fungimapnewsletter 42

AUSTRALIA'S FUNGI MAPPING SCHEME

Inside this Edition:

FUNGIMAP VI. JULY 14-19, 2011 DENMARK, WESTERN AUSTRALIA

On the tenth anniversary of the Inaugural National Conference, the sixth Fungimap Conference will be returning in 2011 to Denmark, Western Australia. More than 140 people came to the first conference, travelling from all Australian states, New Zealand and the U.S.A. Fungimap Conferences have been held biennially since then—in Victoria, Tasmania, Queensland and New South Wales.

This Conference will be held at the Denmark College of Agriculture, where attendees will be housed in single rooms with under-floor heating (www.denmarkag.wa.edu.au). The International Fungi and Fibre Symposium, held there in 2003, found it extremely comfortable and the meals excellent.

Continuing with our successful conference format, in 2011 there will be a day of talks, followed by two days of forays and a day's outing and the usual trivia night and celebratory dinner. Forays, led by experienced guides, will cover vegetation types varying from low coastal heath, woodlands of Blackbutt, Jarrah and Allocasuarina to tall, closed Karri forests. The Valley of Giants near Nornalup, with its magnificent Red Tingle forests surrounding the world-famous Tree Top Walk, will be the venue for the day's outing.

A bevy of interesting speakers has been invited, including some who have not presented talks at previous conferences: including Dr Kevin Thiele, the Director of the Western Australian Herbarium, Laurton McGurk, whose PhD research has taken her into the mysterious and confusing world of the genus *Amanita*, and Peter Davison, whose subject will be myxomycetes found in the remote Kimberley Region of WA.

Workshops will range in scope from beginners' programs including developing basic identification skills, to the more advanced workshops. Of special interest to those wanting to improve the effectiveness of their own presentations and workshops will be 'Train the Trainer' workshops run by our favourite meteorologist Dr Ian Bell, whose courses are in demand world-wide.

Fungimap Conferences pose wonderful opportunities for sharing knowledge, learning new skills, exploring interesting and unfamiliar habitats, meeting old friends and making new ones - as well as for general enjoyment and good fun.

So that workshops and forays aren't overcrowded, we are limiting numbers to 100, although many more than that can attend our talkfest, which will be held in the Denmark Civic Centre. Bookings are now open, and a registration form is enclosed with this issue of the *Newsletter* (and also available on the Fungimap website).

Fungimap and the Fungimap Conference Committee invite you to Fungimap VI and look forward to seeing you in Denmark next July for our biennial foray into the wonderful world of fungi.

Katrina Syme

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FROM THE EDITOR:

Another year, another fungal season. Weather-wise and fungal-wise it has been a varied year: floods and droughts, abundance and absence, commonplace and rare. But unless totally absent the fungi don't disappoint, as is attested by the fungi described and discussed in this issue of the newsletter. A sincere thank you to all contributors, without you the Newsletter couldn't happen. Again, many thanks to Sarah Lloyd for design and printing of the colour pages and to the Central North Field Naturalists for their generous contribution to the printing costs.

The next issue of the newsletter will include events for the forthcoming fungal season, so please send me details of your group's plans. Events added after Newsletter 43 will be included on the Fungimap website but not in later newsletters. Please also send articles, news items, any fungi related material and images of fungi. For the colour pages it is important that images are at resolution of at least at 300 dpi and approx. 1Mb in size. **The deadline for the next issue is Friday, 4th March 2011**.

Very best wishes for an enjoyable and successful fungal season. I look forward to seeing you at Fungimap VI.

Pam Catcheside

Kapenta Clothing

Funky fungi designs on cotton clothing will be available from Kapenta Clothing in July 2011. Place orders through the brochure with this newsletter or from the Kapenta website (www.kapenta.com.au) before 14 April 2011.

Please note that in the brochure Men's short-sleeved shirts are illustrated with the right fabric but long sleeves, see www.kapenta.com.au for images of short-sleeved style (in other fabrics).

New Membership Rates

For Fungimap memberships due from 1 January 2011, rates will increase to:
Full - $40, Concessional - $33, Associate - $14.
The rise is the first since Fungimap was incorporated in 2005, and is similar to the movement in the consumer price index over that time.

TOWARD A CONCEPT FOR BOLETELLUS ANANICEPS

Roy E. Halling and Nigel A. Fechner

The Rev. M. J. Berkeley originally described *Boletus ananiceps* (as '*ananaeceps*') based on a collection from Wangaratta, Victoria, that was transmitted to him by Ferdinand von Mueller (Berkeley 1872). The original description consists of the following nine words in Latin: "*Pileo convexo, in verrucas planas crassas amplas rupto floccoso-squamoso*," plus the locality name and a spore measurement of 0.00117 [in] long. We would translate the Latin this way: "*With convex floccose-squamose pileus broken into plane thick large warts*." Such a description would adequately describe any bolete whose pileus is ornamented with large, flattened and thick squamae or warts. No other macroscopic or microscopic features are noted.

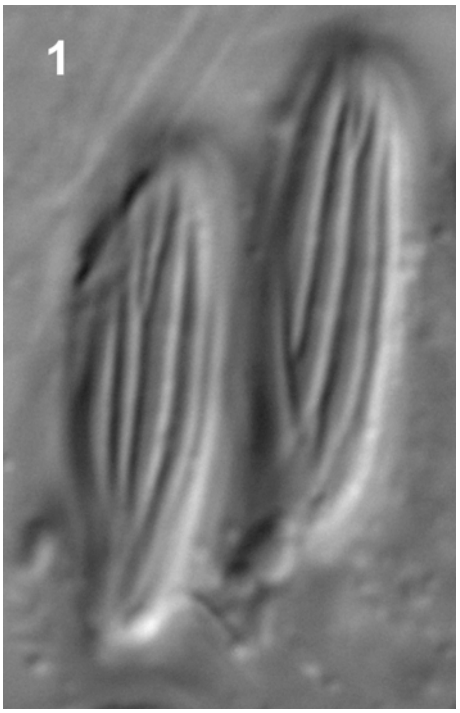

Fig. 1. Spores of *Boletellus ananiceps* lack cross-striae.

