereas the Dominican ones were characterised by a humid tropical climate. Moreover, the habitat in northern Europe had been decidedly more diverse in terms of vegetation density, a circumstance that fosters lichen diversity (Divakar *et al.*, 2015). A complementary factor is probably the coarse bark structure of the amber trees in northern Europe which promotes lichen colonisation considerably better than the smooth bark of Dominican trees (Halbwachs, 2019b; Masuch, 1993). One may assume that, finally, the combination of such factors may have led to the remarkable lichen diversity in Baltic and Bitterfeld amber.

The climatic conditions must also have been favourable for larger fungi. Still, as already explained above, such finds are exceedingly rare. Two examples are depicted in Fig. 9.

Perspective

The Baltic still yields hundreds of tons of amber, enough reason to believe that more fungal species could be detected at any time. However, most amber inclusions are selected for profit, be it for the jewellery industry or private collectors who do not belong to scientific networks. This is certainly a reason why fungal specimens get lost, especially because only clearly discernible organisms are of interest for the market. Most fungi, I suspect, are simply not recognised.

Hopefully, some readers have now taken an interest in amberised fungi. As far as I know, there are amber deposits on the Isle of Wight (Alum Bay) (Nicholas *et al.*, 1993) and Hastings (Sussex) (Brasier *et al.*, 2009). In addition, amber is often found on the beaches of Suffolk („The Amber Coast", see www.visit-aldeburgh.co.uk/blog/the-amber-coast/) which stems from the

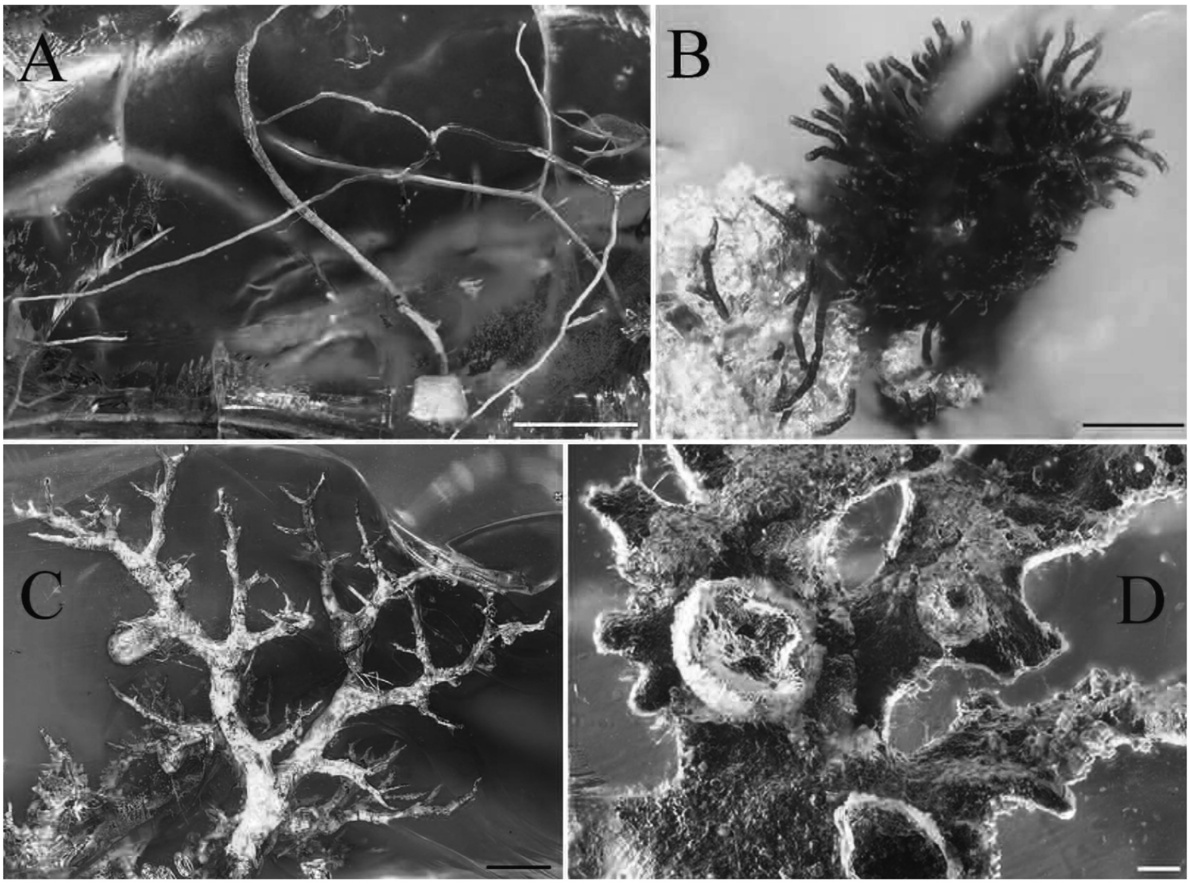

Fig. 8. A – A beard lichen (*Parmeliaceae*), Bitterfeld, Kaasalainen *et al*. (2015), (cc), bar 1 mm; B – Crustose lichen with fruit bodies, c.f. *Taeniolella*, Bitterfeld, Kettunen *et al*. (2016), Cambridge University Press licence no. 4587581396605, bar = 100 µm; C – A fruticose lichen (*Lecanoromycetidae*), Baltic, Kaasalainen *et al.* (2017), Springer licence no. 4587561053948, bar = 1 mm; D – Foliose lichen (*Lecanoromycetidae*), Baltic, Hartl *et al*. (2015), (cc), bar = 200 µm.

