

THE QUEENSLAND MYCOLOGIST



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The Queensland Mycological Society Inc.

The Queensland Mycologist is issued quarterly. Members are invited to submit articles for publication to the editor (rbaxn@acr.net.au). The deadline for contributions for the next issue is 1 May 2007.

Please ensure that the Secretary (fungiql@yahoo.com.au) always has your current email address. If you are on the mailing list but do not wish to receive future issues, please contact the Secretary to have your details removed from the list.

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QMS MEETING CALENDAR

Meetings are held in the Bailey Room at the Herbarium, Mt Coot-tha, commencing at 7pm on the second Tuesday of the month, unless otherwise scheduled.

Note: The **June meeting** will be on the **first Wednesday of the month** to take advantage of Teresa Lebel's visit to Queensland for the Fungimap Conference.

QMS General Meeting: 13 March, 2007: Fungi of Lamington address by Tony Young

QMS General Meeting: 17 April, 2007. The IBISCA Project, address by Ray Baxter and the QMS/IBISCA (previously QMS/BATH) Project Team.

QMS General Meeting: 8 May, 2007. Fungi & Invertebrates, address by Dr Chris Burwell

QMS Annual General Meeting: 6 June, 2007 (Wednesday), address by Teresa Lebel (guest speaker).

QMS General Meeting 10 July, 2007: tba

QMS FIELD TRIP PROGRAMME

An issue raised by members at the QMS strategy meeting was the need to commence forays, so now all those incorporation and insurance details are in place QMS Field Trips for members are being planned.

This is an activity for all QMS members and IT RELIES ON ACTIVE PARTICIPATION OF MEMBERS TO MAKE THE PROGRAMME SUCCESSFUL!! Field trip leaders will be needed, so please volunteer now - speak with the Co-ordinators - Ray or Noreen on 3202 5008.

To ensure members know what to expect on a QMS field trip, [Field Trip Information](#) and [Risk Assessment](#) documents have been circulated to all members. Copies of [Guidelines for Field Trip Leaders](#) are available. The aim is to ensure that every member can volunteer to lead a field trip with confidence, knowing what is expected of them as leader.

The initial aim is for QMS member field trips to take place:

- on a monthly basis – if the drought persists fungi may be hard to find, but there will always something of interest to enjoy;
- on the Saturday preceding the QMS monthly meeting;
- to a specified site, (trying to alternate between all regions of Brisbane - North, South, East, West, Gold Coast and Sunshine Coast);
- with participant numbers limited to 4 to 10 persons, depending on the Field Trip Leader, the terrain etc. Participants will be able to put their name on a field trip list at QMS meetings or by contacting the Field Trip Leader by email or phone;
- with participants being required to read and understand the [Field Trip Risk Assessment](#) documentation prior to attending a field trip. Anyone who would like clarification of the information provided is requested to speak with Ray or Noreen;
- with a record being made of any fungi seen. Note: Specimens will not be taken as collections can only be made by a mycologist with the relevant “permit to collect” for scientific research; and
- a selection of up to five photographs taken on the field trip will then be shown and discussed at the following meeting.

All proposed field trips will be submitted to the QMS Executive for approval.

QMS FIELD TRIPS are small study group outings of approximately 3 hours duration. Numbers are limited, so please contact the leader to book. Participants are asked to meet at 0845 so that the field trips can start by 0900 (unless otherwise stated), and come prepared as per the [Field Trip Information](#) previously circulated – if you have any questions please ring Ray or Noreen on 3202 5008.

10 March, 2007: Raven Street Reserve, Downfall Creek, (UBD 119 F16) Leader John Wrench Ph 3256 3310 or email win_john@bigpond.net.au. The terrain is undulating. This is an easy walk mainly on formed paths with some slightly uneven off track walking. Meet at the Raven Street Reserve Car Park on Rode Road at 0845. Limit 8 persons.

7 April, 2007: D’Aguilar National Park at Jolly’s Lookout, off the Mount Nebo Road, Leader Ray Baxter Ph 3202 5008 or rbaxn@acr.net.au. The terrain is undulating. The walk will follow a formed path, the Thylogale track, as it meanders through eucalypt woodland and vine gullies. Total distance would be 8 kms – if no fungi are seen, but if fungi are there the distance will shorten considerably (we have never missed seeing fungi along this track). There is a short, steep bitumen road stretch back to the parking area, but a car pick up can avoid this. Meet at Jolly’s Lookout at 8.45. Limited to 14 participants.

5 May, 2007: Mt Coot-tha, Leader Nigel Fechner nigel.fechner@epa.qld.gov.au or Ph 3896 9316. This is a “doddle around the botanic gardens”. Meet at the Information Centre by the Planetarium at 0845. Limited to 15 participants.

