

Emendments to *Sprengelia* Sm., (Epacridoideae Ericaceae), Tasmania, Australia

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Abstract

Sprengelia montana R.Br. and *S. propinqua* A.Cunn. ex DC are separated from *S. incarnata* and restored to species status. Emended descriptions for *S. incarnata*, *S. montana* and *S. propinqua* are given. A new endemic species for Tasmania, *S. minima*, R.K.Crowden is described and the relationship between the Tasmanian endemics, *S. distichophylla* (Rodw.) Curtis and *S. minima*, and the New South Wales endemics, *S. monticola* (A.Cunn ex DC) Druce and *S. sprengelioides* (R.Br.) Druce is discussed. An identification key for *Sprengelia* is provided.

Introduction

Early botanists recognised three species of *Sprengelia* in Tasmania, *S. incarnata* Sm., *S. montana* R.Br. and *S. propinqua* A.Cunn. ex DC. Rodway (1903) distinguished *S. incarnata* var. *distichophylla*, but this was later accorded species status by Curtis (1962). Bentham's (1868) notes for *S. incarnata* draw attention to the species' variability and to J.D. Hooker's (1860) suggestion that *S. montana* and *S. propinqua* be submerged in *S. incarnata*. Bentham agreed with Hooker, as did Rodway (1903) and Curtis (1962) in their respective Tasmanian Floras. Curtis regarded 'S. *propinqua*' and 'S. *montana*' as "extreme and distinctive forms of a highly variable *S. incarnata*, there being intermediate forms with variable character combinations" (Curtis 1962, p. 455).

I have examined herbarium specimens held at HO and extensive living material of *S. incarnata* and the two distinctive 'S. *propinqua*' and 'S. *montana*' variants from their range throughout Tasmania. Populations of *S. incarnata* from mainland Australia have also been studied. From these observations, intermediate forms are uncommon and restricted to just a few locations where *S. incarnata* s. str. and *S. incarnata* var. *propinqua* cohabit, suggesting possible hybridisation. Collections from areas free of cohabitation are morphologically consistent, the only perceptible variations found are in size and habit.

Materials and Methods

Flower and leaf measurements were made using living plants, twenty five each of *S. incarnata*, and the variants, *S. incarnata* var. *montana* and *S. incarnata* var. *propinqua*, using one fully opened flower and one mature leaf from each plant. The leaf used was taken from the 5th or 6th most distal node from the involucre. Flower measurements included sepal length and width, petal lobe length and width, corolla tube length, style length and anther length. Leaf measurements were as shown in Fig. 1 (a = length of sheath, b = lamina blade length

from top of sheath to apex, c = width of lamina blade at the widest point). There are two components to the sheath. For the top part (about 2/3) the lower lamina margins overlap, completely wrapping around the stem. Below this the margins are fused to form a ring. The two components added together are included as the measurement. Only Tasmanian plants were included in this study as the main objective was to distinguish between the three Tasmanian forms of *S. incarnata sensu* Curtis.

Results and Discussion

Morphological features in which the three taxa differ include style length, length of the sheathing leaf base, length and width (shape) of lamina, leaf projection and apex. These differences are summarised in Table 1. In *S. incarnata*, lamina length varied greatly from 4 to 22 mm, but much less so in the other species. However, ratios remained more or less constant and some, where relevant, are included in the Table. The most striking difference between the taxa, however, is in floral morphology. In flowers of *S. incarnata s. str.*, the anthers are coherent to the upper style below the stigma and this condition is evident in the bud and early anthesis and persists throughout the life of the open flower. However, in both *S. montana* and *S. propinqua* the anthers are connivent to the style in bud and at the onset of anthesis, but as flowering progresses the anthers separate from the style, and become spreading in the open flower. This difference between *S. incarnata* and the other two taxa

Table 1. Morphological comparisons of *S. incarnata*, *S. montana* and *S. propinqua*.

(The range and means of measured values are given as well as ratios of the means where relevant; all lengths in mm.)

