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***Lomandra macfarlanei* (Asparagaceae: Lomandroideae), a new species from the Northern Territory, Australia**

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Abstract

A new species, *Lomandra macfarlanei* Jian Wang ter (Asparagaceae: Lomandroideae) from north Northern Territory, Australia, is described, illustrated and compared to other species in the *L. multiflora* complex. Notes on its distribution including map, habitat, phenology and affinities are provided. A conservation status of Least Concern is recommended based on IUCN criteria.

Keywords

Lomandra macfarlanei sp. nov., Australian flora, dioecious, endemic, new species, flora of Northern Territory, taxonomy

Introduction

The genus *Lomandra* Labill. (Asparagaceae: Lomandroideae) includes four sections and two series, according to Lee and Macfarlane (1986), and has been studied intensively, especially in recent years (Wang 2023a, 2023b, 2023c; Gunn et al. 2024; Wang 2024; Wang & Gray 2024). To date, 67 species and ten non-autonymic subspecies are recognised (IPNI 2024; POWO 2024). All occur in Australia, except for two species that extend to New Guinea and one species, *Lomandra insularis* Schltr., that is probably endemic to New Caledonia (Wang 2023a, 2023b, 2023c; Gunn et al. 2024; Wang 2024; Wang & Gray 2024).

Lee and Macfarlane (1986) recognised four taxa – *L. leucocephala* subsp. *robusta* A.T.Lee, *L. multiflora* (R.Br.) Britten subsp. *multiflora*, *L. patens* A.T.Lee and *L. tropica* A.T.Lee – from the Northern Territory. Specimens of one of the taxa, *Lomandra multiflora* subsp. *multiflora*, came to my attention while reviewing the Australian *L. multiflora* species group that currently includes five closely related taxa: *L. decomposita* (R.Br.) Jian Wang ter & A.R.Bean, *L. multiflora* (R.Br.) Britten subsp. *multiflora*, *L. multiflora* subsp. *dura* (F.Muell.) T.D.Macfarl., *L. patens* A.T.Lee and *L. ramosissima* Jian Wang ter. It was apparent that those specimens from the north of the Northern Territory differed distinctly in many characters from typical *Lomandra multiflora* subsp. *multiflora*, as well as all other *Lomandra* species, and these specimens are herein described as a new species.

The first collection of the new species was made by R. L. Specht, who was participating in the National Geographic Society of America and Commonwealth Government of Australia Expedition to Arnhem Land Aboriginal Reserve, on 14 August 1948. These collections have mature male and female flowers and fruits. They were distributed to AD, BRI, CANB and MEL, and were chosen here for the type and isotype specimens.

Materials and Methods

This study is based on morphological examination of *Lomandra* material at BRI, as well as *Lomandra* loan material from CANB, CNS, DNA, JCT, MEL, NSW and NT. All measurements are based on dried material except the dimensions of florets, which are based on material reconstituted with boiling water. Herbarium acronyms follow Thiers (2024).

Taxonomy

Lomandra macfarlanei Jian Wang ter, sp. nov.

Holotype: Australia, Northern Territory, Yirrkala, 14 August 1948, R.L. Specht 897 (BRI [AQ118354, 2 Sheets]).

Isotypes: AD ([AD96142080] image seen), CANB ([CANB29364] image seen), MEL ([MEL21264, with fruits in the bag] image seen).

Life Science Identified (LSID): urn:lsid:ipni.org:names:77344741-1

Diagnosis: *Lomandra macfarlanei* is morphologically similar to *L. multiflora* subsp. *multiflora* and *L. multiflora* subsp. *dura*. From *L. multiflora* subsp. *multiflora*, the new species differs by the stiff and upright leaves, acute but becoming obtuse leaf apex; shorter male pedicel; larger, pyramidal fruits (8.5–11 mm long, 5.5–6.5 mm diameter), and larger seeds (6.0–7.5 mm long, 3–4 mm wide). From *L. multiflora* subsp. *dura*, it differs in possessing narrower leaves, with acute becoming obtuse leaf apices; longer male pedicels; larger, pyramidal fruits, and larger seeds.