2 June, 2007: As this is the Fungimap Conference weekend so there will be no field trip.

7 July, 2007: Kalinga North, Leaders Ken Cowell and Floss Wainwright Ph 3266 2104 or ken48@dodo.com.au. The terrain will be level and hilly with some steps. The route planned will take in both sealed and formed walkways. Meet at Kalinga Park car park off Park Road at 0845 (Map 140 H3). Limited to 8 participants.

11 August, 2007: Boonah (private property), Leader Klaus Querengasser Ph 3271 2510; Mobile 0401 90 8585 or email klaus.querengasser@uqconnect.net. The terrain is mainly undulating and hilly, with the possibility of a little rock hopping depending on the interests and abilities of the participants (there is a mostly dry creek running for about a kilometre and a half). Most of the time will be off track walking and a bit rough, but there is an old dirt road running about half the length of the property which makes access to most areas easier. This trip will take most of the day so it is suggested that participants bring lunch as well as morning tea. The meeting point, which is approximately an hour drive time from Ipswich, will be the Rest Area at the corner of the Cunningham Highway (the road to Warwick) and the Boonah-Fassifern Rd (near Kalbar, and a few kilometres before Aratula). After parking there will be about a one kilometre walk to the property. Meeting time 0900. Limited to 8 participants.

8 September, 2007: Venue and Leader wanted.

6 October, 2007: Venue and Leader wanted.

10 November, 2007: Sunshine Coast, Leader Gretchen Evans/Lyn Fairlie Ph 5453 8038 or email linfair@bigpond.com. Drive time is approximately two hours from Brisbane. The terrain will be level and along a normal walking track. The meeting place will be the Mapleton Pub Car Park at 0900, from here there will be a short drive on an unsealed road for about one kilometre along Obi Rd then turn right into Delicia Rd to the starting point at Linda Garrett Park (wet sclerophyll bushland). Limited to 15 participants.

8 December 2007: Venue and Leader wanted.

COLLECTING FUNGI

Are You Aware That:

Under the Queensland *Nature Conservation Act 1992* and the *Nature Conservation (Protected Plants) Conservation Plan 2000*, all Fungi along with algae, lichens, mosses, and liverworts, and a number of plants, are listed as “Schedule 1 Plants”, and that it is an offence to pick or take any Schedule 1 plant from the wild anywhere within the State of Queensland, including private property, without an appropriate permit.

It is expected that all QMS members will comply with the relevant legislation, and will not do anything that may reflect adversely on the QMS.

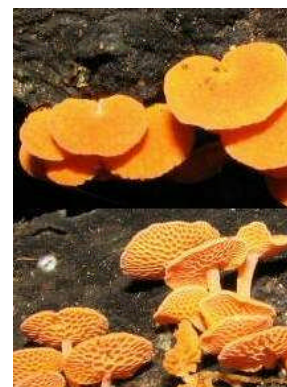
Under Queensland legislation fines are stated in “penalty points”, currently one penalty point = \$75. Any person found guilty of committing an offence under the above Acts could incur a fine. Fines vary up to a maximum of 6,000 penalty points (6,000 x \$75 = \$450,000) in a “protected area” i.e. National Parks, State Forests, Nature Reserves etc; or up to a maximum of 165 penalty points (165 x \$75 = \$12,375) in an “unprotected area” i.e. any land in Queensland that is not declared as “protected”.

FUNGI IN FOCUS: *Favolaschia calocera*

At the QMS October 2006 meeting Sapphire McMullen-Fisher advised that Fungimap had added *Favolaschia calocera* to the list of Fungimap "Target" species. This fungus is believed to be an exotic species, the first report of it in Australia was in July 2005.

In October 2006 QMS members sited it in Lamington National Park. Since then it has been sited repeatedly in the Lamington National Park by the QMS/BATH Project team.

Depending on its age and substrate moisture level it is a fairly bright orange, coarsely pored, small ping pong bat shaped fungus seen growing in large numbers on very large fallen dead wood.



Photograph by Jon Atkinson

FUNGIMAP 2007 CONFERENCE

The Fungimap 2007 Conference will be held from Thursday, 31 May to Tuesday, 5 June 2007 at Bornhoffen PCYC Camp, which is located at 3510 Nerang-Murwillumbah Road, Natural Bridge, Queensland. This is dormitory style accommodation. For those who wish a higher standard of accommodation there are other holiday cabins in the vicinity.

Unfortunately Sapphire McMullen-Fisher who was the QMS/Fungimap Conference Organiser has returned to Tasmania for six months so Ray and Noreen Baxter have taken on the co-ordinating role and can be contacted at rbaxn@acr.net.au.

At this stage exactly what tasks QMS members will be required to take on is unclear, but it is expected that there maybe a need for assistance with transporting conference gear and possibly some visitors from Brisbane to Camp Bornhoffen and back. It is planned to have two buses direct from the Gold Coast to Camp Bornhoffen. QMS members are asked to contact the Baxters to discuss what assistance they personally are able to give.