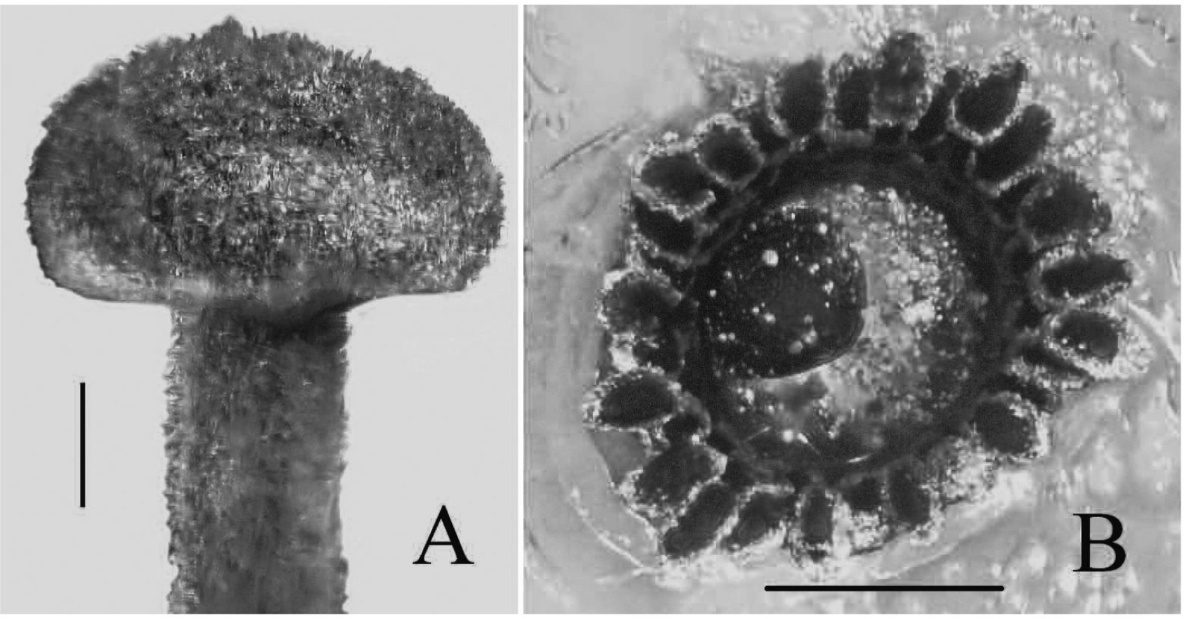

Fig. 9. A - *Gerontomyces lepidotus*, Baltic, bar = 1 mm; B - *Nidula baltica*, Baltic, both in Poinar Jr (2016), bar = 400 µm; images courtesy of George Poinar.

Baltic deposits. I am confident that more deposits exist in the UK, especially in the context of brown coal occurrences, for instance, in Ireland (Briggs, 1997). I gladly offer sample treatment and microscopical preparations in my lab, as far as my capacities allow (for free, of course).

Acknowledgement

I am grateful to Carsten Gröhn (Glinde/Germany) for expert advice.

Appendix

This article is the English version of 'Pilze in Bernsteinwäldern Nordeuropas', published by the German Mycological Society, spring 2020.

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The use of odours in the identification of mushrooms and toadstools

Tony Boniface*

Research published in 2014 (Bushdid *et al.*) established that humans can detect 1 trillion odours. The human genome contains approximately 400 functional olfactory receptor genes each of which codes for a specific olfactory receptor protein, which can combine with the compound causing the odour. Eventually the combination of an odorant molecule and its olfactory receptors results in the initiation of a nerve impulse which is then registered as an odour.

The sense of smell of different humans varies considerably from no sense at all to a very acute sense for many different odours.

A common difficulty that faces anyone trying to aid the identification of a fungus lies in the necessity to describe the smell of a fungal fruiting body with a recognisable odour. Helpful choices of well-known smells are usually required to enable the correct identification of the fungus in question.

An example: based on their smells the genus *Agaricus* contains two main groups. The smell in one group is described as almonds (marzipan) or aniseed. My nose detects a distinct difference between these two odours, aniseed being the smell of certain boiled sweets whereas almond resembles marzipan. However many people seem to be unable to distinguish between them.

Once you have identified a species such as *Clitocybe odora* by its characteristic blue-green colour then remember its smell. To me it is definitely almond as are the Horse Mushroom *Agaricus arvensis*, the Prince *Agaricus augustus* and the Wood Mushroom *Agaricus silvicola*. The second group of *Agaricus* species has a phenolic smell, which is fine for people with experience of chemistry but otherwise it might better be described as the smell of the disinfectant Lysol or failing that, try sniffing a bottle of ink. This odour can be detected in *Agaricus* species such as the Yellow Stainer *Agaricus xanthodermus*, which is a valuable observation to avoid a potential bout of sickness after eating it.

A third, less distinctive group includes *Agaricus bernardii* smelling of urine which is usually easily recognised, but you would need to be a biologist working with these animals or the owner of pet mice to recognise the Mousepee Pinkgill, *Entoloma incanum* which, as its name suggests smells strongly of mouse pee—once found an experience never forgotten!

You may not be familiar wih the smell of horse urine in stables but it is one of the characters used by some to identify *Inocybe haemacta* in the field. This genus contains a number of smelly toadstools ranging from spermatic (semen) in *I. rimosa*, honey in *I. cookei* var. *cookei*, almond in *I. hirtella*, ripe pears in *I. fraudans* and *I. bongardii* and rotting flesh in *I. appendiculata*, also described as the smell of wet cement; a resemblance that I have not yet detected! Also, the familiar smell of the leaves of the scarlet bedding plants, correctly called *Pelargonium* not Geraniums, in *I. obscurobadia* and *I. pelargonium*, as well as the smell of dried Ceps or Penny Bun in *Inocybe maculata*.

Sometimes identifying a toadstool first from other characters, and then noting its smell is the best way to remember it, for instance a farinaceous odour, which is the smell of the Miller, *Clitopilus prunulus* and a Knight, *Tricholoma ustaloides*. The smell of these toadstools is variously described as mealy, freshly ground flour, wet flour, just flour or even bread.

