

Taxonomic revision of the genus *Gamochaeta* Wedd. (Gnaphalieae, Asteraceae) in Chile

Revisión taxonómica del género *Gamochaeta* Wedd. (Gnaphalieae, Asteraceae) en Chile

SUSANA E. FREIRE^{1*}, LUCIANA SALOMÓN¹, NÉSTOR D. BAYÓN², CARLOS M. BAEZA³, MÉLICA MUÑOZ-SCHICK⁴ & MARÍA A. MIGOYA²

¹Instituto de Botánica Darwinion, Casilla de Correo 22, Labardén 200, San Isidro (B1642HYD), Buenos Aires, Argentina.

²Área de Botánica, Departamento de Ciencias Biológicas, Facultad de Ciencias Agrarias y Forestales, Universidad Nacional de La Plata, Avda. 60 entre 116 y 118, 1900 La Plata, Argentina.

³Facultad de Ciencias Naturales y Oceanográficas, Departamento de Botánica, Casilla 160-C, Universidad de Concepción, Concepción, Chile.

⁴Museo Nacional de Historia Natural, Casilla 787, Santiago, Chile.

*sfreire@darwin.edu.ar

ABSTRACT

Twenty four species of *Gamochaeta* (Gnaphalieae, Asteraceae), *G. aliena*, *G. alpina*, *G. americana*, *G. andina*, *G. axillaris*, *G. chamissonis*, *G. depilata*, *G. deserticola*, *G. falcata*, *G. filaginea*, *G. humilis*, *G. longipedicellata*, *G. neuquensis*, *G. nivalis*, *G. oligantha*, *G. procumbens*, *G. ramosa*, *G. serpyllifolia*, *G. simplicicaulis*, *G. spiciformis*, *G. stachydifolia*, *G. subfalcata*, *G. valparadisea*, and *G. villarroelii*, are formally monographed with morphological descriptions, illustrations, geographic distribution and habitat, distribution maps, phenology, lists of representative specimens examined, and a comprehensive identification key for every species. A new name *Gamochaeta ramosa* S.E. Freire, N. Bayón & C.M. Baeza for *Gnaphalium ramosum* Phil. (1864) non Lam. (1779) nec Sch. Bip. (1845), is proposed. The following taxa are newly synonymized: *Gamochaeta foliosa* with *G. spiciformis*; *G. monticola* with *G. oligantha*; *Gnaphalium petraeum* with *Gamochaeta andina*; *G. suffruticosa* with *G. chamissonis*; *Gnaphalium bellidifolium*, *Gamochaeta berteroaana* with *G. filaginea*; and *Gnaphalium agreste* with *Gamochaeta stachydifolia*. Lectotypes are newly designated for *Gnaphalium andinum*, *G. berteroaanum*, *G. suffruticosum*, and *G. villarroelii*.

KEYWORDS: Compositae, endemism, lectotypification, South America, synonyms, taxonomy.

RESUMEN

Este trabajo comprende la revisión de 24 especies de *Gamochaeta* para Chile, *G. aliena*, *G. alpina*, *G. americana*, *G. andina*, *G. axillaris*, *G. chamissonis*, *G. depilata*, *G. deserticola*, *G. falcata*, *G. filaginea*, *G. humilis*, *G. longipedicellata*, *G. neuquensis*, *G. nivalis*, *G. oligantha*, *G. procumbens*, *G. ramosa*, *G. serpyllifolia*, *G. simplicicaulis*, *G. spiciformis*, *G. stachydifolia*, *G. subfalcata*, *G. valparadisea* y *G. villarroelii*. Se incluye una clave para identificarlas y para cada una de las especies se brinda descripción, ilustración, fenología, distribución geográfica y hábitat, mapa de distribución, material adicional examinado y afinidades taxonómicas. Sobre la base del estudio de los materiales tipo, se establecen los siguientes nuevos sinónimos: *Gamochaeta foliosa* con *G. spiciformis*; *G. monticola* con *G. oligantha*; *Gnaphalium petraeum* con *Gamochaeta andina*; *G. suffruticosa* con *G. chamissonis*; *Gnaphalium bellidifolium*, *Gamochaeta berteroaana* con *G. filaginea*; *Gnaphalium agreste* con *Gamochaeta stachydifolia*; y se propone el nuevo nombre *Gamochaeta ramosa* S.E. Freire, N. Bayón & C.M. Baeza para *Gnaphalium ramosum* Phil. (1864) non Lam. (1779) nec Sch. Bip. (1845). Se designan lectotipos para las siguientes especies: *Gnaphalium andinum*, *G. berteroaanum*, *G. suffruticosum* y *G. villarroelii*.

PALABRAS CLAVE: Compositae, endemismo, lectotipificación, Sud América, sinónimos, taxonomía.

INTRODUCTION

The genus *Gamochaeta* Wedd. s.l. (Gnaphalieae, Asteraceae) comprises approximately 50 species (Anderberg 1991, Freire & Iharlegui 1997, Nesom 2006, Bayer *et al.* 2007,

Pruski 2011), with the center of diversity in South America, only a few are known from Central America or reach North America and some are adventives in Asia, Australia, and Europe. Of the *Gamochaeta* species in South America, 24 occur in Chile, seven of which are endemics.

Gamochaeta was originally described by Weddell (1856) who included four species, two of them first described as species of the large genus *Gnaphalium* L. Bentham & Hooker (1873) and Hoffmann (1890) considered *Gamochaeta* as a section of *Gnaphalium*. Cabrera (1961) reinstated *Gamochaeta* as a distinct genus based on its pappus bristles connate at base into a ring, instead of free as in *Gnaphalium*. Wagenitz (1965) and Drury (1970, 1971) once more regarded *Gamochaeta* as a section of *Gnaphalium*, being the view of Drury followed by Merxmüller *et al.* (1977) and Hilliard & Burt (1981). Several authors, e.g., Nesom (1990, 2004a,b, 2006), Anderberg (1991), Dillon & Sagástegui (1991a, b), Freire & Iharlegui (1997), Deble & Marchiori (2007), Bayer *et al.* (2007), Hind (2011), and Chen *et al.* (2011) recognized *Gamochaeta* as a distinct genus.

More recently, analyses using DNA sequences from plastid (trnLF-trnLC and rps16-trnQ) and nuclear (ITS and ETS) markers showed that the monotypic genera *Gamochaetopsis* Anderb. & S.E. Freire and *Stuckertiella* Wedd., were closely nested in a clade with the species of *Gamochaeta* and were currently transferred to *Gamochaeta* (Urtubey *et al.* 2016).

Since the first taxonomic treatments of Chilean species of *Gamochaeta* (under *Gnaphalium*) were carried out by Rémy (1849), Philippi (1895), and Reiche (1905), new species were described or redescribed without a new broad taxonomic evaluation or revision. Catalogues concerning aspects of nomenclature of *Gamochaeta* by Marticorena & Quezada (1985), and Freire & Iharlegui (2008) clarified synonyms and superfluous names. Nevertheless, the revision of species in Chile highlighted the need for further taxonomic adjustments.

This monograph is the first to treat the species of the *Gamochaeta* in depth over their geographic ranges in Chile. The present study provides an identification key, descriptions, illustrations, geographic distribution maps, and taxonomic discussions for 24 species occurring in Chile.

MATERIALS AND METHODS

The study is based on herbarium material from the following herbaria (abbreviations according to Thiers 2015): CONC, F, LP, MO, SGO, SI, UC, and W. Electronic images of type specimens at BM, B-W, CTES, E, F, GOET, HAL, K, M, MO, NY, P, P-LAM, S, and W were also studied.

Floral parts were dissected and observed after boiling in water and stained with 2% safranin. Characteristics of leaf trichomes were observed and recorded in cleared samples using Dizeo de Strittmatter's technique (1973). Observations were carried out using LM (Light Microscopy) and a Nikon Microphot-FXA microscope, equipped with a photographic camera. Leaf descriptions were made utilizing the terminology of Harris & Harris (1994).

MORPHOLOGY AND MICROMORPHOLOGY

HABITAT AND STEMS. Most Chilean species of *Gamochaeta* are perennial herbs, more rarely biennials or annuals, i.e. *G. oligantha*, *G. ramosa*, *G. simplicicaulis*, ranging from few cm (e.g. *G. andina*, *G. oligantha*, *G. deserticola*) to 60-70 cm tall (e.g. *G. americana*, *G. simplicicaulis*), simple (e.g. *G. simplicicaulis*) or more usually with primary branching at ground level only, and ascending commonly unbranched stems (branched stems in *G. ramosa*) from a decumbent base.

PUBESCENCE. The thickness of the wool on leaves is often useful alone or in combination with other characters to distinguish species (e.g., *G. aliena* from *G. filaginea*, woolly and loosely woolly or lanuginose, respectively; e.g., *G. serpyllifolia* from *G. depilata*, woolly and subglabrous or lanuginose, respectively). Pubescence in Chilean species of *Gamochaeta*, as well as in Chilean species of *Pseudognaphalium* (Freire *et al.* 2014) consists of two basic trichome types present on stems, leaves, and phyllaries. However, in contrast to Chilean species of *Pseudognaphalium*, glandular trichomes are poorly represented in *Gamochaeta*.

1. Long uniseriate eseptate flagellate trichomes (Figs. 1A, B; 7B). This type of trichome was referred as hair-type "B" (Drury & Watson 1966) and consists of one or two foot cells, one-two (three)-celled stalks, and a single very long, flagellate, eseptate apical cell. This trichome type is a common Gnaphalieae hair-type and it is present in all Chilean species of *Gamochaeta*.

2. Biseriate glandular trichomes (Figs. 1C, D; 7B). This type is comprised of two rows of cells in the body, with three to many cells in each row, enclosed by a persistent or collapsed cuticular vesicle. These trichomes are short clavate, 0.02-0.05 mm long. Glandular hairs are widespread in all the taxa studied, covering the surface of the leaf with few flagellate trichomes (e.g. *Gamochaeta americana*, *G. filaginea*, *G. simplicicaulis*, *G. villarroelii*) or hidden under the woolly trichomes (e.g. *G. aliena*, *G. alpina*, *G. andina*, *G. serpyllifolia*, *G. stachydifolia*, *G. valparadisea*).

INFLORESCENCE. The capitula in Chilean *Gamochaeta* are usually arranged in a cymose pattern (Endress 2010). The first-order axis (branch) has two short second-order axes (branches), and these short lateral branches of each axis have two or three branching orders, resulting in a dense terminal cluster (Fig. 2A). Capitula are arranged in clusters in *G. alpina*, *G. andina*, *G. depilata*, *G. neuquensis*, *G. oligantha*, *G. procumbens*, *G. serpyllifolia*, and *G. villarroelii*, although sometimes there is a small leafy cluster at base. In other species, clusters or cymose units are arranged in botryoid inflorescence (Troll 1964-1969, Weberling 1985, Rua 1999, Endress 2010) of many cymose units, commonly

called 'spikes' (Fig. 2B) which can be continuous (Fig. 2B1) (e.g. *G. aliena*, *G. americana*, *G. deserticola*, *G. falcata*, *G. filaginea*, *G. stachydifolia*, *G. subfalcata*, and *G. valparadisea* or conspicuously discontinuous (Fig. 2B2) (e.g. *G. axillaris*, *G. chamissonis*, *G. humilis*, and *G. simplicicaulis*), or 'panicle' (Fig. 2C) when the stem is branched at the upper part (e.g. *G. ramosa*, *G. falcata*, and occasionally *G. americana* and *G. filaginea*). Only one species, i.e. *G. longipedicellata* has solitary capitula.

CAPITULA. The capitula of *Gamochaeta* are heterogamous and disciform, usually sessile (pedunculate in *G. longipedicellata*) containing in Chilean species up to (12-55) 74-104 florets with outer pistillate flowers, 3-10 times (e.g. *G. aliena*, *G. alpina*, *G. andina*, *G. depilata*, *G. neuquensis*, *G. nivalis*, *G. procumbens*, *G. ramosa*, *G. serpillifolia*, and *G. spiciformis*) or usually more than 10 times as many as the central bisexual flowers (*G. americana*, *G. axillaris*, *G. chamissonis*, *G. deserticola*, *G. falcata*, *G. filaginea*, *G. humilis*, *G. longipedicellata*, *G. oligantha*, *G. simplicicaulis*, *G. stachydifolia*, *G. subfalcata*, *G. valparadisea*, and *G. villarroelii*). Campanulate to narrowly campanulate involucre are characteristic of most species of this study, ranging from 3 to 5.5 mm high.

PHYLLARIES. The phyllaries are arranged in 3 or 4 imbricate series, with the inner equalling or slightly exceeding the flowers and conspicuously longer than the outer. The outer phyllaries are dorsally pubescent and the inner

glandular or glabrous. The phyllary lamina is polychromous purplish or brownish and shiny, and the stereome is usually undivided, occasionally divided (*G. alpina*, *G. filaginea*, and *G. subfalcata*), or scarcely divided (e.g. *G. andina*, *G. procumbens*, and *G. serpillifolia*).

COROLLA. The corollas are whitish or yellowish, red-purple at apex. Corollas of pistillate florets are filiform and corollas of bisexual florets are tubular, scarcely broadened and purplish above, 5-lobed in all Chilean taxa.

ANTHERS. As most species of the tribe Gnaphalieae, all the taxa of *Gamochaeta* in this study have an apical ovate to lanceolate anther appendage and short basal tails (Fig. 3A).

STYLE. As with many taxa of the tribe Gnaphalieae (e.g. *Achyrocline*, *Pseudognaphalium*), all the species of *Gamochaeta* in this study have two branches truncate to rounded at the apex with many sweeping hairs apically and few dorsally (Fig. 3B).

ACHENIAL PUBESCENCE. The achenes of the all Chilean species present twin hairs or duplex myxogenic hairs, which consist of two small, square basal cells and two short globose to oblong (ca. 0.02 mm long) or sometimes clavate (*G. alpina*, 0.06-0.08 mm long) apical cells rounded at the apex and equal in length (Figs. 3C, 4A-D, 7J).

PAPPUS. In all taxa studied, pappus bristles are barbellate with apical cells acute, and basally connate, falling as a unit.

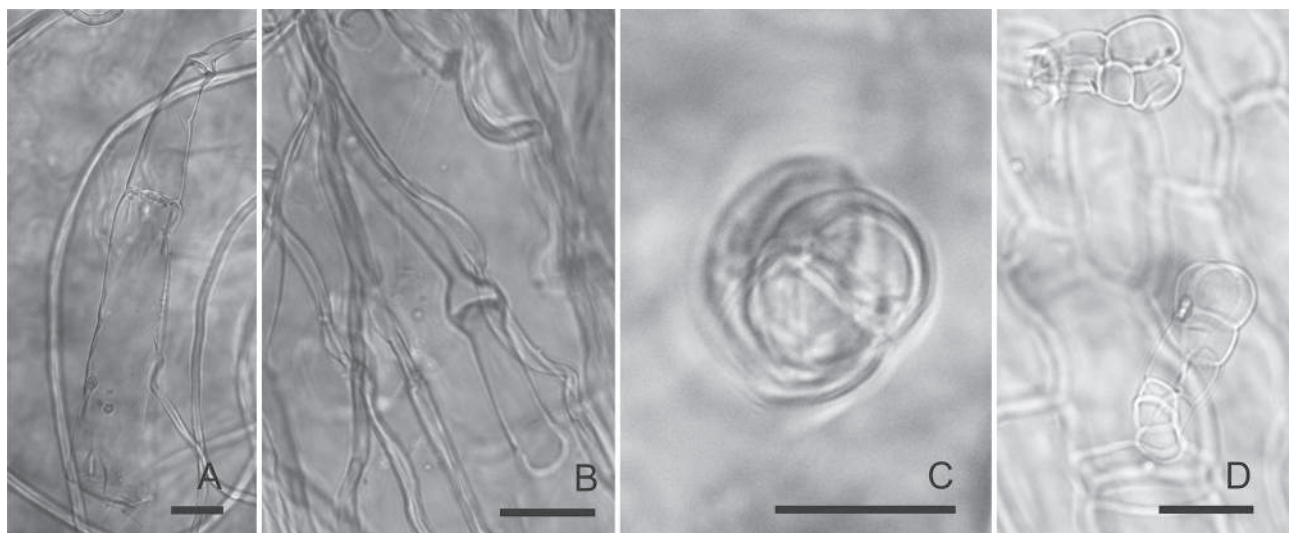


FIGURE 1. Foliar trichomes of *Gamochaeta*. A, Flagellate trichome (*G. villarroelii*, Gunckel 46248, CONC); B, Flagellate trichome (*G. simplicicaulis*, Ricardi 5296, CONC); C, Biseriate glandular trichome (*G. valparadisea*, Finot 83, CONC); D, Biseriate glandular trichome (*G. andina*, Schlegel 3497, CONC). Scale bars: A-D= 0.02 mm.

FIGURA 1. Tricomas foliares de *Gamochaeta*. A, Tricoma flagelado (*G. villarroelii*, Gunckel 46248, CONC); B, Tricoma flagelado (*G. simplicicaulis*, Ricardi 5296, CONC); C, Tricoma glandular biseriado (*G. valparadisea*, Finot 83, CONC); D, Tricoma glandular biseriado (*G. andina*, Schlegel 3497, CONC). Escalas: A-D= 0,02 mm.

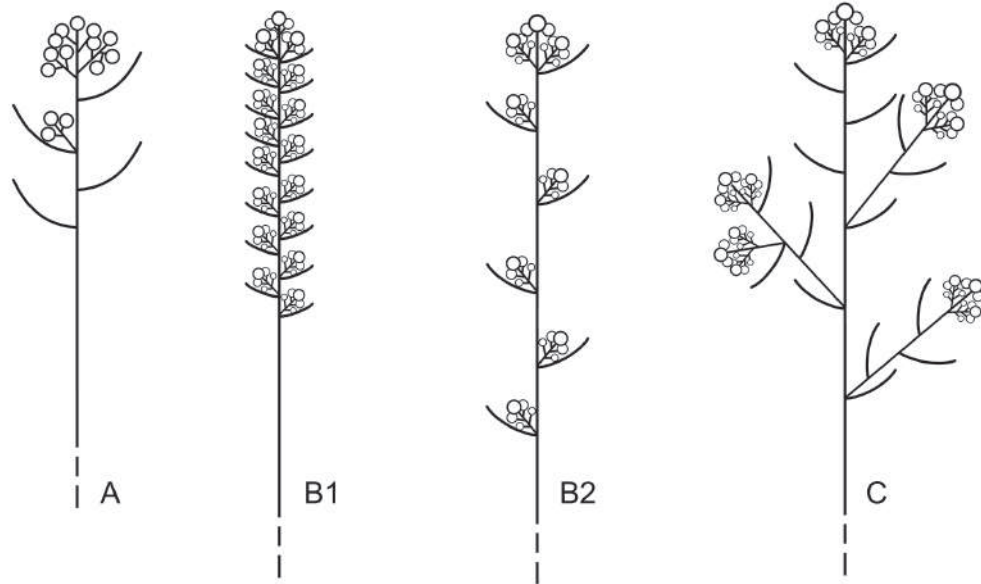


FIGURE 2. Inflorescences of *Gamochaeta*. A, Capitula arranged in dense terminal clusters (*G. alpina*, *G. andina*, *G. depilata*, *G. neuquensis*, *G. nivalis*, *G. oligantha*, *G. procumbens*, *G. serpyllifolia*, *G. spiciformis*, *G. villarroelii*); B, Capitula in dense clusters arranged in botryoid inflorescence or spikes. B1, Continuous spike (*G. aliena*, *G. americana*, *G. deserticola*, *G. falcata*, *G. filaginea*, *G. stachydifolia*, *G. subfalcata*, *G. valparadisea*); B2, Conspicuously discontinuous spikes (*G. axillaris*, *G. chamissonis*, *G. humilis*, *G. simplicicaulis*); C, Capitula in dense clusters arranged in panicles (*G. ramosa*, *G. falcata* occasionally *G. americana*, *G. filaginea*).

FIGURA 2. Inflorescencias de *Gamochaeta*. A, Capítulos agrupados en densos glomérulos terminales (*G. alpina*, *G. andina*, *G. depilata*, *G. neuquensis*, *G. nivalis*, *G. oligantha*, *G. procumbens*, *G. serpyllifolia*, *G. spiciformis*, *G. villarroelii*); B, Capítulos en densos glomérulos reunidos a su vez en inflorescencias botrioides o espigas. B1, Espigas continuas (*G. aliena*, *G. americana*, *G. deserticola*, *G. falcata*, *G. filaginea*, *G. stachydifolia*, *G. subfalcata*, *G. valparadisea*); B2, Espigas conspicuamente discontinuas (*G. axillaris*, *G. chamissonis*, *G. humilis*, *G. simplicicaulis*); C, Capítulos en densos glomérulos reunidos a su vez en panículas (*G. ramosa*, *G. falcata* ocasionalmente *G. americana*, *G. filaginea*).

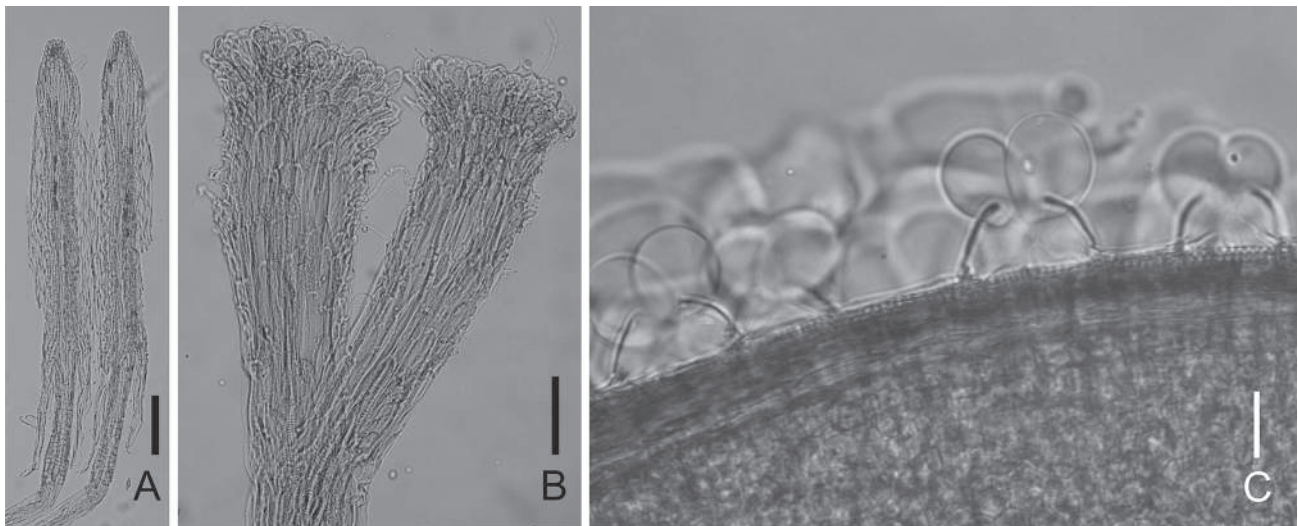


FIGURE 3. A, Stamen; B, Style branches from bisexual floret; C, Globose myxogenic duplex hairs. A-C (*G. ramosa*, Johow s.n. SGO 071064). Scale bars: A= 0.1 mm, B, C= 0.02 mm.

FIGURA 3. A, Estambre; B, Ramas del estilo de una flor bisexual; C, Pelos dobles, globosos y mucilaginosos del aquenio. A-C (*G. ramosa*, Johow s.n. SGO 071064). Escalas: A= 0.1 mm, B, C= 0,02 mm.

TAXONOMIC TREATMENT

Gamochaeta Wedd., Chlor. Andina, 1(4-6): 151. 1856. *Gnaphalium* L. subgen. *Gamochaeta* (Wedd.) Gren., Fl. Jurass. 2: 427. 1869. *Gnaphalium* L. sect. *Gamochaeta* (Wedd.) Benth. & Hook.f., Gen. Pl. 2(1): 306. 1873. *Gnaphalium* L. sect. *Gamochaeta* (Wedd.) O. Hoffm., Nat. Pflanzenfam. 4(5): 188. 1894, comb. illeg. — TYPE: *Gamochaeta americana* (Mill.) Wedd. (= *Gnaphalium americanum* Mill.), lectotype species designated by A. L. Cabrera, Bol. Soc. Argent. Bot. 9: 362. 1961.

= *Gamochaetopsis* Anderb. & S. E. Freire, Bot. J. Linn. Soc. 106(2): 186. 1991. Type: *Gamochaetopsis alpina* (Poepp.) Anderb. & S. E. Freire (= *Laennecia alpina* Poepp.).

= *Stuckertiella* Beauverd, Bull. Soc. Bot. Genève, Sér. 2, 5: 205. 1913. Type: *S. capitata* (Wedd.) Beauverd (= *Gamochaeta capitata* Wedd.), lectotype species designated by A. L. Cabrera, Fl. Patagónica, Colecc. Ci. Inst. Nac. Tecnol. Agropecu. 8(7): 128. 1971.

Annual, biennial or perennial herbs, woolly or glandular-woolly. Leaves alternate, sessile, entire. Capitula small, heterogamous, disciform, sessile or rarely pedunculate, arranged in terminal head-like clusters or more usually distributed into terminal and axillary bracteates or leafy clusters coalescing into spiciform inflorescence (sometimes paniculate), rarely solitary. Involucre campanulate to narrowly campanulate; phyllaries in 3-4-series, papery, phyllary lamina polychromous brownish, shiny, stereome undivided (occasionally divided). Receptacle flat, epaleate. Florets many, pistillate florets outnumbering the bisexual; pistillate corollas filiform or narrowly tubular; bisexual corollas tubular, scarcely broad above, 5(4)-lobed, all corollas whitish or white-yellowish, with red-purple pigmented lobes. Anthers with a small obtuse apical anther appendage; tails shorter than the filament collar. Style branches truncate and penicillate. Achenes pilose with short usually globose to oblong or clavate duplex myxogenic hairs, rarely glabrous. Pappus bristles monomorphic, barbellate, basally connate, deciduous as a unit. Chromosome number: 2n = 28

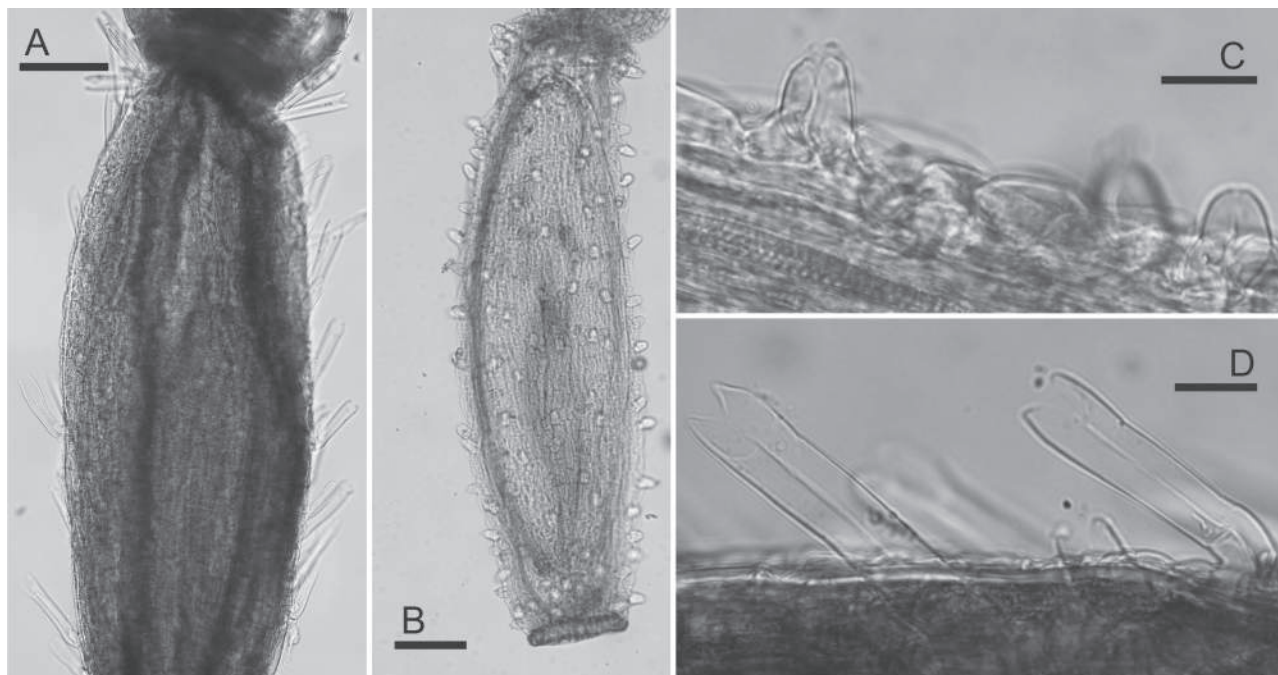


FIGURE 4. Achenial trichomes of *Gamochaeta*. A, Achene with clavate duplex hairs (*G. alpina*, Pfister 7861, CONC); B, Achene with short globose duplex hairs (*G. spiciformis*, García 3921, CONC); C, Short globose duplex hairs (*G. spiciformis*, García 3921, CONC); D, Clavate duplex hairs (*G. alpina*, Pfister 7861, CONC). Scale bars: A, B= 0.1 mm; C, D= 0.02 mm.

FIGURA 4. Aqueños de *Gamochaeta*. A, Aqueño con pelos dobles oblongos (*G. alpina*, Pfister 7861, CONC); B, Aqueño con pelos dobles cortos y globosos (*G. spiciformis*, García 3921, CONC); C, Pelos dobles cortos y globosos (*G. spiciformis*, García 3921, CONC); D, Pelos dobles oblongos (*G. alpina*, Pfister 7861, CONC). Escalas: A, B= 0.1 mm; C, D= 0,02 mm.

