HYPHAL SYSTEMS

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I have put together some references in the list below. These cover the original research dealing with gill and stem development. And the latter few are review type. We (and colleagues elsewhere) have found narrow and inflated hyphae in most agaric stems—even those (like *Agaricus*) which are supposed to be 'monomitic' (if that term can be applied to agarics). No one else has counted cell type distributions so their importance remains unclear. I think the mitic classification system is a valuable piece of observation which shows how a particular group of fungi have differentiated their hypae. But there are difficulties. Function is presumed, not proven. In particular, thick wall is assumed to = reinforcement = skeletal; but secondary hyphal walls could = nutrient store or any of a number of non-strengthening physiological differentiations. The over-riding difficulty is that there are no cell counts in any of these taxonomic observations so the functions and how they might change during development are ignored.

I am also dismayed by the reliance which is placed on drawings of hyphal distributions in fruit body tissues. I once talked to Corner about this and he dismissed any notion of using photography because he thought it important that the mycologist should interpret what he was observing and portray that interpretation. I still receive (and we still publish) descriptions like this in *Mycological Research*. The drawings are often a delight to behold. BUT I tend to the view that the observer should record what he/she observes and to me that means (a) without prior interpretation, and (b) in quantitative terms whenever possible. I hope that what we have already done in *Coprinus* will encourage others to perform similar numerical analyses in other organisms. At the moment we are trying to extend our image analysis into three dimensions; using confocal microscopy to make digital records of optical sections of lumps of tissue, then 'industrial standard' visualisation software to create virtual reconstructions through which we can wander to make cell counts and measurements. The counts and measurements are intended to define parameters for mathematical modelling of morphogenesis. We have managed to make the different parts of this process work; over the next year or so I hope we'll be able to put the whole package together.

Until the '21st century virtual mushroom' emerges, you'll have to make do with this reference list!!

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11th NEW ZEALAND FUNGAL FORAY, 5–9 MAY 1997

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We had a great week away from home for the Fungal Foray. The weather was 'Absolutely Positively' marvellous for the whole time, though I must say that the whole country had the driest and warmest autumn on record. The Boys' Brigade Camp at Wainuiomata (near Wellington) was very satisfactory, thanks to a lot of work on the part of Ron Freeston in putting furniture in the right places and liaising with the caretaker. Microscopes from Victoria University were installed in their own workroom, and the nearby kitchen benches used for displaying specimens found, and for setting up the dryers.

The outing on Tuesday took us to the Wainuiomata Catchment Area, where we were dwarfed by the magnificent rimus, ratas and kahikateas. The bush has never been milled, and it must surely be the best piece of lowland forest still remaining in the North Island. Most interesting find here was *Phallobata alba* (= *Hysterangium lobatum*, type locality Whakatikei Forest Reserve, Paekakriki), a white fungus of jelly-like consistency made up of erect lobed 'fingers'. That evening we saw slides by Ron and Angela Freeston, heard from Peter Johnston about the exotic weed fungi *Amanita muscaria* and *Favolaschia calocera* spreading into native forests and his proposal to map their progress, and Peter Buchanan spoke about revising the New Zealand polypores with Norwegian expert Leif Ryvarden.

Next day was to Kaitoke Regional Park at the Pakuratahi River forks. Here was mixed forest and beech forest, again with forest to the ridge-tops. That evening we saw slides of fungi from Don Horne, heard about and saw Norway with Leif Ryvarden, then saw myxomycete cultures and heard about her work from Ann Bell of Victoria University of Wellington.

The final day saw us torn between an expedition to Butterfly Creek or the Orongorongo Track, with the close proximity of the latter winning out. Again there were many interesting finds to study and photograph. The pessimists who thought that it might be too dry for fungus collecting were partially right, in that we saw some mushrooms shrivelled by the fine weather, but there was plenty to interest still in good condition, including just about all of Geoff Ridley's named species of *Amanita*. Also these collecting grounds were the type collecting areas for species named by Greta Stevenson Cone in her *Kew Bulletin* papers. That evening Heino Lepp told us about Norfolk Island and its fungi, and Peter Austwick showed an interesting collection of fungal books, both antiquarian and modern, and told us about them. Isawa-san had also displayed some of his postcards and magazine illustrations of fungi, including his magnificent close-ups of myxomycetes. Many of us sighed that we couldn't read the Japanese text.

Next years foray will be held at Pureora Forest Park Lodge in the Pureora Forest Park on the 14–18 April 1998. As the crow flies (not that we have any crows in New Zealand) the lodge is 55 km NE of Taupo at 38°28'S 175°34'E. (About 275 km SSE of Auckland). Further details will be announced at a later date.

Participants

Peter and Joan Austwick, Jan and Peter Riddick, Marie and Lawrie Taylor (Auckland); Ann Bell and Dan Mahoney, Denise Judson, Kalideen Hafeel, Barbara Paulus (Victoria University of Wellington), Annette Ah Chee (Hort Research), Peter Buchanan, Prof. Lao Gao, Peter Johnston, Barbara Segedin (Landcare Research), Angela and Ron Freeston (Lower Hutt), Frank Gibbons and Lindsay Gibbons (Te Puke), Masana Izawa and Hiromi Tanaka (Japan), Don and Gwen Horne (Hamilton), Fran Kell (SIR Publishing), Heino Lepp and Judith Curnow (Canberra), David and Esther McLaughlin (University of Minnesota), Gillian Nicholas (University of Canterbury), Geoff Ridley (Forest Research Institute), Brent Rogan (Ministry of Forestry), Leif Ryvarden (University of Oslo), Steven Whitton (University of Hong Kong).