| | <i>S. incarnata</i> | | | <i>S. montana</i> | | | <i>S. propinqua</i> | | |
|---------------------|---------------------------------------|-------------|--------------|-------------------|-------------|--------------|------------------------|-------------|--------------|
| Leaves | | | | | | | | | |
| Phyllotaxy | spreading, maybe twisted or reflexed. | | | sub-erect | | | sub-erect | | |
| Apex | acuminate, pungent | | | shortly mucronate | | | acute, +/-blunt | | |
| | straight | | | upturned | | | upturned | | |
| Texture | thin, flexible | | | thick, stiff | | | thick, stiff | | |
| | Range | Mean | Ratio | Range | Mean | Ratio | Range | Mean | Ratio |
| Blade length | 5–16 | 9.38 | | 3–8 | 4.21 | | 6–20 | 11.09 | |
| Blade width | 2–5 | 2.93 | | 2–3 | 2.5 | | 3–6 | 4.48 | |
| Blade length/width | | | 3.20 | | | 1.68 | | | 2.48 |
| Sheath length | 2.5–3.5 | 2.86 | | 1.8–2.5 | 1.97 | | 3–4 | 3.36 | |
| Sheath/Blade length | | | 0.30 | | | 0.47 | | | 0.30 |
| Flowers | | | | | | | | | |
| Sepal length | 4.1–4.8 | 4.38 | | 4.5–5.1 | 4.84 | | 7.6–8.4 | 7.88 | |
| Sepal width | 0.9–1.2 | 1.04 | | 1.2–1.5 | 1.37 | | 1.5–1.9 | 1.76 | |
| Sepal length/width | | | 4.22 | | | 3.53 | | | 4.48 |
| Lobe length | 3.8–4.4 | 3.99 | | 3.5–4.4 | 3.98 | | 6.2–7.9 | 6.90 | |
| Lobe width | 1.0–1.3 | 1.17 | | 1.0–1.4 | 1.16 | | 1.5–2.0 | 1.67 | |
| Lobe length/width | | | 3.41 | | | 3.43 | | | 4.13 |
| Corolla Tube length | 0.8–1.0 | 0.90 | | 0.9–1.2 | 1.02 | | 1.4–2.0 | 1.69 | |
| Corolla/Lobe length | | | 0.23 | | | 0.26 | | | 0.24 |
| Anther length | 1.2–2.3 | 1.68 | | 1.1–1.3 | 1.20 | | 3.0–4.0 | 3.50 | |
| Style length | 3.2–3.7 | 3.37 | | 1.8–3.0 | 2.13 | | 5.0–6.7 | 6.43 | |
| Style/Lobe length | | | 0.84 | | | 0.54 | | | 0.93 |
| Stigma position | exserted above anthers | | | mid–anthers | | | exserted above anthers | | |

is evident in both fresh and dried specimens. Bentham (1868), in uniting the three Tasmanian forms under *S. incarnata*, recognised that all three anther configurations, connivent, coherent and spreading, occurred in the genus, but apparently assumed that the variation was infraspecific, rather than between species. With access to considerably more specimens, I have formed the view that variation in anther disposition occurs between rather than within species. Taking the difference in anther disposition into consideration with other differences shown in Table 1, it is possible to recognise three morphologically distinct, consistent taxa. Accordingly it is proposed that both *S. montana* and *S. propinqua* be restored to species status. Emended descriptions for these species, as well as *S. incarnata* s. str. are provided below, together with a key for the identification of *Sprengelia* species.

Curtis (1962, p. 455) also refers to forms which inhabit some alpine cushion plants, notably *Dracophyllum minimum* F.Muell. Examination of collections at HO together with fresh field collections from various sites, show two distinct forms of *Sprengelia* resident in or associated with cushion plants. Form 1 is *S. montana*. It occurs mainly around the edges and in the interstitial regions between cushions, but plants may also grow within the cushion clumps, more so in aged and partially degrading cushions. Form 2 is distinctive from other *Sprengelia* species, and is here named *Sprengelia minima*.

A collection of *Sprengelia* from Mt. Read Crowden 0802 006, occurring in *Donatia novae-zelandiae* near the summit cairn, appears distinctive (see below). Further study of flowering material is required. The informal phrase-name *Sprengelia* sp. Mt Read (R.K. Crowden 0802 006) is given to this plant, and a tentative description provided.

Notes on New South Wales species of *Sprengelia*

Brown (1810) described the genus *Ponceletia* with one species *P. sprengelioides* R.Br. A second species *Ponceletia monticola* A.Cunn. ex DC, was later added. *Ponceletia monticola* subsequently was referred to *Sprengelia* as *Sprengelia ponceletioides* Sond. (Sonder 1854), and Mueller (1867) renamed *Ponceletia sprengelioides* as *Sprengelia ponceletia* F.Muell., however, both these are superfluous names and therefore illegitimate. Druce (1917) restored the basionyms and provided the new combinations *Sprengelia sprengelioides* and *Sprengelia monticola*. These names now are accepted in recent flora accounts (e.g. Powell 1992). However, as recorded by Brown (1810) the floral morphologies of *Ponceletia* and *Sprengelia incarnata* differ, ('*Corolla breviter campanulata*' in *Ponceletia*, '*Corolla 5-partita, rotata*' in *Sprengelia*). In this regard *Ponceletia* (i.e. *S. sprengelioides*

