Australian fungi, slime moulds and the people who find them

AFSM Volume 5 - to end of Winter, Aug 2022

Adrian Power **adrian_aus**

02 September 2022

Contents

Changes and additions

Volume 5 (to 2022-08-31)
* Added Fungimap flags to the Top species by proportion of research grade observations
* Added Protozoa breakdown in Fungimap 2 section
* Added level of completeness (LOC) table, so it is easier to compare changes over time
* Corrected chart title: Frequency distribution of species by research grade proportion

Volume 4 (to 2022-06-30)
* Added the proportion of observations that are research grade by month created
* Added the proportion of observations by taxon level of completeness (LOC)
* Added the proportion of Fungimap 1 and 2 observations of all species level observations

Volume 3 (to 2022-06-30)
* Added the Fungimap original and version 2 target species analysis
* Added the cumulative total of observations and users
* Improved charts

Volume 2 (to 2022-05-31)
* Added the Mycetozoa (observed) family tree
* Added IDs to the Top 50 Obs tables
* Added Red Triangle Slugs to Bidjigal map and added overlap analysis for Red Triangle Slug and Ghost Fungus distribution
* Improved map quality and halved file size

Volume 1 (to 2022-03-27)

Introduction - Australian fungi, slime moulds and the people who find them

This document brings together some interesting insights about fungi and protozoa that are not available from iNaturalist directly. It can be downloaded from https://adrianpower.com/. Volume 1 was shared by the Australian Mycological Society in their April 2022 newsletter.

The insights highlight the value and potential of citizen science to contribute to an evidence base to help understand a subject that is literally and figuratively 'in the dark'. My favourite insight is that the top 50 observers of fungi on iNaturalist represent only 0.41% of all users, yet their observations contribute almost half (45.06%) of the total observations. This shows that one person *can* make a world of difference to the information available about fungi and protozoa in Australia.

Adrian Power

Background and aim - an exploration of iNaturalist fungi and protozoa data

My interest in fungi took off while bushwalking in April 2019 where in just a few kilometres I saw an incredible array of different fungi. I was so surprised by the variety, I bought the Field Guide to Australian Fungi (Bruce Fuhrer, 2016) and tried to identify them from the photos I took. The guide opened my eyes to an even larger world of fungi and from that point I was hooked. I quickly learnt how to take better photos for identification purposes and even created a page on my website (now removed) to catalogue my observations. It had square cropped photos with a small description in a grid layout - I didn't realise at the time that I had created a D-I-Y iNaturalist page.

In late 2021 I came across what I thought might have been an orange slime mould that I could not identify and contacted Sarah Lloyd for assistance, who kindly suggested I might be interested in iNaturalist. From that point on life has never been the same. By using iNaturalist I have become even more aware of the sheer variety of fungi out there and a better observer in the field. I also became acutely aware of the stark lack of documented species and reference material.

The more I contributed to iNaturalist, the more I wondered how the data collected is being used. I did a little research yet couldn't find much information except for FungiMap. Though I don't have any biology training, I do have a background in data and analytics and decided to look at the iNaturalist data for myself, to see what I could see.

What started out as a little data exploration has morphed into this document - a mix of ideas for how iNaturalist data can be used. Sometimes even simple ideas can provide compelling insights. Initially I wanted to understand distributions of species but became even more interested in the human factor: what drives people to post their observations and how citizen science contributes to an evidence base.

Looking into the people side of things acknowledges the contributions of those who have added to the data. Though every contribution is valuable, there are a few avid users who have significantly impacted the amount and quality of data available. This document aims to celebrate those contributions.

I aim to release updates of this document regularly (seasonally) and incorporate improvements and additions as I go. This document has been coded in the R and SQL programming languages so it can update automatically.

I have included a couple of interests of mine: documenting the distribution of fungi and protozoa in Bidjigal Reserve (Sydney, Aus) and a little about Red Triangle Slugs and Ghost Fungus. Some people might find it strange that I have mixed kingdoms - i.e. fungi and protozoa. I believe these go hand in hand in that they happen to take up residence in similar locations. If I can help raise the profile of slime moulds even a little, I consider that a success.

I hope you enjoy reading this as much as I enjoyed putting it together. Please let me know if you have any feedback or suggestions for future versions. Message me on iNaturalist, or email fungi@adrianpower.com

iNaturalist, Australian data and limitations

This document explores observations and identifications of fungi and protozoa in Australia. iNaturalist is where I contribute observations and the website makes it easy to download the data I want to analyse. It is also recommended by FungiMap. I am aware of the iNaturalist and Atlas of Living Australia (ALA) collaboration but have not explored the ALA data.

The iNaturalist data for observations is well structured, with minimal data cleansing required. 'Casual' observations are excluded (as these are missing a valid date or location). Non-research grade observations are important contributions to the evidence base and analysing these highlights the need for people to review and accurately identify observations.

Contributions to identifications are as important as the observations themselves. Unfortunately, there is currently no way to export detailed information about identification activity, but some summary statistics have been explored.

A note about iNaturalist species
When looking at an iNaturalist user's observations, there is a species count at the top of the page. There appears to be no 'raw' data available from iNaturalist that corresponds exactly to the iNaturalist species counts. For example, the following fields and their counts have been compared: species_guess, scientific_name, common_name, iconic_taxon_name and taxon_species_name. As such, the species related counts in this document do not always match what is displayed on the iNaturalist website, and so I have minimised the amount of species ranking. There is limited information on how exactly the iNaturalist species counts are calculated, for background see: https://www.inaturalist.org/posts/19369-how-does-inaturalist-count-taxa.

The data fields used in this document to calculate species counts are scientific_name or species_name, depending on the analysis.

Table 1: Proportion of fields that are missing values

Kingdom	Species Guess	Scientific Name	Common Name	Phylum	Class	Order	Genus	Species Name
Fungi	9.0%	0.0%	34.0%	2.0%	2.0%	6.0%	25.0%	52.0%
Protozoa	7.0%	0.0%	37.0%	0.0%	7.0%	18.0%	22.0%	43.0%

Table 2: Proportion of fields by Level Of Completeness (LOC)

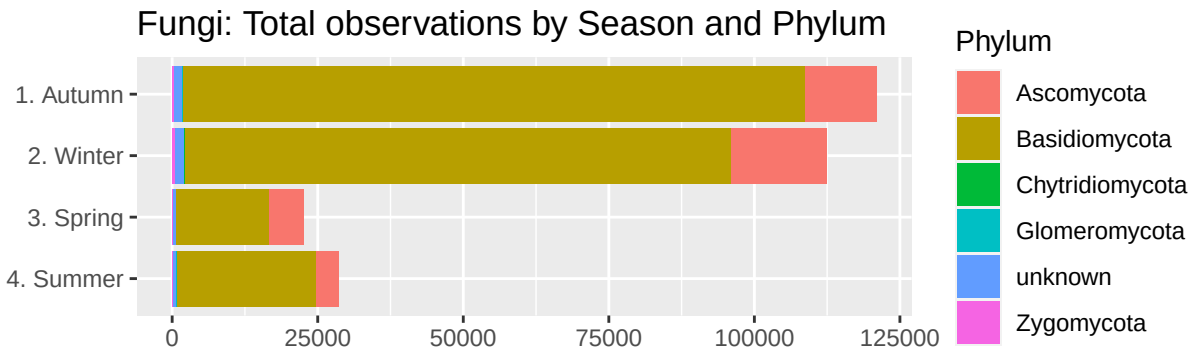
LOC	Fungi Obs	Fungi LOC %	Protozoa Obs	Protozoa LOC %
1. Kingdom	4,416	1.6%	17	0.2%
2. Phylum	2,315	0.8%	431	6.3%
3. Class	10,209	3.6%	813	11.9%
4. Order	54,041	19.0%	261	3.8%
5. Genus	77,252	27.1%	1,392	20.3%
6. Species	136,339	47.9%	3,932	57.4%

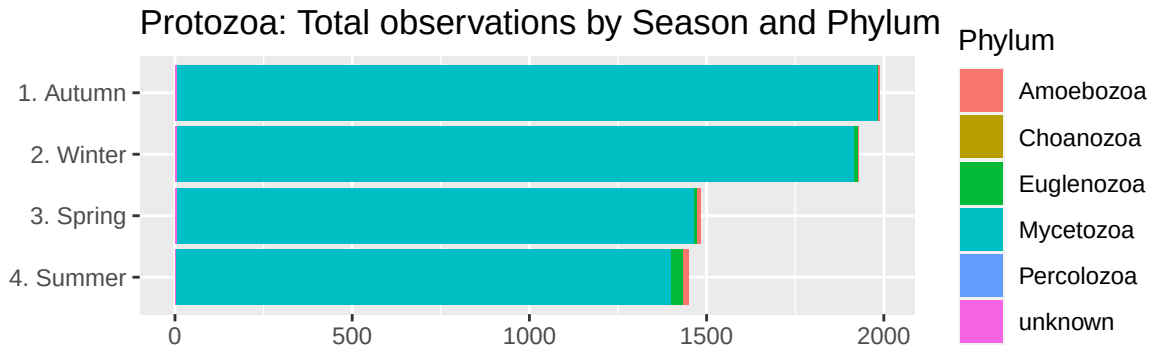
General observations and exploration of the data

As of iNaturalist data to 2022-08-31 , there are 284,572 observations of fungi in Australia, from 12,308 observers and as of 2022-08-31 , there are 6,846 observations of protozoa in Australia, from 1,330 observers.

Seasonal distribution of observations

iNaturalist shows the seasonality for each species on the site, however seeing observations aggregated to the level of kingdom and phylum reveals trends in seasonality and categorisation of observations.

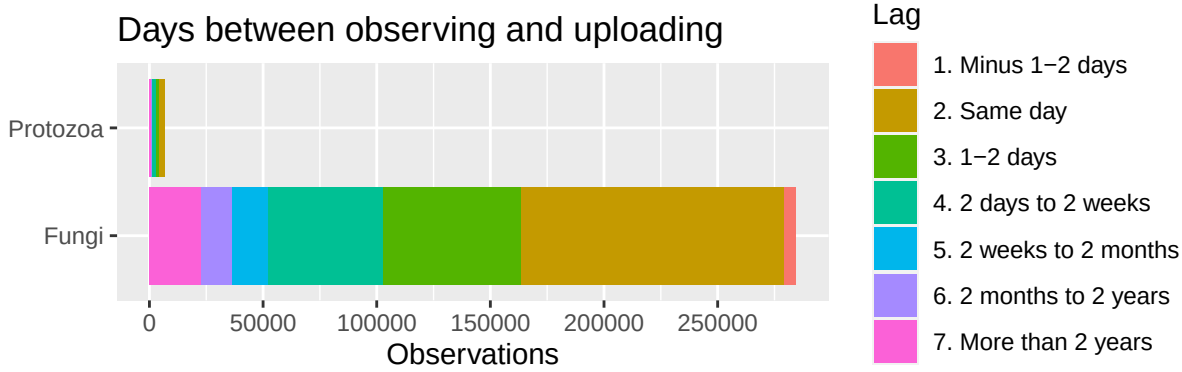




Time between observation and uploading

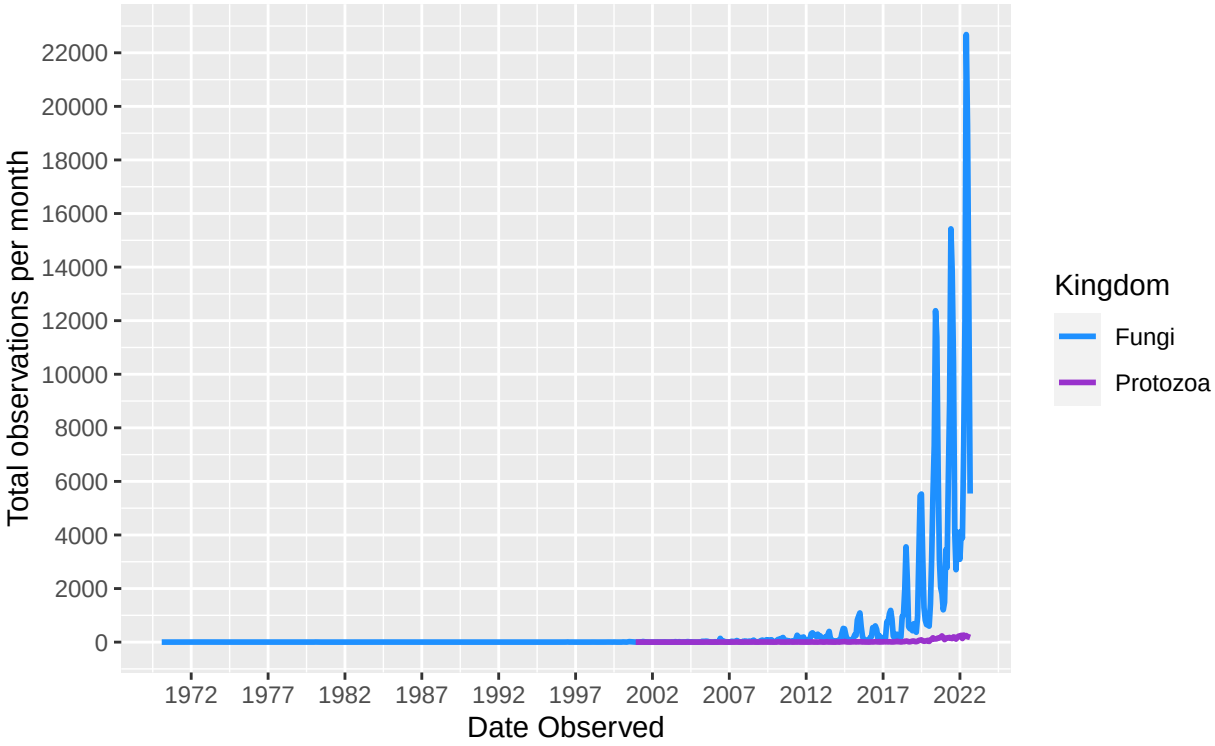
Often people create observations in the field with the iNaturalist app. Sometimes they become interested in fungi and upload photos from 10 years ago. This chart explores the 'lag' between when something was observed VS when the iNaturalist entry was created. There can be a negative lag, sometimes the entry is created before the observation date. This might be for various reasons, such as the adjustment of dates by photo editing software or differences in time zones, or simply a result of incorrect data entry.