Some potential foray sites near the Conference venue have to be identified but more are needed. If anyone has knowledge of any specific sites, or is prepared to guide the mycologist and foray participants on a foray, please contact Ray on 3202 5008. The plan is to have as many potential sites identified as possible, then the week before the conference check out each site to find those with the best fungal activity at that time.

Everyone should have received the Fungimap Conference "early bird" registration form by now. If you have not please contact Karalyn on fungiqld@yahoo.com.au to receive a copy. For those who have the time attending the full conference would be very rewarding, but if your time is limited even attending for a day or two should prove a valuable experience.

The conference will feature talks by some internationally acclaimed mycologists as well as forays and workshops for all levels of mycological interest and knowledge such as beginners, intermediate, microscopy and photography.

This will be a marvellous opportunity for Queenslanders interested in learning more about fungi to access a wide range of educational workshops, and also to soak up some of the wealth of knowledge that flows around when a group of experienced mycologists meet. Because there are so few Queensland mycologists, despite the best efforts of QMS, it is unlikely that this assemblage of mycological experience and knowledge will be available here in the foreseeable future. If you are really interested in fungi this is an opportunity that is too good to miss.

THE QMS/IBISCA PROJECT

(previously known as the QMS/BATH Project)

The second phase of the QMS/IBISCA Project took place over the weekend 23 and 24 February 2007. The team stayed at “Kootootonga” (the Bunkhouse) at O’Reilly’s which was closer to all the sites. Unfortunately Jennifer Singfield had other commitments for the weekend so was unable to attend. A new QMS member, Jon Atkinson, joined the team for the final field phase, his previous experience in photographing and describing fungi was appreciated by all the team. Ray Baxter and the Project Team will talk about the survey experience at the April meeting.

The plan had been to survey ten, or half the IBISCA sites, but due to the number of fungi on a couple of sites this proved a bit ambitious. The thirteen team members still managed to survey nine of the twenty sites. Four team members returned to Lamington on 8 March to survey the tenth site.

Saturday morning at 0700 a team consisting of the four fittest members headed off to the two sites where access was considered to be most strenuous and difficult. At 0800 the rest of the team took on a closer site, from which a large number of specimens were collected. Three members then took the specimens back to Kootootonga and had just finished working on them when the teams started to return. The team of four got in first, had a quick refreshing cup of tea and headed back out to do another site. Once back at Kootootonga everyone set about doing further studies on the specimens collected. In fact Saturday night found everyone still hard at work at 10pm after only a brief Dinner break.

Sunday was a repeat of the same scenario – up and out to survey two more sites before packing everything away for the trip home.

Kootootonga proved to be very appropriate accommodation as it had a long “sunroom” where all the specimens could be worked on.

Over the weekend some exciting fungi were found, amongst them *Chlorociboria* sp., an electric green, disc-shaped ascomycete; an incredible eruption of a *Ramaria* sp. growing on rotting logs (Nigel was very happy); an unusual *Scleroderma*-like ascomycete growing on wood (probably an *Entonaema*); and a glorious *Aphelaria portentosa* to name just a few.

The small team that hit a site on the Thursday found many more fungi than expected including a *Cordyceps* sp. and a *Mutinus* sp.

Between now and sometime after Nigel, our over worked mycologist, retires from full time work, snippets of the data will start to emerge.



Klaus Querengasser, Gretchen Evans, Ken Cowell, Floss Wainwright, Nigel Fechner, James Hansen and Lin Fairlie hard at work
Photograph by Jon Atkinson

The Pharmacological Potential of Macro-fungi

By Dr Evelin Tiralongo to the QMS Meeting 14 November 2006

Why are we interested in Macro-fungi research? Because of the potential of Macrofungi as a source for drug development.

The origin of drugs developed between 1981 and 2002 shows that:

- 48% were synthetic drugs;
- 28% were natural product (NP) or NP derived drugs; and
- 24% were drugs based on NPs.

So basically 52% of drugs are derived from NPs. Further:

- 13% of human disease treatment employs no NP derived drugs
- 87% of human disease treatment employs NP derived drugs.

Why are we interested in Macro-fungi as a source for drugs?

Looking at the evolutionary development of life fungi and animals are more closely related to each other than either is to plants (Redecker D., *et al.* Science. 2000 Sep 15; 289(5486):1920-1.

Eubacteria ("True bacteria", mitochondria, and chloroplasts)
 Eukaryotes (Protists, Plants, Fungi, Animals, etc)
 Archaea (Methanogens, Halophiles, Sulfolobus, and relatives)
 ? Viruses

Looking further, within Eukaryotes are:

Animals (Metazoa)
 Chloanoflagellates (collared-flagellates)
 Fungi
 Mycosporidia
 Stramenopiles (diatoms, chrysophytes, brown algae, opalines, algae & protozoa)
 Alveolates (dinoflagellates, ciliates, apicomplexa)
 Rhodophyta (red algae)
 Green plants (=Viridiaeplanteae: green algae (inc prasinophytes), higher plants)
 The other protists (cryptomonads, euglenids, glauophytes, etc)

Some people believe that the close relationship between animals and fungi can be an advantage because fungi and humans may combat similar diseases and this means that fungi may produce substances that are useful in the treatment of those diseases.