After examination of the holotype in Kew, Singer (1955) transferred *B. ananiceps* to *Boletellus* noting that the spores were ribbed, measured 18-23 × 6.5-6.8 (-7.3) µm, and the ribs lacked cross-striae. Singer further elaborated that a picture (Martin no. 612) illustrated a context that turns reddish, then bluish and at length brown, the pileus is whitish with tall obtuse warts, and the stipe is white. This picture (a painting from the M.C. Cooke collection) might well portray *B. ananiceps*, but there is no indication that Berkeley ever saw it or knew about it since it is not referenced in the original description. Since then, the microscopic feature of ribbed spores that lack cross-striae (Fig. 1) has been used almost exclusively to differentiate *B. ananiceps* from the other squamose-capped members of the genus, most notably *B. ananas*, *B. dissiliens*, and *B. emodensis* (these latter have ribbed spores that possess cross-striae; Fig. 2). While Singer (1955) noted observations on other Australian boletes whose type specimens are housed in Kew, these taxa are peripheral to our discussion here and will receive in-depth commentary in a later paper. *Boletellus ananiceps* has received treatment in Bougher & Syme (1998) and has been listed in other publications noted by May & Wood (1997).

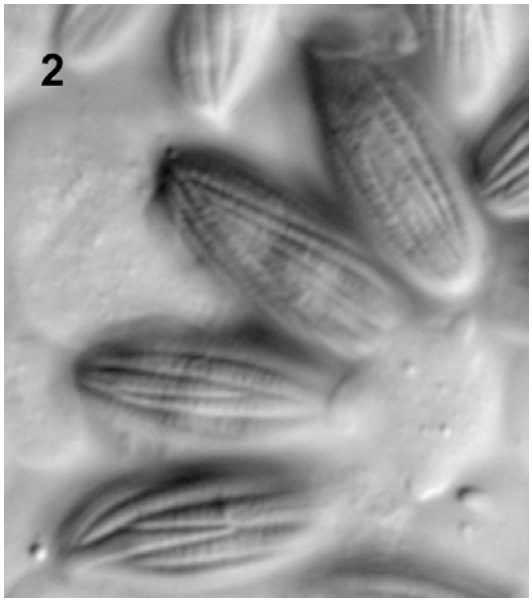

Fig. 2. Boletellus spp. Spores with cross-striae.

Our goal here is to provide details on critical diagnostic characters not previously noted which are vital to accurate determination. These relate primarily to macroscopic features seen in several specimens collected on Fraser Island, Queensland in 2009 and 2010.

It is a special moment when a collection exhibits all stages of development: young and immature to mature, and in prime condition, along with those which are "over-the-hill". Our observations are accumulated from several collections in these various age groups found in a small geographic area over a two-year period. For *B. ananiceps* please notice in Plate 1 [1-3] that there is a particular sequence of events in the formation of the "warts" (squamae) on the pileus as well as the location of the pink to red pigment. In Plate 1 [1], the pink to red colour is confined to a portion of the pileus that is beneath an overlying, fine superficial layer of hyphae. Later (Plate 1 [2]), those superficial hyphae have coalesced and gained an ochre colour, while the red to pink pigmentation has remained below/between the developing squamae. Finally, the squamae become thick and coarse, flattened on and near the disc, to somewhat so toward the margin, and are large but are not, and never were, pigmented (Plate 1 [3]).

Now, one of the most important characters to include in field notes involves careful observation of both the initial flesh colour and that of the oxidation reaction(s) in the basidiome's flesh, immediately after having made a longitudinal section through the centre of the basidiome. In this group of boletes, the reaction can be quite rapid and the true colour can therefore be obscured by the oxidation. In *B. ananiceps* (and most of the others in this group), the true colour of the pileus context is yellow, but is quickly obscured by the bluing so as to appear white. In the stipe, the context is white, but there is a slow change to a brownish orange or a pinkish brown, especially toward the base; though this reaction can sometimes be localised. The fresher the basidiome, the more convincing and obvious is this reaction. See Plate 1 [4] for a visualisation of these localised oxidation reactions.

To summarise: The pileus ***becomes*** squamose, the reddish pigment is never on or in those squamae; the stipe surface is not pigmented, but if so, it is only with some red or pink at the apex, otherwise it is whitish; the pileus flesh is yellow and immediately cyanescent which masks the yellow to make the flesh appear white; the stipe flesh is white and is slowly orange-brown to pinkish orange. The basidiospores are longitudinally ridged with fine ribs that lack cross striae, as seen with the light microscope.

Recommendations: Capture more than one image from several angles if possible and most certainly section the basidiome lengthwise and note the flesh colour(s) and all reaction colours immediately. If drying several specimens is difficult, ¼ to ½ of a mature basidiome can be sufficient for future study.

Acknowledgements
We were accompanied on excursions to Fraser Island by Dr. A.M. Young, Mr. K. Querengasser and Dr. M. Castellano and are grateful for their expertise and willingness to contribute collections to our study of the macromycota of that World Heritage site. We also thank the National Geographic Society Committee for Research and Exploration (USA) in grant #8457-08 for supporting our pioneering field work on Fraser Island. Dr. B. Dentinger (Kew, UK) provided access to the unpublished painting.

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OBSERVATIONS OF A SLIME MOULD NOVICE

Sarah Lloyd

Until about six months ago the only slime moulds I could recognise were the relatively large and colourful Fungimap target species. My first experience of other myxomycetes was seeing a colony of *Arcyria denudata* (Plate 1) growing on a sodden *Melaleuca.* Now, after several months of searching, I have a better idea of where to look and the conditions that trigger their appearance.

Immature sporophores (fruiting bodies) often appear after a bout of wet weather. Old logs and well-rotted stumps, with or without a covering of bryophytes, are particularly rich sites, as is the ground litter layer. Although only millimetres across they can be highly visible against the dark green or brown of the substrate, appearing as white, yellow, orange or pink stalked or sessile beads. During subsequent hours or days they darken and become difficult to see in the gloom of the wet forest. (I soon learnt to mark their whereabouts to save the frustration of fruitless searching.) Some sporophores remain dark as they mature; others, especially *Trichia* species (Plates 2, 3), become visible again when the peridium splits to reveal their brightly coloured spores. I've noticed that a second flush of immature sporophores often appears alongside mature fruiting bodies of the same species.

Plasmodia are relatively easy to monitor especially when they are appear on logs or standing dead trees. Interestingly, I have found several in these situations which have not developed fruiting bodies whereas all those on the ground have done so. A white plasmodium creeping on the leaf litter transformed into white beads and then into crusty spheres tentatively identified as *Diderma globosum** (Figs. 1 & 2, page 5). A yellow plasmodium changed into the distinctive *Leocarpus fragilis* (Plate 1).

Slime moulds seem to be extremely sensitive to disturbance. Rain halted the development of a bright yellow grainy plasmodium as it was producing sporophores on dead leaves and fern fronds. This happened again a metre away the following week, although the sporophores developed enough to be identified as a *Stemonitis* species (Plate 1).