On average, observations on iNaturalist are posted 196 days after they were seen in the wild, with a maximum of 18,537, a minimum of -2 and a median of 1.

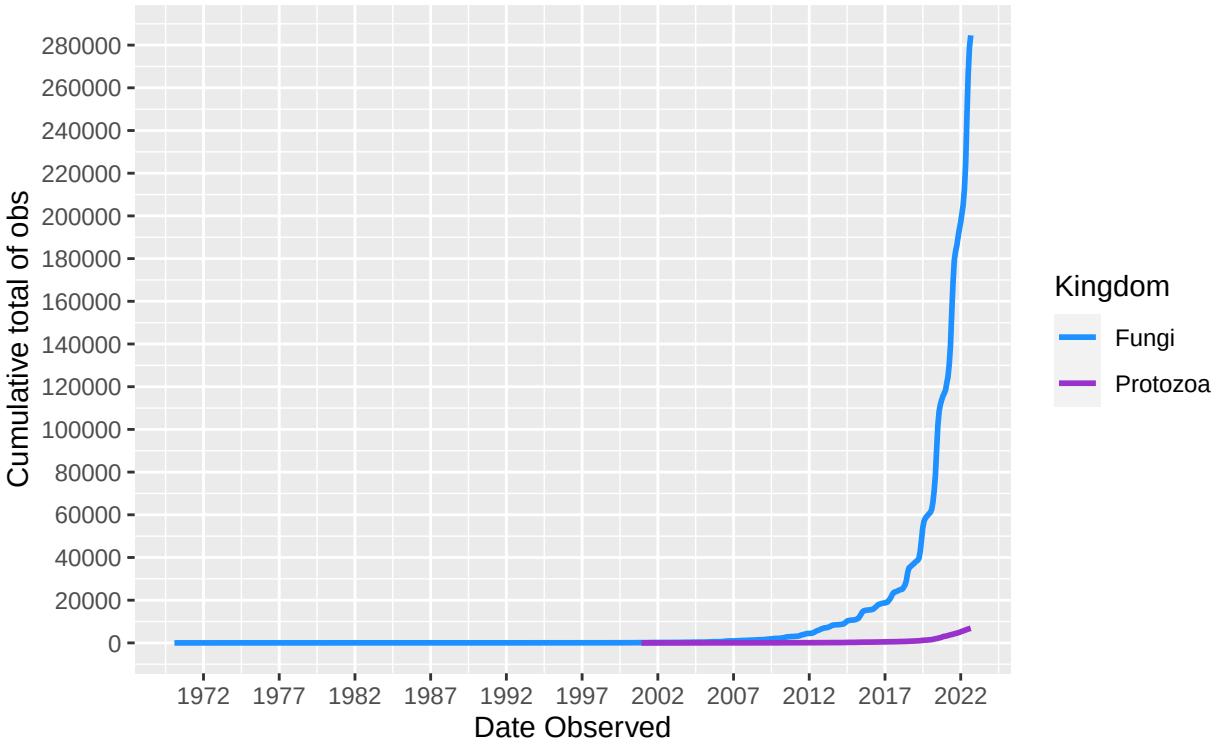


Total observations per month

The following chart shows the total number of observations per month by kingdom.

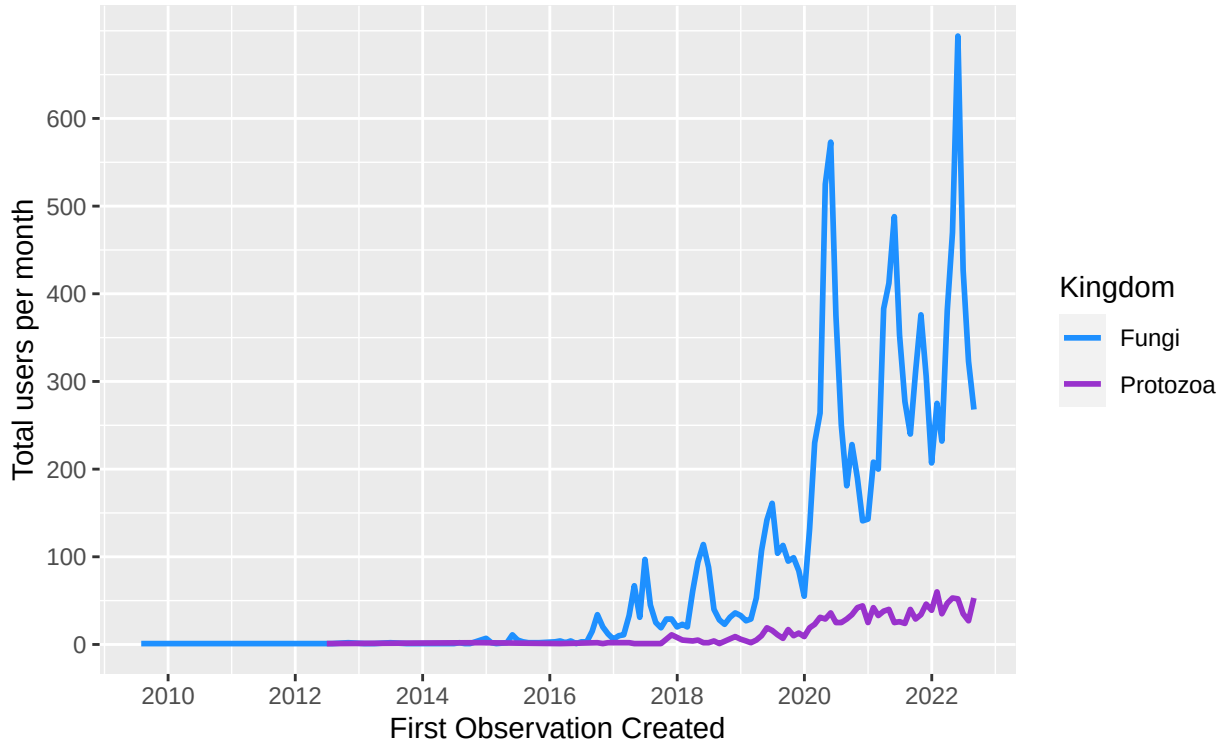


Cumulative total of observations



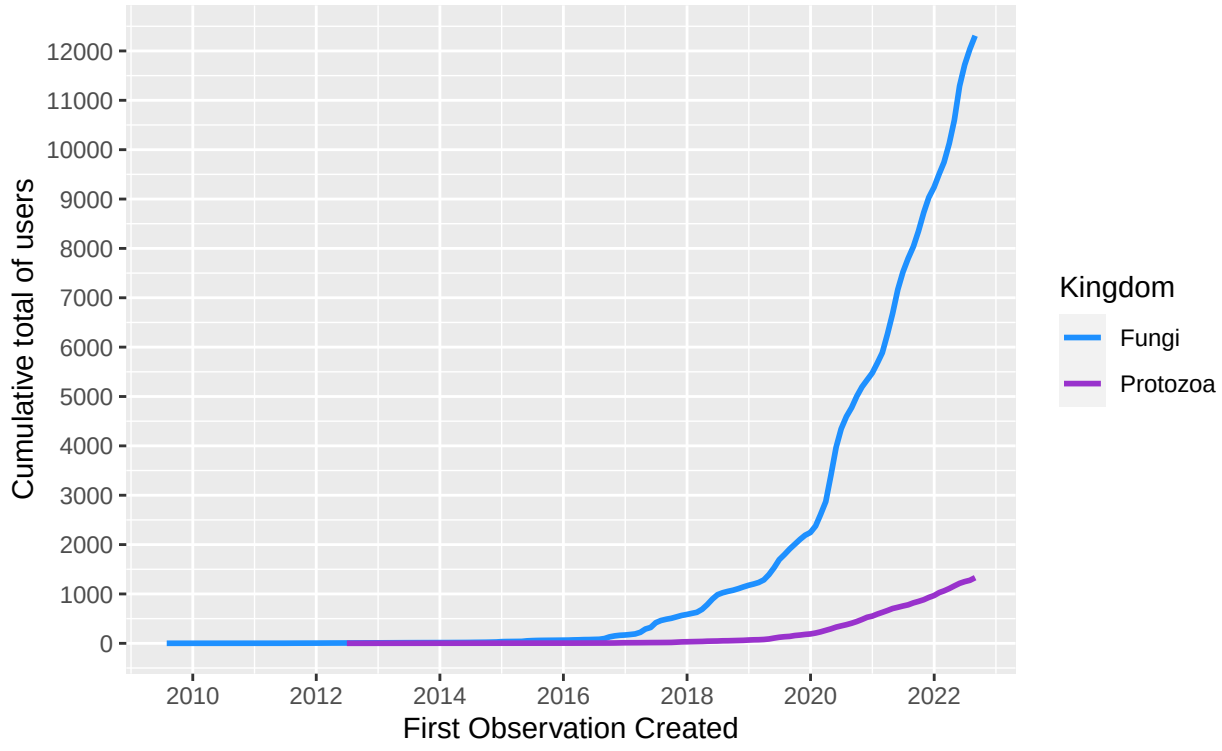
New observers per month

This chart shows the number of new observers per month, based on their first observation date. It would be interesting to look into peaks of interest and whether it correlates with seasons, or events such as bio-blitzes or the release of “Fantastic Fungi” on Netflix. 2020 was clearly a turning point for fungi and protozoa - perhaps this is related to COVID-19 lockdowns and people getting more outdoor exercise.



Cumulative total of observers

Based on the earliest observation created date.



Research Grade Analysis

Thanks to Sequoia Lewien for the idea to look at the species that have high proportions of research grade records. A far higher number of species do not have any research grade observations, which is probably a reflection of the limited number of experts actively contributing to the site for identifications, and that to get a positive ID, often microscopy or DNA sequencing is required. Sometimes people simply upload photos that can't be used for identification, due to being blurry or missing important surfaces or features. It's quite interesting that the RG proportion by kingdom is so similar. In the table below, FM (and version) indicates a FungiMap target species.

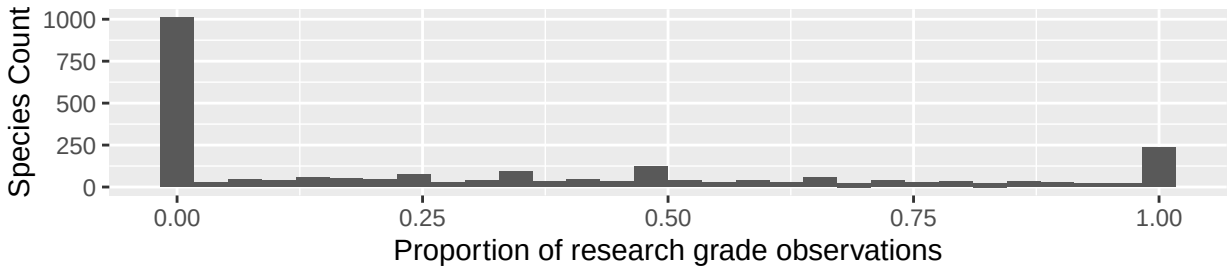
Table 3: Research Grade Observations by Kingdom

Kingdom	RG Count	Obs Count	RG Prop.
Fungi	86,578	284,572	30.4%
Protozoa	2,332	6,846	34.1%

Table 4: Top 25 species by proportion of research grade observations with more than 100 observations