Of the estimated 1.5 million fungi 140,000 produce fruiting bodies - 10% of which have been described. The remaining 126,000 are undescribed. If you estimate 5% of undescribed fungi are of possible benefit in the treatment of diseases this equals 6,300 species. (Hawksworth DL., Int.J.Med.Mushrooms, 2001, (3)333-7).

Microfungi are a useful source of drugs:

Antibiotics

- penicillins – *Penicillium chrysogenum* or *Penicillium notatum*
- cephalosporins – *Cephalosporium acremonium*

Antifungal agents

- micafungin – *Coleophoma empetri*

Immunosuppressive agents

- cyclosporine – *Tolypocladium inflatum*
- mycophenolate – *Penicillium brevicompactum*

Cholesterol-lowering agents

- lovastatin – *Aspergillus terreus* and *Pleurotus ostreatus*
- mevastatin – *Penicillium citrinum*
- rosuvastatin – *Penicillium citrinum* and *P. brevicompactum*

Similarly it is thought that macro-fungi are a potential source for the development of drugs.

Ethnomycology: Historically there has been an interesting relationship in the use of macro-fungi for:

- spiritual ceremonies
- food
- tinder
- medicine

Some interesting ethnomycological examples are:

- Mushrooms were used in sacred ceremonies 1000-500 B.C.E.
- In Mayan Culture psychotropic mushrooms, such as 20 *Psilocybe* and *Stropharia* sp., were used as trade objects and are still present in Mexico.
- In 1991 Oetzi the 5300 years old Iceman was discovered, with *Piptoporus betulinus* and *Fomes fomentarius* around his neck that had been buried with him.
- De Materia Medica Discordes 65 B.C.E. showed *agaricum* or *agarikon*, quinine conk as treatment of “consumption”. *Fomitopsis officinalis* syn. *Laricifomes officinalis*.

Mushrooms used by Indigenous Australians:

In Australia there are not a lot of ethnomycological records, there are some reports of fungi as a food source and some as medicinal source. A few examples are given below.

- It was believed that mushrooms are “fallen stars”
- Subjects of religious beliefs associated with Dreamtime
- Some are considered as evil spirit – *Omphalotus nidiformis*
- *Trametes cinnabarina* (now *Pycnoporus cinnabarinus*) considered spirit child vomit called Murri-siki (Murri – ‘spirit child’ and Siki – ‘sick’)

Edible Mushrooms

- *Choiromyces aboriginum* (Native Truffle)
- Mulga bolete (not yet identified)
- *Fistulina hepatica* (Beefsteak Fungus)
- *Pisolithus tinctorius* (now *Psolithus arhizus*) (Horse Dung Fungus)

But there is no evidence of indigenous Australians using *Agaricus campestris* (Common Field Mushroom) as a food.

Medicinal Mushrooms

- *Mycoclelandia bulundari* (Large Truffle): ‘kumpa’ is squeezed into sore eyes and onto sores; used as a deodorant; and to prevent hair growth
- *Phellinus* sp. (Woody Bracket Fungus): was used as a treatment for sore throat; cough; “bad chest”; fever and diarrhoea
- *Pycnoporus sanguines* (Orange Shelf Fungus) was used for babies thrush in mouth, teething, and to rub on neck and face; for adults: internal pain.

Macro-fungi produce secondary metabolites that have shown a variety of biological activities

Secondary metabolites are products (chemical compounds) of metabolism that are not essential for normal growth or reproduction of an organism.

Some of the secondary metabolites produced by macro-fungi are: polysaccharides, terpenes, sterols, lipids, pigments, lectins, and alkaloids

These metabolites can be used for anticancer, cardiovascular, antiinflammatory, antimicrobial, hypoglycaemic and CNS effects.

Antibacterial activity - Fungi and humans share common microbial pathogens. 76% of >200 screened polypores showed antimicrobial activity. For example:

- *Pycnoporus sanguine* contains cinnabarin which affects *Bacillus cereus*, and *Staphylococcus aureus*.
- *Ganoderma pfeifferi* contains ganomycins A and B which affects *Bacillus subtilis*, and *S. aureus*.
- *Laetiporus sulphureus* contains beauvericin.

Antiviral activity - By working as a direct or biological response modifier:

- *Fomes fomentarius* filtrate from culture inhibits the tobacco mosaic virus.
- *Trametes vesicolour* filtrate Polysaccharidepeptide-Krestin affects HIV, cytomegalovirus; and Polysaccharide- Petide acts as an immunostimulant.
- *Innonotus obliquus* (Chaga) water-soluble lignins affect HIV; and hispolon & hispidin affect Influenza virus A & B.

