

## BUSHWALKING AMONG THE CYTTARIA IN PATEGONIA

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Bushwalking in Pategonia is exhilarating, particularly for a botanist and plant pathologist. The name Pategonia refers to the southern Andes, mountainous areas of southern South America and includes parts of both Argentina and Chile. The magnificent snow-covered Andes are crowned with a permanent ice cap. Glaciers extend into the rivers and from these icebergs tumble into both streams and lakes. Mount Fitzroy, named by Darwin after the captain of the *Beagle*, has spires which tower overhead. The lower slopes are covered with forests of *Nothofagus* spp., such as *N. pumilio* [deciduous] and *N. betuloides* [evergreen] in more sheltered valleys. These trees are quite similar to the Australian species, such as *N. cunninghamii*, which is evergreen and confined to fern gullies in Victoria, and *N. gunnii*, which is deciduous and confined to alpine Tasmania. In fact walking tracks are littered with the small, dainty, often beautifully coloured leaves in both countries. However, the understorey is completely different, being mostly grasses, and *Viola maculata* with the occasional large white puffball, *Lycoperdon perlatum* in Pategonia. Further south in Tierra del Fuego there grow shrubs belonging to familiar genera, such as *Drimys winteri* (Hoffmann 1991). Our mountain peppers are now classified as *Tasmannia*. Species of *Gaultheria* and *Pernetia* (Ericaceae), familiar to Australian botanists, are mixed with northern hemisphere plants such as *Fuchsia magellanica*, *Ribes magellanicum* and *Berberis* spp., our common garden plants. The Pategonian gentian is a *Gentianella* sp. belonging to the same genus as the Victorian species. Many plants belong to a genus common to Pategonia and Australia, illustrating the Gondwana history common to both countries.

The walking tracks through the Pategonian beech forests are also littered with attractive beech oranges among the fallen leaves. They are the orange-coloured, golfball-shaped fruiting bodies of the Ascomycete, *Cyttaria* which grows as a parasite on *Nothofagus* trees. Beech oranges are edible, sometimes called llao-llao (pronounced chow-chow), and were consumed with relish by the indigenous inhabitants, according to Darwin on his famous voyage of the *Beagle*. The fruiting bodies are pitted with pentagonal holes leading into tubes through which the ascospores are released. The Victorian *Nothofagus cunninghamii* is often infected with *Cyttaria gunnii* causing galls and producing similar orange fruiting bodies (Figure 1, Fuhrer 1991). In Tierra del Fuego, *N. pumilio*, was infected with *C. darwinii*.

Darwin observed and collected specimens from the *Beagle* voyage, sending them to Berkeley who named and described them in 1841. The fungus did not kill the tree, but produced large knobby swellings on twigs, branches and trunk. The branches with the galls are often shed, and the extra-ordinary growths litter the forest floor (Figure 2). The galls are used commercially. In the hotel at Pehoe, which was situated on a beautiful lake in the mountains, the galls were polished and used to decorate the backs of the dining chairs and to ornament the light fittings. Discs cut from small galls are polished to reveal the intricate grain and sold as drink coasters.

Seven species of *Cyttaria* and their *Nothofagus* hosts are present (Table 1, Feinstein, pers. comm.). The fruiting bodies differ in shape and size, but the fungal parasites are obviously not host specific. Four species of *Cyttaria* were collected, and later described and illustrated from an expedition to southern Chile (Minter *et al.* 1987).

The seven *Cyttaria* spp. are being studied by Dr Susamo Calvelo at the University of Bariloche in Argentina for possible anti-cancer properties (Feinstein pers. comm.).

Recently a large log covered with goose-necked barnacles was washed onto the seashore near Anglesea, eastern Otways, Victoria. Thousands of goose-necked barnacles, *Lepas anatifera*, smothered the 5 m long log. The wood was identified as *N. pumilio* by the well marked spiral thickenings in the vessels, and had evidently come from Pategonia, transported 10 000 miles by ocean currents in the track of westerly winds (Anderson pers. comm. 1997). A log of *N. pumilio* was once recorded from the shores of Port Davey, south-west Tasmania, and the journey was estimated to have taken more than three years (Barber *et al.* 1959).

### Acknowledgments

I have pleasure in thanking Bruce Fuhrer for permission to print Figure 1, Daniel Feinstein, Bariloche, Argentina, and Flora Anderson, Melbourne, Australia, for permission to print their personal comments.