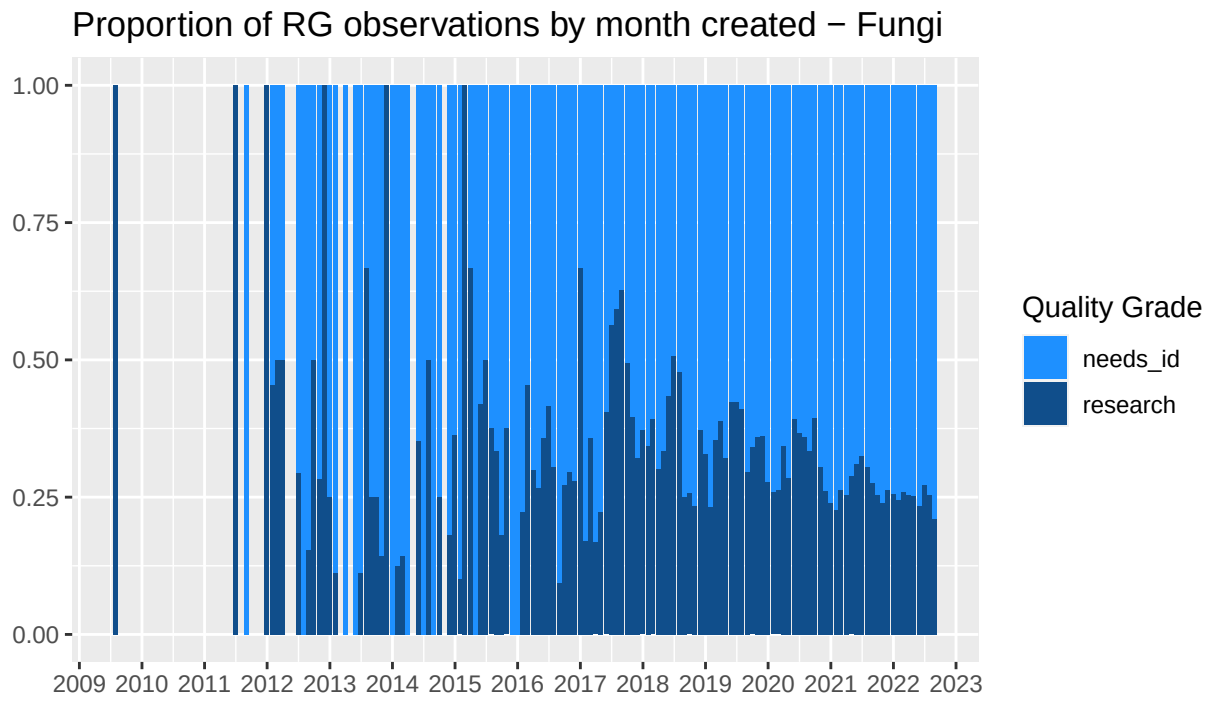
Kingdom	Scientific Name	RG Count	Obs Count	RG Prop.	FM 1	FM 2
Fungi	Favolaschia claudopus	1,870	1,870	100.0%	.	Y
Fungi	Colus pusillus	330	330	100.0%	Y	.
Fungi	Cyttaria gunnii	139	139	100.0%	Y	.
Fungi	Entoloma virescens	150	150	100.0%	Y	.
Fungi	Aseroe rubra	938	939	99.9%	Y	.
Fungi	Mycena interrupta	1,392	1,396	99.7%	Y	.
Fungi	Cruentomycena viscidocruenta	1,590	1,597	99.6%	Y	.
Fungi	Amanita muscaria	2,010	2,018	99.6%	Y	.
Fungi	Neobarya agaricicola	246	247	99.6%	.	Y
Fungi	Mycena lazulina	520	522	99.6%	.	Y
Fungi	Hymenoscyphus berggrenii	175	176	99.4%	.	.
Fungi	Clathrus archeri	148	149	99.3%	Y	.
Fungi	Favolaschia manipularis	159	161	98.8%	.	.
Protozoa	Ceratiomyxa fruticulosa	572	580	98.6%	.	Y
Fungi	Lysurus mokusin	269	273	98.5%	.	.
Fungi	Mycena epipterygia	366	372	98.4%	.	.
Fungi	Clathrus ruber	143	146	97.9%	.	.
Fungi	Porpolomopsis lewelliniae	279	285	97.9%	Y	.
Fungi	Pseudohydnum gelatinosum	615	632	97.3%	Y	.
Fungi	Ileodictyon gracile	175	180	97.2%	Y	.
Fungi	Phallus multicolor	358	370	96.8%	.	.
Fungi	Hericium coralloides	195	203	96.1%	Y	.
Fungi	Psilocybe subaeruginosa	649	677	95.9%	.	Y
Fungi	Leotia lubrica	344	360	95.6%	Y	.
Fungi	Amanita xanthocephala	1,114	1,171	95.1%	Y	.

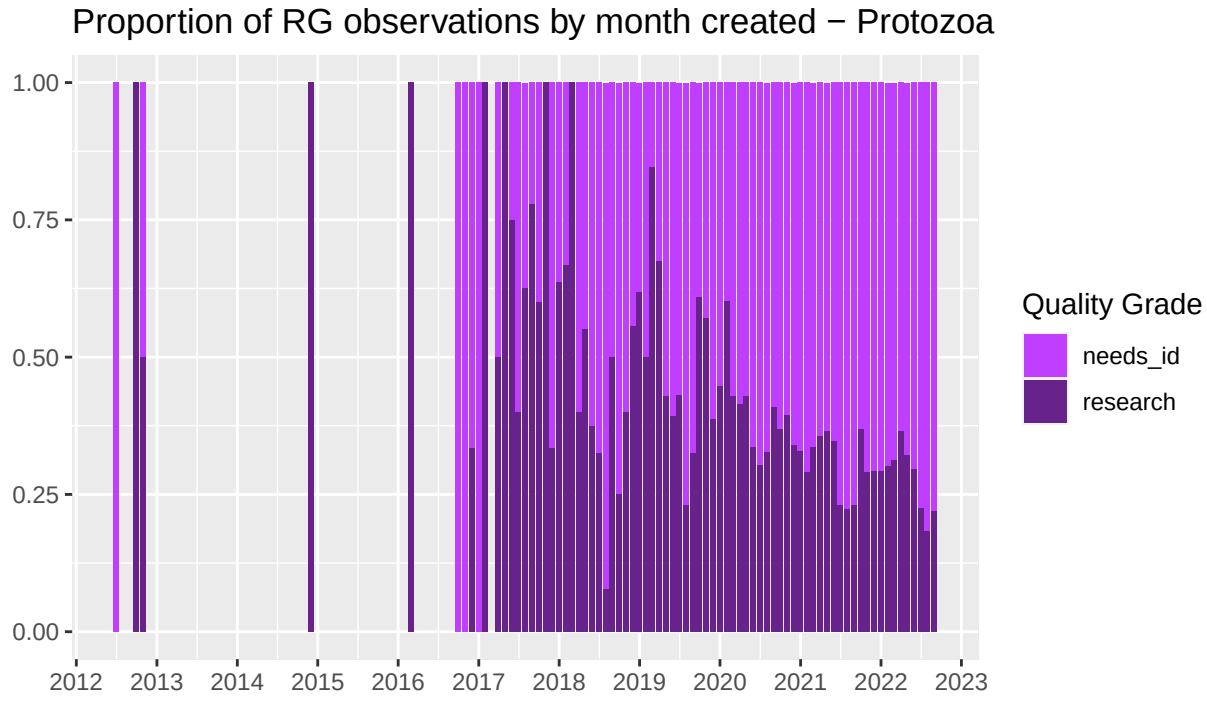
Frequency distribution of species by research grade proportion (scientific name)



Proportion of observations that are research grade by month created

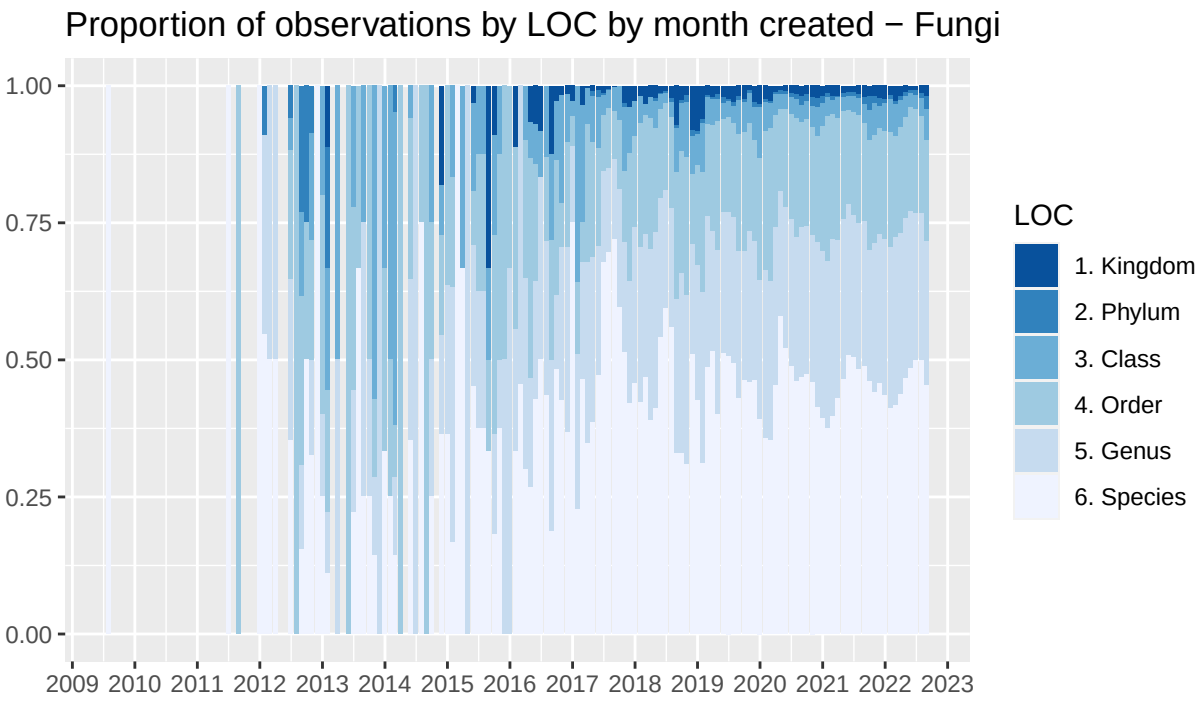
Thanks to Tom May for this suggestion.

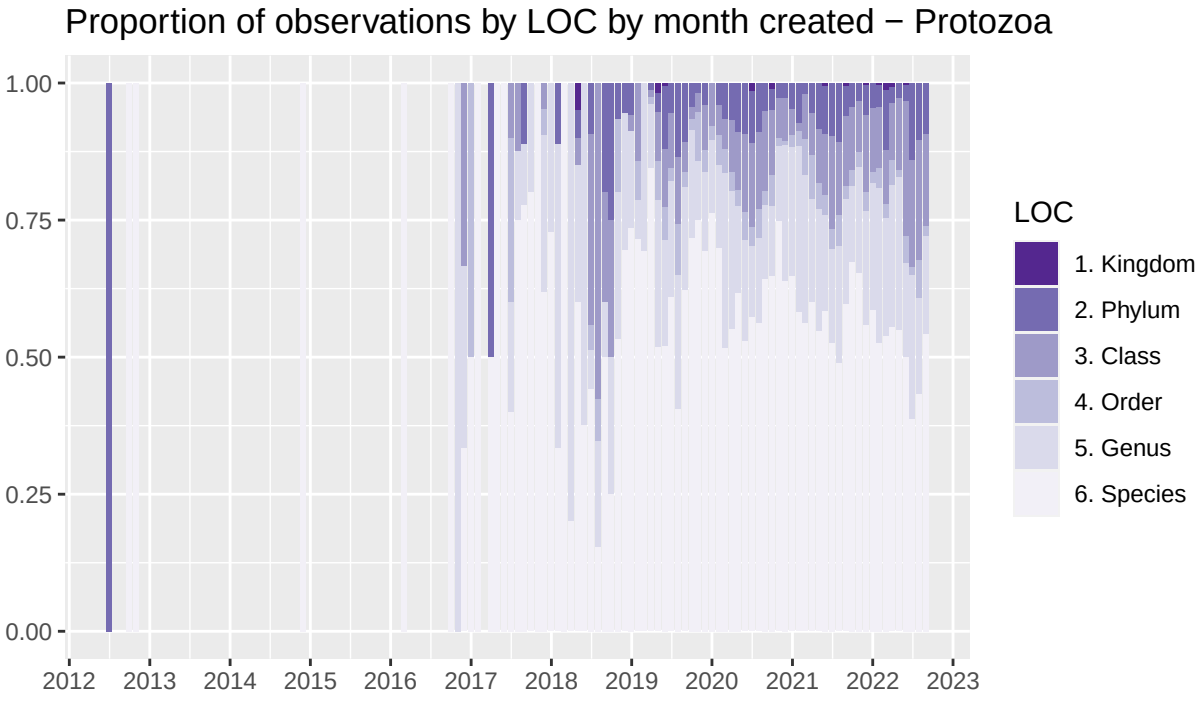




Proportion of observations by taxon Level Of Completeness (LOC)

Level Of Completeness (LOC) meaning the lowest level of taxon recorded for each observation. Thanks to Tom May for this suggestion.





First Find

What species first captures someone's attention enough to lead to their first observation for fungi and protozoa? Note: the aggregation is based on the lowest level of taxon recorded (scientific name).

Table 5: First find - Fungi

Rank	Scientific Name	Count
1	Agaricales	1,117
2	Agaricomycetes	504
3	Trametes coccinea	349
4	Amanita muscaria	273
5	Fungi	241
6	Polyporales	232
7	Aseroe rubra	221
8	Trametes	216
9	Omphalotus nidiformis	206
10	Gymnopilus junonius	185
11	Lecanoromycetes	166
12	Amanita	147
13	Gymnopilus	144
14	Psathyrellaceae	128
15	Agaricus	126
16	Boletales	117
17	Chlorophyllum	114
18	Leratiomyces ceres	101
19	Leucocoprinus birnbaumii	100
20	Coprinus comatus	94
21	Ramaria	92
22	Lichenomphalia chromacea	90
23	Geastrum	89
24	Agaricineae	87
25	Cruentomycena viscidocruenta	86

Table 6: First find - Protozoa

Rank	Scientific Name	Count
1	Fuligo septica	326
2	Myxomycetes	133
3	Mycetozoa	103
4	Tubifera ferruginosa	97
5	Stemonitis	93
6	Ceratiomyxa fruticulosa	70
7	Fuligo	63
8	Mucilago crustacea	47
9	Lycogala epidendrum	46
10	Stemonitis splendens	28
11	Lycogala	26
12	Leocarpus fragilis	22
13	Mucilago	19
14	Leocarpus	18
15	Arcyria	18
16	Tubifera	18
17	Arcyria obvelata	14
18	Physarales	14
19	Trichia decipiens	14
20	Physaraceae	11
21	Physarum	11
22	Diachea leucopodia	10
23	Reticularia lycoperdon	9
24	Stemonitidaceae	7
25	Trichia	7

Bidjigal Reserve - a secret valley

Bidjigal Reserve is a hidden sanctuary in the north-west of Sydney that is an important place to me and is named after the Bidjigal people who are the traditional custodians. I highly recommend you read this incredible overview, "The bushland of Bidjigal Reserve and adjoining reserves", which points out on page 7 that the reserve is known for its diversity of Fungi.

