Pembrokeshire Fungus Recorder

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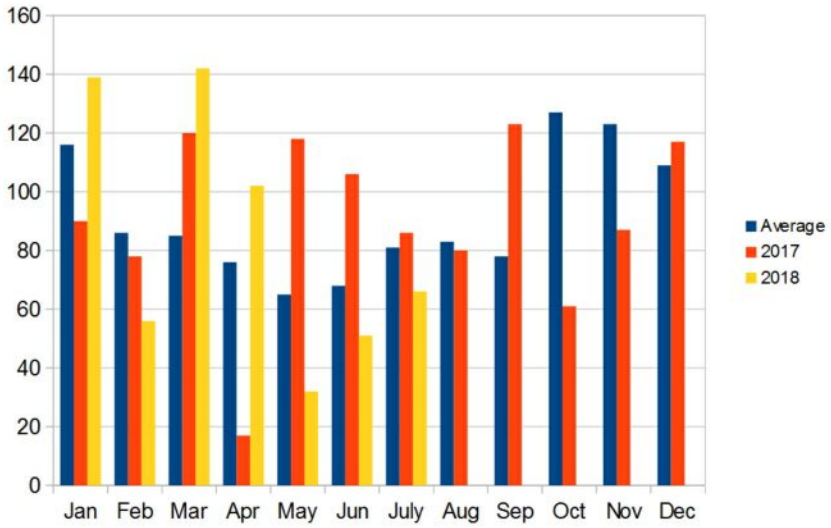
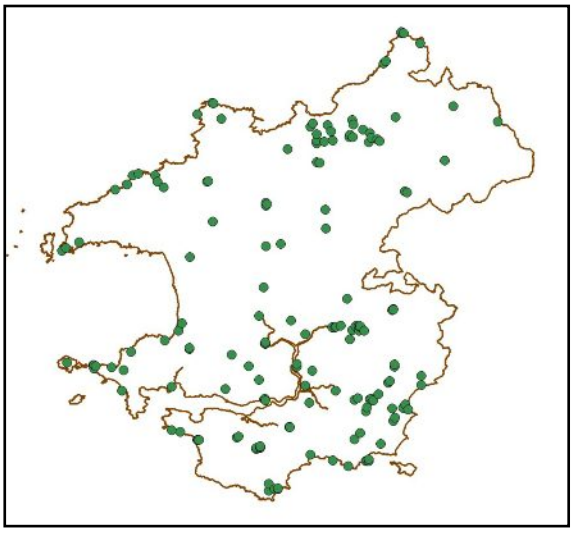
Editorial

A wet start to the year eventually gave way to a hot and dry July. Whatever the reasons, very few records of note were reported in the first half of the year. Fortunes may change however, as the wet August produced good fruiting in woodlands. Hopefully the grassland and dunes will also respond as we move into the autumn.



Our 2017 records have now been submitted to the local and national databases. Only 547 records - reflecting the very disappointing year. The adjacent map shows where most of the effort was targetted. Hopefully this year we can collect significantly more than 1,000 records.



Thanks are due to eveyone who submitted well documented, verified records. Particular thanks are due to our top recorders for 2017: Jane Hodges (122 records), DJH (119), Adam and Suzanne Pollard-Powell (108) and Nigel Lee (57).

David Harries
August 2018

Records

Sarcomyxa serotina (Olive oysterling)

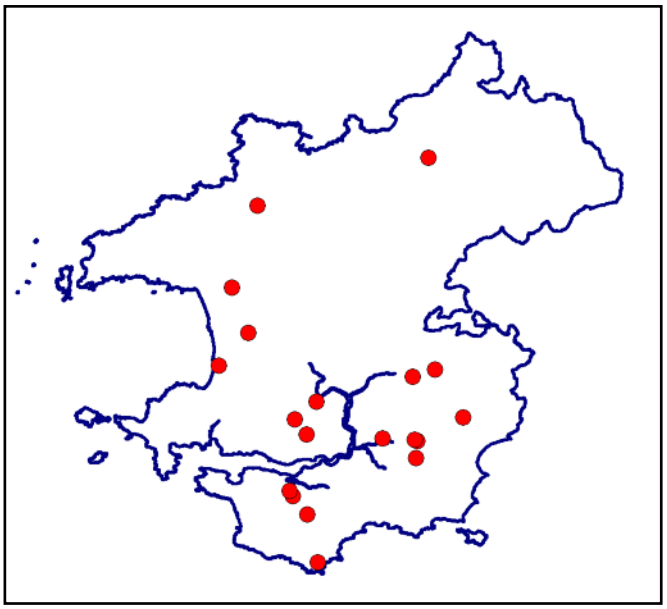
As 2017 was drawing to a close, Den Vaughan reported this fine collection of *Sarcomyxa serotina* on dead wood near Pengelli forest.