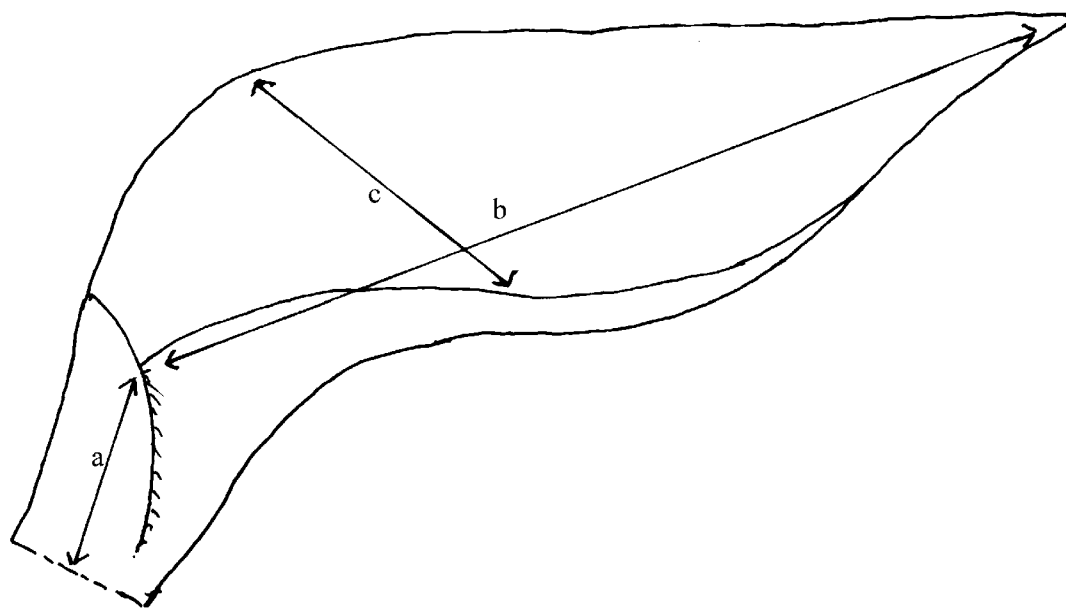


Fig. 1. Schematic leaf of *Sprengelia propinqua*. a = sheath; b = blade length; c = blade width.

and *S. monticola*) more closely resemble the two more recently described Tasmanian species *S. distichophylla* and *S. minima*. The flowers are borne solitary and terminal on the main branches rather than on numerous short, axillary branchlets forming a many-flowered cone, and are goblet-shaped (campanulate) with erect, broader, partially overlapping petals and sepals, rather than the star-shaped (rotate) form of *S. incarnata* with narrow, spreading petals and sepals. Thus it appears sensible to recognize two subgroups of *Sprengelia*, Group A, comprising *S. incarnata*, *S. montana* and *S. propinqua* and Group B with *S. distichophylla*, *S. minima*, *S. sprengelioides*, *S. monticola* and *S. sp. Mt. Read* (R.K. Crowden 0802 006). Consideration may also be given to restoration of the genus *Poncelletia* for Group B, but additional work, involving a molecular study, is required.

Key to *Sprengelia*

Flowers few to numerous, each one terminating a short axillary branchlet, often forming dense conical heads; sepals and petals narrow, spreading, forming a star-shaped flower GROUP A

Flowers single at the ends of main branches, or rarely a second on a short axillary branchlet; sepals and petals \pm erect, partially overlapping, forming a cup-shaped flower GROUP B

GROUP A

1. The anthers and distal part of the staminal filaments coherent around the top of the style and remaining coherent throughout anthesis **1. *S. incarnata***
- 1* Filaments and anthers adnate to style at the onset of anthesis, but separate and becoming erect and spreading as anthesis progresses 2
2. Plant rarely above 30 cm high; flowers pink; stamens mainly glabrous or with sparse hairs; stigma held about middle of anthers **2. *S. montana***
- 2* Tall, robust plant, up to 2 m high; flowers white; stamens hirsute; stigma exserted **3. *S. propinqua***

GROUP B

1. Plant scrambling, procumbent, or a low bush 2
- 1* Plant erect, free growing or inhabiting an alpine cushion plant 3
2. Leaves flattened against stem, distichous; flowers deep pink **4. *S. distichophylla***
- 2* Leaves spreading, not distichous; flowers white **5. *S. monticola***
3. Plant usually 50–100 cm tall; anthers glabrous **6. *S. sprengelioides***
- 3* Plant usually <20 cm tall, branching stem mostly hidden within the host cushion plant; anthers hirsute **4**
4. Anthers spreading at anthesis **7. *S. minima***
- 4* Anthers remain coherent to style at anthesis **8. *S. sp. Mt Read***

Taxonomy

Sprengelia incarnata Sm., Kongl. Vetensk. Acad. Nya Handl. 15: 263 (1794)

An erect shrub, sometimes low and straggling, usually 15–100 cm tall, rarely to 200 cm or more tall in sheltered habitats, glabrous, the older stems lacking leaf scars. Leaves imbricate; sheathing base 2.5–3.5(–10) mm long, blade widening from base, then tapering to an acute, hard, often pungent point, spreading, almost at right angles to the stem; blades of the larger leaves are often recurved and in very lush plants the leaves become twisted or take on a spiral aspect. Leaf blades relatively thin, lanceolate to narrowly ovate, concave, 4–20 (–50) mm long, 2–5 (–11) mm wide, mucro 0.4–0.6 mm long; margin entire or ciliolate where stem-clasping; floral leaves similar but smaller, the innermost with margin hyaline, shorter than calyx and forming an involucre around it. Flowers terminal or terminating short axillary branchlets (in large, very lush plants, the branchlets may show secondary branching), solitary or rarely 2 or 3 together, often crowded in tight clusters up to 20 or more, forming ovate heads; bracts and bracteoles numerous, grading from floral leaves to about 2.5 mm long, 1.3 mm wide, ovate, with margin hyaline and apex acuminate, ultimately mucronate. Sepals pink or white, generally spreading, somewhat scarious, glabrous, narrowly lanceolate, 4.1–4.8 mm long 0.9–1.2 mm wide, shortly united at base. Corolla pink or white, about equal in length to calyx; petals almost free, with a short tube 0.8–1 mm long; at onset of anthesis the corolla tube is fully closed but soon thereafter may develop splits in lower part assuming a clawed appearance; lobes narrowly triangular, 3.8–4.4 mm

long, acute, glabrous, spreading and reflexed. Stamens inserted on receptacle; filament \pm flattened; anthers 1.2–2.3 mm long persisting in a coherent ring around style, papillose-hairy externally. Ovary c. 1.1 mm wide \times 0.9 mm high, ridged, glabrous; style filiform, 3.2–3.7 mm long, exceeding anthers; stigma small. Fruit c. 2 mm diam. Flowering Sep–Nov.