A place to preserve
I hope drawing attention to this area will help its preservation. There are some pristine areas in the reserve, which are maintained through many dedicated local bush care groups both past and present. But it is not perfect. Until the 1970's, when the surrounding area was bulldozed for housing and sewer lines installed along the many creek-lines, the area had crystal clear water which was home to platypus. The area is under pressure, with many sections plagued by weeds, vandalism, rubbish and over-use. The creek lines are often contaminated by sewage overflow. Bidjigal reserve needs coordinated and active management, which sadly is not occurring. It is a beautiful place, home to many plants and animals, including echidna.

The project
When I started on iNaturalist, there were very few records of fungi in this area so I set about changing that through **my project, "The Fungi and Slime Moulds of The Hills District, especially Bidjigal Reserve and Northmead Gully in Sydney, Australia"**. You can help by reviewing identifications on the project page or by visiting the reserve and contributing observations.

The variety
With an incredible diversity of habitats and vegetation communities comes an abundance of varieties of fungi, including (at the time of writing) the southern-most recorded Green Pepe (*Mycena chlorophos*) in Australia. I suspect there are species unique to this area or that are undescribed to science. Without microscopy or DNA sequencing, these species will remain a mystery.

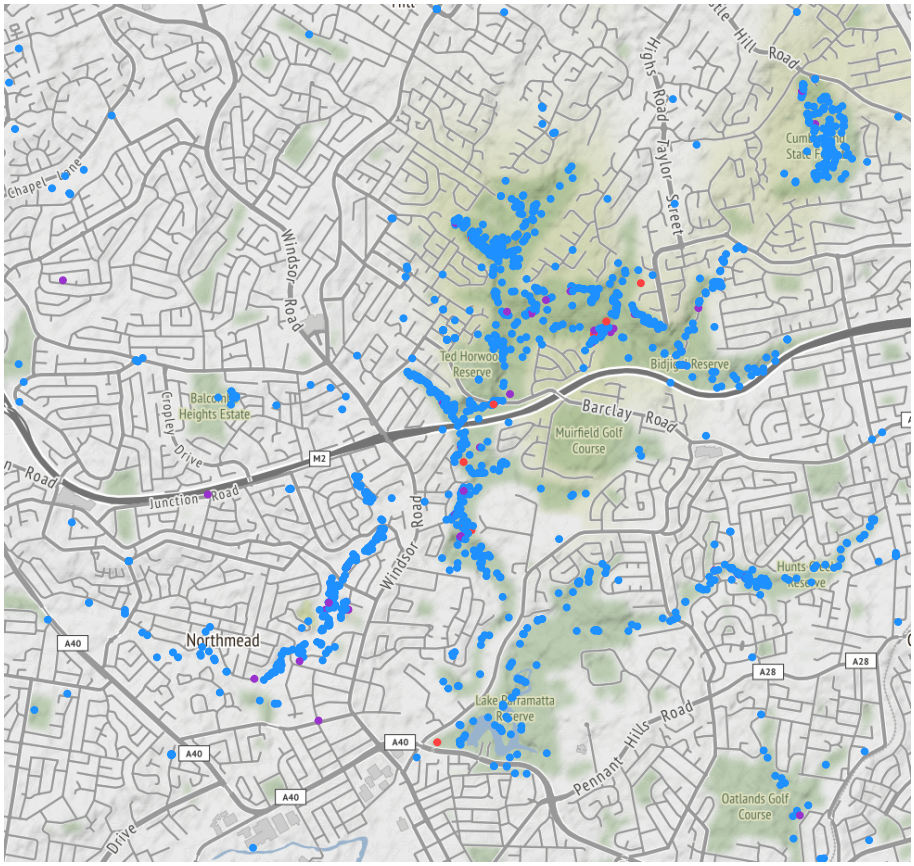


Figure 1: The recorded distribution of fungi (blue), slime moulds (purple) and Red Triangle Slugs (red) in Bidjigal Reserve, Northmead Gully and surrounding areas

The recorded distribution of Red Triangle Slugs and Ghost Fungus in Australia

Omphalotus nidiformis, commonly known as Ghost Fungus, is bio-luminescent and endemic to Australia. Anyone who has seen it glow in the dark will be captivated by its eerie beauty and there are plenty of great long-exposure photos on iNaturalist.

I wondered why it glows. Is it to attract insects who might spread its spores? A quick look on Wikipedia shows Ghost Fungus has, "been observed to attract nocturnal insects such as beetles, native cockroaches and crickets (white-kneed cricket (*Papuastus spp.*) and thorny cricket), as well as giant rainforest snails (*Hedleyella falconeri*) and red triangle slugs (*Triboniophorus graeffei*), which voraciously consume the fungus" ([13],[35]).

Triboniophorus graeffei, commonly known as Red Triangle Slugs are large, air breathing land slugs also endemic to Australia, and equally as captivating with their bright red triangle. One thing I find fascinating is that often in nature, patterns are symmetrical, yet with this slug, the triangle is not.

I wanted to know how closely distributed these two species are. The location data for the map below has been aggregated to 4 decimal places, which groups the observations into approximately 10 m x 10 m areas. Based on the data to date, there are 2,290 areas with only Ghost Fungus observations, 950 areas with only Red Triangle Slug observations and just 3 areas with both.

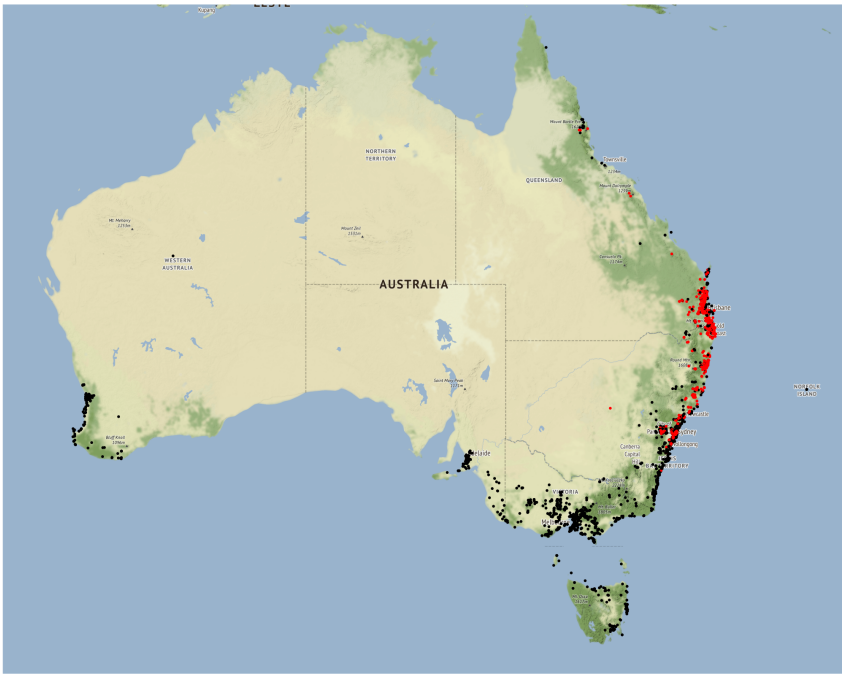
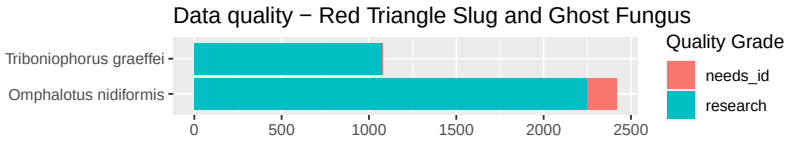


Figure 2: Recorded distribution (in ~10 m^2 areas) of Red Triangle Slugs (red), Ghost Fungus (black) and both (yellow)



Source: https://en.wikipedia.org/wiki/Omphalotus_nidiformis: [13] Maguire, Garry (9 December 2011). "Luminous Ghost Fungus". Springbrook, Queensland: Springbrook Research Centre. [35] Young, T. (1996). "Some more records of fungi used as food by animals in Australia" (PDF). Australasian Mycologist. 15 (1): 8–9.

The recorded distribution of fungi in Australia

As of iNaturalist data to: 2022-08-31

The dots on the map below represent the approximate location of observations, with each dot representing an area of approximately 10 km x 10 km. A colour change from blue to red represents an increase in observations in an area.

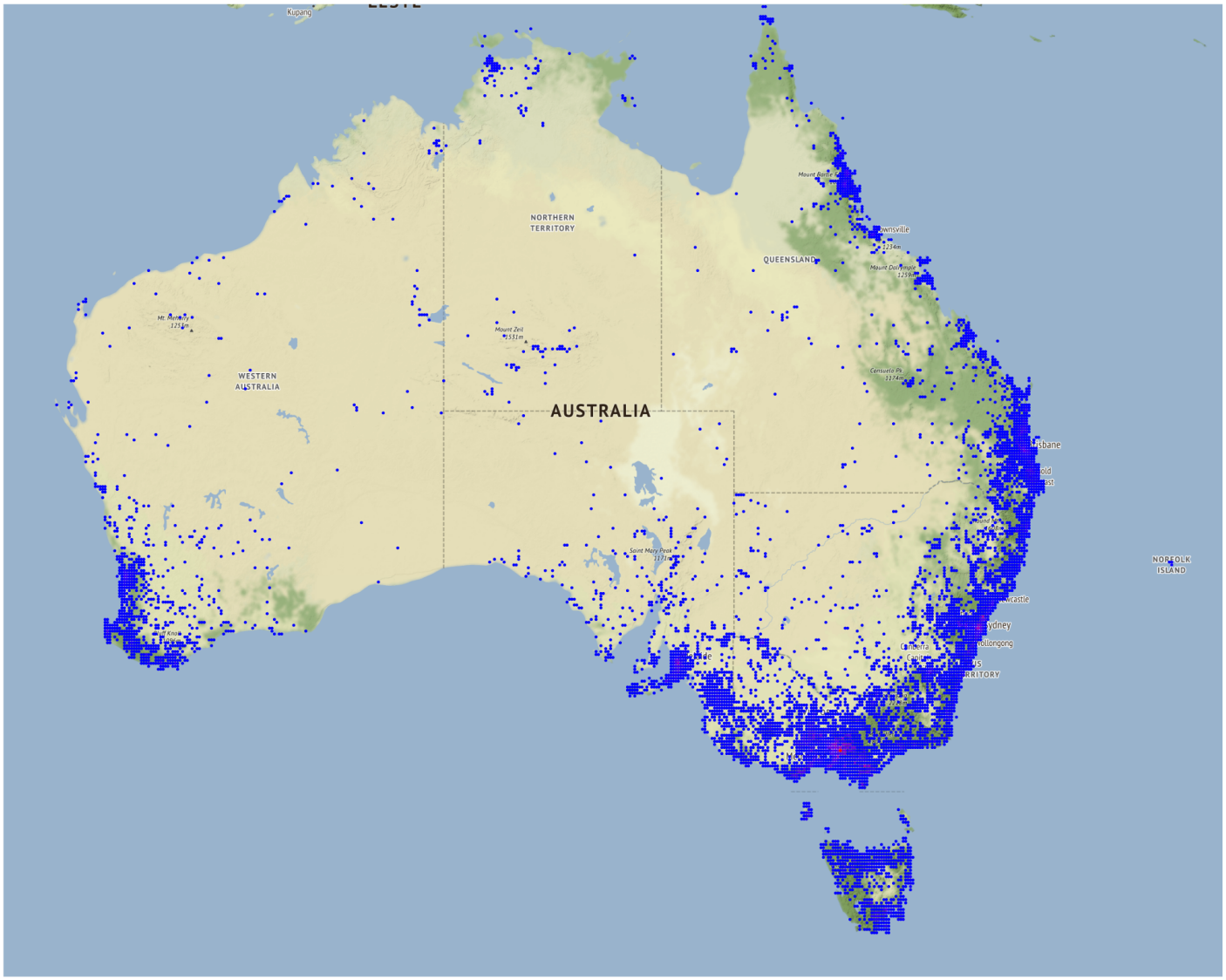


Figure 3: Fungi Distribution Map

The top 50 observers of fungi in Australia

As of iNaturalist data to: 2022-08-31 , there are 284,572 observations of fungi in Australia, from 12,308 observers. Each user represents 0.008% of the total. The Top 50 users contributed 128,239 observations, or 45.06% of the total, while representing only 0.41% of total observers. This page celebrates the contribution these users have made to the data available.

