AUSTRALASIAN MYCOLOGICAL SOCIETY CONFERENCE
MONDAY, 8 MAY 2000
PROGRAMME

Venue: The Gallery Function Room, Quality Hotel Te Anau, 20 Lakefront Drive, Te Anau, New Zealand. ph. +64 3 249 7421; fax. +64 3 249 8037.

TALKS

8.50	**Welcome**
9.00	Edible Mycorrhizal Mushrooms *Wang Yun* & Ian R. Hall*
9.20	A Preliminary Study of *Gymnopilus* in New Zealand. *Anne-Maree Oliver* & David Orlovich*
9.40	The Use of Chemistry in the Taxonomy of *Dermocybe* *Rodney Hilton Jones*
10.00	Fungi of New Zealand (Agarics, Boletes)—Actual Data Pool, Ecology, and Endemism *Egon Horak*
10.30	**Morning tea**
10.50	Wood Decay Potential of Basidiomycete Fungi from New Zealand *Pinus radiata.* *A. Ah Chee*, R.L. Farrell, A. Stewart & R.A. Hill*
11.10	*Trametes versicolor* (Linnaeus: Fries) Pilàt in Culture. *Alison Stringer* & Wang Yun*
11.30	New Zealand's Introduced Pathogenic Polypore Species: Distribution, and Taxonomic Differentiation from Indigenous Taxa. *Peter K. Buchanan*
11.50	50 Years of Foraying—Past Places, Personalities, and Pilze! *Peter K.C. Austwick*
12.10	3 minute presentations by each Poster Author
12.25	**Poster Session**
12.45	**Lunch**
2.05	Leaf Endophytes of Pohutukawa (*Metrosideros excelsa*). *P.R. Johnston*
2.25	Understanding the Diversity of Glomalean Fungi in Tropical Australian Habitats. *Mark Brundrett*
2.45	Phylogenetic Relationships in the Lichen Genus *Ramalina* (Ramalinaceae: Lecanorales). *Nina Hesom-Williams*, Jennifer Bannister & David Orlovich*
3.05	**Afternoon tea**
3.25	Nematophagous Fungi from New Zealand Farm Soils *Hamish McEwen*
3.45	Biosecurity: Where are the Fungal Risks to New Zealand's Indigenous Forests. *Geoff S. Ridley*
4.05	Origins of Myxomycete Associations of Coleoptera. *Richard A.B. Leschen*

POSTERS

1. The Macro Fungi of South Australia.
Pam Catcheside & David Catcheside*

2. Two New Genera of Truffle-like Fungi From Western Australia.
Teresa Lebel

3. A Cladistic Analysis of *Gymnopilus* (Cortinariaceae) using the ITS Region of Nuclear Ribosomal DNA.
D.A. Orlovich & B. J. Rees*

4. Molecular Detection of *Armillaria.*
Jillian L. Smith-White, Brett A. Summerell & Lester W. Burgess*

NOTE FOR SPEAKERS:

Most papers have an allocated time of 20 minutes, being 15 minutes presentation and 5 minutes discussion. This is slightly longer than the period indicated in earlier publicity. White Board, Pens, Overhead Projector, 35 mm Slide Projector, and Screen are provided at the venue.

ABSTRACTS

TALKS

WOOD DECAY POTENTIAL OF BASIDIOMYCETE FUNGI FROM NEW ZEALAND *PINUS RADIATA*

A. Ah Chee[1], R.L. Farrell[2], A. Stewart[3] & R.A. Hill[1]*

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A range of basidiomycete fungi were collected from New Zealand *Pinus radiata* by isolations from wood and fruiting bodies and some species were obtained from fungal culture collections. The basidiomycete cultures were screened for wood decay potential in *P. radiata* wood block assays, enzyme assays and growth assays. Relationships between the assay parameters and to the rot classification of the cultures are discussed.

50 YEARS OF FORAYING—PAST PLACES, PERSONALITIES, AND PILZE!

Peter K.C. Austwick

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The autumn forays of the British Mycological Society were my great learning periods for agaricology, whilst the first three European Mycological Congresses widened one's contacts with the pioneers of modern mycology—Donk, Pilát, Romanesi, Lowe, Wakefield, Martin, and others. The results of these activities in Europe and North America are now evident in the New Zealand Fungal Herbarium (PDD) where some 3,000 of my collections are accessioned.

