

| | | |
|---|------------------------------------|-----------------------|
| * <i>Pavo cristatus</i> | peafowl | |
| * <i>Meleagris gallopavo</i> | wild turkey | |
| <i>Porphyrio porphyrio melanotus</i> | pukeko | not threatened |
| <i>Haematopus ostralegus</i> | torea, pied oystercatcher | not threatened |
| <i>Vanellus miles</i> | spur-winged plover | not threatened |
| <i>Larus dominicanus dominicanus</i> | karoro; southern black-backed gull | not threatened |
| <i>Sterna caspia</i> | taranui; Caspian tern | Nationally Vulnerable |
| <i>Sterna striata striata</i> | tara; white-fronted tern | Gradual Decline |
| <i>Hemiphaga novaeseelandiae</i> | kukupa; kereru; New Zealand pigeon | Gradual Decline |
| * <i>Platycercus eximius</i> | eastern rosella | |
| <i>Chrysococcyx lucidus lucidus</i> | pipiwharau; shining cuckoo | not threatened |
| <i>Ninox novaeseelandiae</i> | ruru; morepork | not threatened |
| <i>Todiramphus sanctus</i> | kotare; kingfisher | not threatened |
| * <i>Alauda arvensis</i> | skylark | |
| <i>Hirundo tahitica neoxena</i> | welcome swallow | not threatened |
| * <i>Turdus merula</i> | blackbird | |
| <i>Gerygone igata</i> | riroriro; grey warbler | not threatened |
| <i>Rhipidura fuliginosa placabilis</i> | piwakawaka, fantail | not threatened |
| <i>Zosterops lateralis</i> | silveryeye; tauhou | not threatened |
| <i>Prothemadera novaeseelandiae novaeseelandiae</i> | tui | not threatened |
| * <i>Emberiza citrinella</i> | yellowhammer | |
| * <i>Fringilla coelebs</i> | chaffinch | |
| * <i>Carduelis carduelis</i> | goldfinch | |
| * <i>Passer domesticus</i> | house sparrow | |
| * <i>Sturnus vulgaris</i> | starling | |
| * <i>Gymnorhina tibicen</i> | Australian magpie | |

THE 20TH NZ FUNGAL FORAY, WESTPORT, May 2006

Petra White

Introduction

The New Zealand Fungal Foray is an annual event held in May each year at a different site in the country. It is intended for both amateur and professional mycologists. The amateurs range from members of the public with a general interest in natural history, to photographers, to gastronomes, to those with an extensive knowledge on New Zealand's fungi.

Initiated in 1986 with a foray at Kauaeranga Valley, Coromandel Peninsula, the event has since been held in such varying places as Tangihua, the Catlins, Wanganui, Ruatahuna, Haast and Nelson. After last year's foray at Ohakune 438 fungi collections representing 298 taxa were deposited into the PDD national collection. Three collections were of species currently listed as Nationally Critical by the Department of Conservation (DoC) (*Hitchmough et al* 2007) (*Ramaria junquilleovortex*, *Squamanita squarrolosa*, *Russula littoralis*), and 67 collections representing 44 taxa were of records flagged as Data Deficient. The list is published on the FUNNZ (Fungal Network of New Zealand) website.

The 20th annual NZ Fungal Foray was held in 2006 from 7-13 May at the University of Canterbury Field

Station in Westport. There were 66 professional and amateur mycologists staying for various durations during the week. We had visitors from Austria, Australia, Thailand, Sweden, England, Tasmania, Japan and USA.

Each day's foraying involved collecting in the field and then identifying our finds back at the Field Centre, labeling them and displaying them on tables set aside for the purpose. Many of the collections were then dried to take back to the Landcare Research herbarium in Auckland (PDD). I worked with Shaun Pennycook to record information on identified species directly onto computer. Additionally, photographs were taken of 425 images of 165 taxa. Many of the taxa had no previous captured image. This process is part of the FUNNZ tracking system, instituted for the first time at this Foray.

This was my fourth Foray and the first foray in which I didn't go alone. I had my boyfriend, Malcolm Greenway, with me. Malcolm had no previous experience with fungi but is a keen photographer, so I knew he would fit right in.

On the way to Westport we had an adventure. In Wellington while waiting for our connecting flight to Westport an announcement was made that the plane was too heavy and they needed two volunteers to take a flight to Nelson instead, where a taxi would be waiting for the drive through to Westport. I had seen this part of the country before, but for Malcolm it was all new, and it was a lovely day for a chauffeured drive, so I put my hand up. Our flight left an hour later. The taxi driver entertained us with stories of how frequently this happened, and how frequently he had to drive lost luggage around.

Some highlights from the foray included finding *Agaricus gennadii*, *Resupinatus merulioides* and *Pholiota alnicola*, new recordings for New Zealand; *Plicaturopsis scarlatina*, a bracket with wavy gills, which is unusual; and a rare unnamed species from the Trichocomaceae family on the shell of a giant land snail (*Powelliphanta* sp., Fig. 1).



Fig.1: Unknown species of Trichocomaceae on land snail, courtesy of FUNNZ.

The 20th NZ Fungal Foray captured information on 682 collections representing 253 taxa. Of these, 57 records had a current 'Data Deficient' status (Hitchmough *et al.* 2007). However, 14 collections had only one previous collection, of which 4 were new records for NZ and 4 were the second collection after the original Type specimen.

Monday 8 May, Lake Hanlon

Malcolm and I teamed up with Ross and Pauline Muir and Shirley Kerr and after breakfast headed north with them up the coast to Lake Hanlon. On the drive up we saw massed displays of kiokio (*Blechnum novae-zelandiae*) cascading down the steep banks above the road and, in bushy areas, karamu (*Coprosma robusta*) heavily laden with orange berries. It was sad to see that even this area dominated by so much untouched wilderness had its weed problem in the form of gorse (*Ulex europaeus*) and pampas (*Cortaderia* sp.).