Table 7: Top 50 observers of fungi in Australia

User	Obs Rank	Obs	Obs %	Species Rank	Species ^	Species %	RG	RG Ratio	IDs	ID Rank #
reiner	1	56,128	19.7%	1	1,078	32.8%	25,104	44.7%	20,783	3
felix75	2	5,362	1.9%	6	467	14.2%	1,558	29.1%	4,437	10
sofiazed1	3	5,168	1.8%	8	442	13.4%	1,028	19.9%	44,173	1
peterzuidland	4	3,744	1.3%	2	790	24.0%	1,023	27.3%	14	470
kenharris	5	3,560	1.3%	12	415	12.6%	476	13.4%	66	195
ghjake	6	3,024	1.1%	3	604	18.4%	1,058	35.0%	4,705	9
blackangus	7	2,591	0.9%	7	456	13.9%	1,340	51.7%	644	44
davidsando	8	2,263	0.8%	57	189	5.7%	696	30.8%	24	347
questagame	9	2,108	0.7%	15	361	11.0%	352	16.7%	39	264
triciastewart	10	2,041	0.7%	13	377	11.5%	504	24.7%	175	113
mononymous	11	1,799	0.6%	43	217	6.6%	662	36.8%	NA	NA
paul2george	12	1,757	0.6%	4	531	16.1%	856	48.7%	940	28
franklinhermit	13	1,659	0.6%	16	360	10.9%	607	36.6%	307	72
bushbandit	14	1,570	0.6%	5	478	14.5%	632	40.3%	9,512	7
daviaker	15	1,545	0.5%	24	291	8.8%	482	31.2%	104	156
michaelcincotta	16	1,537	0.5%	14	373	11.3%	344	22.4%	681	42
adrian_aus	17	1,524	0.5%	18	337	10.2%	312	20.5%	6,632	8
cinclosoma	18	1,522	0.5%	75	166	5.0%	169	11.1%	209	95
eileen64	19	1,518	0.5%	10	434	13.2%	851	56.1%	99	160
pardalotebellion	20	1,490	0.5%	28	263	8.0%	316	21.2%	467	54
rvraders	21	1,487	0.5%	22	299	9.1%	358	24.1%	45	244
kim-tarpey	22	1,409	0.5%	73	167	5.1%	655	46.5%	NA	NA
ladydawn	23	1,248	0.4%	26	281	8.5%	229	18.3%	26	335
melvinxu	24	1,242	0.4%	23	293	8.9%	275	22.1%	NA	NA
streglystendec	25	1,146	0.4%	33	254	7.7%	334	29.1%	134	135
godinoz	26	1,089	0.4%	30	261	7.9%	203	18.6%	NA	NA
mattcampbellaus	27	1,080	0.4%	10	434	13.2%	377	34.9%	1,816	16
crazy_horse	28	1,046	0.4%	34	250	7.6%	460	44.0%	165	117
nicklambert	29	930	0.3%	37	235	7.1%	173	18.6%	211	94
lesfran	30	923	0.3%	21	304	9.2%	405	43.9%	274	79
konan_farrelly	31	920	0.3%	49	200	6.1%	531	57.7%	16,498	4
anon135	32	884	0.3%	17	340	10.3%	201	22.7%	354	61
matisafunguy	33	806	0.3%	57	189	5.7%	287	35.6%	717	39
rainforestfolk	34	804	0.3%	168	99	3.0%	91	11.3%	NA	NA
tassietravelsblog	35	796	0.3%	31	256	7.8%	363	45.6%	39	269
nyoni-pete	36	790	0.3%	41	224	6.8%	147	18.6%	205	98
leshanrahan	37	789	0.3%	32	255	7.8%	318	40.3%	76	180
johneichler	38	787	0.3%	9	437	13.3%	303	38.5%	133	136
arripis	39	783	0.3%	20	319	9.7%	315	40.2%	NA	NA
rhinolophus	40	714	0.3%	61	180	5.5%	192	26.9%	16	432
ivan-theaged	41	708	0.2%	35	242	7.4%	153	21.6%	NA	NA
judy_rob_peters	42	707	0.2%	79	159	4.8%	86	12.2%	NA	NA
robertcronin	43	699	0.2%	50	197	6.0%	155	22.2%	NA	NA
hbeshara	44	681	0.2%	35	242	7.4%	226	33.2%	266	81
malcolm_mckinty	45	670	0.2%	25	284	8.6%	188	28.1%	NA	NA
damontighe	46	667	0.2%	46	208	6.3%	66	9.9%	75	183
cobaltducks	47	640	0.2%	116	121	3.7%	162	25.3%	198	100
coddiwompler	48	637	0.2%	27	266	8.1%	132	20.7%	NA	NA
bennybotany85	49	629	0.2%	88	145	4.4%	148	23.5%	131	137
drongo	50	618	0.2%	45	210	6.4%	140	22.7%	NA	NA

Notes - For each user in the list:

- Obs Rank: based on the number of observations. If there is a tie for positions, users are sorted alphabetically
- Obs: the number of observations
- Obs %: the proportion of observations by the user compared to the total observations of all users
- Species Rank: based on the total number of species observed (distinct taxon_species_name)
- Species: the count of distinct taxon_species_name for each observer ^ **N.B. this will not match the count on iNaturalist (the reason is explained in this document)**
- Species %: the proportion of species observed by the user compared to the the total of all species with observations recorded from all users
- RG: the number of research grade observations
- RG Ratio: the proportion of research grade observations
- IDs and ID Rank (#): based on the Top 500 identifiers per kingdom. See the Identifications section for more detail.

The recorded distribution of protozoa in Australia

As of iNaturalist data to: 2022-08-31

The dots on the map below represent the approximate location of observations, with each dot representing an area of approximately 10 km x 10 km. A colour change from blue to red represents an increase in observations in an area.

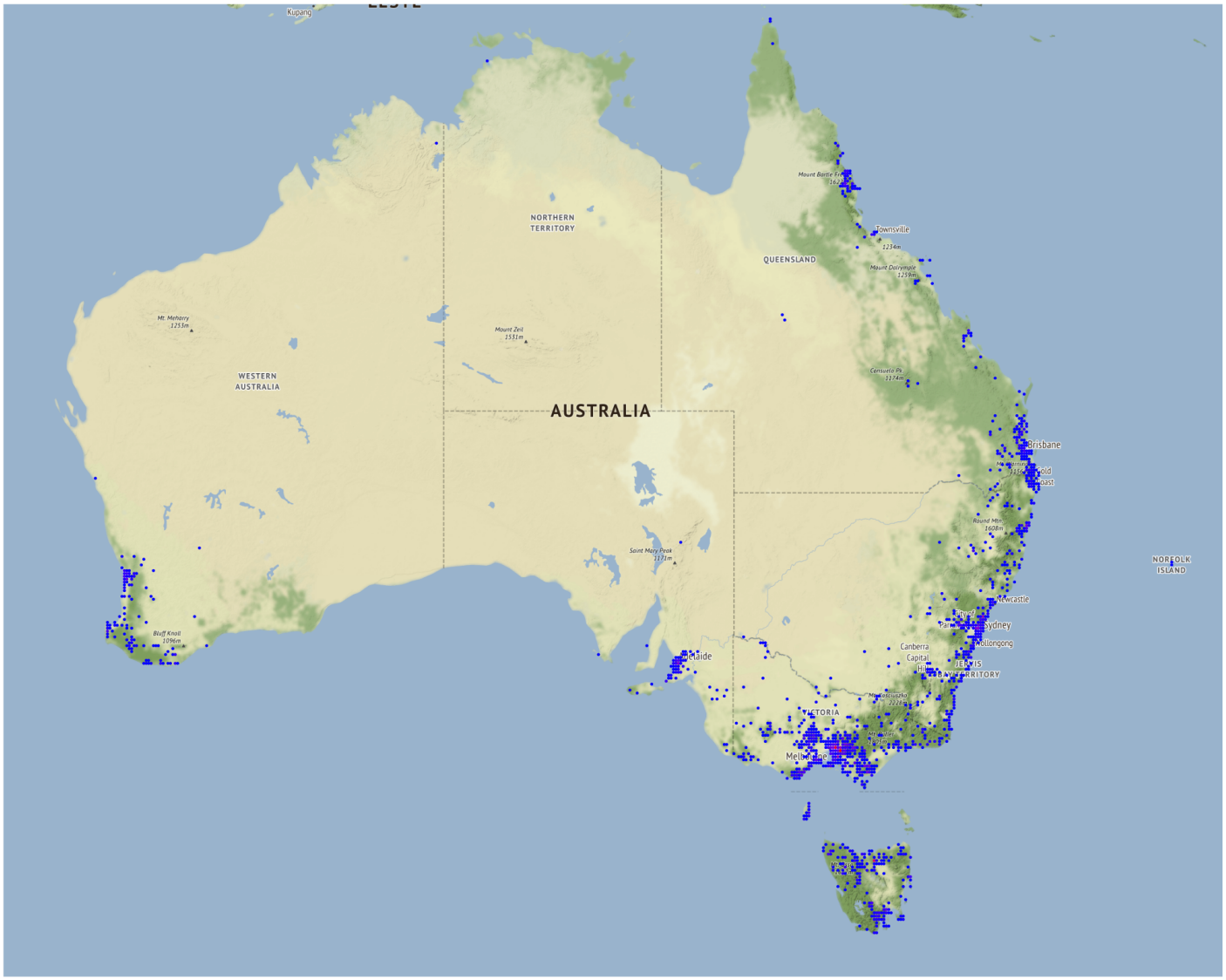


Figure 4: Protozoa Distribution Map

The top 50 observers of protozoa in Australia

As of iNaturalist data to: 2022-08-31 , there are 6,846 observations of protozoa in Australia, from 1,330 observers. Each user represents 0.075% of the total. The Top 50 users contributed 4,156 observations, or 60.71% of the total, while representing only 3.76% of total observers. This page celebrates the contribution these users have made to the data available.

Table 8: Top 50 observers of protozoa in Australia

User	Obs Rank	Obs	Obs %	Species Rank	Species ^	Species %	RG	RG Ratio	IDs	ID Rank #
reiner	1	1,288	18.8%	4	65	24.3%	456	35.4%	446	3
petamcdonald	2	559	8.2%	1	131	48.9%	238	42.6%	98	9
sarahlloyd	3	305	4.5%	2	89	33.2%	173	56.7%	849	2
ghjake	4	121	1.8%	11	24	9.0%	46	38.0%	55	12
peterzuidland	5	112	1.6%	3	66	24.6%	38	33.9%	1	327
adrian_aus	6	110	1.6%	9	30	11.2%	26	23.6%	1,017	1
felix75	7	100	1.5%	12	22	8.2%	27	27.0%	42	18
sofiazed1	8	95	1.4%	15	19	7.1%	26	27.4%	170	7
triciastewart	9	74	1.1%	22	15	5.6%	22	29.7%	8	57
sypster	10	72	1.1%	7	34	12.7%	42	58.3%	5	88
paul2george	11	69	1.0%	6	35	13.1%	34	49.3%	51	14
cowirrie	12	57	0.8%	44	10	3.7%	38	66.7%	4	117
franklinhermit	13	56	0.8%	19	16	6.0%	11	19.6%	5	92
ladydawn	13	56	0.8%	16	18	6.7%	19	33.9%	2	180
davidandjill123	15	53	0.8%	5	39	14.6%	19	35.8%	NA	NA
mononymous	16	48	0.7%	71	7	2.6%	25	52.1%	4	108
fayearcaro1	17	47	0.7%	8	31	11.6%	7	14.9%	NA	NA
bushbandit	18	41	0.6%	14	20	7.5%	26	63.4%	282	5
blackangus	19	39	0.6%	19	16	6.0%	7	17.9%	9	50
coddiwompler	19	39	0.6%	13	21	7.8%	9	23.1%	NA	NA
jameskdouch	19	39	0.6%	10	25	9.3%	6	15.4%	183	6
elusiveorchids	22	38	0.6%	27	13	4.9%	11	28.9%	1	229
ronef	23	37	0.5%	27	13	4.9%	8	21.6%	NA	NA
nicklambert	24	34	0.5%	17	17	6.3%	8	23.5%	11	44
crazy_horse	25	33	0.5%	22	15	5.6%	15	45.5%	11	46
mattcampbellaus	25	33	0.5%	17	17	6.3%	12	36.4%	34	24
rattyexplores	25	33	0.5%	22	15	5.6%	10	30.3%	1	406
lesfran	28	31	0.5%	19	16	6.0%	14	45.2%	NA	NA
rvraders	29	28	0.4%	55	9	3.4%	13	46.4%	1	261
kenharris	30	27	0.4%	27	13	4.9%	3	11.1%	NA	NA
ppolito	30	27	0.4%	71	7	2.6%	3	11.1%	NA	NA
questagame	30	27	0.4%	44	10	3.7%	14	51.9%	NA	NA
wildthingstas	30	27	0.4%	44	10	3.7%	3	11.1%	3	144
peterbos	34	26	0.4%	37	11	4.1%	1	3.8%	NA	NA
elisefleming	35	25	0.4%	44	10	3.7%	5	20.0%	NA	NA
tjeales	35	25	0.4%	36	12	4.5%	7	28.0%	1	287
whitehorseprimaryscience	35	25	0.4%	44	10	3.7%	4	16.0%	NA	NA
jessster78	38	24	0.4%	27	13	4.9%	7	29.2%	17	36
eileen64	39	23	0.3%	25	14	5.2%	12	52.2%	1	305
em_lamond	40	22	0.3%	37	11	4.1%	4	18.2%	21	30
godinoz	40	22	0.3%	62	8	3.0%	4	18.2%	NA	NA
ngaruru	42	21	0.3%	25	14	5.2%	8	38.1%	NA	NA
sandra-tuszynska	43	20	0.3%	37	11	4.1%	6	30.0%	NA	NA
streglystendec	43	20	0.3%	62	8	3.0%	7	35.0%	1	312
advaulrich	45	19	0.3%	27	13	4.9%	10	52.6%	NA	NA
am_anita	45	19	0.3%	27	13	4.9%	10	52.6%	10	48
hbeshara	45	19	0.3%	37	11	4.1%	6	31.6%	NA	NA
pardalotebellion	45	19	0.3%	55	9	3.4%	4	21.1%	4	125
funecology	49	18	0.3%	104	5	1.9%	13	72.2%	8	54
mariannebroug	49	18	0.3%	37	11	4.1%	8	44.4%	2	185

Notes - For each user in the list:

- Obs Rank: based on the number of observations. If there is a tie for positions, users are sorted alphabetically
- Obs: the number of observations
- Obs %: the proportion of observations by the user compared to the total observations of all users
- Species Rank: based on the total number of species observed (distinct taxon_species_name)
- Species: the count of distinct taxon_species_name for each observer **^ N.B. this will not match the count on iNaturalist (the reason is explained in this document)**
- Species %: the proportion of species observed by the user compared to the the total of all species with observations recorded from all users
- RG: the number of research grade observations
- RG Ratio: the proportion of research grade observations
- IDs and ID Rank (#): based on the Top 500 identifiers per kingdom. See the Identifications section for more detail.