The genus *Amanita* includes some species with interesting smells. The False Deathcap, *Amanita citrina*, is easily recognised by its smell of raw potato or of freshly-dug potatoes, whereas the Deathcap, *A. phalloides* and the Destroying Angel, *A. virosa*, both deadly poisonous, smell sickly sweet like over-ripe honey. I raided our larder to find an old jar of crystallised honey, which did indeed smell sickly sweet, but consulting the internet produced a multitude of descriptive terms for the smell of honey, none of which referred to the over-ripe variety. Continuing with the Amanitas, *Amanita solitaria* also called

*40 Pentland Avenue, Chelmsford, Essex CM1 4AZ

Amanita echinocephala is described as smelling of old ham or chloride of lime. With no ageing ham in our fridge I could not determine the difference between the smell of fresh and old ham but chloride of lime is used as bleaching powder. It is made by treating slaked lime with chlorine to produce calcium hypochlorite Ca(ClO)2, which decomposes to release the gas chlorine whose smell chemists will recognise. In the home the smell of fresh sterilizing fluid for babies' bottles will provide a comparison for the toadstool's smell. Chlorine is also the smell of many swimming pools. Another chemical term is nitrous, which describes the smell of *Mycena leptocephala*. This resembles nitric acid, which is not present in any household products and cannot be made safely in the home so without access to a chemistry laboratory the smell cannot be checked, so the nearest I can suggest is the smell of chlorine. *Hygrocybe nitrata* is another species with a nitrous smell.

Other Mycenas have characteristic smells such as iodoform found in *Mycena filopes* and *M. arcangeliana* amongst others (Fig. 1). This is more noticeable if the fruiting bodies are kept in a small box for a short time. The smell of iodoform can be detected when a few drops of a solution of iodine in alcohol are added to a small crystal of washing soda followed by a little hot water. This smell can also be detected at the base of the stipe in *Russula turci* as it is with *Hemileccinum impolitum*, a bolete.

Vegetable smells are frequently found for instance in *Mycena rosea*, the Rosy Bonnet and *Mycena pura*, the Lilac Bonnet, which both smell strongly of radishes when these vegetables are cut. Many of the Poisonpies, *Hebeloma* species, smell of radishes, but *Hebeloma sacchariolens* and its allies have a strong, sweet smell. This has been compared to burnt sugar but my experiment to test this did not support this suggestion. It has also been compared with the flowers of Bird Cherry *Prunus padus*, but my botany books describe the smell of these flowers as of almonds, which to my nose is nothing like Sweet Poisonpie. Once smelt however it is never forgotten! [Editor's note: another suggestion is that of old fashioned window putty which is rather closer to the smell]. Another *Hebeloma* is *H. laterinum*, which to me smells strongly of chocolate. Some books compare its smell to the dessert 'poires belle Helène'. My wife prepared this dish of pears, vanilla ice cream and chocolate sauce for me to test and enjoy which also smelt of chocolate.

The Cucumber Cap, *Macrocystidia cucumis*, to me smells exactly like putty, but is otherwise compared to cucumber sandwiches or cod liver oil.

The Milkcap, *Lactarius semisanguifluus* is said to smell of carrots, which I have yet to confirm. Other Milkcaps have distinct odours. *Lactarius glyciosmus*, The Coconut Milkcap lives up to its name. *Lactarius citriolens* is said to smell of lemons when old. *Lactarius camphoratus*, the Curry Milkcap has the expected smell at least on drying, but I have found that *Lactarius helvus* smells much more strongly of curry. It is called the Fenugreek Milkcap so I bought a pot of Fenugreek and found that I could not detect any difference between it and curry!

One difficult odour is that given for *Lactarius quietus*, the Oakbug Milkcap, which it is claimed smells of bedbugs. Otherwise, oily or wet laundry is a more helpful suggestion. *Lactarius volemus* is distinguished by its fishy smell more specifically shellfish according to some authorities.

Some toadstools smell of garlic such as *Marasmius alliaceus*, the Garlic parachute, as does the waxcap *Hygrocybe helobia* especially after keeping it enclosed for a while.

Others smell of rotten cabbages, especially *Gymnopus brassicolens*, the Cabbage Parachute, as does *Marasmiellus foetidus*, the Foetid Parachute. Another unpleasant example is *Clitocybe* (now *Singerocybe*) *phaeophthalma*, the Chicken Run Funnel, which smells of wet feathers; useful if you keep chickens! *Leucocybe* (formerly *Clitocybe*) *houghtonii* when crushed smells of tomato leaves (see back cover). The Magpie Inkcap, *Coprinopsis picaceus* smells of faeces or surprisingly sometimes naphthalene, which was at one time used to make mothballs. This seems an unlikely alternative odour as I have never smelt naphthalene in the loo!

Some of the Russulas can be identified with the help of their smell: the very common *Russula atropurpurea* smells fruity, like apples, *R. fragrantissima* of aniseed or almonds to some, *R. adusta*, the Winecork Brittlegill, of sherry or old wine casks, *R. maculata* of cedarwood pencil shavings, *R. fellea* and *R. pelargonia* of *Pelargonium* leaves, although *R. fellea* is also reminiscent of stewed apples. *Russula* *pseudoaffinis* has the smell of semen described as spermatic, *R. silvestris smells* of desiccated coconut. *Russula xerampelina* is one of a group of Brittlegills smelling of old shrimps or crabmeat, *Russula foetens* is rancid or oily and *Russula amoenolens* smells of Camembert cheese.

The Aromatic Pinkgill, *Entoloma pleopodium* smells of pear drops, amyl acetate, bananas or nail varnish remover, while *Entoloma ameides* is said to smell of pear drops or bubblegum.