Lake Hanlon, formed after an earthquake in 1929, lies on a terrace at the northern foot of the Karamea Bluffs. The track winds up a moderately steep slope through southern beech forests, then down to the shores of the peaceful and placid lake. Along the sides of the track there were plentiful orange peel fungus (*Aleuria aurantia*, Fig. 2) peeking out of the soil. In the forested areas we found *Phellodon nothofagi* and *P. sinclairii* scattered about, often growing together. There were also some impressive specimens of *Tylopilus formosus*. The most exciting highlight, however, awaited us on the edge of the track that circled the lake. Here we found three lovely examples of sky blue mushroom (*Entoloma hochstetteri*).



Fig. 2: Orange peel fungus (*Aleuria aurantia*), Lake Hanlon, May 2006 (Petra White).

After dinner that evening Don Horne showed slides from last year's Foray (the 19th) held at Ohakune.

Tuesday 9 May, northwards again

Once again the five of us headed north looking for fungi. We stopped at the Denniston Walkway and followed a 100-year-old bridle trail up through mixed beech and hardwood forest. It was quite dry so there was little fungi to be found. A highlight was a colony of *Hypholoma brunneum* growing on dead branches by the side of the track.

So onwards we went and stopped at the Charming Creek walkway. Here we were greeted by groves of wheki (*Dicksonia squarrosa*) and kiekie (*Freycinetia banksii*) cascading down the slopes and hugging trees. Being low-lying and wetter than our previous site, there was enough fungi interest to keep us occupied. Waxgill fungi were common. On a piece of decaying wood I found the puffball *Morganella pyriforme*.

That evening after dinner the first AGM of FUNNZ was held. The Society had been set up at last year's Foray in Ohakune. The office bearers for the coming year are David Orlovich, President; Peter Buchanan, Vice President; Petra White, Secretary; Paula Wilkie, Treasurer; and councilors Jerry Cooper, Geoff Ridley and Shirley Kerr. Afterwards Ross and Pauline Muir

gave a powerpoint presentation of fungi photos they had taken and Baxter Massey showed slides of fungi.

Wednesday 10 May, 5th Mycology Colloquium

The Colloquium, started on the 16th Foray, is a day set aside for talks on various fungal subjects.

Ron Peterson started the day presenting work done with Karen Hughes on how species are defined. There are three ways species are defined: (a) 97.63% DNA match, (b) they mate together, and (c) they look alike. Defining a species involves various techniques such as morphological analysis, mating experiments, DNA sequences, phylogenies and RFLPs (restriction fragment length polymorphism analysis). RFLPs are a type of DNA fingerprinting allowing a researcher to get a quick idea of the particular strain, isolate or species of a fungus, without going to the extra time and expense of DNA sequencing. It is often used to screen samples first, and those that have different RFLP "profiles" (fingerprints) will then get sequenced, and those that have identical RFLP profiles are assumed to be the same.

He gave examples of species that have unexpected distributions. *Pleurotus pulmonarius* is found in Malaysia, India, Austria, Russia, New Zealand and Indonesia. *Flammulina velutipes* is a north temperate species found in the USA, Europe and Japan, but also has been collected in Argentina and New Zealand. It migrated to New Zealand from Japan and Europe. *Panellus stypticus* is bioluminescent in the USA but nowhere else. The New Zealand species doesn't look like the ones in Europe but is sexually compatible. *Pleurotopsis longinqua* is found in Tasmania, New Zealand, Chile, Alaska and western USA. All the Pacific Rim species are found near the coast and are associated with wood products and wood chip, so this is a fairly recent arrival.

Nic Cummings then talked about his PhD project, entomopathogenic fungi in New Zealand native forests. These are pathogens that kill insects, spiders and mites and are found in most of the fungal groups. There are around 700 species that are true pathogens, not including pathogens that infect but don't kill the host. *Cordyceps robertsii* was the first fungal pathogen species recorded (Cunningham, 1921) in New Zealand. Then in 1953 Dingley discovered several more species of *Cordyceps*. In 1983 Samson and Soares recorded *Tolyocladium extinguens*, a species that parasitises glowworms.

Entomopathogenic fungi have low species diversity in agricultural habitats but a high species diversity in natural forests. Nic's aim is to identify fungi attacking arthropods to develop bio-control agents. In his view these fungi are an obvious choice for insect biocontrol and an alternative to chemical control.

The next two speakers gave talks on aspects of two types of mycorrhizal fungi. Mycorrhizal fungi form symbiotic relationships with the host plant. This symbiotic association provides the fungus with a renewable source of food through access to fixed carbon (sugars) from plant photosynthates. These are translocated to the root tissues from their source location (usually leaves), and then to the fungal partners. In return, the plant gains the use of the mycelium's tremendous surface area to absorb mineral nutrients from the soil. Trees and plants with thriving mycorrhizal associations are better able to survive and thrive in stressful natural and artificial environments.

Cressida Bywater and Gabrielle Lockett gave a talk on arbuscular mycorrhizal composition in montane grassland species. Cressida studies grass species while Gabrielle non-grass species. These fungi are ancient asexual organisms 600 million years old. There are about 150 described species. Arbuscular mycorrhizal fungi are endomycorrhizal, i.e. the hyphae grow between and penetrate the cell wall of the host plant. Associations are formed with 80% of terrestrial plants and this association can be beneficial or detrimental depending on the fungal species and host plant. There is evidence of host specificity. Little research has been undertaken on New Zealand species.