Observers by State

Table 9: Summary of users by state

Kingdom	State	Total Users	Total Obs
Fungi	Victoria	4,227	150,914
	New South Wales	3,705	54,960
	Queensland	2,673	31,672
	Tasmania	1,043	16,099
	South Australia	1,031	16,654
	Western Australia	823	11,150
	Australian Capital Territory	374	2,531
	Northern Territory	141	592
Protozoa	Victoria	451	3,518
	New South Wales	336	1,187
	Queensland	237	609
	Tasmania	145	912
	South Australia	102	249
	Western Australia	101	336
	Australian Capital Territory	23	33
	Northern Territory	1	2

Identifications

The work people put into identifications on iNaturalist is just as important as the observations. Although there isn't a way to extract the complete identifications data to allow for a detailed analysis, there are some summary statistics available on the site. iNaturalist lists the top 500 users for identifications per kingdom. I have included the number of identifiers by kingdom, as currently there are less than 500 for protozoa. The top user below refers to the user with the highest number of identifications per kingdom.

Table 10: Summary statistics for top the 500 identifiers by Kingdom

Kingdom	Total Users	Total IDs	Average IDs	Top user IDs	Top user % of Top 500 user IDs
Fungi	500	245,786	492	44,173	17.97%
Protozoa	448	5,535	12	1,017	18.37%

Are the users in the Top 50 Observers the same as the Top 50 Identifiers? Not as much as I anticipated.

Table 11: Proportion of Top 50 Observers who are also Top 50 Identifiers

Kingdom	Proportion
Fungi	24.0%
Protozoa	34.0%

Protozoa and fungi observers

As there are relatively few Protozoa observations and observers compared to those of Fungi, I looked at the proportion of Protozoa observers who also observe Fungi, to understand whether they are predominately the same people.

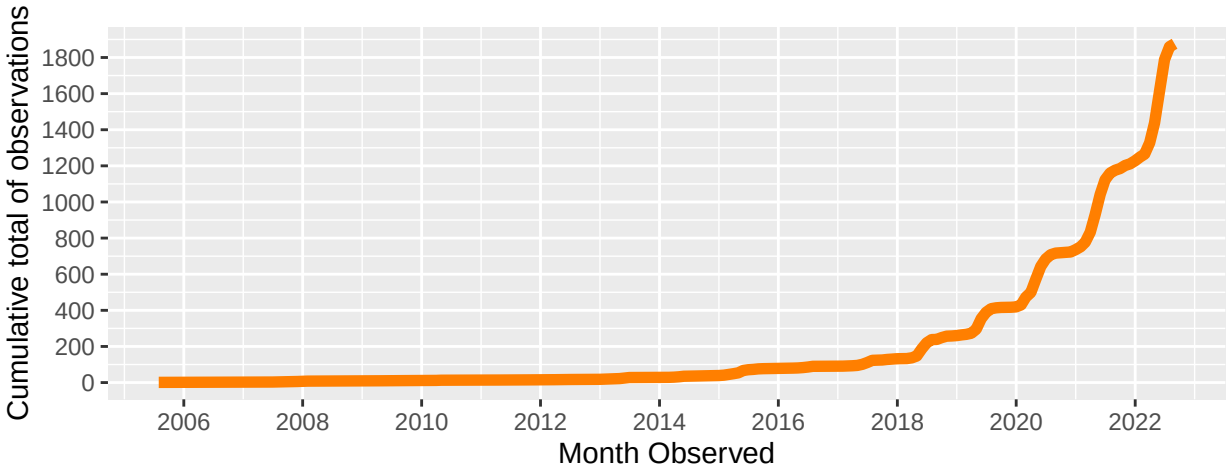
Table 12: Proportion of Protozoa observers who also observe Fungi

Protozoa Observers	Protozoa and Fungi Observers	Proportion of both
1,330	1,221	91.8%

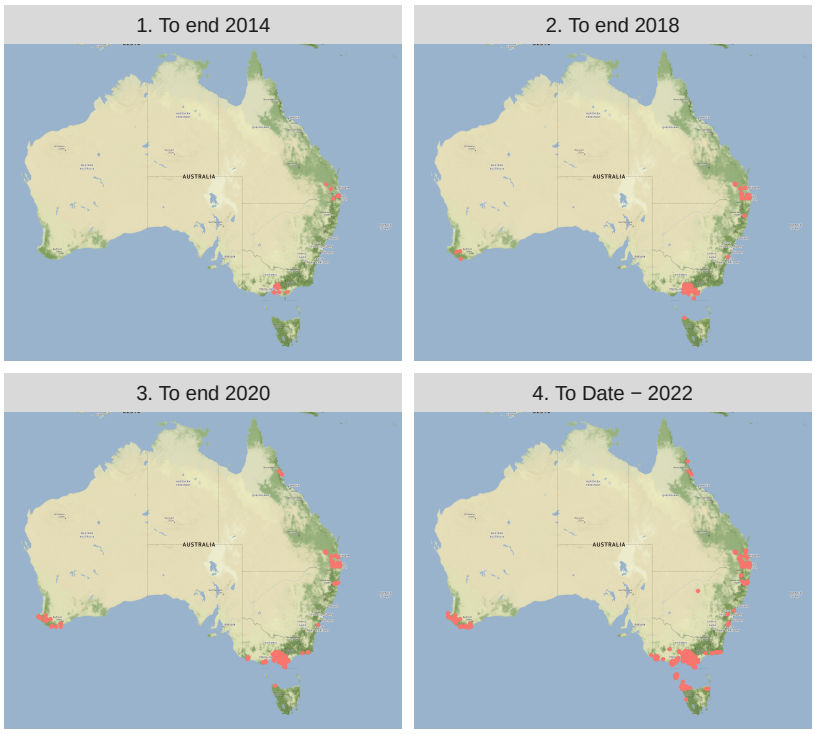
Orange Pore Fungus

Orange Pore Fungus is an introduced invasive species. I consider it the *Lantana* of fungi in Australia. iNaturalist data can be used to track the spread of this species. It is easy to identify and as such has a high proportion of research grade observations. Between the 24th and 25th of March 2022, after the data for Volume 1 was analysed, a taxon split occurred on iNaturalist based on https://doi.org/10.3390/f12101397. This means that *Favolaschia calocera*, was swapped with *Favolaschia claudopus*. The impact of that change meant that many observations required a huge amount of effort from the community to restore the species level IDs. The common name of Orange Pore Fungus has been transferred to *Favolaschia claudopus*.
Note (#): for the time being, logic has been applied to include all observations from the genus Favolaschia, specifically excluding *F. manipularis* and *F. pustulosa* (the only other species with observations in Australia) and as such includes all observations entered under Complex *Favolaschia calocera*, in recognition that it will take time for users to become aware of the change.

Cumulative total of Orange Pore Fungus(#) observations in Australia



Recorded distribution of Orange Pore Fungus(#) in Australia



The Mycetozoa (observed) family tree

This table shows the number of observations for each branch of the Mycetozoa phylum (of the Protozoa kingdom) tree: *class* > *order* > *genus*. Branches of the tree without observations are not included.

Table 13: Mycetozoa (observed) family tree

Mycetozoa Tree: Class > Order > Genus	Branch Obs	Species	Branch RG	RG %
Dictyosteliomycetes > Dictyosteliales > Polysphondylium	1	0	0	0.0%
Myxomycetes > Echinosteliales > Clastoderma	20	1	9	45.0%
Myxomycetes > Echinosteliales > Echinostelium	5	2	0	0.0%
Myxomycetes > Liceales > Alwisia	37	1	16	43.2%
Myxomycetes > Liceales > Cribraria	126	14	47	37.3%
Myxomycetes > Liceales > Dictydiaethalium	49	1	19	38.8%
Myxomycetes > Liceales > Licea	3	3	2	66.7%
Myxomycetes > Liceales > Lindbladia	4	1	2	50.0%
Myxomycetes > Liceales > Lycogala	407	3	147	36.1%
Myxomycetes > Liceales > Reticularia	33	4	6	18.2%
Myxomycetes > Liceales > Tubifera	335	5	198	59.1%
Myxomycetes > Liceales > unknown	18	0	0	0.0%
Myxomycetes > Physarales > Badhamia	60	3	24	40.0%
Myxomycetes > Physarales > Craterium	20	3	10	50.0%
Myxomycetes > Physarales > Diachea	24	1	10	41.7%
Myxomycetes > Physarales > Diderma	42	7	12	28.6%
Myxomycetes > Physarales > Didymium	65	9	20	30.8%
Myxomycetes > Physarales > Elaeomyxa	79	2	64	81.0%
Myxomycetes > Physarales > Fuligo	992	3	539	54.3%
Myxomycetes > Physarales > Leocarpus	133	1	39	29.3%
Myxomycetes > Physarales > Mucilago	248	1	46	18.5%
Myxomycetes > Physarales > Physarella	3	1	3	100.0%
Myxomycetes > Physarales > Physarum	304	22	115	37.8%
Myxomycetes > Physarales > unknown	87	0	0	0.0%
Myxomycetes > Physarales > Willkommlangea	15	1	13	86.7%
Myxomycetes > Stemonitales > Collaria	4	1	1	25.0%
Myxomycetes > Stemonitales > Colloderma	9	1	0	0.0%
Myxomycetes > Stemonitales > Comatricha	72	6	11	15.3%
Myxomycetes > Stemonitales > Enerthenema	14	1	12	85.7%
Myxomycetes > Stemonitales > Lamproderma	58	3	8	13.8%
Myxomycetes > Stemonitales > Macbrideola	11	3	1	9.1%
Myxomycetes > Stemonitales > Paradiachea	29	2	10	34.5%
Myxomycetes > Stemonitales > Paradiacheopsis	3	2	2	66.7%
Myxomycetes > Stemonitales > Stemonitis	494	6	39	7.9%
Myxomycetes > Stemonitales > Stemonitopsis	50	4	16	32.0%
Myxomycetes > Stemonitales > Symphytocarpus	2	0	0	0.0%
Myxomycetes > Stemonitales > unknown	98	0	0	0.0%
Myxomycetes > Trichiales > Arcyria	384	14	86	22.4%
Myxomycetes > Trichiales > Calomyxa	7	1	2	28.6%
Myxomycetes > Trichiales > Dianema	3	1	0	0.0%
Myxomycetes > Trichiales > Hemitrichia	42	4	24	57.1%
Myxomycetes > Trichiales > Metatrichia	50	2	23	46.0%
Myxomycetes > Trichiales > Perichaena	21	3	7	33.3%
Myxomycetes > Trichiales > Prototrichia	2	1	1	50.0%
Myxomycetes > Trichiales > Trichia	414	13	147	35.5%
Myxomycetes > Trichiales > unknown	43	0	0	0.0%
Myxomycetes > unknown > unknown	812	0	0	0.0%
Protosteliomycetes > Ceratiomyxales > Ceratiomyxa	593	2	581	98.0%
Protosteliomycetes > Ceratiomyxales > unknown	1	0	0	0.0%
unknown > unknown > unknown	414	0	0	0.0%

Fungimap target species - original

Fungimap is “a not for profit, citizen-science organisation dedicated to furthering the conservation and knowledge of Australian fungi and started in 1995 as a mapping project”. Please visit the Fungimap site and support their work if you can.

Of the 284,572 observations of fungi in Australia, 33,920 or 11.9% are of an original Fungimap target species.

Of the 136,339 **species level** observations of fungi in Australia, 33,920 or 24.9% are of an original Fungimap target species. *N.b. any discrepancy of counts in the numerator is due to taxon coding gaps.*

The 100 original Fungimap target species are detailed below. Note: Some target species are groups of multiple species; I have initially included only the most common species of those groups. Please let know any specific species that should be included in this list.

