The 22nd New Zealand Fungal Foray, Dunedin, May 2008

Petra White

Sunday 11 May 2008, Arrival

One of the great things about our fungal forays is that we get people from all over the world coming along to foray with us. The 22nd NZ Fungal Foray was no different, with 49 people attending from New Zealand, Great Britain, Tasmania, USA, Sweden and Japan (Fig. 1).

This foray added 769 records to the FUNNZ database representing 368 taxa, and 516 collections to the New Zealand Fungal and Plant Disease Herbarium (PDD). In addition 412 photographs were recorded. New records for New Zealand included *Clitopilus argentinus*, *Entoloma rusticoides*, *Mycena austrofilopes*, *Pluteus nanus*, *Typhula erythropus*, and *Volvariella taylori*. There were 65 records of 47 taxa listed as 'Data deficient' and 2 records of *Russula inquinata*, which is currently listed as 'Nationally Critical', but probably needs reassessment.

It was held between 11-16 May 2008 at the Waiora Scout Camp, Silverstream Valley, 14 km north of Dunedin. The camp is surrounded by 35 ha of native bush and parklands. Inside the camp itself there is kanuka (*Kunzea ericoides*) forest and various exotic trees. Hound's tongue (*Microsorum pustulatum*) was common in the ground tier. Common fungi found here were sea-green webcap (*Cortinarius rotundisporus*) under the kanuka and the introduced species, sticky bun bolete (*Suillus granulatus*), *Cortinarius rufus* and scarlet flycap (*Amanita muscaria*) under the pines. *Chalciporus piperata* was also found here, a fungal pathogen of *A. muscaria*.

On the day we arrived the road was blocked from 11am to 5pm due to a motorcycle race, which meant that those of us who stayed at the camp missed out on lunch. Others went out to eat but had to stay away till after 5pm.

Monday 12 May, Catlins

After breakfast we headed south through Mosgiel to Papatowai and the Old Coach Road Track in the Tahakopa Bay Scenic Reserve. We took the right fork to the beach. At the start of the track the vegetation was dominated by silver beech (*Nothofagus menziesii*). Common trees in the understory were pepper tree (*Pseudowintera* sp.), kotukutuku (*Fuchsia excorticata*), pate (*Schefflera digitata*), wheki (*Dicksonia squarrosa*), wheki-ponga (*D. fibrosa*), kamahi (*Weinmannia racemosa*), crown fern (*Blechnum discolor*) and hound's tongue.

Fig. 1. Participants at the 22nd NZ Fungal Foray, 14 May 2008. Photo: courtesy of FUNNZ.

By the edge of the track the scarlet pouch (*Leratiomyces erythrocephalus*) and the spindle or pale blue pouch (*Clavogaster novozelandiae*) were common. Off the beaten track I found three fruiting bodies of the endemic pagoda leatherbracket (*Podoserpula pusio* var. *tristis*), definitely my highlight for the day.

We had lunch on the beach then walked through the other side of the forest to return to our start point. Here the forest was dominated by rimu (*Dacrydium cupressinum*), matai (*Prumnopitys taxifolia*), miro (*P. ferruginea*) and kahikatea (*Dacrycarpus dacrydioides*). The understorey was similar to that found under the silver beech earlier but with some katote (*Cyathea smithii*) dotted about. In the ground tier bush rice grass (*Microlaena avenacea*) was common. Lemon-drop button (*Bisporella citrina*) was a common fungus found in this part of the forest. On the bark of a rotting log I found several fruiting bodies of the puffball *Lycoperdon compactum* (Fig. 2).

Fig. 2. *L. compactum* on a rotting log, Tahakopa Bay Scenic Reserve, 12 May 2008. Photo: P. White.

Tuesday 13 May, Waipori Gorge

During the morning Steven Stephenson held a workshop on myxomycetes. Some people stayed for this but the rest of us went out foraying. I was in a party that went to Waipori power station. The vegetation was silver beech. One tree had velvet shank (*Flammulina velutipes* – Fig. 3) growing on it and below on the ground there was a nice colony of the sociable inkcap (*Coprinellus disseminatus*). Other species we saw here were brown birdsnest (*Crucibulum laeve*) and lots of *Laccaria* species.

Fig. 3. *Flammulina velutipes*, Waipori Gorge, 13 May 2008. Photo: P. White.

We couldn't find the track so we backtracked to the Waipori Gorge picnic area. Here we found *Amanita muscaria* and *Chalciporus piperata* growing together under silver beech with not a pine or kanuka to be seen. We decided this would be a good site to observe the effects of these introduced species on native forest invasion. There were quite a few wax gill species in this area. Off the track I found a nice collection of *Hygrocybe keithgeorgei*, an interesting find in that the fruiting bodies were rather larger than normal for a wax gill, being up to 40mm in diameter on the cap.