Distribution and habitat: Tasmania (all regions except Macquarie Island); also South Australia, New South Wales, Victoria, New Zealand (South Island). A widespread and abundant species especially in peaty heaths, from sea level to sub-alpine altitudes. Re-examination of specimens held at HO showed (on the basis of anther coherence and style length) that past collections from the highest altitudes in Tasmania lodged as *S. incarnata*, almost without exception are *S. montana*. *Sprengelia incarnata* appears not to occur above middle altitudes in Tasmania, the actual altitude limit varying across the state depending on rainfall and substrate.

Selected specimens examined: **South Australia:** Southern Lofty Region: c. 1.6 km NE of Myponga, c. 55 km SSW of Adelaide, *Donner 5994*, 5 Nov 1977 (HO44941). **New South Wales:** Central Coast: roadside seepage on old Pacific highway, N of Calga, *Crowden 0808 042*, 19 Aug 2008 (HO364910); Royal National Park: S of Sydney, *Tillyard*, 22 Apr 1933 (HO5819). South Coast: Beecroft Peninsular. c. 1.6 km NE of Currawong, 10 m, *Lyne 358*, 27 Aug 1991 (HO301184); roadside swamp along Bareera Rd, near Currawong, *Crowden 0808 001*, 6 Aug 2008 (HO364913). Southern Tablelands: Canowie Brook, N Budawang Range, 2 km NNE of Corung Trig., 700m, *Telford 10738*, 14 Oct 1988 (HO116249). **Victoria:** Wannon: c. 5.7 km along Range Rd. from main Casterton–Dartmoor Rd., *Short 1333*, 1 Oct 1981 (HO46122); Lower Glenelg National Park: near Blackwood Ck, near Portland, *Melville 1580*, 13 Oct. 1952 (HO581713). **Tasmania: Flinders:** Mt. William National Park: 20 m. *Williams s.n.*, 27 May 1986 (HO535110); Goshen Road, *Simson 902*, 4 Aug 1876 (HO514540). **Central Highlands:** Lyell Highway, slopes of Mt. Alma, 410 m, *Cave 642*, 6 Oct 2006 (HO542805). **South East:** Wielangta Road, 1.5 km S of Orford, *Buchanan 16269*, 25 Nov 2004 (HO532564); McManus Hill, Tasman Peninsula, *Cave 488*, 23 Oct 2005 (HO535147); Track to Waterfall Bay, 0.75k S of Devils Kitchen, Tasman Peninsula, *Duretto 1768*, 10 Oct 2004 (HO530748); Alberts Marsh, SE of Fingal, 530 m, *Rozefelds 365*, 31 Oct 1996 (HO328489); Lunawanna, Bruny Island, 15 m, *Baker 1913*, 9 Sep 2008 (HO550675). **West:** Jane River, track near Adelaide River, *Buchanan 16989*, 16 Apr 2008 (HO553683).

Sprengelia montana R.Br., Prodr. Fl. Nov. Holland. 555 (1810)

Sprengelia incarnata f. *montana* (R.Br.) Siebert & Voss, *Vilm. Ill. Blumengärtn.*, ed. 3 1: 610 (1896); *S. incarnata* var. *montana* (R.Br.) Domin, *Biblio. Bot.* 22(89): 1055 (1930); *Sprengelia incarnata pro parte* W.M.Curtis, *The Student's Flora of Tasmania* 2: 454 (1962).

A small erect shrub up to 30 (–50) cm high, usually branched from base, the older stems bare without leaf scars, often growing in fairly dense tufts in or edging alpine cushion plants. Leaves imbricate, with bases sheathing the stem, 1.8–2.5 mm long, the leaf blade thick and stiff, ovate, 3–8 mm long, 2–3 mm wide, keeled in the upper part, spreading to sub-erect, concave, widest at the shoulder, then tapering towards the often upturned apex; apex acute, blunt or with a short mucro; margin entire or ciliolate, hyaline at least in the lower part, infolding and touching just below the apex; Flowers pink, up to 10, solitary or 1 or 2 together terminating short axillary branches, in very crowded heads at the branch tips; bracts ovate, graduating and reducing in size from the foliage leaves to c. 2.5 \times 3.0 mm, with a broad hyaline margin. Sepals narrow lanceolate, straight, 4.5–5.1 mm long, 1.2–1.5 mm wide, acute, spreading. Corolla tube very short, c. 0.9–1.2 mm, lobes lanceolate, squarrose, 3.5–4.4 mm long 1–1.4 mm wide, glabrous, spreading. Staminal filaments inserted on the receptacle, \pm thickened, bent around the ovary, the anthers connivent to the style in the bud but separating and spreading on anthesis; anthers 1.1–1.3 mm long, (glabrous or) sparsely to densely hirsute. Ovary ribbed, 0.9–1.1 mm high, 1.1–1.3 mm wide, glabrous to pubescent, style slender, 1.8–3.0 mm long, stigma amidst the anthers. Flowering Nov–Jan.