The Knights include *Tricholoma sulphureum* the Sulphur Knight smelling of the original coal gas and *Tricholoma saponaceum* the Soapy Knight, but which perfume of soap I have yet to discover. *Lepista irina*, the Flowery Blewit is reputed to be strongly perfumed. *Clitocybe nebularis* the Clouded Funnel has to me a similarly perfumed smell.

Cortinarius traganus smells of acetylene gas or of male goats.

Identification of some Waxcaps is aided by detecting their smells. *Hygrocybe russocoriacea*, the Cedarwood Waxcap is described as smelling of Russian Leather, an odour few people could have experienced but more helpfully compared with cedarwood pencil shavings or Sandalwood; once experienced it is easily recognised. *Hygrocybe laeta* the Heath Waxcap smells distinctly of burnt rubber and *Hygrocybe reidii* the Honey Waxcap is suitably named especially when the base of the stipe is squashed. Finally *Hygrophorus eburneus* the Ivory Woodwax resembles Mandarin oranges, whereas *Hygrophorus cossus*, the Goat Moth Woodwax, smells of Goat Moth caterpillars (a pleasant, almost floral or citrus odour).

Some fungi smell like dimethyl trisulphide, i.e. carrion, or of skatole (faeces) which attracts blowflies. These are the Common Stinkhorn, Dog Stinkhorn, the Red Cage fungus and the Devil's Fingers, *Phallus impudicus*, *Mutinus caninus*, *Clathrus ruber* and *Clathrus archeri* respectively.

It is very unlikely that these smells confer any selective advantage so they must be the result of some chemistry within the fungus of unknown function. Having written this comment I have suddenly remembered that some fungi have smells that attract animals to help disperse their spores. Truffles produce androstenol, similar to a male pig's sex hormone, which attracts female pigs to dig up their underground fruiting bodies. Having a multitude of names describing their smell is a characteristic of truffles so that choosing the most accurate term was impossible.

Reference

Bushdid, C., Magnasco,M.O., Vosshall, L.B. & Keller, A. (2014). Humans can discriminate more than 1 trillion olfactory stimuli. *Science* 343 (6177): 1370–1372.

Fig. 1. *Mycena arcangeliana*, sometimes darker than seen here, one of a number of species with a subtle odour, in this instance that of iodoform (especially detectable when kept for a while in a closed container). Photograph © Mario Tortelli.

When giant fungi (or lichens?) ruled the world - the latest discovery about *Prototaxites*

When the first fossils were found in 1859 of giant columnar growths, dating from the Late Silurian to Late Devonian—approximately 420–370 million years ago—they were so similar to tree trunks that they were named *Prototaxites* (*Taxus* are our living Yew trees). The fossil columns were up to 8.8 m tall and 1.37 m in diameter and have been found at numerous sites around the world.

It soon became obvious however that they were not trees; life on land at that time consisted mainly of algae, primitive liverworts and a few small, early plants. Theories were put forward that they might be giant algae, fungi or lichens.

In a paper in *Geology* (C.K. Boyce *et al.*, 2007) the different carbon isotopes in the fossils were analysed and found to be very different from those found in photosynthetic plants of the same period but were instead what would be expected from non-photosynthetic fungi (see see Kibby, 2008 for more details of this research). The characteristic concentric circles seen in cross-sections of the fossils suggested sporadic growth spurts by means of additional external layers, somewhat analagous to the annual growth layers of pores in many polypores today. Also, the internal tubular structures were of two sorts, thick-walled 'skeletal' tubes and thinner-walled filaments. These thinner tubes have perforate septa, a character associated with red algae and fungi. Root-like structures have been interpreted as extensive rhizomorphs to both support the organism and to possibly transport nutrients across large distances.

More recently a theory was advanced (Graham *et al.*, 2010) that they might actually be formed of mats of liverworts rolled up into columns by wind or water, many however found the idea hard to believe.

But now, in a paper by Honeggar *et al.*, 2008, a specimen from the Rhynie chert in Scotland with the surface structures almost intact was examined using a laser-scanning confocal microscope and autoflourescence techniques. The surface layer was revealed to consist of a layer of polyspored asci packed out with vertical paraphyses, the asci being inoperculate, opening with a split and lacking basal croziers.

So *Prototaxites* appears to be an enormous, basal ascomycete fungus. Just how the fungus supported its huge size and how it obtained sufficient nutrition remain mysteries still to be solved. It is possible that it may have formed an association with photosynthetic algae or cyanobacteria although this remains unproven.

What is clear is that the world at this very early period was dominated by these huge and as yet still enigmatic organisms.

Editor

[My impression of what *Prototaxites* looked like can be seen on the back cover of FM 9(2)]

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Boyce, K.C. *et al.* (2007). Devonian landscape heterogeneity recorded by a giant fungus. *Geology* 35(5): 399–402.

Graham, L.E. *et al.* (2010). Structural, physiological, and stable carbon isotopic evidence that the enigmatic Paleozoic fossil *Prototaxites* formed from rolled liverwort mats. *American J. Botany* 97(2): 268–275.

Honnegger, R. *et al.* (2018). Fertile *Prototaxites taiti*: a basal ascomycete with inoperculate, polysporous asci lacking croziers. *Philosophical transactions of the Royal Society of London, B* 373: 20170146.

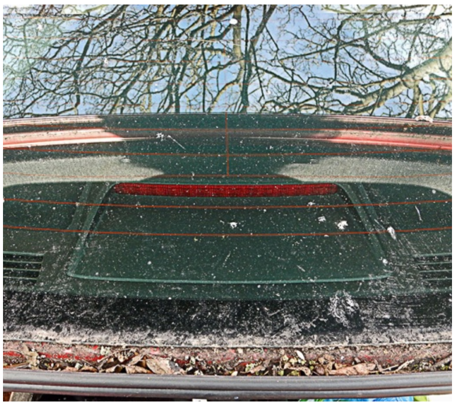
Kibby, G. (2008). An ancient mystery solved? *Field Mycology* 9(2): 48.

doi:10.1016/j.fldmyc.2019.09.008

And the prize for the most novel specimen box goes to - Keith Tulip!

