

Pembrokeshire Fungus Recorder

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Editorial



A strange year, with activities severely constrained by the Covid-19 virus. However we can start this newsletter with some good news - a photographic exhibition at the Guernsey Museum & Art Gallery by our local member and regular contributor of images taken through the microscope: Mike Crutchley. Well done Mike - great to see well deserved recognition of your work. The above picture shows the layout at the Guernsey museum - on display from July to the end of September 2020.

This autumn we will not be holding any formal events - but look forward to hearing about interesting finds that local enthusiasts encounter on their socially distancing excursions. Please post information or queries on our Facebook page and report any confirmed records via either the WWBIC website or Aderyn application (for mobiles/tablets). Links shown below.

Website links:

<https://www.facebook.com/groups/PembsFungi>

<https://www.wwbic.org.uk/wildlife-recording/>

<https://aderyn.lercwales.org.uk/>

David Harries
September 2020

Records

New to Pembrokeshire - *Favolaschia calocera*

In late August Jess Spate reported an exciting new find for Pembrokeshire from the Gwaun Valley: the orange pore-cap (or orange ping-pong bat), *Favolaschia calocera* (fig. 1). This was followed, in September, by a collection from St. Ishmaels (fig. 2) recorded by Billie and Bruce Langridge.



Fig. 1



Fig. 2

This is normally regarded as a sub-tropical species which was originally described from Madagascar but subsequently became established in New Zealand, where it is now common, and also Australia. It is a saprotrophic fungus found on dead wood and grows up to 30 mm in diameter. The bright colour and large pores make it easily recognised in the field.

The first European record was from Italy (1999) with later records from Spain and Portugal - usually in coastal areas. The first UK record was made by Pauline Penna in 2012 when she collected material from west Cornwall. Since that time a number of records (fig. 3) have been made in the south West of England.

Neither the the Fungus Records Database of Britain and Ireland nor the Wales Aderyn system currently show any Welsh records, though an observation was made in 2019 in Caernarvonshire during the Kew Lost and Found Fungi Project (pers. com. Brian Douglas).

In view of its status as a new arrival on our shores it is important that records for this species are logged to provide information on its spread.

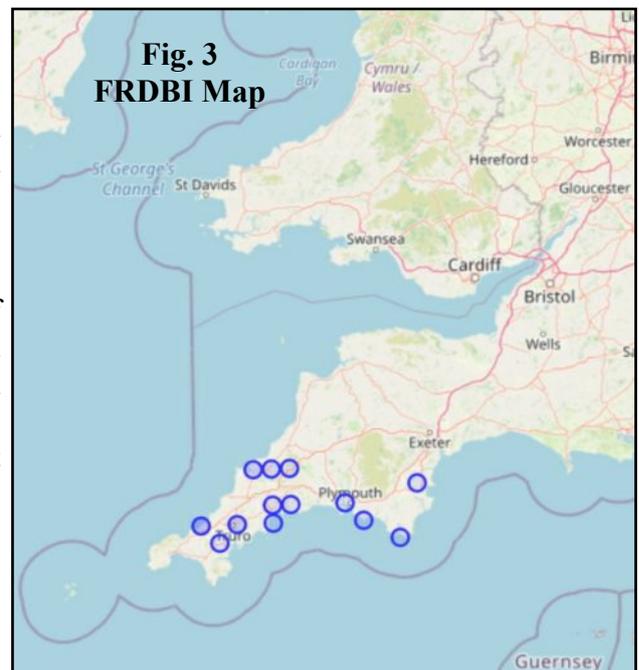


Fig. 3
FRDBI Map

Reference:

Ainsworth, A.M. et al. (2015). Invasion of the Orange Ping-Pong Bats: the rapidly changing distribution of *Favolaschia calocera*. *Field Mycology* 16(4).

Phylloporia ribis.

Murray Taylor reported an interesting find in July. This was a bracket on ash near Creswell Quay. The observation was posted on Facebook and initially threw up a series of suggestions. Mike Karpaty collected a specimen and documented all the features after which we concluded the species was *Phylloporia ribis*. This species has very small spores (3.6 x 2.7 um in this collection) which, in combination with the absence of setae, confirmed the identification.



This species is not widely recorded in Wales, and is usually found on *Ribes* or *Euonymus* but according to Ryvardeen and Melo (2014) it can occur on a wide range of hardwoods including *Fraxinus* and *Acer*. The only previous record from Pembrokeshire was made by Jon Hudson in 2014 - in this case the collection was growing on a more usual host: spindle (*Euonymus europaeus*).