Figs. 1 & 2. *Diderma globosum*. Above: immature specimen. Below: mature specimen.
Photo: Sarah Lloyd

The invertebrates that feed on slime moulds add interest to the search. Collembola (springtails) seem to relish this abundant, albeit ephemeral, food source. Several of one species of *Acanthanura* are almost invariably seen feeding on plasmodia or immature sporophores (Plate 1; see also George, 2010). The occurrence of this species at Birralee has extended its known range by 50 km. Another species, possibly of a new genus in the family Tomoceridae, was observed feeding on immature sporophores. On consecutive days I watched an amphipod feeding on the immature sporophores of what was possibly another *D. globosum* but its development was interrupted by rain and the sporophores disappeared.

The frustration of losing track of slime moulds in the field is only surpassed by that involved in their identification. Some are relatively easy to name by matching images to those in books or websites, but many require a compound microscope to look at their spores and, if present, the capillitium (mass of sterile, thread-like elements within the spore mass of many myxomycetes). I was excited to find my first *Cribraria* species (Plate 1) with its exquisite peridial net, but had trouble deciding if it was 'large' (i.e. diameter 0.5 mm; stipe 1.5-3.5 mm) or 'small'! Fortunately most slime moulds retain all features necessary for identification when dried and are easily stored for future reference.

Few people are fortunate enough to live in a place which allows daily monitoring of these cryptic but intriguing organisms. My slime mould escapades have so far resulted in a collection of over thirty species, many named thanks to patient assistance from Paul George.

I also thank Penelope Greenslade, School of Science and Engineering, University of Ballarat, who identified the collembola from photographs. I remain on the lookout for another specimen of the unknown species (family: Tomoceridae) so its identity can be confirmed.

*Paul George (pers. comm.) states that "Martin & Alexopoulos refer (1969, pp. 358-359) to the complex of *D. globosum - D. spumarioides* as the same as that which Peck described as *D. crustaceum*, whilst highlighting some confusion in the literature. Furthermore, Farr (1981, p. 103) says that these three species are connected by intergrading forms".

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For those interested in slime moulds, Sarah Lloyd's article on 'Slime moulds: the most remarkable organisms' in *The Natural News* 46: 6–11 (2010) is a must, especially the web version with additional photos at:
http://www.disjunctnaturalists.com/articles1/slime-moulds.htm
There are images of Fungimap target species *Ceratiomyxa fruticulosa, Fuligo septica* and *Lycogala epidendrum* and excellent time lapse sequences of developing slime moulds - Eds.

A NEW CAMPANELLA FOR AUSTRALIA - CAMPANELLA TRISTIS

Sapphire McMullan-Fisher and Patrick Leonard

Until recently we thought Australian Campanellas were small, pale, white spored, interveined and laterally attached fungi which don't have a stem. Also, experiences in Victoria and Tasmania suggested that they were associated with grasses or sedges (monocotyledonous hosts/substrates). So you can imagine my surprise when I found a large, stipitate *Campanella* on a rough barked log.

Patrick and I wanted to identify to species the Campanellas that we had been collecting. So we met for a day of discovery, having gathered together our collections and all the taxonomic literature that we could find and, of course, a microscope. Many Campanellas are microscopically distinctive in having asymmetrically shaped spores.

After we had recorded macro-characters of our *Campanella* collections, Patrick diligently checked and photographed their microscopic characters. We then consulted the Interactive Catalogue of Australian Fungi (ICAF) (May *et al.* 2004) to find Australian species and the relevant references.

Results

ICAF revealed references to five *Campanella* species in the literature: *C. olivaceonigra*, *C. gregaria*, *C. gigantispora, C. junghuhnii* and *C. pustulata*. The Australian Virtual Herbarium (AVH 2010) records show that only *C. olivaceonigra* and *C. gregaria* are supported by collections lodged in Australian Herbaria.

After examining our collections (approximately ten, all from southeast Queensland), we found, as we often do, that none of them fitted the descriptions of any of the five species recorded from Australia. When we looked at descriptions of *Campanella* species from New Zealand (Segedin 1993) we found that our collection with large, stemmed fruit-bodies seemed to fit the description of *Campanella tristis* (G.Stev.) Segedin.

Campanella tristis (Plate 2)

Cap 3-45 mm diameter, convex to plano-convex, circular to reniform (kidney-shaped); white, dirty white to grey with olivaceous tints, darkening with age and drying brown; opaque; dry to slightly tacky. **Stipe** present; <1–1 mm diameter, to 5 mm long; mostly eccentric, occasionally central, many specimens with stem attached above the cap; often with a small basal disc. **Gills** adnate; distant (10–14 full length gills); white to off-white; strongly intervenose. **Flesh**: thin and soft but with a tough gelatinous texture.

Basidiospores (Fig. 1) broadly ellipsoid but often appearing humped in one plane and flat on the other, can also be lachryform (tear-drop-shaped), variable in shape, hyaline; 7.9–10.7 × 3.5–5.0 µm, average 8.7 ± 0.86 × 4.3 ± 0.50 µm; Q = 2. **Basidia** clavate, four spored; 20–35 × 5–10 µm. **Cheilocystidia** (Fig. 2) cylindrical, 30–40 x 5–6 µm, in bundles (clusters) of 3 to 8.

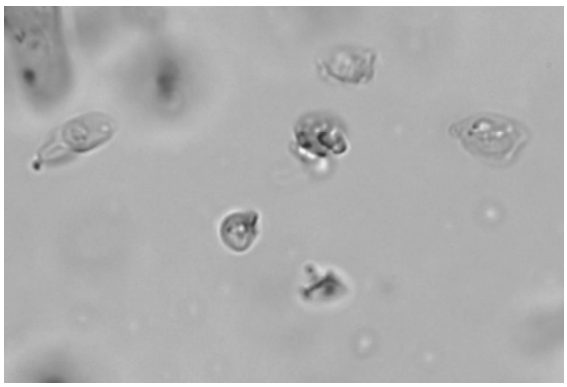

Fig. 1. Spores of *Campanella tristis*
Photo: Patrick Leonard

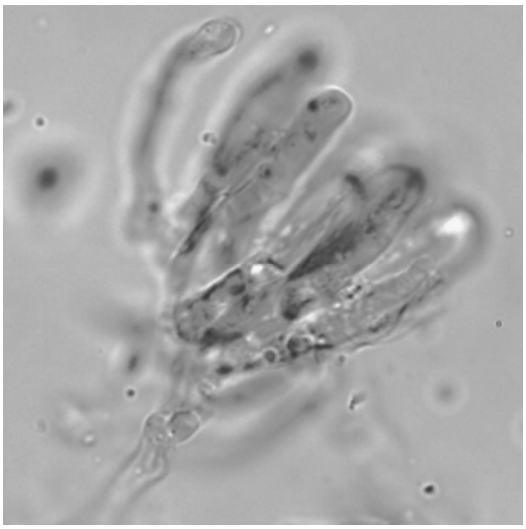

Fig. 2. Bunched cheilocystidia of *Campanella tristis*
Photo: Patrick Leonard

Habitat: Araucarian microphyll to notophyll vine forest on sedimentary rocks. Dominant species include *Araucaria cunninghamii* and *Agathis robusta*, with scattered Eucalypts; rainforest understorey. **Substrate:** rough barked log 60 cm diameter, several metres long.
Collection examined: Doggrell Loop, Cooloola, QLD, 30 December 2009, *SMF2378* (BRI).

