

YOANIA AUSTRALIS IN THE WAITAKERES

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Yuania australis, a small terrestrial orchid, was first collected in Waipoua in 1955. It has since been found in the Atuanui State Forest, Glorit (the type locality), near Kaukapakapa and at Kirk's Bush, Papakura. Naturally Auckland botanists have wondered whether it occurs in the Waitakere Ranges - botanically one of the best explored areas in the country. Last December 15th we decided to go Yuania hunting and headed for the taraire country in the southwest. Along Lone Kauri Road we stopped near the beginning of the Odlin Timber Track, where there was a shallow taraire-filled valley. After about a ten minute search we found our quarry - a clump of four flower heads of Yuania peeping through the leaf litter a few feet from a taraire trunk. After more searching we found a further three clumps giving in all a total of ten flower heads. The number of flowers per stalk ranged from two to five. Seven of the stalks had no flowers open and the other three had only the lowermost one or two open. None appeared to have yet set seed. We found Yuania at about the same stage in the Atuanui State Forest on November 18th, 1973. As at Atuanui Corybas aconitiflorus was found nearby to the Yuania.

The Waitakere site was very similar to the habitats where Yuania is found at Atuanui. It consisted of a shallow valley with an almost complete taraire canopy. The shrub layer was very sparse and there was little ground vegetation. The accompanying table gives some information on the forest composition based on Alan Esler's circular plot sampling method.

Yuania is a curious plant because it completely lacks the green pigment chlorophyll. Thus it is unable to carry out photosynthesis and manufacture complex carbon compounds using energy from the sun. It depends for its source of these complex compounds on other green plants. Like other non-green orchids Yuania does not directly tap the phloem stream of its host as, for example, does the root parasite Dactylanthus taylori. Rather Yuania obtains its nutriment by "digesting" the living matter of a fungus which in turn extracts nutriment from the host green plant. Ella Cambell of Massey University has studied the association of Yuania and its host (Transactions of the Royal Society of New Zealand, 1970 Vol. 12, pages 5-12) and she finds that the common puffball fungus Lycoperdon perlatum acts as the intermediary, conducting nutriment between the roots of the taraire and the rhizome of the orchid. As there is no direct physiological contact between the orchid and the taraire roots one might expect Yuania to be found in association with trees other than taraire provided the fungus was present. As Lycoperdon is widespread in N.Z. this is probable, but no one has yet managed to find Yuania away from taraire areas. This remains a challenge for the observant naturalist!

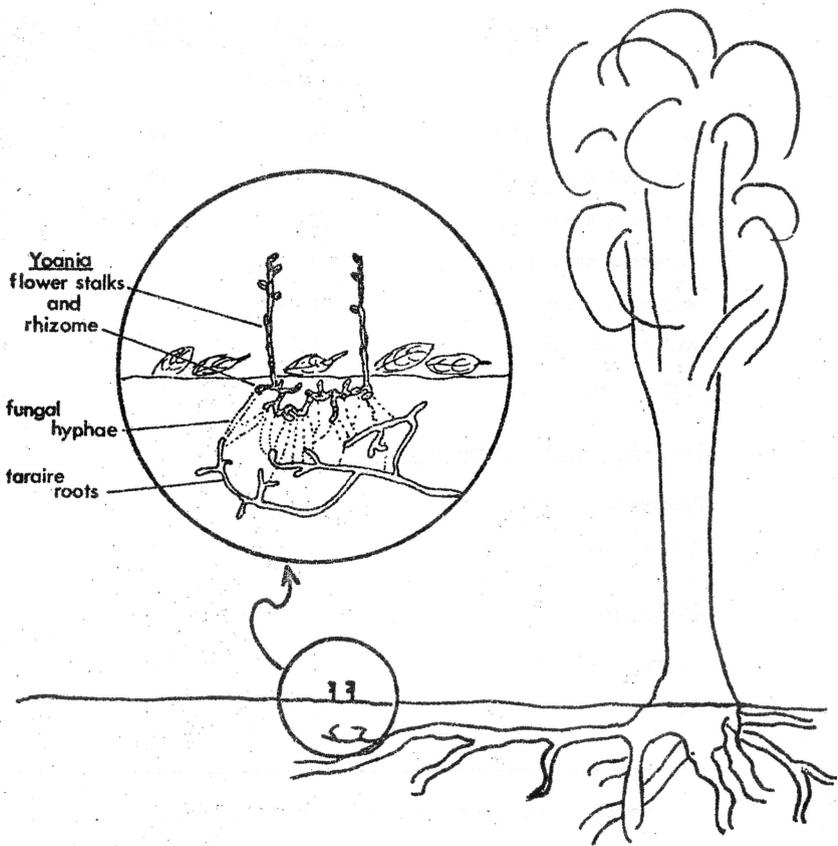


Diagram showing the connection between Yonia and its host

Table: Forest composition at site of occurrence of *Yuania australis* near Lone Kauri Road, Waitakere Ranges.

Canopy (> 4 metres)

	Frequency (No. of plots of occurrence)	Average height (m)	Average cover (%)
<i>Beilshmedia tarairi</i>	5	12	64
<i>Rhopalostylis sapida</i>	5	10	20
<i>Dysoxylum spectabile</i>	3	8	22
<i>Ripogonum scandens</i>	3	9	4
<i>Hedyocarya arborea</i>	2	7	2
<i>Cyathea dealbata</i>	2	6	18
<i>Cyathea medullaris</i>	2	13	16

Shrub-layer (> 1 metre to 4 metres)

<i>Dysoxylum spectabile</i>	2	4	4
<i>Cyathea dealbata</i>	3	3	2

Ground cover

<i>Lastreopsis hispida</i>	3	-	-
<i>Phymatodes diversifolium</i>	3	-	-

1. Based on 5 circular plots of 6 metres diameter.

2. Species recorded in only one of the five plots have been omitted.