This species, previously known as *Panellus serotinus*, is often found fruiting late into the winter.

Hypocreopsis rhododendri (Hazel gloves)

Three new sites have been found so far this year: Lawrenny (March) reported by Jon Hudson, Naples Farm (August) - this observation quite appropriately made during a recording day organised by the West Wales Biodiversity Information Centre (WWBIC). The most recent find was from the Canaston area - reported by Ged Davies.

The distribution map shows all records from 2013 to date (23 records from 18 sites).



Gyromitra exculenta (False Morel)

In April, Ged Davies reported this find made by colleagues at Bluestone.

Although the Fungus Records Database shows 363 UK records for this species, there are just 3 from Wales - remarkably all from Pembrokeshire (1996, 2005 and 2012).

This species is usually found under or near to conifers. Definitely not to be confused with morels, the false morel contains toxic compounds and can be fatal if eaten but not prepared properly.

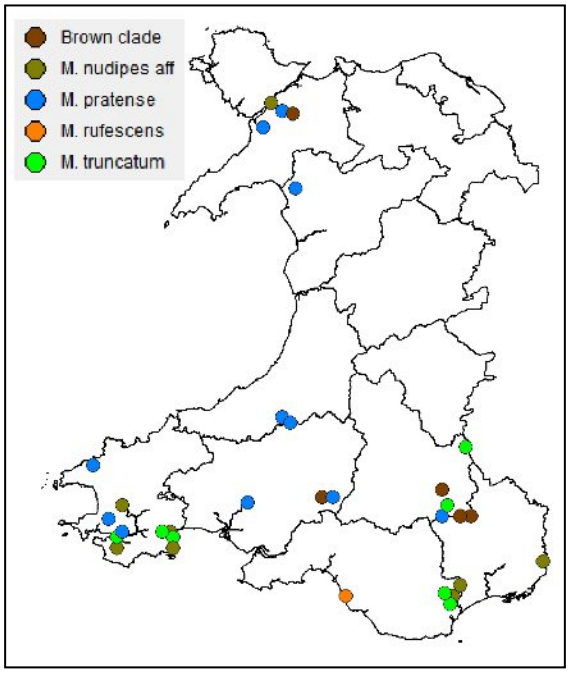
A study of the distribution of green and brown *Microglossum* species in Wales (DJH)

Our understanding of the Microglossum assemblage has been significantly enhanced in recent years thanks to taxonomic studies underpinned by molecular techniques (Kučera et al, 2017).

Microglossum olivaceum (olive earthtongue) is listed in Section 7 of the Environment (Wales) Act 2016 as a species of "key significance to sustain and improve biodiversity in relation to Wales" However, it now appears that our historically broad concept of the species actually comprises a number of different taxa, some of which can be determined by reference to the shape and colour of the fruit-bodies backed up with microscopy.

With this in mind, and with access to the tools necessary to undertake our own investigations, members of the Pembrokeshire Fungus Recording Network (PFRN) undertook a study of the distribution of Microglossum species in Wales. The project, developed jointly between the PFRN and Natural Resources Wales, set out to collect and examine collections of green and brown *Microglossum* species from a network of mycology enthusiasts across Wales.

Voucher material was collected during the autumn 2017 fruiting season and supplemented with voucher material from previous years held by the PFRN and other collectors. We extracted DNA from fragments of fruit-bodies from each of the collections, then amplified and purified a barcode portion of DNA. The resulting extracts were sent to Aberystwyth University for sequencing.



Results were excellent with 33 collections yielding good sequences. The results, when displayed on a map (fig.1) provide some measure of recorder activity, with most collections originating from south and south-west Wales together with several collections from Debbie Evans in the north-west.

Fig 1: Distribution of *Microglossum* collections from Wales

The indications are that *M. olivaceum* collections from Wales include *Microglossum rufescens*, *M. truncatum*, *M. pratense* and several collections likely to form part of a currently unresolved group: *M. nudipes* aff. (fig. 2). One series of samples forms a "brown" clade which is the subject of further investigation at the Royal Botanic Gardens, Kew.

Fig 2: Clockwise from top left:
M. truncatum
M. pratense
M. rufescens
M. nudipes aff.
Brown collection

The outcome of the project has been reported to NRW (Harries, D.J. et al, 2018), and the detailed information forwarded to Kew for inclusion in a substantive UK-wide study.