Anti-tumour & anticancer activity

Ganoderma lucidum (Reishi) folk remedy for cancer, hepatitis, chronic bronchitis, asthma, haemorrhoids, and fatigue syndrome contains >130 biologically active triterpenoids.

Omphalotus olearius (*illudens*) Jack O'lantern mushroom: Active constituent: tricyclic sesquiterpene Illudin S; Analogue: irofulven in CT's

Polysaccharides are biological response modifiers that:

- prevent carcinogenesis
- show direct anticancer effects
- prevent tumour metastasis
- mostly *Polyporaceae*
- 500-2000 kDa

At least 651 species representing 162 genera of basidiomycetes contain polysaccharides which demonstrate such an activity.

Trametes vesicolor (Turkey tail)

- cytotoxic ergosterol derivative
- PSK (Krestin): marketed in Japan for colorectal, gastric, lung cancer
- Natural killer cells cell activation
- increased disease free survival period
- increases activity of cisplatin
- PSP: decreased side effects from radiotherapy.

Grifola frondosa (Maitake, Hen-of-the-Woods)

- MD fraction: in clinical use in Japan & China for adjuvant tumour therapy NK cell activation
- increased cancer regression or symptom improvement (50% liver cancer, 68% breast cancer, 62% lung cancer patients)
- FDA: phase 1 pilot study (patients with advanced breast and prostate cancer).

Ganoderma lucidum

- ganodermic acid A, B, G, H
- stronger effect than aspirin in animal model

*See additional notes by Nigel Fechner

Grifola frondosa

- ergosterol
- inhibit COX 1 & 2.

Antiartherogenic activity

- *Pleurotus ostreatus* (Oyster mushroom) constituent lovastatin acts to decrease lipid peroxidation in AS and reduce the size of atherosclerotic plaques in AS.
- *Ganoderma lucidum* constituent ganodermic acid F & S inhibits cholesterol biosynthesis, inhibits ACE and inhibits platelet aggregation.

Anti-diabetic activity

- *Grifola frondosa*: SX fraction affects type 2 diabetes (n=5).
- *Ganoderma lucidum*: Ganopoly, 1.8 g three times daily, 12 weeks affects type 2 diabetes (n=71).
- *Trametes vesicolor*: coriolan ameliorated diabetic symptoms.

Australian/NZ Macro-fungi

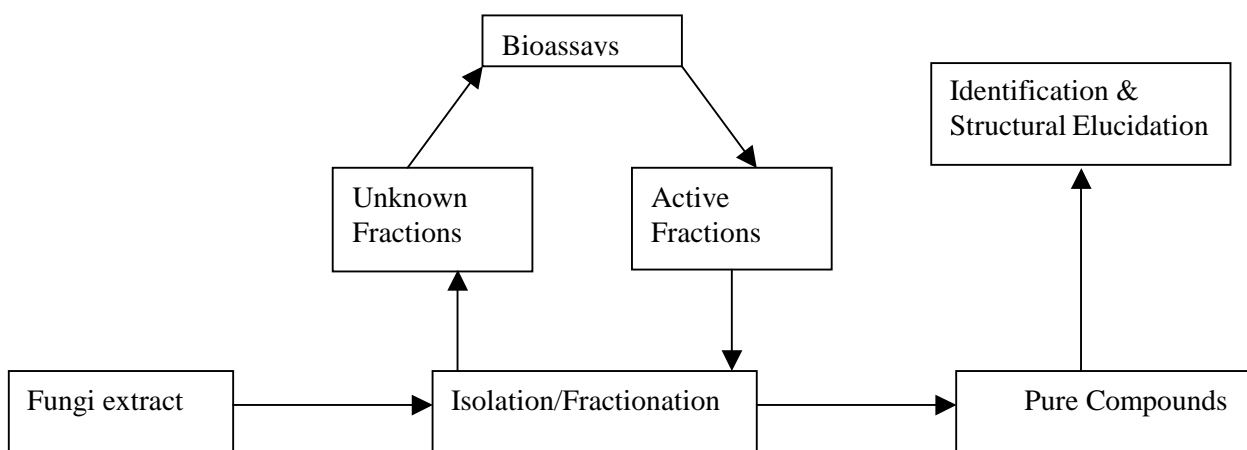
- *Cortinarius speciosissimus* & *Cortinarius orellanus* constituent cortamidine oxide has antibacterial and anti-tumour activity.
- *Dermocybe splendida* constituent tetrahydroanthraquinone has antibacterial, antifungal, and anti-tumour activity.