Wednesday 14 May, 7th Mycology Colloquium

The 7th Mycology Colloquium was held at St Margaret's College, University of Otago. On the way to the venue we met a man who was studying the relationships of mites in the domatia of *Coprosma* species. Some of those mites are fungivores. He told us he was currently looking at fungal hyphae under a microscope. Maybe one day he will present a paper to our Colloquium.

The first speaker for the day was Ian Hall, who spoke about the downs and ups of cultivating edible mycorrhizal mushrooms in New Zealand. He is co-author of books on the subject (Hall 2003, 2007) as well as several articles. He also cited websites on edible fungi and their cultivation (see Web Site list). His talk covered his experience of cultivating mushrooms over the years and the difficulty of gaining funding for research and development of this new industry.

In 1974 he was a teacher at a high school. He traveled to the USA to study at a university there and in 1979 at Fort Collins while meeting with fellow students he overheard a conversation by French people talking about the first truffle that had been harvested from an artificial plantation. Three months later he thought to himself, if they can do it so can we, and produce them out of season in a falling market.

The Périgord black truffle (*Tuber melanosporum*) was one example of what could be cultivated. It was not until 1985 that permission was given to research truffles in New Zealand. Two years later the work of the French and Italians were reproduced and infected plants produced. The following year commercial numbers of black truffle-infected plants were produced. At this time only two of the world's 950 edible mycorrhizal mushrooms had been cultivated commercially and neither in the Southern Hemisphere.

In 1993 the first Périgord black truffles in the Southern Hemisphere were produced at Oakland truffière in Gisborne, owned by Ian Hall's brother Alan. Cultivation of truffles spread to Australia, Chile, South Africa and Argentina. In New Zealand there are now over 100 truffières, the largest being near Christchurch and north of Auckland.

In 2008 commercial numbers of bianchetto truffles (*T. borchii*) were found in Jeff Weston's 5 year old truffière 20 km west of Christchurch - the first commercial harvest in the Southern Hemisphere. Matsutoke (*Tricholoma matsutake*) and porcini (*Boletus edulis*) are only two of the seven mushrooms they wanted to grow that they haven't yet. Despite a lot of concerns raised about the system in place for developing an edible fungi market, the Minister's response is lukewarm and the 2500 scientists spread over 80 electorates have been ignored.

Ross Beever, Landcare Research, was our next speaker, giving a talk on *Phytophthora*, a genus of plant-damaging Oomycetes (water molds), an example being the potato blight (*P. infestans*). His talk focused on *P.* taxon *Agathis* that attacks kauri (*Agathis australis*).

Phytophthora kernoviae has been recorded in Cornwall and is widespread in northern pine forests in New Zealand and in isolated areas in soil under kauri. Its role in kauri health is unknown.

Phytophthora cinnamomi is common in New Zealand and around the world and has caused "little-leaf symptoms" in Waitakere kauri. With this species the plant dies of drought stress and it is associated with feed root infection. There is occasional death of large trees.

Phytophthora taxon *Agathis* ("PTA") is so far only known from New Zealand; it is associated with yellowing foliage, thin crown, dead trees and gummosis on the lower trunk (up to 6 metres up). It can affect large trees, and ringbarks the trees ("kauri collar rot"). In a study of a kauri stand in the Waitakere Ranges a third of the trees were found to be dead. It is present in Waipoua Forest and on Great Barrier Island. It has a patchy distribution, collar rot being most widespread. There has been some research on a number of other species to see the affect of PTA; most had little effect.

In 1974 PTA was called *Phytophthora leveae* but now it is recognised as a distinct species using molecular genetics techniques of 'ITS species' identification. The question remains as to whether PTA is native or introduced. PTA is highly pathogenic to kauri and gummosis symptoms and rapid death are only a recent phenomenon, suggesting that it's introduced. However it is known only from kauri, suggesting that it's native. The isolates are uniform (= introduced) but are not matched to date by isolates elsewhere in the world (= native, maybe endemic?). However, Clade 5 morpho species (*P. katsurae* and *P. heveae*) are known from Australia, Papua New Guinea and Taiwan, and PTA is a member of Clade 5, so if PTA was introduced then it was probably from somewhere in the southern Asia/Australasian region.

His conclusion – PTA poses a threat to kauri and should be treated as an exotic incursion for management purposes.

After morning tea Jerry Cooper gave a talk on the New Zealand Biodiversity Recording Network (NZBRN), started two years ago. In the early 1980s Jerry joined the British Mycological Society and then in 1983 bought his first PC, using Microsoft Access to gather foray records. Then the internet came about. Jerry wrote an interface for the Fungal Records Database of Britain and Ireland, which now has 1.3 million records.

The FUNNZ database goes back 20 years to the time when the annual forays first began. In the UK there are 14,756 records of fungi and 40 action plans have been developed as a result of gathering this information. Jerry looked for a way to do this in New Zealand. In 2005 the Swedish Artportalen Species Gateway won the Global Biodiversity Information Facility (GBIF) Ebbe Neilsen award. Jerry was given this software system by the Swedish Species Information Centre for use in New Zealand. GBIF is a global database of plant records.