Distribution and habitat: Tasmania (Ben Lomond, Central Highlands, Southern Ranges, West); endemic. Localised populations of *S. montana* are widespread in montane regions, occurring in wet areas and often inhabiting or close to cushion plants. I am not aware of any populations where *S. incarnata* and *S. montana* cohabit or have an actual interface, so the chance of interspecific hybridization is remote.

Selected specimens examined: **Tasmania: Central Highlands:** Track below Crater Lake Scouts hut, Cradle Mt., 1080 m, *Powell 1556*, 29 Nov 1981 (HO410762). **Southern Ranges:** Mt. Field National Park: Tarn Shelf, , 1200 m, *Smith 359*, (HO36471). Near summit of Mt. Wellington, *Burbidge 3204*, 19 Jan 1949 (HO5803). Hartz Mountains National Park: Hartz Mts., 900 m, *Comber 2245*, 2 Apr 1930 (HO5779); Hartz Mt. track, *Wiecek 580 & Brown*, 10 Feb 1995 (HO318372); Jubilee Ra. Head of South Styx R., 840 m, *Buchanan 5176*, 8 Jan 1985 (HO407256); **West:** Mt. Humboldt, 920 m, *Jarman s.n.*, 17 Jan 1978 (HO411794). **Ben Lomond:** Mt Arthur, above tree line, *Noble 29096*, 13 Mar 1980 (HO79291). SE slope of Mt. Lloyd, 800 m, *Buchanan 5642*, 13 Feb 1985 (HO406623).

Sprengelia propinqua A.Cunn. ex DC., Prodr. (DC.) 7(2): 768 (1839)

Sprengelia incarnata f. *propinqua* (A.Cunn. ex DC.) Siebert & Voss, *Vilm. Ill. Blumengärtn.*, ed. 3 1: 610 (1896). *Sprengelia macrantha* Hook.f., *Lond. J. Bot.* 6: 273 (1847). *Sprengelia propinqua* var. *demissa* F.Muell., *Fragm. (Mueller)* 1(5): 39 (1859). *Sprengelia incarnata* pro parte. W.M.Curtis, *The Student's Flora of Tasmania* 2: 454 (1962).

An erect, robust shrub, multiple branches from the base, up to 2m high; branches glabrous, older parts bereft of leaves, without leaf scars. Leaves imbricate, crowded on distal branches, sheathing stem basally, 3–4 mm long; leaf blade ovate, 6–20 mm long, 3–6 mm wide, concave, stiff, spreading to sub-erect, upturned towards apex, widest at shoulder then tapering to a barely pungent mucro, glabrous, lower surface striate, margin ciliate near the apex, hyaline towards the base. Flowers white, terminating short branches (often with secondary branchlets) crowded in the upper axils; bracts ovate, similar to foliage leaves, but graduating from them to a smaller size 3.5–5 mm long, 3–4.5 mm wide. Sepals narrowly lanceolate, straight, 7.6–8.4 mm long 1.5–1.9 mm wide, spreading. Corolla tube 1.4–2 mm long, becoming clawed at base as a result of ovary swelling after fertilization; lobes narrowly lanceolate, 6.2–7.9 mm long, 1.5–2.0 mm wide, spreading and reflexed. Staminal filaments inserted on receptacle, bent around ovary, upper part and anthers connivent to style in bud, but separating and spreading with onset of anthesis; anthers 3–4 mm long, densely hairy. Ovary ridged, slightly pubescent, 0.9–1.1 mm high, 1.3–1.4 mm wide, style slender, 5.9–6.7 mm long, stigma exerted above anthers. Fruit a capsule. Flowering Nov–Jan.

Distribution and habitat: Tasmania (Central Highlands, Southern ranges, West); endemic. Found in poorly drained shrubberies, heaths and sedge communities on Precambrian silicates of high rainfall areas in the southwest from near sea level to an altitude of > 1000 m. It is frequently found in cohabitation with *S. incarnata* and there is evidence of intermediate forms and hybridization between these two species. An analysis of probable hybridization in several communities will be reported elsewhere.

Selected specimens examined: Tasmania: **Southern Ranges;** 1.5 km SSE of Elliott Hill, Port Davey, 40m, *Buttermore* 82, 17 Jan 1986 (HO95523). The Coronets, rocky ridge top, 800 m, *Collier* 2214, 24 Jan 1987 (HO103899). Kathleen Is, Port Davey, 120 m, *Buchanan* 9184, 4 Jan 1987 (HO125938). Mt. Frederick, Weld R., 920 m, *Collier*. 3838, 19 Nov 1988 (HO118240). 1 km N of Reservoir Lakes, 770 m, *Adams* 62, 13 Jan 1984 (HO76339). Southern Jubilee Ra., 740 m, *Buchanan* 5359, 16 Jan 1985 (HO120776). **West;** Eagle Creek track, Franklin R. drainage side N of Elliott Ra., *Jarman s.n.*, 16 Jan 1978 (HO30290). Trappers Inlet, Lake Pedder, *Morris* 8007, 11 Jan 1980 (HO32606). 1 km NE of Strahan, 60 m, *Moscal* 5278, 6 Jan 1984 (HO80566). Point Hibbs, Meerim Beach–Whitehorses Beach, *Moscal* 5705, 17 Jan 1984 (HO74503).

