REDISCOVERY OF *PLEUROSORUS RUTIFOLIUS* ON BANKS PENINSULA

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Pleurosorus rutifolius (R. Br.) Fée has always held a special interest for Christchurch botanists, because of its extraordinary, inappropriate habitat and its very local occurrence close to the city. Peter Mahan (1988) has retold how Robert Brown[2] kept knowledge of the fern's location to himself, a secret later exploded by Arnold Wall's determined explorations. Wall's search was divertingly described by Gordon Ogilvie (1978, p. 87) as this "gigantic fossick". Wall (1918, p. 7; 1953, p. 25) also wrote his own brief accounts of this episode.

Given (1972) gave a comprehensive analysis of the records then known for *Pleurosorus rutifolius* in New Zealand. He drew attention to the fact that records of recent date (i.e., post-1930) existed for only six localities. Of particular relevance here are the handful of records from Banks Peninsula. Voucher specimens exist for Pigeon Bay (Laing), Mt Herbert, and Camp Bay (both by Wall). None of these are more recent than 1925. Wall (1953, p. 25) also gives "above the Purau-Port Levy road on the northern flanks of Mount Evans", but there is no means of telling when this record was made, or whether and when he last confirmed this or any of his other records for Banks Peninsula.

It was therefore a considerable but welcome surprise to me, on 2nd November 1989, to find *Pleurosorus rutifolius* in a site on Banks Peninsula overlooking Lyttelton Harbour, even though the locality was clearly a `possible' habitat for this fern. The surprise was the greater for two reasons: (1) I was looking for something else - `hot-rocks' *Pellaea*, and (2) the surprise was immediate - *Pleurosorus rutifolius* was present in the very first group of rocks I examined. Only later, on consulting Given (1972), did I discover that the locality was one of Wall's stations for *Pleurosorus rutifolius*. Some ten plants were seen, with another isolated example some distance away. Most of these were plants of some size, and one, under a deep overhang, was very large indeed. This observation is very significant, in view of the extreme and prolonged drought on Banks Peninsula in 1988. There is no way these plants could have grown to such size, had they been established from germination of spores subsequent to the drought breaking. (This opinion is not based on an unsupported assumption about the growth rate of juvenile *Pleurosorus*, because I have experience of raising *Pleurosorus* plants (albeit the European species) from spores under glasshouse conditions.) It follows that the rhizomes must have survived

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[2] NOT the same Robert Brown (R. Br.) who first gave our plant the epithet *rutaefolia*!

the heat and extreme dryness of that recent drought, though of course the fronds would have withered.

In consequence, my own opinion regarding the prospects for survival of *Pleurosorus rutifolius* in New Zealand is optimistic. Indeed, I believe this fern is probably no rarer today than it was 70 years ago. The reason for the lack of recent records of this species on Banks Peninsula is I think simply that none of us have been looking in the right place at the right time. Present-day botanists (*pace* Hugh Wilson!) are not as indefatigeable or as catholic in their wanderings as was Arnold Wall, who became something of a legend in his own lifetime. There is a strong tendency for botanists, when on Banks Peninsula, to concentrate on bush remnants, or else on the montane/subalpine communities. Hot, dry rocks understandably don't normally have much appeal.

Important new records of *Pleurosorus rutifolius* , involving large populations, have been made subsequent to David Given's compilation (e.g., by Brian Molloy, 1980, in the Lowry Peaks Range of North Canterbury, and by Tony Druce in Marlborough). There are also indications that, if conditions are right, it is capable of establishment from spores today; plants have been found in the man-made retaining dry stone walls under the Summit Road at Mt. Cavendish.

David Glenny (1989, p. 51) records *Pleurosorus rutifolius* from a station in the Mount Hutt Ecological District. In describing this as "the first inland Canterbury population to be found in recent years", he was plainly unaware of Molloy's record. He certainly could not have known that in 1956 I found a substantial population on rocks on the north side of the Waitaki Hydro project, because I never published the record or deposited a specimen! (This site is, of course, only just in Canterbury.) Those particular rocks have mostly now gone, in the name of progress, but last October I confirmed the survival of *Pleurosorus rutifolius* on rocks on the north side of Lake Aviemore. It is also present along the Deep Stream track. Take note, however, that the rule of orientation recognised about Christchurch, comprehensively quantified by measurement on Mt. Cavendish by David Given (1972, p. 501), that *Pleurosorus rutifolius* is found only on north-facing rocks, does not apply in the lower rainfall of the Waitaki basin. Searching north-facing rocks there will bring no joy. I confirmed this observation in January of this year, when I located a small population of *Pleurosorus rutifolius* near the mouth of Clear Stream, a tributary of the Otematata River, and therefore just in north Otago. (Here, once again, its associates were `hot-rocks' *Pellaea* and the two New Zealand species of *Cheilanthes*.) Most of these plants had a westerly aspect, but one was facing due south! I find this difference in behaviour quite understandable, because there must be a limit to the heat and dryness that even *Pleurosorus rutifolius* can tolerate.