Discussion

Campanella tristis is relatively large, up to 45 mm radius, and has a distinctive stem with a slightly bulbous base (Plate 2). Specimens start white and become darker with age, typically becoming grey with olivaceous tints. They dry to a dark brown colour rather than the buff or off-white typical of other *Campanella* species.

The spores of the Queensland collection are somewhat narrower than those given by Segedin (1993) for *C. tristis* [8.0–10.5 × 5.5–7.0 (8.5 × 6.0) µm] but, given their variability in shape and size, the difference is not significant. Interestingly the habitat described from New Zealand was similar to that of our Queensland collection: on dead wood of indigenous species in a mixed podocarp-dicotyledonous forest; our collection was found on a rough barked log in a mixed Eucalypt - *Araucaria* forest.

Our searches of the Interactive Catalogue of Australian Fungi (May *et al.* 2004) and Australia's Virtual Herbarium (AVH 2010) found no records of *Campanella tristis*. Therefore, our collection is a new record of this species from Australia and Queensland.

Our investigations so far suggest that we have collected least five different taxa of *Campanella* including C. *tristis* in southeast Queensland. We hope that further work will either result in identifications of previously described or, perhaps, new species.

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NEW TARGETS FOR FUNGIMAP

Compiled by Pam Catcheside, Tom May and Sapphire McMullan-Fisher

D = description; P= photograph; CP= colour photograph; I= illustration.

Entoloma viridomarginatum (Cleland) Horak (Plate 2)

Common Name Green-edge Pinkgill

Entoloma viridomarginatum is a small, green-capped agaric with characteristically green-edged gills. It grows in soil among leaf litter. The cap is 18–30 mm diam, slightly convex, finely fibrillose-scaly and with a dimpled centre. Colours range from dusky olive green to dark green. Gills are sinuate (notched near the stem), with a slightly decurrent tooth, moderately distant and yellowish to light pinkish-cinnamon; the margin is dark green. The stem is up to 60 mm high, slender, shiny but finely punctuate (with tiny raised dots) under the cap; it is green in the upper part, yellow nearer the base. The spore print is pale pinkish brown to salmon-coloured.

Look-alikes. *Entoloma rodwayi* is similar to *E. viridomarginatum* but its gill margins are not green. The only other green *Entoloma* in Australia, *E. obscureovirens*, has a dark brown-olivaceous rather than green or yellow stipe. A number of *Hygrocybe* species are green but these are the fleshier, more 'watery' Waxcaps. They have white, yellow or at most pale green gills and give a white spore print.

Distribution: S.A. N.S.W., Vic, Tas.

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Filoboletus manipularis (Berk.) Singer (Plate 2)
Common Name Pored Ghost Mycena

Filoboletus manipularis is easily identified by its white to pale cream cap with rounded pores (not gills) on its under surface. Caps are 5–35 mm diam, with most around 20 mm diam., convex to bell-shaped becoming umbonate (with central, raised knob), and often appear dimpled due to the pores. The centre of the cap often has a brown tint. Pores are adnate, 1–3 per mm and symmetrically arranged. The central stem is up to 80 mm high and 2–5 mm diam, white but pale brown towards the slightly swollen base.
Filoboletus manipularis is a saprotroph on wood and grows singly but usually in clusters (caespitose). It occurs in subtropical to tropical rainforests and is reputed to be bioluminescent although there are few reports on the luminescence of Australian material.

Look alikes. The introduced *Favolaschia calocera* is bright orange and has shorter, laterally attached stems; most native *Favolaschia* species do not have long, central stems. *Filoboletus manipularis* is related to *Mycena* and, though some mycenoid taxa are heavily veined between the gills, they do not have the neatly rounded pores of this species.

Distribution (in Australia): Tropical, northern N.S.W., Qld.

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Marasmiellus affixus (Berk.) Singer (Plate 3)
Common Name Little Stinker

Marasmiellus affixus well deserves its common name: Little Stinker. This innocent-looking and pretty, little, cream to pinkish-cream fungus has a strong rotten cabbage or old-wet-nappy smell and forms dense colonies on rotting twigs and branches. *Marasmiellus affixus* is a basidiolichen: a lichen whose fungal partner in the fungal/algal symbiotic association is a Basidiomycete. The small fruit bodies grow from a mat 30 cm or larger, a thin film of algal cells and mycelium which causes a dirty cream-yellow or greenish discolouration within the woody substrate. Caps of the fungal partner are 2–15 mm across, bell- to fan-shaped, cream, buff, pale creamy-pink or creamy-yellow; the tops of older specimens may be zoned with a series of concentric circles. The similarly-coloured stem is lateral to off-centre, short and curving. Its few main gills, which are adnexed or adnate, radiate from the stem, between them there are two to three series of shorter gills.

Look-alikes. Some species of *Mycena*, *Marasmiellus* or *Marasmius* resemble *Marasmiellus affixus* but no other species of these genera has the same distinctive and strong ammoniacal smell. The stem bases of *Mycena* spp. have either a disc or are hairy with tufts of hyphae. Small *Marasmius* species that look similar to *M. affixus* have wiry, often dark brown or black stems. Other species of *Marasmiellus* often have stems darker towards the base.

Distribution: Qld., S.A., Tas., Vic.

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Podaxis beringamensis Priest & M. Lenz (Plate 3)
Common name Termite Powderpuff.

This tall (to 500 mm) club-shaped, stalked puffball is restricted to termite mounds. The fruit body grows from the top of the mound, its stem extending for up to 200 mm into the mound.
The head of the club grows to 350 mm high and 100 mm diam. The sheathing cap is whitish with dark brown to blackish, large, projecting scales resembling wood shavings. The cap is often rather pointed at the apex, and splits to release the powdery spore mass which is initially ochre to brown and then black at maturity. The stem may grow to 120 mm long and 20 mm diam. It is whitish and at the base has similar outward curling scales as the cap.