Sprengelia minima R.K.Crowden, *sp. nov.*

Diagnosis: inter plantas pulvinatas, incolens; a *Sprengelia incarnata* floribus cupulatis non stellaribus, sepalis petalisque erectis, antheris stylo in alabastro conniventibus, in flore aperto patentibus differt.

Type: Mawson Plateau, Mt. Field National Park, 100 m NW from top end of ski tow (now abandoned) in *Dracophyllum minimum* cushions, 42 41 S 146 34 E, 1285 m, *AM Gray* 1513, (holo: HO530529; iso: MEL, CAN, NSW).

A small much branched shrub, known mostly as an inhabitant of the alpine cushion plants *Dracophyllum minimum* and *Donatia novae-zelandiae*, either wholly contained within the cushion, or with short branchlets prostrate on the surface. Leaves imbricate, sheathing stem basally 1–1.5 mm long, blade erect to sub-erect, 3–5 mm long, 1–2 mm wide, concave, broadest just above shoulder, tapering sharply for half its length then more gradually to a blunt mucro, thick, keeled in upper half, glabrous, weakly striate in lower part of both surfaces, margins involute and touching below apex forming a solid cylinder, microciliate above and a thin hyaline edge in lower part. Flowers white, solitary, terminal on main branches, rarely a single floret on a short, axillary branchlet; bracts similar to foliage leaves though grading to a lesser size 2–2.35 mm long 1–1.5 mm wide, those immediately subtending the flowers with a broad hyaline margin; Sepals broadly lanceolate, erect, 3.5–4 mm long, 1–1.5 mm wide, concave, acute. Corolla tube c. 0.5 mm, lobes 3–3.5 mm long, 0.5 mm wide, lanceolate-ovate, generally erect, slightly spreading at tips in older flowers, slightly wavy. Staminal filaments inserted on receptacle, flattened below then cylindrical, at first bent around style, but straightening and spreading with anthers as anthesis progresses, anthers papillose-hairy, 1–1.5 mm long. Ovary c. 1 mm wide, 0.8 mm high, 5-locular, glabrous; style slender, deeply inserted in a depression at top of ovary, short 0.7–1.3 mm, stigma held below top of the anthers. Fruit a capsule. Flowering Dec–Jan.

Distribution and habitat: Tasmania (Southern Ranges, West); endemic. Found on Mt Field, the Hartz Range and elsewhere as an inhabitant of the bolster plants, *Dracophyllum minimum* F.Muell. and *Donatia novae-zelandiae* J.R.Forst & G.Forst.

Etymology: the name *minima* was chosen because the plant is of much smaller habit than other species of *Sprenghelia*.

Conservation: not considered to be at risk. All populations known to date are in National Parks or other conservation areas.

Notes: this taxon appears to be exclusively a cushion inhabitant. On Mt. Field (K Col & Mawson Plateau) it is associated only with *Dracophyllum minimum*, but at Lake Esperence (Hartz Ra.) and elsewhere it also inhabits *Donatia novae-zelandiae*. Plants growing in *Dracophyllum minimum* (Mt. Field–dolerite) barely emerge above the surface contour of the host cushion (Fig. 2) whilst those in *Donatia novae-zelandiae* (Lake Esperence – Precambrian silicates) are more exposed, with several short, prostrate branchlets spreading on the cushion surface (Fig. 3). The much branched stems within the cushion are bare or clothed with dead leaves, with only a few green leaves near the tips (Fig. 4). Drawings of leaf and flower section are given in Fig. 5.

Selected specimens examined: Tasmania: Southern Ranges: Mt. Snowy, within cushion plant community in fjelmark bolster plant community, 1080 m, *Moscal 10748*, 28 Apr 1985 (HO401725). Lake Cygnus, W. Arthur Ra., 860 m, *Collier 2011*, 7 Dec 1986 (HO121415). Mt. Damoin, 1030 m, *Collier 4406*, 25 Nov 1989 (HO119821). Propsting Ra., 600 m, *Jarman s.n.*, 16 Feb 1977 (HO323143). K Col track to Mt Field West, *Curtis s.n.*, 7 Jan 1948 (HO94830). Abrotanella Rise, 1000 m, *Buchanan 15172*, 26 Mar 1998 (HO324939). Mt. Sprent, 900 m, *Jarman s.n.*, 8 Feb 1977 (HO323145). Hartz Mts., 900 m, *Comber 2244*, 2 Apr 1930 (HO5771). Lake Esperence, Hartz Ra. National Park, *Crowden 0912 007*, 11 Dec 2009 (HO565495). K Col. On track to Field West, Mt. Field National Park, 1200 m, *Crowden 0505 001*, 22 Jan 2005 (HO530152). **West:** Mt Sedgewick, 600 m, *Comber s.n.*, 28 Feb 1930 (HO5769).