Tegan Garland then talked about her PGDipSci project, a comparison of ectomycorrhizal basidiomycete fungal diversity associated with *Nothofagus menziesii*, *Leptospermum scoparium* and *Kunzea ericoides*. The hyphae of ectomycorrhizal fungi penetrate the plant roots but do not penetrate the cell wall. It has been suggested (Baylis 1980) that mycorrhizal fungi might help the spread of beech trees. Beech trees spread poorly into grassland, whereas the reverse is the case with *Kunzea*. Tegan collects soil samples from several sites in the South Island and is looking at which species are shared between *Nothofagus* and *Leptospermum*/*Kunzea*. This work has implications for forest management and in conservation, and may promote greater understanding in New Zealand rainforest restoration.

After morning tea Michael Noordeloos, Natural Herbarium of the Netherlands, gave a talk on the phylogeny of *Entoloma* species. These fungi belong to the family Entolomataceae, which has an estimated 2,000 described species. *Entoloma* have pink, angular spores with a wide variety of shapes. Some are truffle-like (e.g. *Richoniella*). Michael asks whether *Entoloma* is monophyletic, i.e. one genus, as there is considerable variability in pileus structure in these species. About 60 *Entoloma* species have been reported in New Zealand.

Greg Mueller then presented his preliminary studies on Australasian genus *Laccaria*, a genus he has been working on for almost 30 years. He has done fieldwork in Queensland, Tasmania, Victoria and the Eastern

Highlands of Papua New Guinea. *Laccaria* belongs to the family *Hydnangiaceae*. There are two other genera in this family, *Hydnangium* and *Podohydangium*, the three together comprising 89 taxa. The false truffle genus *Hydnangium* is restricted to *Eucalyptus*.

Laccaria are found in north temperate and south temperate rainforests and southern Asia. They are not known in Africa. There are 50-60 species recognised worldwide and 7 are known from New Zealand. *Laccaria* are easy to identify as a genus but difficult for species delimitation and identification. *Laccaria* species form ectomycorrhizas with a wide diversity of plant hosts but individual species show varying degrees of host specificity. There is a distinct separation between northern and southern hemisphere species. Evidence suggests a Gondwanan origin of this group. The *Laccaria/Hydangium* genera are proving to be an excellent model for understanding the evolution, distribution and ecology of macrofungi.

Andrea Roberts followed with a talk on the connection between arbuscular mycorrhizal fungi (AMF) and invasion of tussock hawkweed (*Hieracium lepidulum*) in New Zealand. Exotic plant invasion is implicated in the decline of 57% of New Zealand's endangered plant species. Tussock hawkweed is long-lived and invading southern tussock grasslands. AMF's occur in greater than 80% of terrestrial plants. AMF associations have been shown to increase *H. lepidulum* growth when fertiliser is added and it is possible that AMF's have a role in the invasion process.

Toni Atkinson finished off the morning with a talk entitled "The Story of my Family". The fungal family she studies is *Lasiosphaeriaceae*, which belongs to the Ascomycetes class. There are three described types of ascocarps (fruiting bodies) based upon shape: cleistothecium (spherical), apothecium (cup-shaped), and perithecium (flask-shaped). *Lasiosphaeriaceae* are flask-shaped and, like the spherical-shaped ascomycetes, are microscopic in size.

After lunch Karl Soop started the afternoon with a talk on *Cortinarius* phylogeny. He was followed by Genevieve Gates who spoke about her work on macrofungal biodiversity as a tool for the sustainable management of coarse woody debris in the forest landscape. She has been looking at the stages of decay in forestry plantations. She has found quite a number of *Russula* and *Amanita* species growing on moss-covered logs.

Next came Katrin Walbert with observations of serial changes in ectomycorrhizal fungi associated with a *Pinus radiata* plantation in New Zealand. She has been using three methodologies in the work: sporocarp survey, soil cores survey and molecular methods. Where these fungi are lacking there is a soil deficiency in nitrogen, potassium. She has found that species diversity increases with the age of the plantation.

There is a change in species composition over time and an increase in species number.

David Orlovich, University of Otago, then spoke about his work with ectomycorrhizal fungal diversity on *Nothofagus* roots using molecular methods. There are greater than 226 ectomycorrhizal fungal species described in association with *Nothofagus* in New Zealand.

Barbara Paulus, Landcare Research, followed with a presentation on her work in Te Urewera forests owned by Tuhoe Tuawhenua Trust. These forests have been selectively logged since the 1970s. The Trust is concerned at the effects of this selective logging and whether there is any difference in fungal diversity between old growth and selectively logged forests. Barbara has studied the effects of logging in New Zealand and has done some overseas work as well. She works on fine woody debris, which she defines as between 2-5cm in diameter.

Landcare records show 448 fungal species from the area, a lot of which were recorded from the 2001 Fungal Foray. A total of 136 species were found, 48% of which were corticioid, and 10% of which were new records for New Zealand. Xylariaceae formed 11% and discomycetes 7% of the recorded species. Others included Agaricales, Heterobasidiomycetes and Hypocreales. She found a greater diversity in unlogged sites. 49.3% of species occurred in unlogged sites, 28.7% in logged sites and 21.9% of species were found in both.

A break for afternoon tea and then Egon Horak took the podium with a talk on the comparisons of Agaric and Bolete species in New Zealand versus Argentina and Chile. He has looked at *Nothofagus* forests in New Guinea, New Zealand, Tasmania, the southern tip of South America, and New Caledonia. One hundred million years ago these places were all part of Gondwanaland.

To finish off the day, Phil Knightbridge, of DoC gave an overview of the West Coast Conservancy biodiversity programme. The West Coast Conservancy covers an area of 2.3 million hectares, 83% of which is public conservation land. Most habitats are well represented in the public estate, exceptions being fertile well drained valley floors, coastal dunes and fertile swamps. DoC allocates 4 million dollars annually for biodiversity work in the West Coast Conservancy, which works out at \$2.10 per hectare per year. Some of the bigger projects this money goes to include possum, goat and weed control. Giant land snails (*Powelliphanta*) and some species of birds are intensively managed.

