

Sebaea ovata (Gentianaceae) and its habitat near Wanganui

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ABSTRACT

Sebaea ovata, once a widespread yet localised "gentian" in New Zealand, had its last confirmed sighting in 1971. The discovery in 1989 of numerous plants in a dune hollow on conservation land near Wanganui offers the prospect of maintaining this population and protecting the species as part of the indigenous flora.

INTRODUCTION

Sebaea ovata, an annual herbaceous member of the Gentianaceae, was recorded by Hooker (1867) as occurring in Australia, Tasmania, and New Zealand. Habitats included "bogs at Hokianga, A Cunningham; grassy places, Ahuriri [Napier], Colenso; Port Cooper [Lyttleton Harbour], Lyall". The Hokianga plants originated "in bogs at Mangamuka, Hokianga - 1834. R Cunningham" (A Cunningham, in Allan 1961).

Collections made since the publication of Hooker's "Handbook" and held in New Zealand herbaria are listed in Table 1. Several apparently early collections lack collection dates and specific locations, but *S. ovata* certainly occurred last century in scattered localities from Northland to Hawkes Bay and Canterbury.

Kirk's collections from Canterbury (two in WELT, one each in WELTU, AK) are all undated. Location on two is given as "Lake Ellesmere", and "Lake Ellesmere Flat near Lincoln" appears on the other two (Table 1). Actually the label on WELTU 5762 is not in Kirk's handwriting and reads "Ellesnore" instead of Ellesmere, but both Bryony Macmillan and Barry Sneddon (pers. comms.) attribute this to a mis-reading of Kirk's original label. Bryony Macmillan points out that Kirk's itinerary (in Hamlin 1965) shows he was collecting between Lincoln and Lake Ellesmere on 20 November 1883, which is the basis for that date in Table 1.

All records from the Wellington area were made early this century. Since then, all collections have originated from coastal dunes of the Wanganui, Manawatu, and Horowhenua Districts in the south-west of the North Island. There is one unconfirmed sighting of a few plants of *S. ovata* on the south head of Hokianga Harbour "several years ago" (Peter de Lange, pers. comm.).

In "Rare and endangered plants of New Zealand" (Given 1981) *S. ovata* was listed with an indeterminate conservation status, ie a species which is probably threatened but for which there is insufficient information to state whether the species is "rare", "vulnerable", "endangered", or even "extinct". This indeterminate status has been maintained in unpublished revisions of the threatened plants checklist by David Given and various co-authors, largely because there were no recent records of it.

This article reports the re-discovery of *S. ovata* in January 1989, and subsequent observations of the plants.

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Herbarium	Collector	Date	Location	Notes
Armstrong herbarium, on loan from Christchurch Botanic Gardens No. 6293	J B Armstrong	1869	Little Rakaia [Canterbury]	-
CHR 332485	J B Armstrong	-	Banks Peninsula	-
AK 11584A	J B Armstrong	-	Canterbury Plains	-
WELT 23420 AK 7154	W Colenso	-	Ahuriri [Napier]	-
WELT 47854	A Hamilton	-	Hawkes Bay	-
WELT 47837 (Herbarium of T Kirk)	Mr Tryon	-	Waimarama [South of Napier]	On cliffs (clay)
WELT 47624 (Herbarium of Wm Martin)	-	-	Lake Coleridge (or L Sarah)	-
AK 7132 (perhaps = WELT 47849)	Kirk	Perhaps all on 20.11.1883 (see text)	Lake Ellesmere	-
WELTU 5762 WELT 47847	T Kirk		Lake Ellesmere Flat near Lincoln	-
AK 7153	B C Aston and T F Cheeseman	-	Cape Turakirae [Cook Strait]	-
CHR 332486 WELT 47848	B C Aston	-	Palliser Bay	-
WELT 47836, 47855 (prob. = CHR 332487, and close to Petrie's specimen WELT 6232)	B C Aston and D Petrie	2.2.1912	East of mouth of Orongorongo River, South Wellington	Wet land near sea, largely among large rocks
CHR 17645	H H Allan	20.4.1935	Foxton	Old salt meadow
CHR 23272	H H Allan	6.12.1939	Foxton	Salt meadow
CHR 77220	L B Moore	17.11.1946	Hokio Beach (west of Levin)	Flats between sand dunes
CHR 159786	A P Druce	Dec 1964	Hokio Beach (west of Levin)	Sand flat
CHR 197172	A P Druce	Nov 1967	Turakina Beach, Rangitikei District	Flowers not observed to open
WELTU 7215	B V Sneddon & A P Druce	14.12.1967	Hokio Beach	Inter-dunal hollow along with various rushes and sedges
WELTU 15678	K G Ryan	30.8.1971	Hokio Beach	Dune hollow, dune vegetation
CHR WELT 15677	C C Ogle	23.1.1989 6.2.1989	Whangaehu River mouth near Wanganui	(See text of this paper)