KEY TO THE SPECIES OF *GAMOCHAETA* IN CHILE

1. Capitula long pedunculate, solitary *G. longipedicellata*
 1'. Capitula sessile, in head-like clusters or in spikes.
 2. Capitula in head-like clusters, sometimes with 1(or 2) clusters at base.
 3. Stems branched on the upper part *G. ramosa*
 3'. Stems unbranched on the upper part.
 4. Annual herbs 1-4 cm high. Capitula 2-3(-6) *G. oligantha*
 4'. Perennial herbs; robust stems more than 4 cm high. Capitula 5 or more.
 5. Head-like clusters with 5-10 capitula.
 6. Caulinar leaves linear. Head-like clusters solitary *G. andina*
 6'. Caulinar leaves linear-obovate. Head-like clusters usually with 1 or 2 isolated clusters at base *G. neuquensis*
 5'. Head-like clusters with more than 10 capitula.
 7. Stems uniformly leafy. Head-like clusters subtended by leaves as large as caulinar leaves. Achenes glabrous *G. villarroelii*
 7'. Stems with basal leaves crowded. Head-like clusters subtended by leaves shorter than caulinar leaves. Achenes shortly pilose.
 8. Leaves broadly obovate to widely obovate (1.5-5 cm × 5-15 mm); slightly to conspicuously discolorous *G. spiciformis*
 8'. Leaves linear-obovate to suborbicular (0.4-2.6 cm × 2-5 mm); concolorous.
 9. Leaves linear-obovate, acute and shortly acuminate at apex *G. procumbens*
 9'. Leaves linear-obovate to suborbicular obtuse to rounded at apex.
 10. Leaves arachnoid to glabrescent, greenish on both surfaces *G. depilata*
 10'. Leaves whitish-woolly on both surfaces.
 11. Leaves suborbicular *G. alpina*
 11'. Leaves linear-obovate.
 12. Outer phyllaries obtuse *G. nivalis*
 12'. Outer phyllaries acute to acuminate *G. serpyllifolia*
 2'. Capitula crowded into axillary bracteate or leafy clusters coalescing into spiciform inflorescence (sometimes paniculate).
 13. Leaves conspicuously discolorous.
 14. Capitula arranged in conspicuously discontinuous spikes. Stem solitary, uniformly leafy with leaves linear-obovate or obovate *G. simplicicaulis*
 14'. Capitula arranged in continuous spikes (or discontinuous at base). Stem branched at base (multistemmed plants). Basal leaves rosulate, widely obovate; caulinar leaves obovate *G. americana*
 13'. Leaves concolorous or slightly discolorous (woolly or lanuginose on both surfaces or more densely below).
 15. Capitula arranged in conspicuously discontinuous spikes.
 16. Plants up to 12 cm tall *G. humilis*
 16'. Plants 15-50 cm tall.
 17. Capitula crowded in the axils of the basal and upper leaves *G. axillaris*
 17'. Capitula crowded in the axils of the upper leaves *G. chamissonis*
 15'. Capitula arranged in continuous spikes (or discontinuous at base).
 18. Caulinar leaves broadly obovate more than 6 mm wide, densely whitish woolly.
 19. Stems uniformly leafy; all leaves approximate *G. valparadisea*
 19'. Basal leaves rosulate *G. stachydifolia*
 18'. Caulinar leaves obovate, linear-obovate or linear to linear-falcate up to 5 mm wide (sometimes up to 12 mm wide in *G. subfalcata*, but with leaves lanuginose).
 20. Caulinar leaves linear to linear-falcate, apex acute *G. falcata*
 20'. Caulinar leaves obovate or linear-obovate, apex obtuse.
 21. Capitula in dense unbranched spikes.
 22. Plants 3-10 cm high *G. deserticola*
 22'. Plants 15-35 cm high *G. subfalcata*
 21'. Capitula in elongated spikes usually branched.
 23. Leaves densely whitish woolly on both surfaces *G. aliena*
 23'. Leaves lanuginose above and woolly below *G. filaginea*

1. *Gamochaeta aliena* (Hook. & Arn.) Cabrera, Bol. Soc. Argent. Bot. 9: 363. 1961. ≡ *Gnaphalium alienum* Hook. & Arn., J. Bot. (Hooker) 3: 329. 1841. TYPE. Chile. *H. Cuming 64* (holotype, K 000500334!; isotypes, E 00322501!, E 00327205!). Fig. 5.

Perennial herbs, 16-17 cm tall, multistemmed, stems ascending to erect, unbranched, more densely leafy at base (type specimen), densely whitish-lanate. Basal leaves 30-33 × 4-5 mm, linear-obovate, apex obtuse, mucronate; concolorous, whitish-woolly on both surfaces; caulinar leaves 15-17 × 2-3 mm, narrowly linear. Capitula many, in spikes interrupted at base. Involucre narrowly campanulate, 4.5-5 × 3-3.5 mm. Phyllaries 4-seriate, lamina light-brown at apex; outer phyllaries 4-4.2 × 1.5-1.7 mm, ovate, apex acute-acuminate, lanuginose; inner phyllaries 4.5-4.7 × 0.7-1 mm, oblong-lanceolate, apex acute, glabrous. Pistillate florets ca. 18, corolla white-yellowish, purplish at apex, filiform, 2.8-3 mm long. Bisexual florets ca. 6, corolla white-yellowish, purplish at apex, tubular, 3-3.2 mm long. Achenes ca. 0.5 mm long, pilose, with short globose duplex hairs. Pappus bristles 3-3.2 mm long.

PHENOLOGY. Flowering from January to March (October).

DISTRIBUTION AND HABITAT. *Gamochaeta aliena* is endemic to central and south Chile (Coquimbo, Metropolitana, Maule, Biobío, Araucanía, Los Lagos), growing between 250-2600 m.

RELATIONSHIPS. *Gamochaeta aliena* is closely similar to *G. filaginea* in habit, capitula arrangement, and leaf shape. However, *G. aliena*-V-be differentiated by its whitish-woolly leaves on both surfaces (vs. whitish-lanuginose above, and whitish-woolly below in *G. filaginea*). *Gamochaeta aliena* also resembles *G. falcata* in habit and capitula arrangement. However, *G. aliena*-V-be differentiated mainly by its cauline leaves that are linear-obovate (vs. linear to linear-falcate and usually folded in *G. falcata*).

ADDITIONAL MATERIAL EXAMINED. CHILE. Región de Coquimbo. Prov. Elqui: Elqui, 1898, Philippi s.n. (SGO 076319). Prov. Ovalle: Los Molles, 2600 m, 20-X-1977, Zöllner 9867 (CONC). Prov. Choapa: Choapa, I-1863, Philippi s.n. (SGO 044943). Región Metropolitana. Prov. Cordillera: Cajón del Maipo, desde Bocatoma a la Angostura del Río Maipo, ca. del Retén "Los Queltehues", 25-II-1995, Villagrán 8647 (SGO). Prov. Santiago: Cuesta de Mallarauco, en la cima hacia el poniente, 28-X-1979, Muñoz 1431 (SGO). Región del Maule. Prov. Cauquenes: Subestación experimental Cauquenes, El Boldo, X-1981, Avendaño 0-189 (SGO). Prov. Curicó: Llico, I-1878, Sanfurgo s.n. (LP). Región del Biobío. Prov. Ñuble: Chillán, Bureo, 2-II-1934, Barros 49, 3364 (LP); Bureo, 250 m, II-1926, Barros s.n. (CONC 116281). Región de la Araucanía. Prov. Malleco: Pinares de Nahuelbuta, Volkmann s.n. (SGO 064475); Angol, III-1885,

Philippi s.n. (SGO 044915). Región de Los Lagos. Prov. Chiloé: Castro, Barros 3298 (LP).

2. *Gamochaeta alpina* (Poepp.) S. E. Freire & Anderb., Pl. Syst. Evol. 2016 [01-VII-2016] [epublished]. *Laennecia alpina* Poepp., Nov. Gen. Sp. Pl. 3: 56, tab. 262. 1845. *Lucilia alpina* (Poepp.) Cabrera, Bol. Soc. Argent. Bot. 9: 361. 1961. *Gamochaetopsis alpina* (Poepp.) Anderb. & S. E. Freire, Bot. J. Linn. Soc. 106(2): 186. 1991. TYPE. Chile austral. Rupium fissuris montis Pico de Pilque, Cordillera de Antuco, -I-1829, *E. F. Poeppig 889* (lectotype, W-0028920!, designated by Freire, Fl. Argentina 7(1): 483, 2014). Figs. 6, 29A.

Perennial herbs, 3-5 cm tall, caespitose, multistemmed, stems ascending, unbranched, more densely leafy at base and more loosely at the upper part, whitish-woolly. Leaves 8-25 × 2.5-10 mm, widely obovate or suborbicular, attenuate at base, apex rounded, mucronate; concolorous, whitish-woolly on both surfaces. Capitula many, in head-like clusters, subtended by obovate leaves. Involucre narrowly campanulate, 3-5 × 2.5-4 mm. Phyllaries 12-20, 4-seriate, lamina light-brown at apex; outer phyllaries 2-2.5 × 1 mm, ovate, apex acute to acuminate, lanuginose; inner phyllaries 3-4.5 × 0.2-0.5 mm, oblong-lanceolate, apex acute or subacute, glabrous. Pistillate florets 9-17, corolla whitish, purplish at apex, filiform, 2.2-3 mm long. Bisexual florets 3-5, corolla whitish, purplish at apex, tubular, 2.5-3 mm long. Achenes 0.5-1.5 mm long, pilose, with clavate duplex hairs. Pappus bristles 2.5-3 mm long.

PHENOLOGY. Flowering in January and February.

DISTRIBUTION AND HABITAT. *Gamochaeta alpina* occurs in mountains from southern Chile (Araucanía, Los Lagos, Magallanes y de la Antártica Chilena) and bordering regions in Argentina (Neuquén, Río Negro; Cabrera 1971, Freire 2014), between 700-2000 m.

RELATIONSHIPS. *Gamochaeta alpina* resembles *G. serpyllifolia*, in habit, leaves, and capitula arrangement. It differs in having achenes with clavate twin hairs, whereas *G. serpyllifolia* has achenes with globose twin hairs.

ADDITIONAL MATERIAL EXAMINED. CHILE. Región de la Araucanía. Cautín: Al pie del Volcán Quetrupillán, 2000 m, I-1958, Herb. Gunckel 71253 (CONC). Malleco: Termas del Río Blanco, 1100 m, I-I-1948, Pfister 7861 (CONC). Región de Los Lagos. Llanquihue: Co. Vichadero, Casa Pangué, 1700 m, 14-I-1953, Pfister 13591 (CONC). Región de Magallanes y de la Antártica Chilena. Prov. Magallanes: Parque Nacional Alberto M. de Agostini, Glaciar Nueva Zelanda, 11-II-1996, Pisano 8835 (CONC). Prov. Última Esperanza: Senos de Catherine, 700-900 m, 51°12'S-73°10'W, 14-II-1992, Arroyo & al. 92-394 (CONC); Monte Balmaceda, 51°37'S-73°20'W, 14-15-I-1996, Pisano & al. 8452 (CONC).



FIGURE 5. *Gamochaeta aliena*. A, Habit; B, Leaves; C, Capitulum; D, Phyllaries; E, Pistillate floret; F, Bisexual floret; G, Style branches; H, Achene; I, Pappus; J, Distribution [A-I, Sanfuro in 1878, LP].

FIGURA 5. *Gamochaeta aliena*. A, Planta; B, Hojas; C, Capitulo; D, Filarios; E, Flor pistilada; F, Flor bisexual; G, Ramas del estilo; H, Aquenio; I, Papus; J, Distribución [A-I, Sanfuro en 1878, LP].

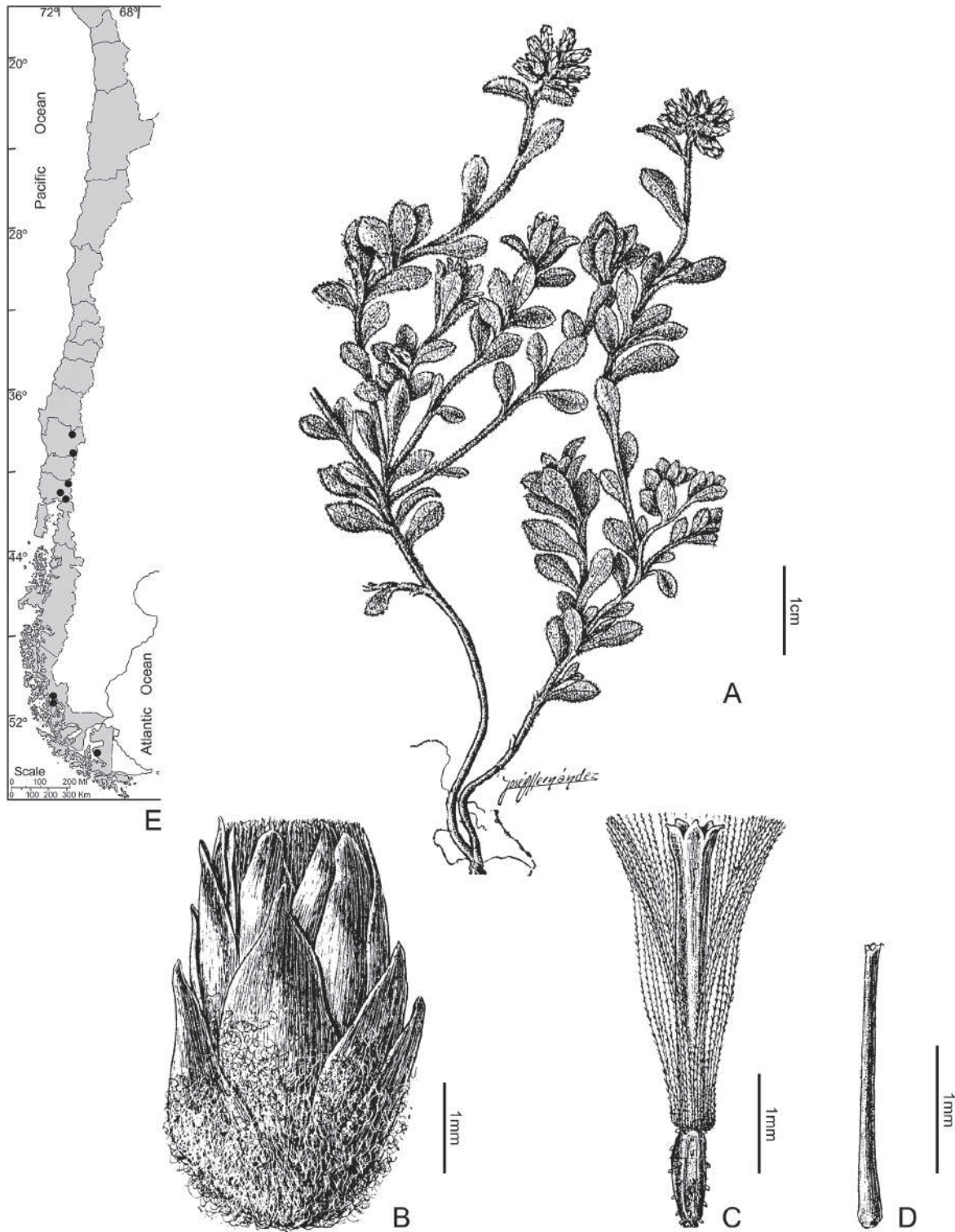


FIGURE 6. *Gamochaeta alpina*. A, Habit; B, Capitulum; C, Bisexual floret; D, Corolla of pistillate floret. E, Distribution [A-D, from *Fl. Patagónica* 8(7): 114. 1971], sub *Lucilia alpina*, Fig. 107].

FIGURA 6. *Gamochaeta alpina*. A, Planta; B, Capítulo; C, Flor perfecta; D, Corola de la flor pistilada. E, Distribución [A-D, de *Fl. Patagónica* 8(7): 114. 1971, sub *Lucilia alpina*, Fig. 107].

3. *Gamochaeta americana* (Mill.) Wedd., Chlor. Andina 1(4-6): 151. 1856. \equiv *Gnaphalium americanum* Mill., Gard. Dict. (ed. 8) no. 17. 1768. \equiv *Gnaphalium purpureum* L. var. *americanum* (Mill.) Klatt, Linnaea 42(1): 140. 1878. TYPE. Jamaica. 1731, *W. Houston s.n.* (lectotype BM 001009488!, designated by S. L. M. Moore & A. B. Rendle, Fl. Jamaica 7: 206. 1936). Fig. 7.
- = *Gnaphalium spicatum* Mill. var. *chonoticum* Hook.f., Bot. Antarc. Voy. Vol. I, Fl. Antarc. 2: 309, 1846. TYPE. Chile. [Prov. Aysen] Chonos Arch., Dec. 1834, *C. Darwin* [Henslow's 333], (lectotype, K 000500392!, designated by Porter, Bot. J. Linn. Soc. 93: 56. 1986; isolectotype, CGE).
- = *Gnaphalium coarctatum* Willd., Sp. Pl. 3(3): 1886. 1803, nom. nov. \equiv *Gnaphalium spicatum* Lam., Encycl. 2(2): 757. 1788, nom. illeg., non Miller, 1768. \equiv *Gnaphalium purpureum* L. var. *spicatum* Klatt, Linnaea 42(2): 140. 1878. \equiv *Gnaphalium purpureum* L. var. *spicatum* Baker, Fl. Bras. 6(3): 124. 1882, nom. illeg. \equiv *Gamochaeta spicata* Cabrera, Bol. Soc. Argent. Bot. 9: 380. 1961. \equiv *Gamochaeta coarctata* (Willd.) Kerguelen, Lejeunia 120: 104. 1987. TYPE. [Uruguay]. Monte Video, -X-1767, *P. Commerson s.n.* (holotype P-LAM 00309295!).
- = *Gnaphalium consanguineum* Gaudich., Ann. Sci. Nat. (Paris) 5: 103. 1825. TYPE. Argentina. Islas Malvinas, *C. Gaudichaud s.n.* (lectotype, P 00704625!, designated by A. L. Cabrera, Bol. Soc. Argent. Bot. 9: 364. 1961).
- = *Gnaphalium guatemalense* Gand., Bull. Soc. Bot. France 65: 42. 1918. \equiv *Gamochaeta guatemalensis* (Gand.) Cabrera, Bol. Soc. Argent. Bot. 9: 363. 1961. TYPE. Guatemala. Dpto. Alta Verapaz, -II-1907, *H. von Tuerckheim II 1634* (holotype, LY; isotypes MO, NY, SI!).
- = *Gamochaeta irazuensis* G. L. Nesom, Phytologia 68(3): 199-200. 1990. TYPE. Costa Rica. Volcán Irazu, 10,000-11330 ft., 1-XII-1937, *P.H. Allen 702* (holotype, F 0050254F!).

Annual, biennial to perennial herbs, 10-60 cm tall, multistemmed, solitary or more often several ascending stems, unbranched, whitish-woolly, with basal rosette of leaves, persisting at flowering. Basal leaves 1.5-6(12) cm \times 5-20(25) mm, widely obovate, attenuate at base, apex rounded to obtuse, mucronate, margins flat or wavy toward the apex; strongly discolorous, glabrescent or glabrous and green above, and with adpressed white tomentum on lower surface; caulinar leaves remote, gradually diminishing in size upwards, obovate. Capitula many, in clusters in the axils of the upper leaves, arranged in continuous elongated spikes (inflorescence branched in robust plants). Involucre narrowly campanulate, 3-5 \times 2-3 mm. Phyllaries 3-4-seriate, lamina light-brown at apex; outer phyllaries 2-3 \times 1-1.5 mm, ovate, apex obtuse or acute to acuminate, lanuginose; inner phyllaries 3-4.5 \times 0.6-1 mm, oblong, apex rounded to

acute to short acuminate, glabrous. Pistillate florets 80-90, corolla white-yellowish, purplish at apex, filiform, 2-3 mm long. Bisexual florets 2-4, corolla white-yellowish, purplish at apex, tubular, 2.2-3 mm long. Achenes 0.5-0.8 mm long, pilose, with short globose duplex hairs. Pappus bristles 2.5-3 mm long.

VERNACULAR NAMES. "Diuca-lahuén", "vira", "vira-vira".

PHENOLOGY. Flowering from September to April.

DISTRIBUTION AND HABITAT. *Gamochaeta americana* has a wide distribution including Central and South America (Jamaica, Panama, Colombia, Peru, Bolivia, Brazil, Paraguay, Uruguay, Argentina, and Chile) and is adventive in North America and Old World (Eurasia, Africa, Australia, and New Zealand). In Chile this species has been collected in Arica and Parinacota, Coquimbo, Valparaíso, Metropolitana, Libertador General Bernardo O'Higgins, Maule, Biobío, Araucanía, Los Ríos, Los Lagos, Aysén del General Carlos Ibáñez del Campo, and Magallanes and Antártica Chilena, growing on grassland, abandoned crop fields and modified soils along roads, from sea level to 3500 m.

RELATIONSHIPS. *Gamochaeta americana* resembles *G. simplicicaulis* in its discolorous leaves. However, *G. americana-V-be* differentiated by its capitula arranged in continuous spikes (vs. conspicuously discontinuous in *G. simplicicaulis*), as well as by the often several stems with many basal leaves rosulate (vs. solitary stem with few and slightly approximate basal leaves in *G. simplicicaulis*).

OBSERVATION. There has been considerable differences of perspective regarding the specific limits of *Gamochaeta americana*. In fact, Adams (1972) and D'Arcy (1975) followed by Nesom (1990) and Dillon (1991a, b) placed *G. coarctata* into synonymy under *G. americana*. Other authors, e.g. Godfrey (as *Gnaphalium*, 1958), Cabrera (1961, 1963, 1971, 1974, 1978), Drury (1971), Freire & Iharlegui (1997), Nesom (2004 a, b), Pruski & Nesom (2004), and Hind (2011) preferred to maintain *G. americana* and *G. coarctata*, mainly based on phyllary apices. In the present treatment we adopt the broad concept for *G. americana*, including taxa with acute to obtuse phyllaries. In addition, *G. coarctata* was said to differ from *G. americana* (Pruski & Nesom 2004) by its stems being up to 60 cm tall (vs. to 25), basal leaves wider than 8 mm (vs. narrower), and involucre 3-4 mm high (vs. 4.5). However, subsequent collections have shown to be within the range of variation for *G. americana*. Furthermore, this synonymy is congruent with molecular evidence, since *Gamochaeta americana* and *G. coarctata* conform a clade, which also comprises *G. ustulata* (Nutt.) Holub (USA), all them with discolorous and widely obovate leaves (Urtubey *et al.* 2016).

ADDITIONAL MATERIAL EXAMINED. CHILE. Región de Arica y Parinacota. Prov. Parinacota: Camino de Arica a Portezuelo de Chapiquiña km 96, 3450 m, 9-II-1964, C. Marticorena & al. 52 (CONC); Camino de Azapa a Chapiquiña, Episcacha, km 94, 3500 m, 25-IX-1958, Ricardi & Marticorena 4767/1152 (CONC). Región de Coquimbo. Prov. Limarí: Fray Jorge, 31-XI-1971, Martínez 52555 (CONC). Prov. Choapa: Pichidangui, 6 m, 9-IX-1982, Montero 12239 (CONC). Región de Valparaíso. Prov. Petorca: Petorca, carretera Panamericana, 4 km antes del pte. Guaquén, 15-X-1971, Marticorena & al. 1267 (CONC). Prov. Marga-Marga: Marga-Marga, IX-1914, Jaffuel s.n. (CONC 89680). Prov. Valparaíso: Concón, -XII-1951, Gunckel 22386 (CONC); Los Juanes, 32°46'S-71°32'W, XI-1953, Gunckel 36656 (CONC); Los Juanes, 32°46'S- 71°32'W, II-1955, Gunckel 50722 (CONC). Islas de Juan Fernández, Isla de Masafuera, Q. de El Mono, 5-10 m, 28-XI-1965, Muñoz & Sierra 7095 (CONC); Quintero, Los Juanes, 30 m, 20-I-1954, Navas s.n. (CONC 116196, 116315); Islas de Juan Fernández, Masafuera, up path from mouth of Q. Las Vacas to Los Inocentes, 1030 m, Stuessy & al. 5078 (CONC). Región Metropolitana de Santiago. Prov. Chacabuco: Batauco, 9-X-1951, Gunckel 22793 (CONC); Termas de Colina, 20-IX-1954, Navas s.n. (CONC 116313). Prov. Cordillera: San José de Maipo, Las Vertientes, 890 m, 29-IX-1951, Gunckel 24664 (CONC); Clarillo, XI-1962, 800 m, Gunckel 39459 (CONC); Las Vertientes, -X-1955, Navas 156 (CONC). Prov. Santiago: Q. de Peñalolén, 23-X-1952, 1000 m, Bravo 402 (CONC); Peñalolén, 14-XI-1951, 1200 m, Gunckel s.n. (CONC 116367). Región del Libertador General Bernardo O'Higgins. Prov. Cachapoal: Termas de Cauquenes, 1-XI-1952, Pfister s.n. (CONC 10058). Región del Maule. Prov. Curicó: Barros Negros, 24-II-1931, Barros 24042 (CONC). Prov. Linares: a lo largo del Río Achibueno, desde junta estero Las Ánimas a junta estero Riecillo, 9-III-1999, Ruiz & López 1185 (CONC). Región del Biobío. Prov. Ñuble: San Carlos, El Roble, 2-II-1921, Barros 3312 (CONC); A 8 km de Ñipas, fundo "Taiguén", 2-II-1959, Matthei s.n. (CONC 27059, 27060); Camino hacia El Roble y Gómez, aprox. 17 km después del desvío hacia El Boldo, 36°03'S-72°46'W, 590 m, 6-XII-2001, Mihoc & al. 3435 (CONC); A 5 km al N de Quinchamali, 130 m, 19-XI-1992, Rodríguez & Marticorena 2916 (CONC); Atacalco, Los Cipreses, 7-XII-1945, Pfister 4953 (CONC); Camino desde Longitudinal a Quirihue, Quillanco, 36°28'S-72°16'W, 90 m, 13-XI-1978, Rodríguez 222 (CONC); Co. Cayumanqui, ca. de la cumbre, 36°42'S-72°31'W, 760 m, 22-X-1981, Ugarte 206 (CONC). Prov. Concepción: Coronel, 25-II-1923, Barros 894 (CONC); Tomé, 24-XI-1925, Barros 1032 (CONC); Concepción, 10 m, XI-1931, Barros 4334 (CONC); Concepción, 22-XI-1922, Barros 10360 (CONC); Gualpén, 9-XI-1924, Barros 24695 (CONC); Dichato, XI-1930, Barros s.n. (CONC 116284, 116354); Tomé, 28-XI-1937, Behn s.n. (CONC 20863); Camino entre Concepción

y Bulnes, poco antes del Pte. Queime, 16-XII-1967, Cea & Ugarte s.n. (CONC 35036); Talcahuano, Parque Hualpén, 36°47'S- 73°10'W, 60 m, 2-I-1970, Carrasco 332 (CONC); Florida, Fundo "Santa Anita", 3-XI-1957, Duran s.n. (CONC 24293); Pichaco, Hualqui, 21-XI-1936, Junge s.n. (CONC 5849); Santa Juana, Fundo "Saruca", 37°11'S-72°58'W, 50 m, 23-XI-1987, Olea 49 (CONC); Camino a Nonguén por la cantera, 7-I-1941, Pfister 553 (CONC); Co. de la Toma, 21-XI-1943, Pfister 4271 (CONC); Boca del Bío-Bío, 17-XI-1945, Pfister s.n. (CONC 4889); Desembocadura del Bío-Bío, 20-XII-1950, Pfister s.n. (CONC 11334); Co. de La Toma, 21-XI-1943, Pfister s.n. (CONC 4273); La Toma, 21-XI-1943, Pfister s.n. (CONC 20866); Hualpén, 13-XII-1950, Ricardi 613 (CONC); Lirquén, 11-XII-1950, Ricardi s.n. (CONC 11034); Talcahuano, Rocoto, 15-XI-1967, Villarroel & Weldt 91 (CONC). Prov. Biobío: Quilleco sector Las Ánimas, 37°27'S-71°57'W, 370 m, 21-XI-2000, Baeza & López 1812 (CONC); Co. Pilque, 37°20'S- 71°37'W, 910 m, 9-III-2001, Baeza & al. 3623 (CONC); Lomas entre Candelaria y Los Setenta, 2-XI-1935, Junge s.n. (CONC 5595); La Laja, camino de Bío-Bío a Santa Bárbara, pasado estero Pirquinco, 37°49'S-71°40'W, 400 m, 14-III-1976, Marticorena 1008 (CONC); La Laja, camino de Bío-Bío a Copahue, estero Epún, 37°52'S-71°27'W, 1260 m, 13-III-1976, Marticorena & al. 969 (CONC); Yumbel, 29-X-1977, Vinet 23-A (CONC). Prov. Arauco: Camino desde Tubul a Arauco, sector Las Peñas a 300 m del Pte. Tubul, 37°14'S-73°27' W, 3-I-2001, Baeza & López 2783 (CONC); Camino costero de Arauco a Lebu, 8 km después del cruce a Tubul, 37°15'S-73°25'W, 90 m, 11-I-2001, López & al. 2176 (CONC); Camino a Quidico, bosque en terreno húmedo, 37°20'S-73°35'W, 8 m, 13-I-2001, Parra & Torres 160 (CONC); Playa Punta Morguilla, 37°42'S-73°38'W, 6-II-2001, Parra & Torres 430 (CONC); A 8 km del cruce a Quinahue, camino Lebu-Los Álamos, 70 m, 37°42'S-73°36'W, 19-II-2001, Parra & Torres 543 (CONC); A 4 km al N de Tirúa, 38°19'S-73°29'W, 90 m, 20-II-2001, Parra & Torres 674 (CONC); Junto al estero Ranquilco, 37°48'S-73°31'W, 40 m, 23-II-2002, Parra & Torres 959 (CONC). Región de la Araucanía. Prov. de Malleco: Angol, 5-XI-1933, Escuela Agrícola "El Vergel" 53 (CONC); Road from Victoria to Termas de Tolhuaca before Parque Nacional Tolhuaca near Pte. Tacadero, 38°13'S-71°49'W, 942 m, 30-XII-2003, Gardner & Knees 6872 (CONC); Parque Nacional Galletué, cerca del estero El Porfiado, 38°38'S-71°25'W, 10-I-1977, Marticorena & al. 1451 (CONC); Baños Los Pemehues, al NO de Tolhuaca, 13-I-1949, Pinto s.n. (CONC 8806); Termas de Manzanar, 6-II-1953, Pinto s.n. (CONC 13623); Nacimiento, fundo "El Tambillo", 11-XI-1950, Pfister s.n. (CONC 10850); Mininco, 19-X-1952, Schwabe s.n. (CONC 13351). Prov. Cautín: Cunco, 2-II-1931, Aravena 342 (CONC); Palguín, 8-XII-1945, 500 m., Gunckel 42828 (CONC); Pto. Saavedra, 3 m, 30-XII-1932,