The system is now online at http://www.nzbrn.org.nz/ giving a portal for birds, plants, fungi, frogs and lizards, mammals and invertebrates. It is funded by the Terrestrial & Freshwater Biodiversity Information System (TFBIS), a contestable fund managed by the Dept of Conservation. The fungal portal has FUNNZ records (11,000 records from forays) and the Landcare PDD records. Anyone can enter records by signing up and logging on with user name and password.

Genevieve Gates, University of Tasmania, was next with a talk on European Fungal Forays and Follies. In 2007 she flew to Amsterdam and St Petersburg in Russia for the Fifteenth Congress of European Mycologists. Three hundred people from 40 European countries attended. She was only the second Australian to ever attend this conference. There were some interesting talks at the European conference such as fungi in rafters, fungi in library books, and a paper on the gold content in some fungi. She did a field trip to a 300-year-old larch (*Larix* sp.) forest in the Gulf of Finland.

Next she attended the 18th Nordic Mycological Conference held at Nykobing-falster, Denmark, during 1-6 October 2007. She traveled on to Rome, Milan and Rigo in Italy, and did a foray in Aspromonte National Park. She said every town in southern Italy had a fungi festival during October or November. From here she flew to England and told us how in Harrogate Botanical Gardens there is a corner set aside for coarse woody debris as a habitat for fungi. Her tour ended in December at the Asian Mycological Conference held in Penang, Malaysia.

The morning finished with a talk by Peter Johnston, Landcare Research, entitled "Hyphae amongst the feathers and fur, the causes and consequences of changes to New Zealand's fungal biota." In the fruiting bodies of blue-green potato fungus (*Rossbeevera pachydermis*), purple potato fungus (*Gallacea scleroderma*), spindle pouch fungus (*Clavogaster novozelandiae*) and King's pouch fungus (*Cortinarius porphyroideus*) the spores remain enclosed and are spread by birds. The fruiting bodies are brightly coloured. Similarly, scarlet pouch fungus (*Leratiomyces erythrocephalus*), found amongst supplejack (*Ripogonum scandens*) and miro berries, has evolved for bird dispersal.

Can fungi that have evolved to attract birds also attract mammals in sufficient numbers to disperse them? NZ fungi have evolved in response to ecological pressures very different from what exists today, so we cannot look to the past to predict the future.

The number of known fungal species doubled between 1980-2007, but the unknown species are still possibly about 15,000. Developing molecular technologies have reformed how we collect knowledge. A third of the known fungal species are exotic. The majority of NZ indigenous fungi have been dispersed in geologically recent times. There are

some "ancient" fungi associated with recent plants. For example, *Notholepiota areolata* could be an ancient *Kunzea*/*Leptospermum*-associated fungus. These plant species established in the last 10 million years or so. It is possible that ancient fungi are the true guardians of our native biota.

On the whole, exotic fungi stay with exotic plants. However, a third of indigenous fungi are associated with exotic trees. Fungi are mobile and take advantage of opportunities provided by introduced plants. Peter asked what kinds of native fungi can take advantage of these opportunities and what kinds can't?

A few exotic fungi have established on native plants. For example *Amanita muscaria*, first recorded in 1880, was found in 1950 associated with *Nothofagus* at Nelson Lakes. Then in the late 1990s the species was widespread in the South Island under *Nothofagus* and there is evidence that its distribution is expanding. It has also been recorded in central North Island under *Nothofagus*. Is it outcompeting native mycorrhizal fungi and what effect could that have on the spread of *Nothofagus* species?

Then there is the impact of exotic introduced fungi pathogens. There could be a dramatic immediate impact through a change in the balance of the ecosystem and the removal of highly susceptible plant and animal species, or there could be subtle long term impacts changing the balance of the ecosystem. For example, *Phytophthora cinnamomi* is probably already causing subtle impacts on *Nothofagus* and *Agathis* regeneration. The slow expansion of the *Nothofagus* range is attributed to ectomycorrhizal ecology. *Nothofagus* seedlings need rapid development of mycorrhizas. There is the possibility of extinction from the loss of vectors and the impact of preferred hosts on New Zealand's fungal biota.

After lunch Toni Atkinson, University of Otago, gave a talk entitled "From the land of the Long White Cloud to the Great Smoky Mountains, New Zealand and Appalachian diversity among woody decay pyrenomycetes." *Pyrenomycetes* (now called *Sordariomycetes*) are fungi that occur primarily as perithecial ascomata (flask-shaped fruiting bodies) on a wide range of substrates including soil, dung, leaf litter, decaying wood, as well as other fungi. There are 6,000 reported species in New Zealand, 10,000 in North America, and 2,500 in the Smokies.

Next came Nick Singers, Dept of Conservation, who spoke on the difficulties of working with the threatened species project and its relevance to fungi. There are 2,000 species on the list plus 3,000 data deficient. The department has only a small fund of money, so with such limited resources it cannot work on all these at once. For example, which species are secured from extinction/recovered first is a complex problem. At a strategic level, statements are not specific, so though all work is valuable it is not easy to determine where to put the effort first.