UNDERSTANDING THE DIVERSITY OF GLOMALEAN FUNGI IN TROPICAL AUSTRALIAN HABITATS

Mark Brundrett

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Glomalean fungi, which form arbuscular mycorrhizal associations, are arguably the most important group of soil organisms as they form beneficial symbiotic associations with the majority of plants. The diversity and distribution of these fungi were examined throughout a region of tropical Australia which includes Kakadu National Park. This project was a research collaboration between the Environmental Research Institute of the Supervising Scientist in Jabiru and the University of Western Australia. Topsoil for this survey was collected at the end of the growing season from 32 sites, including natural habitats (eucalypt savanna, rocky hillsides, wetlands and rainforest) and highly disturbed minesite habitats. These fungi survive in soil as spores, root fragments and mycelia, but the relative importance of these propagules is unknown. Consequently, several methods were used to examine fungal populations in soils: (a) counting spore numbers (b) estimating spore biovolumes (c) identification of fungi by colonisation patterns in bioassay plant roots and (d) isolation of fungi in pot cultures. In total, 16 species of VAM fungi were identified from spores found in these samples and seven additional fungi were recovered from the same soils using four complimentary pot culturing methods. These experiments demonstrated that different methods of detecting fungi produced different answers about which fungi were most important in soils. Undisturbed sites contained between 5 and 13 species of VAM fungi, but disturbed sites had a much lower diversity. Most species were widespread, but some apparently were restricted to disturbed habitats or waterlogged soils, suggesting that habitat conditions influenced fungal distribution patterns. In highly disturbed minesite habitats, VAM fungi were only found in patches of vegetation. The abundance of VAM fungus spores and other propagules increased with plant cover, eventually reaching levels well above those found in undisturbed plant communities. Spore occurrence data provided good information about most species in the genera *Scutellospora*, *Acaulospora* and *Gigaspora* but greatly underestimated the importance of *Glomus* species in soils, as these were more dominant in bioassay plant roots and trap cultures. Differences in propagule strategies suggest that fungi have different life history categories, corresponding with genera or groups within genera. Observations of fungi in pot cultures provided valuable new information about their biology.

NEW ZEALAND'S INTRODUCED PATHOGENIC POLYPORE SPECIES: DISTRIBUTION, AND TAXONOMIC DIFFERENTIATION FROM INDIGENOUS TAXA

Peter K. Buchanan

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Few introduced pathogenic species of polypore fungi have been recorded in New Zealand. Two that have been recognised recently are *Meripilus giganteus* and *Phaeolus schweinitzii*. Both are known from single locations in the South Island, each on a single host species. The host tree of *M. giganteus*, a garden specimen of *Fagus sylvatica*, is progressively dying while the fungus fruits abundantly each year from the roots. *Phaeolus schweinitzii* has been recorded on *Pinus radiata* in a public park but has not been reported from plantations. Earlier New Zealand records of *P. schweintizii* sensu G. Cunn. were based on misidentification of an indigenous species of *Phaeolus* that appears to be non-pathogenic. *Heterobasidion annosum*, an economically important pathogen in Northern Hemisphere forests, was mistakenly recorded from Australasia. The Australasian species is now recognised as an indigenous saprobic taxon, *H. araucariae*, confined almost exclusively to members of the Araucariaceae. Accurate identification of these species has important implications for biosecurity and plant health.

PHYLOGENETIC RELATIONSHIPS IN THE LICHEN GENUS *RAMALINA* (RAMALINACEAE: LECANORALES)

Nina Hesom-Williams, Jennifer Bannister & David Orlovich*

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Ramalina is a worldwide genus of lichens with 14 species occurring on mainland New Zealand. Several species occur both in New Zealand and in the Northern Hemisphere, whilst others are restricted in distribution to only the Otago and Southland regions of southern New Zealand. *Ramalina canariensis* occurs in both the northern and southern hemispheres but does exhibit some morphological variation over its range. *Ramalina erumpens* occurs only in Otago and Southland but is very similar to *R. farinacea* from the Northern Hemisphere. Three species with hollow thalli (*R. geniculata* from the North Island of New Zealand, *R. riparia* from Otago and Southland and *R. inflata* from the sub-Antarctic Islands and Tasmania) may form a natural group. This talk will outline a study to be undertaken this year to discover the evolutionary relationships between the New Zealand species of *Ramalina* using DNA sequence data and to determine the relationships of the New Zealand flora with Northern Hemisphere species. Cladistic analysis of sequences from the internal transcribed spacer region of nuclear ribosomal DNA will be done using DNA extracted from fresh and dried material and using a range of outgroup taxa from the Cladoniaceae, Stereocaulaceae and Parmeliaceae.