Reference:

Ryvardeen & Melo (2014). Poroid Fungi of Europe. Synopsis Fungorum 31, Fungiflora.

Hapalopilus nidulans (Cinnamon bracket) - DJH

During a woodland walk at home (near Hundleton) in July, I came across this interesting bracket found on dead wood. It keyed out to *Hapalopilus nidulans* (also known as *H. rutilans*). The irregular, cinnamon-brown brackets gave a strong and distinctive purple stain when treated with potassium hydroxide. This feature gives rise to an alternative common name of purple dye polypore which refers to its use in the production of a purple dye.

The Fungus Records Database of Britain and Ireland shows that the species is widely distributed in England but shows no records from Wales. However Aderyn, the LERC Wales' Biodiversity Information & Reporting Database, shows 6 records from Wales, including one from Brynberian in north Pembrokeshire in 2013.



The Date waxcap - something of an enigma (David Harries & Trevor Theobald)

Trevor Theobald started the waxcap-grassland recording season with a great find - a collection of 12 fruitbodies of *Hygrocybe spadicea* in 3 groups on a former roadside verge, now a lay-by, near Johnston. Nearby plants included selfheal, hawkbit, hawksbeard, brown knapweed and common daisy. The verge is managed by the local authority as amenity grassland and used as a picnic area.



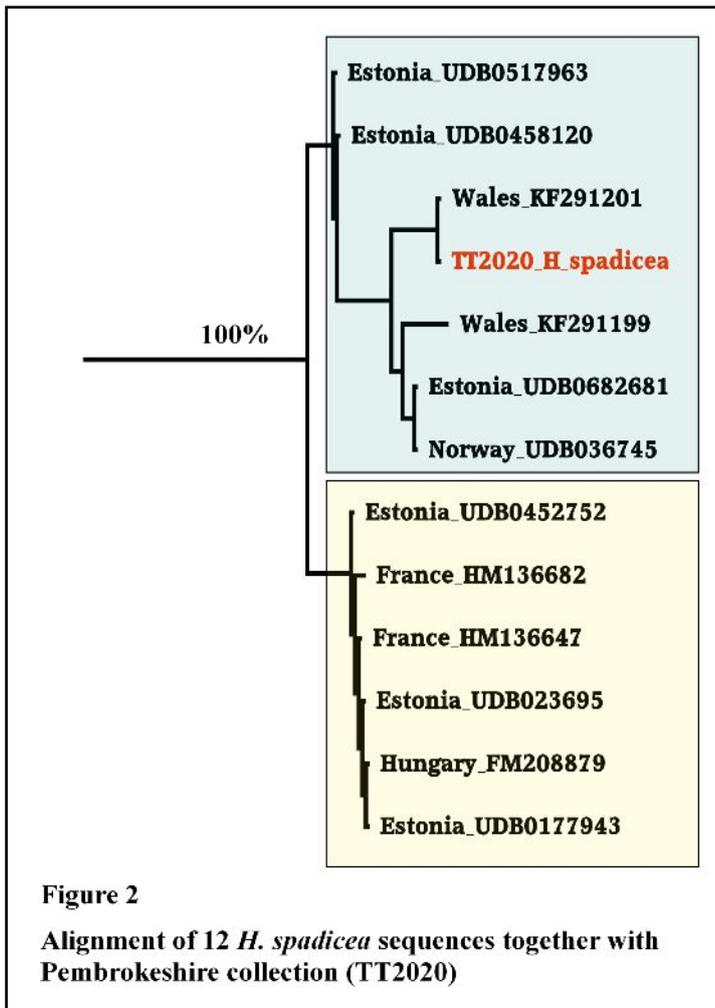
Hygrocybe spadicea collection (photos: T. Theobald)

H. spadicea (date waxcap) is a rarely recorded, though easily recognised, member of the waxcap-grassland assemblage. The Fungus Records Database of Britain and Ireland contains just 33 records (after de-duplication) of which 4 are from Pembrokeshire. Gareth Griffith (2004) indicates that the rarity of *H. spadicea* records “would appear to stem from its preference for atypical grassland sites (south-facing, dry slopes with thin soils, usually within a few kilometres of the sea), possibly indicating a preference for higher soil temperatures or tolerance of droughting”

This species is included in the Section 7 list of “species of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales”. It has also been assessed by the International Union for the Conservation of Nature (IUCN) and appears on their red list as Vulnerable (fig. 1). The IUCN website describes the species a “well-characterized waxcap with a brown, conical to umbonate pileus, contrasting with the yellow stipe and lamellae. The species is characteristic for grass-heaths on dry, very poor, acidic to weakly acidic soil and for limestone-grasslands, in Europe priority plant communities in the Natura 2000 network that are strongly declining all over Europe.”



