

Plants are listed in alphabetic order by genera, but their families are given, an improvement on my older edition. The names are without authorities. Common synonyms are cross-referenced, some of these being old names that persist through the efforts of the nursery trade, *Dracaena australis* for *Cordyline australis*, for example.

Later parts of the book include general gardening advice, a temptingly-photographed guide to botanical gardens, estate gardens, and arboreta (including those of Hawaii, for some reason), and a list of mail-order suppliers. There is a short account of the meanings of the most common Latin and Greek epithets and a guide to the pronunciation of c. 250 common generic names, where we are reminded that "feijoa" is a Spanish word (fayHOEuh), and that "hydrangea" consists of four syllables, not three. The Sunset world though, like ours, seems to be divided into people who give a toss about such things, with no decision being rendered on PitTOSporum or PittoSPORum.

Earlier editions of this work have been huge bestsellers (4 million copies between 1954 and 1994), enabling the current one to be offered at a fraction of the price of its competitors. In value for money, and also in the quality of its information, it is far and away the best gardening book I know of.

***Gastrodia* aff. *sesamoides* in Auckland City (2)**

E. K. Cameron

Auckland City

I read with interest Peter de Lange's article (de Lange, 1995) about the population of the potato or pot-bellied orchid (*Gastrodia* means "pot-bellied"), *Gastrodia* aff. *sesamoides* in Symonds Street, Auckland City discovered in December 1994. Can you imagine my surprise when I discovered a similar city population in another part of built-up Auckland on 8 December 1995. This new one is on the Parnell side of Newmarket, on the corner of Parnell Road and George Street. The orchids are in a planter at the Nestlé Building entrance, again less than 1m from a busy footpath.

The site is a triangular sloping planter, 6 m across with an 8 m tall silver birch tree, a low *Juniper* cultivar as dense ground cover and pine bark over the ground by the orchids. There were 15 orchid stems emergent through the *Juniper* and they were less than 50 cm apart; flowering stems were 24-85 cm tall; flowers per stem (4)-16-28; most flowers were fully open except one stem which was entirely in bud. The flowers were weakly scented, had a long column; perianth pale brown, white at the mouth, darkened towards the base with pale calli (bumps); stem shining pale brown with pale streaks. I vouchered two stems (AK 225971).

Two days later, for comparison, I visited Peter's site in Symonds Street. I counted 31 orchid stems over the bordered area 6 m x 5 m; stems 19-93 cm tall, some of the taller ones were on their side with only an erect tip; flowers per stem 4-46; they ranged from in bud to fully open, some were shrivelled and appeared to have suffered from sap-sucking insects. Under the rich *Casuarina* litter there was a thin covering of pine bark. The orchids were identical to the Newmarket ones.

The Newmarket site is more "up-market", being a well cared for bed in an attractive setting with higher light. The sloping bed with a high tree canopy means the potato orchids are clearly visible

above the *Juniper* ground cover. The flat Symonds Street site is unkept and more shaded with the tree canopy being much lower. There were other planter beds near the Symonds Street site which were more open and most contained bark and various shrubs and trees. Apart from a single onion orchid, *Microtis unifolia*, there were no orchids to be seen in the adjacent beds.

I returned to both sites on 6 January 1996. At Newmarket there were eight dry stems bent over and lying on the *Juniper*, no ovaries had developed. At Symonds Street c. 10 stems were persisting, but only one flower appeared to be swelling, most were shrivelled up with the stem tips curving over. On 13 January the only ovary that looked like it might swell was shrivelled up and a Christmas tree had been dumped into a corner of the bed.