## References

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Table 1. *Cyttaria* spp. parasitic on *Nothofagus* spp. in South America

<i>N. pumilio</i>	<i>C. darwinii</i> <i>C. harioti</i> <i>C. hookeri</i>
<i>N. betuloides</i>	<i>C. darwinii</i> <i>C. harioti</i> <i>C. hookeri</i>
<i>N. dombeyi</i>	<i>C. exigua</i> <i>C. harioti</i> <i>C. johowi</i>
<i>N. antarctica</i>	<i>C. darwinii</i> <i>C. harioti</i> <i>C. hookeri</i>
<i>N. obliqua</i> <i>N. alpina</i>	<i>C. espinosae</i> <i>C. espinosae</i>  <i>C. berteroi</i>

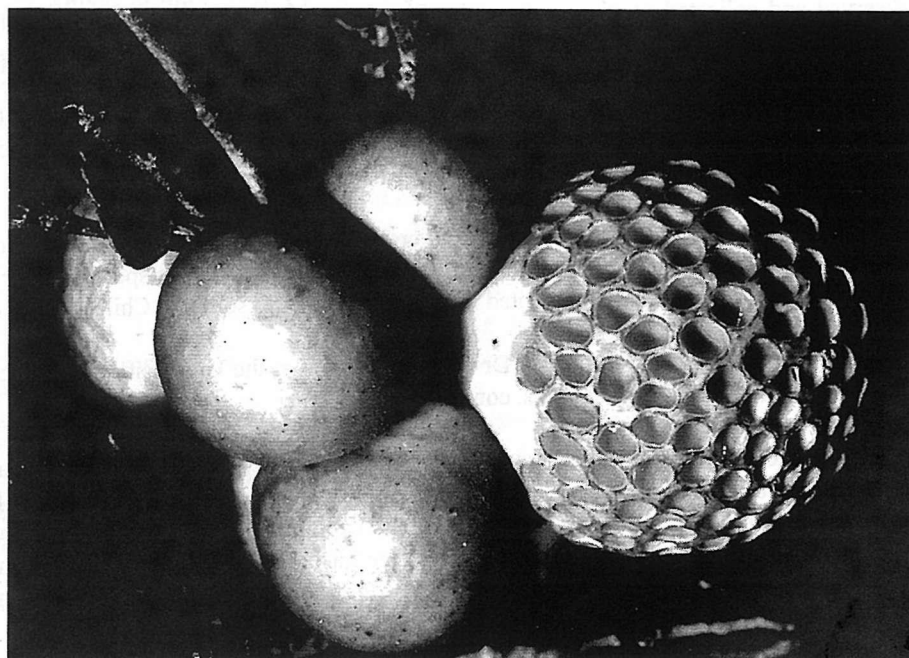
Figure 1. *Cyttaria gunnii*. Photo: Bruce Fuhrer (1985).



Figure 2. *Cyttaria* gall on *N. pumilio*. Photo: G. Weste (1997).

### THE GIANT AGARIC *TRICHOLOMA CRASSUS* (BERK) SACC. REAPPEARS IN QUEENSLAND

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In 1847, Berkeley described a very large agaric from Perideniya in Sri Lanka which he named *Agaricus crassus*. The species was eventually transferred to the genus *Tricholoma* by Saccardo in 1887. Pegler (1986) found that the species *Tricholoma pachymeres* (Berk. & Br.) Sacc. was synonymous and a paper is currently in press to transfer *Tricholoma crassus* and related species to a newly erected genus *Macrocybe* (Pegler, pers. comm.).

*Tricholoma crassus* has now reappeared in Queensland and astonished everyone who viewed the fungus collection by its enormous size. Two basidiomes were collected by J. McLurcan of Russell Island in Moreton Bay on 20 January 1998 and forwarded to the Queensland Herbarium. Each agaric basidiome was about 48 cm in diameter and stood about 30 cm above ground. The cap was probably convex on first appearing but the mature collections were more or less irregularly funnel shaped. The caps are velvety smooth on the upper surface and whitish buff with scaly, cracking, dark brown areas at the centre. The edges of the caps are lobed and irregular and often incurved. The flesh is about 6 cm thick and white. The lamellae were adnexed, probably near sinuate when young, and pale creamish buff. The stipe is smooth, creamy white, 15 cm diameter and 10 cm above ground with at least the same length below ground. There is no ring or volva. There was no smell other than the usual, undescribable 'fungousy' smell. A sketch of the fungus is shown below.

The spore print was white. The spores were oval, smooth, hyaline, non-amyloid. Spore dimensions are yet to be taken.

The group of species to which *Tricholoma crassus* belongs is well known in South East Asia and Pegler (1986) reports that the species is widespread and pantropical in distribution. Apparently it also occurs in 'fairy rings' in open grassland which must be one of the more spectacular fungal eruptions.

I wish to extend my sincere thanks to Mary McGowan of the Queensland Herbarium who brought the fungal collection to my