Slime moulds are hard to find and supposedly don't travel well - but Keith found that if you park under damp Sycamore for long enough, they come to you; appear to thrive in the car boot trim, *and* travel to the AGM!

Physarum auriscalpum seems to be the likely ID – the microscopy +the calcareous scales on the peridium are concentrated on the upper surface, leaving the base nearly limeless seems to me to be the clincher. It's on bark but also on herbaceous – so could include bark lichens. Seen growing among a lichen Xanthoria parietina.

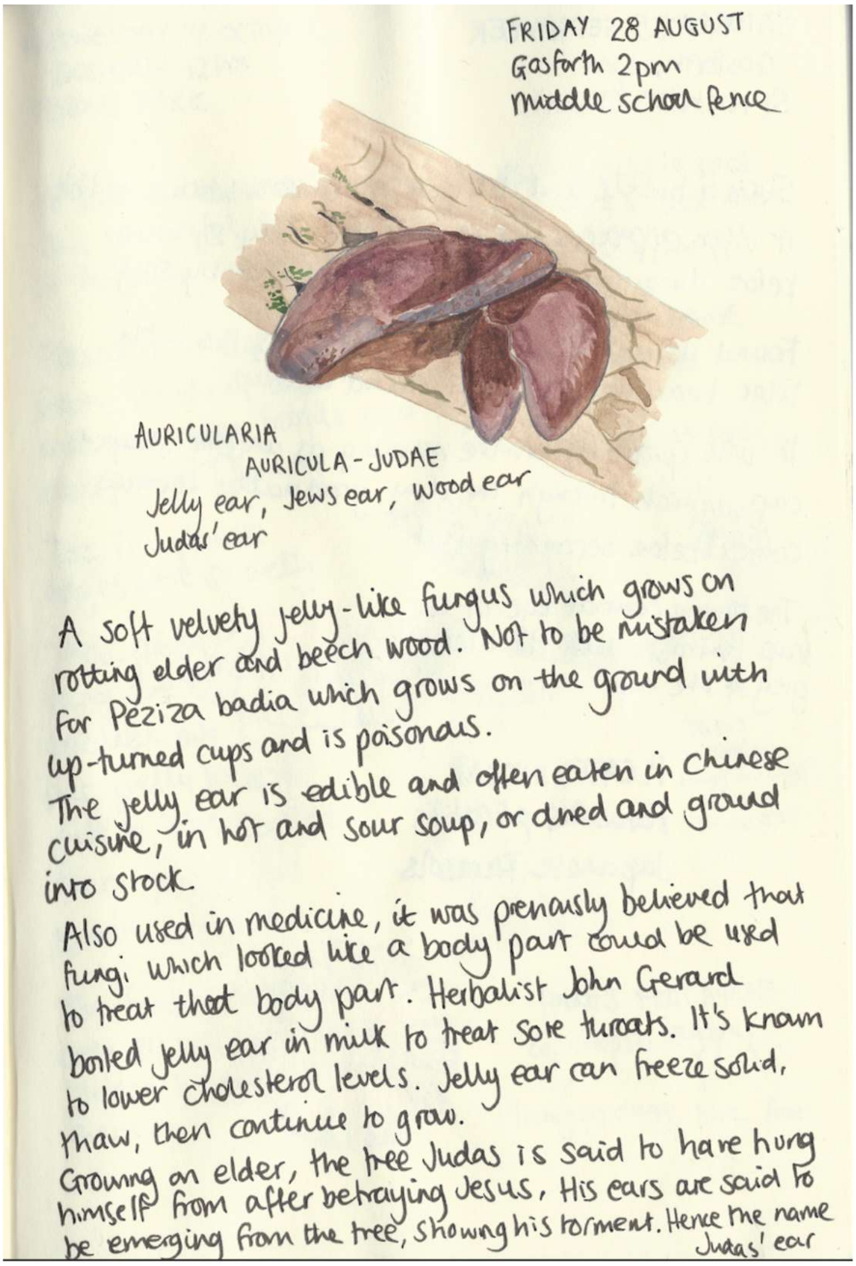


Jill Cunningham

An Introduction

I'm a new member of NEFSG and looking forward to meeting some of you in a future gathering. I thought it might be nice to contribute to the newsletter by introducing myself.