Etymology: This specific epithet honours Dr Terry D. Macfarlane (1953–) of the Western Australia Herbarium, who has researched the taxonomy of various plant groups. He is one of the two authors of *Lomandra* Labill. for *Flora of Australia* and has described several species of the genus (Lee & Macfarlane 1986; Macfarlane & Conran 2014).

Description: Plants robust, forming tussocks from condensed ascending rhizomes, each tussock comprising 1–5 tufts. Leaves firm, stiff, upright. Leaf sheath margins at first membranous or cartilaginous, rarely fraying into short-to-long strips or fibres up to 3 cm long, white, or pale to brown. Leaf blades light green to straw coloured, smooth, slightly convex on the abaxial side or inrolled, 35–100 cm long, 1.5–4 mm wide, 0.25–0.4 mm thick, with 20–30 parallel veins on both adaxial and abaxial sides; apex acute becoming obtuse; the margins slightly thickened, smooth. Male inflorescence one per tuft, paniculate, much shorter than longest leaf; the scape flattened, smooth, (9–)18–35 cm long, 1.2–2 mm broad, pale yellow; the primary rachis flattened, 2–4-angled, smooth, 6–17 cm long, bearing numerous branches and

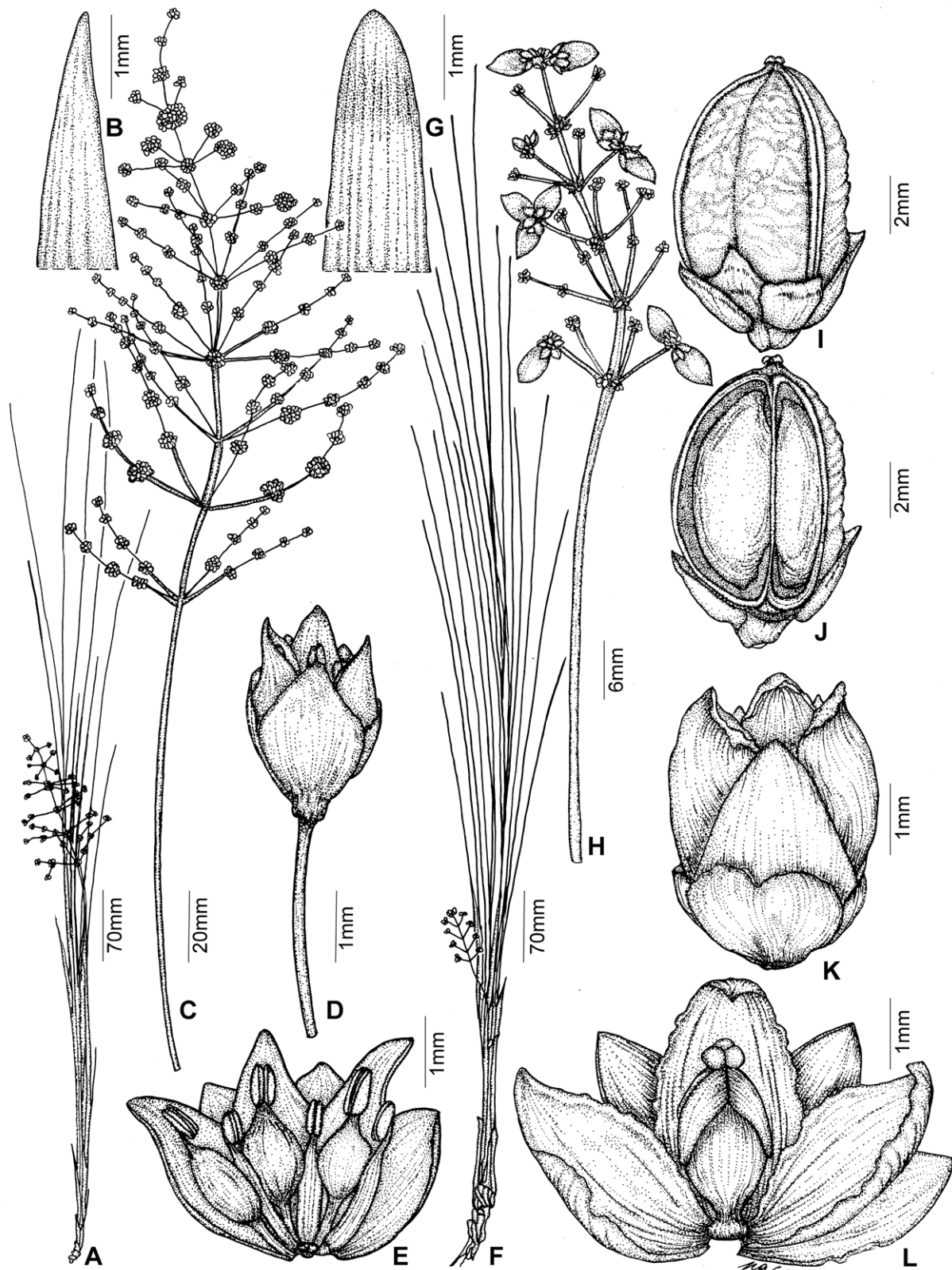


Figure 1. *Lomandra macfarlanei* (A–E male and F–L female). (A) Habit of tuft with male inflorescence. (B) Distal part of leaf showing its apex. (C) Male inflorescence. (D) Male flower with pedicel. (E) Male flower spread open. (F) Habit of tuft with female inflorescence. (G) Distal part of leaf showing its apex. (H) Female inflorescence with fruits. (I) Exterior of unopened fruit with hardened tepals. (J) Side section of unopened fruit. (K) Female flower. (L) Female flower spread open. A, D and E from Kerrigan 1150 (DNA); B from Brennan 5486 (DNA); C from Brennan 7749 (DNA); F and H from Dunlop & White 10284 (Sheet 2 of 2) (DNA); G, K and L from Kerrigan 1149 (DNA); I and J from Brennan 2423 (DNA). Image: Nicole Crosswell.

flower clusters; branches and flower clusters appearing whorled or opposite at nodes; inflorescence branches usually flattened, smooth, 1–8 cm long; flower clusters 1–3.5 cm apart on the primary rachis, 0.5–2.3 cm apart on the secondary rachis (first branch), 0.5–1.5 cm apart on the tertiary rachis (secondary branch). Cluster bracts usually 3–6, long- to short-deltoid, up to 6.5 mm long, 