Remarkable facts about *Pleurosorus rutifolius* may begin with its ecology, but they don't end there. Dismemberment of the unnatural genus

Gymnogramma (otherwise *Gymnogramme*) exposed the extraordinary geographical distribution of Pleurosorus, which still lacks a satisfactory explanation. *Pleurosorus* contains three recognised species; one in Australia and New Zealand, one in Chile (*Pleurosorus papaverifolius*) and one (very locally) in southern Spain and Morocco. Copeland (1947, p. 169) found this distribution so odd that he wrote that it "suggests that the plant was possibly introduced to Spain". However, being aware of the nature of the limestone mountains around Grazalema where *Pleurosorus hispanicus* occurs, I find this idea highly improbable.

Pleurosorus rutifolius is very much commoner in S.E. Australia than in New Zealand, as is well illustrated by the distribution map within Victoria given by Duncan & Isaacs (1986, p. 177). Climatic regimes suitable for the fern are clearly much more widely distributed in Australia.

The first New Zealand author to use the generic name *Pleurosorus* was apparently Marguerite Crookes (Dobbie 1951). Both *Anogramma leptophylla* (the Jersey fern) and *Pleurosorus rutifolius* were included in *Gymnogramme* by earlier New Zealand authors (e.g., Hooker 1867, Cheeseman 1925, Dobbie 1931) but these two ferns are now known to be quite unrelated, being superficially united by a shared feature of convergent retrograde evolution, namely, loss of the indusium (its protective function being taken over by hairs in *Pleurosorus*).

It is now quite clear that *Pleurosorus* is not related to either the adiantoid or pteroid ferns, but instead to the spleenworts, with which it shares a chromosome number of 36 or a multiple thereof. Some years ago I was able to confirm this relationship by synthesising an intergeneric hybrid between *Pleurosorus hispanicus* and *Asplenium petrarchae* subsp. *bivalens*, another Mediterranean taxon (Lovis 1973, plate 2). The European species of *Pleurosorus* was subsequently (Greuter & Burdet, in Greuter 1980) transferred to *Asplenium*, as *A. hispanicum*! If it was considered that we should follow this lead, perhaps for the sake of consistency, then our species ought also to be transferred to *Asplenium*[3]. I have no intention of doing so myself, because I am still unconvinced about the desirability of submerging all the small satellite genera in Aspleniaceae within *Asplenium*. Of course, I can't stop someone else making such a new combination, but, equally, I don't have to accept it or follow it. It is perhaps worth pointing here, since name changes tend to confuse everybody except professional taxonomists (and even them also, sometimes!), that there is no obligation to accept or follow the latest taxonomic change or development, when such a change is solely an expression of individual taxonomic opinion. However, a purely nomenclatural change, like *Cheilanthes humilis* (Forst. f.) Green for *C.*

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[3] As has already been reported elsewhere (Brownsey et al. 1985) this has already been achieved, after a fashion, by the somewhat indirect, means of proposing that the various species recognised within *Pleurosorus* are really only worthy of subspecific rank (Salvo et al., 1982). Naturally, we don't agree with any of this!

sieberi Kunze, (see Brownsey & Smith-Dodsworth 1989, pp. 49/50), which just brings existing usage into line with the International Code of Nomenclature, is mandatory (so long as it has been correctly made) and one has to accept it.

If we were to merge genera wherever intergeneric hybrids are shown to exist or be viable, the result would be some really enormous, totally unmanageable, genera in the Poaceae (Gramineae) and the Orchidaceae. Another consequence would be the disappearance, amongst our New Zealand Asteraceae (Compositae), of some of our best known and most readily recognisable genera. For a start, we would have to combine *Celmisia* and *Olearia*! (See Clarkson 1988). Intergeneric hybrids may be an anachronism, but it is one that has to be tolerated, if we are to have a taxonomy with a basis in commonsense.

Returning to *Pleurosorus rutifolius*, I agree with David Given that the main danger to the species locally is "botanists lacking conservational commonsense". I also note the awesome foresight, in view of contemporary developments, with which he writes also of "engineering projects which could prejudice the existence of the colony" (Given 1972, p. 505).

Despite the incidental success in finding *Pleurosorus*, the excursion mentioned above was not successful in its principal objective, which was location of a viable population of `hot-rock' *Pellaea* on Banks Peninsula. However, two more stations of putative hybrids between *Pellaea* `hot-rock' sp. and *P. rotundifolia* (cf. Glenny 1987, p. 46; Lovis 1987, p. 50) were found that day. Clearly, this particular situation is getting out of control!

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