MECODIUM DILATATUM AND M. ATROVIRENS ON THE PORT HILLS.

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On 29th May this year (1982) we made the extremely surprising discovery of one patch of each of Mecodium (Hymenophyllum) atrovirens and M. (H). dilatatum growing within 2 metres of each other on rock above Allandale in the Port Hills.

The trees in the immediate vicinity of the site are Fuchsia excorticata, Melicytus ramiflorus, Pittosporum eugenioides and Pseudopanax arboreus. The associated ground flora consists solely of other ferns, namely Asplenium bulbiferum ssp. gracillimum, A. flabellifolium, A. hookerianum sens. lat. (variable!), A. terrestre, Blechnum chambersii, Ctenopteris heterophylla, Phymatosorus diversifolius and Polystichum vestitum.

Mecodium dilatatum (Forster f.) Copeland.

This species, endemic to New Zealand, is generally accepted to be not only our largest, but also our most handsome, filmy fern, "A magnificent Fern, the noblest of the genus" (Hooker 1855, p.13).

The only previous record for this species on the Port Hills is for "Ohinitahi, Lyttelton Harbour" made by Potts (1882, p.248). Cockayne (1915) noted that it had been recorded by Potts, but was "probably now extinct". Wall (1918) included M. dilatatum in his list of seven "lost" species of ferns (all of which, excepting only H. 'tunbridgense' are now known to be still living today on the Port Hills). Thompson (1979) does not mention this species.

J.B. Armstrong (1880) listed it for Banks Peninsula (without locality), but Laing (1919, p. 373) wrote that "I have searched the most secluded gullies on the peninsula in vain for this ... species". However, Martin (1920), on the authority of D.G. Riches of Akaroa, who had made observations "since about 1880", gives for M. dilatatum "Hickory and Armstrong's Bush" under the category "former habitats of species not recently noted on Banks Peninsula". The whereabouts of Riches's herbarium is unfortunately not known (Given, pers. comm.), and indeed there is no specimen known of this fern from the peninsula. (There is more than a hint of a contemporary difference of opinion concerning the reliability of Riches's records, for Martin (loc. cit., p.315) while mentioning the "copious collections exclusively from this area" that Riches had made, takes the trouble to state that "many of the localities cited by Riches have been corroborated by Mr Louis J. Vangioni, of Akaroa, and Mr George Penlington, of Christchurch", but not long afterwards Laing and Wall (1924, p.44) state that "as Riches is known to have received many species from the North Island, the evidence of his herbarium is to be accepted with reservation".) Given (1971), in his note on rare and lost ferns in the Banks Peninsula flora, does not mention M. dilatatum.

Our find of Mecodium dilatatum is thus not only a spectacular vindification of Potts' record for Lyttelton Harbour, after an interval of exactly one hundred years, but also the first fully authenticated record for the entire Banks Peninsula volcanic district.

From the very fact that Potts recorded Hymenophyllum javanicum (=atrovirens), from Banks Peninsula, but not from the Port Hills, we can infer that the station we have located for M. dilatatum cannot be identical to that known to Potts, though clearly it must be in the same general district. It must not be assumed from the specific reference to 'Ohinitahi', that Potts knew of M. dilatatum

growing in the immediate vicinity of his home in Governor's Bay, since though Ohinetahi is now applied only to Potts' house (still standing today), Ohinetahi was in Potts' time the name for the district now known as Allandale (Anderson 1927, p. 45).

There can be little doubt that the status here of M. dilatatum (and that of M. atrovirens) is that of a survivor, not a recent recoloniser. The presence of two species, otherwise unknown in the area, on the same site, would appear to place their relict status beyond question.

A voucher frond has been deposited in the DSIR Botany Division herbarium, in order that future generations shall not view our record with the same scepticism as some have tended to regard those of Potts, Armstrong, and Riches.

Mecodium atrovirens (Colenso) Copeland.