There are 49 species of fungi listed as nationally critical (excluding micro-fungi), sixteen species are in lower threat categories, and c.1200 species are data

deficient. Phil listed some possible threats to fungi: loss of habitat (which is not such an issue on the West Coast), loss of host species, predation, over collecting and threat of exotic species. The question was asked what should DoC be doing to conserve fungi on the West Coast?



Fig. 3: Nile River, May 2006 (Petra White).

Peter Johnston noted that the common fly agaric (*Amanita muscaria*) associated with exotic pine has now naturalised in native beech forests. However at this point in time little is known about what effect this will have on this ecosystem and how this threat could be managed. In general it was agreed that habitat protection was a very good start for fungal conservation. Protection of threatened host species was also something that could be done at present e.g. scarlet mistletoe is the host for *Diaporthe* sp. Facilitating collections such as those undertaken on the Foray was seen as the best way to increase our knowledge of species currently listed as nationally critical or data deficient.

After dinner Egon Horak showed slides demonstrating aspects of his talk in the Colloquium that day. Afterwards a birthday cake was brought out and ceremoniously cut to mark twenty years of fungal forays. Peter Buchanan also remarked that it was the first anniversary of the formation of FUNNZ. Then to finish off the day Don Horne showed more slides.

Thursday 11 May, Inland Pack Track

After breakfast we headed out foraging again, this time southwards. Just before Punakaiki, we turned into Bullock Creek Rd, a dirt road leading to the Inland Pack Track. From the carpark we walked uphill into forests of kanuka (*Kunzea ericoides*), towering rimu (*Dacrydium cupressinum*) and taurepo (*Rhabdothamnus solandri*). The track forked, and we took the track to the right.

The track to the left was the Cave Creek Track. I had been there once before, a decade previously, that time riding a mountain bike. I still remember the sense of horror looking down the chasm into Cave Creek and

seeing the place where they built the platform on crumbling limestone.

There were lots of wax gills scattered about and also the fruiting bodies of *Phellodon nothofagi* and *P. sinclairii*. At one point a tree had fallen over the track. Pauline and I headed uphill to find a way round the obstacle, while the others scrambled through underneath it. A short distance uphill at the base of a tree I discovered the most exciting find of the day, an impressive colony of fruiting bodies of a yellow-brown mushroom glistening with moisture. We paused to take photographs and collect specimens for identification. It turned out to be *Pholiota alnicola*, which had not previously been recorded for New Zealand.

The rain began so we headed back to the car and down Bullock Creek Rd. On the way we met a campervan coming the other way. In attempting to pass us, it got stuck against the bank. Ross attempted to tow it out but without success. We continued onwards, promising to get help. Only a short distance down the road we encountered reinforcements in the form of a huge grader. We told the driver what had happened and he said he saw the campervan coming in and knew there would be a problem. There is a sign at the entrance to the road warning campervans against entry. We had lunch at Punakaiki and then drove north again, stopping at Cape Foulwind to see the seal colony on the way.

After dinner that evening Genevieve Gates gave a Powerpoint presentation of fungi photos taken in Borneo. Afterwards a DVD was shown from last year's foray at Oakune put together by the Levin Nature History Club.



Fig. 4: *Entoloma hochstetteri*, Nile River, May 2006 (Petra White).

Friday 12 May, Nile River Walk

For our final day of foraging we headed south again to the beech/broadleaf forests of the Nile River Walk. We followed the path of a scenic railway. A track crisscrossed over it. The Nile River to our left (Fig. 3) was backed by a stunning karst escarpment clothed in native vegetation. The banks of the river were covered in large areas of granite stones and, in places, river sand.

Tutu (*Coriaria arborea*) was common, as was wheki (*Dicksonia squarrosa*) and wheki-ponga (*D. fibrosa*). The understory was dominated by bush rice grass (*Microlaena avenacea*), tupari maunga (*Gahnia xanthocarpa*) and piupiu (*Blechnum discolor*). Just off the track we discovered a single fruiting body of

Entoloma hochstetteri (Fig. 4). Nearby, growing from the ground were *Amanita nothofagi* and *Hygrocybe firma*. Near the river bank there was a fallen tree covered in the bracket fungus *Fomes hemitephra*.

Beyond the end of the railway we crossed a suspension bridge and here in the ground tier we found a lot of *Nematoceras* orchids in flower. Just uphill and a little off the track I discovered a large colony of pagoda fungus (*Podoserpula pusio* var. *pusio*), always a stunning find as it makes such a fantastic display. We had lunch and walked back to the car, hitching a ride on the small train on the way.

After dinner that night Pauline Muir showed photos taken at the foray.

Acknowledgements

David Orlovich, Phil Knightbridge and Tegan Garland for editorial comments.