Table 1: herbarium collections of *Sebaea ovata* in New Zealand (in chronological order where date of collection is known). AK = Auckland Institute and Museum; CHR = Botany Division, DSIR, Christchurch; WELT = National Museum, Wellington; WELTU = Victoria University of Wellington.

REDISCOVERY OF *SEBAEA OVATA*

Members of the Wellington Botanical Society and Wanganui Museum Botanical Group held a combined field excursion over the period 21-23 January 1989. On 23 January, the party drove through the pine forests of the old Forest Service's Harakeke Block of Lismore Forest, south-east of Wanganui. Near the mouth of Whangaehu River is an unplanted area of some 250ha of dunes in predominantly native vegetation (Figure 1), locally known as the Harakeke Dunes.

On two brief visits to these dunes in 1988 I had noted a wide variety of native plant communities, particularly in dune hollows. One, a damp sandy flat

covered in short turf vegetation, I had ear-marked for a closer inspection on the January trip. Once gathered at the site, the entire party immediately fell to hands and knees, noting species such as sand gunnera¹, a round-leaved form of *Selliera radicans*, native lobelia, a small sedge (*Schoenus nitens* s.s.), and a milfoil (*Myriophyllum votschii*). There were some adventives, too, such as hawkbit, stunted plants of Yorkshire fog, and a few centaury plants, pink flowered members of the gentian family.

It was some minutes and 20-30m from the start of our slow crawl of discovery that we encountered some slender erect herbs with tiny, bright yellow flowers. Though most plants were fastigiately branched, they were clearly similar in general form to the centaury plants, and hence in the gentian family.

None of us was sure as to whether we were among plants of the long-lost native species, *Sebaea ovata*, because we lacked suitable reference books in the field. However, we took photographs, and also two of the 50 or more plants around us as voucher specimens. Their identity was later confirmed by both Tony Druce and staff of Botany Division at Christchurch.

Habit and habitat

Figures 2 and 3 show the form of *S. ovata* and some details of its flowers. Each flower has five petal lobes which, in warm and sunny conditions just separate to expose the stigma (Figure 3.) Live plants have pale yellow-green foliage and stems, but after flowering the plants die, mostly remaining erect and pale brown. Flowering plants seen at the Whangaehu River dunes are 40-140mm tall,



Fig. 1 Right bank of mouth of Whangaehu River. Marram is in foreground, damp dune hollow beyond with clumps of *Isolepis nodosa*; toetoe in distance. January 1989.

Photo: Y Cave.

¹Formal names of plants are given in Appendix 1.

although Allan (1961) gives plant height as being up to 250mm¹. Specimen WELTU 7215 is about 230mm.

Because there does not appear to be a sketch or photograph of New Zealand plants of *S. ovata* in other publications, it is hoped that this paper will lead to more discoveries of the species. The plants are not large but because there are few other erect dicotyledon herbs in their sand dune habitat they are quite conspicuous.

