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Gastrodia minor Petrie, an Epiparasite of Manuka

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Summary

THE non-green orchid, *Gastrodia minor*, obtains its nutrient supplies by the absorption of fungal cytoplasm in the digestive layer of its tubers. The fungus concerned is partially ectotrophic and partially endotrophic on the roots of manuka and behaves, at least in part, as a root-inhabiting parasite.

OCCURRENCE OF *Gastrodia minor*

Gastrodia minor Petrie was first described by Petrie from material collected in the Town Belt, Dunedin, in shady manuka bush (Petrie, 1892), but from this locality it has now disappeared. It is very plentiful at the eastern end of Lake Manapouri growing under the manuka, *Leptospermum scoparium* J. R. and G. Forster, which occurs as a scrub vegetation in clearings in the southern beech forest and as a fringing belt along the shore of the lake. There may be no other plants present except the mosses, *Dicranoloma billardieri* (Schwaegr.) Par. and *Thuidium furfurosum* (H.f. and W.) Jaeg., as an open floor-covering. At the beech-manuka ecotone *G. minor* occurs only 60 cm distant from the larger *G. cunninghamii*, a plant of the *Nothofagus* forests in this area. Neither *Gastrodia* species was found in association with the kanuka, *Leptospermum ericoides* A. Rich., which occurs in groves in some of the clearings. *G. minor* may also be found growing under manuka in the Taihape-Taupo region of the North Island.

DESCRIPTION OF *Gastrodia minor*

An account of the above-ground portion of the plant has been given by Petrie (Petrie, 1892) and further details have been added by Hatch (Hatch, 1948). There is a slender, umber-brown, flowering stem 8–24 cm high bearing 3–9 flowers. The flowers either do not open at all or open very slightly and were not visited by insects so far as could be determined, but in every case a seed-capsule developed. Hatch has already shown that the structure of the flower is such that self-pollination is possible (Hatch, 1954).

Below ground there is a branching system of 2 to 12 tubers, the largest up to 10 mm in diameter and 40 mm in length (Fig. 1). They lie at a depth of about 70 mm in the soil, the new tubers spreading laterally from the old ones rather than growing to a higher level. Interwoven with the tubers are numerous fine manuka roots not more than 12 mm in diameter and often much less, some

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