H. spadicea was one of the priority species investigated by the Royal Botanic Gardens, Kew, and Aberystwyth University during “Project Waxtongue” (Cannon et al, 2012). The authors concluded that it may actually be an aggregate of two taxa: one from montane central Europe and the other represented in the UK. They further noted that as the species was originally described from Austria,



then it is possible that the UK collections may represent another species which will require a new name.

Thanks to support from the Pembrokeshire Nature Partnership and the British Mycological Society we were in a position to carry out DNA-barcoding on Trevor's collection. We extracted the DNA, amplified the barcode region, and submitted the resulting amplicon to the Sanger sequencing facility at Aberystwyth to obtain a sequence. The result was a good sequence which was combined with publicly available sequences held on Genbank to provide a dataset which in turn was used to generate a phylogenetic chart (figure 2). The sequence has been deposited on Genbank: MT940836.

The chart demonstrates that the *H. spadicea* sequences split into two well supported clades - the bootstrap value is shown as 100% and provides an indication of the confidence we have in the result inferred by the analysis program (anything above about 70% is a strong indication that the result is likely to be reliable). The collection from

Pembrokeshire (TT2020) nested neatly with other collections from Wales. This result ensures that should there be a reevaluation of the *H. spadicea* species concept we can be certain of the identity of our Pembrokeshire specimen.

References:

Cannon et al (2012). Systematics, barcoding and ecology of fungi from waxcap grasslands in Britain. Project report to DEFRA 4.

Griffith et al (2004). Charismatic megafungi - the conservation of waxcap grasslands. British Wildlife.



British Mycological Society promoting fungal science

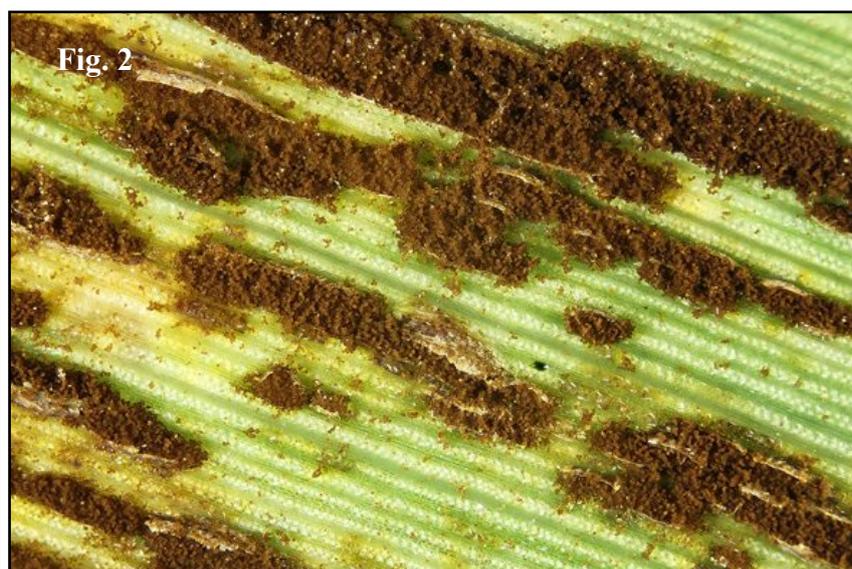
Principal sponsors of PFRN barcoding work

**Lemongrass rust - an unusual find in west Wales - by R. Nigel Stringer, David Harries,
Mike Crutchley and Kevin McGinn**

Lemongrass (*Cymbopogon citratus*) is one of over 50 species belonging to the genus *Cymbopogon* in the family *Poaceae*. It is a perennial grass native to India and Sri Lanka that has been intentionally introduced into the tropical and sub-tropical parts of the world. The name Lemongrass is derived from the lemon-like odour of the essential oils present in the shoots. Commercially, Lemongrass oil is known as Cochin because at one time more than 90% of the oil was shipped from the Port of Cochin in Kerala State, India. Kerala had the monopoly in the production and export of Cochin oil where the annual production was around 1000t produced from an area of ca.16,000 ha. The oil is mainly used in the cosmetics, pharmaceutical and perfumery industry but is also used in culinary flavourings, beverages, meat & fish products and is also used to flavour wines and sauces. However, it is recently becoming increasingly used in Asian cooking, mostly in the USA but now is increasing used across the globe (Joy *et al* 2006)

Cymbopogon citratus is known as American Lemongrass and is becoming more popular in the UK for its culinary use in Thai cooking. Live plants are commercially grown in Africa and Asia and the leading exporter is Guatemala (CABI 2020). Plants can now be bought in the UK from Garden Centres, DIY stores and from specialist nurseries advertising on the Internet.