Visits to Harakeke Dunes from February-May 1989 have revealed juvenile (non-flowering), flowering, and dead plants on each occasion. The colony of many hundreds of plants is now known to extend over an estimated area of 20m × 200m, with sparse or more dense patches of *S. ovata* in pockets separated by clumps of club sedge. On 2 July 1989 much of the same hollow was under water up to 100mm deep. A thin sheet of ice covered the surface, the result of frost the previous night. A short search revealed only three plants of *S. ovata*, each with a mixture of green and dead leaves.

On 21 February a one-metre square quadrat was placed over several of the densest patches. The highest density of *S. ovata* was 71 plants/m². Plant cover was measured in this quadrat, with the results in Table 2. Non-vegetated substrate (damp sand, rabbit droppings, dead leaves and small twigs) accounted for 40% of the cover. A flowering plant was dug up in a turf of some 100mm diameter, and potted in my greenhouse. The parent plant died soon after, but by April numerous seedlings appeared in its place. By mid-June there were 42 seedlings, the largest being 20mm tall with four pairs of leaves.

For continuous establishment of its seedlings, *S. ovata* needs short-stature, open vegetation with bare ground between the plants. The life-span of individual plants is not yet known, but is likely to be less than six months. Since flowering plants were present each month between January and May, it seems that there is production of seeds over a considerable part of each year. This allows the species to take advantage of open ground at any time.

Adventive plants are now common in dune hollows suitable for *S. ovata*. Even in the quadrat with a maximum density of *S. ovata* plants (Table 2), by far the most abundant species is hawkbit, whose leafy rosettes effectively cover bare ground. Throughout the area occupied by *S. ovata* there are other adventive plants, Yorkshire fog and strawberry clover being the most common. *S. ovata* appears to be unpalatable to rabbits. Rabbits may, in fact, help its survival by reducing the cover of adventive plants, and if rabbit numbers were to be much reduced *S. ovata* could disappear. This is to be tested experimentally with a rabbit enclosure.

¹Australian plants bearing the same name are described as being about 500mm tall (Harris 1970). The same author states that *Sebaea ovata* occurs in "montane habitats in New South Wales, Victoria and Tasmania", while Galbraith (1977) gives its habitat as grassland from southern Queensland to Tasmania. The Field Naturalists' Club of Victoria (1928) states that around Melbourne *S. ovata* occurs in grassland on basalt plains, forest country, and in dwarf scrub. No Australian publications that I have seen make reference to coastal habitats. Such differences in form and habitat compared to New Zealand plants suggest that there may be different taxa under the name *S. ovata*. Allan (1961) accepted that New Zealand plants belonged in *S. ovata*, but cited the view of Allan Cunningham in 1839 that they differ from true *S. ovata* in several details, including their more slender form. Hooker's opinion, that Tasmanian specimens do not differ significantly from New Zealand plants, was also cited.

Vegetation of the dunes

Spinifex, pingao, and sand daphne are common on the foredunes, with club sedge, tauhinu, and sand coprosma increasingly common on dunes away from the sea. In dune hollows there is a wide variety of plant communities, ranging in stature from matted salt marsh plants, dominated by *Selliera* and *Samolus repens*, to taller jointed rush with club sedge, sand iris and *Schoenus nitens*.



Fig. 2 *Sebaea ovata* in mat of *Gunnera dentata*, Whangaehu Dune hollow. January 1989.
Photo: Y Cave.



Fig. 3 Close-up of flowers of *Sebaea ovata*. January 1989.
Photo: Y Cave.

Some hollows contain even taller shrubland of *Coprosma propinqua*, *Olearia solandri*, toetoe, and occasional cabbage trees, over-topping a dense sward of sand coprosma and jointed rush. Close to the river are freshwater swampy patches with flax and jointed rush. New Zealand mint plants grow to 600mm tall among the rushes.