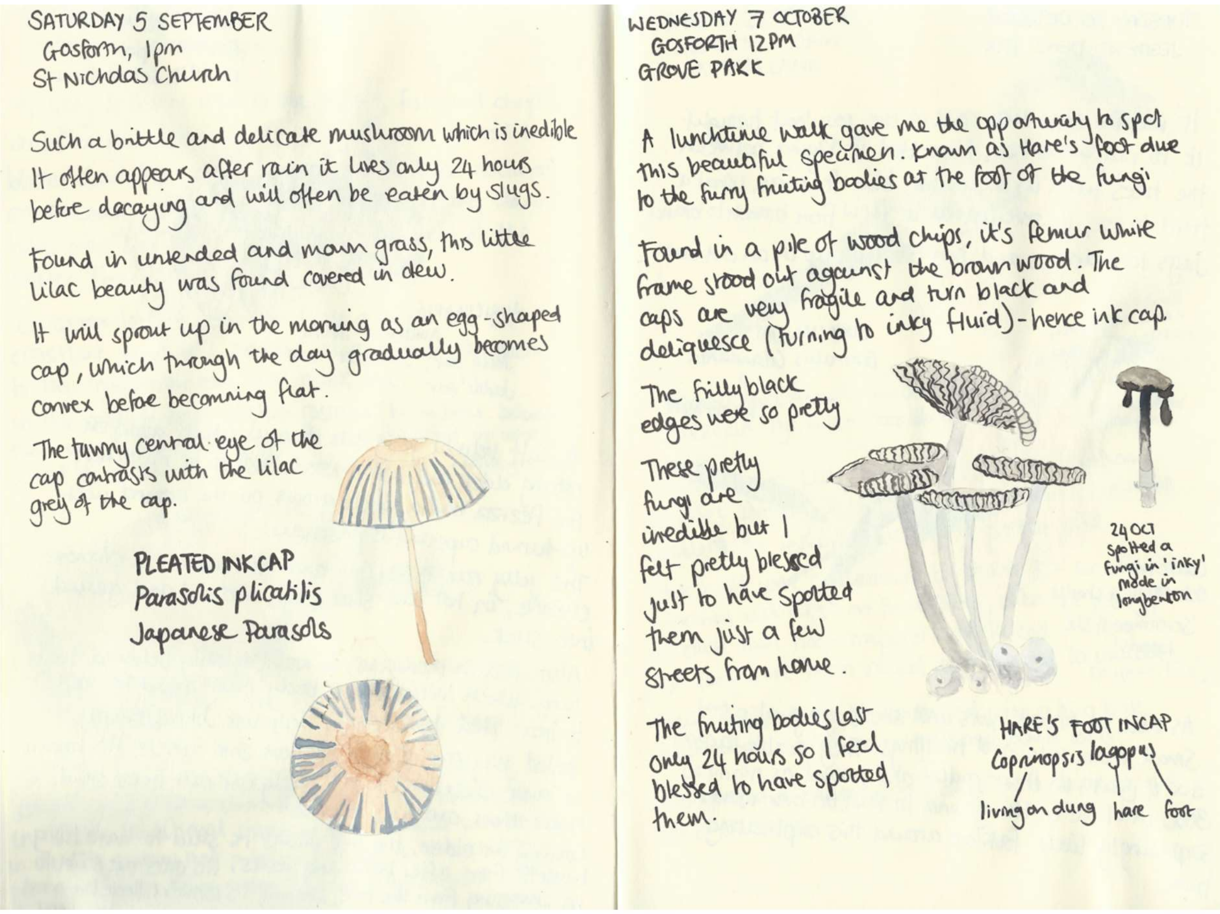
I'm Helen and I live in South Gosforth, Newcastle with my husband and three children. I've always been interested in nature and was always thrilled to find a toadstool on a walk, but my love for fungi really started to flourish in late 2019 when I started a nature journal. It was amazing how many different species could be found in the streets and green spaces of my own neighbourhood.


FRIDAY 28 AUGUST
Gosforth 2pm
middle school fence

AURICULARIA
AURICULA-JUDAE
Jelly ear, Jews ear, Wood ear
Judas' ear

A soft velvety jelly-like fungus which grows on rotting elder and beech wood. Not to be mistaken for Peziza badia which grows on the ground with up-turned cups and is poisonous.
The jelly ear is edible and often eaten in Chinese cuisine, in hot and sour soup, or dried and ground into stock.
Also used in medicine, it was previously believed that fungi which looked like a body part could be used to treat that body part. Herbalist John Gerard boiled jelly ear in milk to treat sore throats. It's known to lower cholesterol levels. Jelly ear can freeze solid, thaw, then continue to grow.
Growing on elder, the tree Judas is said to have hung himself from after betraying Jesus, His ears are said to be emerging from the tree, showing his torment. Hence the name Judas' ear

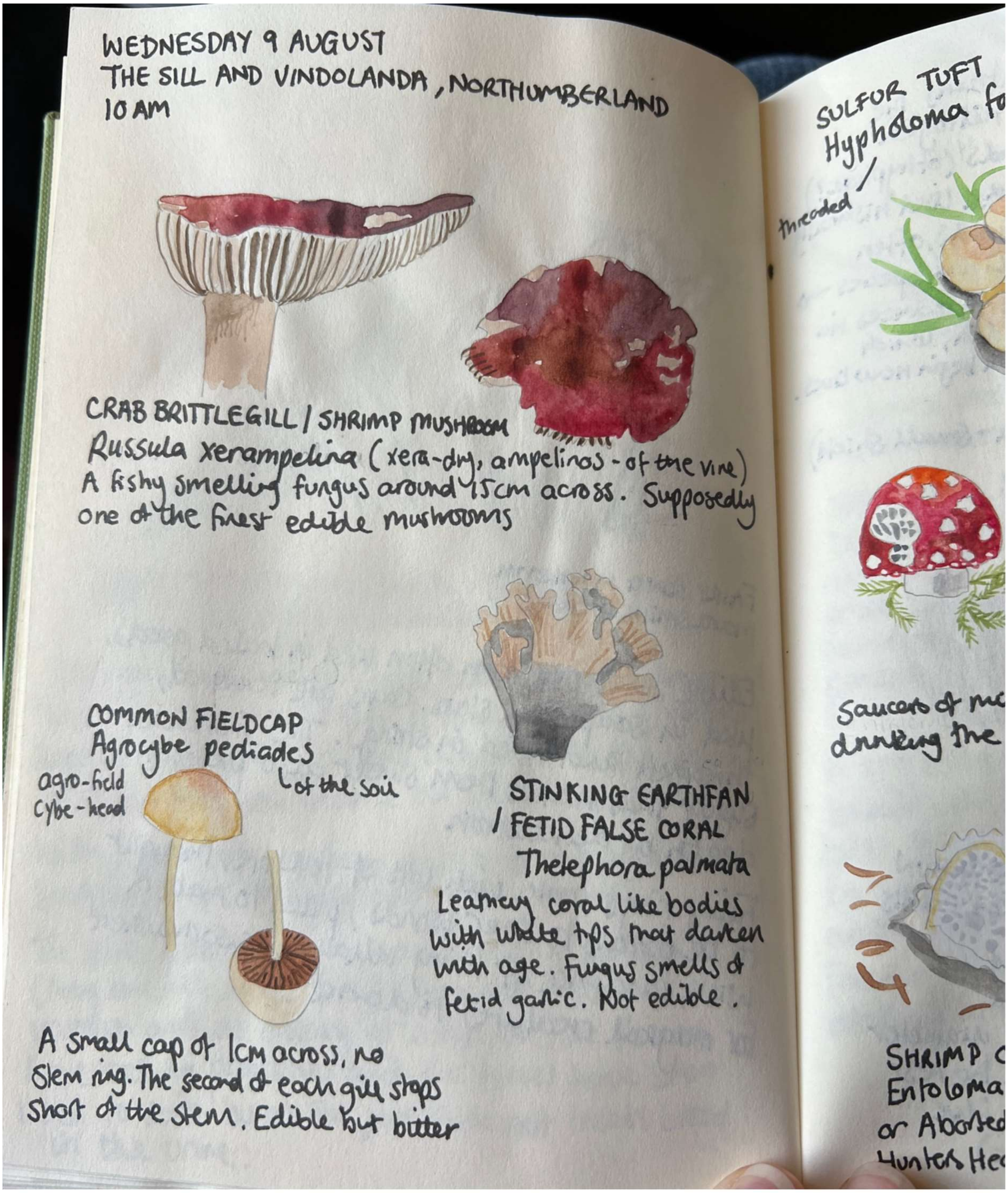
Little did I know then that my journal would become an important focus a few months later on our government-approved daily walks during the pandemic lockdowns and a thing which would be important for my wellbeing. I enjoyed slowing down and noticing the plants, fungi, trees, and animals in nearby streets, painting them in my journal, looking up their names and finding out about them online. I particularly like to know how they earned their names and if there is any folklore associated with them. I wouldn't describe myself as superstitious, but I do carry around a conker in the winter to ward off colds and as a family we always stand in the centre of a fairy-ring, hold hands, close our eyes and make a wish together (!)