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- <http://www.funz.org.nz>
<http://nzfungi.landcareresearch.co.nz/html/mycology.asp?ID=83-XXX-98>
<http://www.hiddenforest.co.nz/index.htm>

Species List

Legend

* exotic

| | | | |
|-----|---------------------------------------|----|----------------------------------|
| BC | Box Canyon, Karamea | LW | Lyell Walkway |
| BCr | Bullock Creek Track, Punakaiki | MC | Murray Creek Track, Reefton |
| BT | Bridle Track, Denniston | MG | Moria Gate Track, Karamea |
| BW | Britannia Walk, Waimangaroa | NL | Nikau Loop Track, Karamea |
| CB | Carters Beach, Westport | NR | Nile River Walkway |
| CC | Charming Creek Walkway | OA | Oparara Arch Walk, Karamea |
| CT | Croesus Track, Blackball | OG | Oparara Gorge, Karamea |
| DT | Denniston Track | OR | Okari River, Westport |
| FT | Fenian Track, Karamea | PR | Pororari River Track |
| GF | Golden Fleece Battery, Reefton | RT | Rimu Track, Karamea |
| HT | Heaphy Track | TC | Tiropahi Creek Track, Charleston |
| IP | Inland Pack Track, Punakaiki | TF | Tawhai Forest, Reefton |
| KR | Karamea River Walk | TT | Tiropahi Tramway, Charleston |
| LD | Lake Daniells Track, Springs Junction | TW | Truman Walk, Punakaiki |
| LH | Lake Hanlon | WT | Waterfall Track, Lewis Pass |
| LP | Lewis Pass | | |

| Ascomycetes | Sites Recorded | | |
|--|----------------|--------------------------------|----------------------|
| <i>Aleuria aurantia</i> | LH, OA | <i>Lambertella tubulosa</i> | OA |
| <i>Allophylaria</i> sp. | PR | <i>Hispidula rubra</i> | DT |
| Arachnopezizaceae (unidentified cup fungus) | DT | <i>Hypomyces chrysospermus</i> | NR |
| <i>Ascocoryne sarcoides</i> | BC, NR | <i>Hypocrea sulfurella</i> | PR |
| <i>Ascocoryne</i> sp. | CC | <i>Hypocrea</i> sp. | BT, PR |
| <i>Biscogniauxia</i> sp. | CC | <i>Neobarya fungicola</i> | MC |
| <i>Coccomyces limitatus</i> | DT | <i>Paurocotylis pila</i> | CC, FT |
| <i>Crocicreas</i> sp. | DT | <i>Propolomyces versicolor</i> | DT |
| <i>Delortia</i> sp. | PR | <i>Pseudaegerita viridis</i> | OA |
| <i>Hypomyces chrysospermus</i> | PR | <i>Scutellinia</i> sp. | FT, PR |
| <i>Lachnellula rhopalostylidis</i> | PR | <i>Trichocomaceae</i> | CC, FT, MG |
| | | <i>Xylaria</i> sp. | Pororari River Track |
| | | <i>Xylaria tuberiformis</i> | OA |

| | | | |
|--|---|--|---|
| Hyphomycetes | | <i>Clavulina hispidulosa</i> | NR |
| <i>Candelabrum</i> sp. | OA | <i>Clavulina leveillei</i> var. <i>atricha</i> | NR |
| <i>Endophragmia boewei</i> | OA | <i>Clavulina samuelsii</i> | IP |
| <i>Helicodendron websteri</i> | OA | <i>Clavulina</i> sp. | CC, MC, DT, IP, Perseverance Rd, Punakaiki |
| <i>Helminthosporium velutinum</i> | NR | ? <i>Clitocybe</i> sp. | PR |
| <i>Helicoon</i> aff. <i>maiorcense</i> | OA | <i>Clitocybula</i> sp. | LP |
| <i>Helicoon</i> sp. | OA | <i>Collopus epipterygius</i> | DT, OA |
| <i>Isaria tenuipes</i> | CC | <i>Collopus subviscosus</i> | CC |
| <i>Selenosporella curvispora</i> | OA | <i>Collybia incarnata</i> | Perseverance Road |
| <i>Spirosphaera caricis-graminis</i> | OA | <i>Collybia rimutaka</i> | OA |
| <i>Stachylidium bicolor</i> | PR | <i>Collybia</i> sp. | OA |
| <i>Subulispora britannica</i> | OA | <i>Coltricia cinnamomea</i> | OG |
| <i>Trichoderma</i> sp. | Lake Daniells Track, Springs Junction | <i>Conchomyces bursiformis</i> | BCr, CC, NR |
| | | <i>Coprinus</i> spp. | NR, PR |
| | | <i>Coprinus comatus</i> | Caltex service station, Westport |
| | | <i>Coprinus disseminatus</i> | MC |