How Do We Do It

Screening of fungal extracts

1. Collect and macerate fungi material
2. Extraction with aqueous or organic solvents
3. Bioassay
4. Fractionation of active fractions
5. Repeat bioassay and fractionation until pure compound
6. Structural elucidation of pure compound

BIOASSAY GUIDED FRACTIONATION



Projects

Tasmanian & Victorian macro-fungi

Dermocybe and *Cortinarius* extracts

- screening
- antibacterial activities
- antifungal activities
- cytotoxic activities
- anticancer activities
- anti-inflammatory activities

How Can QMS Help

- Help with mapping fungi species
- Help in identifying fungi species
- Help in collecting fungi material for research in consultation with the Herbarium
- Help in identifying & recording of macro-fungi that have been used by indigenous Australians

Note:

Following on from Evelin Tiralongo's very interesting address our President, Nigel Fechner, has included some additional information, References and a Glossary of Pharmacological Terms to assist members who may not have a pharmacological background.

*Research on *Ganoderma* in China and Japan has revealed that:

- The extract inhibits platelet aggregation
- The extract lowers blood pressure (6 month clinical trial : 47% of hypertensive patients lowered their blood pressure by 10 -19 mmHg, 10% by 20-29%)
- LDL levels dropped by 68% of 90 patients following 4 months of ingesting Reishi
- Historically the plant has been reported to relieve pain and inflammation in the joints.
- The extract has been shown to have powerful anti inflammatory effects *in vitro* and *in vivo*. (Journal of Chinese Medicine, 669 -674 1992).

- The immune stimulating properties of the extract have been attributed to the polysaccharides.
- Ganodermic acids (oxygenated triterpenoids) present in the extract are implicated in platelet inhibition, lowering LDL and anti inflammatory processes

* Source : The Potential of Herbal Products for Nutraceutical and Pharmaceutical Development
Presented at the International Business Communications (IBC) Fifth Annual Conference,
"Functional Foods 1998", Copthorne Tara Hotel, London
7th-8th September 1998
by Dr John A. Wilkinson, Middlesex University, UK

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Nigel Fechner, March 2007

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To assist those in attendance at meetings, notes on the addresses given are included in issues of the Queensland Mycologist. However, the notes never do justice to the topic as they do not reflect the enthusiasm of the speaker or cover the questions and discussions that were raised on the topic. So remember, where possible it is far better to attend the meetings, get the information first hand and participate in the invaluable information sharing opportunity.

SUMMARY OF QMS MEETINGS

December 2006 Meeting: This was the Christmas Celebration and, according to all reports was a great success. Those who attended reported having a fun night. Most made special mention of Nigel Fechner's quiz, John Wrench's exhibit and Floss Wainright's mushroom cake. Poems from the evening are printed in this issue of The Queensland Mycologist.

23 January 2007: Members were invited to a "Strategy and Planning" meeting to help plan for QMS in 2007 and beyond. Quite a few members joined the committee in discussing a wide range of topics and options for QMS. Members may notice some additional activities, such as the field trips, as these concepts are translated into action.

13 February 2007: President, Nigel Fechner advised members that the Committee has decided to minimise business at meetings so he gave a brief report on the "Strategy & Planning Meeting" and of current QMS/IBISCA; and QMS/Fungimap Conference activities. Then followed information on the Field Trip programme and members were invited to nominate to attend the first two field trips and/or to lead one later in the year.

Business over everyone sat back to enjoy the photographic display presented by John Wrench. John has been photographing fungi for many years and while most of the photos were from Downfall Creek or Chermside some were from other areas.

The meeting concluded with the tantalising odours of another delicious supper prepared by Nigel Fechner for members.

MEMBERS CHRISTMAS PARTY POEMS***Fungus fluxus atque Boletus subterfugans***

*Out of sight, but never wholly out of mind,
Although the waiting, hoping for evidence, a manifesting,
Seems endless, teasing almost –
Worthwhile, though, if it really comes about.*

*But why so long, so unpredictable?
Is this visible, showy upper half of earth so inhospitable
So disapproving of fecundity, of admiration for arresting shapes,
For colours and mysterious scents?*

*Parched, dispiriting intemperate –
From this uncongenial mode of earth's long arid pilgrimage
All creation pauses, cringes even,
Withdraws at last to reckon its resources, new strategies,
New devices for some desperate evolving.*

*Then water comes again – perhaps a final brave assay,
And tissues are refreshed, resume the course
They always took to find the light and be complete.
The fascinating forms parade again, if we but know.*

*Then we are charmed, forgetting soon
How long we hoped for this surprise; marvelling, recording all
And urging others to make haste
In case it vanishes before they come
And decades pass until it all comes round once more.*

*Perhaps it never will, again
Or we have missed it,
Having passed, ourselves.*

Explanation of title

In Latin, fungus can be translated as two words, “*fungus*” as used by Pliny and Horace, and “*boletus*” as used by Pliny and Juvenal. The specific “*fluxus*” is used by Cicero to mean frail, transient. The specific “*subterfugans*” is used by Cicero to mean shy, avoiding. “*Atque*” is a form for “and”.