***Sprenghelia* sp.** Mt Read (R.K. Crowden 0802 006)

A small shortly branched shrub, known only as an inhabitant of the alpine cushion plant *Donatia novae-zelandiae*, from a single location (Mt. Read, near the summit cairn). In habit similar to *S. minima* with short branchlets prostrate on the cushion surface, but becoming more dense at the cushion margins, sometimes spilling over onto the substrate. Leaves similar in all respects to *S. minima*, imbricate, the base sheathing the stem 1–1.5 mm long, the blade erect to sub-erect, 3–5 mm long, 1–2 mm wide, concave, broadest just above the shoulder, tapering sharply for half its length then more gradually to a blunt mucro, thick, keeled in the upper half, glabrous, weakly striate in the lower part of both surfaces, the margins involute and touching below the apex forming a solid cylinder, minutely ciliate above and a thin hyaline edge in the lower part. Flowers not seen, the developing capsules solitary, terminal on the main branches, bracts similar to the foliage leaves though grading to a lesser size 2–2.35 mm long 1–1.5 mm wide, those immediately subtending the capsules (flowers) with a broad hyaline margin; A single capsule containing (probably) mature seeds was still attached to the style and coherent anthers, a significantly different state to *S. minima*. Further study of flowering material is required to determine whether this represents a true feature of the species or is just an aberration in this plant.

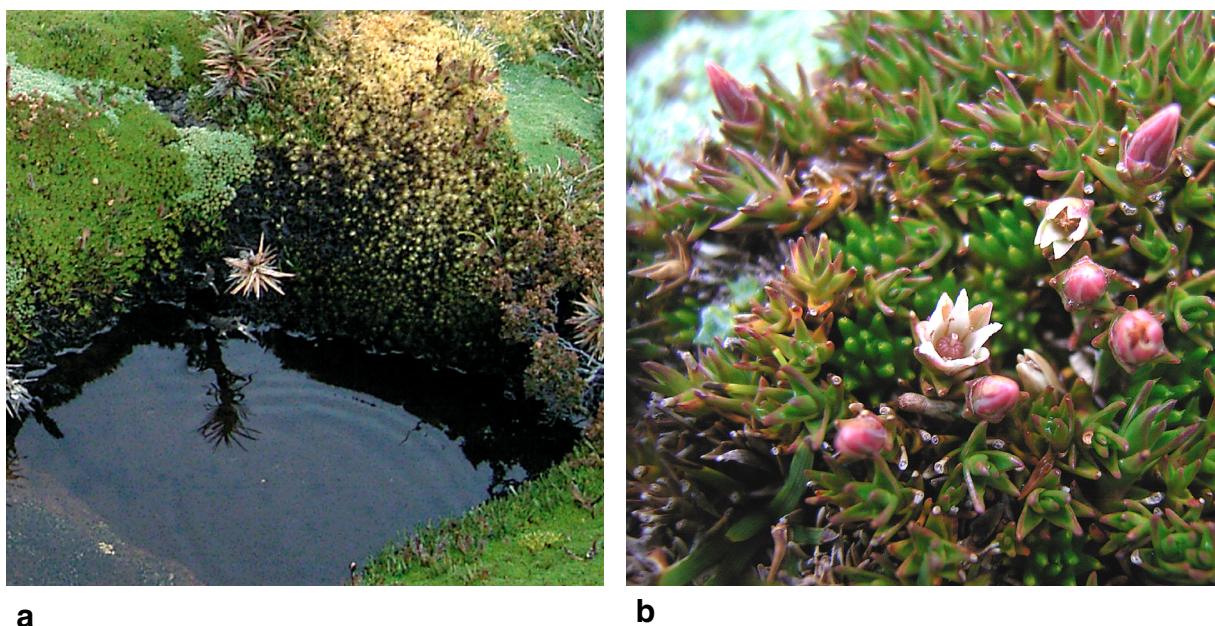


Fig. 2. *Sprenghelia minima*. **a**, habitat photo showing several small flower clusters in a *Dracophyllum minimum* cushion on the Mawson Plateau, Mt. Field National Park; **b**, close-up photo of flower cluster.

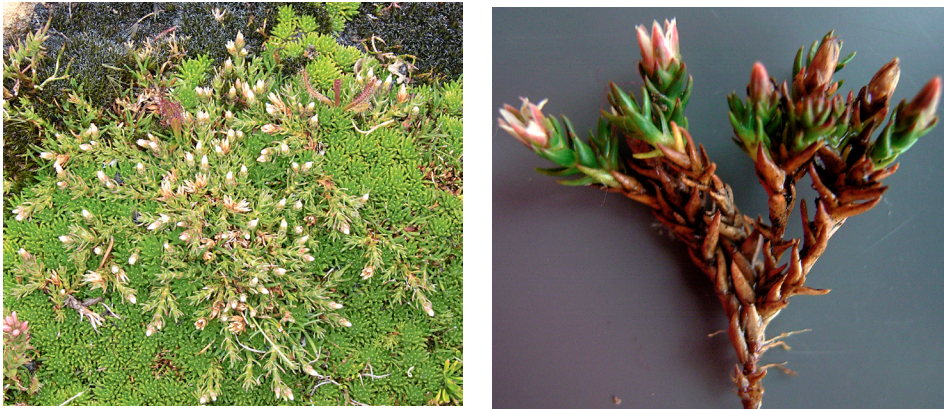


Fig 3. *Sprengelia minima*. Habit/habitat photo, showing plant growing in *Donatia novae-zelandiae* cushion at Lake Esperence, Hartz Mts. National Park.