Montero 1129 (CONC); Pastene, 400 m, 8-XII-1934, Montero 2247 (CONC). Región de Los Ríos. Prov. Valdivia: Niebla, 6-I-1935, Gunkel 5011 (CONC); Isla Teja, 50 m, XII-1961, Gunkel 38815 (CONC); Cuesta de Soto, 100 m, 9-XII-1963, Gunkel 41442 (CONC); Panguipulli, III-1922, Hollermayer 18b (CONC); La Barra Río Bueno, La Barra lado S, 9-I-1938, 2 m, Montero 3357 (CONC); La Barra Río Bueno, La Barra lado S, 7-I-1938, Montero 3570 (CONC). Cord. Pelada, camino a Co. El Mirador, 16-III-1964, 600 m, Ramírez 171 (CONC); La Unión, camino de Hueicolla a La Unión, km 1, 22-I-1971, Cord. Pelada, Co. Mirador, 1040 m, 1-II-1965, Ricardi & al. 1202 (CONC); Weldt-Rodríguez 942/237 (CONC). Región de Los Lagos. Prov. Osorno: Trumao, 2-XII-1934, Hollermayer 646a (CONC); Cantiamo, camino de Quilacahuín a Trinidad, 40°22'S-73°18'W, 30 m, 19-III-1990, Matthei & Quezada 1053 (CONC); Antillanca-Osorno, 16-II-1956, Pfister s.n. (CONC 19038); Orillas del lago Puyehue, 200 m, 3-IV-1965, Ramírez 5 (CONC); Volcán Osorno, 1100 m, 16-III-1964, Sparre & Constance 10707 (CONC); Volcán Osorno, 1000 m, 16-III-1954, Sparre & Constance 10719 (CONC); Río Pilmaiquén, La Poza, 110 m, Zollitsch 190 (CONC); Isla Fresia, IX-1956, s. coll. (CONC 116343). Prov. Llanquihue: Puerto Montt, Isla Tenglo, 27-II-1935, Junge s.n. (CONC 5340); Colegual, 20-I-1952, Klenner s.n. (CONC 12321); Lago Todos los Santos, Punta Guano, 8-XII-1971, Marticorena & al. 1968, 1989, 2011 (CONC); Ensenada, Lago Llanquihue, 13-I-1946, Pfister s.n. (CONC 6024); Puerto Montt, Laguna Mansa, 3-I-1951, Pfister s.n. (CONC 10246). Prov. Chiloé: Ancud, 7-I-1924, Barros 902 (CONC); Isla Grande de Chiloé, Chiloé National Park, 30 km North of Cucao at the mouth of Río Anay, 3 m, 42°28'S-74°15'W, 27-I-1986, Gardner 3593 (CONC); Timuquina, Changao Chico, 22-I-1932, Junge 1719 (CONC); Camino de Quellón a Castro, Lago San Miguel, bosques en la orilla Este, 43°04'S-73°40'W, 30 m, 12-I-1975, Marticorena & al. 112 (CONC); Isla Alao, orilla de vega, 30 m, 6-II-1983, Meza & Valenzuela 5075 (CONC). Región de Aysén del General Carlos Ibáñez del Campo. Prov. Aysén: Quitralko, 21-XII-1947, Behn s.n. (CONC 20861); Puyuhuapi, 27-XII-1939, Schwabe 50 (CONC); Puerto Puyuhuapi, 44°20'S-72°32'W, 27-XII-1939, Schwabe s.n. (CONC 10739). Prov. de General Carrera: Río Romero, 47°01'S-73°00'W, 19-III-1967, Seki 496 (CONC); Ventisquero Soler, 46°52'S-73°08'W, 24-27-III-1967, Seki 529 (CONC). Región de Magallanes y de la Antártica Chilena. Prov. de Magallanes: Río de las Minas, 9-II-1950, Barrientos 25770 (CONC); Magallanes, 150 m, IX-1914, Jaffuel s.n. (CONC 89680); Punta Arenas, I-1951, Barrientos s.n. (CONC 76379). Punta Arenas, 18-III-1955, Magens s.n. (CONC 116167).

4. *Gamochaeta andina* (Phil.) Cabrera, Bol. Soc. Argent. Bot. 9: 365. 1961. ≡ *Gnaphalium andinum* Phil., Anales Univ.

Chile 90: 24. 1895. TYPE. Chile. Santiago, parte elevada de los andes (Arañas), Talca (Descabezado) y [Ñuble] Baños de Chillán, -II-1892 [*Philippi s.n.*] (lectotype, designated here, SGO 064515!; isolectotype SGO 85504). Fig. 8.

= *Gnaphalium petraeum* Phil., Anales Univ. Chile 90: 21. 1895, **syn. nov.** TYPE. Chile. Aconcagua: Vallis Aconcagua, Guardia Nueva, -XII-1885 [*Philippi s.n.*] (holotype, SGO 076255!).

Perennial herbs, 3-6 cm tall, multistemmed, stems ascending to erect, unbranched, more densely leafy at base, whitish-lanate. Leaves 10-25 × 0.8-1(3) mm, narrowly linear, apex acute, mucronate; concolorous, whitish-lanuginose on both surfaces. Capitula few, ca. 10, in solitary head-like clusters, subtended by linear leaves. Involucre narrowly campanulate, 3-4 × 1.2-2 mm. Phyllaries 3-4-seriate, lamina light-brown at apex; outer phyllaries 2-3 × 1-1.5 mm, ovate, apex acute, lanuginose; inner phyllaries 3.5-4 × 0.8-1 mm, oblong-lanceolate, apex acute, glabrous. Pistillate florets ca. 12, corolla white-yellowish, purplish at apex, filiform, 2.8-4 mm long. Bisexual florets ca. 3, corolla white-yellowish, purplish at apex, tubular, 2.8-4 mm long. Achenes ca. 0.7 mm long, pilose, with short globose duplex hairs. Pappus bristles 2.8-4 mm long.

PHENOLOGY. Flowering from January to February.

DISTRIBUTION AND HABITAT. *Gamochaeta andina* is endemic to central Chile (Metropolitana, Maule, Biobío), and has been collected between 2190-2300 m.

RELATIONSHIPS. *Gamochaeta andina* resembles many species of the genus in habit, and capitula arrangement, but can be diagnosed principally by its linear leaves.

OBSERVATIONS. 1. According to the protologue, *Gnaphalium andinum* Phil., was based on the following specimens 'Habitat in editiore parte Andium: Arañas (Santiago), Descabezado (Talca), Termas de Chillán etc'. We were able to locate the collection 'Cordill. de las Arañas, Januar 1861' (LP 067307!), 'Talca (Descabezado del Maule) [Philippi, 1862]' (SGO 85503!), and 'Baños de Chillán, -II-1892' (SGO 64515!). Even when both collections agree in all respects with the protologue, we select as lectotype of *G. andinum* the specimen 'Baños de Chillán, -II-1892' which is better preserved, and is kept at SGO where the original herbarium of Philippi is deposited.

2. *Gnaphalium petraeum* Phil., was characterized by its caespitose habit, multistemmed, 5 cm high, with linear-oblong leaves, 10 × 2.5-3 mm, and few capitula arranged in head-like clusters. We place *Gnaphalium petraeum* in synonymy with *Gamochaeta andina* because there is no diagnostic character that differentiates the former from the later.

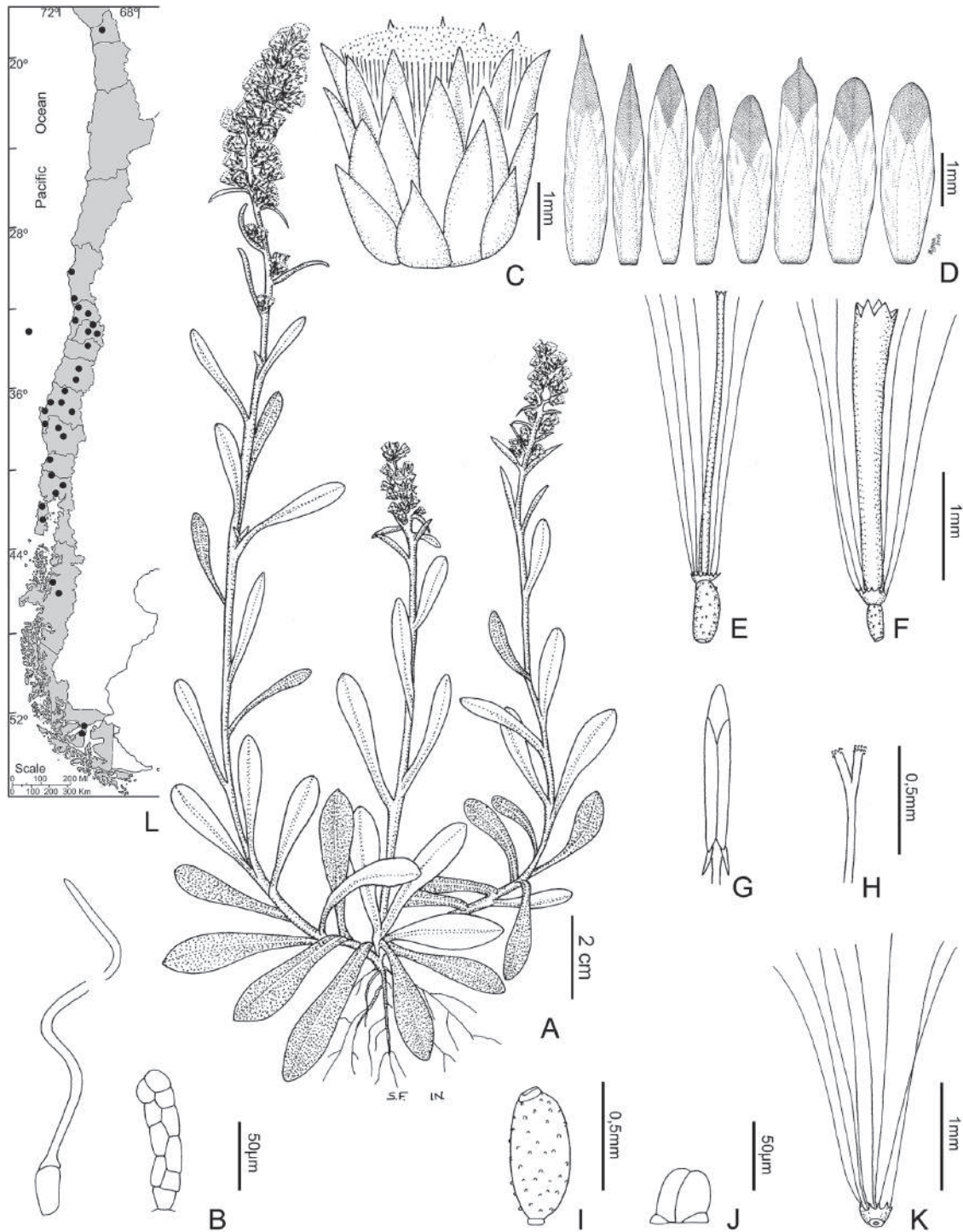


FIGURE 7. *Gamochaeta americana*. A, Habit; B, Foliar trichomes; C, Capitulum; D, Inner phyllaries from different specimens; E, Pistillate floret; F, Bisexual floret; G, Stamen; H, Style branches; I, Achene; J, Globose duplex hair; K, Pappus; L, Distribution [A-C, E-L, from *Fl. Paraguay* 27: 31, fig. 8.1998; D, From left to right, Bayer ARG-02004 LP, Pedersen 6292 LP, Grüner 130 LP, Dawson 32726 LP, Cabrera 5780 LP, Cabrera 114 LP, Dawson 760 LP, Cabrera 327 LP].

FIGURA 7. *Gamochaeta americana*. A, Planta; B, Tricomas foliares; C, Capítulo; D, Filarios internos de diferentes ejemplares; E, Flor pistilada; F, Flor bisexual; G, Estambre; H, Ramas del estilo; I, Aquenio; J, Pelo doble corto y globoso; K, Pappus; L, Distribución [A-C, E-L, tomado de *Fl. Paraguay* 27: 31, fig. 8.1998; D, de izquierda a derecha, Bayer ARG-02004 LP, Pedersen 6292 LP, Grüner 130 LP, Dawson 32726 LP, Cabrera 5780 LP, Cabrera 114 LP, Dawson 760 LP, Cabrera 327 LP].



FIGURE 8. *Gamochoaeta andina*. A, Habit; B, Leaf; C, Capitulum; D, Phyllaries; E, Pistillate floret; F, Bisexual floret; G, Style branches; H, Achene; I, Pappus; J, Distribution [A-I, Schlegel 3497, CONC].

FIGURA 8. *Gamochoaeta andina*. A, Planta; B, Hoja; C, Capítulo; D, Filarios; E, Flor pistilada; F, Flor bisexual; G, Ramas del estilo; H, Aqueño; I, Pappus; J, Distribución [A-I, Schlegel 3497, CONC].

3. According to the protologue, *Gnaphalium petraeum* Phil., was based on the specimen 'Inveni in via ad Uspallata haud procul a Guardia Vieja'. However, there is a collection at SGO which has this inscription: 'Vallis Aconcagua, Guardia Nueva'. Probably 'Guardia Nueva' instead of 'Guardia Vieja' was a transcription error.

ADDITIONAL MATERIAL EXAMINED. CHILE. Región Metropolitana de Santiago. Cordillera: RN Río Clarillo, 33°43'S-70°29'W, II-2004, Romero & Aldunate 34 (CONC); Parque Nacional El Morado, Cajón de Morales, I-1997, Teillier & Pauchard 2550 (SGO). Región del Maule. Talca: Comuna San Clemente, Paso Pehuenche, 2300 m, 35°59S-70°24'W, I-2005, Luebert & Teillier 2290 (CONC); Laguna del Maule, 2190 m, 36°00'S - 70°30'W, 20-I-1961, Schlegel 3497 (CONC). Región del Biobío. Ñuble: Baños de Chillán, I-1878, Philippi s.n. (SGO 085502). Biobío: Laguna del Laja, faldeos de la Sierra Velluda, 15-II-1960, Ricardi & Marticorena 5168/1552 (CONC, LP).

5. *Gamochaeta axillaris* (J. Rémy) Cabrera, Bol. Soc. Argent. Bot. 9: 367. 1961. ≡ *Gnaphalium axillaris* J. Rémy, in Gay Fl. Chil. 4: 230. 1849. TYPE. Chile. Without locality, *C. Gay* 98 (holotype, P 00704620!). Fig. 9.

Perennial herbs, up to 20-25 cm tall, stem usually solitary, erect, unbranched, whitish-tomentose. Basal leaves, 2.5-3.5 cm × 5-7 mm, widely obovate, attenuate at base, apex obtuse, mucronate; concolorous to slightly discolored, whitish-tomentose on both surfaces; caulinar leaves 1.8-3.5 × 0.2-0.4 cm, linear to linear-obovate, gradually diminishing in size upwards. Capitula many, in spiciform clusters in the axils of the leaves from the base to the upper part, forming a discontinuous elongated spike. Involucre narrowly campanulate, 4 × 3 mm. Phyllaries 3-4-seriate, lamina light brown at apex; outer phyllaries 3 × 1.2 mm, ovate, apex acute, basally lanuginose; inner phyllaries 3.5-4 × 0.5 mm, oblong, apex obtuse, glabrous. Pistillate florets 52-63, corolla white-yellowish, purplish at apex, filiform, 2.2-2.4 mm long. Bisexual florets 3-4, corolla white-yellowish, purplish at apex, tubular, 2.5 mm long. Achenes 0.5 mm long, pilose, with short globose duplex hairs. Pappus bristles 2.3-2.5 long.

PHENOLOGY. Flowering in January.

DISTRIBUTION AND HABITAT. *Gamochaeta axillaris* is endemic to Central and South Chile (Metropolitana, Los Ríos).

RELATIONSHIPS. *Gamochaeta axillaris* resembles *G. pennsylvanica* in habit, from which *G. axillaris* can be distinguished by its capitula borne from the base of stem.

ADDITIONAL MATERIAL EXAMINED. CHILE. Región Metropolitana. Prov. Santiago: Valle del Macul, Grandjot

51-C (LP), not seen. Región de Los Ríos. Prov. Ranco: San Juan, I-1884, Philippi s.n. p.p. (SGO 76258).

6. *Gamochaeta chamissonis* (DC.) Cabrera, Bol. Soc. Argent. Bot. 9: 368. 1961. ≡ *Gnaphalium chamissonis* DC., Prodr. 6: 233. 1838. ≡ *Gnaphalium purpureum* L. var. *chamissonis* (DC.) Klatt, Linnaea 42(2): 140. 1878. TYPE. Chile. Feb-Mar 1816, *L. C. A. von Chamisso* s.n. (holotype, G-DC foto serie Field Mus. 8221 p.p., SI!; isotype, HAL 0112153!). Fig. 10.

= *Gnaphalium fernandezianum* Phil., Bot. Zeit. 15: 640. 1856. ≡ *Gamochaeta fernandeziana* (Phil.) Anderb., Opera Bot. 104: 157. 1991. TYPE. Chile. Isla Juan Fernández, Masafuera, -X-1854, *P. Germain* 21, (holotype, SGO 064504!; isotypes, LP 001915!, S-R-2426!).

= *Gnaphalium suffruticosum* Phil., Linnaea 33: 165. 1864. ≡ *Gamochaeta suffruticosa* (Phil.) Anderb., Opera Bot. 104: 157. 1991, **syn. nov.** TYPE. Chile. Choapa, -XII-1862, Landbeck s.n. (lectotype, designated here, SGO 085505!; isolectotype, LP 001944!).

= *Gnaphalium serranoi* Phil., Anuario Hidrogr. 11: 196. 1886. ≡ *Gamochaeta serranoi* (Phil.) Cabrera, Bol. Soc. Argent. Bot. 9: 379. 1961. TYPE. Chile. XI Región. Prov. Aysén, Río Palena, year 1885, *Hirth* s.n. (holotype, SGO-064516!; isotype, LP 001954!).

= *Gnaphalium julietii* Phil., Anales Univ. Chile 90: 23. 1895. ≡ *Gnaphalium purpureum* L. var. *julietii* (Phil.) Reiche, Anales Univ. Chile 112: 123. 1903. *Gamochaeta julietii* (Phil.) Anderb., Opera Bot. 104: 157. 1991. TYPE. Chile. Orillas del lago Cayutué, *Philippi* s.n. (holotype, SGO-064499!; isotype, LP 001927!).

= *Gnaphalium polybotryum* Phil., Anales Univ. Chile 90: 24. 1895. ≡ *Gamochaeta polybotrya* (Phil.) Cabrera, Fl. Patagónica, Colecc. Ci. Inst. Nac. Tecnol. Agropecu. 8(7): 127. 1971. TYPE. Chile. Prov. de Chillán, -XII-1869 [*Philippi* s.n.] (holotype, SGO064468!; isotype, LP 001940!).

Perennial herbs, 15-50 cm tall, multistemmed, stems ascending, usually unbranched, densely leafy at base and more loosely at the upper part, whitish-woolly. Leaves 2,5-6 cm × 3-7 mm, narrowly obovate to obovate, long attenuate at base, apex subobtuse to acute, mucronate; concolorous, whitish-woolly on both surfaces. Capitula many, in clusters subtended by linear-obovate leaves, arranged in discontinuous elongated spikes. Involucre narrowly campanulate, 3.5-5 × 3-4 mm. Phyllaries 4-seriate, lamina light-brown at apex; outer phyllaries ca. 2 × 1 mm, ovate, apex acuminate, lanuginose; inner phyllaries 3-4.5 × 0.8-1 mm, oblong, apex obtuse-apiculate, glabrous. Pistillate florets 27-50, corolla white-yellowish, purplish at apex, filiform, 3-4 mm long. Bisexual florets 2-4, corolla white-yellowish, purplish at apex, tubular, 3-4 mm long. Achenes 0.5-0.8 mm long, pilose, with short globose duplex hairs. Pappus bristles 3-4 mm long.

PHENOLOGY. Flowering from (September) November to April (June).

DISTRIBUTION AND HABITAT. *Gamochaeta chamissonis* occurs in mountains from northern, central and southern Chile (Arica y Parinacota, Coquimbo, Valparaíso, Archipiélago Juan Fernández, Metropolitana, Maule, Biobío, Los Lagos, Aysén del General Carlos Ibáñez del Campo) and bordering regions in Argentina (Chubut, Neuquén, Río Negro, Santa Cruz, Tierra del Fuego), growing on rocky soils between (25-315)700-3830 m.

RELATIONSHIPS. *Gamochaeta chamissonis* resembles *G. filaginea* by its narrowly obovate to obovate leaves and multistemmed habit. However, *G. chamissonis*-V-be differentiated by its leaves whitish-woolly on both surfaces (vs. whitish-lanuginose above, and whitish-woolly below) and capitula arranged in discontinuous and elongate spikes (vs. capitula arranged in lax elongated spikes interrupted at base).

OBSERVATION. According to the protologue, *Gnaphalium suffruticosum* Phil., was based on two specimens 'Prope Illapel et Choapa invenit orn Landbeck', and characterized by its caespitose habit with linear-obovate to spatulate leaves and capitula in discontinuous spikes. We were able to locate these collections at SGO 'Illapel, Decemb. 1862, Landbeck' (SGO 064513), and 'Choapa, Decemb. 1862, Landbeck' (SGO 085505). Even when both collections are in accordance with the protologue of *G. suffruticosum*, the specimen SGO 085505 from Choapa is selected here as the lectotype, because it represents better the characters of the protologue. We propose to place *Gnaphalium suffruticosum* into synonymy with *Gamochaeta chamissonis* because there is no diagnostic character that differentiates the former from the latter.

ADDITIONAL MATERIAL EXAMINED. CHILE. Región de Arica y Parinacota. Prov. Parinacota: Q. Allane, 18°0'5"S-69°37'16"W, 3830 m, 10-VI-2012, Moreira 1957 (SGO). Región de Coquimbo. Prov. Elqui: Co. Tololo, 2000 m, 26-XI-1967, Jiles 5107 (CONC). Región de Valparaíso. Prov. Los Andes: Los Andes, camino de Los Andes a Portillo, 1300 m, 15-XI-1970, Marticorena 560 (CONC); Portillo, 2870 m, 6-III-1954, Ricardi 2872 (CONC). Región Metropolitana de Santiago. Prov. Cordillera: Las Vertientes, 800 m, 2-XI-1955, Gunckel 28973 (CONC); RN Río Clarillo, II-2004, Romero & Aldunate 36, 37 (CONC). Región del Maule. Prov. Talca: Alto de Vilches, faldeos del Co. Peine, 1500 m, 28-I-2000, Finot & López 1620 (CONC); Central Los Cipreses, Q. El Ciego, 1600 m, 12-IV-2000, Finot & López 2034 (CONC); Comuna de San Clemente, Paso Pehuenches, Cues. Los Cóndores, 1600 m, I-2005,

Luebert 5522 (CONC); Valle del Río Maule, Río Cipreses, Laguna de la Invernada, 1300 m, 18-XII-1990, Leuenberger & al. 4035 (CONC); Los Bellotos del Melado, 700-800 m, 1-III-2005, Mihoc 36, 66 (CONC). Prov. Linares: Fundo El Castillo, 975 m, 4-III-1999, Ruiz & López 965 (CONC). Región del Biobío. Prov. Ñuble: Chillán, Bureo, 4-IX-1932, Barros 37 (LP); Bureo, 250 m, 4-I-1930, Barros 3241 (CONC); Co. Cayumanqui, 20-XII-1977, Oehrens s.n. (CONC 89659); Monroy, III-2002, Rodríguez & al. 5489 (CONC). Prov. de Concepción: Comuna de Concepción, Chome, 9-XII-2011, Baeza 4350 A (CONC). Concepción, 4-XI-1927, Barros 2086 (CONC); Chiguayante, 25 m, 18-XII-1950, Ricardi 694 (CONC); Talcahuano, Rocoto, 30 m, 15-XI-1967, Villarroel & Weldt 162 (CONC). Prov. Biobío: Comuna de Yumbel, entre Tomeco y Yumbel, ca. 15 km del cruce a Yumbel, 290 m, 16-XII-2011, Baeza 4351 (CONC); entre Canteras y Tucapel, 315 m, 26-VI-1998, Finot 593 (CONC). Prov. Arauco: Laraquete, Las Cruces, loma de las Casas, 12-III-1936, 50 m, Junge 5730 (CONC). Región de Los Lagos. Prov. Llanquihue: Cayutué, 180 m, I-1973, Martínez s.n. (CONC 75465). Región de Aysén del General Carlos Ibáñez del Campo. Prov. General Carrera: Río Exploradores, entre Río Circo y Río Verde, 180 m, 2-III-1967, Seki 283 (CONC).

7. *Gamochaeta depilata* (Phil.) Cabrera, Bol. Soc. Argent. Bot. 9: 369. 1961. ≡ *Gnaphalium depilatum* Phil., Anales Univ. Chile 90: 10. 1895. TYPE. Chile. Región del Biobío. Prov. Ñuble, Baños de Chillán, I-1878, *Philippi s.n.* (holotype, SGO064496!; isotypes, LP 001909!, LP 001910!). Fig. 11.

= *Gnaphalium obscurum* Phil., Anales Univ. Chile 90: 26. 1895. TYPE. Chile. Región del Biobío. Prov. Ñuble, Baños de Chillán, 1862 [*Philippi s.n.*] (holotype, SGO064963!).

Perennial herbs, 5-20 cm tall, multistemmed, stems ascending, unbranched, densely leafy at base and more loosely at the upper part, glabrescent. Leaves 1.2-2.2 cm × 4-7 mm, obovate, attenuate at base, apex obtuse to rounded, mucronate; concolorous, arachnoid to glabrescent, greenish on both surfaces. Capitula many, in head-like clusters, subtended by obovate leaves, occasionally small clusters in the axils of the upper leaves. Involucre narrowly campanulate, ca. 5 × 1.2-1.5 mm. Phyllaries 4-seriate, lamina light brown at apex; outer phyllaries ca. 2.5 × 2 mm, ovate, apex acute, lanuginose; inner phyllaries 5 × 1 mm, oblong-lanceolate, apex subacute, glabrous. Pistillate florets 12-20, corolla white-yellowish, purplish at apex, filiform, ca. 3.5 mm long. Bisexual florets 2-3, corolla white-yellowish, purplish at apex, tubular, ca. 3.5 mm long. Achenes 1-1.2 mm long, pilose, with short globose duplex hairs. Pappus bristles ca. 3.5 mm long.