There are two objectives – (a) securing threatened species from extinction, and (b) long term recovery of the species. The work on these two objectives is in development, but it is an 8-step process and they are less than half way through the process. A species is rated by how widespread it is, moving from the highest rating, endemic to New Zealand, to the highest rating present in Australasia, to the lowest rating, pandemic.

In summary the protection strategy for fungi is to control animals, manage fungi individuals, and control plants and weeds. For example, with *Russula papakaiensis* and *R. miniata* pigs, deer and possums need to be controlled.

Anna Hopkins, Forest Biosecurity and Protection Scion spoke next about her work for the CSIRO and University of Western Australia, using native fungi for revegetation in the Western Australian wheat-belt. Wheat and sheep farming comprise 20% of Western Australia's export earnings. The wheat-belt has a Mediterranean climate in a rocky and sandy environment. The vegetation is scrubby with larger and larger woodlands the further downslope you go.

The woodland soils are fertile and therefore predominantly cleared for farmland, and only 11% are reserved. Scattered remnants on private land are considered threatened. Vegetation clearance has resulted in the loss of 450 plant species and it is predicted that 20% of the wheat-belt is affected by dryland salinity. Strategies include replanting shrubs and trees, altering farming methods and engineering options. In order to combat salinity, 80% of the area needs revegetating. The benefits of revegetation include protection of animals, biodiversity and wind erosion control.

Ectomychorrizal fungi are important for regeneration; 70% of ectomychorrizal fungi found in the area are endemic and it is a hotspot for truffle-like fungi. These fungi associate with *Eucalyptus*, *Acacia* and *Allocasuarina*. Ectomychorrizal fungi are not returning naturally in the revegetation sites, so need to be introduced.

Anna collected soil from a healthy and an unhealthy remnant site. She mixed different soil from contrasting remnants in different soil concentrations and grew seedlings in undisturbed soil for two months. She classified fungi into morphological groups and molecular classifications, but did not attempt to identify species, as she was more concerned with the diversity of species rather than their identification.

Fifteen ectomychorrizal morphotypes were identified. There was a 39-49.5% colonisation rate but no sign of differences between soil types. For root inoculations at low concentrations, the number of morphotypes is similar to 50% soil inoculation.

She concluded (1) that soil inoculation is useful for inoculation of ectomychorrizal fungi and (2) that root inoculation is effective and results in less disturbance of native remnant vegetation. Both remnants in the study provided similar numbers of ectomycorrhizal morphotypes, but this may not always be the case.

Ian Dickie, Landcare Research, then gave two reports from the hyphal front: ectomycorrhizal communities and wood decay fungi. He defined "myco-r-rhiza as fungi plus root with an "r" in the middle. "Ecto-myco-r-rhiza" is defined as outside fungi plus root with an "r" in the middle.

He is working on comparing ectomycorrhizal groups in oak and pine with those found in grass. *Buddleya* is supposedly non-mycorrhizal but accumulates phosphorus. In 1964 Greta Stevenson showed *Buddleya* as being ectomycorrizal in the United Kingdom. Ian concludes a number of lessons from his research:

1. Don't trust the literature. There are some herbaceous plants and a sedge that are ectomycorrhizal.
2. Not all ectomycorrhizal plants are trees.
3. Definition matters – how did they define ectomycorrhizal?
4. Our knowledge is incomplete. Potentially a *Pisonsia* is ectomycorrhizal.
5. Ectomycorrhizal communities are a global phenomenon.

In his wood-rot report Ian told us how on the Westport foray he collected around 300 samples for accumulation history research. *Phlebia nothofagi* was very dominant in the samples. He concludes that history matters in terms of species composition. The order of arrival affects biodiversity.

The last speaker for the day was Steven Stephenson, University of Arkansas, whose topic was myxomycetes. These are plasmodial slime molds or myxogastrids, a fungus-like organism with approximately 875 species worldwide. They are classified by spore colour, the development of fruiting bodies and the type of plasmodium.

The distribution of collections in New Zealand include 300 from the subantarctic, 160 from Stewart Island and 820 from the South Island (420 from southern beech), 1250 from the North Island, and 300 from the snowbank (alpine).

Thursday 15 May, Orokonui Sanctuary

This day we went as a group to Orokonui Ecosanctuary, a 307 ha native forest managed by the Otago Natural History Trust. It is the only cloud forest in New Zealand where indigenous plants and animals can live in the wild without threat from most introduced pests. It is home to some of New Zealand's most fascinating and rare forest wildlife.

In 2007 an 8.7 km pest-proof fence was erected around the ecosanctuary at a cost of $2.2 million. Since then pests have been almost entirely eradicated and a number of endangered species have been reintroduced. There are encouraging signs that they are adapting well to their new home. It is becoming increasingly common for native birds to find their own way to the ecosanctuary and take up residence.

Fig. 4. *Aleuria aurantia*, growing from the ground near the fenceline of Orokonui Ecosanctuary, 15 May 2008. Photo: P. White.