In July 2019 RNS received an email from KM informing him of Lemongrass plants being sold in the garden section of a store in Llanelli which looked as if they were infected by a fungal pathogen, possibly a rust fungus. RNS visited the following day and purchased all of the plants which were brought home in sealed plastic bags for further inspection. All plants exhibited dark longitudinal striations up to 10 cm in length on both sides of the leaves (Fig. 1). When viewed under a low-power microscope these linear striations were composed of contiguous areas of the leaf surface where the epidermis had split from which masses of brown-black spherical spore-like objects were emerging (Fig. 2). MC was able to take transverse sections of the leaves using his home-made microtome and from the photograph (Fig. 3) it can be seen that the infection zone is localised (white tissue on lower surface of the leaf) with the spores being produced from this layer. These spores, when viewed under a high-power microscope were globoid to oval (Fig. 4) measuring 23-29 μ m x 19-24 μ m with a thick cell wall (3-5 μ m) and within the wall 3-4 pale areas called pores can be seen. Microscopic examination of the spores indicated that the organism infecting the host was in fact a rust fungus.



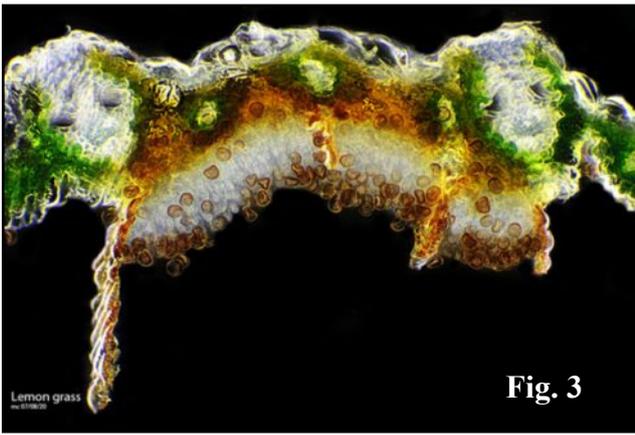


Fig. 3

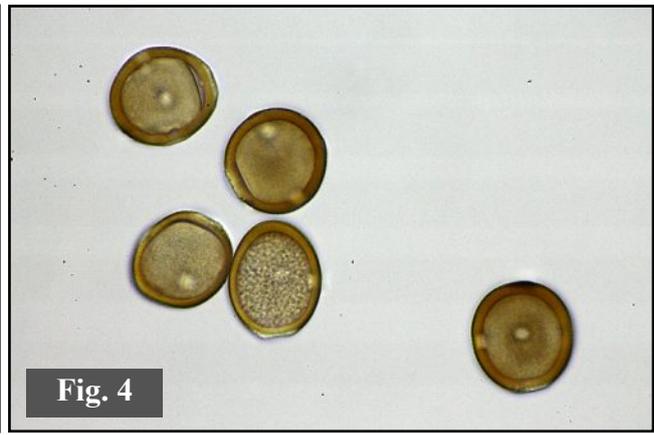
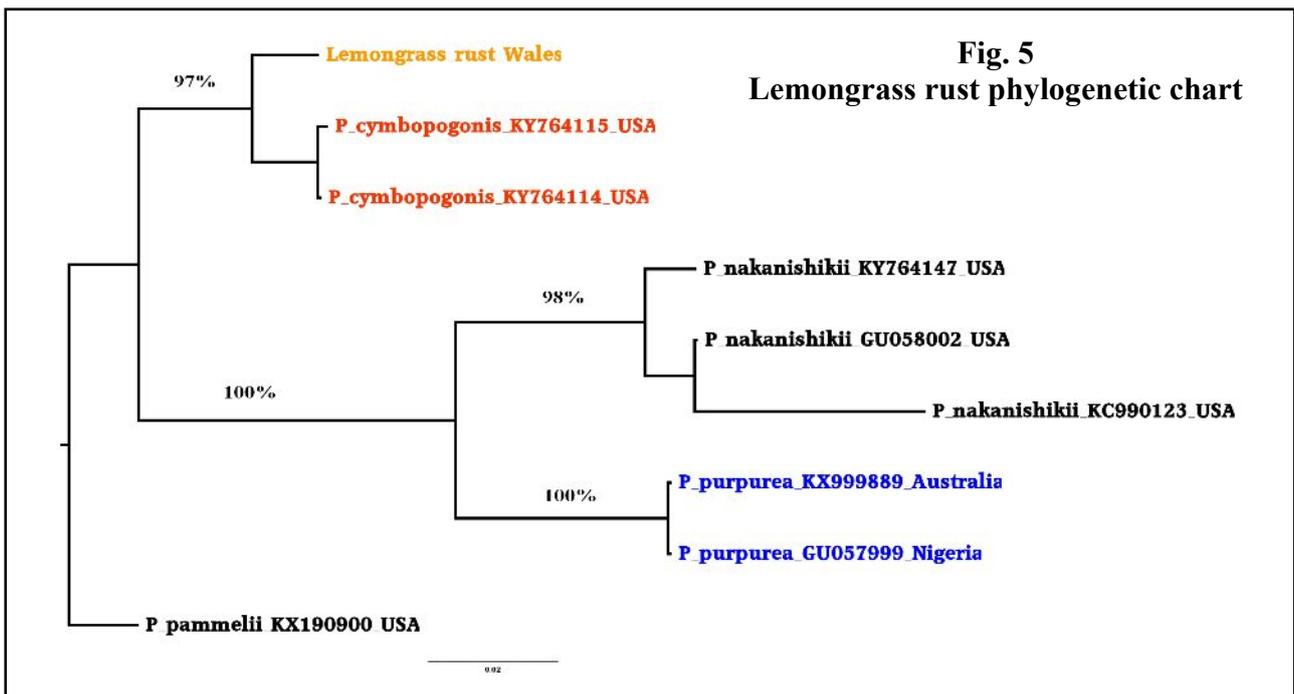


Fig. 4

Lemongrass is susceptible to many fungal diseases including leaf blotch fungi (*Curvularia* and *Helminthosporium* species) and several species of rusts. The most commonly occurring rust on Lemongrass in other parts of the world is *Puccinia nakanishika* Dietel. This is now spreading into areas wherever the host plant is grown. Our specimen did not match the description of *P. nakanishika* using microscopy. There are a possible seven species of rust that can infect Lemongrass (Cummins 1971) and our specimen closely resembled *Puccinia cymbopogonis* Mass.