In the first few weeks of the pandemic, my children and I had spotted a wide range of fungi including Velvet Shanks, False Turkey Tail, Candy Cap, Parrot Waxcap and Oak Mazegill Fungi, all within five minute's walk of our house. The children became adept at spotting the fungi-friendly environments of mossy corners, rotting wood and woodland floors and looking for mushrooms helped to make the same neighbourhood walks interesting rather than monotonous. It was interesting to see how even individual fruiting bodies evolve over a few days, especially the stick ink caps.

A few months into the pandemic I was made redundant from my job of 22 years in the tech industry, I decided to go back to university and started a one-year MA degree in multidisciplinary innovation. “What has this to do with fungi?” I hear you ask! Well, my final thesis explored how people can work together for social innovation – to make positive changes in the world. I found it hard to explain the slow and hidden work involved in developing relationships, building trust, and finding shared matters of concern. These are all things that we must invest time and energy in, but which often don’t result in anything we can show to others and so are often unappreciated. How could I illustrate this in a simple way in my dissertation? On a nature walk, while mulling this question over I realised that fungi were the perfect metaphor. The work that happens in social innovation is like the work done by the mycelium, activity happens ‘beneath the surface’ as people meet, share resources, and communicate with each other. Then when shared interests and aims are found, people connect and work together like hyphal knots of fungi. Projects grow and become visible and tangible like the fruit of the mushroom. I used this analogy to structure my thesis and illustrated my report with paintings of mushrooms.

I now work at Northumbria University design school, continuing to research creativity and social innovation. I’m particularly interested in how people can be encouraged to get involved support social justice projects in their own communities. Some of our students recently worked on a bio-design project, exploring how things like mycelium might be used in the future to create more sustainable materials for products - fungi continues to feature in my work in a different ways. The kids are a bit bigger than they were in 2019 but I still manage to get them out for a walk together occasionally and fungi-spotting is still part of the experience. We recently found a diverse selection on an overnight visit to The Sill.



I hope that by being part of NEFSG I will learn more about fungi, can share this knowledge with my children and continue to be inspired by the complexity and power of these fascinating organisms. I look forward to meeting other people who share the wonder of fungi.

Helen Simmons

Agathomyia wankowiczii, ***on the way to Sainsbury's!*** **23/02/24.**

Had yet another short divert into Throckley/Walbottle Dene prior to doing mum's shop. Wandered off the beaten path; thought I'd look at some mosses + liverworts; caught sight of swathes of a slime mould on a fallen trunk; ooo, Metatrichia floriformis I think; glanced up the bank; ah, an old trunk with big brackets - Ganoderma; oh, big, *thin* brackets - G. applanatum……OH! one with lumps on the pores. A clamber up the bank – and YO!Agathomyia wankowiczii galls – (but only the one bracket and no more found…as yet – I had the shopping to do).

This species was first found in Kent in 1990 and has been moving north. I've found it from 2019 in Preston Park, 3 sites in Darlington, and Castle Eden Dene, but this is my first in Northumberland. Agathomyia wankowiczii, the Yellow Flat-footed Fly, (*who chose those names!?),*lays eggs in the pores of *only* G. applanatum. The galls start as small 'warts' which grow up to 1cm. Inside each 'wart' is the grub of the fly which later falls out, buries itself and pupates in the ground. All my records have been from sheltered, shady, damp sites. Keep an eye out for them – there must be more around or arriving soon.

Jill Cunningham

N.E.F.S.G. Annual General Meeting. 17/02/2024

Attended by 19 members.

1 – **Presentation by Keith Thomas**, Brew Lab re DNA technology + database, promoted much discussion.

2 - **Apologies** – Peter Holmes, Mary Hull, Kennedy Page, Gordon Simpson, Rhona + John Sutherland, Richard Thompson.