Fig. 5. *Peziza ammophila*, collected at Taieri Mouth and laid out on the display table, 15 May 2008. Photo: P. White.

The forest is kanuka with some beech. Crown fern (*Blechnum discolor*) was common on the forest floor. The pagoda leatherbracket and blue pinkgill (*Entoloma hochstetteri*) have been reported here, but we did not find them. We had to hunt around to find

much in the way of fungi. On the forest floor I found red truffle (*Paurocotylis pila*) and, on the earth next to the pest-free fence, massed displays of orange peel fungus (*Aleuria aurantia* – Fig. 4).

After leaving the ecosanctuary, we visited the Dunedin Botanic Gardens before returning to the Scout Camp to lay out our specimens.

Meanwhile this day there was an interesting find at Taieri Mouth of *Peziza ammophila*, growing from a sand dune (Fig. 5). In this species a globose fruitbody grows beneath the sand, breaking the surface when fully developed; then the peridium splits into between five and ten pointed petals, which peel backwards to expose the inner surface of the cup. At this stage *P. ammophila* looks like an earthstar that has lost its central spore sac. The fertile surface is inside the cup, as with all *Peziza* species.

Friday 16 May, somewhere out there among the flax

For the last day of foraying I decided to do something different and went out with Peter Johnston to Swampy Spur looking for fungi at an elevated flaxfield. Apart from the flax (*Phormium cookianum*) there was *Dracophyllum*, *Astelia*, *Hebe* and occasional *Griselinia littoralis*. Peter spent much of the morning scrabbling for discomycetes among the flax leaves and underneath the bushes.

On the way back we stopped to foray in manuka (*Leptospermum scoparium*) forest with an understorey of flax and kiokio (*Blechnum novae-zelandiae*). Here I found another example of pagoda leatherbracket (*Podoserpula pusio*, variety not identified).

Acknowledgements

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Web Sites

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List of fungal taxa and their localities recorded during 22nd Fungal Foray, May 2008

Legend

*	Exotic	OS	Orokonui Sanctuary	TM	Taieri Mouth
?	Identification uncertain	PF	Purakaunui Falls	WF	Waipori Falls
CFT	Crystal Falls Track, Waipori Gorge	SR	Sandymount Reserve	WGP	Waipori Gorge Picnic Area
DBG	Dunedin Botanical Gardens	SS	Swampy Spur	WSC	Waiora Scout Camp
EG	Evansdale Glen	SV	Silverstream Valley	WV	Waipori Village
GB	Gould Bank	TBS	Tahakopa Bay Scenic Reserve	WG	Woodside Glen
GT	Government Track, Waipori Falls	TFR	Taieri Ferry Rd		

Taxon	Sites Recorded
Ascomycota	
Abrothallus curreyi	WGP
Aleuria aurantia	OS
?*Aleurina* sp. (=*Jafneadelphus* sp.)	SV
Ascocoryne sarcoides	SS
Beauveria sp.	WGP
Cercophora ambigua	SS, WG
Chlorociboria aeruginascens	EG, OS, SR, WG
Chlorociboria halonata	TBS
Colletotrichum lupini	Warrington Spit Beach
Clathrosporium intricatum	TFR
Crocicreas sp.	GT, OS
Daldinia sp.	GT, WGP
Daldinia eschscholzii	WG
Dendryphiopsis sp.	SS
Echinosphaeria medusa	WG
Gibellula leiopus	OS
Geoglossum umbratile	WGP
Helotium elaeocarpi	OS
Hymenoscyphus sp.	SV
Hypocrea sp.	EG, GB, OS
Hypoxylon placentiforme	WGP

Immersiella caudata (= *Cercophora caudata*)	WG
Lachnum sp. (undescr.)	OS
Lachnum lanariceps	TBS
Lachnum nothofagi	CFT
Lasiosphaeria sorbina	WG
Leotia lubrica	CFT, SV
Melanochaeta aotearoae	WG
Mycosphaerella sp.	WGP
Nectria sp.	OS
?*Nectria cinnabarina* *	WSC
Orbilia alnea	OS
Penicillium vulpinum	EG
Plectania campylospora	EG
Pseudaegerita sp.	WG
Stictis subiculata	SS
Sphaerostilbella novae-zelandiae	WG
Selenosporella sp.	WG
Thaxteriella helicoma (= *Drepanospora pannosa*)	WG
Xylaria castorea	OS