Rotorua

While holidaying in Rotorua I contacted Chris Ecroyd and told him about the Auckland City potato orchids, and asked him about the ones growing in the Forest Research Institute (FRI) grounds. Chris informed me that a couple of years ago he had seen a few potato orchids growing in the bark gardens at the Pak N Save supermarket carpark in Rotorua. On 3 January 1996 I had a look around the extensive carpark but failed to locate any. Later that day Chris found 6 plants of what appeared to be *Gastrodia cunninghamii* (NZFRI 21977). They were past their best. We then spent a couple of hours in the FRI grounds where *G. aff. sesamoides* is locally common under various cultivated trees. We carefully exposed the swollen rhizomes of one clump as I was keen to see how inter-connected the swollen rhizomes ("tubers") were. One fine flowering stem measured 122cm tall! [Could this be New Zealand's tallest orchid? Or is it *Cryptostylis subulata* which has been recorded as 120cm tall (Beard, 1996: 41)?] *Gastrodia cunninghamii* was also present in the FRI grounds. In some places it was virtually mixed in with the *G. aff. sesamoides*. Much of the *G. aff. sesamoides* was in flower, whereas the *G. cunninghamii* flowers were well past anthesis, had swollen ovaries and were also a much darker colouring (stems and flowers). In one place Chris showed me where *G. minor* is also present. All three species within a few metres of each other (*G. cunninghamii* NZFRI 9913, *G. minor* NZFRI 15001, *G. aff. sesamoides* NZFRI 408)! I wonder if this occurs anywhere else in New Zealand?

Taxonomy

Currently there are four *Gastrodia* taxa recorded for New Zealand and only two of these are described (St George, 1994: 47): *G. cunninghamii* and *G. minor*. The name *Gastrodia aff. sesamoides* is used to separate the New Zealand taxon from the Australian *G. sesamoides s.str.* which is now regarded as different (see Ogle, 1994: 9). The fourth New Zealand taxon is *G. "long column"* (see Wilson, 1982: 294).

Below the ground

Below the ground the flowering stem is attached to an enlarged rhizome up to 8 cm long x 3 cm broad and 2 cm deep (Campbell, 1964), occurring simply or occasionally 2-4 joined together. The plants that Chris Ecroyd and I unearthed from under a large *Thuja plicata* in the FRI grounds had rhizomes up to 7.6 x 2.6 x 2 cm and it appeared that more than four tubers were joined together (AK 224770, 224772). Roots were evident coming from the fleshy rhizomes, some were coralloid-like.

Campbell (1964) interpreted the *Gastrodia aff. sesamoides* from Silverdale behaves as an epiparasite on the roots of Tasmanian blackwood (*Acacia melanoxylon*). A fungus, thought to be the widespread *Fomes mastoporus*, occurs both as a root-inhabiting parasite in the *Acacia* roots and also as an endophyte in the roots and rhizomes of the *Gastrodia* (Campbell *op. cit.*).

Campbell also recorded the tubers as usually lasting for one season only; and that the orchid has only a limited rhizome system compared with *G. cunninghamii*, but that the possession of roots up to 13 cm long adds to its possibilities for making contact with its "host". The FRI orchids were certainly intimately associated with the roots of the *Thuja* with the orchid tubers lying horizontally just under the feeding roots of the conifer in thick humus. Fine rhizomes/roots were evident from the fleshy orchid rhizomes.

Campbell (1980: 13) in a summary of New Zealand orchids records the work of Burgeff (1936), that showed saprophytic orchids (which include *Gastrodia* spp.) can utilise a wide range of complex organic substances including bark and lignin by secreting enzymes which oxidise the tannins in bark and so make available the other substances in the cell walls.

Auckland localities

As Peter (de Lange, 1995) recorded, no species of *Gastrodia* appear to have ever been common in the mainland Auckland region. Within the Auckland region the following *Gastrodia* have been recorded (based on AK, AKU, CHR, WELT herbarium specimens, published records and E.D. Hatch *pers. comm.*):