Acknowledgements

The project team acknowledges support in the form of materials and advice provided by the mycology section at Aberystwyth University (Dr. Gareth Griffith) and the Lost and Found Fungi project team at the Royal Botanic Gardens, Kew, together with funding from Natural Resources Wales and the British Mycological Society.

References:

Kučera, V., Lizoň, P. & Tomšovský. M. (2017). Taxonomic divergence of the green naked-stipe members of the genus Microglossum (Helotiales) Mycologia 109.

Harries, D.J., Hodges J.E., Theobald, T. (2018) A study of the distribution of Microglossum species in Wales. Natural Resources Wales Evidence Report No 255.

Entoloma bloxamii - A Pembrokeshire perspective on big blue pinkgills (DJH)

Until fairly recently it was a pretty safe bet that any robust blue or blue-grey entoloma in grassland could be regarded as *E. bloxamii*. Doubts started to emerge when Morgada et al (2013) published a study of entoloma collections which included a grey-blue voucher from Pembrokeshire. DNA sequences showed that this aligned with a newly described species, *E. ochreoprunuloides*, which exhibits a range of colours including shades of light and dark brown and pink as well as the violaceous grey-blue of the Pembrokeshire collection.

Given the conservation importance of *E. bloxamii* - the species is listed as one of conservation interest in England (Section 41) and Wales (Section 7) - mycologists at Kew decided to have a look at collections in the UK. The "Lost and Found Fungi" programme proved an ideal way of engaging with fungus groups with the result that a good range of material was received from across the UK.

The output from this programme was published in Field Mycology in January (Ainsworth et al. 2018) and shows that UK collections from the *E. bloxamii* group contain at least 4 distinct blue or blue-grey species. These are *E bloxamii, E madidum, E. atromadidum* and *E. ochreoprunuloides f. hyacinthinum*. Fortunately for field mycologists fresh, well-coloured collections, can be identified using a combination of fruit-body colour and spore microscopy. A key to the UK species can be found at:

http://fungi.myspecies.info/content/entoloma-bloxamii-sensu-lato-britain

Collections from Pembrokeshire have been examined and so far three species have been recorded: the missing member of the quartet being *E. bloxamii*. This autumn we plan to collect additional samples so that we gain a better understanding of the distribution of these species in the County. If anyone finds good examples of species from this group - please photograph the collection, record details and retain voucher material so we can investigate further.

Pembrokeshire collections

1. ***E. madidum***: collection found at Stackpole (Saddle Point) during the Kew Lost and Found visit, November 2016.

2. ***E. atromadidum***: collecton from Tyrhos chapel yard (NE Pembrokeshire). Note that the specimen is distinctly darker than *E. madidum* (atro = darkening)

3. ***E. ochreoprunuloides* f. *hyacinthinum*:** collection from Somerton Farm, Hundleton.

References:

Morgado, L.N. et al (2013). Persoonia - Molecular Phylogeny and Evolution of Fungi 31: 159–178.

Ainsworth, AM (2018) Big Blue Pinkgills. Field Mycology 19(1):5-14.

2018 Training and Field events

Thanks to support from the Kew "Lost and Found" project and guest expert Dr. Brian Douglas, we were able to hold two events over the first weekend of June.

The first was a workshop hosted at the West Wales Biodiversity Information Centre at Whitland which provided an introduction to molecular (DNA) techniques in mycology. This event was fully subscribed with participants from Glamorgan and Carmarthenshire as well Pembrokeshire and was aimed at field mycologists who wished to gain a better understanding of the way in which DNA analysis is used to improve our understanding of the relationship between fungal taxa.

Brian provided an overview of the principles and showed examples of the way in which DNA analysis has been used to identify or confirm new species. Nigel Stringer provided a practical illustration based on work on rusts, whilst I gave an overview of our *Microglossum* project (see article in this newsletter).

Top: DNA training event (photo TT)
Right: Nigel Stringer with Stackpole group

The second event was a public field event based at Stackpole and was again fully subscribed. The main focus of the day was to introduce enthusiasts to ascomycetes using examples collected during a walk around Bosherston Lily Ponds. Ascomycete interest was supplemented with discussion on lichens by Robin Crump and Trevor Theobald whilst Nigel Stringer provided an entertaing commentary on rust collections. Although extremely warm for the time of year, sufficient specimens were found to occupy everyone - though it must be the first fungus event we have run that included a sunburn warning in the introductory risk assessment talk!

The party returned to the Stackpole Centre at lunchtime and a number of people stayed on to discuss collections and view examples under a microscope. Mike Crutchley brought along a specialist camera and TV monitor to demonstrate some of the techniques now available.