To confirm our tentative identification DJH took a small sample of the spores and extracted DNA using the CTAB method (Doyle, 1987). The internal transcribed spacer (ITS) barcode region was amplified by a polymerase chain reaction (PCR) using a Bentolab thermal cycler. The resulting DNA amplicon was sequenced at the Aberystwyth University (IBERS) Sanger sequencing laboratory.

A phylogenetic chart was constructed using our sequence together with publicly available sequences for Lemongrass rusts held on the Genbank database (www.ncbi.nlm.nih.gov/nucleotide). The resulting tree (Figure 5) showed our example nesting with two other sequences for *P. cymbopogonis*. (The bootstrap % values provide a measure of confidence in the result of the analysis with values >70 usually regarded as acceptable).



DNA analysis supported the microscopic determination and confirmed that the rust was *P. cymbopogonis*. This is the first record of this rust in Wales. Coincidentally, in May 2019 there had been a report of this rust on Lemongrass from England (KM pers. comm). The only other record is a specimen of this rust held in the Kew Fungarium which was collected from Entebbe, Uganda and identified and described by Masee in 1911.

Author's Note: All plants were disposed of following examination. The rust is confined to *C. citratus* and will not pose a threat to our native species. The host is not grown commercially in Wales.

All photographs Copyright authors.

Acknowledgements:

The authors wish to thank Caron Evans of IBERS, Aberystwyth University, for carrying out the DNA sequencing work and the British Mycological Society for their financial support for DNA barcoding work by BMS field groups.

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BMS - UK Fungus Day videos

A series of "five minutes on fungi" videos will be launched from Monday 14th September.

Follow the link from the UKFD homepage for details:

<https://www.ukfungusday.co.uk>

UK Fungus Day 3 OCT 20

A new video will be added periodically in the run up to UK Fungus Day

Make sure to visit this page regularly for new content.