Table 14: Fungimap Original Target Species

Class > Order > Genus	Scientific Name	RG	Obs	RG %	Users	States / Territories
Agaricomycetes > Agaricales > Agaricus	Agaricus xanthodermus	267	471	56.7%	262	7
Agaricomycetes > Agaricales > Amanita	Amanita austroviridis	17	17	100.0%	11	3
Agaricomycetes > Agaricales > Amanita	Amanita muscaria	2,010	2,018	99.6%	1,069	7
Agaricomycetes > Agaricales > Amanita	Amanita phalloides	48	68	70.6%	37	5
Agaricomycetes > Agaricales > Amanita	Amanita xanthocephala	1,114	1,171	95.1%	405	7
Agaricomycetes > Agaricales > Anthracophyllum	Anthracophyllum archeri	314	340	92.4%	135	5
Agaricomycetes > Agaricales > Armillaria	Armillaria luteobubalina	446	690	64.6%	338	7
Agaricomycetes > Agaricales > Asterophora	Asterophora mirabilis	15	16	93.8%	8	1
Agaricomycetes > Agaricales > Battarrea	Battarrea phalloides	99	108	91.7%	68	5
Agaricomycetes > Agaricales > Bolbitius	Bolbitius titubans	184	377	48.8%	270	7
Agaricomycetes > Agaricales > Coprinus	Coprinus comatus	634	711	89.2%	487	7
Agaricomycetes > Agaricales > Cortinarius	Cortinarius austroalbidus	7	27	25.9%	14	4
Agaricomycetes > Agaricales > Cortinarius	Cortinarius austrovenetus	719	763	94.2%	334	7
Agaricomycetes > Agaricales > Cortinarius	Cortinarius metallicus	25	28	89.3%	20	3
Agaricomycetes > Agaricales > Cortinarius	Cortinarius persplendidus	96	187	51.3%	94	7
Agaricomycetes > Agaricales > Cortinarius	Cortinarius roseolilacinus	2	3	66.7%	2	1
Agaricomycetes > Agaricales > Cortinarius	Cortinarius rotundisporus	818	871	93.9%	334	6
Agaricomycetes > Agaricales > Cortinarius	Cortinarius sublargus	1	24	4.2%	17	3
Agaricomycetes > Agaricales > Cortinarius	Cortinarius symeae	0	2	0.0%	2	1
Agaricomycetes > Agaricales > Cruentomycena	Cruentomycena viscidocruenta	1,590	1,597	99.6%	670	7
Agaricomycetes > Agaricales > Cuphophyllus	Hygrocybe cheelii	83	97	85.6%	54	4
Agaricomycetes > Agaricales > Cyptotrama	Cyptotrama asprata	418	445	93.9%	220	4
Agaricomycetes > Agaricales > Entoloma	Entoloma virescens	150	150	100.0%	106	3
Agaricomycetes > Agaricales > Fistulina	Fistulina hepatica	114	166	68.7%	84	6
Agaricomycetes > Agaricales > Gliophorus	Gliophorus graminicolor	151	256	59.0%	69	4
Agaricomycetes > Agaricales > Gymnopilus	Gymnopilus junonius	1,107	1,788	61.9%	880	8
Agaricomycetes > Agaricales > Hebeloma	Hebeloma aminophilum	8	48	16.7%	26	5
Agaricomycetes > Agaricales > Lepista	Lepista nuda	182	296	61.5%	183	6
Agaricomycetes > Agaricales > Leucopaxillus	Leucopaxillus lilacinus	21	31	67.7%	15	4
Agaricomycetes > Agaricales > Lichenomphalia	Lichenomphalia chromacea	1,260	1,476	85.4%	656	7
Agaricomycetes > Agaricales > Macrotyphula	Macrotyphula juncea	124	143	86.7%	36	3
Agaricomycetes > Agaricales > Marasmius	Marasmius elegans	484	573	84.5%	154	8
Agaricomycetes > Agaricales > Marasmius	Marasmius oreades	82	368	22.3%	263	7
Agaricomycetes > Agaricales > Mucronella	Mucronella pendula	90	94	95.7%	41	4
Agaricomycetes > Agaricales > Mycena	Mycena interrupta	1,392	1,396	99.7%	354	5
Agaricomycetes > Agaricales > Mycena	Mycena leaiana australis	21	30	70.0%	16	4
Agaricomycetes > Agaricales > Mycena	Mycena nargan	265	340	77.9%	123	6
Agaricomycetes > Agaricales > Omphalotus	Omphalotus nidiformis	2,248	2,416	93.0%	1,110	7
Agaricomycetes > Agaricales > Oudemansiella	Oudemansiella radicata	25	152	16.4%	117	5
Agaricomycetes > Agaricales > Panellus	Panellus pusillus	204	277	73.6%	69	4
Agaricomycetes > Agaricales > Pleurotus	Pleurotus australis	21	51	41.2%	32	4
Agaricomycetes > Agaricales > Podaxis	Podaxis pistillaris	83	119	69.7%	71	6
Agaricomycetes > Agaricales > Porpolomopsis	Porpolomopsis lewelliniae	279	285	97.9%	137	5
Agaricomycetes > Agaricales > Roridomyces	Roridomyces austrororidus	271	378	71.7%	64	3
Agaricomycetes > Agaricales > Schizophyllum	Schizophyllum commune	1,471	1,558	94.4%	653	8
Agaricomycetes > Agaricales > Schizostoma	Schizostoma laceratum	1	1	100.0%	1	1
Agaricomycetes > Agaricales > Tubaria	Tubaria rufofulva	143	210	68.1%	87	7
Agaricomycetes > Agaricales > Volvopluteus	Volvopluteus gloiocephalus	242	467	51.8%	291	7
Agaricomycetes > Amylocorticiales > Podoserpula	Podoserpula pusio	252	293	86.0%	65	5
Agaricomycetes > Auriculariales > Pseudohydnum	Pseudohydnum gelatinosum	615	632	97.3%	190	4
Agaricomycetes > Boletales > Astraeus	Astraeus hygrometricus	33	44	75.0%	29	4
Agaricomycetes > Boletales > Boletellus	Boletellus obscurecoccineus	290	367	79.0%	223	7
Agaricomycetes > Boletales > Calostoma	Calostoma fuhreri	1	1	100.0%	1	1
Agaricomycetes > Boletales > Calostoma	Calostoma fuscum	60	77	77.9%	50	6
Agaricomycetes > Boletales > Calostoma	Calostoma rodwayi	22	23	95.7%	13	2
Agaricomycetes > Cantharellales > Craterellus	Craterellus cornucopioides	57	63	90.5%	30	4
Agaricomycetes > Geastrales > Geastrum	Geastrum fornicatum	10	23	43.5%	9	4
Agaricomycetes > Gloeophyllales > Gloeophyllum	Gloeophyllum concentricum	2	2	100.0%	2	1

Agaricomycetes > Gloeophyllales > Neolentinus	Neolentinus dactyloides	19	28	67.9%	20	3
Agaricomycetes > Gomphales > Beenakia	Beenakia dacostae	49	52	94.2%	13	2
Agaricomycetes > Phallales > Aseroe	Aseroe rubra	938	939	99.9%	710	7
Agaricomycetes > Phallales > Clathrus	Clathrus archeri	148	149	99.3%	123	6
Agaricomycetes > Phallales > Claustula	Claustula fischeri	2	2	100.0%	2	1
Agaricomycetes > Phallales > Colus	Colus pusillus	330	330	100.0%	233	6
Agaricomycetes > Phallales > Ileodictyon	Ileodictyon cibarium	8	8	100.0%	7	3
Agaricomycetes > Phallales > Ileodictyon	Ileodictyon gracile	175	180	97.2%	151	7
Agaricomycetes > Phallales > Phallus	Phallus indusiatus	132	144	91.7%	104	2
Agaricomycetes > Polyporales > Cymatoderma	Cymatoderma elegans	355	385	92.2%	228	5
Agaricomycetes > Polyporales > Fomitopsis	Piptoporus australiensis	106	196	54.1%	128	6
Agaricomycetes > Polyporales > Laccocephalum	Laccocephalum hartmannii	54	81	66.7%	37	6
Agaricomycetes > Polyporales > Laccocephalum	Laccocephalum mylittae	2	6	33.3%	6	4
Agaricomycetes > Polyporales > Microporus	Microporus affinis	119	151	78.8%	90	3
Agaricomycetes > Polyporales > Microporus	Microporus xanthopus	630	669	94.2%	339	3
Agaricomycetes > Polyporales > Neolentiporus	Neolentiporus maculatissimus	29	31	93.5%	18	2
Agaricomycetes > Polyporales > Panus	Panus fasciatus	164	211	77.7%	142	7
Agaricomycetes > Polyporales > Phlebia	Phlebia subceracea	131	165	79.4%	52	5
Agaricomycetes > Polyporales > Sanguinoderma	Sanguinoderma rude	470	514	91.4%	206	7
Agaricomycetes > Russulales > Hericium	Hericium coralloides	195	203	96.1%	123	4
Agaricomycetes > Russulales > Stereum	Stereum hirsutum	252	466	54.1%	284	7
Agaricomycetes > Russulales > Stereum	Stereum ostrea	102	184	55.4%	113	5
Leotiomycetes > Helotiales > Ascocoryne	Ascocoryne sarcoides	518	547	94.7%	112	5
Leotiomycetes > Helotiales > Banksiamyces	Banksiamyces macrocarpus	20	32	62.5%	11	2
Leotiomycetes > Helotiales > Chlorovibrissea	Chlorovibrissea bicolor	15	15	100.0%	4	1
Leotiomycetes > Helotiales > Cyttaria	Cyttaria gunnii	139	139	100.0%	94	2
Leotiomycetes > Helotiales > Vibrissea	Vibrissea dura	61	66	92.4%	17	3
Leotiomycetes > Leotiales > Leotia	Leotia lubrica	344	360	95.6%	133	6
Pezizomycetes > Pezizales > Cookeina	Cookeina tricholoma	14	18	77.8%	16	2
Pezizomycetes > Pezizales > Geomorium	Geomorium beatonii	5	5	100.0%	3	1
Pezizomycetes > Pezizales > Helvella	Helvella fibrosa	26	31	83.9%	12	3
Pezizomycetes > Pezizales > Morchella	Morchella australiana	52	69	75.4%	50	6
Pezizomycetes > Pezizales > Morchella	Morchella esculenta	4	10	40.0%	5	2
Pezizomycetes > Pezizales > Urnula	Urnula campylospora	276	326	84.7%	91	4
Sordariomycetes > Hypocreales > Cordyceps	Cordyceps hawkesii	20	38	52.6%	23	2
Sordariomycetes > Hypocreales > Drechmeria	Drechmeria gunnii	327	400	81.8%	134	6
Sordariomycetes > Hypocreales > Hypocreopsis	Hypocreopsis amplectens	17	17	100.0%	10	1
Sordariomycetes > Xylariales > Poronia	Poronia erici	85	88	96.6%	58	8
Tremellomycetes > Tremellales > Tremella	Tremella fuciformis	1,257	1,391	90.4%	498	7
Tremellomycetes > Tremellales > Tremella	Tremella mesenterica	564	762	74.0%	453	7
x No obs x	Flabellophora superposita	0	0	NA	0	0
x No obs x	Uromyces politus	0	0	NA	0	0

Fungimap - Fungi Down Under 2 target species

Fungimap is working on their second target species list https://fungimap.org.au/fungi-down-under-100-target-species/fungi-down-under-2/. The list below includes the species as of 2022-06-20 and interestingly will include several slime moulds!

Fungi: Of the 284,572 observations of fungi in Australia, 28,206 or 9.9% are of a Fungimap version 2 target species. Of the 136,339 **species level** observations of fungi in Australia, 28,206 or 20.7% are of a Fungimap version 2 target species. *N.b. any discrepancy of counts in the numerator is due to taxon coding gaps.*

Protozoa: Of the 6,846 observations of protozoa in Australia, 2,047 or 29.9% are of a Fungimap version 2 target species. Of the 3,932 **species level** observations of protozoa in Australia, 2,047 or 52.1% are of a Fungimap version 2 target species. *N.b. any discrepancy of counts in the numerator is due to taxon coding gaps.*

Note: Some target species are groups of multiple species; I have included only the most common species of those groups. Please let know any specific species that should be included in this list, noting this list will be reviewed once Fungimap makes it final.

Table 15: Fungimap 2 Target Species - PROTOZOA

Class > Order > Genus	Scientific Name	RG	Obs	RG %	Users	States / Territories
Myxomycetes > Liceales > Lycogala	Lycogala epidendrum	142	272	52.2%	123	6
Myxomycetes > Physarales > Elaeomyxa	Elaeomyxa cerifera	58	70	82.9%	14	3
Myxomycetes > Physarales > Fuligo	Fuligo septica	534	872	61.2%	466	8
Myxomycetes > Physarales > Leocarpus	Leocarpus fragilis	39	100	39.0%	54	5
Myxomycetes > Physarales > Physarum	Physarum viride	66	118	55.9%	33	6
Myxomycetes > Trichiales > Hemitrichia	Hemitrichia serpula	19	20	95.0%	14	4
Protosteliomycetes > Ceratiomyxales > Ceratiomyxa	Ceratiomyxa fruticulosa	572	580	98.6%	183	7