FUNGI OF NEW ZEALAND (AGARICS, BOLETES)—ACTUAL DATA POOL, ECOLOGY, AND ENDEMISM

Egon Horak

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No abstract submitted.

LEAF ENDOPHYTES OF POHUTUKAWA (*METROSIDEROS EXCELSA*)

P.R. Johnston

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Possums are one of the major pests in New Zealand's forests. These animals favour some species of tree more than others for browsing, and within those species, some individual trees are generally selected over others. Endophytic fungi, present in the living leaves of all trees, are often patchy in their distribution between individual trees of a single species. It has been suggested that the patchy distribution of endophytes, where individual species of fungi may be present or absent in individual trees, might influence possum browsing behaviour. Using pohutukawa as an example, I will be asking whether we know enough about the diversity, distribution and biology of leaf endophytic fungi to be able to address this question of the influence of leaf endophytes on possum feeding behaviour.

THE USE OF CHEMISTRY IN THE TAXONOMY OF *DERMOCYBE*

Rodney Hilton Jones

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Several recent publications dealing with the systematics of *Dermocybe* (*Cortinariaceae*) have recognised the taxonomic value of pigment chemistry in this group. The relatively restricted occurrence of specific secondary metabolites in *Dermocybe* taxa provide a welcome suite of potentially informative, non-morphological characters. Pigment chemistry has been utilised in a current Australian Biological Resources Study funded revision of *Dermocybe* taxa occurring in Australia. A phenetic analysis has been carried out on material collected from Victoria, but also including some representative material from several Australian herbaria. Data matrices were compiled from morphological and chemical information. Most clusters in the analysis of morphological data correspond to putative taxa. Thin-layer chromatography (TLC), incorporating three different solvent systems, was used to examine the occurrence of anthraquinones in the taxa under study. Preliminary results support the value of TLC in recognising misidentifications, and delimiting taxa. However, difficulties with reproducibility in this technique make comparison of results problematic. Indications are that caution should be exercised in the interpretation of pigment patterns from different TLC plates or different studies.

ORIGINS OF MYXOMYCETE ASSOCIATIONS OF COLEOPTERA

Richard A.B. Leschen

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Several lineages of Coleoptera contain species that are exclusively associated with Myxomycetes and yet only a few of these have been studied using modern phylogenetic methods. Ongoing and previously published cladistic studies are used to determine the phylogenetic pattern of host use and origins of myxomycophagous beetles. Myxomycophagy evolved in lineages of beetles that are associated with leaf litter or rotten wood. Scaphisomatini (Staphylinidae), and possibly Agathidiini (Leiodidae), appear to have evolved from ancestors that were associated with Basidiomycetes, while remaining taxa had ancestors that fed on spores, conidia and hyphae of microfungi (Latridiidae) and were saprophagous, lignicolous, or were associated with leaf litter. Myxomycetophagous lineages appear to be a relatively old because the species contained in these monophyletic groups are typically widely distributed, are relatively diverse compared with sister taxa of the same relative age, and are basal in the trees examined. Interestingly, while some of the larger groups of myxomycophagous beetles are relatively widespread (scaphidiinae Staphylinidae, Sphindidae, and *Enicmus* Latridiidae), others may be restricted to holarctic and circumtropical regions (agathidiine Leiodidae) or New Zealand (*'Alsobius'* Leiodidae, and one or two genera of aleocharine Staphylinidae).

NEMATOPHAGOUS FUNGI FROM NEW ZEALAND FARM SOILS

Hamish McEwen

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Fourteen nematophagous fungal species were recovered from conventional, semi-organic[1] and organic farms in the lower North Island New Zealand, as part of a Masters Degree from Victoria University of Wellington. A total of 42 sample sites yielded 72 individual records (135 isolates), seven endoparasitic species and seven predacious species, with the organic farms having the highest species diversity and highest frequency of nematophagous fungi. *Arthrobotrys oligospora*, *Arthrobotrys conoides*, *Dactylaria gracilis* and *Monacrosporium megalosporum* were examined for their growth rates and their ability to trap four nematode worm species. Trapping percentages varied (in some instances significantly) across the four fungal species and the two temperature regimes (15°C, 20°C) tested. Variation in the trapping abilities of the fungi tested has implications for the biological control of parasitic nematodes in livestock.

