



FUNGI FORAGERS

No.28: January 2022

OUR PURPOSE: TO RAISE AWARENESS AND INTEREST IN FUNGI OF THE CAIRNS REGION

This newsletter is not associated with any club or organisation but is emailed free of charge to anyone who may be interested. Anyone who wishes to contribute to the newsletter with observations, anecdotes, corrections, comments or photographs is welcome to do so. Although this “newsletter” is science-based we try not to make it too “scientific”. We recognise that there are school children, bush-walkers and others just interested in fungi, and we hope this leaflet will become a medium for furthering that interest. **The emphasis is on fungal biology and ecology** rather than identification.

Barry Muir, Editor Jenn Muir

Field meetings to find interesting species of fungi (not necessarily edible species) are known as 'forays', after the first such meeting organized by the Woolhope Naturalists' Field Club, Herefordshire, England, in 1868 and entitled "A foray among the funguses" [*sic*]. The Woolhope Club was an early member of the British Mycological Society founded in 1896. (Wikipedia)

LEATHER MADE FROM FUNGAL MYCELIUM

The following is paraphrased and adapted from Elizabeth Gamillo, writing for Smithsonian Institution SmartNews magazine (December 6, 2021). A company called MycoWorks in California has created a new ecofriendly leather derived from fungi. Mycelium is made into a material that imitates leather and is reported to match or even exceed the quality, durability and aesthetics of leather made from cow hide.



MycoWorks uses engineered mycelium cells that can be grown into three-dimensional structures, eventually forming a tough material, dubbed Fine Mycelium, which has the strength, durability, and performance of traditional leather. Apparently, most mushroom leather is made from a compressed solid foam that mycelium forms naturally, but without engineering, it lacks the same look and feel as other animal and synthetic leathers.

Fine Mycelium can be grown in trays in a short amount of time. These trays can be designed to fit a designer's exact specifications, eliminating any waste from excess scraps (as reported by *Guardian* newspaper). After Fine Mycelium is harvested, it is tanned and finished to look and feel like animal leather's unique grain but without the toxic chemical by-products that result from traditional leather processing.

The leather has already made a high fashion debut. In March 2021, luxury fashion brand Hermés debuted their Victoria bag, which featured MycoWork's Fine Mycelium material, reports Olivia Rosane for *EcoWatch*. Other companies, including Adidas' with their Mylo-made Stan Smith shoes and Lululemon with their mushroom-based yoga products, have also jumped on the eco-friendly bandwagon, per *Refinery29*.

The use of plant-based leather comes during a time when scientists and innovators are trying to come up with solutions for the climate crisis and animal agriculture. Manufacturing leather from cattle wreaks more havoc on the environment than any other type of fabric—even plastic-based leathers—because of deforestation and methane emissions connected to animals raised for leather and meat, the *Guardian* reports. Livestock alone make up nearly 15 percent of the globe's greenhouse gas emissions, *EcoWatch* reports.

Some experts criticize mushroom-based leather because it is currently only available as a luxury item. For the material to be a truly sustainable option and make a major impact, it would need to be accessible at a lower price, reports the *Guardian*. Likewise, skeptics question whether mushroom leather companies can supply independent artisans with enough material to create products that uphold their traditional craftsmanship, per *Refinery 29*. Similar criticisms were levelled at telephones and trains when they were first invented!

Fine Mycelium is carbon-neutral, can be grown to order and provides a sustainable option for manufacturers seeking durable accessories made from long-lasting material, the *Guardian* reports. "We have been trained as consumers to think in terms of a straight line whereby we buy something, use it, and throw it away. Fungi can inform thinking about fashion on lots of levels. This is about material innovation, but it's also about the culture of making endless new things, and what we can learn from thinking in terms of nature and of cycles instead," says biologist Merlin Sheldrake, author of *Entangled Lives: How Fungi Make Our Worlds, Change Our Minds, and Shape Our Futures*.



DID YOU KNOW?