| Oomycetes | | <i>Cortinarius achrous</i> | LD |
| <i>Pythium insidiosum</i> * | Westport Beach | <i>Cortinarius alboaggregatus</i> | MC |
| | | <i>Cortinarius alboroseus</i> | FT, LD |
| Basidiomycetes | | <i>Cortinarius anomalus</i> | TC |
| <i>Aeruginospora</i> cf. <i>furfuracea</i> | CT | <i>Cortinarius aurantioferreus</i> | FT |
| <i>Agaricus gennadii</i> | HT | <i>Cortinarius austrocyranites</i> | LW |
| <i>Agaricus</i> sp. | CC | <i>Cortinarius cardinalis</i> | CC |
| <i>Amanita australis</i> | BT | <i>Cortinarius caryotis</i> | TC |
| <i>Amanita muscaria</i> | MC | <i>Cortinarius castoreus</i> | CC, KR |
| <i>Amanita nehuta</i> | BT, CC | <i>Cortinarius chalybeus</i> | MC, OA |
| <i>Amanita nothofagi</i> | DT, LD, MG, NR, TC | <i>Cortinarius collybianus</i> | LH |
| <i>Amanita pareparina</i> | OA | <i>Cortinarius cucumeris</i> | GF |
| <i>Amanita pekeoides</i> | GF, NR, TC, | <i>Cortinarius cupreonatus</i> | FT |
| <i>Amanita taiepa</i> | BW, LH | <i>Cortinarius cycneus</i> | BC, MC, MG, OA |
| <i>Armillaria hinnulea</i> | BW, CC, FT | <i>Cortinarius dulciolens</i> | CC, TC |
| <i>Armillaria limonea</i> | FT, LD, PR, | <i>Cortinarius ignellus</i> | FT |
| <i>Armillaria novaezelandiae</i> | CC, LH, MG | <i>Cortinarius ionomataius</i> | LD |
| <i>Artomyces turgidus</i> | CC | <i>Cortinarius laquellus</i> | FT, KR |
| <i>Artomyces</i> sp. | CC | <i>Cortinarius mariae</i> | GF |
| <i>Astrosporina</i> sp. | CC | <i>Cortinarius meleagris</i> | KR, LW |
| <i>Auricularia cornea</i> | OR, PR | <i>Cortinarius paraoniti</i> | FT |
| <i>Austroboletus lacunosus</i> | CC, CT, IP, KR, LH, MC, TC | <i>Cortinarius peraurantiacus</i> | TC |
| <i>Austroboletus niveus</i> | LH | <i>Cortinarius perareus</i> | FT, LD, MC |
| <i>Austropaxillus macnabbii</i> | LD | <i>Cortinarius perelegans</i> | MC |
| <i>Bisporella citrina</i> | MC, NR | <i>Cortinarius pholiotellus</i> | LD |
| <i>Bisporella</i> sp. | LH | <i>Cortinarius porphyroideus</i> | CC, LD, LW, MG, NR, track to Crazy Paving Cave Karamea |
| <i>Boletus</i> sp. | CC | <i>Cortinarius rhipiduranus</i> | MC, TC |
| <i>Callistosporium</i> sp. | TF | <i>Cortinarius rotundisporus</i> | BCr, IP, LH, TC |
| <i>Calocera</i> sp. | CC, HT, OA | <i>Cortinarius singularis</i> | Waimangaroa |
| <i>Calostoma rodwayi</i> | BC, BCr, IP, Perseverance Rd | <i>Cortinarius subgemmeus</i> | MC |
| <i>Calvatia cyathiformis</i> | CB | <i>Cortinarius suecicolor</i> | BC, KR |
| <i>Camarophyllus</i> | PR | <i>Cortinarius veronicae</i> | BC, TC |
| <i>aurantiopallens</i> | | <i>Cortinarius violaceus</i> | TT |
| <i>Camarophyllus</i> sp. | CC | <i>Cortinarius</i> cf. <i>violaceus</i> | TF |
| <i>Campanella olivaceonigra</i> | CC | <i>Cortinarius xenosma</i> | TC |
| <i>Campanella</i> sp. | PR | <i>Cortinarius</i> cf. <i>xenosma</i> | LD |
| <i>Cantharellula</i> sp. | PR | <i>Cortinarius</i> spp. | CC, DT, FT, KR, LD, LP, MC, OA, TC, TF, Waimangaroa |
| <i>Cantharellus wellingtonensis</i> | CC, FT | <i>Crepidotus mollis</i> | HT |
| <i>Chamonixia pachydermis</i> | BCr, CT, IP, LD, LH, MC, OA, Perseverance Rd, WT | <i>Crepidotus</i> sp. | CC, NR, OA, Perseverance Rd, PR |
| <i>Chlorociboria</i> sp. | CC, MT | <i>Crinipellis procera</i> | LW |
| <i>Clathrus archeri</i> | HT | <i>Crucibulum laeve</i> | CC, FT, PR |
| <i>Clavaria amoena</i> | Chasm Creek Walkway, PR | <i>Cuphocybe</i> cf. <i>phaeomyxa</i> | TF |
| <i>Clavaria</i> sp. | PR | | |
| <i>Clavulina geoglossoides</i> | MC | | |