Basidiomycota

Abortiporus biennis *	WSC
Agaricus sp.	GT, WGP
Amanita muscaria *	WGP, WSC
Agaricus lanatoniger	WGP
Aleurodiscus ochraceoflavus	EG, SV, WGP, WSC
Aleurodiscus parmuliformis	OS
Amanita nehuta	WGP
Amanita nothofagi	WG
Amanita taiepa	WGP
Amylocorticium cebennense	OS
Armillaria sp.	OS, TBS
Armillaria limonea	SV, WG
Armillaria novaezelandiae	TBS
Artomyces sp.	EG
Aseroe rubra	EG, OS, SV, WSC
Asterostroma aff.	OS
Athelopsis bananispora	SV
Austroboletus lacunosus	WV
Austrogautiera sp.	GT
Bisporella citrina	OS, SV, TBS, WGP
Bjerkandera adusta	TBS
Botryobasidium sp. "Craigieburn"	SV
Bolbitius muscicola (= *Pluteolus muscicola*)	CFT, WGP
Calocera sp.	SV
Calocera fusca	OS, TBS
Camarophyllus aurantiopallens	OS
Candelabrochaete sp.	OS
Cantharellus wellingtonensis	WGP, WG
Ceraceomyces sp.	OS
Ceratobasidium sp.	TBS
Ceriporiopsis merulinus	PF
Chalciporus piperatus *	WGP, WSC
Chlorencoelia sp.	SS
Chondrostereum purpureum *	SV
Chondrostereum vesiculosum	WG
Clavaria amoena	GT
Clavaria corallinorosacea	WG
Clavogaster novozelandicus	TBS
Clavulina sp.	OS, WG
Clavulina brunneocinerea	WG, WGP
Clavulina cf. *urnigerobasidiata*	WG
Clavulina cristata var. *zealandica*	WGP
Clavulina vinaceocervina var. *avellanea*	WGP
Clavulinopsis spiralis (= *Clavaria spiralis*)	OS
Clitocybe sp.	TSR
Clitocybe clitocyboides	GT, TFR
Clitopilus argentinus	EG, GT
Clitopilus dingleyae (= *Rhodocybe dingleyae*)	WG
Collopus epipterygius	SV, WG
Collybia incarnata	EG, SV
Conchomyces bursiformis	EG, OS
Coniophora sp.	WGP
?*Coniophora arida* *	OS
Conocybe rickeniana	WSC
Coprinellus disseminatus	GB, GT, TBS, WGP
Cortinarius spp.	EG, GT, TBS, WG, WGP, WSC
Cortinarius sp. (new sp.)	WSC
Cortinarius (*Phlegmacium* sect. *Balteati*)	WSC
Cortinarius sp. (undescr. group *Obturi*)	SV
Cortinarius cf. *carbonellus*	OS, SV
Cortinarius caryotis	WSC
Cortinarius cf. *chalybaeus*	EG
Cortinarius chalybeus	EG, SV
Cortinarius collybianus	GT
Cortinarius cremeolinus	GT, TBS
Cortinarius (*Myxacium*) *cucumeris*	TBS
Cortinarius cf *exlugubris*	WSC
Cortinarius cf. *gemmeus*	WSC
Cortinarius indodatus	SV
Cortinarius cf. *ionomataius*	EG
Cortinarius lubricanescens	TBS
Cortinarius minoscaurus	SV, WF
Cortinarius papaver	WG
Cortinarius cf. *paraoniti* (ined.)	WG
Cortinarius paraxanthus	GT, WGP
Cortinarius persplendidus (= *Dermocybe splendida*)	EG
Cortinarius rattinoides	TBS
Cortinarius rotundisporus	GT, OS, SS, SV, WGP, WSC
Cortinarius rufus *	WSC
Cortinarius tessiae	TBS
Cortinarius vernicifer	EG
Cortinarius veronicae	CFT, TBS, WGP
Cortinarius vitreopileatus	WGP
Crepidotus sp.	WSC
Crepidotus "*fuscovelutinus*" (ined.)	WG
Crepidotus gilvidus	EG, OS, SS, WSC
Crepidotus nanicus	WG, WGP
Crepidotus novae-zealandiae	WGP
Crepidotus "*praecipuus*" (ined.)	GB, GT, SV, TBS, WG
Crucibulum laeve	EG, GT, OS, SV, WF, WSC
Cystoderma clastotrichum	OS, TFR, WSC
Dacryopinax sp.	SV
Dendrothele cf. *pulvinata*	OS
Dendrothele corniculata	WG