[1] 'semi-organic' refers to farms that either practise organic principles but are not certified, or those farms moving to certification.

A PRELIMINARY STUDY OF *GYMNOPILUS* IN NEW ZEALAND

Anne-Maree Oliver & David Orlovich*

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Gymnopilus is a genus of wood-rotting basidiomycetes with over 150 species distributed worldwide. *Gymnopilus* produces a rusty-brown spore print and has rough spore ornamentation, commonly without a plage. The genus has been revised recently in Australia (B. Rees, unpublished) and there are several accounts of the genus for other countries: North America (Hesler 1969, *Mycologia Memoirs* **3,** 1–117), Great Britain (Orton 1993, *British Fungus Flora* **7,** 58–72) and Norway (Høiland 1990, *Mycotaxon* **39,** 257–279). Whilst the genus has not been revised in New Zealand, several endemic species were described by Horak (1989, *Opera Botanica* **100,** 115–129) and some collections have been made in New Zealand with affinities to overseas taxa (*G. junonius* and *G. crociphyllus*). This talk will outline a project to be undertaken this year to study the morphological variation in collections of *Gymnopilus* using multivariate analysis. Collections of *Gymnopilus* from the New Zealand Fungal Herbarium (PDD) will be used in the analysis, in addition to new collections made during 2000. For comparison, data from overseas collections will be incorporated from herbarium specimens and from existing literature. Once operational taxonomic units are defined, a phylogenetic analysis will be done using morphological and/or molecular characters, incorporating data from Australian species.

BIOSECURITY: WHERE ARE THE FUNGAL RISKS TO NEW ZEALAND'S INDIGENOUS FORESTS

Geoff S. Ridley

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The study of invasions of ecosystems by pests, weeds and disease has concentrated on the characteristics of the invasive organisms and the quality of the habitat being invaded. Although this has had some predictive value it has failed to elucidate the behaviour of non-soil pathogenic fungi in indigenous forest systems. The study of major epiphytotic events in the temperate Northern Hemisphere clearly demonstrates that pathogens can move in either an east or west direction around that hemisphere, whereas epiphytotics in indigenous forests resulting from the movement of temperate fungal pathogens either north or south across the tropics, or east or west around the Southern Hemisphere have never been observed. Rather than this being the result of a failure for these organisms to be transported across these barriers the lack of epiphytotics is speculated to be the result of the biogeographic and tectonic history of the Southern Hemisphere landmasses. The biogeography of Pangea indicates a degree of specialisation on that supercontinent resulting in regional biotas that were further differentiated by the subsequent separation of Gondwana from Laurasia. This was further compounded by the early breakup of Gondwana. When this history is coupled with the biological specialisation that occurs between a plant host and its fungal pathogens it is inevitable that a fungal pathogen transported across the tropics or around the Southern hemisphere will not find a susceptible host. It also explains why such devastating epiphytotics can occur in the Northern Hemisphere. Although there appears to be little chance of major epiphytotics occurring in New Zealand from the establishment of northern temperate fungal pathogens there is some evidence that non-host specific soil pathogens and tropical pathogens could pose a threat to our forests.

TRAMETES VERSICOLOR (LINNAEUS: FRIES) PILÀT IN CULTURE

Alison Stringer[1] & Wang Yun*[2]

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Trametes versicolor (Linneaus: Fries) Pilàt is used in traditional Chinese medicine, and according to recent western studies may have beneficial properties. The aim of this project was to obtain *T. versicolor* from six different localities around New Zealand and to grow it in pure culture. Fruiting bodies had been already obtained from Greenlane, Auckland. Three more specimens were found in Brontë (Mapua), Nelson; Roslyn, Dunedin; and McClean Falls, Catlins. The specimens were dried, and kept in boxes as herbarium records. Sterile dikaryotic material from beneath the surface of the fruiting bodies was transferred aseptically to potato dextrose agar (PDA) plates. The plates were then incubated at 24 C in the dark. When the mycelia had grown to the edge of the plate, 1 cm square pieces of the inoculated agar were transferred to jars of media that would induce fruiting body formation. These were incubated at 24°C in the dark. When the mycelia had grown to the bottom of the media, the lids of the jars were loosened. When the secondary mycelia emerged, was starting to turn pale brown and produce straw-coloured fluid, the lids of the jars were removed. The jars were then taken out of the incubator, put on a bench in the lab, and covered with damp paper towels. They were later transferred to a fog tent (23°C, 91% relative humidity), as the lab was too dry. Hopefully these cultures will soon produce fruiting bodies, which will confirm the tentative classification of the specimens as *T. versicolor*.