Many of the most conspicuous fungi have been introduced to Australia in association with exotic soil and trees. *Lactarius deliciosus*, *Chalciporus piperatus*, *Suillus luteus* and *Suillus granulatus* are European fungi found in pine plantations in Eastern Australia. The deadly *Amanita phalloides* is found under Oak trees in urban Canberra and Melbourne and has caused deaths when people eat it by mistake for other species of mushroom. There are concerns that the Fly Agaric *Amanita muscaria* is forming mycorrhizal associations with native *Nothofagus* woodland, thereby displacing local species (IMC8 2005). Lawns, farms and parklands sometime produce fungi such as the shaggy ink cap (*Coprinus comatus*), the poisonous *Chlorophyllum molybdites* and several species of *Agaricus*, including the edible *A. bisporus* and *A. campestris* as well as poisonous *A. xanthodermus*.

Mycorrhiza of *Rhizopogon luteolus* was deliberately introduced to improve the performance of pines in pine plantations in Western Australia in the early part of the 20th century (Cleland 1976).

The stinkhorn-like species *Aseroë rubra* is significant in that it is the first fungus species known to have been introduced in the other direction, namely from Australia to Europe. It was recorded growing on soil transported from Australia to a glasshouse in Kew Gardens in 1829 (Entwisle & Catterns (2003).

Primary reference: Wikipedia

Cleland JB (1976). Toadstools and mushrooms and other larger fungi of South Australia. South Australian Government Printer. p. 326

IMC8 Fungus of the Month - April 2005. The Fly Agaric menace

Entwisle T, Catterns A (2003). "Starfish Fungus: Tim Entwisle talks to Angela Catterns on 702 ABC Sydney — 29 July 2003". Royal Botanic Gardens website. Royal Botanic Gardens, Sydney.

TNQ AND FNQ JANUARY FUNGI VERSUS SYDNEY, NSW FUNGI

IRENE DENTON

Overall, the best time for fungi in Sydney is March to August, the autumn and winter months. Some fungi (eg Hygrophoraceae) have been studied sufficiently to establish that they need overnight temperatures of less than 16 degrees to fruit. Fungi can be seen September to November, fruiting in response to rain with and developing surprisingly fast sometimes. In spring, subsequent heat or dryness may result in the fruits shrivelling faster than in autumn-winter. If the rain continues for a few days, then the combination of the rain and higher spring temperatures can make the fruiting bodies collapse more quickly.

The Sydney region generally sees close enough to nil fungi during December to February (except for the permanent polypore bodies). Sydney weather has been more abnormal in recent years, with some very dry and warm winters resulting in less variety and numbers of fungi. In Sydney we have enjoyed good flushes of fungi October, November and early December 2021 as we have had a weather pattern conducive to them: rain followed by some dry moderate-temperature days, then repeat (and repeat).

In January 2015, I travelled to Cairns to join a birdwatching trip to the most northern areas of Queensland. It can seem to be a crazy time to travel to the area, but the attraction is that birds migrate from areas just north of Cape York Peninsula (eg the New Guinea area). I was fascinated to see a number of fungi during this trip, contrasted with Sydney where virtually zero fungi are fruiting at this time.

The following statistics comparing Parramatta North (Sydney) and Horn Island (Torres Strait) are not directly comparable due to the number of years included, as various weather stations are opened and closed and only have records for certain years. Bamaga's mean January rainfall 1961-2021 (excluding some years) was 432 mm. Nevertheless, the following comparisons are adequate for this article.

Distance Horn Island to Bamaga, FNQ is 34km	Parramatta North (Sydney) 1967-2021		Horn Island 1995-2021	
	December	January	December	January
Mean temperature (° C) Minimum - Maximum	16.3-27.6	17.7-28.6	25.8-32.0	25.2-30.9
Mean rainfall (millimetres)	72.8	100.7	174.4	407.5
Mean number of days of rain 1mm or more	7.7	8.9	9.7	18.2
Mean 3pm relative humidity (%)	55	57	71	75

HORN ISLAND	2013	2014	2015	RAINFALL
November	54.8 mm	0.6 mm		
December	129.2 mm	22.6 mm		
TOTAL	184.0 mm	23.2 mm		
January	395.4 mm heaviest daily rain started 17 Jan	671.0 mm heaviest daily rain started 19 Jan	2 Jan: 8.0 mm 3 Jan: 32.8 mm 4 Jan: 0.0 mm 7 days starting 5 Jan: > 350.0 mm The heaviest rains commenced about 12 days earlier than the previous 2 years.	