<u>Locality and fl stems</u>	<u>Date</u>	<u>Reference</u>
1. <i>Gastrodia</i> aff. <i>sesamoides</i>		
<u>Kaipara Ecological District (ED)</u>		
Woodhill Forest, Kawau Crk	Nov. 1962	Bruce Roy*
Woodhill Forest, Coal Seam Hill (c. 5 fl stems)	Jan. 1986	Cameron 3836 & Bellingham, AKU 19090
Woodhill Forest, upp. Wainui Inlet (4 fl stems)	Nov. 1987	Wright 7891, AK 179251; Cameron 4614, AKU 20458
<u>Rodney ED</u>		
Silverdale, Bankside	Dec. 1945	Bartlett, AK 108992
≡	Nov. 1946	Bartlett, AK 24593
≡	Dec. 1947	Bartlett, AK 24592
≡	Dec. 1953	Olsen, AK 155155
≡ (c. 10 fl stems)	Dec. 1959	F.W. Bartlett*
≡ (c. 12 fl stems)	Nov. 1962	Campbell 1964: 238
Glorit, Mt Auckland (3 fl stems)*	Jan. 1964	Hatch 1964; & Beever, CHR 195662
≡	Dec. 1966	Horsman 1967
<u>Tamaki ED</u>		
Henderson, cnr Swanson & Rathgar Rds (1 fl stem - never reappeared)	1959	Brook, AK 69193, and P.J. Brook <i>pers. comm.</i>
Swanson, Scenic Dr. just below rail bridge (few isolated fl stems)	Oct. 1966	Horsman 1967 and J. Cole <i>pers. comm.</i>
Greenhithe, Isobel Rd (25 fl stems)	Dec. 1966	E.D. Hatch 1968; & Hatch CHR 181615
≡	Dec. 1967	Hatch, CHR 191668
Coatesville, Mahoenui (1 fl stem)	Jan. 1969	E.D. Hatch 1969
≡	Feb. 1969	Smith, CHR 189030
Symonds St (8 fl stems)	Dec. 1994	de Lange, AK 221396- 397

≡ (31 fl stems)	Dec. 1995	<i>pers. ob.</i>
Newmarket (15 fl stems)	Dec. 1995	<i>Cameron 8340,</i> <i>AK 225971</i>
<u>Inner Gulf Is ED</u>		
Waiheke Id	Dec. 1923	<i>Matthews, AK 200471</i>
<u>Little Barrier ED</u>		
Behind bunkhouse	Dec. 1978	<i>Beever 78070, CHR</i> <i>362280</i>
<u>Great Barrier ED</u>		
Great Barrier, Port Abercrombie	1867-68	<i>Kirk, WELT 19077</i>
Kaiarara	Dec 1867	<i>Kirk, WELT 19075</i>
Near Port Fitzroy	Dec. 1938	<i>Mason, CHR 22232</i>
Tramline Track (few fl stems)**	Dec 1986	<i>Sykes 384/86 CHR</i> <i>437535</i>
Central Gt Barrier (3 different sites)	Nov.-Dec. 1964	<i>Cooper, AK 119011 &</i> <i>119065 & 119744</i>
Northern Gt Barrier (1 site) (few fl stems)	Jan. 1983	<i>Taylor, AK 161005 &</i> <i>AKU 14122</i>
2. <i>Gastrodia minor</i>		
<u>Waitakere ED</u>		
Spraggs Bush (1 fl stem)	Dec. 1980	<i>Braggins, AK 151985</i>
≡ (3 fl stems)	Dec. 1981	<i>Cameron 937,</i> <i>AKU 13618</i>
3. <i>Gastrodia cunninghamii</i>		
<u>?Tamaki ED</u>		
Hobson's Glen (locality & det.?)	1886	<i>Kirk, WELT 19076</i>
<u>Little Barrier ED</u>		
Forest c. 1200'	Dec. 1965	<i>Hamilton, CHR 141185</i>
<u>Great Barrier ED</u>		
Gt Barrier	1867-68	<i>Kirk, WELT 77826</i>
Northern Gt Barrier (few fl stems)	Jan. 1983	<i>Wright 5372, AK 160883</i>

≡ = from exactly the same population as above

* = *pers. comm.* E.D. Hatch, 1996

** = *pers. comm.* W.R. Sykes, 1996

Note: there are no herbarium specimens supporting *G. aff. sesamoides* for the Waitakere Range (cf. Mead, 1969 & Gardner, 1982), although the Swanson record is very close.