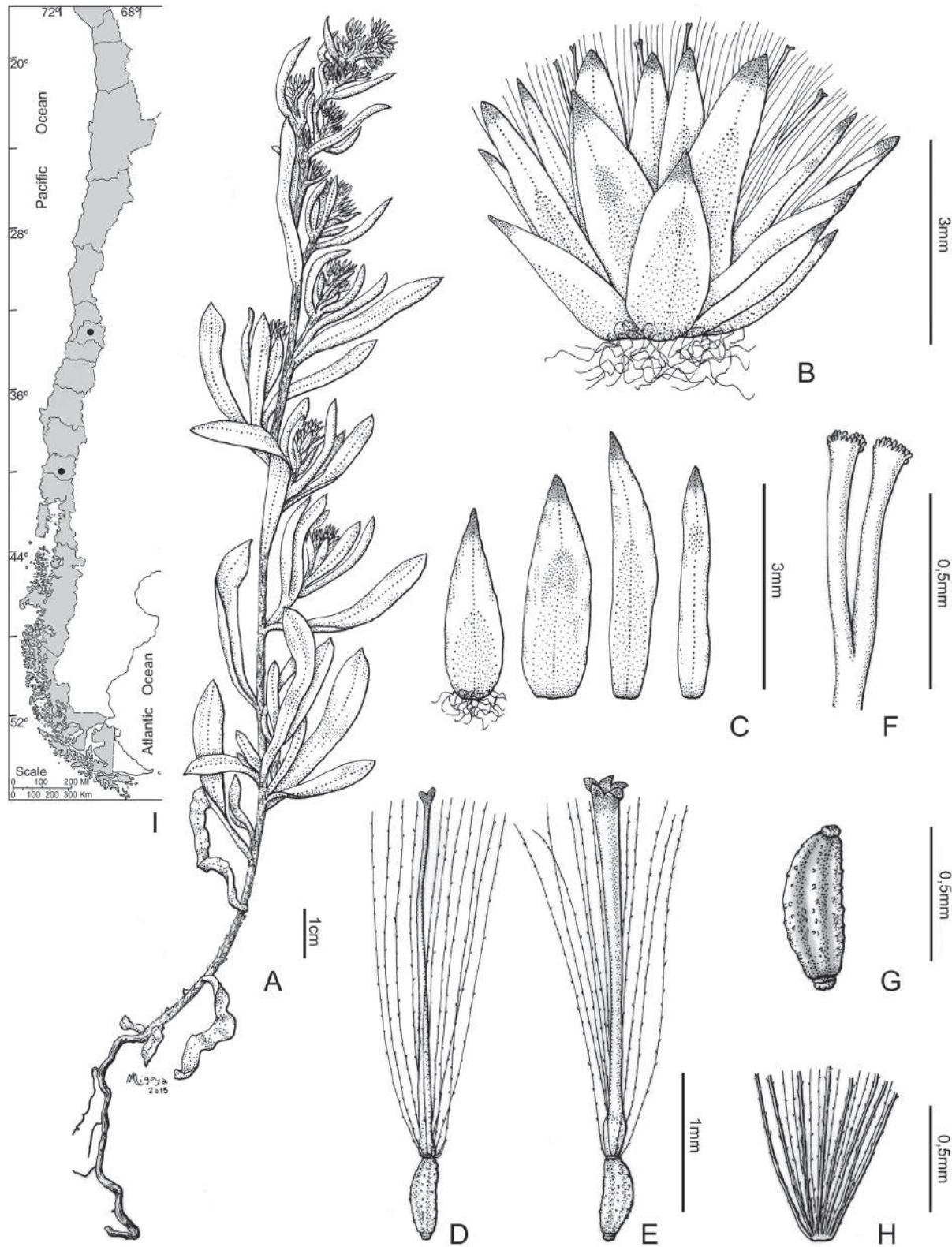


FIGURE 9. *Gamochaeta axillaris*. A, Habit; B, Capitulum; C, Phyllaries; D, Pistillate floret; E, Bisexual floret; F, Style branches; G, Achene; H, Pappus; I, Distribution [A-H, from probably Philippi in 1884 p.p., SGO 76258].

FIGURA 9. *Gamochaeta axillaris*. A, Planta; B, Capitulo; C, Filarios; D, Flor pistilada; E, Flor bisexual; F, Ramas del estilo; G, Aquenio; H, Papus; I, Distribución [A-H, Philippi? in 1884 p.p., SGO 76258].

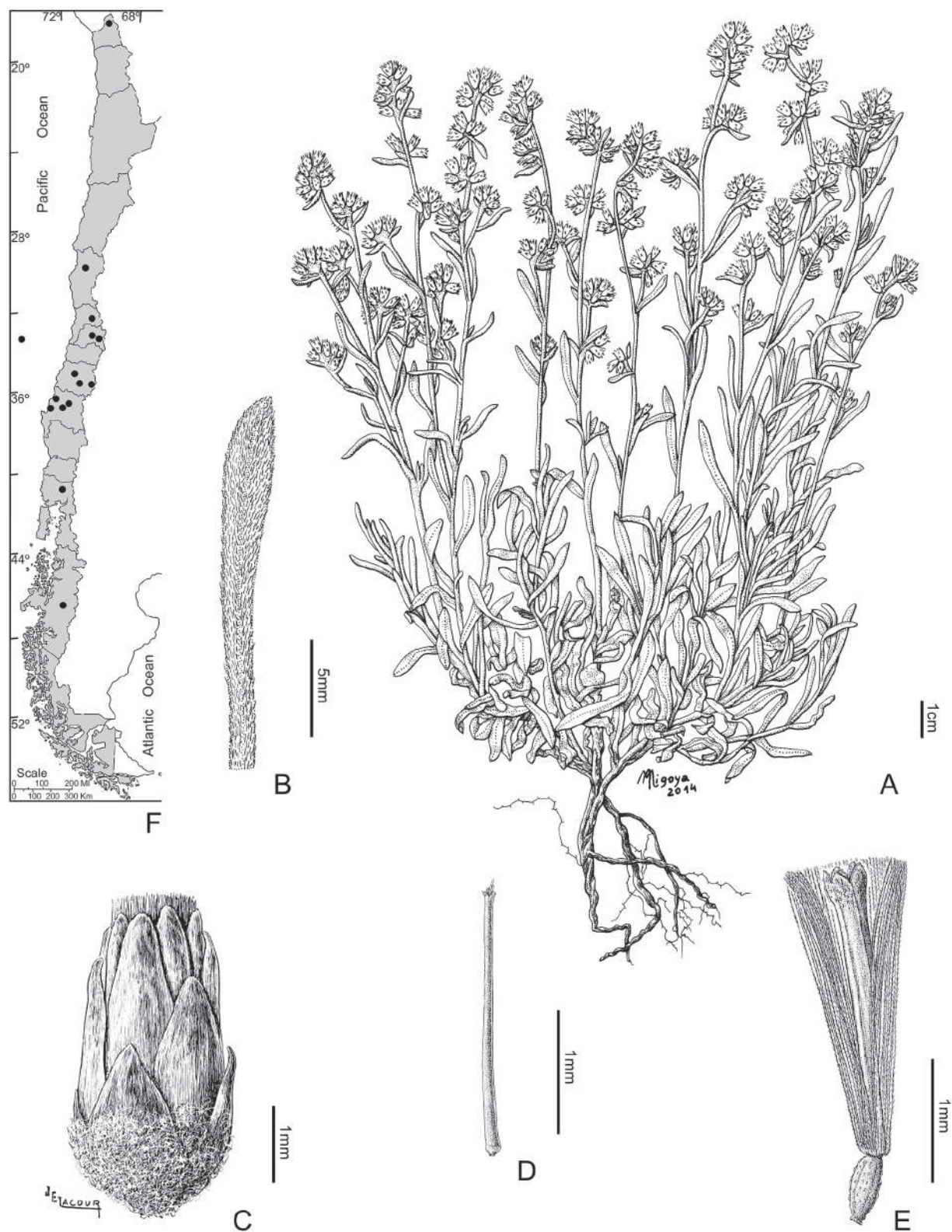


FIGURE 10. *Gamochaeta chamissonis*. A, Habit; B, Leaf; C, Capitulum; D, Corolla of pistillate floret; E, Bisexual floret; F, Distribution [A-B, from *Fl. Argentina* 1: 471. 2014; C-E, from *Fl. Patagónica* 8(7): 124. 1971].

FIGURA 10. *Gamochaeta chamissonis*. A, Planta; B, Hoja; C, Capítulo; D, Corola de la flor pistilada; E, Flor bisexual; F, Distribución [A-B, tomado de *Fl. Argentina* 1: 471. 2014; C-E, tomado de *Fl. Patagónica* 8(7): 124. 1971].

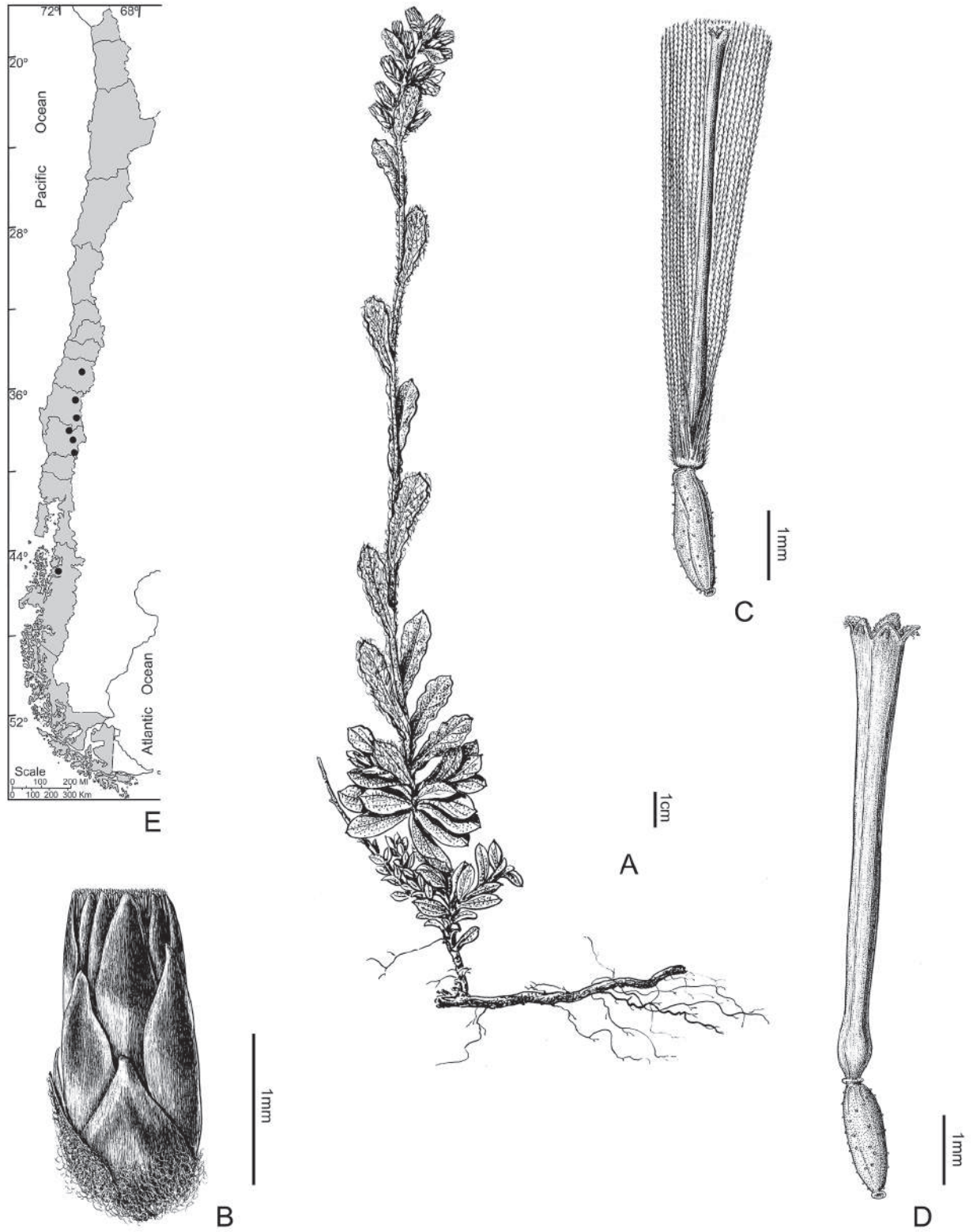


FIGURE 11. *Gamochaeta depilata*. A, Habit; B, Capitulum; C, Pistillate floret; D, Bisexual floret without pappus; E, Distribution [A-D, from *Fl. Patagónica* 8(7): 121. 1971].

FIGURA 11. *Gamochaeta depilata*. A, Planta; B, Capítulo; C, Flor pistilada; D, Flor bisexual sin papus; E, Distribución [A-D, tomado de *Fl. Patagónica* 8(7): 121. 1971].

PHENOLOGY. Flowering from January to March.

DISTRIBUTION AND HABITAT. *Gamochaeta depilata* occurs in mountains from southern Chile (Maule, Biobío, Araucanía, Los Ríos, Aysén del General Carlos Ibáñez del Campo) and bordering regions of Argentina (Neuquén, Río Negro) between 500-2000 m.

RELATIONSHIPS. *Gamochaeta depilata* resembles *G. nivalis*. Both species have basal leaves crowded, the capitula arranged in head-like clusters and leaves obovate or linear-obovate with apices that are obtuse to rounded. However, *G. depilata* can be differentiated by its lanuginose to subglabrous leaves (vs. densely lanate on both surfaces in *G. nivalis*).

ADDITIONAL MATERIAL EXAMINED. CHILE. Región del Maule. Prov. Talca: El Picazo, Alto de la Laguna, Barros 2297, 26-I-1934, 2329 (LP). Región del Biobío. Prov. Ñuble: Cord. de Polcura, 22-II-1954, Ledezma 677 (CONC); Termas de Chillán, II-1931, Deltor 2101 (CONC). Prov. Biobío: Reserva Nacional Ralco, sector de vega con lenga, 1800 m, 37°52'S-71°23'W, I-2002, Mihoc & al. 4092 (CONC). Región de la Araucanía. Prov. Malleco: Termas de Tolhuaca, 2-I-1947, Gunckel 16519 (CONC). Prov. Cautín: Temuco. Volcán Llaima, 11-II-1948, Barros 7324 (LP); Temuco, Refugio Volcán Llaima, 2000 m, 3-II-1961, Ricardi & Matthei 5310/114 (CONC). Región de Los Ríos. Prov. Valdivia: Volcán Villarrica, 8-I-1931. Barros 13 (LP), Hollermayer 496 (LP). Volcán Villarrica, 1300 m, I-1931, Joseph 5849 (CONC). Volcán Villarrica, 1300 m, 14-III-1954, Sparre & Constance 10685 (CONC). Región de Aysén del General Carlos Ibáñez del Campo. Prov. Aysén: Lago Yulton, 45°08'S-72°58'W, 500 m, 19-I-2007, García 3961 (CONC).

8. *Gamochaeta deserticola* Cabrera, Revista Invest. Agric. 11(4): 405. 1957. TYPE. Argentina. Salta. Incahuasi, I-1940, A. G. Schulz 2656 (holotype, LP 000227!; isotype, CTES 0013924!). Fig. 12.

Perennial herbs, 3-10 cm tall, multistemmed, stems ascending to erect, unbranched, more densely leafy at base, remote upwards, whitish-lanate. Leaves 8-10 × 2.5-3.5 mm, obovate, attenuate at base, apex obtuse, mucronate; concolorous, whitish-woolly on both surfaces. Capitula many, in clusters subtended by linear-obovate leaves, arranged in dense continuous ovoid spikes, sometimes with solitary capitula in the axils of the upper leaves. Involucre campanulate, ca. 4 × 3 mm. Phyllaries 3-4-seriate, lamina light-brown at apex; outer phyllaries ca. 2 × 1 mm, ovate, apex acute, lanuginose; inner phyllaries ca. 3.5 × 0.5 mm, oblong-lanceolate, apex subobtuse to rounded, glabrous. Pistillate florets ca. 25, corolla white-yellowish, purplish at apex, filiform, ca. 2 mm long. Bisexual florets 1-2, corolla white-yellowish, purplish at apex, tubular, ca. 2 mm long.

Achenes ca. 0.7 mm long, pilose, with short globose duplex hairs. Pappus bristles ca. 2 mm long.

PHENOLOGY. Flowering from September to February (May).

DISTRIBUTION AND HABITAT. *Gamochaeta deserticola* occurs in mountains from northern to southern Chile (Arica y Parinacota, Antofagasta, Coquimbo, Valparaíso, Metropolitana, Libertador General Bernardo O'Higgins, Maule, Biobío, Araucanía) and bordering regions in North West Argentina (Jujuy, Salta), growing between (15)200-3500 m.

RELATIONSHIPS. *Gamochaeta deserticola* is closely similar to *G. subfalcata*. Both have unbranched ascending to erect stems, linear-obovate concolorous leaves, and capitula arranged in dense ovoid spikes. However, plants of *Gamochaeta deserticola* are smaller, up to 10 cm tall (vs. 15-50 cm tall in *G. subfalcata*). *Gamochaeta deserticola* also resembles *G. erythraetis* from Peru, Bolivia, and northwestern Argentina in its small habit, ascending stems, and concolorous leaves. However, *G. deserticola*-V-be mainly differentiated by its numerous capitula arranged in dense ovoid spikes (vs. few capitula in lax spikes in *G. erythraetis*).

ADDITIONAL MATERIAL EXAMINED. CHILE. Región de Arica y Parinacota. Prov. Parinacota: Putre, 3500 m, XII-1955, Levi 240 (LP). Región de Antofagasta. Prov. Antofagasta: Q. de Yales, Paposo, 25° 00' S - 70° 25' W, 650 m, 2-XII-2009, Finger & al. 49 (CONC); Taltal, Q. El Médano, al N de Paposo, 200 m, 8-X-1941, Pisano & Bravo 407 (CONC). Región Coquimbo. Prov. Coquimbo: Illapel, carretera Panamericana, 10 km al N de Huentelauquén, 16-X-1971, Marticorena & al. 1415 (CONC). Coquimbo, 15 m, 26-IX-1934, Montero 1851 (CONC). Coquimbo, El Faro, 30 m, 15-IX-1980, Montero 11952 (CONC). Prov. Limarí: Ovalle, La Calera, Incahuasi, 350 m, 8-IX-1957, Jiles 3174 (CONC). Región de Valparaíso. Prov. de Marga-Marga: Marga-Marga, IX-1910, Jaffuel 904-03165 (CONC). Prov. San Antonio: ca. 6-8 km east of Algarrobo on the road to Casablanca, on South side, 33°18' S-71°34'W, 350 m, 15-V-1994, Bliss 712 (CONC), ibid. 12-V-1994, Bliss 724 (CONC). Prov. Valparaíso: Quintero, Loncura, 32°46'S-71°32'W, XI-1953, Gunckel 27398 (CONC); Quintero, Punta San Fuentes, 13-XI-1971, Mahu 7675 (LP). Región Metropolitana de Santiago. Prov. Santiago: Batocho, 480 m, Levi 3163 (CONC); Q. de La Plata, 33°29'S-70°54'W, 740 m, 3-XI-1961, Schlegel 4071 (CONC). Región del Libertador Bernardo O'Higgins. Prov. Colchagua: Vegas del Flaco, NW del "Sanatorio", 1740 m, 7-II-1974, Mahu 9871 (LP). Región del Maule. Prov. Talca: Cord. de Talca, El Picazo, 30-XII-1936, Barros 3142 (SI). Región del Biobío. Prov. Concepción: Concepción, 21-X-1928, Barros 2911 (LP); San Pedro, 1-XI-1944, Barros 3138 (LP); Ramuncho, 12-XII-1950, Ricardi 521 (CONC). Región de la Araucanía. Prov. de Malleco: Angol, Parque Nacional

de Nahuelbuta, entre el Centro del Parque y la Laguna de las Totoras, 8-I-1968, Ricardi & al. 1935 (CONC).

9. *Gamochaeta falcata* (Lam.) Cabrera, Bol. Soc. Argent. Bot. 9: 370. 1961. \equiv *Gnaphalium falcatum* Lam., Encycl. 2(2): 758. 1786. \equiv *Gnaphalium stachydifolium* Lam. var. *falcatum* (Lam.) Klatt, Linnaea 42(2): 140. 1878. \equiv *Gnaphalium purpureum* L. var. *falcatum* (Lam.) Torr. & Gray, Fl. N. Amer. 2(3): 428. 1843. TYPE. [Uruguay] "Commerson a trouvé cette espèce à Monte-Video, dans des lieux maritimes" (holotype, P-LAM 00309225!; probable isotypes, P 00704627!, P 00704628!, P 00704629!). Fig. 13.

Perennial herbs, (10-)15-30(-50) cm tall, multistemmed, stems ascending to erect, branched above, more densely leafy at base, whitish-lanate. Leaves 1.2-4 cm \times 2-5 mm; basal leaves linear-obovate, apex obtuse; caulinar leaves linear to linear-falcate, apex acute, mucronate, usually folded; concolorous, whitish-woolly on both surfaces. Capitula many, in stalked axillary spikes, coalescing, forming a spiciform or paniculate inflorescence. Involucre narrowly campanulate, 4-5 \times ca. 2 mm. Phyllaries 4-seriate, lamina light-brown at apex; outer phyllaries ca. 1.5 \times 0.8 mm, ovate, apex acute, lanuginose; inner phyllaries ca. 4 \times 0.8 mm, oblong-elliptic, apex acute, glabrous. Pistillate florets ca. 70, corolla white-yellowish, purplish at apex, filiform, ca. 2.5 mm long. Bisexual florets 3-4, corolla white-yellowish, purplish at apex, tubular, 2.5 mm long. Achenes 0.6-0.7 mm long, pilose, with short globose duplex hairs. Pappus bristles ca. 2.5 mm long.

PHENOLOGY. Flowering in (October) January and February.

DISTRIBUTION AND HABITAT. *Gamochaeta falcata* has been found in southern Brazil, Paraguay, Uruguay, northeastern and central-west Argentina, and in Chile (Maule, Biobío, and Araucanía), usually growing between 950-1940 m. According to Rémy (1849) *G. falcata* also occurs in Quillota, Santiago, and Estrecho de Magallanes.

RELATIONSHIPS. *Gamochaeta falcata* resembles *G. aliena* in habit. However, *G. falcata*-*V* be differentiated mainly by its cauline leaves that are linear to linear-falcate (vs. linear-obovate in *G. aliena*).

OBSERVATION. Rémy (1849) mentioned *Gnaphalium chilense* Hook. & Arn. (Bot. Beechey Voy.: 30. 1830), non *G. chilense* Spreng. (1826), as a synonym of *G. falcatum* (\equiv *Gamochaeta falcata*). According to the protologue, *G. chilense* Hook. & Arn. was characterized by 'foliis utrinque argenteo-lanatis inferioribus spathulatis superioribus linearibus, floribus glomerato-spicatis, involucri foliis nitidis acuminatis', and based on a specimen from Concepción. Unfortunately, the type collection of *Gnaphalium chilense* Hook. & Arn.

'Hab. Conception' was not located at K, where the original herbarium of Hooker is probably deposited. For this reason, until the type of Hooker & Arnott's name is located or any materials can be provided, the identity of *G. chilense* Hook. & Arn. is uncertain.

ADDITIONAL MATERIAL EXAMINED. CHILE. Región del Maule. Prov. Curicó: Llico, sector La Punta, 24-X-2001, 20 m, Peñailillo & Rojas 4 (CONC). Región del Biobío. Prov. Ñuble: Nevados de Chillán, Ruinas del Refugio Waldorf, 36°52'S-71°27'W, 1940 m, 13-I-2009, Pfanzelt 174 (CONC); Camino a Termas de Chillán (Los Presillos), 1000 m, 8-II-1945, Pfister 4978 (CONC). Prov. Arauco: entre Curanilahue y el río Descabezado, 37°31'S-73°17'W, 360 m, 19-I-1998, Baeza & Kottirsch 1262 (CONC). Región de La Araucanía. Prov. Malleco: Angol, Parque Nacional Nahuelbuta, entre el centro del Parque y Agua de Las Totoras, 1250 m, 8-I-1968, Ricardi & al. 1910 (CONC). Prov. Cautín: Volcán Llaima, 30-I-1942, 950 m, Gunckel 12410 (CONC). Without locality: Joseph 2632 (CONC).

10. *Gamochaeta filaginea* (DC.) Cabrera, Bol. Soc. Argent. Bot. 9: 371. 1961. \equiv *Gnaphalium filagineum* DC., Prodr. 6: 234. 1838. TYPE. Brasil. Rio Grande [do Sul], *F. Sellow s.n.*, *Herb. Imp. Bras.* 986 (lectotype, designated by Freire & Iharlegui, Fl. Argentina 7(1): 474, 2014, P 00704630!). Fig. 14. \equiv *Gnaphalium berterioanum* DC., Prodr. 6: 233. 1838. \equiv *Gnaphalium stachydifolium* Lam. var. *berterioanum* (DC.) DC. Linnaea 42(2): 141. 1878. *Gamochaeta berterioana* (DC.) Cabrera, Bol. Soc. Argent. Bot. ix. 367. 1961, **syn. nov.** TYPE. Chile. In rupestribus apricis collium Rancagua, 1818, *C. L. G. Bertero 304* (lectotype, designated here, P 00704624!; isolectotypes P 00704621!, P 00704622!, P 00704623!).

Gnaphalium bellidifolium Phil., Anales Univ. Chile 90: 19. 1895, **syn. nov.** TYPE. Chile. Alfalfal, -I-1888 [Philippi s.n.] (holotype, SGO 064475!).

Perennial herbs, 15-40 cm tall, multistemmed, stems ascending to erect, unbranched, sometimes branched at the upper part, more densely leafy at base, whitish-lanate. Basal leaves 1-3.5 cm \times 2-5 mm, obovate, apex obtuse, attenuate at base; caulinar leaves linear-obovate, apex subobtuse to acute, mucronate; concolorous to slightly discolorous, whitish-lanuginose above, and whitish-woolly below, with long eglandular eseptate trichomes. Capitula many, in lax elongated spikes interrupted at base. Involucre narrowly campanulate, 4-4.5 \times 3-4 mm. Phyllaries 4-seriate, lamina light-brown at apex; outer phyllaries ca. 2 \times 1 mm, ovate, apex acute-acuminate, lanuginose; inner phyllaries ca. 3 \times 0.8 mm, oblong-elliptic, apex acute, glabrous. Pistillate florets ca. 78, corolla white-yellowish, purplish at apex,

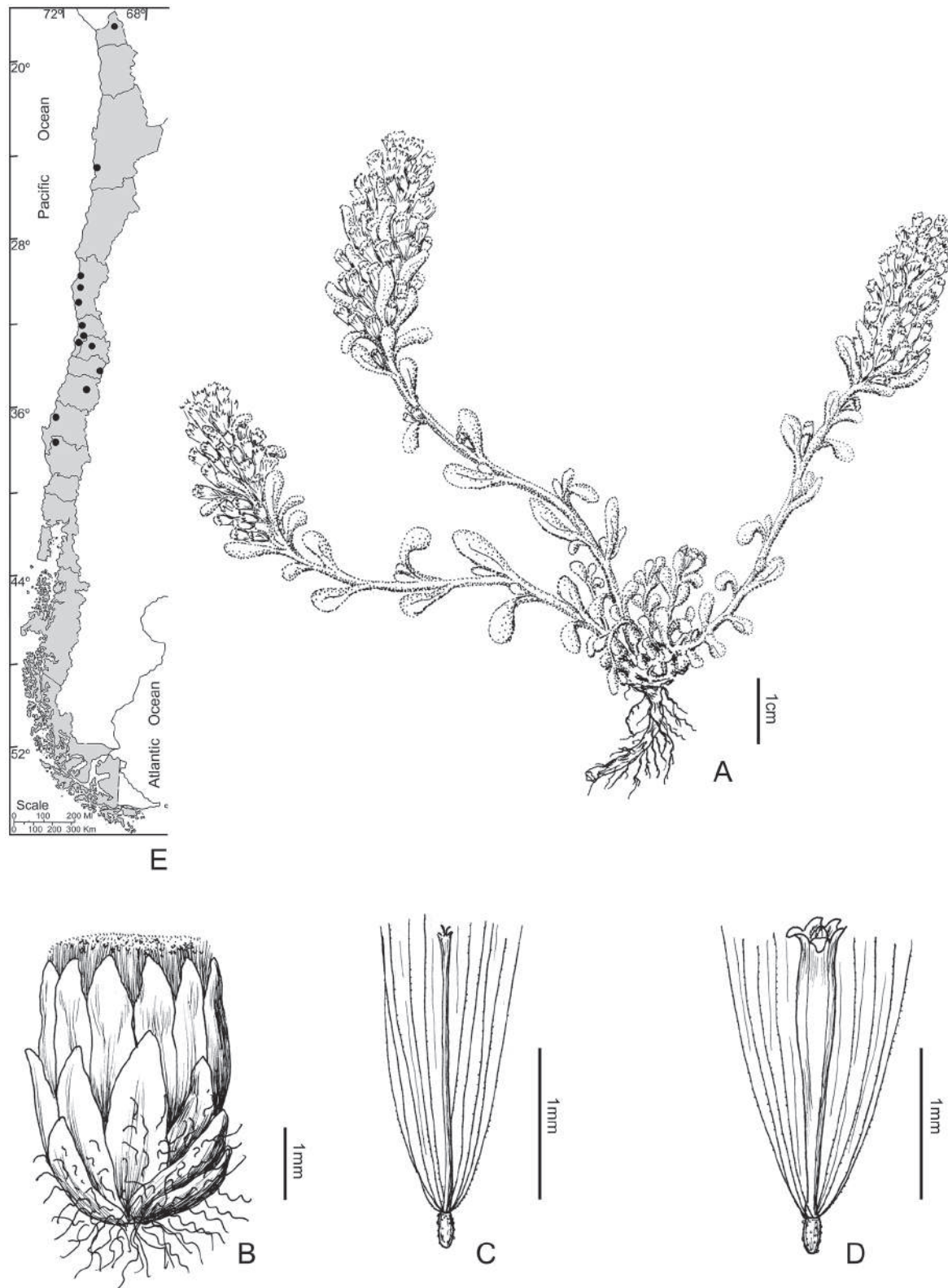


FIGURE 12. *Gamochaeta deserticola*. A, Habit; B, Capitulum; C, Pistillate floret; D, Bisexual floret; E, Distribution [A-D, from *Fl. Jujuy* 13(10): 307. 1978].

FIGURA 12. *Gamochaeta deserticola*. A, Planta; B, Capítulo; C, Flor pistilada; D, Flor bissexual; E, Distribución [A-D, tomado de *Fl. Jujuy* 13(10): 307. 1978].