0.5–1 mm wide at the widest point, with 1–5 obvious veins, largest at the basal node of primary rachis, shorter and narrower upwards along primary rachis as well as on secondary and tertiary rachis. Flowers in groups of 4–15(–25), all of similar age within each cluster; bracteoles 3, cucullate, c. 0.5 mm long and 0.4 mm wide, membranous, completely encircling the pedicel. Flowers pedicellate, the pedicels slender, terete, 1.5–3(–4.5) mm long, 0.1–0.2 mm wide, pale to grey, erect to spreading. Flower buds ovoid, light green, at anthesis becoming campanulate, creamy-white to yellowish. Perianth segments 6, with distinct outer and inner whorls; outer tepals 3, broadly elliptical, thin, free, uniform in size and texture, 2–2.5 mm long, 0.5–1 mm wide, creamy-white; inner tepals 3, elliptical, free except on lower 1/4–1/3, uniform in size and texture, 2.3–3 mm long, 0.9–1 mm wide, mostly creamy-white except for yellow in the middle of outer surface. Stamens 6, all adnate basally to inner surfaces of inner tepals; 3 on slightly higher level, inserted on inner tepals, with a swollen filament c. 0.7 mm long by 0.5 mm at the widest point; 3 on slightly lower level, inserted in between inner tepals, with filaments c. 0.5 mm long by 0.15 mm wide; anthers all similar, c. 0.3 mm long and 0.2 mm wide, creamy-white to yellow. Pistillode not obvious. Female inflorescences one per tuft, a spike or once-branched panicle usually with 3–6 flower clusters along primary rachis; scape 10–28 cm long, 1–2.1 mm wide, flattened, smooth; rachis flattened or angled; branches and flower clusters appearing whorled or opposite at nodes; the primary rachis 1.5–8 cm long, the secondary rachis usually 1–1.3 cm long. Cluster bracts usually 3–6, long- to short-deltoid, up to 1 cm long, 0.5–1.5 mm wide at the base, usually largest at the basal node of primary rachis, shorter and narrower distally with 1–5 obvious veins. Flowers in group of 3–12, all similar age within each cluster; bracteoles 3, cucullate, c. 1.5 mm long and 2 mm wide, membranous, completely encircling the flower base. Flowers sessile; outer 3 tepals broadly ovate, 3–3.5 mm long and 2–2.2 mm wide, adnate at the base; inner 3 tepals ovate, 3–3.5 mm long and 1.8–2 mm wide, adnate near base. Staminodes 3(–6), whitish-transparent, with filaments and vestigial anthers,