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|--|---|--|---|
| <i>Cyclomyces tabacinus</i> | BC | <i>Humidicutis pura</i> | DT, MG |
| <i>Cystoderma clastotrichum</i> | CC | <i>Hydnum crocidens</i> | TC |
| <i>Cystolepiota</i> sp. | FT, OA | <i>Hydnum crocidens</i> var. | CC |
| <i>Dacrymyces tortus</i> | OA | <i>crocidens</i> | |
| <i>Daldinia eschscholzii</i> | NR | <i>Hydropus</i> sp. | CC |
| <i>Dermocybe alienata</i> | BC, LD | <i>Hygrocybe blanda</i> | CC, DT |
| <i>Dermocybe canaria</i> | MC, OA | <i>Hygrocybe cantharellus</i> | CC, CT, DT |
| <i>Dermocybe cardinalis</i> | DT | <i>Hygrocybe cerinolutea</i> | FT, OA |
| <i>Dermocybe castaneodisca</i> | MC | <i>Hygrocybe firma</i> | CC, CT, DT, IP, LH, NR, OA, PR, RT, TW, Waimangaroa |
| <i>Dermocybe indotata</i> | FT, Waimangaroa | <i>Hygrocybe julietae</i> | BCr, CC, NR |
| <i>Dermocybe vinacaecolor</i> | LH | <i>Hygrocybe miniata</i> | TW |
| <i>Dermocybe vinicolor</i> | CC, TC | <i>Hygrocybe rubrocarnosa</i> | RT |
| <i>Dermocybe</i> spp. | OA, OG, TF | <i>Hygrocybe</i> spp. | BC, OA, OG, PR |
| <i>Descolea gunnii</i> | BT, Perseverence Road | <i>Hygrophorus involutus</i> | PR, RT |
| <i>Descolea majestatica</i> | IP | <i>Hygrophorus salmonipes</i> | PR |
| <i>Descolea phlebophora</i> | BC, OA | <i>Hygrophorus</i> sp. | CT, PR |
| <i>Descolea</i> sp. | IP, LD | <i>Hypholoma brunneum</i> | CC, FT, HT, NR |
| <i>Discinella terrestris</i> | BT, IP, LH | <i>Hypholoma fasciculare</i> | CC, NR, RT |
| <i>Entoloma atrellum</i> | CC, PR | <i>Ileodictyon cibarium</i> | CB |
| <i>Entoloma canoconicum</i> | TW | <i>Inocybe destruens</i> | BCr |
| <i>Entoloma chloroxanthum</i> | LH | <i>Inocybe luteobulbosa</i> var. | NR |
| <i>Entoloma convexum</i> | BCr | <i>luteobulbosa</i> | |
| <i>Entoloma farinolens</i> | DT, LH | <i>Inocybe rimosa*</i> | NR |
| <i>Entoloma hochstetteri</i> | CC, LH, Lake Kaniere, NR, OA, PR, TT, TW | <i>Inocybe</i> cf. <i>scabriuscula</i> | CC |
| <i>Entoloma perzonatum</i> | LH, NL | <i>Inocybe strobilomyces</i> | TF |
| <i>Entoloma procerum</i> | CC, DT | <i>Inocybe</i> sp. | BT, OA |
| <i>Entoloma translucidum</i> | DT | <i>Insiticia roseoflava</i> | OA |
| <i>Entoloma viridomarginatum</i> | BC, CC, OA | <i>Laccaria fibrillosa</i> | CT, IP, LD |
| <i>Entoloma</i> spp. | CC, OA, PR | <i>Laccaria glabripes</i> | LD, Perseverence Road, PR |
| <i>Farysporium endotrichum</i> | DW, TC | <i>Laccaria lilacina</i> | CT |
| <i>Favolaschia calocera*</i> | CC, FT | <i>Laccaria masoniae</i> var. | LD |
| <i>Favolaschia</i> sp. (on <i>Cyathea</i> <i>medullaris</i>) | PR | <i>brevispinosa</i> | |
| <i>Flagelloscypha</i> sp. | PR | <i>Laccaria proxima*</i> | NR |
| <i>Fomes hemitephrus</i> | BCr, CC, DT, KR, IP, NR | <i>Laccaria violaceonigra</i> | Perseverence Road |
| <i>Fusarium tumidum</i> | road to Denniston | <i>Lacrymaria lacrymabunda*</i> | NR |
| <i>Galerina ? austrocalyptrata</i> | OA | <i>Lactarius clarkeae</i> | BCr, IP, LH |
| <i>Galerina patagonica</i> | CC, HT, LH, PR, RT | <i>Lactarius sepiaceus</i> | LD |
| <i>Gallacea violacea</i> | Andrews Track, near Arthurs Pass | <i>Lactarius umerensis</i> | NR, PR |
| <i>Ganoderma australe</i> | FT | <i>Lactarius</i> sp. | IP |
| <i>Ganoderma</i> cf. <i>applanata</i> | NR | <i>Leotia lubrica</i> | CT, LH, MC, NR, Perseverence Road, PR, TC |
| <i>Ganoderma</i> sp. | FT, LH, IP | <i>Lepiota</i> sp. | BC, CC, NR, OA |
| <i>Geoglossum cookeanum</i> | CC | <i>Lepiota purpurata</i> | OA |
| <i>Gliophorus</i> sp. | TF | <i>Leucoagaricus</i> sp. | OA |
| <i>Gliophorus chromolimoneus</i> | BT, CC, MC | <i>Lichenomphalia</i> sp. | CC |
| <i>Gliophorus graminicolor</i> | CC, CT | <i>Lycoperdon perlatum</i> | CC, FT |
| <i>Gliophorus lilacipes</i> | CC, CT, LH, OA | <i>Macowanites carmineus</i> | BCr, BT, CC, DT, IP, TC |
| <i>Gliophorus pallidus</i> | BT | <i>Marasmiellus</i> sp. | NR, PR, TF |
| <i>Gliophorus viridis</i> | BT, OA | <i>Marasmiellus violaceogriseus</i> | NR |
| <i>Gloeoporus phlebophorus</i> | BCr, MG | <i>Marasmius</i> spp. | NR, PR |
| <i>Gloiocephala nothofagi</i> | LH, Perseverence Road | <i>Marasmius gelatinosipes</i> | NR, OA |
| <i>Grifola</i> sp. | CC | <i>Marasmius rhopalostylidis</i> | PR |
| <i>Gymnopilus crociphyllus</i> | NR | <i>Melanophyllum echinatum</i> | Perseverence Road |
| <i>Gymnopilus ferruginosus</i> | BCr, BT, TC | <i>Melanophyllum</i> sp. | OA |
| <i>Gymnopilus junonius</i> | Westport Beach | <i>Moellerodiscus</i> | DT |
| <i>Gymnopilus</i> sp. | FT | <i>microcoprosmae</i> | |
| <i>Hebeloma</i> sp. | NR | <i>Morganella compacta</i> | HT, LH |
| <i>Hebeloma mediorufum</i> | CC | <i>Morganella pyriformis</i> | CC |
| <i>Hemimycena</i> sp. | Perseverence Road | <i>Mycena</i> spp. | CC, Denniston, MC, NR, OA, Perseverence Road, PR, TF |
| <i>Hohenbuehelia</i> sp. | CT | <i>Mycena austrororida</i> | Chasm Creek Walkway, CC |
| <i>Hohenbuehelia petalodes</i> | LD | <i>Mycena carmeliana</i> | OA |