John Wrench Dec. 2006

A FUNGAL LIMERICK

*There was a young man with a quiz
Who said, “This is how it is”
“You must learn your fungi
So when you are hungry
You will know what species to miss”*

by Rachel Griffiths, December 2006

A FUNGAL RHYME

*There was a small fungi from Tyne
Which somehow ended up in a wine
Though he'd rather be beer
It was termed a “good year”
In the end the result was quite fine*

by Nigel Fechner, December 2006

MAGNIFYING GLASS

*What wonderful things are fungi
 Beautiful – terrible – colourful –
 Useful – necessary and photogenic
 A delight to the photographer – sometimes
Distasteful to the nose – sometimes
 Of great interest to the biochemist – always
 Necessary for the life of the forest – and also for us
 A very good excuse (if one is needed) for a walk after rain
 Exercise for us – both body and brain*

by Annitta Hearle, December 2006

FUNGI FOOD FILE

This segment was included in response to members' request but no contributions from members have been received for this edition.

QMS 2006 MILESTONES

All members are advised that the first QMS AGM and election of Office Bearers will be held on 6 June 2007.

The Committee assisted by a small number of enthusiastic members has helped QMS off to a flying start, some are now feeling overburdened and looking forward eagerly to other members taking on some of the roles.

To briefly mention a few of the 2006 milestones:

- The focus initially revolved around administrative issues such as: What will this group be called? Next the President and Secretary, with Diana Leemon and the Committee, grappled with achieving Incorporation and commenced the educational speakers programme for meetings.
- By May 2006 QMS had "Objectives"; A Beginners Workshop was conducted and the first issue of our Newsletter The Queensland Mycologist was circulated.
- In June, Professor Roger Kitching addressed the monthly meeting and invited QMS to participate in IBISCA Queensland, which was the start of the QMS/IBISCA Project.
- A QMS Brochure was published.
- A few artistic QMS members developed logo – the earthstar (*Geastrum* sp).
- Next came the chance to host the 4th Fungimap Biennial Conference, which will be held 31 May to 5 June, 2007.
- The QMS website is under development.
- The year ended with a highly successful Christmas Party.
- 2007 has started with the introduction of a Field Trip programme.

That brief listing hides the hours of effort that have been contributed to getting QMS up and running. All members will now have the opportunity, at the AGM in June, to take QMS forward by nominating for vacant positions, such as:

- The Committee; or
 - The Queensland Mycologist Editor, or
 - The Field Trip Co-ordinator.
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Glossary of Pharmacological Terms:

Nigel Fechner, March 2007

The majority of the following definitions have been adapted from Wikipedia, the free online encyclopaedia: http://en.wikipedia.org/wiki/Main_Page

Angiotensin is an oligopeptide in the blood that causes vasoconstriction, increased blood pressure, and release of aldosterone from the adrenal cortex.

Antiatherogenic agent : biologically active substance that prevents atherogenesis, the accumulation of lipid containing plaques on the innermost layers of the arteries.

Apoptosis (Greek: *apo* - from, *ptosis* - falling; commonly pronounced with a silent second 'p') is a process of deliberate life relinquishment by a cell in a multicellular organism. It is one of the main types of programmed cell death (PCD), and involves an orchestrated series of biochemical events leading to a characteristic cell morphology and death. The apoptotic process is executed in such a way as to safely dispose of cell corpses and fragments.

In contrast to necrosis, which is a form of cell death that results from acute cellular injury, apoptosis is carried out in an orderly process that generally confers advantages during an organism's life cycle. For example, the differentiation of fingers and toes in a developing human embryo requires cells between the fingers to initiate apoptosis so that the digits can separate.

Beauvericin was originally isolated from *Beauveria bassiana* but has been detected in various fungal species including *Fusarium* spp. Beauvericin has antibiotic, insecticidal, apoptotic and cholesterol acyltransferase inhibiting activities.

Cisplatin, cisplatinum or **cis-diamminedichloroplatinum(II) (CDDP)** is a platinum-based chemotherapy drug used to treat various types of cancers, including sarcomas, some carcinomas (e.g. small cell lung cancer and ovarian cancer), lymphomas and germ cell tumors.

As a compound cisplatin was first described by M. Peyrone in 1845 (known as Peyrone's salt). The structure was elucidated by Alfred Werner in 1893. It was rediscovered in the 1960s by Barnett Rosenberg and van Camp *et al*, who discovered that electrolysis products from a platinum electrode inhibited binary fission in *Escherichia coli* (*E. coli*) bacteria. The bacteria grow to 300 times their normal length but cell division fails.

Cisplatin acts by crosslinking DNA in several different ways, making it impossible for rapidly dividing cells to duplicate their DNA for mitosis. The damaged DNA sets off DNA repair mechanisms, which activate apoptosis when repair proves impossible.

Cisplatin has a number of side-effects that can limit its use:

- Nephrotoxicity (kidney damage).
- Neurotoxicity (nerve damage).
- Nausea and vomiting.
- Ototoxicity (hearing loss).
- Alopecia (hair loss).
- Electrolyte disturbance: (hypomagnesaemia, hypokalaemia and hypocalcaemia).