Dentipellis aff. *Fragilis*	WGP
Dentipellis leptodon	WG
Dermocybe vinicolor	CFT
Descolea gunnii	EG, GT, SV, TFR, WG, WSC
Descolea majestatica	CFT, WF, WGP
Descomyces albus *	SV, WSC, WGP, Waipori kayak course carpark
Entoloma aromaticum	WG, WGP
Entoloma conferendum *	WSC
Entoloma distinctum	TBS, TFR
Entoloma rusticoides *	Warrington Sand Dunes
Entoloma scabripes	WGP
Entoloma sulphureum	Purakaunui Falls
Entoloma uliginicola	SV
Exidia sp.	WGP
Exidia nucleata (=*Myxarium nucleatum*)	TBS, TFR
Exidiopsis sp.	Pilots Bay, WG
Flagelloscypha pseudopanax	EG
Flammulina velutipes	SV, WG, WGP
Fomes hemitephrus	TBS
Galerina patagonica	GT, TG, WV
Gallacea sp.	EG, SV
Gallacea scleroderma	GT, WG
Ganoderma australe	CFT
Ganoderma cf. *applanatum*	TBS
Geastrum triplex	CFT, SV, TBS, WG
Geastrum velutinum	EG, TBS
Gliophorus chromolimoneus	WF, WGP
Gliophorus graminicolor (=*Gliophorus pallidus*)	TBS
Gloeoporus sp.	TBS
Gloiocephala xanthocephala	EG, OS, SV, TBS
Gymnomyces sp.	WGP
Gymnopus spp.	EG, SS
Hebeloma spp.	GT, WGP, WSC, WV
Hebeloma velutipes	WGP
Hemimycena sp.	WG
Henningsomyces candidus	TBS
Hericium coralloides	WF
Heterochaete sp.	GB
Heterochaete delicata	EG
Heterotextus miltinus	Birchall Road
Hohenbuehelia sp.	TM
Hohenbuehelia cyphelliformis *	EG
Hohenbuehelia luteohinnulea	EG, TBS
Humidicutis conspicua	WGP
Humidicutis luteovirens	GT
Humidicutis mavis	TBS
Humidicutis rosella	TBS
Hydnum crocidens var. *crocidens*	SS
Hydnum crocidens var. *wellingtonii*	TBS
Hydropus funebris	WG, WGP
Hygrocybe blanda	WGP
Hygrocybe conica *	GT
Hygrocybe julietae	OS
Hygrocybe keithgeorgei	WG
Hygrocybe lilaceolamellata	GT, WG
Hygrocybe procera	GT
Hymenochaete sp.	OS, WGP
Hymenochaete sp. "yellow margin"	OS
Hymenogaster sp.	WGP, WSC
Hyphoderma aff.	WGP
Hyphoderma sp.	WSC
Hyphoderma assimile	GT
Hyphoderma litschaueri	WSC
Hyphoderma puberum	WGP
Hyphoderma utriculosum	OS, WG, WGP
Hyphodontia spp.	OS, WG, WGP, WSC
Hyphodontia aff. *australis*	WGP
Hyphodontia cf. *crustosa*	OS, SR
Hyphodontia aff. *sambuci*	WG
Hyphodontia cf. *sambuci*	EG, GB, SV, WF, WG, WGP
Hyphodontia cunninghamii	WGP
Hyphodontia lanata	OS
Hyphodontia barba-jobi	WGP
Hyphodontia subalutacea	WSC
Hyphodontia subscopinella	OS, TBS, WSC
Hypholoma acutum	SV, TBS
Hypholoma brunneum	CFT, GT, SV, TBS, WG
Hypholoma fasciculare	CFT, WGP
Hysterangium sp. "smooth"	WSC
Hysterangium ?*rugisporum*	WSC
Hysterangium rugisporum	WSC
Inocybe sp.	WGP
Inocybe scissa (=*Astrosporina scissa*)	WG, WGP, WV
Inocybe viscata (=*Astrosporina viscata*)	WG
Insiticia roseoflava *	OS, WG. WGP
?*Irpex* sp.	TBS
?*Junghuhnia* sp.	SR
Junghuhnia meridionalis	OS, WGP
Laccaria spp.	TBS, WSC, WGP
Laccaria glabripes	TBS, WG
Lachnella villosa *	EG
Lactarius clarkeae var. *aurantioruber*	WGP
Lactarius clarkeae var. *clarkeae*	WGP
Lactarius rufus *	WSC
Lactarius turpis *	WSC
Lactarius umerensis	OS, TBS, WG, WGP
Leccinum scabrum *	Regency Motel Mosgiel
Lentinellus sp.	WGP
Lepiota sp.	EG
Lepista spp.	GT, TFR, TM
Lepista irina *	GB
Leratiomyces sp.	SV
Leratiomyces ceres *	Warrington (private garden), WSC
Leratiomyces erythrocephalus	DBG, GB, GT, OS, TBS, WG, WGP
?*Leratiomyces erythrocephalus*	TFR
Leucoagaricus spp.	EG, GT, TFR, WG
Leucocoprinus sp.	OS
?*Lopharia* sp.	WGP
Lopharia sp. "cream"	WGP
Lopharia sp. "white"	WGP
Lycoperdon perlatum	TBS, WG
Marasmius sp.	OS, TFR
Marasmius gelatinosipes	WGP
Melanoleuca sp.	GT
Melanoleuca exscissa var. *exscissa*	TFR
Melanotus citrisporus	TFR, WG
Micromphale spp.	EG, GT, SV, TBS
Lycoperdon compactum (=*Morganella compacta*)	TBS
Mucronella sp.	OS, TBS

