

## Conclusions

One can pursue these observations in a comparative context by examining conifers in which the pollen never enters the pollen chamber, but germinate outside the ovule so that the pollen tube itself assumes the responsibility of gamete transfer over a relatively extended distance. This occurs in Araucariaceae, in *Tsuga* (Pinaceae) and *Saxegothaea* (Podocarpaceae). The latter genera provide examples of anomalous non-saccate pollen types in the two families otherwise characterized by pollen with sacchi. This is a process of "extended siphonogamy" that points towards the angiosperm condition in which pollen tube growth through the style of the gynoeceum is necessary because of the angio-ovulate condition. Members of the Araucariaceae approach the condition quite closely; they are virtually angio-ovulate because the pollen does not need to germinate near the ovule (Owens *et al.* 1995). Clearly this is a parallelism in the trend toward the reproductive condition in flowering plants. Wind-pollinated flowering plants have no use for sacchi - they are not involved in a pollen delivery process dependent on the free water of a pollination drop, water is detrimental to pollen function in all but hydrophilous angiosperms.

These observations, set out very briefly, demonstrate the value of a broad comparative approach in studying reproductive mechanisms in plants. Concentration on a limited aspect in a limited range of taxa can never produce basic information that is necessary for biotechnological application. I hope this message is not lost on funding agencies in New Zealand.

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## **"Manuka" and "kanuka"**

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The ancestry of these names for our two *Leptospermum* species, *L. scoparium* and *L. ericioides* (*Kunzea ericioides* to some) does not seem to have been discussed before. The genus is an Australian one, not generally present in the Pacific islands (but see below), and so the Maori, on encountering here in New Zealand, would have had to coin a name for it, or transfer a name from some plant in the country that they had left behind.

Apparently, they did the latter. There is a widespread myrtaceous shrub, *Decaspermum fruticosum*, common at higher altitudes in the islands, and quite similar to the leptospermums in its silky sweet-smelling, smallish leaves and its abundant white blossom. This plant, and closely related species, occur in the Western Pacific and

eastwards to Tahiti, and Whistler (1991) notes their names: nukanuga in Fiji, nu'anu'a in Samoa, nukonuka in Tonga, and (possibly) anu'a in Tahiti. Clearly these names and ours are cognate. A twist to the story is that *Decaspermum* is not found in the Cook Islands, so if this was the Maori homeland, as many suppose, then it has to be hypothesised that some memory of the plant was retained from a previous country (presumably Tahiti), perhaps in song or proverb.

The meanings of the prefixes ma- and ka- are not clear to me, but the first may be indicative of whiteness, and the second, perhaps, of the ability to burn (Williams 1971). The recently published New Zealand English Dictionary (Orsman 1997) traces these two words through our literature, and is particularly interesting on their pronunciation.

It is not quite true that *Leptospermum* is lacking from the Cook Islands. Rather incredibly, *L. scoparium* was collected by Cheeseman in his 1899 visit to Rarotonga. The specimens (AK 74313-5) are undoubtedly correctly identified. They came from Maungaroa, a fairly accessible and well-botanised location. Manuka has never again been seen on the island. All this is a mystery at least as deep as the origin of the Maori name.

Cheeseman did not get a Cook Islands name for his collection. In a notebook he wrote: "Several plants scattered over the eastern slope of Maungaroa growing among *Gleichenia dichotoma* and *Lycopodium cernuum*. Far from all cultivation, and apparently truly wild", and then in his published account (1903) he says: "Several clumps on the south-eastern slopes of Mt Maungaroa ... Doubtless introduced, but I could obtain no evidence of this". Gill & Sykes (1996) note that Cheeseman's diary of his Rarotongan trip ends abruptly, apparently several days before he left to come back. They suggest that wet weather may have forced him to stay inside and work on drying his plants, this boring work not needing to be diarised; but I wonder whether the opposite explanation might be true, and whether between showers Cheeseman went for one last walk up Maungaroa, only to be shocked into silence by a plant that simply should not have been there ...

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## ***Lepidium flexicaule* survey, Rangitoto Island 12 - 14 January 1998**

**Bec Stanley, Steve Benham and Brent Torrens**

In January, as part of a joint co-operation between Department of Conservation and Auckland Regional Council Botanic Gardens the northern and western coast of Rangitoto island was surveyed for *Lepidium flexicaule*, ranked as nationally endangered but presumed extinct in Auckland. The last time this cress was collected on Rangitoto was by Cheeseman in 1882 (AK 4481). Whilst we did not find *L. flexicaule* after searching this stretch of coastline focusing particularly on what looked like suitable sites, this survey was worthwhile as we can at least confirm this species is extinct on Rangitoto. Other parts of the Rangitoto coastline are more accessible and have been searched for this species in the past. The survey also enabled us to investigate possible future translocation sites and make some notes on the vegetation of this less frequently visited area of Rangitoto coastline.

There were several likely habitats for *L. flexicaule* including some seepage areas just north of McKenzie Bay, and a gull colony about halfway between McKenzie Bay and Boulder Bay. It was at the gull colony that we stumbled upon the similar (but introduced) *Coronopus didymus* or twin cress that made our hearts race for a second. This cress has distinctive seeds (from *L. flexicaule*), the mature fruits separate into two ovoid nutlets. The leaves are distinctly pungent, bitter and pepper-like to taste.