inserted on basal part of tepal. Pistil conspicuous, the ovary obovoid, 1.3–2.5 mm long, 1–1.5 mm diameter; styles stout, fused, with 3 robust out-curved stigmatic lobes; ovary with 3 locules; ovules 1 per loculus. Capsule vertically arranged along the rachis except the terminal one; sessile, in groups of 2–3 or more of similar ages, 8.5–11 mm long, 5.5–6.5 mm diameter with or without transverse wrinkled carpels at maturity; carpels green outside, pale yellow inside; the carpel margins ridged; the hardened perianth persistent, 3.5–4 mm long, 2.5–3 mm wide; the hardened bracts occasionally persistent, 1.3–1.5 mm long, 0.8–1 mm wide. Fruiting styles 0.2–0.5 mm long. Seeds 1 per locule, ovoid, 6–7.5 mm long, 3–4 mm wide, slightly 2-sided on inner face, rounded on outer face, smooth to rough, translucent in appearance, light brown to brown (Figure 1).

Specimens examined: Australia. Northern Territory: Yirrkala, Aug 1948, *Specht 897* (AD the plant on the left side, BRI sheet 2 of 2, CANB the plant on the right side, MEL inflorescence and flowers in the bag); 60 mls S Giddy River Crossing, Jun 1972, *Byrnes 2681* (DNA); Gove Peninsula, Jan 1974, *Hinz 751* (DNA); Yirrkala, E Arnhem Land, Feb 1974, *Scarlett 322* (DNA); Gove Peninsula, Arnhem Land, Nov 1974, *Cooper s.n.* (NSW 151534); Gove, Mar 1982, *Hinz F8253* (DNA); Gove Peninsula, Mar 1984, *Dunlop 6669* (DNA); 50 m East of Nhulunbuy Oval, Jan 1985, *Cleminson 9* (DNA); NE Arnhem Land, Sep 1987, *Clark 1516* (DNA); Rindarry Creek, NE Arnhem Land, Feb 1988, *Russell-Smith 4905 & Lucas* (DNA); NE Arnhem land, Dalywoi Bay, Little Bondi, Feb 1988, *Wightman 4158* (DNA); Tin Camp Creek, 6.5 km WNW Myra Falls, Apr 1993, *Brennan 2267* (DNA); Cape Shield, Blue Mud Bay, May 1993, *Leach 3638 & Cowie* (DNA); 15 km WSW Cape Arnhem, Feb 1994, *Brennan 2423* (DNA); Cape Arnhem, 1.5 km N of Little Bondi Beach, Mar 1995, *Barritt 1859 & Wightman* (DNA); Turtle Beach, c. 8 km SE of Yirrkala, May 1996, *Cowie 6975* (DNA); Arnhem Land, Mitchell Range, Apr 1999, *Dunlop & White 10284* (Sheet 2 of 2) (DNA); Nitmiluk National Park, Mar 2001, *Michell 3453* (DNA); Gove, May 2005, *Risler & Woinarski 2651* (DNA); Gove, Alcan mine lease, Mar 2006, *Brennan 6866* (DNA); Gove, Jul 2006, *Kerrigan 1149* (DNA); ditto, 1150 (DNA); Daliwuy Bay area, Jun 2008, *Brennan 7749* (DNA); c. 8.7 km SSE of Yirrkala, Jun 2008, *Cowie 12194* (DNA); Wongalara Wildlife Sanctuary, c. 30 km W of homestead, Jun 2102, *Cowie 13579* (DNA).

