



A new species of *Lepidium* (Brassicaceae) in the Cook Islands

W. R. SYKES

Allan Herbarium, Landcare Research, P. O. Box 69040, Lincoln 7460, New Zealand; email: sykesw@landcareresearch.co.nz

Abstract

Lepidium makateanum is a small, erect, densely bushy shrublet confined to areas of makatea (raised coral) on Miti‘aro in the Ngaputoru Group north-east of Rarotonga. It is closely related to *L. bidentatum*, a common coastal species throughout East Polynesia. On some other islands of East Polynesia, other taxa are also said to be closely related to *L. bidentatum*, but none represent the Miti‘aro plant.

Keywords: makatea, Miti‘aro, Ngaputoru Group

Introduction

The genus *Lepidium* Linnaeus (1753: 643) belongs in the tribe Lepidieae of the Brassicaceae. There are about 250 (Al-Shehbaz, 2012) species distributed across temperate and subtropical regions with a few in the tropics. Four species grow wild in the Cook Islands (Sykes, unpublished), two of which are introduced weeds originating in temperate regions of the Northern Hemisphere. They are *Lepidium didymum* Linnaeus (1767: 92) and *L. virginicum* Linnaeus (1753: 645), both being different in significant ways from the two indigenous species. Thus, *L. virginicum* has dull green deeply dissected rosette leaves and 2 stamens instead of 4 or 6, whilst *L. didymum* is prostrate or semi-prostrate with deeply dissected leaves and only partially dehiscent broad rounded silicles. This leaves the indigenous *L. bidentatum* Montin (1778: 324) (often called *L. piscidium* Forster (1786: 46)) and the main subject of this note, a hitherto undescribed species confined to the small island of Miti‘aro in the Ngaputoru Group N.E. of Rarotonga. There it grows among outcrops of makatea (jagged uplifted coral) in the east and north-east of the island within a kilometre or so of the makatea cliff edge above the modern reef. *Lepidium bidentatum* is also common on Miti‘aro, growing in coastal areas as well as further inland in the open scrub covering most of the makatea. In certain places the two taxa occur in the same area but usually they are separated spatially as well as having morphological differences but there is no doubt that these two *Lepidium* species are closely related. *Lepidium makateanum* is a small shrublet, usually dense and compact with stems densely puberulent and an inflorescence elongating to *c.* 40 mm, while *L. bidentatum* is a herb or subshrub of variable but usually open habit, sprawling to almost erect with stems and inflorescence glabrous or almost so and the inflorescence elongating to *c.* 300 mm.

Lepidium bidentatum is widespread in the South Pacific from New Caledonia to Hawai‘i and much of French Polynesia but nowhere does it have the distinctive characters of the Miti‘aro endemic species, although there are other makatea islands there, especially in the Taumotu Group, where *L. bidentatum* also grows. In Hawai‘i *L. bidentatum* is widely distributed and variable, but in addition to this species there are two other indigenous species of *Lepidium* (Wagner *et al.* 1990). Both of these species are said to be presumably derived from *L. bidentatum* (Wagner *et al.* 1990, p. 405), and one of them has significant resemblances to the Miti‘aro *Lepidium*. This is *L. arbuscula* Hillebrand (1888: 10), a localised endemic on the leeward side of the mountains on O‘ahu. It is small puberulent shrub 60–120 cm high with the coriaceous leaves crowded towards the shoot apices and as in the Miti‘aro plant the woody stems have prominent semi-circular leaf scars. The flowers and seeds, excluding the puberulent sepals of *L. arbuscula*, are similar in the two taxa. However, the leaves and silicles of *L. arbuscula* are broader, the former having serrate margins from the apex nearly to the base. The inflorescences of *L. arbuscula* are also much more conspicuous because the racemes are much longer than in the Miti‘aro species.