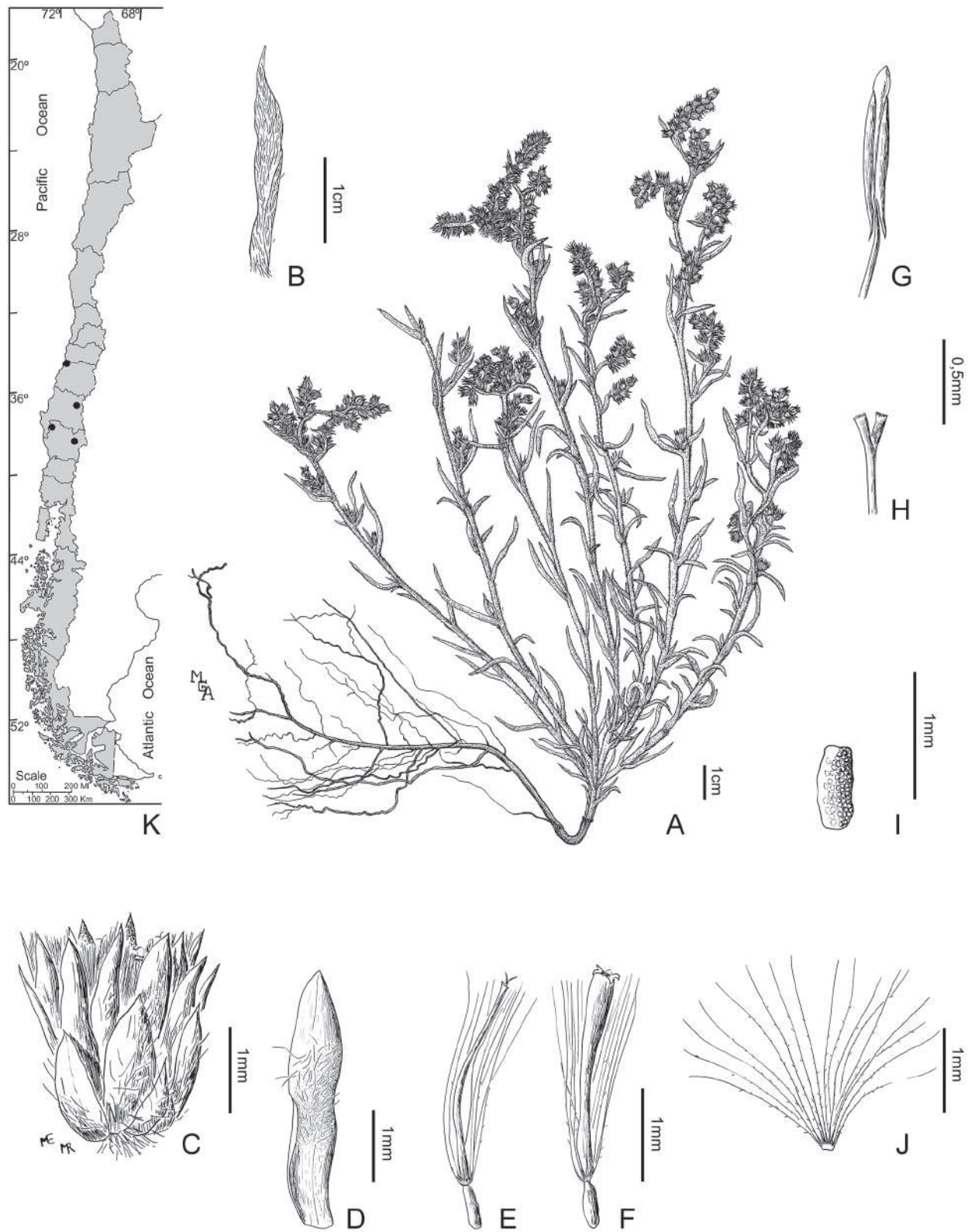


FIGURE 13. *Gamochaeta falcata*. A, Habit; B, Leaf; C, Capitulum; D, Inner phyllary; E, Pistillate floret; F, Bisexual floret; G, Stamen; H, Style branches; I, Achene; J, Pappus; K, Distribution [A-I, from *Fl. Il. Entre Ríos* 6(6a): 320. 1974].

FIGURA 13. *Gamochaeta falcata*. A, Planta; B, Hoja; C, Capítulo; D, Filario interno; E, Flor pistilada; F, Flor bisexual; G, Estambre; H, Ramas del estilo; I, Aquenio; J, Pappus; K, Distribución [A-I, tomado de *Fl. Il. Entre Ríos* 6(6a): 320. 1974].

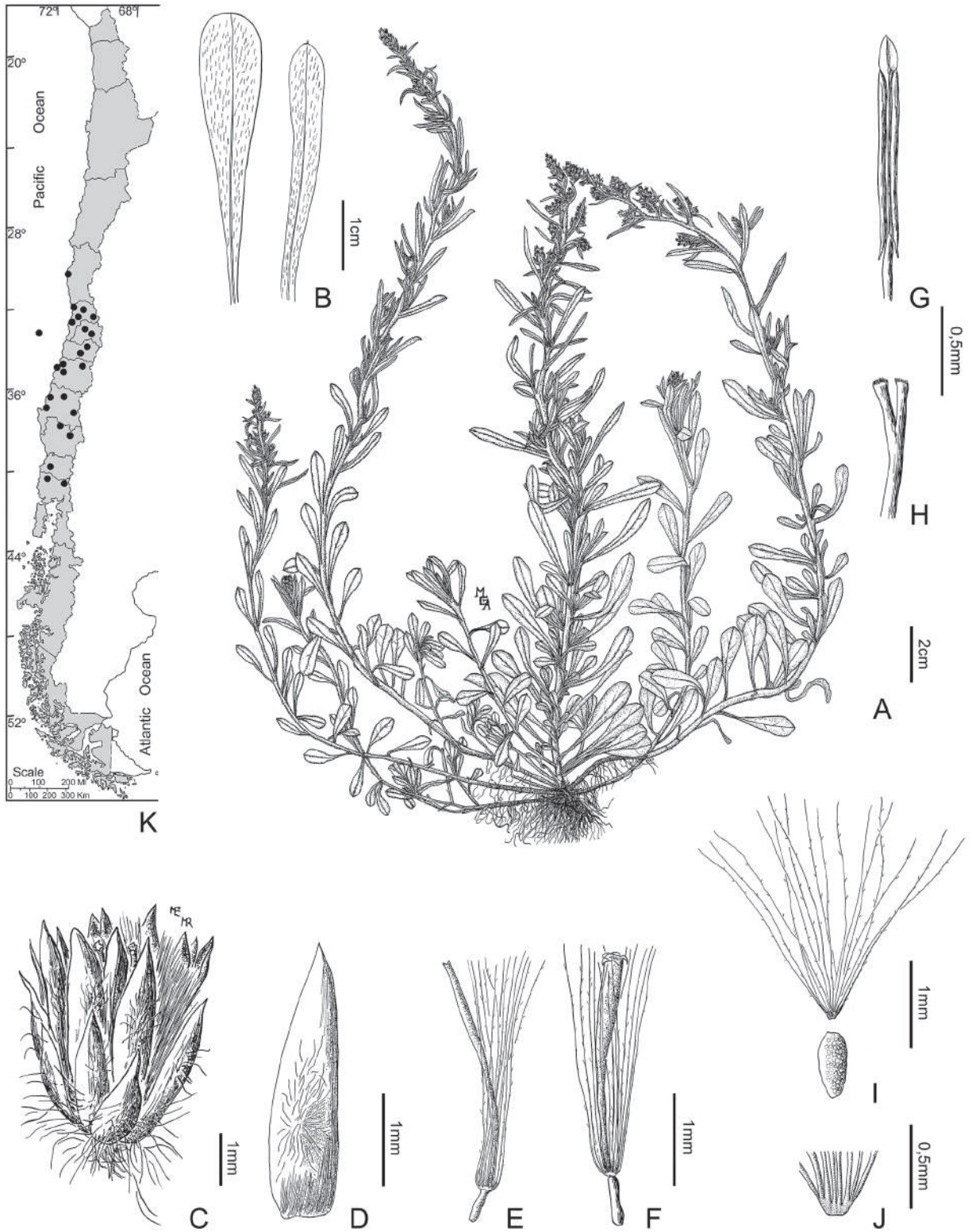


FIGURE 14. *Gamochoaeta filaginea*. A, Habit; B, Leaves; C, Capitulum; D, Inner phyllary; E, Pistillate floret; F, Bisexual floret; G, Stamen; H, Style branches; I, Achene and pappus; J, Basal portion of the pappus; K, Distribution [A-J, from *Fl. Il. Entre Ríos* 6(6a): 322. 1974].

FIGURA 14. *Gamochoaeta filaginea*. A, Planta; B, Hojas; C, Capítulo; D, Filario interno; E, Flor pistilada; F, Flor bisexual; G, Estambre; H, Ramas del estilo; I, Aquenio y pappus; J, Porción basal del pappus; K, Distribución [A-J, tomado de *Fl. Il. Entre Ríos* 6(6a): 322. 1974].

filiform, ca. 2 mm long. Bisexual florets 3-4, corolla white-yellowish, purplish at apex, tubular, ca. 2 mm long. Achenes 0.7-0.9 mm long, pilose, with short globose duplex hairs. Pappus bristles ca. 2.5 mm long.

PHENOLOGY. Flowering from August to March.

DISTRIBUTION AND HABITAT. *Gamochaeta filaginea* has been found in southern Brazil, Uruguay, Chile, and northeastern and central-west Argentina. In Chile occurs in Coquimbo, Valparaíso, Metropolitana, Libertador General Bernardo O'Higgins, Maule, Biobío, Araucanía, Los Ríos, and Los Lagos, growing from sea level to 2000 m.

RELATIONSHIPS. *Gamochaeta filaginea* is closely similar to *G. aliena* in habit, capitula arrangement, and leaf shape. However, *G. filaginea* has leaves whitish-lanuginose above and whitish-woolly below (vs. whitish-woolly leaves on both surfaces in *G. aliena*). *Gamochaeta filaginea* also resembles *G. subfalcata* (which is widespread throughout from southern United States, Uruguay, and north and central Argentina, and as far as New Zealand) in habitat and leaves. However, *G. filaginea*-V be differentiated by its capitula arranged in lax elongated spikes (vs. capitula arranged in dense spikes in *G. subfalcata*), and acute inner phyllaries (vs. obtuse in *G. subfalcata*).

OBSERVATIONS. 1. Even if the label of the lectotype of *Gnaphalium filagineum* kept at P reads 'Brésil. Province de Río Grande (Herbier Impérial du Brasil 986) C. Gaudichaud 1833', which is in accordance with the protologue, the collector is Sellow. Gaudichaud numbered the collections that Sellow had made in Brazil.

2. De Candolle (1838: 233) mentioned two syntypes in the protologue of *Gnaphalium berteroaenum*: 'In rupestribus apricis collium ad Rancagua (Bert. ! N. 304), et Conceptionem Chilensium (Beech.)'. We found the collections *Bertero 304* kept at P (P 00704621!, P 00704622!, P 00704623!, P 00704624!), and *Bertero 304 et 1004* at M (M 0161472!, M 0161473!), MO (MO714288!), NY (NY 00169501!). We propose the material '*Bertero 304*', P 00704624 as lectotype of *Gnaphalium berteroaenum* which is in accordance with the protologue and matches more precisely the locality and collector number indicated in the protologue.

3. *Gamochaeta berteroaana* and *G. bellidifolia* are proposed here as new synonyms of *G. filaginea* because there are no diagnostic characters to separate them as distinct taxa. All of these share multistemmed habit, basal and upper leaves that are obovate and linear-obovate, respectively, lanuginose on both surfaces, and capitula arranged in elongated spikes interrupted at base. In addition, the differential character mentioned in the protologue of *G. bellidifolia*, i.e., stems branched at the upper part, is a variable feature throughout the range of *G. filaginea*.

ADDITIONAL MATERIAL EXAMINED. CHILE. Región de Coquimbo. Prov. Limarí: Ovalle, Fray Jorge, 20-VIII-1950, Jiles 1778-a (CONC); Ovalle, Parque Nacional Fray Jorge, 30°40'S-71°40'W, 500 m, 6-XI-1974, Marticorena & al. 531 (CONC). Región de Valparaíso. Prov. Petorca: Alicahue, ca. Cabildo, 32°21'S-70°48'W, 31-XI-1976, Zöllner 9929 (CONC). Pichicuy, 24-XII-1978, Zöllner 10408 (CONC). Prov. de los Andes: Saladillo, Río Blanco, 2000 m, 22-XI-1957, Silva 19690 (CONC). Prov. San Felipe de Aconcagua: Bajada de El Melón, 13-IX-1957, Cabrera 12525 (LP); Prov. Marga-Marga: Marga-Marga, -IX-1910, Jaffuel 893 (CONC); Co. Penitente, 1000 m, 3-X-1971, Zöllner 5197 (CONC). Prov. Valparaíso: Viña del Mar, 20 m, 26-X-1930, Behn 20868 (CONC); 3 km al N de Laguna Verde, 180 m, 2-XI-1990, Lammers & al. 7782 (CONC); Quintero, 40 m, XII-1950, Richter 21613 (CONC); Islas de Juan Fernández, Masatierra, down into Villagra from the Mirador, 470 m, 17-I-1991, Stuessy & al. 11772 (CONC); Quintero, 20 m, IX-1923, Werdermann 35 (LP). Región Metropolitana de Santiago. Prov. Santiago: El Arrayán, 14-I-1954, Arriaga 8106 (CONC); Q. de Peñalolén, 33°28'S-70°33'W, 1000 m, 23-X-1952, Bravo 401 (CONC); Co. San Cristóbal, 750 m, 11-X-1950, Gunckel 26379 (CONC); Curacavi, -XI-1953, Gunckel 37992 (CONC); Tiltil, 700 m, 31-X-1922, Montero 1361 (CONC); Q. de La Plata, 740 m, 23-XI-1960, Schlegel 3212 (CONC). Prov. Cordillera: El Manzano, 890 m, 30-X-1964, Gunkel 42415 (CONC); Santiago, 15-X-1921, Joseph 1442 (CONC); Cajón del río Maipo, Q. El Canelo, 22-XI-1968, Mahu 5617 (LP); RN Río Clarillo, 33°43'S-70°29'W, II-2004, Romero & Aldunate 35 (CONC). Región del Libertador General Bernardo O'Higgins. Prov. Cachapoal: Termas de Cauquenes, 30-X-1952, Pfister 12995 (CONC). Prov. Colchagua: San Fernando, Centinela, 350 m, 21-X-1921, Montero 1428 (CONC); Río Tinguiririca, San Fernando, 29-XII-1950, Ricardi 9875 (CONC). Región del Maule. Prov. Curicó: road between Romeral and Los Queñes, valle del Río Teno, 35°00'S-70°49'W, 630 m, 16-XI-2006, Tepe & al. 1996 (CONC). Prov. Cauquenes: Reserva Nacional Los Ruiles, sector Tierra de Panllevar, 15-XII-1999, Finot 1412 (CONC); Chanco, XI-1961, 100 m, Gunkel 37450 (CONC); Chanco, XI-1961, Quirós s.n. (CONC 116237). Prov. Talca: Constitución, a orillas del Río Maule, 14-IX-1958, Barnier 39 (CONC); Constitución, La Palmilla, 29-X-1958, Barnier 261 (CONC); Constitución, San Ramón, 25-XI-1958, Barnier 381 (CONC). Prov. Linares: Quivolgo, 26-XI-1958, Barnier 415 (CONC); Linares, Escuela Agrícola Don Bosco, 15-I-1956, Barrientos s.n. (CONC 116304); Cauquenes fundo "Porvenir", 250 m, 36°17'S-72°31'W, 29-X-1975, Rodríguez 669 (CONC); Fundo "El Castillo", entrando por Copihue y siguiendo camino al E, 36°14'S-71°14'W, 975 m, 5-III-1999, Ruiz & López 947 (CONC). Región del Biobío. Prov. Ñuble: Yungay, fundo "Baquedano", Santa Lucía, región precordillerana del Río Cholguán, 4-9-II-1957, Artigas 19555 (CONC); San

Carlos, San Fabián, 29-I-1932, Barros 48 (LP); San Carlos, 180 m, I-1926, Barros s.n. (CONC); San Carlos, Cachapoal, X-1953, Palacios 14668 (CONC); Atacalco, 25-XI-1944, Pfister 4280 (CONC); Valle Alacalco, fundo "Cipreses", 7-XI-1945, Pfister 4950 (CONC). Prov. Concepción: Concepción, 25-X-1938, Barros 2278 (LP); Laraquete, 23-XI-1937, Barros 2308 (LP); Concepción, Florida, fundo "Santa Anita", 3-XI-1957, Durán 24291 (CONC); Co. detrás de la Universidad de Concepción, 36°49'52"S-73°1'49"W, 104 m, 31-X-2003, Figueroa 5 (CONC); Pte. Queime, en los cerros, 36°45'S - 72°35'W, 7-XI-1972, Gajardo & González s.n. (CONC 89657); Co. de La Toma, 30-XI-1934, Junge 5164 (CONC); Concepción, Q. divisoria entre Co. de La Toma y Buenavista, 2-XII-1934, Junge 5188 (CONC); Hualqui, 21-XI-1936, Junge 5839 (CONC); Concepción, Pte. Queime, 13-XII-1967, Parra & Rodríguez 89 (CONC); Co. de "La Toma", 19-XI-1934, Pfister 1260 (LP); Pingueral, Dichato, 31-X-1954, Pfister 18027 (CONC); Nonguén, 75 m, 19-XII-1950, Ricardi 787 (CONC, LP); Rafael, 19-XI-1950, Torres 10450 (CONC); Merquiche, 36°29'S-72°54'W, 10 m, 2-XI-1980, Ugarte 162 (CONC). Prov. Biobío: Carrizal, alrededores, 37°30'S-72°58'W, 22-I-1998, Baeza & Kottirsch 1640 (CONC); Antuco, 3-X-1937, Barros 188 (LP); Candelaria, Arenales del fundo "Los Setenta", 1-XI-1935, Junge 5554 (CONC); Parque Nacional Laguna del Laja, Camping Lagunillas, 18-XI-2001, Mihoc 3146 (CONC). Prov. Arauco: Laraquete, Valle del Río de las Cruces, 21-XI-1945, Pfister s.n. (CONC 4897). Región de Araucanía. Prov. Malleco: Entre Capitán Pastene y Tirúa, sección Aillaguampi, 630 m, 38°11'S-73°08'W, 21-I-1998, Baeza & Kottirsch 1559 (CONC); Mininco, 187 m, 21-X-1966, Montero 7706 (CONC); Prov. Cautín: Termas del Río Blanco, 1-I-1948, Pfister 7879 (CONC). Curacautin, Termas Tolhuaca, 1300 m, 20-II-1935, Montero 2197 (CONC). Región de Los Ríos. Prov. Valdivia: Los Guindos, 160 m, 28-I-1941, Gunckel 15751 (CONC). Región de Los Lagos. Prov. Osorno: Llifén, laderas de Huequecura, frente al lago, 19-II-1958, Marticorena & Furet 10 (CONC); Antillanca, 1100 m, 15-I-1954, Pfister 14565 (CONC).

11. *Gamochaeta humilis* Wedd., Chlor. And. 1: 153. 1856. TYPE. Bolivia. Dpto. La Paz, Chuquiaguillo, La Lancha, 4500 m, year 1854, *H. A. Weddell s.n.* (lectotype, designated here, P 00704631!; isolectotype P 00704632!). Fig. 15.

Perennial herbs, caespitose, to 12 cm tall, multistemmed, stems prostrate to ascending, unbranched, densely leafy at base and more loosely at the upper part, whitish-tomentose. Basal leaves rosulate, 4-22 × 1.5-4 mm, obovate to oblanceolate, attenuate at base, apex obtuse to rounded; slightly discolorous, upper surface whitish-lanuginose, lower surface whitish-woolly; caulinar leaves 5-20 × 2-5 mm, oblanceolate, apex acute. Capitula many, in clusters subtended by linear-obovate leaves, arranged

in discontinuous elongated spikes, sometimes terminally glomerulate. Involucre campanulate, 4-4.5 × 3.5-4 mm. Phyllaries 3-4-seriate, lamina light brown at apex; outer phyllaries 1.5-2.2 × 0.5-1 mm, ovate, apex acute, lanuginose; inner phyllaries ca. 2.8-3 × 0.4-1 mm, oblong-obovate, apex acute, subglabrous. Pistillate florets 35-40, corolla white-yellowish, purplish at apex, filiform, ca. 2 mm long. Bisexual florets ca. 3, corolla white-yellowish, purplish at apex, tubular, ca. 2 mm long. Achenes 0.5-0.7 mm long, sparsely pilose, with short globose duplex hairs. Pappus bristles ca. 2 mm long.

PHENOLOGY. Flowering in January, May.

DISTRIBUTION AND HABITAT. *Gamochaeta humilis* occurs in northern Chile (Arica y Parinacota, Antofagasta), Bolivia, and Peru, growing between 3500-4600 m.

RELATIONSHIPS. *Gamochaeta humilis* resembles *G. chamissonis* in its capitula arrangement. However, plants of *G. humilis* are caespitose, to 12 cm tall (vs. *G. chamissonis* 15-50 cm tall).

ADDITIONAL MATERIAL EXAMINED. CHILE. Región de Arica y Parinacota. Prov. Parinacota: camino de Caquena a Parinacota, 18°4'36"S-69°13'41"W, 4470 m, 25-V-2012, Moreira, Muñoz & Morales 1621 (SGO). Región de Antofagasta. Prov. Antofagasta: Linzor, 5-I-1957, Navas s.n. (LP).

12. *Gamochaeta longipedicellata* Cabrera, Bol. Soc. Argent. Bot. 15(4): 330. 1974. TYPE. Argentina. Jujuy. Dpto. Cochinoca, Abra Pampa, Co. Huancar, Ene 1963, *A. L. Cabrera et al.* 15265 (holotype, LP 000229!; isotypes, K 000500404!, SI 000871!). Fig. 16.

Annual herbs, caespitose, 1-4 cm tall, multistemmed, stems prostrate to ascending, unbranched, densely, uniformly leafy, lanuginose to whitish-lanate. Leaves to 10 × 2-2.5 mm, oblong-obovate to obovate, attenuate at base, apex obtuse to rounded; concolorous, whitish-woolly on both surfaces. Capitula few, solitary in the axils of the upper leaves, long pedunculate, peduncle up to 30 mm long. Involucre campanulate, 4-4.5 × 2-3.5 mm. Phyllaries 3-4-seriate, lamina light brown at apex; outer phyllaries ca. 4 × 1.2-1.5 mm, ovate, apex acute, lanuginose; inner phyllaries ca. 4.5 × 1 mm, oblong-obovate, apex acute, subglabrous. Pistillate florets ca. 30, corolla white-yellowish, purplish at apex, filiform, ca. 2.5 mm long. Bisexual florets 3-4, corolla white-yellowish, purplish at apex, tubular, ca. 2.5 mm long. Achenes ca. 0.8 mm long, pilose, with short globose duplex hairs. Pappus bristles ca. 2.5 mm long.

PHENOLOGY. Flowering in January to March.

DISTRIBUTION AND HABITAT. *Gamochaeta longipedicellata* occurs in northern Chile (Tarapacá), Bolivia, and northwest Argentina (Jujuy, Catamarca), growing between 3500-4550 m.

RELATIONSHIPS. *Gamochaeta longipedicellata* resembles *G. oligantha* in its caespitose habit. However, *G. longipedicellata*-*V*-be differentiated by its long pedunculate capitula arranged 1 per axil (vs. capitula sessile arranged in glomerules in *G. oligantha*).

ADDITIONAL MATERIAL EXAMINED. CHILE. Región de Tarapacá. Prov. Iquique: Collaguasi, Q. San Nicolás, 20°59'S-68°42'W, 4550 m, 23-I-1994, Teillier 3273 (SGO).

13. *Gamochaeta neuquensis* Cabrera, Bol. Soc. Argent. Bot. 9: 372. 1961. TYPE. Argentina. Neuquén. San Martín de los Andes, -I-1941, *A. Bridarolli 2033* (holotype, LP 000232!). Fig. 17.

Perennial herbs, 5-12 cm tall, multistemmed, stems ascending to erect, unbranched, usually more densely leafy at base, whitish-lanate. Leaves 10-17 × 1-3 mm, linear-obovate, attenuate at base, apex acute to obtuse, mucronate; concolorous, arachnoid to whitish-woolly on both surfaces. Capitula few, ca. 5, in head-like clusters, subtended by linear leaves, capitula sometimes solitary in axils of the upper leaves. Involucre narrowly campanulate, ca. 4 × 2 mm. Phyllaries 3-4-seriate, lamina light-brown at apex; outer phyllaries ca. 2 × 1 mm, ovate, apex acute, lanuginose; inner phyllaries ca. 3.5 × 0.8 mm, oblong-lanceolate, apex acute, glabrous. Pistillate florets ca. 12, corolla white-yellowish, purplish at apex, filiform, ca. 2.5 mm long. Bisexual florets 4-5, corolla white-yellowish, purplish at apex, tubular, 2.2-3 mm long. Achenes ca. 0.7 mm long., pilose, with short globose duplex hairs. Pappus bristles 2.5-3 mm long.

PHENOLOGY. Flowering in November and February.

DISTRIBUTION AND HABITAT. *Gamochaeta neuquensis* occurs in central and southern Chile (Metropolitana, Los Lagos, and probably Magallanes y de la Antártica Chilena) and bordering regions in Argentina (Neuquén, Río Negro), growing between 780-1150 m.

RELATIONSHIPS. *Gamochaeta neuquensis* resembles *G. filaginea* in multistemmed habit and linear-obovate leaves. However, *G. neuquensis*-*V*-be differentiated by being 12 cm tall (vs. 15-40 cm tall in *G. filaginea*) and few capitula arranged in head-like clusters (vs. many, in lax elongated spikes interrupted at base in *G. filaginea*).

ADDITIONAL MATERIAL EXAMINED. CHILE. Región Metropolitana Santiago. Prov. Cordillera: La Obra, 780 m, 5-XI-1922, Montero 1432 (CONC). Región de los Lagos. Prov. Osorno: Volcán Osorno, 41°05'S-72°30'W, 1150 m,

18-II-1976, Veblen 355 (UC).

14. *Gamochaeta nivalis* Cabrera, Bol. Soc. Argent. Bot. 9: 374. 1961 ≡ *Gnaphalium nivale* Phil., Anales Univ. Chile 90: 21. 1895, nom. illeg., non Tenore, 1811. TYPE. Chile. Valdivia. Huahuim, supra nivem perpetuam, 14-I-1887, *O. Philippi s.n.* (holotype SGO-064514!; isotype, LP 001935!). Figs. 18, 29B.

= *Gnaphalium affine* D'Urv. var. *pusillum* Speg., Anales Mus. Nac. Hist. Nat. Buenos Aires 5: 63. 1896. TIPO. Argentina. Ushuaia, *C. L. Spegazzini s.n.* (lectotype, designated here, LP 000073!).

= *Gamochaeta spiciformis* (Sch. Bip.) Cabrera var. *subaffinis* Cabrera, Bol. Soc. Argent. Bot. 9: 381. 1961. TYPE. Argentina. Río Negro. Lago Nahuel Huapi, Co. Catedral, -I-1954, *A. L. Cabrera 11537* (holotype, LP 000234!).

Perennial herbs, 4-7 cm tall, caespitose, multistemmed, stems ascending, unbranched, densely leafy at base and more loosely at the upper part, whitish-woolly. Leaves 5-10 × 2-5 mm, linear-obovate, attenuate at base, apex obtuse, mucronate; concolorous, whitish-woolly on both surfaces. Capitula many, in head-like clusters, subtended by linear-obovate leaves. Involucre narrowly campanulate, 5 × 1.8 mm. Phyllaries 4-seriate, lamina light-brown at apex; outer phyllaries 1.8-2.5 × 0.8-1.4 mm, ovate, apex obtuse, lanuginose; inner phyllaries 3.5-4.5 × 0.4-1 mm, oblong-lanceolate, apex subacute, glabrous. Pistillate florets 13-15, corolla white-yellowish, purplish at apex, filiform, ca. 3 mm long. Bisexual florets 2-3, corolla white-yellowish, purplish at apex, tubular, ca. 3 mm long. Achenes 1-1.2 mm long., pilose, with globose duplex hairs. Pappus bristles ca. 3 mm long.

PHENOLOGY. Flowering from January to March.

DISTRIBUTION AND HABITAT. South Chile (Biobío, Araucanía, Aysén del General Carlos Ibáñez del Campo, Magallanes y de la Antártica Chilena), and central-southwest Argentina (Chubut, Mendoza, Neuquén, Río Negro, Santa Cruz, Tierra del Fuego), between 800-3000 m.

RELATIONSHIPS. *Gamochaeta nivalis* is similar to *G. serpyllifolia* in habit and capitula arrangement. *Gamochaeta nivalis* differs from *G. serpyllifolia* by its outer phyllaries that are obtuse (vs. acute to acuminate in *G. serpyllifolia*) and leaves that are linear-obovate (vs. broadly obovate to orbicular in *G. serpyllifolia*).

OBSERVATIONS. We have concluded that the name Huahuim it is Hua-Hum, argentinian locality in the Neuquén province, because Otto Philippi, on the summer of 1887, went through the mountains of the now Los Lagos region in Chile, and then travelled through the Argentinian site (Muñoz-Schick *et al.* 2012).



FIGURE 15. *Gamochaeta humilis*. A, Habit; B, Leaf; C, Capitulum; D, Phyllaries; E, Bisexual floret; F, Pistillate floret; G, Achene; H, Pappus; I, Distribution [A-H, Moreira & al. 1621, SGO].

FIGURA 15. *Gamochaeta humilis*. A, Planta; B, Hoja; C, Capítulo; D, Filarios; E, Flor bisexual; F, Flor pistilada; G, Aquenio; H, Pappus; I, Distribución [A-H, Moreira & al. 1621, SGO].