Origin of the Auckland City orchids

Clearly the non-city Auckland *Gastrodia* populations are few in number, few in flowering stems and far between. The closest record to the city is at Greenhithe in 1966, some 12 km away; next

closest are the Henderson/Coatesville records which are 16-18 km away, 1959-1967. Therefore local origin seems most unlikely for the city plants even if we are creating ideal *Gastrodia* habitats. The associated cultivated plants, "hosts", with the Symonds Street and Newmarket orchids are different species, but what the two sites had in common was pine bark over the ground.

Therefore one possibility is that the orchids have been accidentally transported to Auckland in the crushed pine bark as seed. Most of Auckland's crushed bark comes from the central North Island, particularly Kinleith (R. Bale of Fence Crete *pers. comm.*, 1996). *G. aff. sesamoides* and *G. cunninghamii* are known to be locally common in some of the central North Island pine plantations. The orchid seeds (most orchid seeds are long-lived) could be lodged in the bark and remain during the bark peeling and crushing process. If *Gastrodia* is also able to act as a true saprophyte (rather than restricted to life as an epiparasite) and utilise bark, then this would be a great advantage when the seeds germinate in an established bark garden.

The other possibility is that the *Gastrodia* was already growing in amongst the roots of the cultivated woody plants before they were planted in the bark gardens. If at least fragments of the orchid's fleshy rhizome survived the planting process then they could become established. It is possible for nursery stock to come from a *Gastrodia* area. I believe this origin is most unlikely because nurseries would have recorded such obvious orchids if they appeared amongst their plants and potato orchids are virtually unknown in cultivation.

From their initial establishment in the bark garden the orchid may be spreading only vegetatively. The Newmarket population less than 50 cm across is most likely to be connected (based on what I observed at the FRI excavated site) and therefore of recent origin. The Symonds Street population covering 6 x 5 m would clearly be much older if it has only spread vegetatively.

The absence of seed set in one season at both sites supports this single establishment theory. Possibly the pollinator is absent or they may require to be out-crossed? Campbell (1980: 9) reports that Hatch found that *Gastrodia cunninghamii* and *G. minor* appeared suited to cross-pollination and that self-pollination is also possible. In Australia *Gastrodia sesamoides s.str.* have both self pollinated and insect-pollinated forms (Bates, 1978).

Conclusion

It would be good to know more about the pollination, germination and seed viability of *Gastrodia aff. sesamoides* and whether it always acts as an epiparasite requiring a living "host" root for nutrients or whether it can live as a true saprophyte as well. On the present evidence it appears *G. aff. sesamoides* is being accidentally transported to Auckland City as seed in crushed bark from the central North Island and vegetatively spreading in two Auckland bark gardens. This type of dispersal is rather similar to the accidental movement of *Cassytha paniculata* southwards (see Cameron, 1995).

I wonder where and when the next Auckland City population of *Gastrodia* will be found and which species it will be?

Acknowledgements

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O Ye Vitex and Carex, Bless the Lord

Submitted by Helen Preston Jones

Words by Jessica Beever to music by Andrew Carter. The original is a section, Badgers and Hedgehogs, from Carter's Benedicite written as a result of inspiration from the new carvings made for the part of York Minister destroyed by fire.

O ye Vitex and Carex, bless the Lord.

O ye Vitex and Rubus and Carex, bless the Lord.

O ye Vitex and Rubus and Rumex and Juncus and Carex, bless the Lord.

O ye Clematis and Cassytha, Passiflora and Sicyos,
Samolus and Sophora and Schefflera and Sonchus
And Vitex and Carex, bless the Lord.

O ye Fomes and Phoma and Fissidens and Physcia,
Lindsaea and Lycopodium, Phylloglossum and Phymatodes
And Vitex and Carex, bless the Lord.

O ye Pterostylis and ye Corybas and Bulbophyllum and Orthoceras,
Dawsonia and Dingleya and Dacrycarpus and Agathis
And Vitex and Carex, bless the Lord.