Table 16: Fungimap 2 Target Species - FUNGI

Class > Order > Genus	Scientific Name	RG	Obs	RG %	Users	States / Territories
Agaricomycetes > Agaricales > Agaricus	Gyrophragmium inquinans	1	1	100.0%	1	1
Agaricomycetes > Agaricales > Amanita	Amanita arenaria	0	1	0.0%	1	1
Agaricomycetes > Agaricales > Amanita	Amanita armeniaca	29	34	85.3%	15	5
Agaricomycetes > Agaricales > Amanita	Amanita flavella	102	118	86.4%	84	3
Agaricomycetes > Agaricales > Calyptella	Calyptella longipes	19	21	90.5%	16	2
Agaricomycetes > Agaricales > Chlorophyllum	Chlorophyllum brunneum	171	416	41.1%	272	7
Agaricomycetes > Agaricales > Chlorophyllum	Chlorophyllum molybdites	218	451	48.3%	289	4
Agaricomycetes > Agaricales > Clavaria	Clavaria amoena	552	759	72.7%	258	6
Agaricomycetes > Agaricales > Clavaria	Clavaria zollingeri	108	126	85.7%	101	6
Agaricomycetes > Agaricales > Collybia	Collybia eucalyptorum	445	684	65.1%	143	4
Agaricomycetes > Agaricales > Collybiopsis	Marasmiellus affixus	99	201	49.3%	32	4
Agaricomycetes > Agaricales > Coprinellus	Coprinellus micaceus	93	356	26.1%	253	7
Agaricomycetes > Agaricales > Cortinarius	Cortinarius archeri	1,014	1,086	93.4%	583	7
Agaricomycetes > Agaricales > Cortinarius	Cortinarius canarius	18	18	100.0%	14	3
Agaricomycetes > Agaricales > Cortinarius	Cortinarius globuliformis	5	7	71.4%	4	2
Agaricomycetes > Agaricales > Cortinarius	Cortinarius phalarus	28	46	60.9%	18	4
Agaricomycetes > Agaricales > Cortinarius	Cortinarius sinapicolor	527	578	91.2%	219	7
Agaricomycetes > Agaricales > Cyclocybe	Cyclocybe parasitica	73	97	75.3%	43	4
Agaricomycetes > Agaricales > Cystoderma	Cystoderma muscicola	20	40	50.0%	17	3
Agaricomycetes > Agaricales > Deconica	Deconica horizontalis	141	264	53.4%	43	5
Agaricomycetes > Agaricales > Descolea	Descolea recedens	341	519	65.7%	152	7
Agaricomycetes > Agaricales > Descolea	Descolea tenuipes	0	3	0.0%	3	1
Agaricomycetes > Agaricales > Entoloma	Entoloma albidosimulans	9	46	19.6%	5	3
Agaricomycetes > Agaricales > Entoloma	Entoloma aromaticum	12	74	16.2%	12	3
Agaricomycetes > Agaricales > Entoloma	Entoloma austroroseum	1	2	50.0%	2	1
Agaricomycetes > Agaricales > Entoloma	Entoloma panniculus	22	45	48.9%	21	5
Agaricomycetes > Agaricales > Entoloma	Entoloma splendidum	0	2	0.0%	1	1
Agaricomycetes > Agaricales > Entoloma	Entoloma viridomarginatum	71	86	82.6%	39	5
Agaricomycetes > Agaricales > Favolaschia	Favolaschia claudopus	1,870	1,870	100.0%	555	6
Agaricomycetes > Agaricales > Galerina	Galerina patagonica	399	678	58.8%	176	6
Agaricomycetes > Agaricales > Gymnopilus	Gymnopilus allantopus	327	550	59.5%	238	6
Agaricomycetes > Agaricales > Hebeloma	Hebeloma victoriense	0	7	0.0%	6	4
Agaricomycetes > Agaricales > Henningsomyces	Henningsomyces candidus	66	91	72.5%	11	5
Agaricomycetes > Agaricales > Hygrocybe	Hygrocybe astatogala	48	95	50.5%	57	5
Agaricomycetes > Agaricales > Hypholoma	Hypholoma brunneum	153	244	62.7%	88	5
Agaricomycetes > Agaricales > Inocybe	Inocybe violaceocaulis	6	15	40.0%	12	4
Agaricomycetes > Agaricales > Lentinula	Lentinula lateritia	6	7	85.7%	7	2
Agaricomycetes > Agaricales > Lepista	Lepista sublilacina	49	71	69.0%	53	3
Agaricomycetes > Agaricales > Leratiomyces	Leratiomyces ceres	938	1,153	81.4%	671	7
Agaricomycetes > Agaricales > Leucoagaricus	Leucoagaricus leucothites	20	107	18.7%	100	7
Agaricomycetes > Agaricales > Leucocoprinus	Leucocoprinus birnbaumii	441	538	82.0%	423	6
Agaricomycetes > Agaricales > Limacella	Limacella pitereka	36	71	50.7%	35	6
Agaricomycetes > Agaricales > Macrolepiota	Macrolepiota clelandii	665	982	67.7%	498	7
Agaricomycetes > Agaricales > Macrolepiota	Macrolepiota dolichaula	117	180	65.0%	134	5
Agaricomycetes > Agaricales > Marasmius	Marasmius alveolaris	84	148	56.8%	36	5
Agaricomycetes > Agaricales > Melanophyllum	Melanophyllum haematospermum	46	69	66.7%	17	2
Agaricomycetes > Agaricales > Montagnea	Montagnea arenaria	7	20	35.0%	11	5
Agaricomycetes > Agaricales > Mycena	Mycena cystidiosa	695	873	79.6%	160	5
Agaricomycetes > Agaricales > Mycena	Mycena lazulina	520	522	99.6%	20	2
Agaricomycetes > Agaricales > Mycena	Mycena toyerlaricola	70	102	68.6%	22	3
Agaricomycetes > Agaricales > Nidula	Nidula emodensis	8	15	53.3%	12	2
Agaricomycetes > Agaricales > Pholiota	Pholiota aurivella	26	49	53.1%	27	4
Agaricomycetes > Agaricales > Pleurotus	Pleurotus tuber-regium	22	29	75.9%	15	1
Agaricomycetes > Agaricales > Pluteus	Pluteus atromarginatus	49	102	48.0%	36	4
Agaricomycetes > Agaricales > Porodisculus	Porodisculus pendulus	4	4	100.0%	4	4
Agaricomycetes > Agaricales > Psathyrella	Psathyrella echinata	250	313	79.9%	59	4
Agaricomycetes > Agaricales > Psilocybe	Psilocybe subaeruginosa	649	677	95.9%	298	7
Agaricomycetes > Agaricales > Scytinotus	Scytinotus longinquus	111	140	79.3%	55	5
Agaricomycetes > Agaricales > Simocybe	Simocybe phlebophora	35	55	63.6%	15	3
Agaricomycetes > Agaricales > Xeromphalina	Xeromphalina leonina	43	59	72.9%	15	3
Agaricomycetes > Auriculariales > Auricularia	Auricularia delicata	30	64	46.9%	39	2
Agaricomycetes > Boletales > Australopilus	Australopilus palumanus	11	11	100.0%	8	2
Agaricomycetes > Boletales > Austroboletus	Austroboletus lacunosus	39	92	42.4%	41	5
Agaricomycetes > Boletales > Austropaxillus	Austropaxillus infundibuliformis	113	337	33.5%	134	5
Agaricomycetes > Boletales > Boletus	Boletus edulis	19	26	73.1%	9	3
Agaricomycetes > Boletales > Gymnogaster	Gymnogaster boletoides	15	15	100.0%	12	3
Agaricomycetes > Boletales > Gyrodontium	Gyrodontium sacchari	14	14	100.0%	12	2
Agaricomycetes > Boletales > Phlebopus	Phlebopus marginatus	748	880	85.0%	365	7
Agaricomycetes > Boletales > Sutorius	Sutorius australiensis	6	10	60.0%	8	4
Agaricomycetes > Cantharellales > Cantharellus	Cantharellus concinnus	516	700	73.7%	233	8

Agaricomycetes > Cantharellales > Hydnum	Hydnum repandum	34	113	30.1%	59	6
Agaricomycetes > Geastrales > Geastrum	Geastrum pectinatum	7	61	11.5%	45	8
Agaricomycetes > Geastrales > Sphaerobolus	Sphaerobolus stellatus	93	97	95.9%	34	6
Agaricomycetes > Gomphales > Ramaria	Ramaria botrytoides	31	91	34.1%	48	4
Agaricomycetes > Gomphales > Ramaria	Ramaria capitata	50	222	22.5%	151	7
Agaricomycetes > Gomphales > Ramaria	Ramaria fennica	5	11	45.5%	6	2
Agaricomycetes > Hymenochaetales > Coltriciella	Coltriciella dependens	61	86	70.9%	25	5
Agaricomycetes > Hymenochaetales > Cotylidia	Cotylidia undulata	0	3	0.0%	3	2
Agaricomycetes > Phallales > Phallus	Phallus rubicundus	260	343	75.8%	254	5
Agaricomycetes > Polyporales > Aurantiporus	Aurantiporus pulcherrimus	153	170	90.0%	123	5
Agaricomycetes > Polyporales > Byssomerulius	Byssomerulius corium	178	307	58.0%	93	7
Agaricomycetes > Polyporales > Hexagonia	Hexagonia vesparia	143	157	91.1%	99	7
Agaricomycetes > Polyporales > Laetiporus	Laetiporus portentosus	669	1,018	65.7%	566	7
Agaricomycetes > Polyporales > Lentinus	Lentinus sajor-caju	56	123	45.5%	88	3
Agaricomycetes > Polyporales > Podoscypha	Podoscypha petalodes	433	549	78.9%	284	6
Agaricomycetes > Russulales > Auriscalpium	Auriscalpium barbatum	3	3	100.0%	2	1
Agaricomycetes > Russulales > Lactarius	Lactarius eucalypti	685	755	90.7%	188	7
Agaricomycetes > Russulales > Lentinellus	Lentinellus tasmanicus	20	96	20.8%	10	2
Agaricomycetes > Russulales > Multifurca	Multifurca stenophylla	17	21	81.0%	7	2
Agaricomycetes > Russulales > Russula	Russula persanguinea	542	856	63.3%	298	7
Arthoniomycetes > Arthoniales > Chrysothrix	Chrysothrix candelaris	230	386	59.6%	126	7
Dacrymycetes > Dacrymycetales > Heterotextus	Heterotextus peziziformis	279	446	62.6%	195	7
Lecanoromycetes > Lecanorales > Badimiella	Badimiella pteridophila	1	1	100.0%	1	1
Lecanoromycetes > Lecanorales > Cladia	Cladia muelleri	21	59	35.6%	29	5
Lecanoromycetes > Lecanorales > Psora	Psora decipiens	108	169	63.9%	44	5
Lecanoromycetes > Lecanorales > Xanthoparmelia	Xanthoparmelia semiviridis	53	86	61.6%	39	4
Lecanoromycetes > Peltigerales > Nephroma	Nephroma australe	0	1	0.0%	1	1
Lecanoromycetes > Pertusariales > Thamnolia	Thamnolia vermicularis	5	5	100.0%	3	2
Lecanoromycetes > Teloschistales > Teloschistes	Teloschistes chrysophthalmus	417	650	64.2%	154	7
Leotiomycetes > Helotiales > Chlorociboria	Chlorociboria aeruginascens	69	138	50.0%	72	5
Leotiomycetes > Helotiales > Hymenotorrendiella	Hymenotorrendiella eucalypti	329	384	85.7%	31	4
Leotiomycetes > Helotiales > Lachnum	Lachnum virgineum	114	186	61.3%	35	6
Leotiomycetes > Helotiales > Phaeohelotium	Phaeohelotium baileyanum	625	712	87.8%	188	6
Pezizomycetes > Pezizales > Aleuria	Aleuria aurantia	94	150	62.7%	104	6
Pezizomycetes > Pezizales > Aleurina	Aleurina ferruginea	322	355	90.7%	144	7
Pezizomycetes > Pezizales > Cookeina	Cookeina insititia	3	3	100.0%	3	2
Pezizomycetes > Pezizales > Gyromitra	Gyromitra tasmanica	15	19	78.9%	9	3
Pezizomycetes > Pezizales > Phillipsia	Phillipsia subpurpurea	37	47	78.7%	37	2
Pezizomycetes > Pezizales > Scutellinia	Scutellinia scutellata	11	23	47.8%	14	4
Pezizomycetes > Pezizales > Sowerbyella	Sowerbyella rhenana	47	70	67.1%	37	5
Pezizomycetes > Pezizales > Trichaleurina	Trichaleurina javanica	2	2	100.0%	2	1
Pucciniomycetes > Septobasidiales > Septobasidium	Septobasidium clelandii	44	44	100.0%	11	3
Sordariomycetes > Hypocreales > Cordyceps	Cordyceps meneristitis	28	38	73.7%	13	2
Sordariomycetes > Hypocreales > Neobarya	Neobarya agaricicola	246	247	99.6%	53	3
Sordariomycetes > Hypocreales > Trichoderma	Trichoderma gelatinosum	100	153	65.4%	22	6
Sordariomycetes > Xylariales > Annulohypoxylon	Annulohypoxylon bovei	152	181	84.0%	44	6
Sordariomycetes > Xylariales > Daldinia	Daldinia concentrica	4	32	12.5%	26	5
Sordariomycetes > Xylariales > Hypoxylon	Hypoxylon howeanum	257	290	88.6%	50	4
Sordariomycetes > Xylariales > Xylaria	Xylaria hypoxylon	46	127	36.2%	54	6
x No obs x	Amanita hemibapha	0	0	NA	0	0
x No obs x	Austroboletus subvirens	0	0	NA	0	0
x No obs x	Cribbea gloriosa	0	0	NA	0	0
x No obs x	Cribbea reticulata	0	0	NA	0	0
x No obs x	Entoloma carminicolor	0	0	NA	0	0
x No obs x	Entoloma matthinae	0	0	NA	0	0
x No obs x	Filoboletus manipularis	0	0	NA	0	0
x No obs x	Humidicutis viridimagentea	0	0	NA	0	0
x No obs x	Itajahya hornseyi	0	0	NA	0	0
x No obs x	Laccaria sp. A (not broken down to sp.)	0	0	NA	0	0
x No obs x	Oudemansiella australis	0	0	NA	0	0
x No obs x	Oudemansiella turbinispora	0	0	NA	0	0
x No obs x	Ramaria abietina	0	0	NA	0	0
x No obs x	Stalked puffballs (not broken down to sp.)	0	0	NA	0	0
x No obs x	Tulostoma pulchellum	0	0	NA	0	0

Thanks

Thank you to everyone who has provided feedback and to everyone on iNaturalist. I hope it's motivating to know how your contributions can be used. Your feedback motivates me to keep producing new volumes.

Future versions

My plan is to update this document regularly, perhaps seasonally. Here is a list of ideas that might make it to future versions, minus any previous ideas that have been incorporated.

Ideas
* I'll be re-visiting the idea to analyse species with IDs that are recorded mostly overseas so these can be reviewed, based on feedback from Tom May and @allyvan

Data Source

iNaturalist. Available from https://www.inaturalist.org. Accessed per "Date To" in the table below.

Table 17: iNaturalist data dates for this report

iNaturalist Data Source	Kingdom	Data From	Data To
Observations	Fungi	1970-01-01	2022-08-31
Observations	Protozoa	2000-11-12	2022-08-31
Observations	Animalia	2001-10-19	2022-08-31
Identifications	Fungi	2022-09-02	2022-09-02
Identifications	Protozoa	2022-09-02	2022-09-02

Copyright

Contact

- iNaturalist: **https://www.inaturalist.org/people/adrian_aus/**
- Email: fungi@adrianpower.com
- https://adrianpower.com/