Look alikes. This species differs from Black Powderpuff (*Podaxis pistillaris*) by the growth on termite mounds whereas *P. pistillaris* grows in bare, sandy or stony soil. Fruit bodies of *P. beringamensis* are up to 500 mm high, while those of *P. pistillaris* are much smaller: 60–150 mm high, usually with a rounded apex.

Distribution: northern Australia (northern N.S.W., Qld, W.A., likely to occur in N.T.).

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Porodisculus pendulus (Schwein.) Murrill (Plate 3)
Common names Pendulous-disc Polypore, Little Hoof.

Porodisculus pendulus is a small polypore with fruit bodies 6–14 mm long that resemble little hooves or miniature ships' ventilators. They form large patches on burnt bark, usually of eucalypts, growing in tiers, particularly on the lower sections of the trunk and on fallen trees. Each fruit body consists of a rounded head on a curved, pendent short stalk. The colour is fawn, grey- to dark-brown. Texture is hard, corky and dry. The cap or head is convex, 2–8 mm diam and 2–7 mm high. Young specimens are covered with a brownish powdery bloom, later they become finely cracked and rough. The fertile lower surface is a circular, slightly hollowed disc with minute but dense rounded pores, and surrounded by a thick margin.

Look-alikes. *Dictyopanus pusillus*, Little Ping-pong Bat, also grows in massed tiers on wood, but not usually on burnt wood. Its fruit bodies are paler: whitish-cream to buff, flatter, thinner and not hoof-shaped. The pored lower surface is semicircular, not on a pendant disc and the pores are larger, to 3 per mm with thinner partitions between them. Texture is firm but soft and pliable, not hard and corky. *Porodisculus pendulus* is said to be the smallest polypore species.

Distribution in Australia: N.S.W., S.A., Vic., W.A.

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CONFERENCE REPORTS

Pam Catcheside

AN INVASION OF MYCOLOGISTS: 9TH INTERNATIONAL MYCOLOGICAL CONGRESS, EDINBURGH, UK, 1-6 AUGUST 2010

The townsfolk of Edinburgh must have wondered what had happened when, invaded not only by visitors for the annual Festival and Fringe, they found that 1640 mycologists from 83 countries had converged on their city.

The International Mycological Congress has been held every four years since 1971. In 2006 the venue was Cairns, Australia; other host countries have been the UK, USA, Japan, Germany, Canada, Israel and Norway. In 2014 the conference will be held in Bangkok, Thailand.

In Edinburgh, delegates were welcomed by the Chair of the IMC organising committee, Prof. Nick Read and the President of the British Mycological society (BMS), Prof. Lynnne Boddy. The Keynote speaker, Prof. John Taylor from the University of California at Berkeley, USA, paved the way for an eclectic and exciting conference by exhorting us to consider the poetry of mycological accomplishment and its challenges.

Each of the following five days began with a plenary session, i.e. a lecture attended by all delegates, after which a choice between talks from five concurrent sessions had to be made. This choice was particularly difficult since there were almost 500 presentations. A host of over 1000 posters, changed each day, was displayed; each lunch time and at the end of the day their author(s) stood by to discuss the contents. Also during the two-hour lunch break meetings were held, including sessions on the governance and rules relating to fungal nomenclature.

Talks covered a wide range of topics but fell into five categories: Evolution, Diversity and Systematics; Cell Biology, Biochemistry and Physiology; Genomics, Genetics and Molecular Biology; Pathogenesis and Disease Control; Environment, Ecology and Interactions. Selection of highlights can only be a personal one. Talks I found especially interesting were ones on fungal endophytes and biocontrol. Endophytes are fungi or bacteria which live within plant tissues but do not cause any apparent symptoms or infections. Some are known to have adverse effects on insects, nematodes and plant pathogens and therefore have potential as biocontrol agents. *Metarhizium anisopliae* is an insect pathogenic fungus, effective against grasshoppers and cockroaches. Diana Leeman, Vice President of the Australasian Mycological Society, spoke of its use against sheep lice, cattle ticks and sheep blowflies.

In another study, presented by Ray St. Leger, University of Maryland, USA, we learned that genes which kill one of the main malaria-causing parasites, *Plasmodium falciparum*, have been inserted into the Metarhizium fungus. Mosquitoes pick up the infected fungal spores and

the Plasmodium parasite is killed before it can get out of the insect's salivary glands and into the human victim.

Another fungal insect pathogen, *Beauveria bassiana*, is the asexual form of a vegetable caterpillar, *Cordyceps bassiana*, and has been used against termites, fire ants, mosquitoes and plant crop pathogens such as the Coffee borer beetle, Colorado potato beetle, boll weevil, banana weevil and codling moth. Such fungal endophytes would seem to show enormous promise, not only in the field of biological control but also as anti-cancer anti-diabetic, insecticidal and immunosuppressive compounds.

The larger fungi were well-represented by talks on Ascomycetes, mycorrhizal fungi and fungi living at climatic extremes. The diversity of talks was 'mind-blowing' while posters mirrored and expanded on the topics presented. Those from the Australian contingent covered hypogeous fungi (Sandra Abell-Davis, James Cook University), Australian species of *Laccaria* (Elizabeth Sheedy, University of Melbourne and Royal Botanic Gardens Melbourne) and Australian species of *Amanita* (Laurton McGurk, Curtin Univerity).

The smorgasbord of talks, posters, plenary lectures, and socialising with mycologists from around the world was a wonderful experience. I shall never forget being one of the huge mob of fungal enthusiasts piped across a major road in the city centre by two intrepid Highlanders in full Scottish dress, who, together with our police escort, conducted us safely from the opening ceremony in the Usher Hall to the Edinburgh International Conference Centre. And, if any were to stray, there was a trail of life-size cut-outs of *Amanita muscaria* stuck on to the path!

Photo: David Catcheside

INTERNATIONAL SOCIETY FOR FUNGAL CONSERVATION

On 6th August 2010, immediately after the close of the 9th International Mycological Congress (IMC9), a group of approximately fifty mycologists from around the world gathered at the Royal Botanic Garden Edinburgh (RBGE). At that meeting it was agreed that a new society, the International Society for Fungal Conservation (ISFC) should be formed. This meeting followed one in Whitby, UK, in 2009 (Pouliot 2010), when the need to form such a society was recognised. [Pouliot & May (2010) emphasise the "need for a coherent national strategy for the conservation of Australian fungi" in a paper published recently in a special issue of *Mycologia Balcanica* devoted to fungal conservation.]