rosette leaves ephemeral; cauline leaves concentrated in upper part of stems, sessile or shortly and indistinctly petiolate, glabrous; lamina to c. 3×0.7 cm, from almost narrow linear to oblanceolate or narrow oblong-oblanceolate, usually entire, occasionally with up to 4 small lateral teeth; base attenuate, apex from almost rounded to acute or mucronate. Inflorescence of erect simple racemes to 4 cm long; pedicels 2–4 mm long, elongating to c. 8 mm in fruit, puberulence of raceme rachis and pedicels as on stems. Sepals 1–1.5 mm long, \pm broadly elliptic, almost glabrous except sometimes for a few hairs outside down the centre; margins white or translucent white. Petals 1.5–2.3 mm long, spathulate or oblanceolate to broad obovate, white; limb 0.6–1.2 mm wide. Stamens 6 (< petals, longer ones only slightly less); anthers c. 0.5 mm long. Silicles 4.5–5.5 mm long, rounded-elliptic, often as wide as long; apically notched with style shortly exerted. Seed 2–2.5 mm long, obovoid, somewhat flattened, tending asymmetric, medium brown, minutely papillate, with a narrow groove around position of the plumule; radicle incumbent. Flowering occurs throughout much of the year but the main period is probably in the cooler months from June to September.

Distribution and habitat:—Southern Cook Islands, Ngaputoru Group, Miti‘aro. *Lepidium makateanum* is only found in a few northern and eastern parts of the coastal makatea in open places and in low scrub. Locally common where it does occur.

Etymology:—The Latin name denotes the habitat, much of the island of Miti‘aro being composed of raised jagged coral rock or makatea that is such a feature of a number of islands in Polynesia, including its near neighbours in the Southern Cook Islands.

Additional specimens examined:—COOK ISLANDS. Miti‘aro, Ka‘apoto, 22 August 1982, *W. R. Sykes 2411/CI* (CHR 399609); Miti‘aro, south of Omutu Landing, 21 August 1982, *W. R. Sykes 2401/CI* (CHR 399613); Miti‘aro, Omapere, inland side of road, 24 July 1991, *C. Luttrell 226* (CHR 587431); Miti‘aro, 26 July 1984, *Merlin 326* (CHR 433883); Miti‘aro, N.E. Coast, July 2004, *B. Maxwell s.n.* (CHR 592458).

Notes:—The area of exposed makatea where the undescribed species grows is also where the small cushion-forming composite *Tetramolopium mitiaroense* Lowrey, Whitkus and Sykes (2005: 448) is found. This plant also does not grow elsewhere in the Cook Islands and is again endemic to Miti‘aro. Very close relations of both of these Miti‘aro endemics grow in Hawai‘i where they are also endemic.

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References

- Al-Shehbaz, I.A. (2012) A generic and tribal synopsis of the Brassicaceae (Cruciferae). *Taxon* 61: 931–954.
- Forster, J.R. (1786) *De Plantas Esculentis Insularum Oceani Australis Commentatio Botanica*. Berolini, 80pp.
- Hillebrand, W.B. (1888) *Fl. Hawaiian Isl.* [Hillebrand] 10.
<http://dx.doi.org/10.5962/bhl.title.15785>
- Linnaeus, C. (1753) *Species plantarum*. Salvius, Stockholm, 1200 pp.
- Linnaeus, C. (1767) *Mantissa Plantarum*. Holmiae, 92 pp.
- Lowrey, T.K., Whitkus, R. & Sykes, W.R. (2005) A new species of *Tetramolopium* (Asteraceae) from Miti‘aro, Cook Islands. *Biogeography, Phylogenetic Relationships, and Dispersal. Systematic Botany* 30(2): 448–455.
<http://dx.doi.org/10.1600/0363644054223693>
- Montin, (1778) *Nova Acta Physico-Medica Academiae Caesareae Leopoldino-Carolinae Naturae Curiosorum Exhibentia Ephemerides sive Observationes Historias et Experimenta* 6: 324., t. 5.