Cytomegalovirus (CMV), is a genus of Herpes viruses; in humans the species is known as **Human herpesvirus 5** (HHV-5). The name means "very big cell virus". CMV primarily attacks salivary glands. CMV infection can also be life threatening for patients who are immunocompromised (e.g. patients with HIV or organ transplant recipients).

Ergosterol is a component of fungal cell membranes, serving the same function that cholesterol serves in animal cells. The presence of ergosterol in fungal cell membranes coupled with its absence in animal cell membranes makes it a useful target for antifungal drugs. Ergosterol is also

used as a fluidizer in the cell membranes of some protists, such as trypanosomes. This is the basis for the use of some antifungals against West African sleeping sickness. Amphotericin B is an antifungal drug that targets ergosterol. It binds to ergosterol and creates a pore in fungal membranes. This causes ions and other molecules to leak out of the cell, killing it.

Fractionation is a separation process in which a certain quantity of a mixture (solid, liquid, solute or suspension) is divided up in a large number of smaller quantities (fractions) in which the composition changes according to a gradient. Fractions are collected based on differences in a specific property of the individual components. Common trait in fractionations is the need to find an optimum between the amount of fractions collected and the desired purity in each fraction. Fractionation makes it possible to isolate more than two components in a mixture in a single run. This property sets it apart from other separation techniques.

Ganopoly is an aqueous polysaccharide fraction extracted from *Ganoderma lucidum* by patented biochemical technique and has been marketed as an over-the-counter product for chronic diseases including cancer and hepatopathy in many Asian countries.

Ito, H., Hidaka, H. & Sugiura, M. (1979). Effects of coriolan, an antitumor polysaccharide, produced by *Coriolus versicolor* Iwade. Japanese journal of pharmacology 29(6): 953-957.

Lipid peroxidation refers to the oxidative degradation of lipids. It is the process whereby free radicals "steal" electrons from the lipids in cell membranes, resulting in cell damage. This process proceeds by a free radical chain reaction mechanism. It most often affects polyunsaturated fatty acids, because they contain multiple double bonds in between which lie methylene -CH₂- groups that are especially reactive hydrogen.

Lovastatin is a member of the drug class of statins, used for lowering cholesterol (hypolipidemic agent) in those with hypercholesterolemia and so preventing cardiovascular disease

Lovastatin was isolated from a strain of *Aspergillus terreus* and it was the first statin approved by the FDA (August 1987). Lovastatin is also naturally produced by certain higher fungi such as *Pleurotus ostreatus* (oyster mushroom) and closely related *Pleurotus spp.*

The mode of action of statins is HMG-CoA reductase enzyme inhibition. This enzyme is needed by the body to make cholesterol.

Lovastatin causes cholesterol to be lost from LDL, but also reduces the concentration of circulating LDL (low density lipoprotein) particles. Apolipoprotein B concentration falls substantially during treatment with lovastatin. Lovastatin's ability to lower LDL is thought to be due to a reduction in VLDL, which is a precursor to LDL. Also, Lovastatin may increase the number of LDL receptors on the surface of cell membranes, and thus increase the breakdown of LDL.

Lovastatin can also produce slight to moderate increases in HDL, and slight to moderate decreases in triglycerides. Both of these effects are typically beneficial to a patient with a poor lipid profile.

Micafungin is fungicidal against most clinically relevant species of *Candida*. It also has activity against many other fungi, including *Aspergillus spp.*

Polysaccharide-K, also known as **PSK**, is a proteoglycan (a polysaccharopeptide) found in the mushroom *Coriolus* or *Trametes versicolor*. The results obtained from a large number of published scientific studies and clinical trials showed that PSK is a powerful immunomodulator capable of stimulating diverse immunological functions (ie. They act as biological response modifiers whose therapeutic effects are derived from their capacity to stimulate key effector pathways of the immune system). For instance, PSK can improve cancer survival by restoring and enhancing cellular immune functions in patients with depressed immunity due to radiation and/or chemotherapy or surgical stress after curative resection of cancer.

PSK is extracted from *Trametes versicolor*, a mushroom found virtually all over the world. In Japan, it is called (polysaccharopeptide-Krestin) and in China, it is called PS-P (polysaccharide-

peptide). PSK is used as a generic term for PS-Krestin and PS-P, which have the same chemical and structural characteristics.

Syndrome X is a cluster of metabolic disorders that all result from the primary disorder of insulin resistance. All the metabolic abnormalities associated with syndrome X can lead to cardiovascular disorders - when present as a group, the risk for cardiovascular disease and premature death are very high.

The characteristic disorders present in metabolic syndrome X include:

- insulin resistance
- hypertension
- abnormalities of blood clotting
- low HDL and high LDL cholesterol levels
- high triglyceride levels

The chief abnormality present in syndrome X is insulin resistance.

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