Dr. David Minter has been the chief instigator and inspiration behind the founding of the new society. At IMC9 he gave an impassioned and very entertaining talk on the need for fungal conservation, exhorting the audience to take up the cause of the fungi and increase awareness of the importance of this kingdom by both the public and governments.

At the subsequent meeting at RBGE there was unanimous support for the founding of a society to promote fungal conservation. It was decided that the name should be the International Society for Fungal Conservation to demonstrate that it would be a **global** society thus having greater influence amongst governing institutions. A steering committee was formed which was requested to formulate a draft constitution by late October 2010. The committee did so and a constitution has now been adopted. The recently developed website includes the comment that 'Although the wellbeing of fungi is essential for life on this planet, amazingly, up to now, they have been almost totally overlooked by all mainstream conservation movements.'

One of Fungimap's aims is 'To promote the conservation of Australian macrofungi' and we are all active in bringing the fungal kingdom into the public arena. A statement on our website explains what we are doing for Fungi conservation and management policy in Australia; Fungimap is a Founder Member of the newly formed group; it is exciting and encouraging to be part of an international society, active in fungal conservation.

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ISFC website: http://www.fungal-conservation.org/

Fungimap policy: http://www.rbg.vic.gov.au/fungimap/policy-development

Further comments

Minter DW. Fungi: the orphans of Rio: http://www.biodiversityislife.net/?q=node/382

MODELS OF FUNGI

IN WESTERN AUSTRALIA

Kirsten Tullis, who works in the Exhibition & Design section of the Western Australian Museum, would like information about construction of models of fungi for a display the museum is planning. Her email address is: kirsten.tullis@museum.wa.gov.au

SALLY GREEN'S CROCHETED MODELS OF FUNGIMAP TARGET SPECIES

The colour insert in this Newsletter has three more photographs (Plate 4) of Sally Green's crocheted models of Fungimap target species (*Fungimap Newsletter* 41, page 13). You can test your knowledge of the Fungimap targets by identifying Sally's wonderful creations.

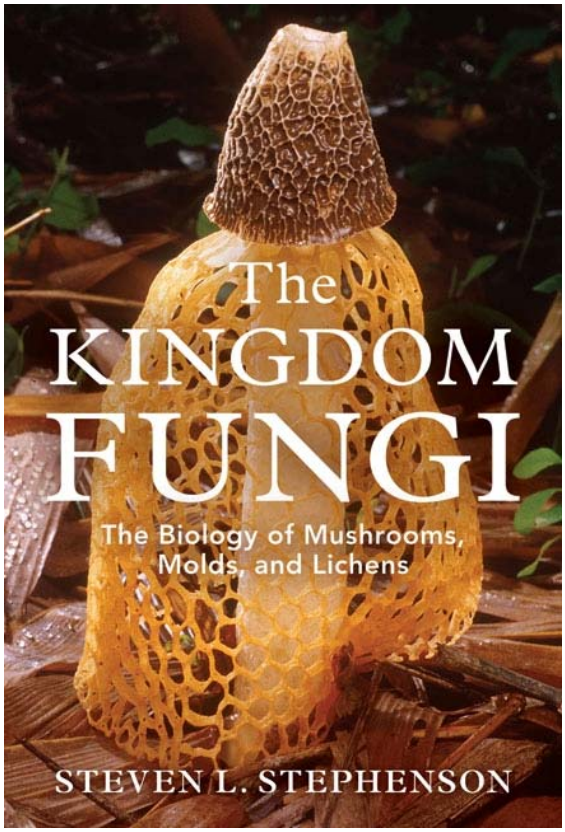
BOOK REVIEW

The Kingdom Fungi, The Biology of Mushrooms, Molds and Lichens

by Steven L. Stephenson

Timberland Press, 2010. 328 pages, 56 page colour insert (124 photographs); hardback.
ISBN 978 0 88192 891 4. RRP $49.95

Reviewed by Paul George



This book sets out to 'introduce the reader to the biology, general structure and morphological diversity of ... fungi' and hopes to 'serve as a useful first text for the general naturalist, amateur mycologist or interested layperson who simply wants to become more familiar with fungi'. I fall into several of those categories and so was keen to see whether this book lived up to its promise.

The first impression is of a book written in clear, straightforward language, clearly laid out and printed on bright white paper. The author introduces the basic concepts early and builds upon these in a systematic approach.

Each chapter begins with a bullet point summary of the sub-headings, and the opening paragraphs give a high level description of the material that is elaborated within the chapter. The well structured format makes for a smooth read from beginning to end, while allowing the reader searching for specific content to quickly find any desired topic.

This book refers to predominantly American species, but this should not deter an Australian reader. The book doesn't pretend to be a field guide, but it does provide an informative understanding of the genera, families, and higher classifications of fungi. The first six chapters explore the major phyla of fungi. These include water fungi, yeasts and many of the ascomycetes. Ascomycetes with larger fruit bodies are discussed separately. The vast majority of fungi are too small to observe in nature, yet they occur everywhere.

The chapter on mushrooms and other larger fungi provides a section on identification of gilled fungi. Stephenson starts with major spore colour groups, breaking these down to families and genera based on morphology and other macro-characters, while pointing out the pitfalls of relying on such characters alone. A similar 'top-down' approach is

given for polypores, tooth fungi, corals, puffballs, etc. Slime moulds (while not strictly fungi) and lichens each get a chapter.

The role of fungi in nature and the interactions between fungi, plants and animals are discussed in a couple of chapters. Did you know that certain mycorrhizal fungi feed orchids by providing them with organic molecules (instead of the typical other way around)? Or that some endophytic fungi live within their live host plants and provide protection against insects, roundworms and bacteria?

The special relationships that fungi have with humans and society are also explored, covering their utility as food, and in fermentation, medicine and dyes. Their impact on culture through disease, literature and myth is also discussed. This chapter is a fascinating one, but is of necessity only a brief exploration of these ideas. The final chapter deals with fossil fungi and evidence for plant-fungi interactions from 410 million years ago.

The colour photos illustrate both macro- and micro-characters and are frequently very beautiful. They include images of typical species to represent major genera, as well as fascinating micrographs, for example of powdery mildew, the hyphae of endomycorrhizal fungi and nematodes trapped in a fungus.

A short glossary is included, but is rarely required, as the technical terms are defined as they arise within the text. Eight pages of references are also included.

The book is highly recommended as both an entertaining discourse on the Kingdom of Fungi, and an introductory text for the budding student of fungi.