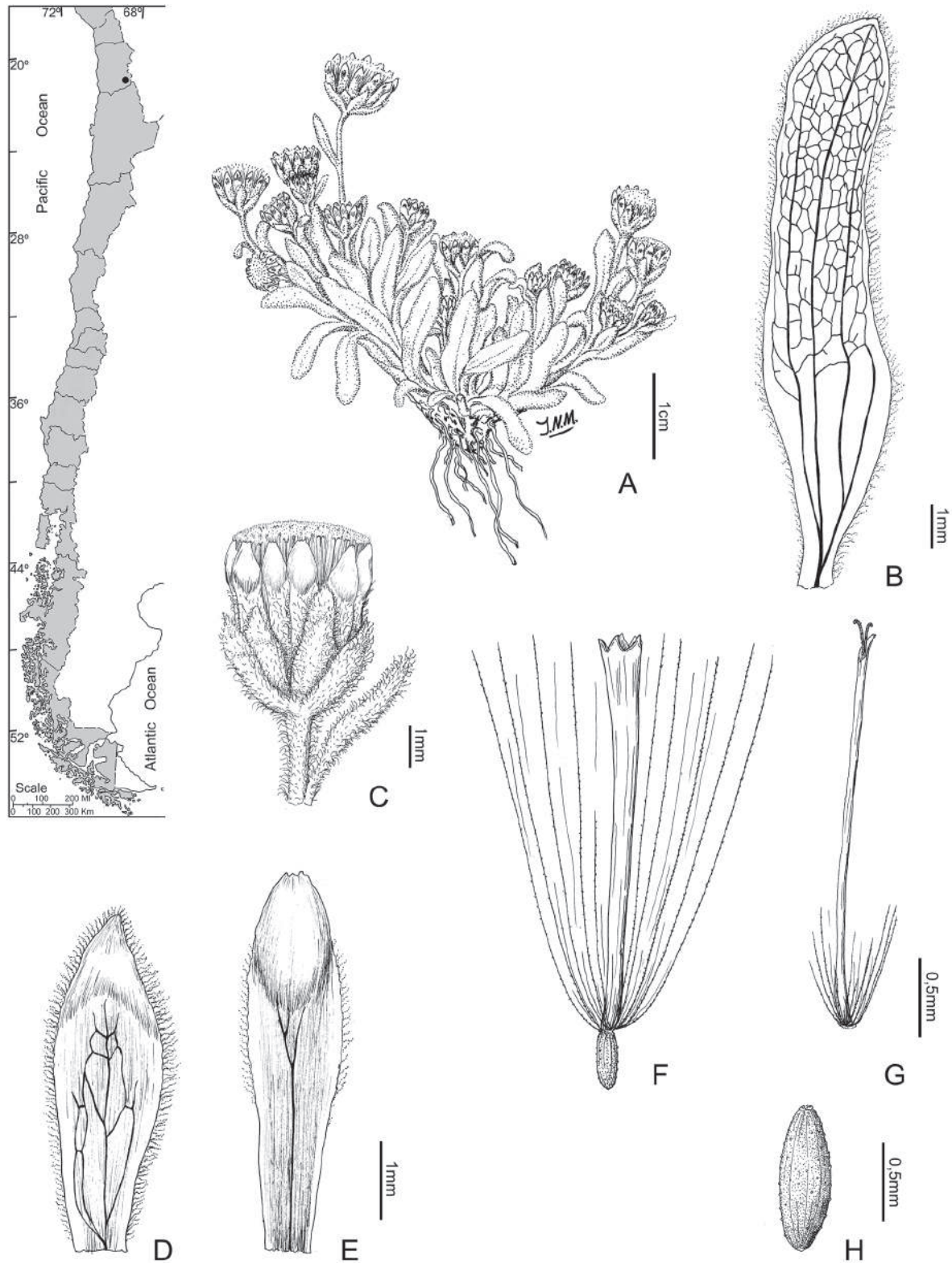


FIGURE 16. *Gamochaeta longipedicellata* A, Habit; B, Leaf; C, Capítulum; D, Inner phyllary; E, Outer phyllary; F, Bisexual floret; G, Pistillate floret; H, Achene; I, Distribution [A-H, from *Fl. Jujuy* 13(10): 304. 1978].

FIGURA 16. *Gamochaeta longipedicellata* A, Planta; B, Hoja; C, Capítulo; D, Filario interno; E, Filario externo; F, Flor bisexual; G, Flor pistilada; H, Aquenio; I, Distribución [A-H, tomado de *Fl. Jujuy* 13(10): 304. 1978].

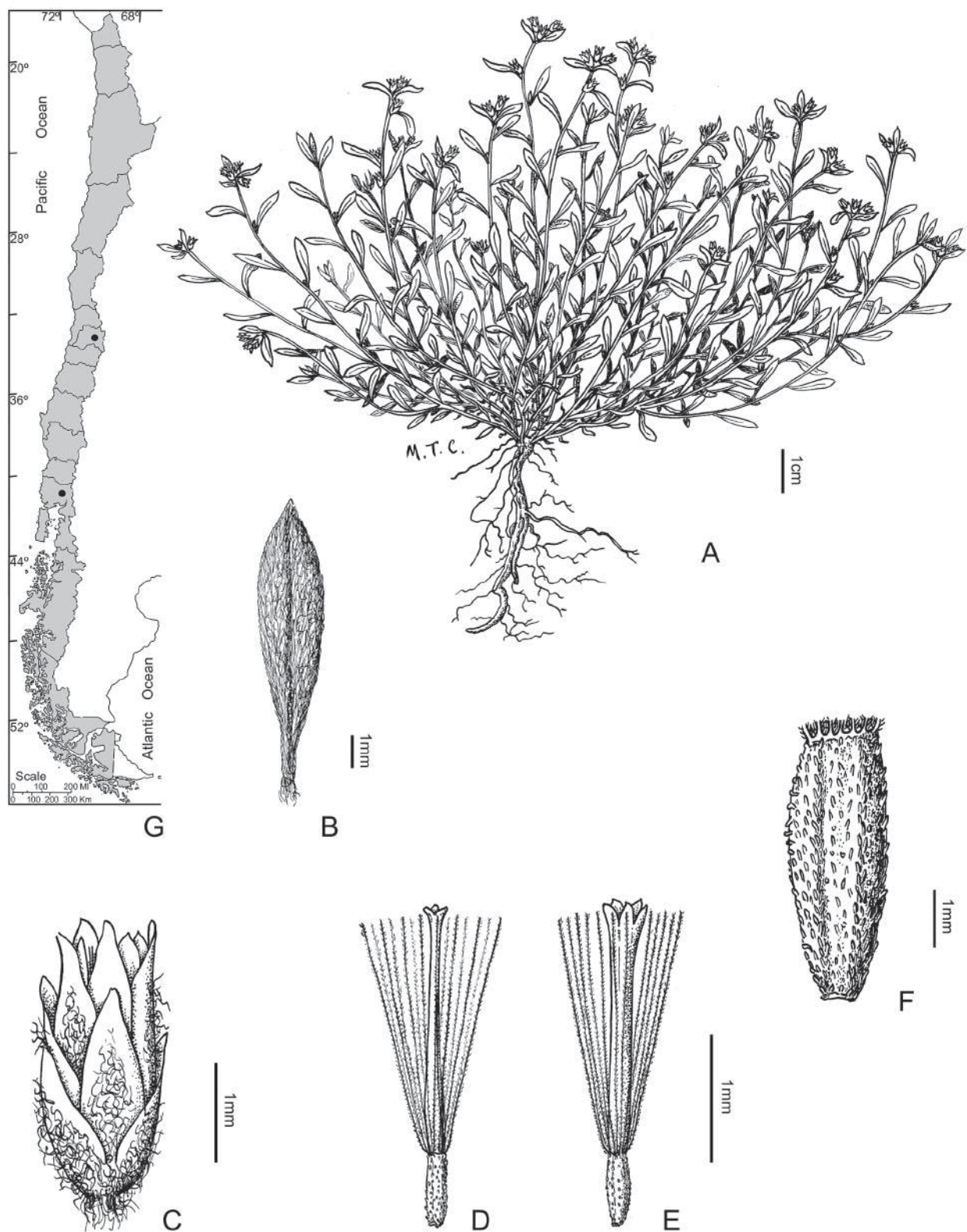


FIGURE 17. *Gamochoaeta neuquensis*. A, Habit; B, Leaf; C, Capitulum; D, Pistillate floret; E, Bisexual floret; F, Achene; G, Distribution [A-F, from Cabrera 1961 : 373].

FIGURA 17. *Gamochoaeta neuquensis*. A, Planta; B, Hoja; C, Capitulo; D, Flor pistilada; E, Flor bisexual; F, Aquenio; G, Distribución [A-F, tomado de Cabrera 1961: 373].

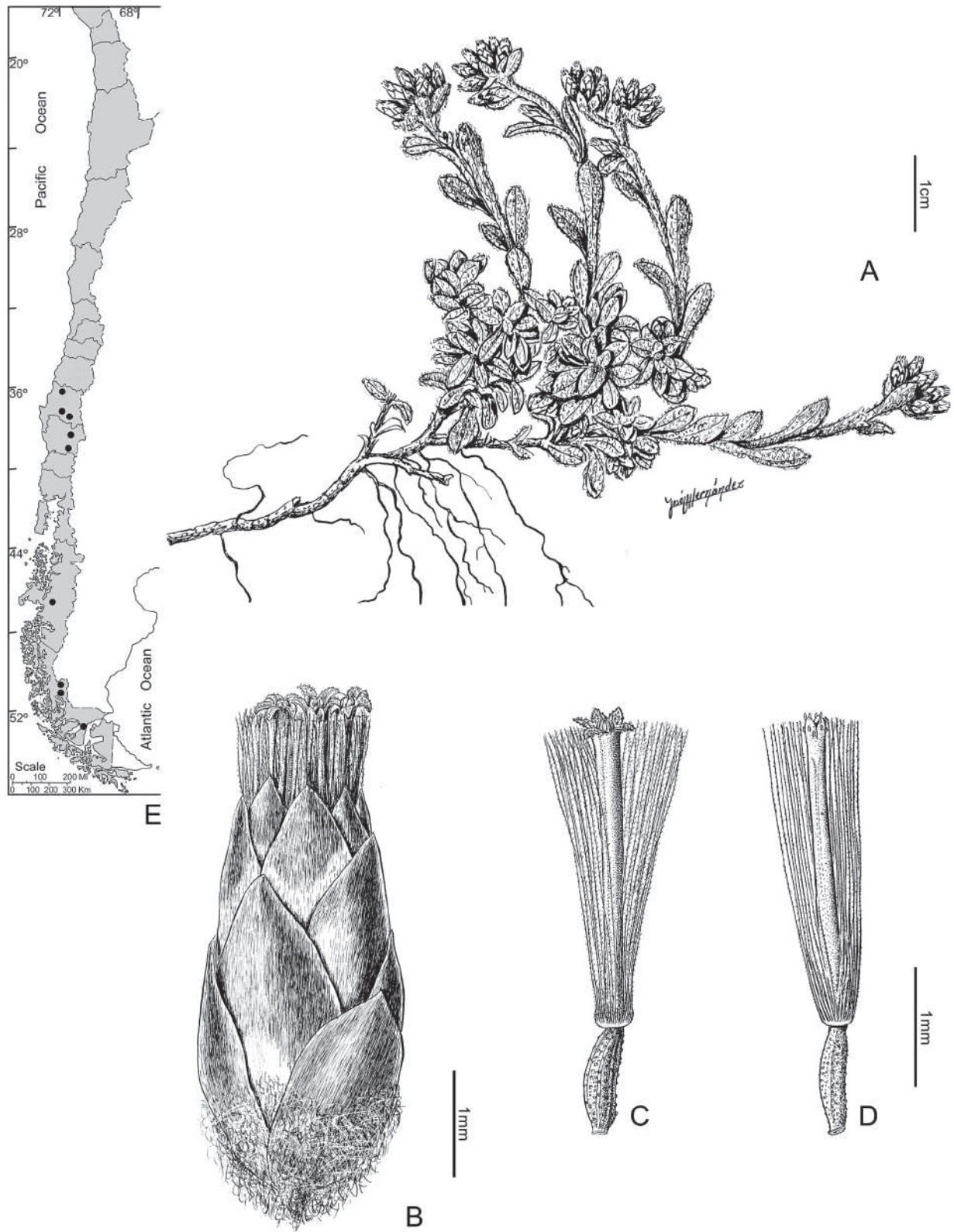


FIGURE 18. *Gamochaeta nivalis*. A, Habit; B, Capitulum; C, Bisexual floret; D, Pistillate floret; E, Distribution [A-E, from *Fl. Patagónica* 8(7): 121. 1971].

FIGURA 18. *Gamochaeta nivalis*. A, Planta; B, Capítulo; C, Flor bisexual; D, Flor pistilada; E, Distribución [A-E, tomado de *Fl. Patagónica* 8(7): 121. 1971].

Katinas *et al.* (2001) stated that the specimen 'Argentina, Prov. Tierra del Fuego, Antártida e Islas del Atlántico Sur, "Uhsuuaia", "landagaia" (2 labels). Specimen labeled "a" by Spegazzini' was the holotype of *Gnaphalium affine* D'Urv. var. *pusillum* Speg. However, it is an implicit lectotipification, which was made after 1 January 1990. Consequently, this specimen is here designated as lectotype.

ADDITIONAL MATERIAL EXAMINED. CHILE. Región del Biobío. Ñuble: El Roble, 2-II-1929, Barros s.n. herb. Gunckel 23185 (CONC). Biobío: Reserva Nacional Ralco, faldeos Volcán Callaqui, 1735 m, II-2002, Mihoc & al. 4341 (CONC). Región de la Araucanía. Malleco: Lonquimay, Paso Pino Hachado, 1900 m, 10-I-1948, Pfister 8140 (CONC); Pino Hachado, 200 m del límite lado N del camino, 1840 m, 10-II-1960, Ricardi & Marticorena 5084/1468 (CONC); Camino de Termas de Manzanares a Lonquimay, km 29, 900 m, 9-II-1960, Ricardi & Marticorena 5031/1415 (CONC). Cautín: Sierra Nevada, 2900 m, 21-II-1990, DeVore 1337 (CONC); Parque Nacional Villarrica, 1051 m, 11-I-2006, Marticorena & Jiménez 491 (CONC). Región de Aysén del General Carlos Ibañez del Campo. Ventisquero Soler, on the moraines, 46°52'S- 73°08'W, 24-27-III-1967, Seki 574 (CONC). Región de Magallanes y de la Antártica Chilena. Magallanes: Pto. Natales, 31-I-1936, Behn s.n. (SGO 126850); Punta Arenas, 29-I-1960, Montero 6253 (CONC); Punta Arenas, Tres Brazos, 30-XII-1951, Pfister s.n. (CONC 11776). Última Esperanza: Sierra de los Baguales, Co. Santa Lucía, 9-I-1985, Arroyo 850023 (CONC); Sierra del Toro, 700-750 m, 9-II-1992, Arroyo & al. 92-73 (CONC); Sierra del Toro, 51°10'S- 72°50'W, 700-750 m, 10-II-1992, Arroyo & al. 92-118 (CONC); Co. Castillo, Estancia Castillo, 19-I-1952, Paschke s.n. (CONC 12244).

15. *Gamochaeta oligantha* (Phil.) L. E. Navas, Fl. Cuenca de Santiago de Chile 3: 215. 1979. \equiv *Gnaphalium oliganthum* Phil., Linnaea 33: 167. 1864. TYPE. Chile. [Prov. Aconcagua] Catemu, -IX-1860 [Philippi s.n.] (holotype, SGO 64427!). Fig. 19.

= *Gamochaeta monticola* (Phil. ex Reiche) Cabrera, Bol. Soc. Argent. Bot. 9: 374. 1961. \equiv *Gnaphalium monticola* Phil. ex Reiche, Anales Univ. Chile 112: 117. 1903. **syn. nov.** TYPE. [Chile]. Cord. de Santiago, Las Arañas, -I-1861, C. L. Landbeck 60 (holotype, SGO064517!; isotype, LP 001933!).

Annual herbs, caespitose, 1-4 cm tall, stem solitary (2 or 3), prostrate to ascending, unbranched, densely, uniformly leafy, arachnoid-lanuginose to whitish-lanate. Leaves 8-15 \times 1.5-2 mm, linear-obovate, attenuate at base, apex acute to obtuse, mucronate; concolorous, arachnoid to whitish-woolly on both surfaces. Capitula few, 2-3(6), in head-like clusters, subtended by linear leaves. Involucre narrowly campanulate, ca. 4 \times 2 mm. Phyllaries 4-seriate, lamina

light-brown at apex; outer phyllaries 2-2.2 \times 1.5 mm, ovate, apex acute, lanuginose; inner phyllaries ca. 4 \times 1 mm, oblong-lanceolate, apex acute, glabrous. Pistillate florets ca. 30, corolla white-yellowish, purplish at apex, filiform, ca. 2 mm long. Bisexual florets ca. 2, corolla white-yellowish, purplish at apex, tubular, ca. 2 mm long. Achenes 0.7-0.8 mm long., pilose, with short globose duplex hairs. Pappus bristles ca. 2 mm long.

PHENOLOGY. Flowering from August to February (May).

DISTRIBUTION AND HABITAT. Northern, central and southern Chile (Antofagasta, Coquimbo, Valparaíso, Metropolitana, Maule, Biobío, Araucanía, Los Ríos, Magallanes y de la Antártica Chilena) and regions in Argentina (Neuquén), between 30-980 m.

RELATIONSHIPS. *Gamochaeta oligantha* appears to occupy an isolated position in the genus by its distinctive small annual habit with unbranched and uniformly leafy stems.

OBSERVATION. According to the protologue, *Gnaphalium monticola* Phil. ex Reiche, was based on a specimen 'Cordilleras de Santiago (Las Arañas). Enero', and characterized by its caespitose habit with prostrate and densely leafy stems, spatulate leaves that were white-lanate, and capitula in head-like clusters. After examining the type material, we propose to place *Gnaphalium monticola* into synonymy of *Gamochaeta oligantha* because there is no diagnostic character that differentiates the former from the latter.

ADDITIONAL MATERIAL EXAMINED. CHILE. Región Antofagasta. Prov. Antofagasta: Taltal, 26-IX-1940, Barros 2326 (LP). Región Coquimbo. Prov. Elqui: Isla Damas, 30 m, 29°14'S-71°31'W, 31-VIII-2002, Arancio 14867 (CONC). Camino a Guayacán, 32°29'23"S-70°55'40"W, 400 m, 23-IX-1999, Arroyo & Humaña 992233 (SGO). Andacollo, 11-XI-1958, Ricardi & Marticorena 4952 (CONC). Prov. Limarí: Comuna Ovalle, Fray Jorge, 15-IX-1947, Ibáñez & Kuschel s.n. (SGO 130580); Fray Jorge, al N de la Portada, 600 m, 20-IX-1974, Mahu 10203 (LP). Fray Jorge, 21-IX-1893, Philippi s.n. (SGO 076287). Región Valparaíso. Prov. Petorca: La Ligua, Quebradilla, 23-IX-1947, Barros 7316 (LP). Prov. Los Andes: Los Andes, cerros vecinos a la ciudad, 22-IX-1923, Barros 4 (LP); 22-IX-1923, Barros 3322 (CONC). Prov. San Felipe de Aconcagua: San Felipe, 23-IX-1923, Barros 3348 (LP). San Felipe, Co. de Lo Vargas, 980 m, 17-IX-1953, Torres 14157 (CONC). Prov. San Antonio: Reserva Nacional El Yali, 33°44'37"S-71°42'29"W, 12-X-2000, Arroyo & Plissock 203010 (SGO). Región Metropolitana de Santiago. Prov. Chacabuco: Colina, XI-1949, Acevedo s.n. (SGO 134018); Polpaico, 26-IX-1947, Barros 7319 (LP).

Prov. Santiago: Co. San Cristóbal, 13-IX-1936, Barros 2 (LP). Rinconada de Lo Cerda, Q. de La Plata, 740 m, 33° 29'S-70°54'W, 25-IX-1960, Schlegel 2917 (CONC); Q. de Peñalolén, 33°28'S-70°33'W, 23-X-1952, Bravo 193 (CONC). Región del Maule. Prov. Curicó: Lolol, 19-IX-1937, Barros 2298 (LP). Prov. Talca: Talca, IX-1923, Joseph 4329 (CONC). Región del Biobío. Prov. Ñuble: San Carlos, El Roble, 3-II-1929, Barros 16 (LP); Pangal del Laja, 14-X-1962, Ricardi 5218 (CONC, LP). Prov. Concepción: Penco, 1-I-1947, Barros 7313 (LP). Región de la Araucanía. Prov. Malleco: Fundo Solano, Los Alpes, Cord. de Nahuelbuta, 18-I-1958, Eyerdam 10341 (F). Región de Los Ríos. Prov. Valdivia: San Carlos, Cord. de los Sauces, 14-II-1925, s. coll. (LP 068899). Región de Magallanes y de la Antártica Chilena. Prov. Última Esperanza: Península Antonio Varas, 51°45'S-72°35'W, 35 m, 29-IV-2009, Pfanzelt 285 (CONC).

16. *Gamochaeta procumbens* (Phil.) Cabrera, Bol. Soc. Argent. Bot. 9: 376. 1961. ≡ *Gnaphalium procumbens* Phil., Anales Univ. Chile 90: 25. 1895. TYPE. Chile. 'In Andibus prov. Talca invenit orn. Heribertus Dupuy' (holotype, SGO 64489!). Figs. 20, 29C.

Perennial herbs, 10-25 cm tall, caespitose, multistemmed, stems ascending, unbranched, densely leafy at base and more loosely at the upper part, whitish-tomentose. Leaves 19-25 × 5 mm, linear-obovate, attenuate or slightly attenuate at base, apex acute and shortly acuminate, mucronate; concolorous, whitish-tomentose on both surfaces. Capitula many, in head-like clusters, subtended by linear-obovate leaves, sometimes with 1(or 2) clusters at base. Involucre narrowly campanulate, ca. 4 × 2 mm. Phyllaries 4-seriate, lamina light brown at apex; outer phyllaries 3.5 × 1.2 mm, ovate, apex obtuse or acute to acuminate, lanuginose; inner phyllaries 4 × 0.8 mm, oblong-lanceolate, apex acute or subacute, glabrous. Pistillate florets ca. 20, corolla white-yellowish, purplish at apex, filiform, ca. 3 mm long. Bisexual florets ca. 3, corolla white-yellowish, purplish at apex, tubular, ca. 3.2 mm long. Achenes ca. 0.5 mm long, pilose, with short globose duplex hairs. Pappus bristles ca. 3.3 mm long.

DISTRIBUTION, HABITAT, AND PHENOLOGY. Endemic to central and south Chile (Metropolitana, Libertador General Bernardo O'Higgins, Maule, Biobío, Los Ríos), between 1558-2150 m. Flowering in January and February.

RELATIONSHIPS. *Gamochaeta procumbens* resembles *G. nivalis* in habit, leaves, and capitula arrangement, but differs from *G. nivalis* by the former's leaves that are acute and shortly acuminate at the apex (vs. obtuse to rounded in *G. nivalis*).

OBSERVATION. According to the protologue, *Gnaphalium procumbens* Phil. was based on the specimen 'In Andibus prov. Talca invenit orn. Heribertus Dupuy'. It was characterized

by its obovate, white-wooly leaves, and capitula arranged in head-like clusters and small clusters in the axils of the upper leaves. We were able to locate one collection at SGO (SGO 64489), where the original herbarium of Philippi is deposited, which agrees in all respects with the protologue of *G. procumbens*. Although this sheet does not have the collector and locality mentioned in the protologue (label probably missing) there is a label with the name written by Philippi's own hand, so it has been considered as holotype by the botanist C. Muñoz in October 1966.

ADDITIONAL MATERIAL EXAMINED. CHILE. Región Metropolitana de Santiago. Maipo: 5 km después de la barrera de entrada al Parque Río Yeso, 33°38'21"S-69°55'48"W, 2920 m, 14-I-2011, Moreira 1395 (SGO). Región del Libertador General Bernardo O'Higgins. Cachapoal: Reserva Nacional Río Los Cipreses, valle del Río Los Cipreses, Q. Los Piuquenes, 34°27'43"S-70°28'25"W, 2150 m, 17-II-2000, Arroyo & al. 201106 (SGO). Colchagua: Cord. del Flaco, 23-I-1948, Barros 7330, 7331 (LP). Región del Maule: Talca: Entre paso Pehuenches y Laguna del Maule, 13-II-1963, Ricardi 963 (CONC). Región del Biobío. Ñuble: Cordillera, Termas de Chillán, 2000 m, 4-II-1936, Cabrera 3590 (LP); Co. Pirigallo, 2100 m, 6-II-1936, Cabrera 3648 (2 sheets, LP); Co. Pirigallo, 2000 m, 20-I-1936, Puentes s.n. (CONC 116347). Región de Los Ríos. Valdivia: Comuna de Panguipulli, Faldeos Volcán Choshuenco, 39°55'S-71°59'W, 1558 m, 5-II-2012, Baeza 4356 (CONC).

17. *Gamochaeta ramosa* S. E. Freire, N. Bayón & C. M. Baeza, **nom. nov.** ≡ *Gnaphalium ramosum* Phil., Linnaea 33: 164. 1864, nom. illeg., non Lam. 1779 nec Sch. Bip. 1845. TYPE. Chile. Aconcagua. Concumén, 1863, *L. Landbeck s.n.* (holotype SGO 064485!; isotype LP 001942!). Fig. 21.

Annual herbs, caespitose, 10-15 cm tall, stems 2 or 3, erect, weak, branched on the upper part, loosely leafy, arachnoid-lanuginose. Leaves 1.2-2 cm × 3-4 mm, linear-obovate, attenuate at base, apex acute to obtuse, mucronate; concolorous, membranous, arachnoid to whitish-lanuginose on both surfaces. Capitula many, in head-like clusters, on terminal branchlets, subtended by linear leaves forming paniculate inflorescence.

Involucre narrowly campanulate, 3.5-4 × 2 mm. Phyllaries 4-seriate, lamina light-brown at apex; outer phyllaries 2-2.5 × 1 mm, ovate, apex acute lanuginose; inner phyllaries ca. 4 × 0.5-0.7 mm, oblong-lanceolate, apex acute, glabrous. Pistillate florets ca. 20, corolla white-yellowish, purplish at apex, filiform, ca. 2 mm long. Bisexual florets ca. 3, corolla white-yellowish, purplish at apex, tubular, ca. 1.5 mm long. Achenes 0.7-0.8 mm long, pilose, with short globose duplex hairs. Pappus bristles ca. 2 mm long.

PHENOLOGY. Flowering from October to February.

DISTRIBUTION AND HABITAT. *Gamochaeta ramosa* is endemic to central Chile (Coquimbo, Valparaíso, Metropolitana, Libertador General Bernardo O'Higgins, Maule, Biobío), from sea level to 3000 m.

RELATIONSHIPS. *Gamochaeta ramosa* appears to occupy an isolated position in the genus by its distinctive branched loosely leafy stems, and capitula in head-like clusters on terminal branchlets.

ADDITIONAL MATERIAL EXAMINED. CHILE. Región de Coquimbo. Prov. Choapa: Puerto Manso, 9 km N Huentelauquén, 12-15 m, 31-X-2000, Teillier & Márquez 4905 (CONC). Región Valparaíso. Prov. de Petorca: Zapallar, 2-I-1933, Johow s.n. (SGO 071064). Prov. Marga-Marga: Limache, Garaventa 369 (CONC). Región Metropolitana Santiago. Prov. Chacabuco: Altos de Chicauma, 33°12'S-70°56'W, 900 m, 23-XII-2004, García 652 (CONC). Prov. Santiago: Q. de Peñalolén, 1000 m, 25-X-1952, 33°28'S-70°33'W, Bravo 201 (CONC). Prov. de Talagante: Peñaflores, X-1956, 400 m, Levi s.n. (CONC 116169). Región del Libertador General Bernardo O'Higgins. Prov. Cachapoal: Termas de Cauquenes, 700 m, 31-X-1952, Pfister 13014 (CONC). Prov. de Colchagua: Río Tinguiririca, La Rufina, 34°44'S-70°46'W, 770 m, 3-I-1951, Ricardi 10009 (CONC). Región del Maule. Prov. de Talca: Cord. de Talca, El Picazo, 26-I-1939, Barros 2289 (LP). Región del Biobío. Prov. Concepción: Santa Juana, 24-X-1987, Rechinger 63035 (W).

18. *Gamochaeta serpyllifolia* Wedd., Chlor. Andina 1(4-6): 152. 1856. \equiv *Gnaphalium serpyllifolium* J. Rémy, Fl. Chil. 4: 233. 1849, nom. illeg., non Bergius, 1767 \equiv *Gamochaeta munozii* Cabrera, Bol. Soc. Argent. Bot. 9: 374. 1961, nom. superfl. TYPE. Chile. Región de Coquimbo. Prov. Colchagua: Cordillera de Talcaregüe, II-1831, C. Gay 245 (lectotype, P 00704608!, designated by J. Pruski, Taxon 54: 799. 2005; isolectotypes, G photo Field Mus. 28720 SI!, P 00704609!). Fig. 22.

Perennial herbs, 10-15 cm tall, caespitose, multistemmed, stems ascending, unbranched, densely leafy at base and more loosely at the upper part, whitish-woolly. Leaves 4-10 \times 3-4 mm, widely obovate or suborbicular, shortly attenuate at base, apex obtuse to rounded, mucronate; concolorous, whitish-woolly on both surfaces. Capitula many, in head-like clusters, subtended by linear-obovate leaves. Involucre narrowly campanulate, 5 \times 3 mm. Phyllaries 4-seriate, lamina light-brown at apex; outer phyllaries 2.2-3.3 \times 1.1-1.3 mm, ovate, apex acute to acuminate, lanuginose; inner phyllaries 3.2-4.2 \times 0.3-1 mm, oblong-lanceolate, apex acute, glabrous. Pistillate florets ca. 20, corolla white-yellowish,

purplish at apex, filiform, ca. 3 mm long. Bisexual florets 2-3, corolla white-yellowish, purplish at apex, tubular, ca. 3 mm long. Achenes ca. 0.8 mm long., pilose, with globose duplex hairs. Pappus bristles ca. 3 mm long.