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| <i>Mycena cystidiosa</i> | Perseverence Road | <i>Ramariopsis ramarioides</i> | LH, PR |
| <i>Mycena epipterygia</i> | MC, OA | <i>Ramariopsis simplex</i> | CC |
| <i>Mycena interrupta</i> | BCr, CT, FT, LH, LW, MC | <i>Ramariopsis</i> sp. | CC |
| <i>Mycena mariae</i> | NR, OA | <i>Resinomyцена</i> sp. | OA |
| <i>Mycena mamaku</i> | LH | <i>Resupinatus applicatus</i> | NR |
| <i>Mycena minirubra</i> | BCr, NR | <i>Resupinatus merulioides</i> | PR |
| <i>Mycena podocarp</i> | PR | <i>Rhizopogon</i> sp. | CB |
| <i>Mycena pura</i> | BT | <i>Richoniella pumila</i> | CC, RT |
| <i>Mycena sanguinolenta</i> | CC, OA | <i>Rozites</i> sp. | LD |
| <i>Mycena ura</i> | BT, CC, LH, MC, NR | <i>Russula</i> sp. | IP, Karamea, LD, MCr, Punakaiki |
| <i>Nidula niveotomentosa</i> | BT, MC, OG, TC, track past Denniston Mine | <i>Russula albonigra</i> | BT |
| <i>Nivatogastrum</i> sp. | PR | ? <i>Russula novae-zelandiae</i> | IP |
| <i>Octaviana tasmanica</i> | BCr, CC, LD, OA, NR | <i>Russula roseostipitata</i> | LP |
| <i>Omphalina foetida</i> | OA, PR | <i>Russula tawai</i> | BCr, CT, TC |
| <i>Oudemansiella</i> sp. | BC, NR | <i>Russula umerensis</i> | LP |
| <i>Panellus stypticus</i> | FT | <i>Sarcodon thwaitesii</i> | BT |
| <i>Panus</i> sp. | Perseverence Road | <i>Schizophyllum commune</i> * | HT |
| <i>Phaeocollybia</i> sp. | TC | <i>Sebacina</i> sp. | PR |
| <i>Phaeoarasmius lanatulus</i> | BCr | <i>Simocybe</i> sp. | PR |
| <i>Phaeosolenia densa</i> | PR | <i>Sirobasidium brefeldianum</i> | BC, BT |
| <i>Phellodon nothofagi</i> | BCr, IP, LH, MC, NR, OA, TC | <i>Stereum vellereum</i> | BT, CC |
| <i>Phellodon sinclairii</i> | FT, IP, LH, NR | <i>Stropharia aurantiaca</i> * | Westport Beach Camping Area |
| <i>Pholiota alnicola</i> | BCr | <i>Suillus brevipes</i> * | CB, NR |
| <i>Pholiota squarrosipes</i> | RT | <i>Suillus granulatus</i> * | HT |
| <i>Pholiota</i> sp. | CC, Upper Waimangaroa River Valley | <i>Thaxterogaster viola</i> | BCr |
| <i>Phylloporus</i> sp. | Chasm Creek Walkway | <i>Thelephora</i> sp. | CC |
| <i>Phylloporus novaezelandiae</i> | FT | <i>Trametes versicolor</i> | CC |
| <i>Pleurocollybia cremea</i> | PR | <i>Tremella fuciformis</i> | NR |
| <i>Pleurocollybia</i> sp. | CC | <i>Tremella mesenterica</i> | NR, Westport Beach |
| <i>Pleuroflammula praestans</i> | CC | <i>Tremellodendropsis</i> | PR |
| <i>Pleurotopsis longinqua</i> | CT, OA, OG | ? <i>flagelliformis</i> | |
| <i>Pleurotopsis subgrisea</i> | OA | <i>Tremellodendropsis</i> sp. | PR |
| <i>Pleurotopsis</i> sp. | NR | <i>Tricholoma</i> sp. | MCr, LD, NR |
| <i>Pleurotus djamor</i> | CC, near Little Wanganui, Karamea | <i>Tricholoma elegans</i> | LD |
| <i>Plicaturopsis scarlatina</i> | near Mirror Tarn, Karamea | ? <i>Trogia</i> sp. | NR |
| <i>Pluteus</i> sp. | CC | <i>Tylophilus formosus</i> | CC, IP, KR, LH, Maruia, NR, TC |
| <i>Podoserpula pusio</i> | NR | <i>Vuilleminia comedens</i> | BT |
| <i>Polyporus arcularius</i> | TC | <i>Weraroa erythrocephala</i> | NL, PR |
| <i>Psathyroma</i> sp. | BC | <i>Weraroa virescens</i> | BT, CT, MG, NR, OA, TT |
| <i>Psathyrella</i> sp. | LH, OG, PR | <i>Xerocomus nothofagi</i> | CC, IP |
| <i>Psathyrella asperospora</i> | RT | <i>Xerocomus</i> ? <i>scabripes</i> | LW |
| <i>Psilocybe</i> sp. | BCr | <i>Xeromphalina leonina</i> | CC |
| <i>Pycnoporus coccineus</i> | DT, NR, Westport Beach | <i>Xeromphalina</i> sp. | PR |
| <i>Ramaria lorithamnus</i> | MC | | |
| <i>Ramaria samuelsii</i> | BCr, FT | | |

Myxomycete

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| <i>Craterium minutum</i> | PR |
| ? <i>Trichia crateriformis</i> | BCr |

Two rock-forest remnants at Meola Creek, Auckland City

Rhys Gardner

The longest basalt lava flow of the Auckland Volcanic Field runs northwestwards from the Three Kings volcano and reaches the sea between Pt Chevalier and Westmere; including its continuation here in the harbour it is almost 10 km long. In this urban setting it is largely without natural vegetation, although at Gribblehurst Park in Sandringham there is the well-known stand of "rock forest", of titoki (*Alectryon excelsus*), mahoe (*Melicytus ramiflorus*) and cabbage tree (*Cordyline australis*). This article describes its only

other two areas of rock-forest, and the observations are based on several short visits to the area in 2007.

The upstream stand (Fig. 1A) is situated on the western flank of the flow, where Meola Creek (Waititiko) winds around the south side of the Chamberlain Park golf-course. Above the stream's narrow flood-level terrace (which has several old *Salix fragilis* trees, but no native ones) there is a slope of angular basalt boulders. The cover is mostly provided