Unfortunately, our trip experienced VERY heavy rain, fairly constantly throughout the entire trip.

Even though I advocate taking photos of fungi from many angles including the underside to record the gills (or pores) for identification purposes, this would have meant getting extremely muddy. I sometimes had very little time to photograph anything other than birds as I had to keep up with the group.

Note the very thick forest. With a few steps into the forest, light levels diminished greatly, and the weather conditions sometimes produced a fine mist.

Photo at right: Lockerbie Scrub 2015 Jan 10



Here's photos of some of the fungi seen on the trip. As I have very few resources on FNQ fungi, I have only been able to put a genus name to some of these, and sometimes even these names are tentative. I would very much appreciate advice of scientific names from the CFF readership. (Advise Barry Muir.)



Lentinellus, maybe, The Tip, Cape York Peninsula
2015 Jan 10



Lentinellus, maybe, Lockerbie Scrub 2015 Jan 6



Mycena adscendens, Lockerbie Scrub
2015 Jan 11



Hohenbuehelia, Lockerbie Scrub 2015 Jan 11



Agaric,
Bamaga
airport
2015
Jan 9.
These
very long
stipes
bear a
ring.



Favolaschia manipularis, Lockerbie Scrub 2015 Jan 11



Agaric, Lockerbie Scrub
2015 Jan 11

Fantastic colour.

All of the fungi to this point are on wood.

The following were in the soil, and this was very interesting to me considering the rainfall. Any fungi with a soil substrate would surely have been drowned by mid-January.

It leads me to wonder whether these fungi would have fruited at all in a more normal year of more than 174 mm rainfall in December. Perhaps they would have fruited and released spores in November when the mean rainfall is about 39.1 mm (ie before the heavier rainfall), but the unusual lower rainfall in the last two months of 2014 may have allowed them to fruit in January 2015.



Cowal Creek near Bamaga (far left) and flooded road nearby 2015 Jan 9



Parasola plicatilis, Lockerbie Scrub 2015 Jan 6. Note the plant seedlings responding to the rain.

Goodness knows how these fared with the ongoing heavy rain, but at this stage, their caps are sufficiently open that they may have had to chance to release mature spores. Rain helps fungi spores to spread.



Cystoderma, maybe, Roma Flat 2015 Jan 10



The overall start of the road to the thick Lockerbie Scrub forest, and Roma Flat forest and more open scrubland.

As well as agarics, there were fungi in other morphogroups.



Polypore, Cowal Creek near Bamaga 2015 Jan 9



Polypore, Seisia 2015 Jan 11



The brown is road dust and mud.
Polypore, Lockerbie Scrub 2015 Jan 6.



Ascomycetes, Lockerbie Scrub 2015 Jan 6

In Cairns mid-January, almost every day, there would be no rain in the morning or afternoon, with humidity and storms building up during the day and then at least some rain released during the evening or night.



Marasmiellus, Lake Barrine 2015 Jan 15



Agaric, Flecker Botanical Garden, Cairns 2015 Jan 13

Barry Muir has advised me that the main season for Cairns area fungi is your wet season January to March, with some fungi appearing at other times. That is, the main fungi season in the Cairns area is effectively the opposite of Sydney area, at the hottest time of year rather than the coldest. See CFF Newsletters numbered 3 (2017 June), 10 (2018 August), 16 (2019 August) and 18 (2020 February) for discussions on climate and fungi in the Cairns area.

Thank you to Commonwealth of Australia (Bureau of Meteorology) for climate information.

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Wishing CFF readers in TNQ and FNQ a great fungi season.