EDIBLE MYCORRHIZAL MUSHROOMS

Wang Yun & Ian R Hall*

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About half of the world's edible mushrooms are formed by ectomycorrhizal fungi. Five of these: *Boletus edulis* (porcini), *Cantharellus cibarius* (chanterelle), *Tricholoma matsutake* (matsutake), *Tuber melanosporum* (Périgord black truffle) and *Tuber magnatum* (Italian white truffle) have well established world markets worth in excess of US$2 billion, but there are many others which have important local markets. However, the consumption of mycorrhizal mushrooms amounts to only 5% of all mushroom consumed. This is partly because only a handful of these mushrooms have been cultivated but also because the harvest of many of these mushrooms from natural areas has declined dramatically over the past 100 years. The production of these mushrooms in plantations established with specially infected trees for out-of-season Northern Hemisphere and local markets is the aim of Crop & Food Research's edible mushroom group. Commercial quantities of Périgord black truffles were first harvested in Gisborne in 1997 but recently two other plantations have also begun producing. One of these is near Christchurch and the other in the North Island on a heavily limed volcanic soil. We are now in the process of developing techniques to infect, for example, *Quercus robur* (English oak), *Pinus radiata* (Monterey pine), *Betula pendula* (birch) and *Corylus avellana* (hazel) with bianchetto, Burgundy truffle, Italian white truffle, matsutake, porcini and saffron milk cap. Experimental plantations have already been established for some of these. Those mycorrhizal mushrooms that command very high prices, such as matsutake and the Italian white truffle, warrant the expense of establishing plantations dedicated to their production. However, other mushrooms like porcini that have a relatively low price are probably better produced as secondary crops in plantation forests.

POSTERS

THE MACRO FUNGI OF SOUTH AUSTRALIA

Pam Catcheside[1] & David Catcheside*[2]

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The macrofungi in South Australia were last collected intensively by J.B. Cleland. Most of his material, now in the State Herbarium in South Australia, was amassed in the period 1910–35 in the more readily accessible parts of the State. This collection formed the basis for Cleland's monograph (Cleland 1934 & 1935) which recently has been revised (Grgurinovic 1997) to update nomenclature and to include descriptions of microscopic features.

We have begun systematic collection of new material from a broad range of ecosystems, concentrating particularly on national parks and reserves. In 1999, the target regions were the Northern and Southern Lofty Ranges and the South East of South Australia with an additional reconnaissance visits to the Murraylands and the Flinders Ranges. Eighty-two visits were made to 42 parks and more than 1000 observations of approximately 300 species recorded. This has allowed the identification of sites suitable for long term monitoring to establish a more comprehensive account of the macrofungal flora of South Australia.

Our new records for South Australia since 1997 include *Mycena interrupta* (1998) at the limits of its biogeographical range, *Calostoma fuhreri* (1998), *Nothojafnea cryptotricha* (1997), *Nidularia niveotomentosa* and *Lentinellus ursinus* (1999). Other species found which have been little collected in SA include *Banksiamyces* spp. that occur in all locations surveyed, *Podoserpula pusio* and *Resupinatus cinerascens.*

In 2000, target regions will be the Flinders Ranges, Murraylands and Eyre Peninsula.

References:

Cleland, J.B. (1934 & 1935). *Toadstools and Mushrooms and Other Larger Fungi of South Australia*, Parts I and II. Government Printer, Adelaide [Reprint 1976].

Grgurinovic, C.A. (1997) *Larger Fungi of South Australia.* The Botanic Gardens of Adelaide and State Herbarium and The Flora and Fauna of South Australia Handbooks Committee.