Multiclavula mucida	WG
Mycena spp.	CFT, OS, TBS, TFR, WG
Mycena austrofilopes	WG
Mycena austrororida	TBS, WF
Mycena epipterygia	SV
Mycena interrupta	GT, OS, SV
Mycena mariae	TBS. WG, WGP
Mycena morris-jonesii	TBS
Mycena parsonsii	WG
Mycena subviscosa	OS, SS, WSC
Mycena ura	TBS, WGP
Mycenula fuscovinacea (=*Mycena fuscovinacea*)	SS, WGP
Mycoacia lutea	WG
Octaviania tasmanica	Waipori kayak course carpark, WGP
Omphalina sp.	GT
Omphalina nothofaginea (=*Clitocybe nothofaginea*)	OS
Panaeolus sp.	EG, GB
Panellus spp.	OS, SS,WG
Paurocotylis pila	GT, Moeraki Boulders, OS, TBS, TM, WF, WGP
Paxillus involutus *	DBG
Peniophora sp.	WGP
Peyronelina glomerulata	WG
Peziza ammophila	TM, Warrington Spit beach
Plicaria badia (=*Peziza badia*)	Mosgiel, Regency Motel
Phanerochaete sp.	OS, TM, TSR
Phellinus sp	WG
Phellinus robustus	SV
Phlebia aff.	WGP
Phlebia sp.	SV, WGP
?*Phlebia* sp.	WG
Phlebia subfascicularis	WGP
Pholiota sp.	TSR
Pholiota multicingulata	EG
Pholiota subflammans	DBG, TFR
Phragmidium violaceum *	EG, SR, TM
Physalacria stilboidea	EG, OS, SV, TBS, WGP
Pleurocollybia cremea	TFR
Pleuroflammula praestans	EG, TBS, SV
Pleurotopsis longinqua	OS, TFR
?*Plicatura* sp.	SV
Pluteus concentricus	WV
Pluteus nanus *	Warrington Sand Dunes
Pluteus readiarum	GT, TBS, WGP
Pluteus similis	SV
Pluteus velutinornatus	TFR
Podoserpula pusio	SS
Podoserpula pusio var. *tristis*	TBS
Polyporus hypomelanus	WGP
Polyporus infernalis (=*Polyporus hypomelanus* sensu G.Cunn.)	CF, WGP
Polyporus sp.	EG
Psathyrella asperospora	TFR, WG
Psathyloma sp.	WGP
Psathyrella sp.	WG
Psilocybe sp.	GB, OS, WSC
Psilocybe makarorae	EG, WSC
Psilocybe semilanceata	WSC
Psilocybe subaeruginosa *	EG, GB, OS
Ramaria lorithamnus	CF, TBS
Ramapiopsis sp.	TBS
Ramariopsis crocea	OS
Rectipilus fasciculatus	SS
Resupinatus applicatus	EG, GT
Rhodocollybia sp.	SS, WSC
Rickenella fibula	Birchhall Road, Waiora
Rickenella swartzii *	SV
Rossbeevera pachydermis (=*Chamonixia pachydermis*)	WF, WGP, Waipori Falls Rd
Russula acrolamellata	WGP
Russula atroviridis	EG, WGP
Russula australis	GT
Russula cf. *acrolamellata*	EV
Russula cremeoochracea	CFT, SV, TG, WGP, WSC
Russula inquinata	TG, WSC
Russula macrocystidiata	TSR
Russula multicystidiata	WGP
Russula roseopileata	SV, WG
Russula tawai	EG, WF, WSC
Russula tricholomopsis	CFT, TBS, WG, WGP,
Schizophyllum commune	Waipori Power Station
Schizopora radula	GB, OS, WG, WGP
Scleroderma spp.	DBG, WGP, Waipori kayak course carpark
Scleroderma cepa	WSC, Waipori Falls
Scopuloides hydnoides	WG
Septobasidium sp.	EV
Simocybe sp.	WGP
Sphaerobolus stellatus	SV, TFR
Steccherinum cf. *fimbriatum*	EG
Steccherinum fimbriatum	WSC, WGP
Stereum sp.	OS
Stereum ostrea	OS, TBS
Subulicystidium longisporum	WGP
Suillus granulatus *	WSC
?*Suillus subacerbus* *	WSC
Telamonia sp.	WG, WGP
Tephrocybe sp.	GT
Thelephora terrestris	Mosgiel, Regency Motel
Tomentella "pink-plum"	WG
?*Tomentella* cf. *Sublilacina* *	WGP
Trametes scabrosa *	TBS
Trametes versicolor	WG
Tremella foliacea	EG
Tremella fuciformis	TBS
Tremella lutescens	GB, GT, OS, SS, SV
Tricholoma sp.	WGP
Tricholoma viridiolivaceum	SV, WGP
Tubulicrinis gracillimus	WGP
Tulasnella sp.	WGP
Tylopilus formosus	CFT, TBS, WG, WGP
Typhula sp.	WG
?*Typhula erythropus*	SV
Volvariella taylori *	TM
Vuilleminia sp.	TBS

Myxomycota

Arcyria cinerea	WGP
Didymium squamulosum	CFT
Physarum leucophaeum	WGP
Stemonitis sp.	WGP
Trichia favoginea	OS, SV, WGP
Trichia varia	WGP