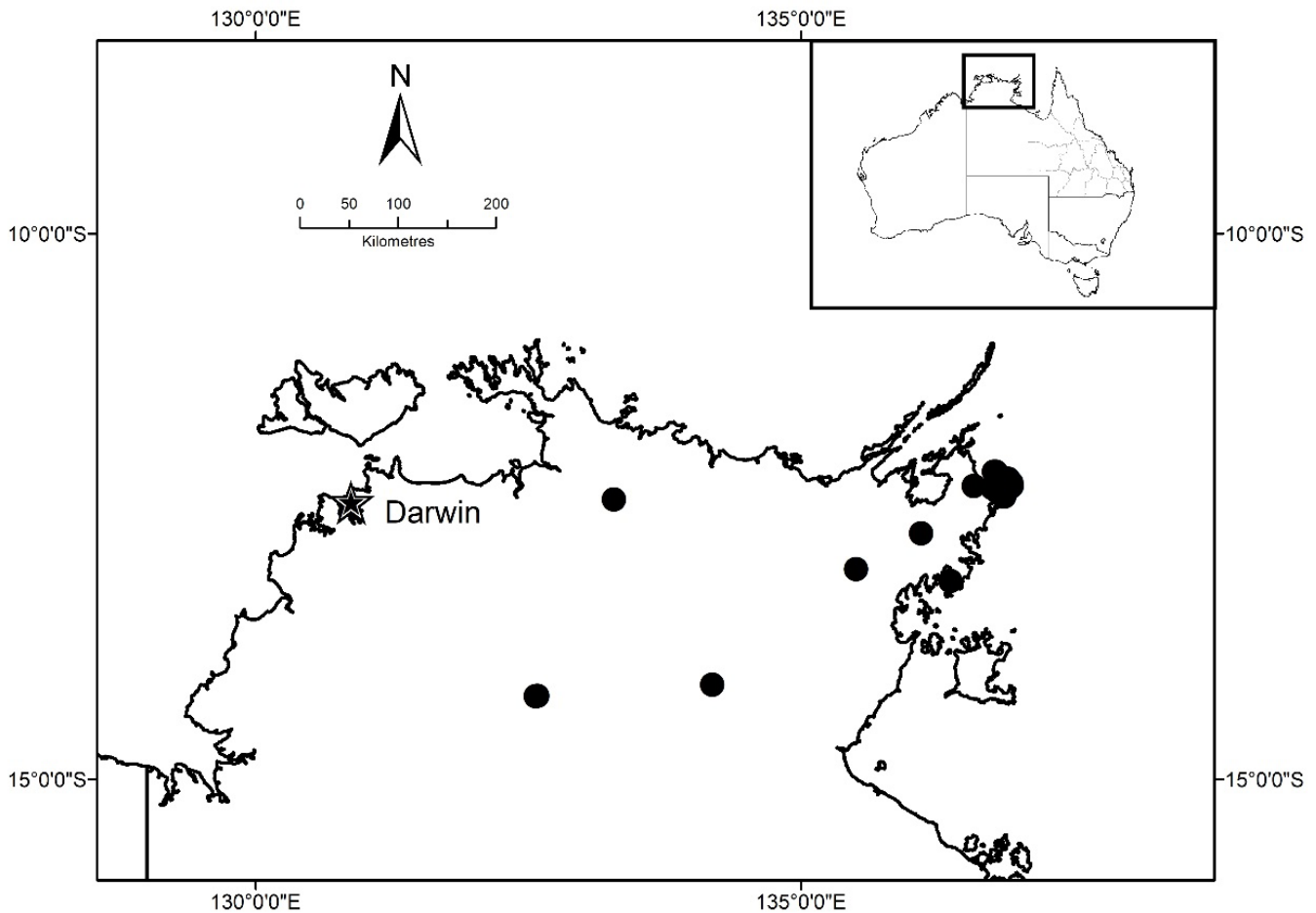


Figure 2. Distribution of *Lomandra macfarlanei* (solid circles).

Distribution

Lomandra macfarlanei is endemic to Australia, where it is confined to the north of the Northern Territory (Figure 2).

Recognition

The new species resembles *L. multiflora* subsp. *multiflora* and *L. multiflora* subsp. *dura*. From *L. multiflora* subsp. *multiflora*, it differs by having stiff and upright leaves, which have distinctly acute leaf apices that grade into obtuse, while the male flowers have shorter pedicels (1.5–3 mm c.f. 3–8 mm long), and female infructescences that have larger fruits (8.5–11.0 mm c.f. 6.0–7.5 mm long), which are pyramidal rather than globose, and possess larger seeds. The new species differs from *L.*

multiflora subsp. *dura* by having narrower leaves, with acute grading into obtuse leaf apices, longer rather than sessile or short male pedicels (1.5–3 mm c.f. 0–0.5 mm long), and larger fruits.

Ecology

Lomandra macfarlanei usually grows in open *Eucalyptus tetradonta* F.Muell. and *E. phoenicea* F.Muell. woodland on laterite ridges, windswept cliff tops, or plateaus at rear of beaches. The soils are usually red loam, white sand or sandstone scree. It is also found in herbland on bauxite plateaus or on rocky slopes of sandstone gorges under *Allosyncarpia* forest. In coastal shrubland it is associated with *E. tetradonta* F.Muell., *Acacia oncinocarpa* Benth. and *Heteropogon triticeus* (R.Br.) Stapf on sand over bauxite on low headlands.

Phenology

Male flowering was recorded from January to March and then June to August. However, flower buds have been recorded in March and June. Female flowering was recorded in February, and May to July. Mature fruits were collected from February to May and then August and September.