3 – **Matters arising from 2023 AGM minutes.** No matters arising.

4 – **Approval of 2023 AGM minutes.**Proposed, Lydia Koelmans. Seconded, Jo Scott.

5 - Chairman Report. Alan thanked Doug and Jo for their input on Lichens, and thanked Sally and Cath for the successful UK Fungus Day event at Barnard Castle He mentioned the excellent trip to Germany and noted the highlight finds. He also commented on the well-attended Earth Tongue workshop tutored by Mal Greaves and thanked all members for recording and leading forays.

6 - Treasurer Report.114 members, an increase of 28 on last year. Funds very healthy £2214, (approx. £1950 after Barnard Castle room payment). Action – Cath Gillie + Ron Pattinson to contact Barnard Castle regards payment.
It was noted that the website stated 60 members. Action – Ron Pattinson to ask John to update this.

7 - Election of Officers. All to remain in posts. Alan has offered to continue his Chairmanship. Gabi asked what the post entailed + Alan gave a brief resume. Proposed, Doug McCutcheon. Seconded, Gordon Beakes.

8 - Procedural matters.
***Up-dated NEFSG Constitution**. Noted needed for future grant/funding applications.
***Safeguarding Policy.** Both approved. Proposed, Keith Tulip. Seconded, Gordon Beakes.
***Risk Assessment Form for foray leaders.** Concerns noted that it may be too lengthy/detailed and could put off leaders. Many options were discussed including - suggestions such as to put it on the website for all to read prior to meets. Ron informed us that the NEFSG insurance is for 3rd party only + we could be liable if Risk Assessment is not followed. Cath mentioned 'due diligence'. Action – Keith Tulip to search out Tom's original Risk Assessment and send it to Alan. Action – deferred to be discussed at the next Committee Meeting in May.
Many thanks were given to Sally and Cath for their work on these policies.
There was also a related discussion on the club's title – 'East' or 'Eastern'? Discussion concluded that we are 'East' on everything other than the banking, where we are 'Eastern'. East was the preferred choice. Action – Ron Pattinson, Treasurer, to contact the bank to see if the account name can be changed easily. Noted – that those who pay their subs direct would have to change their payment details.

9 - Proposed 2024 Foray Programme + UK Fungus Day + Cortinarius Workshop. Mike handed out the programme. This year, as requested, it has 1 foray each weekend from September to November + 1 meet in April. This allows for Pop-up Forays in the months between, either as joint forays with other groups or to see seasonal fungi as they appear. Mike encouraged members to suggest possible Pop-ups and that he will email members + offered help with leadership and Cate2 recording.
Dominique mentioned that other groups have 1 meet a month between November and September to maintain interest in the group throughout the year and to record seasonal fungi. Discussed and agreed that the Pop-ups would cover that this year.

Sally has looked into Morpeth Town Hall + outside space for future Study days/Workshops/Events. The next Cortinarius Workshop is likely to be 2 days rather than 4 due to cost, time, Geof Kibby not available this year.
Action – Mike to send the Proposed Programme to Jo for the Newsletter and to John for the Website.

10 – AOB.
*Gabi raised the problem of the quantity and size of the photo emails using up too much space on phones. Mike has recently reduced the quantity and size of those being sent which has helped but not solved the problem. Options were discussed, e.g., putting them on the website; Facebook; separately from the written report, etc. Action – to be discussed/reviewed at the next Committee Meeting.

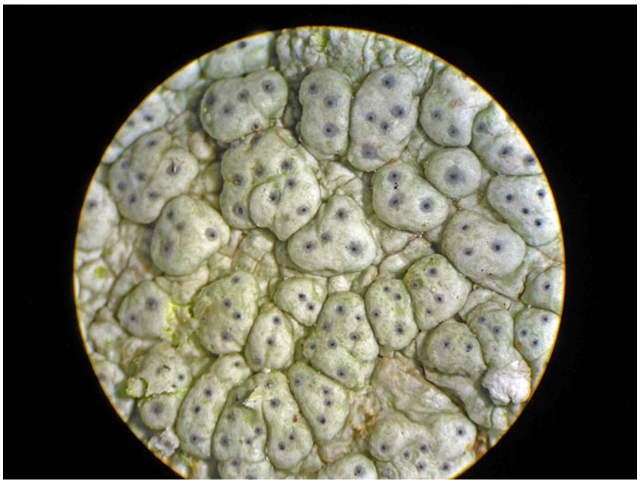
Date of 2025 AGM. Alan to arrange for around this time next year.

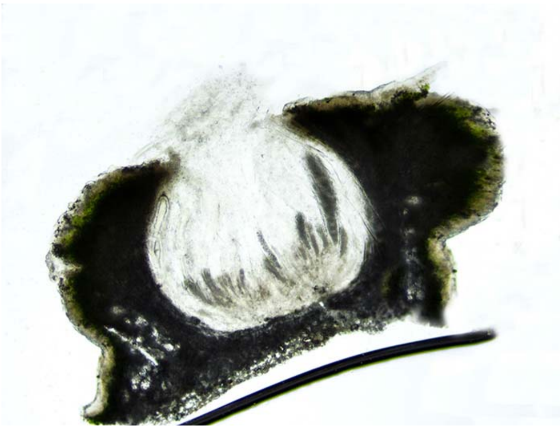
Next Committee meeting – 15th May 2024.

At the end of the Meeting Paul Forster gave an excellent slide-show on the last Germany visit and also an enjoyable You Tube video on a joint venture with the University and NEFSG.

Lichen Lookout

A closer look at Pertusaria pertusa (Pepperpots). A common species seen as light greenish patches on trees. Can have a distinct white prothallus showing as a white edge to the lichen thallus. The apothecia are sunk in wart like structures with black holes giving it the appearance of pepperpots.





Cross section through 'wart'

Apothecia showing the 2 large spores