FUNGAL NEWS

For a list of **Fungi events** and activities around Australia, see the calendar of fungi events on the Fungimap website, where you can also find contact details of the various regional fungi groups.

FIELD NATURALISTS CLUB OF VICTORIA FUNGI GROUP FORAYS 2010

Virgil Hubregtse, Paul George, Pat and Ed Grey and Les Hanrahan

This year our group held 12 forays. Sites visited included Mount Macedon, Greens Bush, Otway Ranges, Bunyip State Forest, Coranderrk, Keppels Falls (near Marysville), Blackwood, and Upper Yarra Reservoir. Since a number of our favourite foraying areas had been burnt in the disastrous fires of February 2009, we decided to pay three visits to Bunyip State Forest (in May, June and September) and three to Greens Bush (in April, June and September). The September forays yielded far fewer fungi than those held from April to July.

Some highlights of these forays were:-

Mount Macedon: *Cordyceps gunnii* were plentiful. One specimen, which came out of the ground quite easily, had a total length of 750 mm including the parasitised moth larva.

Greens Bush: A most unusual find was a small desiccated spider on a gum leaf that had about thirty small knobs (1-2 mm tall) protruding from various parts of its body. Presumably a *Cordyceps* sp. was responsible for the spider's grisly demise. An orange fungus that looked like *R. flocktoniae* was, in fact, *Lactarius clarkeae* – a species that seems to share many of the characteristics of both *Russula* and *Lactarius*.

An uncommon find was a small, slender orange / brown *Cortinarius* with a white patch on the cap and a white volva. This proved to be *Cortinarius phalaris*, a species recorded from WA by Bougher and Syme, but not often found in Victoria. *Craterellus australis* was a 'first' for our Group, with its shaggy dark brown to black funnel-shaped cap and fertile surface consisting of pale grey gill folds with many irregular branches and crossings that extend down the stipe. *Craterellus* species can look very similar to *Cantharellus*, with their thick blunt, decurrent gills, but the latter are usually more colourful and have clamp connections (microscopic analysis of our specimen failed to reveal any clamps). Another surprise, found by John Eichler, was *Septobasidium clelandii*, which looks like tiny dark blade-like eruptions (with pale tips) emerging from swellings in the twigs of Tea-tree. This is actually a parasitic fungus on a female coccid bug that forms galls in Tea-tree.

Otway Ranges: We had three forays in this area, and over 210 species, including 36 Fungimap targets, were recorded for the weekend.

1. Mait's Rest yielded the new lichen Fungimap Target species *Badimiella pteridophila*, the 'Radar-dish lichen', growing on the leaves of swordgrass in the car park; old favourites such as *Cymatoderma elegans*, *Hericium coralloides* and *Pseudocolus fusiformis;* the spiny-capped *Lepiota aspera*; and delightfully slimy *Mycena austrororida*.

2. Melba Gully: Large specimens of *Craterellus cornucopioides* were a welcome sight. Geoff Lay made what might be the most exciting find of the trip – the Fungimap Target *Helvella chinensis*. This drab, grey stalked, hairy cup is very difficult to see amongst the leaf litter of a dark wet forest, which may account for its apparent rarity.

3. Triplet Falls: Here we had the pleasure of the company of members of the Adelaide Fungi Group. A *Strobilomyces* sp. attracted a lot of attention. It was a large reddish grey/black bolete with shaggy scales on the cap, and large pale grey pores that turned orange-brown when bruised. Its decurrent pores extended down a very shaggy stipe. The shaggy scales were smaller than *S. strobilaceus*, and our specimens resembled #296 in Fuhrer (2005). The common name, 'Old Man of the Woods' seems quite apt for this mushroom, which does not decay readily.

Bunyip State Forest: *Xylaria filiformis*, subsequently examined by Ed Grey (See *Fungimap Newsletter* 41: p.11), looked like very thin *X. hypoxylon*, but was growing on dead tree-fern fronds, while *X. hypoxylon* is restricted to wood.
Another species we hadn't seen before in this location was a *Pleurotus* sp. with a lavender-grey, felty upper surface and creamy white, decurrent gills, growing on a Manna Gum trunk. A particularly large *Cortinarius* with a cap diameter of 170 mm, growing in a cluster under eucalypts in the drier area of the Nature Trail, was also new to us. We also found a lovely photogenic group of *Mycena vinacea*, a fungus that grows in both pine and eucalypt forests, amongst pine needles or eucalypt leaf litter.

Coranderrk: A number of boletes, including the large *Phlebopus marginatus*, were present, while an old log was home to masses of *Xeromphalina leonina* fruit-bodies.

Keppels Falls: Huge amounts of *Ascocoryne sarcoides* were growing on burnt logs. Only a few other fungi species were present.

Blackwood: This area is a great place to see Cortinars. The white-capped, white-stemmed *Cortinarius austroalbidus*, noted for its fenugreek (curry) smell, was one of the first seen. Other Cortinars seen included the red *Dermocybe splendida* and *D. cramesina*, the green *D. austroveneta*, the slimy yellow *Cortinarius sinapicolor*, and *C. fibrillosus* with a conical red-brown cap densely covered in pale fibrils. An unusual Cortinar was *Cortinarius globuliformis*, seen in the same area last year. This almost underground species has bright yellow, short caps embedded in the soil amongst bright yellow mycelium. Another truffle-like fungus we saw was *Cortinarius levisporus* (previously *Thaxterogaster levisporus*). The smooth, globular white fruit bodies were bunched together in the leaf litter on the ground. Inside the cut surface, the rusty-brown gleba was divided by the white branch-like columella. A hand lens revealed the intricate folds of the gleba. On a Narrow-leaf Peppermint trunk were dozens of small, to 10 mm, 'shells' of the Earpick Fungus *Auriscalpium sp*. The numerous dark brown caps have grey teeth underneath. We have only ever found this species on this one tree.

Upper Yarra Reservoir: We were pleased to find large numbers of *Hygrocybe graminicolor.* This species is typically a grassy green colour, but most of the specimens we found were more pale brown or straw-coloured. Even the youngest of these specimens had little green and were already tending towards brown. Tony Young has a colour plate of *H. viscidibrunnea,* from Western Australia, which appears the same colour and texture of our specimens. He suggests that this species may be a brown form of *H. graminicolor.* Jurrie Hubregtse's microscopic analysis suggested that our specimens conformed to *H. graminicolor.*

Dermocybe splendida was found in a large numbers and several groups were arranged in 'fairy rings' up to two metres in diameter. Fairy rings are typically associated with saprotrophs such as *Marasmius oreades* and *Agaricus campestris*, which grow in an expanding circle as they consume the nutrients in the soil. However, *Cortinarius* species are mycorrhizal and they occasionally form 'tethered rings' around the bases of trees, but in this location the central tree was not obvious.