Conservation Status

Lomandra macfarlanei is endemic to the north of the Northern Territory. Currently there are seven locations known, stretching along its geographic range. It can be a common species where it occurs. It is recorded from Nitmiluk National Park and is not known to be at risk in the wild. Therefore, the species is not considered to be threatened and a Least Concern conservation status is recommended using the IUCN (2024) criteria.

Key to the *Lomandra multiflora* group with flat leaves.

1. Male inflorescence usually twice- or more branched; female inflorescences twice-branched.....2
Male inflorescence usually unbranched or once- or twice-branched; female inflorescences unbranched or once-branched.....3
2. Scape and rachis glabrous; fruiting styles 1.8–2.5 mm long.....*L. patens*
Scape and rachis verrucous; fruiting styles 0.2–0.5 mm long.....*L. ramosissima*
3. Male inflorescence usually twice-branched, male buds globular.....*L. decomposita*
Male inflorescence usually unbranched or once-branched, male buds ellipsoid.....4
4. Male flowers sessile or on pedicels to 0.5 mm long.....*L. multiflora* subsp. *dura*
Male flowers on pedicels 1.5–8 mm long.....5
5. Leaves 0.25–0.4 mm thick; male flowers on pedicels usually 1.5–3 mm long;
fruits pyramid-like, 8.5–11.0 mm long.....*L. macfarlanei*
Leaves 0.5–0.6 mm thick; male flowers on pedicels usually 3–8 mm long;
fruits globular, 6.0–7.5 mm long.....*L. multiflora* subsp. *multiflora*

Data Accessibility Statement

No additional database.

Conflict of Interest

The author declares that he has no conflict of interest.

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