PHENOLOGY. Flowering from (December) January to March.

DISTRIBUTION AND HABITAT. Central and south Chile (Metropolitana, Maule, Biobío, Araucanía, Los Ríos, Aysén del General Carlos Ibañez del Campo), and central-southwest Argentina (Mendoza, Neuquén; Cabrera 1971), between 700-3200 m.

RELATIONSHIPS. *Gamochaeta serpyllifolia* is similar to *G. nivalis* in habit and capitula arrangement. *Gamochaeta serpyllifolia* differs from *G. nivalis* by its outer phyllaries that are acute to acuminate and leaves that are broadly obovate to orbicular. In contrast, *G. nivalis* has obtuse outer phyllaries and linear-obovate leaves.

ADDITIONAL MATERIAL EXAMINED. CHILE. Región Metropolitana de Santiago. Prov. Cordillera: Cajón del Morales entre laguna y glaciario, 2400 m, 27-I-2002, Teillier & Márquez 5319 (CONC). Región del Maule. Prov. Curicó: Peteroa, II-1950, Hernández 20728 (CONC); límite Argentina-Chile, 1300 m, Sayago s.n. (LP). Laguna del Planchón, 2-I-1971, Zöellner 5315 (CONC). Prov. Talca: El Picazo, Alto de la Laguna, 26-I-1939, Barros 2287 (LP). Laguna de la Invernada, 35°43'S-70°46'W, 1300 m, 11-IV-2000, Finot & López 1962 (CONC); Cord. de Talca, II-1879, Philippi s.n. (SGO 064510). Región del Biobío. Prov. Ñuble: Termas de Chillán, I-1933, Behn s.n. (SGO 126855); El Roble, 3-II-1929, Barros 14 (LP). San Carlos, Co. Malalcura, 2-II-1922, Barros 41 (CONC). Termas de Chillán, 2000 m, 26-II-1947, Pfister 7491 (CONC). Baños de Chillán, Aguas Calientes, 2200 m, III-1927, Werdermann 1294 (MO). Prov. Biobío: Sierra de la Polcura, sobre la Laguna Laja, 2-II-1968, Zöellner 1388 (CONC). Parque Nacional Laguna de la Laja, sendero desde los Zorros al pie de Sierra Velluda, 1380 m, 24-I-2001, Baeza & al. 3211 (CONC). Reserva Nacional Ralco, faldeos Volcán Callaqui, 37°54'S-71°23'W, 1735 m, II-2002, Mihoc & al. 4332 (CONC). Reserva Nacional Ralco, faldeos del Volcán Callaqui, 1735 m, II-2002, Mihoc & al. 4336 (CONC). Región de la Araucanía. Prov. Malleco: Buenavista, year 1925, Pennell 12751 (SGO); Lonquimay, Paso Pino Hachado, 1900 m, 10-I-1948, Pfister 8142 (CONC). Región de Los Ríos. Provincia de Valdivia: Comuna de Panguipulli, Faldeos Volcán Choshuenco, 39°55'S-71°59'W, 1558 m, 5-II-2012, Baeza 4357 (CONC). Región de Aysén del General Carlos Ibañez del Campo. Prov. General Carrera: Río Exploradores, Ventisquero Circo, 46°20'S-73°15'W, 27-II-1967, Seki 211 (CONC).

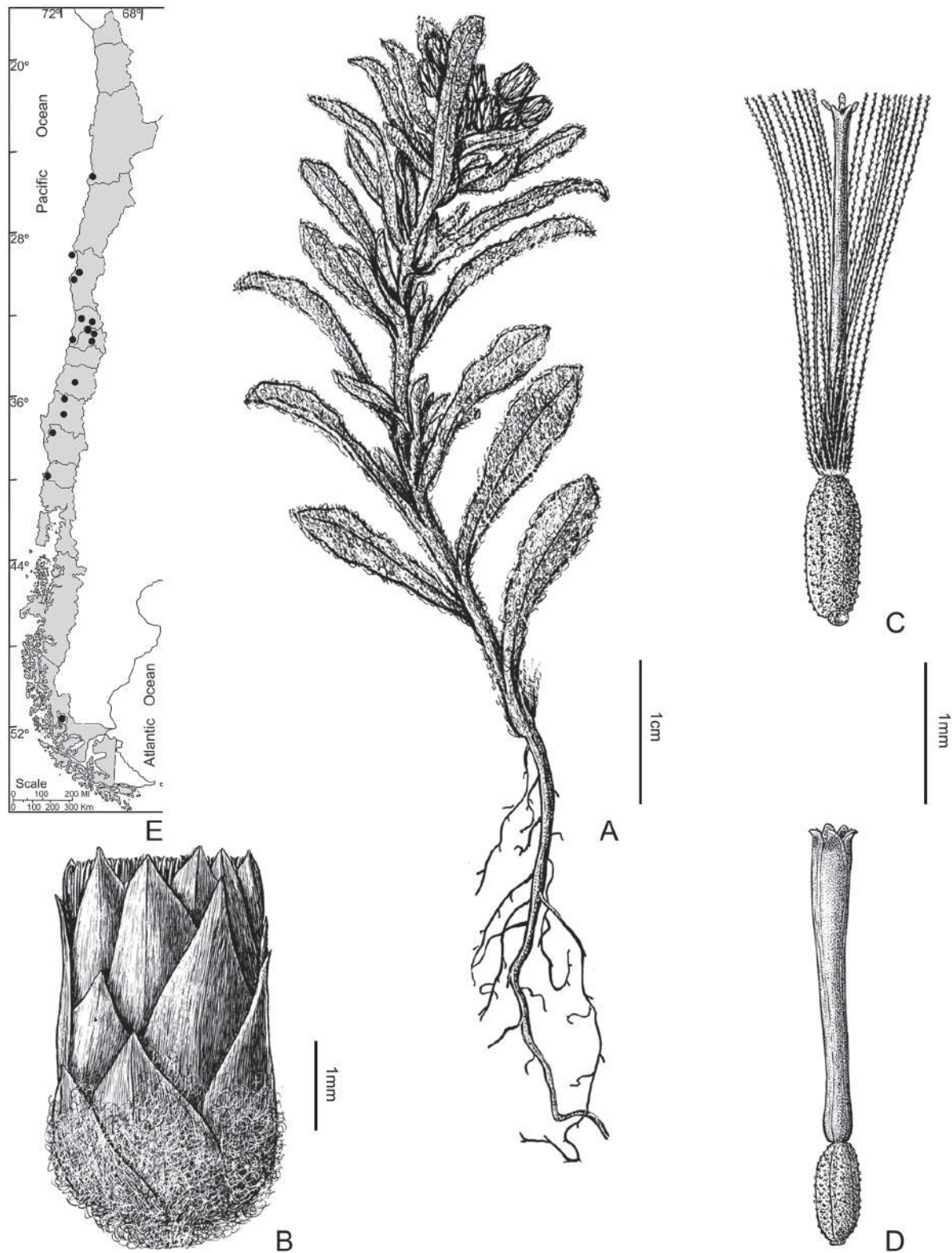


FIGURE 19. *Gamochaeta oligantha*. A, Habit; B, Capitulum; C, Pistillate floret; D, Bisexual floret without pappus; E, Distribution [A-D, from *Fl. Patagónica* 8(7): 118. 1971].

FIGURA 19. *Gamochaeta oligantha*. A, Planta; B, Capítulo; C, Flor pistilada; D, Flor bissexual sin papus; E, Distribución [A-D, tomado de *Fl. Patagónica* 8(7): 118. 1971].

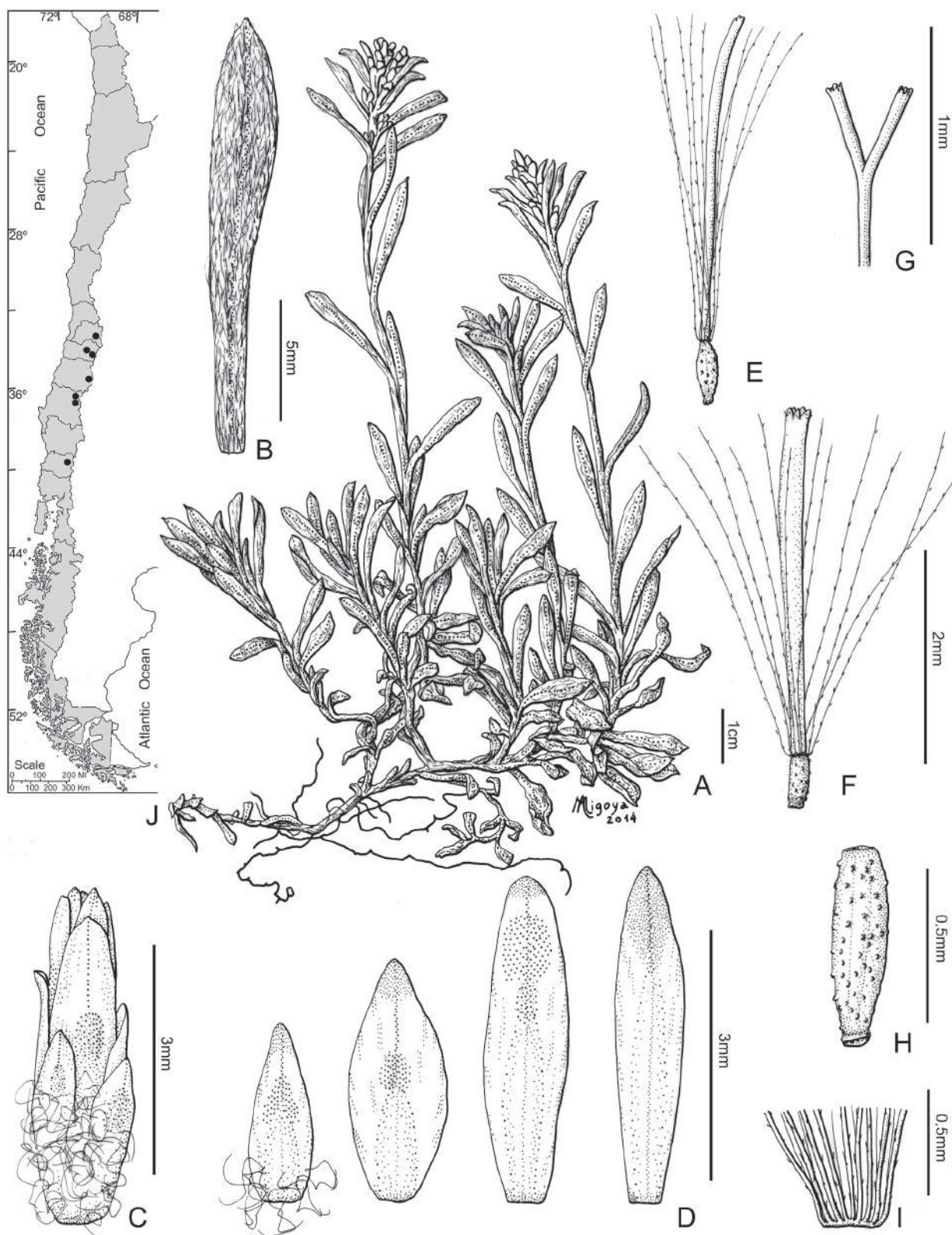


FIGURE 20. *Gamochaeta procumbens*. A, Habit; B, Leaf; C, Capitulum; D, Phyllaries; E, Pistillate floret; F, Bisexual floret; G, Style branches; H, Achene; I, Pappus; J, Distribution [A-I, Baeza 4356, CONC].

FIGURA 20. *Gamochaeta procumbens*. A, Planta; B, Hoja; C, Capítulo; D, Filarios; E, Flor pistilada; F, Flor bisexual; G, Ramas del estilo; H, Aquenio; I, Pappus; J, Distribución [A-I, Baeza 4356, CONC].

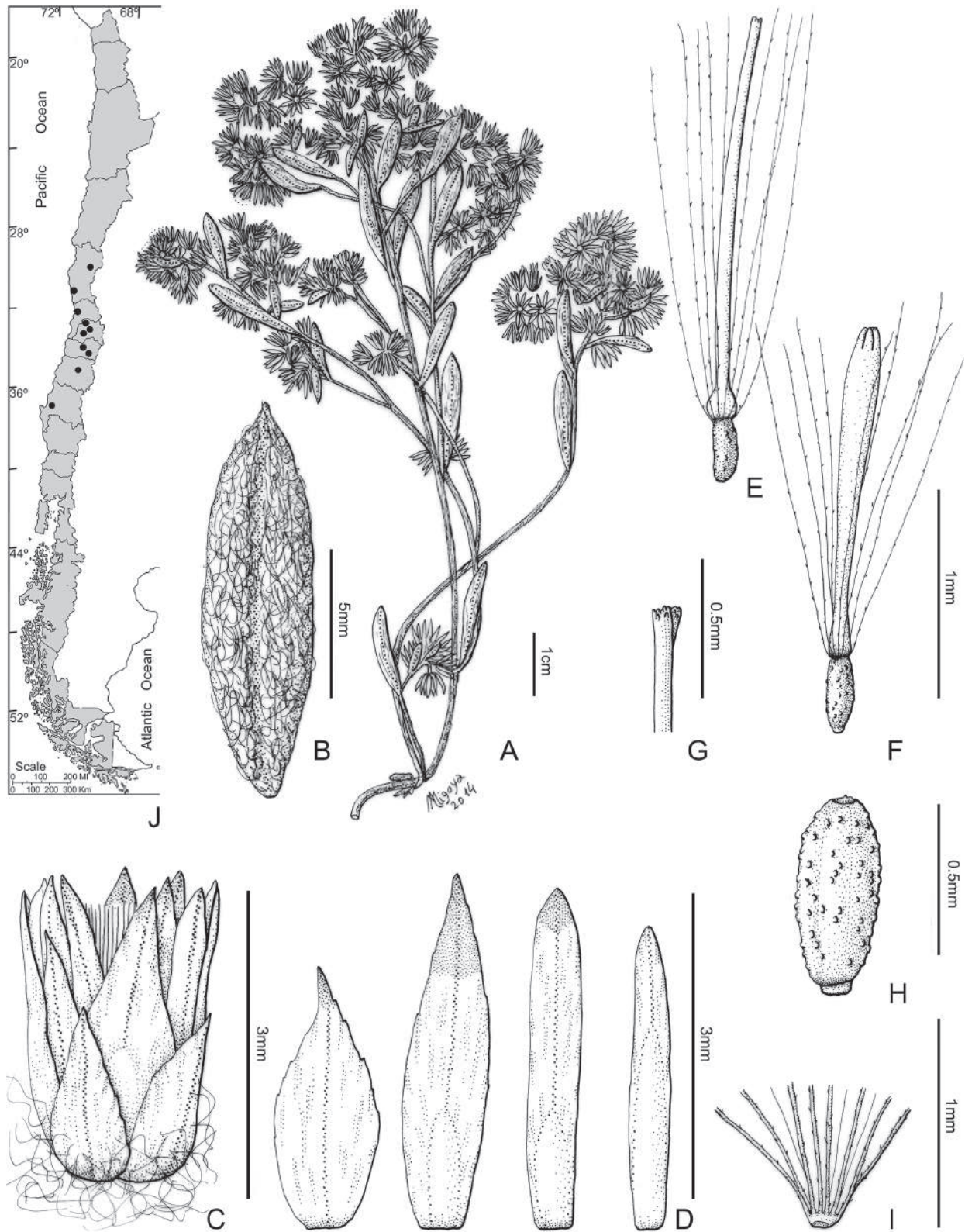


FIGURE 21. *Gamochaeta ramosa*. A, Habit; B, Leaf; C, Capitulum; D, Phyllaries; E, Pistillate floret; F, Bisexual floret; G, Style branches; H, Achene; I, Pappus; J, Distribution [A-I, Landbeck in 1863, LP].

FIGURA 21. *Gamochaeta ramosa*. A, Planta; B, Hoja; C, Capítulo; D, Filarios; E, Flor pistilada; F, Flor bisexual; G, Ramas del estilo; H, Aqueño; I, Pappus; J, Distribución [A-I, Landbeck en 1863, LP].

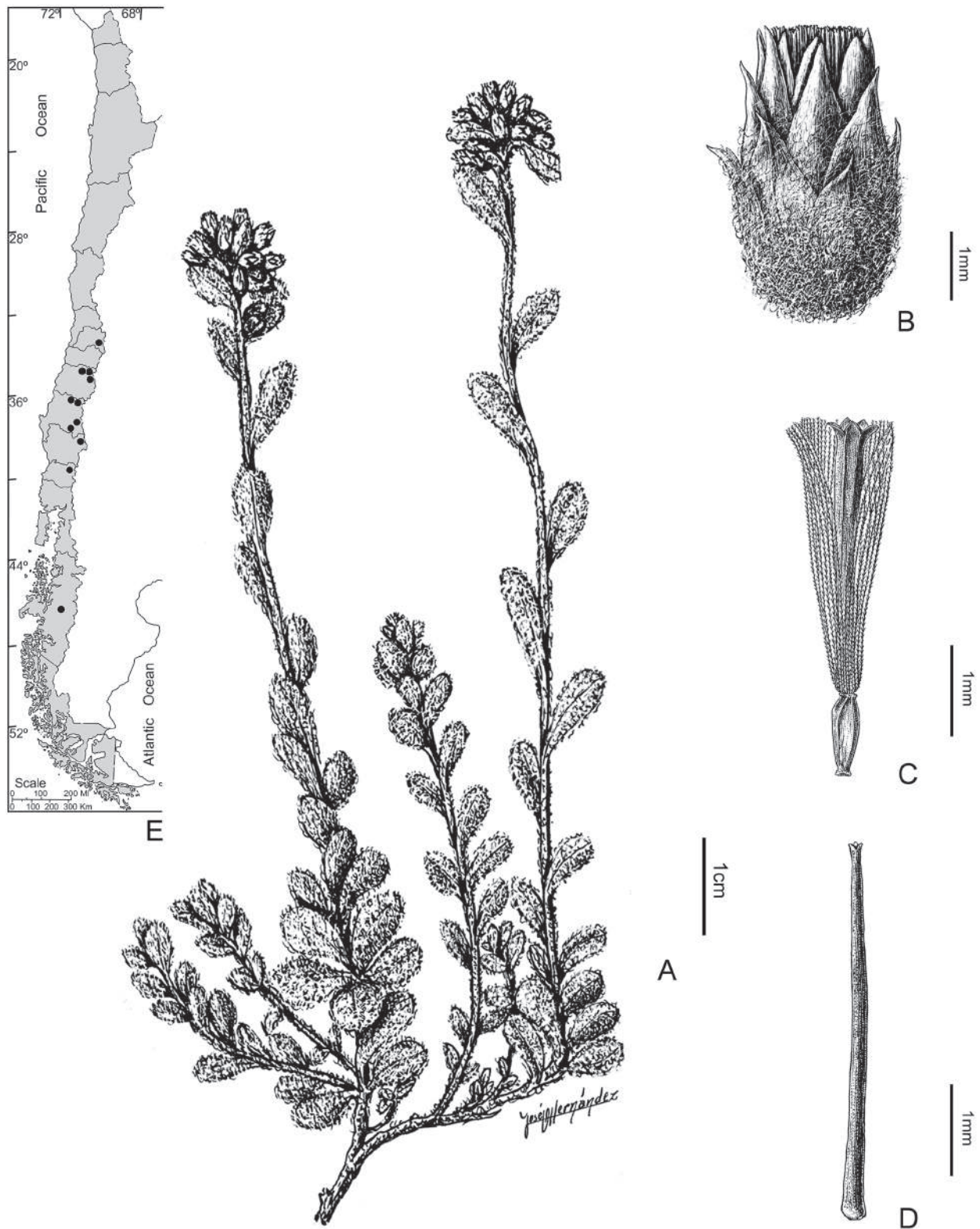


FIGURE 22. *Gamochaeta serpyllifolia*. A, Habit; B, Capitulum; C, Bisexual floret; D, Corolla of the pistillate floret; E, Distribution [A-E, from *Fl. Patagónica* 8(7): 121. 1971].

FIGURA 22. *Gamochaeta serpyllifolia*. A, Planta; B, Capítulo; C, flor bisexual; D, Corola de la flor pistilada; E, Distribución [A-E, tomado de *Fl. Patagónica* 8(7): 121. 1971].

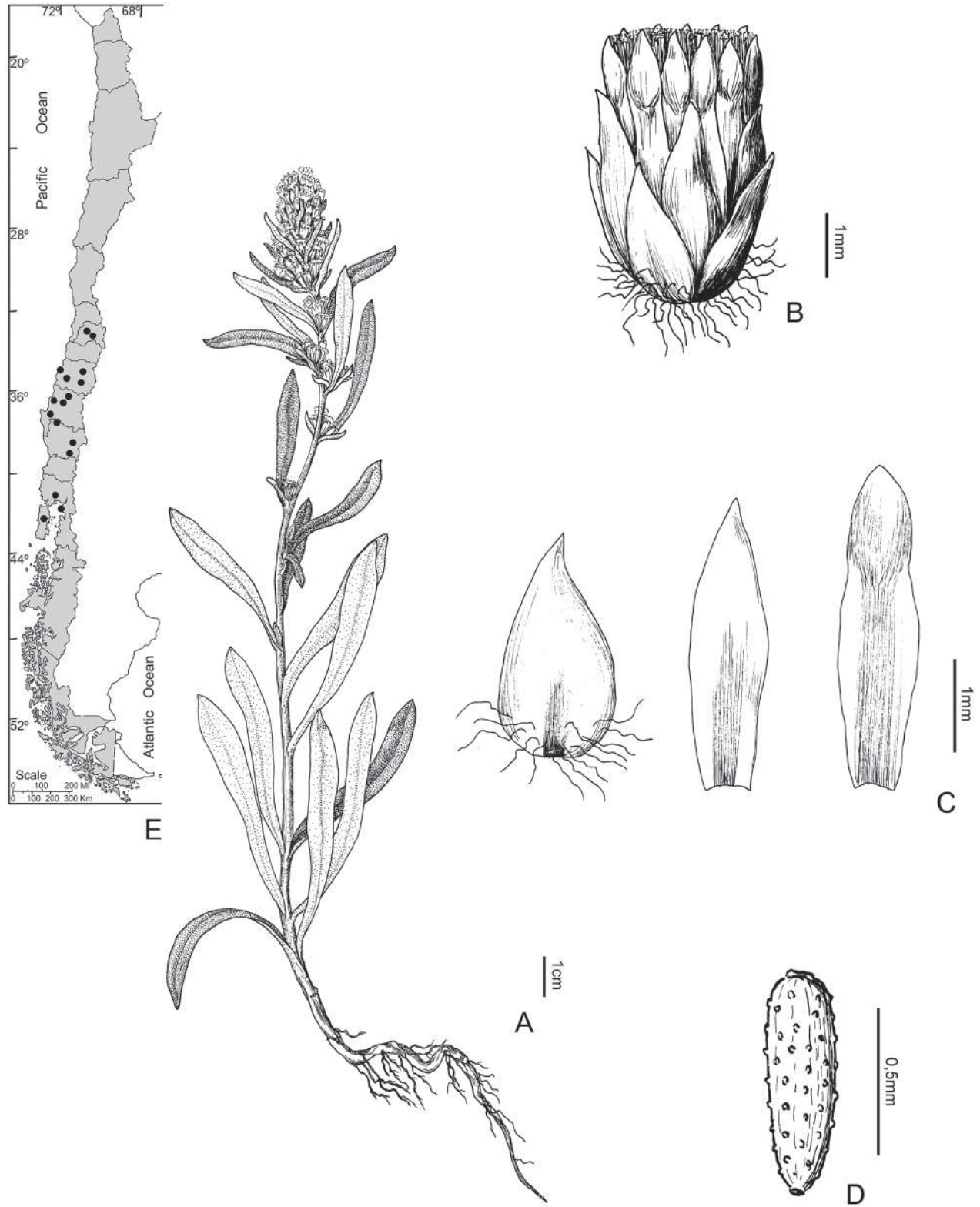


FIGURE 23. *Gamochaeta simplicicaulis*. A, Habit; B, Capitulum; C, Phyllaries; D, Achene; E, Distribution [A-D, from *Fl. Jujuy* 13(10): 306. 1978].

FIGURA 23. *Gamochaeta simplicicaulis*. A, Planta; B, Capitulo; C, Filarios; D, Aquenio; E, Distribución [A-D, tomado de *Fl. Jujuy* 13(10): 306. 1978].

19. *Gamochaeta simplicicaulis* (Willd. ex Spreng.) Cabrera, Bol. Soc. Argent. Bot. 9: 379. 1961. ≡ *Gnaphalium simplicicaule* Willd. ex Spreng., Syst. Veg. 3: 481. 1826. ≡ *Gnaphalium purpureum* L. var. *simplicicaule* (Willd. ex Spreng.) Klatt, Linnaea 42(1): 140. 1878. TYPE. [Venezuela] Cumana, Tumiriquiri, F. W. H. A. von Humboldt 343 (holotype, B-W 15493!, photo Field Mus. 15116!). Fig. 23.

Annual herbs, 30-70 cm tall, stem solitary, erect, unbranched, whitish-woolly, uniformly leafy. Leaves 2-7(-9) cm × 3-10(20) mm, remote, obovate to linear-obovate, attenuate at base, apex rounded to obtuse, mucronate, margins flat or wavy to the apex; strongly discoloured, glabrescent or glabrous and green above, and with adpressed white tomentum on lower surface; scarcely decreasing in size upwards. Capitula many, in clusters in the axils of the upper leaves, arranged in discontinuous elongated spikes (inflorescence branched in robust plants). Involucre narrowly campanulate, 3.5-4 × 2-2.5 mm. Phyllaries 3-4-seriate, lamina light-brown at apex; outer phyllaries ca. 3 × 1.3 mm, narrowly ovate, apex acute to acuminate, lanuginose; inner phyllaries ca. 4 × 1 mm, oblong-elliptic, apex acute to short acuminate, glabrous. Pistillate florets ca. 90, corolla white-yellowish, purplish at apex, filiform, ca. 2.5 mm long. Bisexual florets 4-5, corolla white-yellowish, purplish at apex, tubular, ca. 3 mm long. Achenes 0.5-0.7 mm long., pilose, with short, globose duplex hairs. Pappus bristles 2.5-3 mm long.

VERNACULAR NAME. "Vira-vira".

PHENOLOGY. Flowering from November to April.

DISTRIBUTION AND HABITAT. *Gamochaeta simplicicaulis* is widely distributed throughout South America (Venezuela, Brazil, Uruguay, Paraguay, Argentina, and Chile) and adventive in New Zealand and the southeastern USA (Nesom 1999, 2000). In Chile it has been collected in the Región Metropolitana, Maule, Biobío, Los Lagos, and Araucanía, growing on moist semi-fixed dunes and fields on the edge of forests; from sea level to 1270 m.

RELATIONSHIPS. *Gamochaeta simplicicaulis* resembles *G. americana* in having strongly discoloured leaves. However, *G. simplicicaulis*-V-be differentiated by its solitary stem (vs. multistemmed in *G. americana*) and the capitula arranged in discontinuous spikes (vs. continuous spikes, interrupted at base in *G. americana*).

ADDITIONAL MATERIAL EXAMINED. CHILE. Región Metropolitana de Santiago. Prov. de Cordillera: Río Clarillo, 33°43'S-70°29'W, II-2004, Romero & Aldunate 38 (CONC). Prov. Santiago: Co. San Cristóbal, 750 m, 3-XI-1950, Castillo 18647 (CONC). Región del Maule. Prov. Curicó:

Upeo, 7-XII-1975, Zöllner 9055 (CONC). Prov. Talca: Constitución, 7 km río arriba hacia el puente ferroviario, 35°20'S-72°22'W, 2-IV-1975, Parra & Rodríguez 145 (CONC). Prov. Cauquenes: Reserva Nacional Los Ruiles, 35°50'S-72°30'W, 187 m, 5-I-2005, Marticorena & Jiménez 181 (CONC). Prov. Linares: Fundo "El Castillo", entrando por Copihue y siguiendo camino hacia el E, 36°14'S-71°14'W, 4-III-1999, Ruiz & López 888 (CONC), ibid. 975 m, 5-III-1999, Ruiz & López 959 (CONC). A lo largo del Río Achibueno, desde junta estero Las Ánimas a junta estero Riecillo, 36°05'S-71°10'W, 9-III-1999, Ruiz & López 1203 (CONC). Región del Biobío. Prov. Ñuble: Chillán, II-1926, Barros 395 (CONC). Prov. Concepción: Hualpén, 9-III-1940, Junge s.n. (CONC 6766). La Toma, lomas detrás de la Cantera Chica, 2-XII-1945, Pfister s.n. (CONC 4924); Pichaco, Hualqui, 12-XII-1936, Junge s.n. (CONC 5875). Prov. Biobío: Camino de Nacimiento a Maitenrehue, sector Carrizal, 37°34'S-72°45'W, 380 m, 6-XII-1997, Baeza & Kottirsch 777 (CONC). Nacimiento, 70 m, 4-XI-1925, Barros s.n. (CONC 116332). Prov. Arauco: Trongol Alto, sector Alto Tres Pinos, 37°37'S-73°06'W, 930 m, 19-I-1998, Baeza & Kottirsch 1342 (CONC). Región de la Araucanía. Prov. Malleco: Comunidad Maitenrehue, Los Copihues, 37°44'S-72°48'W, 930 m, 16-I-1998, Baeza & Kottirsch 1116 (CONC). Prov. Cautín: Volcán Villarrica, 5-II-1938, Hollermayer 816 (LP); Parque Nacional Conguillío, sector Triful, 38°38'S-71°42'W, 1270 m, I-2000, Weinberger 1462/19 (CONC). Región de Los Lagos. Prov. Llanquihue: Puerto Varas, 15-I-1924, Barros 3468 (CONC). Puerto Varas, Peulla, 41°06'S-72°02'W, 1250 m, III-1967, Zollitsch 252 (CONC). Prov. Chiloé: Río Inio, 24-II-1952, Levi 654 (CONC). Castro, bosque ca. de Chonchi, 12-II-1967, Ricardi 5296 (CONC). Prov. Palena: Rolecha, 41°55'S-72°50'W, 5-I-1951, Pfister 10289 (CONC).