PERTH URBAN BUSHLAND FUNGI TEAM, PERTH FUNGI IN 2010

Neale Bougher

The Perth Urban Bushland Fungi Project (PUBF) endured a paucity of funding in 2010, but did organise and hold five fungi field events for the public during the year. Events were made possible due to the assistance of 12 volunteer fungi leaders, the cooperation of local community groups, and a modest but crucial and well-received donation from members of the Western Australian Naturalists' Club. PUBF's public events in 2010 were held at: Talbot Rd bushland (60 people attended), Craigie bushland (35), Lake Gwelup (43), Katanning (25), and Mundaring (37). Absolutely no advertising of events was done in 2010 and yet all public events were booked out in advance by web and email requests. In 2010 the Perth region experienced an extremely dry autumn and winter which no doubt curtailed the fruiting of many fungi. Nevertheless, some fungi did fruit, and 297 fungi were recorded in 2010 at the public PUBF events. Data from these events has been electronically stored by PUBF. However, with the exception of the rural Katanning event, the usual PUBF fungi survey reports have not been produced, issued to community groups or posted on-line this year due to the lack of funding.

Fig. 1 *Phanerochaete tuberculata*
Photo: Neale Bougher

In addition to the above public events, a select group of experienced volunteers and staff of the Botanic Gardens and Parks Authority (BGPA) assisted Neale Bougher during 10 non-public survey days at Bold Park and Kings Park in 2010. Bold Park is a regionally significant bushland of more than 400 hectares located in the west metropolitan area of Perth. The first major study of fungi in the park in 1999 recorded 120 species of fungi. Subsequent surveys in 2002, 2003, 2004, 2005, 2007, 2008, 2009 and 2010 have recorded a putative total of 461 species of fungi. Each survey year has yielded a significant number of newly recorded species at Bold Park, e.g. 5 examples of the 16 new fungi records in 2010 are *Botryobasidium subcoronatum, Coniophora puteana*, *Peniophora cinerea*, *Phanerochaete tuberculata* (Fig. 1), and *Propolis versicolor*.

Kings Park and Botanic Garden is located only 1.5 km from central Perth, and includes a regionally significant bushland covering about 267 ha of the 400 ha Park. Recently, a historical investigation has been undertaken into the fungi recorded from Kings Park dating back to 1839 [Bougher (2010) *Western Australian Naturalist* 27: 61–90]. The predominantly sporadic and uncoordinated records in the past have not yielded an accurate measure of the total number of fungi species at Kings Park. In 2009, the BGPA took a significant step to address this poor

knowledge base by conducting the first of what is intended to be annual surveys to document the fungi. The survey in 2009 recorded a total of 123 species of fungi including 67% new species records for Kings Park, e.g. 5 examples of the 82 new fungi records in 2009 are *Dasyscyphus acuum, Hyphodontia breviseta* (Fig. 2), *Peziza moravecii, Pleuroflammula praestans* (Plate 4) and the banksia-cone dwelling *Aleurodiscus* "sp. pink-orange" [this may be the same species recently featured in *Fungimap Newsletter* 41: p. 12 by Katie Syme, and on page R-3 of the field book *Fungi of the Perth Region and Beyond (2009)* - online at www.fungiperth.org.au]. In 2010, 47% of the 108 fungi recorded had not been previously recorded at Kings Park, e.g. 5 examples of the 51 new fungi records in 2010 are *Galerina pumila*, *Peniophora scintillans*, *Pluteus perroseus, Skeletocutis amorpha,* and *Trechispora microspora*. It is likely that the diversity of fungi at Kings Park is at least as high as at Bold Park, and this may well be confirmed by continued successive annual surveys.

Fig. 2 *Hyphodontia breviseta*
Photo: Neale Bougher

The Fungilab, including PUBF facilities and operations, will be moving to the Department of Environment and Conservation's brand new Western Australian Conservation Science Centre at Kensington, probably in January 2011.

News from Regional Fungal Network – Central Coast NSW

Pam O'Sullivan

The last few months have shown the power of what one person can do in one place in one year for fungal awareness. Over the last year Gregg Heathcote, who works in the Cultural Collections unit at the University of Newcastle's Callaghan campus, has been documenting the fungi he has been seeing on the campus. Gregg photographed these fungi and accompanied the images with locality, date and a few lines of information. This raised a wider awareness of fungi and resulted in a '… Meet Our Fungal Friends' exhibition which was initially displayed in the University's Auchmuty Library, then, on request, to other venues. This was the most professional fungal exhibition I've had the pleasure of viewing. It was based around a selection of Gregg's photos and incorporated displays of dried specimens and some wonderful fungi books from the University's collection in glass cabinets, and much more.

The display has generated a huge response, with Gregg being interviewed by ABC Radio and the *Newcastle Herald* doing an article on the exhibition and fungi. Within the University, Professor Tim Roberts, the Director of the Tom Farrell Institute for the Environment, was so excited by the exhibition that he decided to base their final forum of the year on **Regional solutions for a sustainable future depend on recycling**, including a speaker on fungi, one on water and one on solid waste. The forum is to be followed by their end of year Farrell Fancy Fungal Finale, celebrating the cycling of the year, and the theme-based natural and man-made recyclers, with fungal food, fun and fizz!

I recommend a visit to http://www.flickr.com/photos/uon/sets/72157623900051704/ where you'll find the photo set 'Fungi on the University'. Click on 'Details' to read a little about each fungus Gregg has included. The site shows 251 fungi photos including two very exciting ones, a lilac *Inocybe violaceocaulis* (Fig. 1, also Fungimap Newsletter 40, pages 4-6) and *Agaricus rotalis* (Plate 4).

Fig 1. *Inocybe violaceocaulis*
Photo: Gregg Heathcote

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Eric Whiting 86

QLD
Keith Ashley 1
Lisa Forbes 1
Vanessa Lewis 1
Sapphire McMullan-Fisher 38
Tess Mitchell 1
Michael Nayler 2

SA
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Wendy Cook 25
Field Naturalists Club of Victoria 146
Cath Greenop 2
Richard Hartland 39
Glenys Hodgson 1
Virgil Hubregtse 15
Ellen Lyndon 69
Catherine Nield 1
Jan Osmotherly 1
Tony Schnaedelbach 1
Nigel Sinnott 1
Steve Whipps 6

WA
Marion Blackwell 1

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