TWO NEW GENERA OF TRUFFLE-LIKE FUNGI FROM WESTERN AUSTRALIA

Teresa Lebel

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During winter 1999, several collections of truffle-like fungi were made from mallee woodlands near Norseman, Western Australia. At the time of collection it was obvious that the specimens belonged to two different genera, one possibly an ascomycete and the other basidiomycete, and neither appeared to match previously described genera. On microscopic examination both collections were shown to be basidiomycetes, but from very different families within the Agaricales. The first new genus has many distinguishing characters of the Amanitaceae, with large, smooth, hyaline spores, parallel hyphae in the hymenophoral trama, and inflated cells in the peridium. This genus could be a relative of the truffle-like *Torrendia*, but with a very reduced fruitbody form. The probable relationships of the second new genus have not been as easy to determine. The smooth, thick-walled, dextrinoid spores resemble those of another truffle-like genus, *Melanogaster*, but the spores of *Melanogaster* are brown walled and do not react to Melzers' reagent. Other features of the fruit body and hymenophore of this new genus are also very different. At the moment only single collections of each of these fungi are available for examination. Provided here are general descriptions and photos of the two collections; in the hope that more collections will be made. Collections of fungi from mallee woodlands in southern Australia are few considering the potential for new species and genera.

A CLADISTIC ANALYSIS OF *GYMNOPILUS* (CORTINARIACEAE) USING THE ITS REGION OF NUCLEAR RIBOSOMAL DNA

D.A. Orlovich[1] & B.J. Rees*[2]

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Gymnopilus are wood-rotting basidiomycetes common in New Zealand and Australian forests. The genus comprises two sub-genera: one contains two artificial sections based on spore size. To date, there has been no published phylogenetic analysis of the genus. There are a number of species complexes within the genus that have distributions spanning the northern and southern hemispheres and another (the *G. purpuratus* group) that has a Gondwanan distribution. We are sequencing the internal transcribed spacer (ITS) region of nuclear ribosomal DNA and are using this data to construct a phylogeny by cladistic analysis. In many cases we have sequenced collections of one species from a number of geographically separate locations to assess the variation within each species. We have also sequenced DNA from species in a number of related genera for outgroup comparison. *Gymnopilus* was found to be paraphyletic and should include *Pyrrhoglossum pyrrhum* and *Galerina eucalyptorum*. Species with an annulus: *G. junonius*, *G. pampeanus*, *G. purpuratus*, *G. 'purpuratipes'* and *G. 'vinaceus'* are referred to section *Annulati* (*sensu* Singer 1986). The results indicate that section *Annulati* is polyphyletic, although Hesler's (1969 *Mycologia Memoirs* **3**, 1–117) subgenus *Annulati* is more narrowly defined and may not include *G. purpuratus*, *G. 'purpuratipes'* and *G. 'vinaceus'*. The Southern Hemisphere *Gymnopilus pampeanus* was found to be a sister taxon to *G. junonius*. Similarly, *G. austropicreus* and *G. picreus* were also sister taxa. Much of our data has come from Australian collections. We are working towards extending the range of collections to include more taxa, in particular from New Zealand and the other continents of Gondwana, and to increase the number of sequences for the related genera: *Galerina*, *Phaeocollybia* and *Pyrrhoglossum*.

MOLECULAR DETECTION OF *ARMILLARIA*

Jillian L. Smith-White, Brett A. Summerell & Lester W. Burgess*

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The basidiomycetes genus, *Armillaria*, is characterised by its ability to infect and cause root rot in a wide variety of plants. Within the Australasian region, four species have been observed *A. luteobubalina*, *A. fumosa*, *A. hinnulea* and *A. novaezelandiae*. Currently, the only means of diagnosing Armillaria root rot is by morphological analysis of mycelium, rhizomorphs and by observing annual fruiting body production. However, this is more difficult when dealing with *A. luteobubalina* as rhizomorph production has rarely been observed under field conditions. The introduction of a molecular diagnostic tool has the potential to increase sensitivity and reduce the process of identification and disease assessment to a single day. We are currently testing molecular primers that are thought to be specific for the *Armillaria* genome. These primers are internal to the ITS and produce a fragment approximately 400bp in length. With the application of restriction enzymes there is also the potential to differentiate between *Armillaria* species. Preliminary testing has shown that the restriction enzyme *Hinf* 1 may be sufficient to distinguish all four of the Australasian species. This type of analysis will not only lead to a more rapid diagnostic test for *Armillaria* but also aid in the research of its distribution and associations.