This species is evidently not common even in parts of New Zealand where filmy ferns are generally plentiful. Allan (1961, p. 28) describes it as "Apparently rare". Mecodium atrovirens has never before been recorded on the Port Hills. Potts (loc. cit., p. 246) recorded it for Banks Peninsula as H. javanicum Sprengel. It is not included by either Armstrong (loc. cit.) or Martin (loc. cit.). Laing (loc. cit.) cites Potts' record, but records it as H. australe Willdenow. Given (1971) (loc. cit.) does not mention this species, but it has subsequently been discovered on Banks Peninsula, by G.C. Kelly in 1971 in the course of his reserves survey (Kelly 1972, p. 234).

This fern belongs to a poorly understood group (cf Allan loc. cit., pp 25/26). It is generally agreed that Mecodium flexuosum (A. Cunningham) Copeland, with its much divided upright frond, possessing a very wavy wing to the stipe and rachis, is distinct. Brownlie (1959, p. 195) noting that M. australe Willd. is based on Australian material (Copeland's illustration, reprinted in Crookes

(1951, 1963) is of an Australian specimen), stated that "a comparison of specimens from that country and from New Zealand, shows all the local material which has been identified as H. australe to be either H. flexuosum or H. atrovirens". He concludes "that H. australe should be omitted from the New Zealand flora", thus contradicting or countermanding the opinion of Copeland (1940, p. 457), with respect to M. atrovirens, that "Specimens of this species and of Mecodium australe (Willd.),sent me from New Zealand by Professor J.E. Holloway, seem very distinct ... the two are too different in New Zealand to be regarded as forms of a single species".

Subsequently Allan (loc. cit.) did indeed omit australe, while Crookes (1963), though retaining a description and Copland's illustration of australe, writes (loc. cit., p. 66) "There now seems very grave doubts as to whether M. australe actually exists in New Zealand at all". Tindale (1963), who comments "There has been a good deal of controversy about whether H. atrovirens of New Zealand is identical with H. australe collected in Australia". (loc. cit., p. 27), also rejects Copeland's opinion, but in a different way; she regards australe as common to Australia and New Zealand, reducing atrovirens to synonymy under australe.

Not wishing to express any opinion at this time in this controversy, we follow the treatment indicated in Allan's Flora of N.Z., whereby New Zealand plants formerly attributed to M. australe, as distinct from M. flexuosum (and apart from the elusive M. montanum) all now fall under the umbrella of M. atrovirens.

According to this interpretation, our material, with its small, rather sparely divided, hanging fronds, is closest to Mecodium atrovirens, and we therefore refer to it as such, though we recognise that the issue is not as clear-cut as this approach might make it seem. Our

population is variable, containing some fronds with a perfectly plane wing, which conform well to the original description of M. atrovirens, and others in which the rachis wing, and often the wing of the upper half of the stipe, is very distinctly wavy. However, this feature is very much less evident, almost undetectable, in pressed specimens. It may prove to be of significance that the various opinions so far expressed regarding this complex have been formulated principally on the basis of herbarium material. This observation is recorded because Crookes (loc. cit.) uses 'wing much crinkled/wing plane' in her key as the character to separate flexuosum from other members of the group; Allan (loc. cit., p. 26) confirms that "the conventional means of separation" is 'wing strongly crisped/wing plane', but recognises the possibility of flexuosum possessing either a plane or crisped wing in his key (p. 24). Clearly, the entire group does indeed merit more detailed study.

Another curious feature of this population, one also worthy of note, is the attitude of the sori. The receptacles are held in an approximately vertical position, irrespectaive of the alignment of the fronds, which are so pendant as to hang virtually suspended from the rhizome. This results in the sori being reflexed to an acute angle with respect to the lamina, so that they stand away from the surface of the frond in a very distinctive fashion.

Subsequent to our initial discovery, we have located a second smaller patch and a third tiny colony of M. atrovirens at some little distance from our original find.

We cordially thank David Given for help in the D.S.I.R. Botany Division Herbarium.