Fig.4. *Sprengelia minima*. Form. The green leaves only are at or above the surface contour of the host cushion plant.

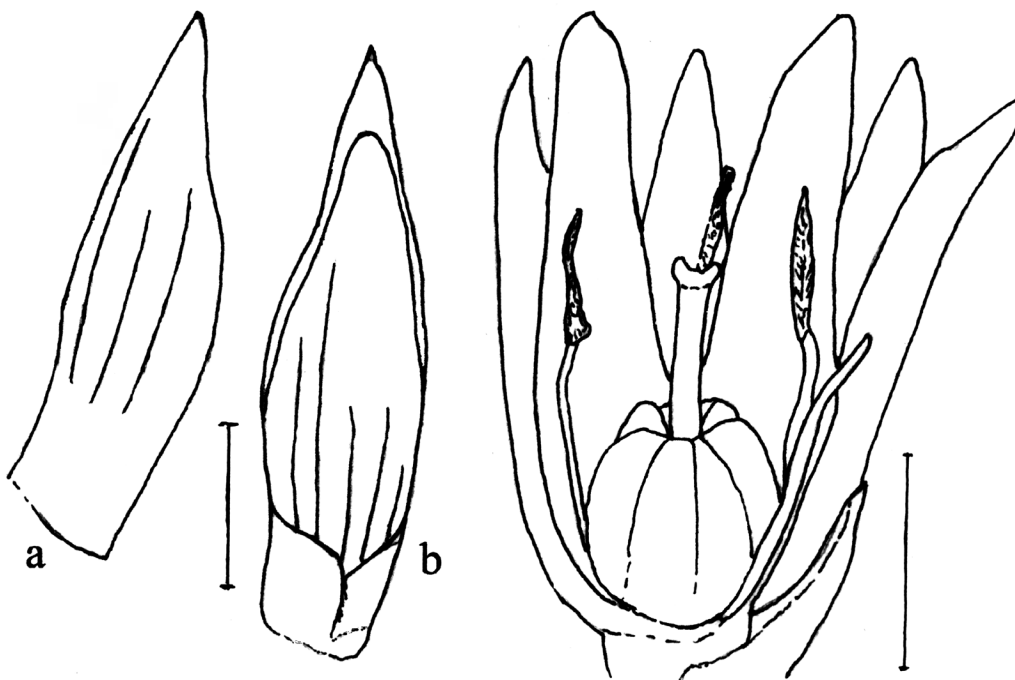


Fig. 5. *Sprengelia minima* **a**, leaf adaxial view; **b**, leaf abaxial view, scale bar = 1mm; **c**, flower section, scale bar = 1mm.

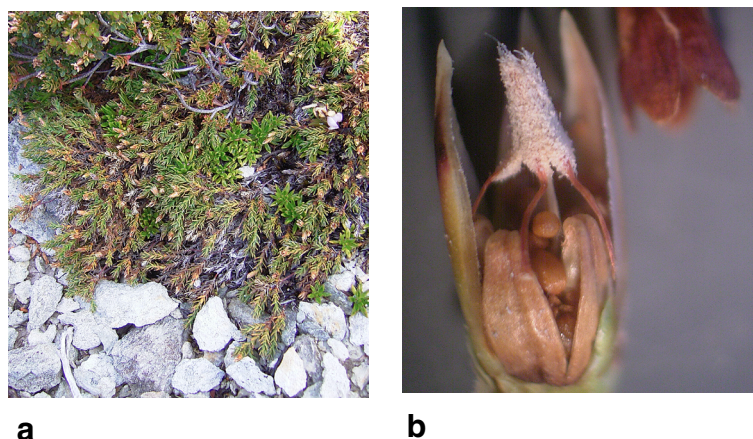


Fig 6. *Sprengelia* sp. Mt Read. **a**, habit photo, showing plant growing from edge of *Donatia zelandiae* cushion onto the quartzite substrate at Mt Read; **b**, anthers cohere persistently to the style in the Mt Read form. Note the petal residues (top right) above the specimen.

Notes: within the cushions, the plants present an appearance similar to *S. minima* as found at Lake Esperence, (Hartz Range) It is prostrate and straggling over the surface of the cushion and with presumably solitary flowers (not seen, but with solitary formed capsules) terminating the main branches. However, at the cushion margins they present a larger, more dense, prostrate form which may spread out from the cushion edge onto the surrounding substrate (Fig. 6a). Unfortunately only vegetative or specimens past flowering have been observed to date, but on one plant, the detached remains of a single old flower showed anthers in a persistent ring around the style (Fig. 6b), as is usual in *S. incarnata*, rather than spreading as in *S. minima*. However, the corolla residue (Fig 6b) more likely resembles the remains of a cup-shaped rather than a star-shaped flower.

Specimen examined: Tasmania: West: Mt. Read in the cushion plant *Donatia novae-zelandiae*, near the summit cairn, 1114 m, *Crowden 0802 006*, 20 Feb 2008 (HO564911).

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