Stackpole event: post lunch discussions and viewing of specimens. (Photo: TT)

Microstroma - an uncommon? smut in west Wales

Mike Crutchley, Arthur O. Chater and R. Nigel Stringer

Smuts are fungal parasites of higher plants. The name 'smut' is derived from a Germanic word for 'dirt' (Schmutz) because some smuts produce spore masses which are black in colour. Some are serious pathogens of cereals and cause major losses in productivity of crops such as maize, wheat, oats and sugarcane worldwide. However, they also occur on native plants infecting the flowers, leaves or roots of the host depending on the species. Historically in the UK - the most well known 'smut' on one of our native plants is the one found on Red Campion where the fungus infects the anthers (Figure 1).


Fig. 1

Smuts are related to another group of plant pathogens called rusts and the closeness of this relationship has only recently been highlighted with the advent of DNA studies. These studies have shown that the 'Red Campion Smut' has more in common with species of rusts than smuts and has been moved accordingly into one of the taxonomic groups related to rusts called the Microbotryales (which causes much confusion to older mycologists!).

AOC and his colleague Paul Smith have over the last few years collected specimens of smut infected hosts from Wales and other sites in the UK and these have been sent to European research laboratories for DNA sequencing. Using these techniques it has been shown that AOC and Paul Smith in particular have discovered not only new species to Wales but to the UK and indeed to science, thus highlighting the importance and usefulness of this new technology.

Smuts are not that common compared to rusts and mildews and searching for them in the field is time consuming. Eighty-one species are recorded from Wales, sixty-six on native plants (Woods et al. 2018). Twenty-nine of these are considered to be extinct or threatened with extinction. With many smuts there is very little information on the abundance and distribution of species not only in Wales but the rest of the UK and as a result it is not possible to assign a 'conservation status' to them.


Fig. 2

A few years ago, AOC and Ray Woods were looking for the micro-colonies of the rust *Cronartium quercuum* on oak and came across chalky-white deposits located in discrete patches confined to the underside of leaves (Figure 2) and nothing on the upper surface except small, yellowish spots. The deposit was not the even, powdery-silky covering on oak leaves caused by the powdery mildew which occurs on both sides of the leaf from late July/early August onwards. Further examination showed that these chalky-white

deposits were spore masses (Figure 3) and the fungus was eventually identified as *Microstroma album* - a member of the family Microstromataceae in the Exobasidiomycetes, one of the four Classes of smuts found in the UK. Infection starts with the growth of hyphae inside the upper surface of the leaf below the stomata causing a yellow discolouration. The white spore masses on the lower surface are the 'teleomorphic' stage. Spore-bearing cells which emerge through the stomata form a column on which are produced large masses of one-celled basidiospores (Figure 4).


Fig. 3


Fig. 4

The only record of *M. album* in Wales prior to those made by AOC and Ray Woods in 2014 was by the Rev. J. E. Vize of Forden Montgomeryshire (VC 47) in the late nineteenth century. However, recent searching by AOC and Ray Woods have provided a number of records from Cardiganshire (VC 46 - 10 records) and mid Wales (VC 43 - 5, VC 42 - 1) and together with sightings from other recorders it has now been recorded from VC's 44 (AOC, RNS), VC45 (Nic and Mike Crutchley and Matt Sutton), and VC 41 (Mark Evans). Most records are from *Quercus robur* but other hosts include *Q. petraea, Q. cerris* and *Q.* x *rosacea*.

There is another Microstroma species which occurs in the UK - *M. juglandis* which occurs on walnut, *Juglans regia.* In this species the spore-bearing cells that emerge through the stomata form a rosette rather than a column, and the infection is associated with black, necrotic areas of leaf. There are single records from VC's 42, 43, 44, 45 and 48 and two from VC46, mostly from gardens. Walnut is very sparse compared to oak so this smut is correspondingly rare, and it is sometimes present only in very small quantity. First recorded in Norfolk in 1951 but to date there are over 40 records in Britain suggesting that either it has spread significantly over the past 60 years or people are becoming more observant! It does no harm to the trees in Britain, but elsewhere, as in Romania, *M. juglandis* seems to cause damage (Fodor & Hâuţa 2014).

Author's note: The photographs were taken by International award-winning photographer Mike Crutchley and these provided the inspiration for the article.

References:

E. Fodor & O. Hâuţa (2014). *Microstroma album* (Desm) Sacc. and *Microstroma juglandis* (Berenger) Sacc. in North Western Romania. Analele Univ. Oradea Fasc. Protecţia mediului 23: 427-438.

R. G. Woods, A. O. Chater, P. A. Smith, R. N. Stringer & D. A. Evans (2018). Smut and allied fungi of Wales. A guide, Red Data List and Census Catalogue.