Adventive plants are locally conspicuous; marram on the foredunes, pampas, evening primrose, and boxthorn further back. In July 1989, a start was made in a programme to eliminate boxthorn and pampas. Small plants were pulled and larger plants were cut, followed by poisoning of the stumps. Tree lupins, once abundant, have recently all but disappeared. Grazing by uncontrolled cattle, probably aided by rabbits, has induced some patches of rough pasture, but fencing to exclude cattle was completed in July 1989.

The flora of Harakeke Dunes is currently known to total 190 species, 87 of them indigenous. In addition to *Sebaea ovata*, there are several other notable occurrences, including pingao, sand daphne, and sand iris, the last-named a much-depleted and very rare species in the North Island. I found a single plant of a previously unrecorded *Coprosma* hybrid, *C. acerosa* × *C. propinqua*, here in April 1989. *Mazus* sp. (*M. pumilio* auct. NZ) and *Isolepis basilaris* are two other nationally uncommon plants of the dune hollows.

The future

The Harakeke Dunes were allocated to the Department of Conservation in 1987, and legal protection as a Scientific Reserve is currently being investigated. This will strengthen the Department's capacity to deal with unauthorised off-road vehicles and cattle, and to finance weed control. The area is probably the largest relatively natural dune system in the Foxton Ecological District (which extends from near Hawera to Paekakariki), and will be a nationally significant protected natural area for its representative dune communities.

The presence of several nationally threatened plant species makes the Harakeke Dunes additionally important. *Sebaea ovata* is the rarest of these in New Zealand, and ensuring its survival must be a priority in future management of the area.

Species	Cover(%)
<i>Leontodon taraxacoides</i> (hawkbit)	28
Bare sand	18
Litter	16
<i>Schoenus nitens</i> s.s.	14
<i>Gunnera dentata</i> var. (sand gunnera)	6
Rabbit droppings	6
<i>Sebaea ovata</i>	4
<i>Holcus lanatus</i> (Yorkshire fog)	4
<i>Leptocarpus similis</i> (jointed rush)	2
<i>Juncus caespiticus</i>	2
	TOTAL = 100%

Table 2: Species cover in a one-metre square quadrat containing 71 *Sebaea* plants. Estimates based on 50 points at 50mm intervals along diagonals of the quadrat. 21 February 1989.

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Footnote

On 13 August 1989, after I had completed this paper, Graham Randle and I discovered some dead *Sebaea* plants in a dune hollow on the true right of the Waitotara River mouth, 40km north-west of the Harakeke Dunes. The size and extent of this population will be assessed in the summer when new plants appear.

APPENDIX 1: Formal Names of Plants named in the text

<i>Common Name</i>	<i>Formal Name</i>
boxthorn	<i>Lycium ferocissimum</i>
cabbage tree	<i>Cordyline australis</i>
centaury	<i>Centaureum erythraea</i>
club sedge	<i>Isolepis nodosa</i>
evening primrose	<i>Oenothera stricta</i>
flax	<i>Phormium tenax</i>
hare's tail	<i>Lagurus ovatus</i>
hawkbit	<i>Leontodon taraxacoides</i>
jointed rush	<i>Leptocarpus similis</i>
marram	<i>Ammophila arenaria</i>
native lobelia	<i>Lobelia anceps</i>
New Zealand mint	<i>Mentha cunninghamii</i>
pampas	<i>Cortaderia selloana</i>
pingao	<i>Desmoschoenus spiralis</i>
sand coprosma	<i>Coprosma acerosa</i> var. <i>acerosa</i>
sand daphne	<i>Pimelea arenaria</i>
sand gunnera	<i>Gunnera dentata</i> var. (= <i>G. arenaria</i>)
sand iris	<i>Libertia peregrinans</i>
spinifex	<i>Spinifex sericeus</i>
tauhinu	<i>Cassinia leptophylla</i> var. <i>leptophylla</i>
toetoe	<i>Cortaderia toetoe</i>
tree lupin	<i>Lupinus arboreus</i>
Yorkshire fog	<i>Holcus lanatus</i>

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