20. *Gamochaeta spiciformis* (Sch. Bip.) Cabrera, Bol. Soc. Argent. Bot. 9: 381. 1961. ≡ *Gnaphalium spiciforme* Sch. Bip., Flora 38: 116. 1855. TYPE. [Chile] Prope Sandy Point [Punta Arenas], W. Lechler 1250 (holotype P?; isotypes, K 000500331!, GOET 001561!, LP 001956! ex P, NY 00169521!, S 10-26437!), photo ex Berlin (B¹ photo Field Mus. 15119!). Figs. 24, 29D.

= *Gnaphalium foliosum* Phil., Linnaea 33: 163. 1854 ≡ *Gamochaeta foliosa* (Phil.) Anderb., Opera Bot. 104: 157. 1991, **syn. nov.** TYPE. Chile. [Prov. Curicó] Llico, -XII-1861, Landbeck s.n. (holotype SGO 64605!; isotype LP 001919!).

= *Gnaphalium petersianum* Phil., Anales Univ. Chile 90: 21. 1895. ≡ *Gamochaeta petersiana* (Phil.) Anderb., Opera Bot. 104: 157. 1991. TYPE. Chile. Curicó. Valle de los Cipreses [cerca de las Termas de Peteroa] 1889/1890, M. Vidal s.n. (holotype, SGO 064477!; isotype, LP 001937!).

= *Gnaphalium affine* D'Urv. var. *medium* Speg., Anales Mus. Nac. Buenos Aires 5: 63. 1896. TYPE. Argentina.

Ushuaia, *C. L. Spegazzini s.n.* (lectotype, designated by Freire & Iharlegui, Fl. Argentina 7(1): 480. 2014, LP 000071!; isolectotype LP 000070!).

= *Gnaphalium mucronatum* Phil., Anales Univ. Chile 90: 20. 1895, nom. illeg., non Bergius, 1767. ≡ *Gnaphalium purpureum* L. var. *mucronatum* (Phil.) Skottsb., Kongl. Svenska Vetensk. Acad. Handl., n.s. 56(5): 317. 1916. TYPE. Chile. Valle del Río Palena, -II-1887, *F. Delfin s.n.* (holotype, SGO-064483).

Perennial herbs, (7-)10-30 cm tall, multistemmed, stems ascending, unbranched, commonly more densely leafy at base, lanuginose. Leaves 1.5-5 cm × 5-15 mm, widely obovate, attenuate at base, apex obtuse, mucronate; discolorous, upper surface usually green, lanuginose to glabrescent, lower surface white-tomentose. Capitula many, in head-like clusters, subtended by obovate leaves. Involucre narrowly campanulate, 4-5 × 2 mm. Phyllaries 3-4-seriate, lamina reddish to purple at apex; outer phyllaries 2-2.5 × 0.8-1 mm, ovate, apex acute, lanuginose; inner phyllaries 4-4.5 × 0.5-0.8 mm, oblong, apex obtuse, glabrous. Pistillate florets ca. 50, corolla white-yellowish, purplish at apex, filiform, 2.5-3 mm long. Bisexual florets 4-5, corolla white-yellowish, purplish at apex, tubular, 2.5-3 mm long. Achenes 1-1.2 mm long, pilose, with short globose duplex hairs. Pappus bristles 2.7-3.2 mm long.

PHENOLOGY. Flowering from September to March.

DISTRIBUTION AND HABITAT. Central and south Chile (Coquimbo, Valparaíso, Biobío, Araucanía, Los Ríos, Los Lagos, Aysén del General Carlos Ibáñez del Campo, Magallanes y de la Antártica) and Argentina (Chubut, Neuquén, Río Negro, Santa Cruz, Tierra del Fuego; Cabrera 1971), between 250-1500 m.

RELATIONSHIPS. *Gamochaeta spiciformis* resembles *G. serpyllifolia* in having many capitula arranged in head-like clusters. However, *G. spiciformis*-V-be differentiated by its lanuginose, larger leaves (vs. densely lanate on both surfaces, 4-10 mm long. in *G. serpyllifolia*), and phyllaries reddish to purple at apex.

OBSERVATION. According to the protologue, *Gnaphalium foliosum* Phil. was based on the specimen 'prope Llico in parte litorali prov. Colchagua [today Región del Maule, Prov. Curicó] invenit orn. Landbeck unicum specimen', and characterized by its obovate leaves arachnoid-lanose pubescence, and capitula arranged in head-like clusters. We propose to place *Gnaphalium foliosum* into synonymy of *Gamochaeta spiciformis* because there is no diagnostic character that differentiates the former from the latter. In addition, *Gnaphalium foliosum* appears to be only a variety of small plants, as was pointed out by Cabrera (1961) for

Gnaphalium peteroanum Phil., which after examining subsequent collections are within the range of variation for the species.

ADDITIONAL MATERIAL EXAMINED. CHILE. Región de Coquimbo. Prov. Limarí: Ovalle, Zorrilla, 26-IX-1948, Jiles 911 (CONC). Bosque Fray Jorge, IX-1970, Muñoz s.n. (CONC 116317). Choapa: Pichidangui, Co. Santa Inés, entrada al bosque de "olivillo", X-1981, Meza 994 (SGO). Carretera Panamericana, 20 km al S de Los Vilos, 14-XI-1957, Ricardi & Marticorena 4239/624 (CONC). Región de Valparaíso. Los Andes: Co. Bahamondes, 35-40 km from Argentina border, 1000-1500 feet, Ea. Vicuña, 8-IV-1968, Goodall 1760 (UC). Petorca: Pichicuy, ladera W, cerros frente a la playa, 1-XI-1974, Marticorena & al. 176 (CONC). San Antonio: Llolleo, 21-X-1950, Gunckel s.n. (CONC 116224). Valparaíso: Quintero, Los Molles, XII-1951, Gunckel 23441 (CONC); Quintero, Los Arrayanes, -XI-1952, Gunckel 23803 (CONC); Ritoque, 5-XI-1952, Gunckel 23902 (CONC); Quintero, Campiche, II-1956, Gunckel 39517 (CONC 116307); Dunas de Ritoque, XI-1953, Gunckel 40586 (CONC). Quintero, Co. de la Cruz, XI-1953, Gunckel s.n. (CONC 116295); 8-XII-1950, Gunckel s.n. (CONC 18983); Quintero, 2-XI-1952, Levi 179 (CONC). Región del Biobío. Concepción: Concepción, XI-1930, Barros 4316 (CONC). Vegas de Talcahuano, 4-IV-1951, Cekalovic 75 (CONC). Región de la Araucanía. Cautín: Cunco, Cord. de los Andes, Reserva Nasampulli, 2-I-2004, Gardner 6942 (CONC). Volcán Villarrica, 8-III-1933, Hollermayer 496 a (CONC). Región de Los Ríos. Valdivia: Paso Carirriñe, bosque 4 km después del límite, 18-I-1976, C. Marticorena & al. 657 (CONC). Región de Los Lagos. Osorno: Trumao, Cord. Pelada al S del Riobueno, 14-XII-1934, Hollermayer 683 (SGO). Antillanca, 18-II-1956, Pfister 19058 (CONC). Llanquihue: Co. Vichadero, casa Pangué, 14-I-1953, Pfister s.n. (CONC 13599). Puerto Varas, volcán Osorno, 1100 m, 16-III-1954, Sparre 10707 (LP). Chiloé: Castro, Cord. de San Pedro, desde Alcaldeo Llau-Llau a Lago Anquilda, 7-II-1982, Villagrán 3867 (SGO). Región de Aysén del General Carlos Ibáñez del Campo. Aysén: Quitralco, 15-XII-1947, Behn 110 (CONC). Río Marta, cercano al Río Cuervo, 16-I-2007, García 3921 (CONC). Laguna San Rafael, lado S del Ventisquero San Rafael, 18-I-1959, Muñoz 6252 (SGO). Capitán Prat: Villa O'Higgins, Cuenca Río Mosco, 22-III-2003, García 89 (CONC). General Carrera: Estero Cofré, 24-II-1996, Vogel 542 (CONC). Región de Magallanes y de la Antártica Chilena. Magallanes: Punta Arenas, XII-1936, Díaz s.n. (CONC 116189). Península de Brunswick, Co. Mirador, 8-II-1979, Dollenz 606 (CONC); comuna de Punta Arenas, 27-I-2007, Domínguez 984 (CONC); Punta Arenas, Co. Cancha Sky, 31-XII-1952, Pfister & Ricardi s.n. (CONC 11735). Punta Arenas, Refugio Club Andino, 25-II-1949, Pisano 2172 (CONC). Tierra del Fuego: Glaciar Reina Isabel II, 17-II-1971, Pisano 3019 (LP). Última

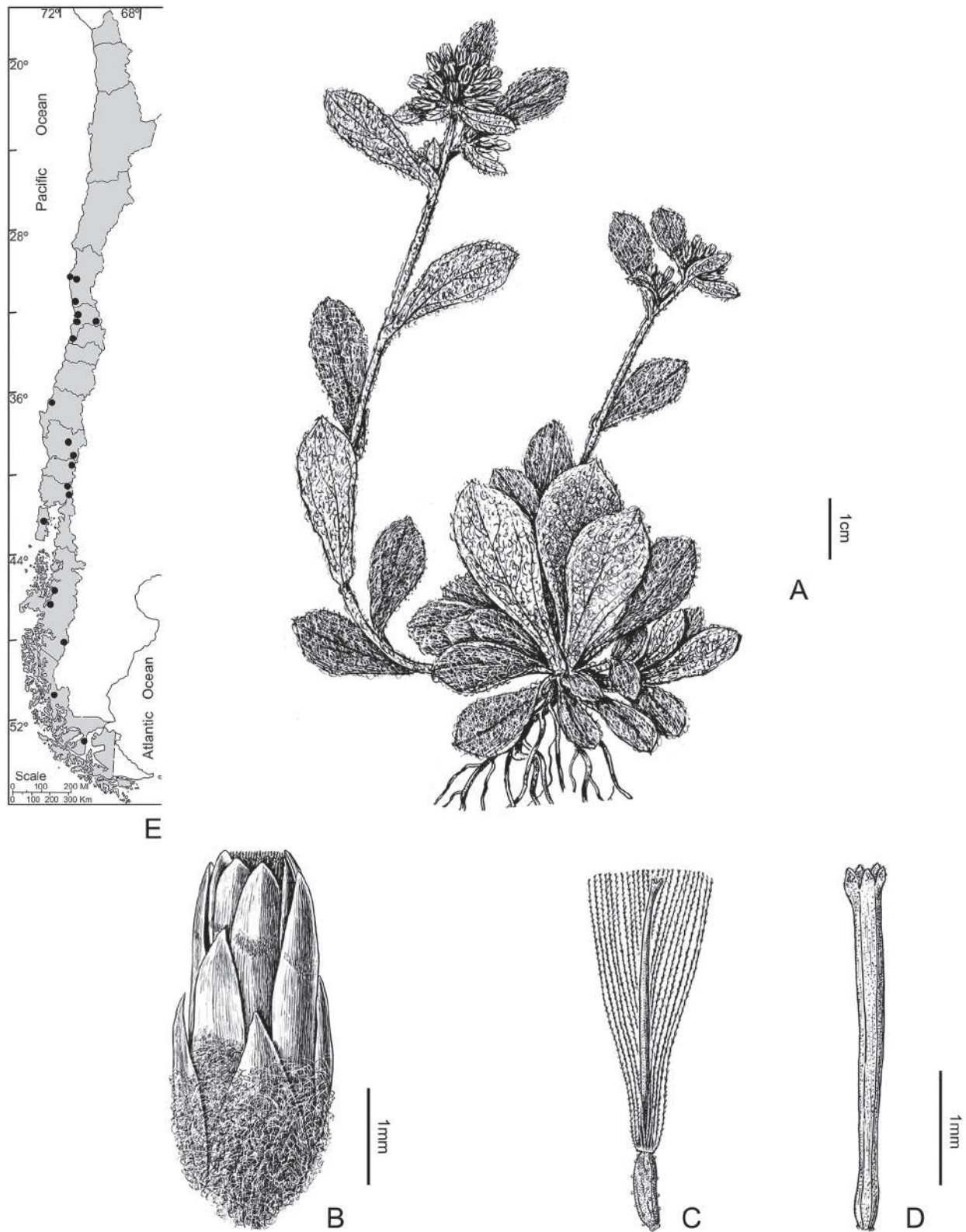


FIGURE 24. *Gamochoaeta spiciformis*. A, Habit; B, Capitulum; C, Pistillate floret; D, Corolla of the bisexual floret; E, Distribution [A-D, from *Fl. Patagónica* 8(7): 118. 1971].

FIGURA 24. *Gamochoaeta spiciformis*. A, Planta; B, Capítulo; C, Flor pistilada; D, Corola de la flor bissexual; E, Distribución [A-D, tomado de *Fl. Patagónica* 8(7): 118. 1971].

Esperanza: Puerto Natales, Glaciar Amalia, 12-I-2008, Aravena & al. 925 (CONC). Puerto Natales, entre Puerto Toro y Glaciar Serrano, 19-I-2002, Aedo 7462 (CONC). Paine, II-1954, Barrientos s.n. (CONC 116319). Cord. del Paine, 50°56'S-73°00'W, 750-1000 m, 14-II-1992, Von Bohlen & Cavieres 92-361 (CONC). Cordillera, Estación Co. Paine, 24-II-1974, Pisano 4337 (CONC).

21. *Gamochaeta stachydifolia* (Lam.) Cabrera, Bol. Soc. Argent. Bot. 9: 382. 1961. \equiv *Gnaphalium stachydifolium* Lam., Encycl. 2(2): 757. 1786. \equiv *Gnaphalium purpureum* L. var. *stachydifolium* (Lam.) Baker, Fl. Bras. 6(3): 125. 1882. TYPE. [Uruguay] Monte video, *P. Commerson* s.n. (holotype, P-LAM 00309226!; probable isotypes, P 00704593!, P 00704595!, P 00704596!). Fig. 25. = *Gnaphalium agreste* Phil., Anales Univ. Chile 90: 22. 1895, **syn. nov.** TYPE. Chile. Colchagua: Rengo [*Philippi* s.n.] (holotype, SGO 064494!),

Perennial herbs, 10-40 cm tall, multistemmed, stems ascending, unbranched, densely leafy at base and more loosely at the upper part, densely whitish-woolly. Leaves 3-8 cm \times 6-15 mm, widely obovate, attenuate at base, apex rounded to obtuse, mucronate, margins flat; concolorous, with adpressed white tomentum on both surfaces; caulinar leaves gradually diminishing in size upwards. Capitula many, in clusters in the axils of the upper leaves, arranged in continuous elongated spikes, interrupted at base. Involucre narrowly campanulate, 4.5-5 \times 2.5-3 mm. Phyllaries 3-4-seriate, lamina reddish to purple at apex; outer phyllaries ca. 2 \times 1 mm, ovate, apex acute-acuminate, lanuginose; inner phyllaries ca. 4 \times 0.5 mm, oblong, apex acute, glabrous. Pistillate florets ca. 50, corolla white-yellowish, purplish at apex, filiform, ca. 3 mm long. Bisexual florets ca. 3, corolla white-yellowish, purplish at apex, tubular, ca. 3 mm long. Achenes 0.4-0.5 mm long., pilose, with short globose duplex hairs. Pappus bristles ca. 3 mm long.

PHENOLOGY. Flowering from October to December.

DISTRIBUTION AND HABITAT. South Brazil (São Paulo, Rio Grande do Sul, Santa Catarina), Uruguay, Argentina (Buenos Aires, Chubut, Córdoba, La Pampa, La Rioja, Mendoza, Río Negro, Santa Cruz, Tierra del Fuego), and Chile (Biobío, Los Ríos) from sea level to 1800 m.

RELATIONSHIPS. *Gamochaeta stachydifolia* is closely similar to *G. valparadisea*. Both species have broadly obovate leaves which are densely white-lanate and capitula arranged in spikes, only interrupted at base. However, *G. stachydifolia*-*V*-be differentiated by its stems which are densely leafy at base and more loosely on the upper part (vs. uniformly leafy stems in *G. valparadisea*).

OBSERVATION. According to the protologue, *Gnaphalium agreste* Phil. was based on the specimen 'Habitat in provincias Colchagua et Rengo'. It was characterized by its 3-5 unbranched stems, 10-12 cm high, with spatulate white-lanate leaves, and capitula in dense spikes. We propose to place *Gnaphalium agreste* into synonymy with *Gamochaeta stachydifolia* because there is no diagnostic character that differentiates the former from the latter.

ADDITIONAL MATERIAL EXAMINED. CHILE. Región del Biobío. Prov. Concepción: Concepción, without date, Barros 2905 (CONC). Región de Los Ríos. Prov. Valdivia: Mehuín, 20 m, 24-XI-1974, Montero 10950 (CONC).

22. *Gamochaeta subfalcata* (Cabrera) Cabrera, Bol. Soc. Argent. Bot. 9: 383. 1961. \equiv *Gnaphalium subfalcatum* Cabrera, Revista Mus. La Plata 4, Secc. Bot. 17: 174. 1941. TYPE. Argentina. [Prov. Buenos Aires. Pdo. Avellaneda:] Isla Maciel, 12-X-1929, *A. L. Cabrera 944* (holotype, LP 000244! ex Herb. Cabrera). Fig. 26.

Perennial herbs, 15-35 cm tall, multistemmed, stems ascending to erect, unbranched, more densely leafy at base, remote upwards, whitish-lanate. Leaves 15-50 \times 3-5(12) mm, linear-obovate, attenuate at base, apex obtuse, mucronate; concolorous, whitish-woolly (whitish-lanuginose) on both surfaces. Capitula many, in clusters subtended by linear-obovate leaves, arranged in dense continuous spikes, interrupted at base. Involucre campanulate, 3-3.5 \times 2-2.5 mm. Phyllaries 3-4-seriate, lamina light-brown at apex; outer phyllaries 1.5-2 \times 1 mm, ovate, apex acute, lanuginose; inner phyllaries ca. 3.5 \times 0.5 mm, oblong-lanceolate, apex subobtusate to rounded, glabrous. Pistillate florets ca. 100, corolla white-yellowish, purplish at apex, filiform, ca. 2 mm long. Bisexual florets 3-4, corolla white-yellowish, purplish at apex, tubular, ca. 2 mm long. Achenes 0.4-0.6 mm long., pilose, with short globose duplex hairs. Pappus bristles ca. 2 mm long.

PHENOLOGY. Flowering from October to January.

DISTRIBUTION AND HABITAT. New Zealand, Brazil (São Paulo, Rio Grande do Sul, Santa Catarina), Uruguay, north and central Argentina (Buenos Aires, Catamarca, Chaco, Córdoba, Corrientes, Entre Ríos, Formosa, Jujuy, La Pampa, Salta, San Juan, San Luis, Santa Fe, Santiago del Estero, Tucumán), and Chile (Coquimbo, Valparaíso, Metropolitana, Maule, Biobío), growing on grassland, sandy soils, damp roadsides, and along railways, from sea level to 4100 m.

RELATIONSHIPS. *Gamochaeta subfalcata* is closely related to *G. deserticola* in habit, leaves, and inflorescence. However, plants of *G. subfalcata* are taller, 15-35 cm tall (vs. up to 10 cm in *G. deserticola*). *Gamochaeta subfalcata* also resembles *G.*

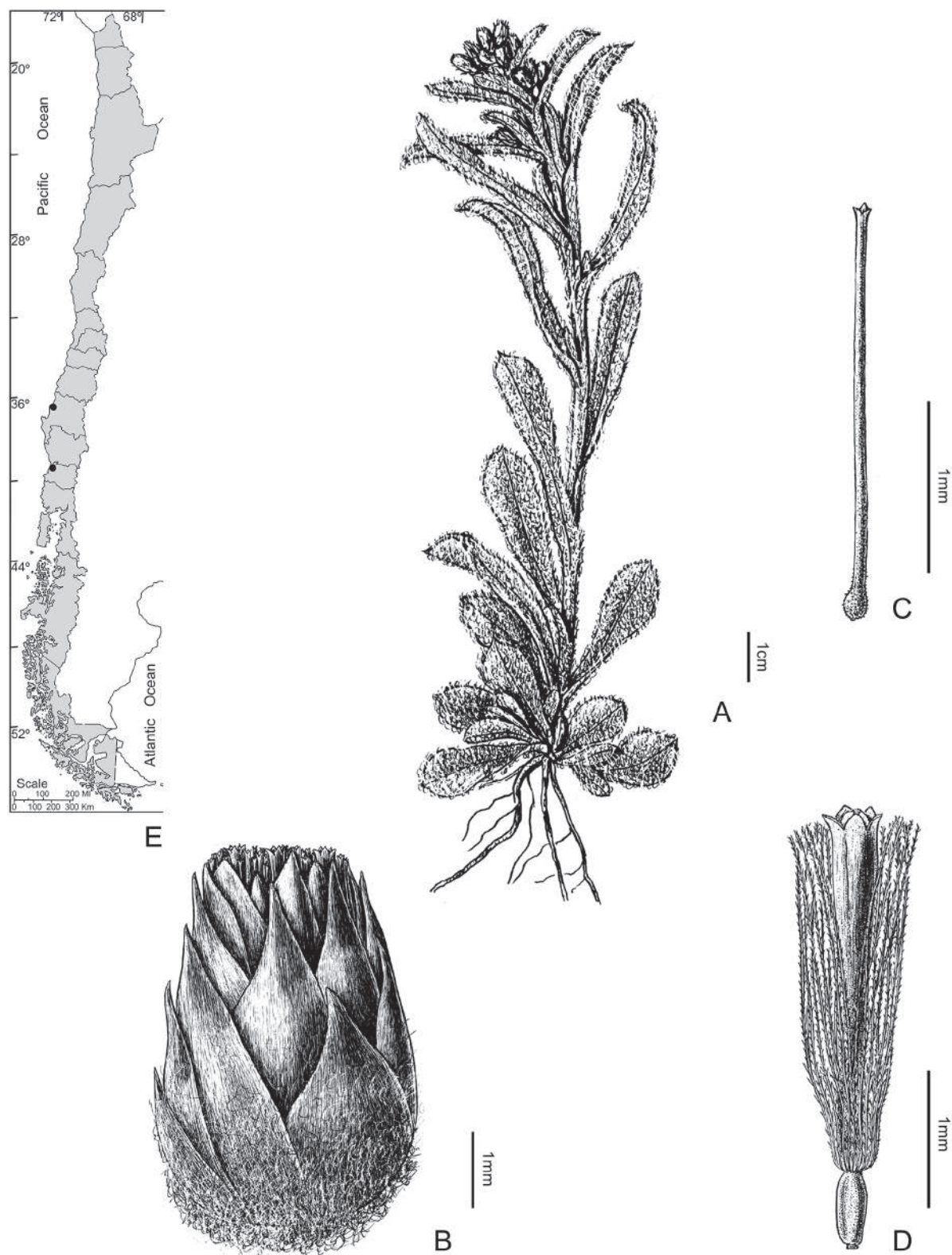


FIGURE 25. *Gamochaeta stachydifolia*. A, Habit; B, Capitulum; C, Corolla of the pistillate floret; D, Bisexual floret; E, Distribution [A-D, from *Fl. Patagónica* 8(7): 124. 1971].

FIGURA 25. *Gamochaeta stachydifolia*. A, Planta; B, Capitulo; C, Corola de la flor pistilada; D, Flor bissexual; E, Distribución [A-D, tomado de *Fl. Patagónica* 8(7): 124. 1971].

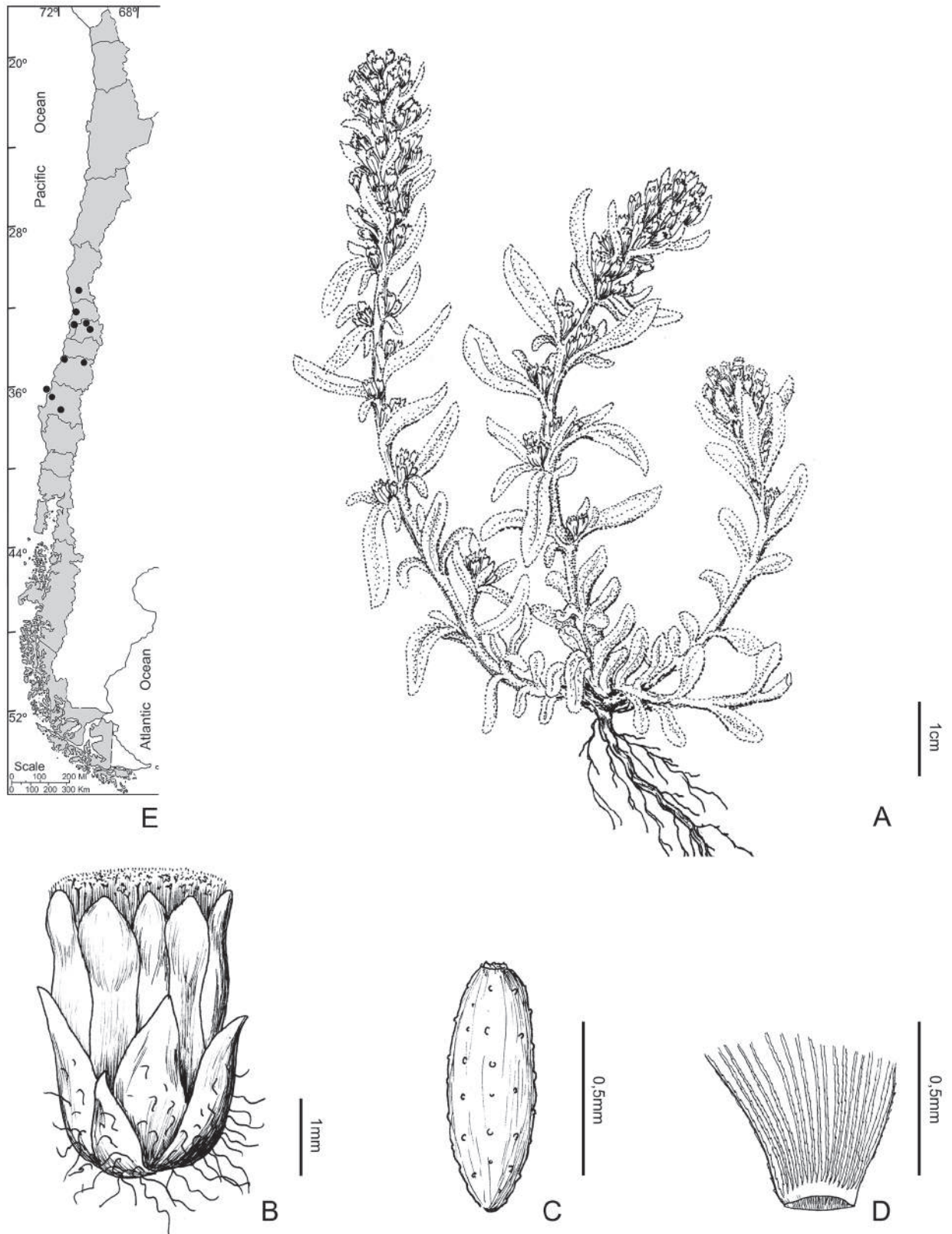


FIGURE 26. *Gamochaeta subfalcata*. A, Habit; B, Capitulum; C, Achene; D, Pappus; E, Distribution [A-D, from *Fl. Jujuy* 13(10): 306. 1978].

FIGURA 26. *Gamochaeta subfalcata*. A, Planta; B, Capitulo; C, Aquenio; D, Pappus; E, Distribución [A-D, tomado de *Fl. Jujuy* 13(10): 306. 1978].

filaginea in its robust habit, ascending stems and concolorous or slightly discolorous obovate to linear-obovate leaves. However, *G. subfalcata*-V-be mainly differentiated by its numerous capitula arranged in dense spikes (vs. few capitula in lax spikes, often branched, in *G. filaginea*).

ADDITIONAL MATERIAL EXAMINED. CHILE. Región Coquimbo. Prov. Choapa: Illapel, Hacienda "Las Cañas", 31°43'S-71°17'W, 12-X-1953, Jiles 2405 (CONC). Región de Valparaíso. Prov. Petorca: Zapallar N between Papudo and Zapallar along coastal road, 32°31'28"S-71°28'19"W, 30 m, 10-XI-2006, Tepe & al. 1932 (CONC). Prov. Valparaíso: Valparaíso, Quinteros, 9-XI-1942, Junge 6854 (CONC). Casablanca, 33°19'S-71°24'W, 18-X-2004, Rojas SAGH-1913 (CONC). Región Metropolitana de Santiago. Prov. Chacabuco: altos de Chicauma, 33°12'S-70°56'W, 900 m, 21-X-2006, García 3008 (CONC). Prov. Santiago: Lo Prado, 400 m, 13-X-1951, Levi 519 (CONC). Santiago, Rocas de Santo Domingo, 20-X-1950, Pfister & Ricardi 9764 (CONC). Región del Maule. Prov. Curicó: Los Queñes, 9-I-1939, Barros 2271 (LP). Llico, sector La Punta 34°47'S-72°03'W, 24-X-2001, Peñailillo & Rojas s.n. (CONC 155218). Región del Biobío. Prov. Bío-Bío: Los Ángeles, Abanico, 1200 m, 28-XI-1959, Montero 6089 (CONC). Prov. Concepción: Concepción, 8-X-1928, Barros 2902 (CONC). Talcahuano, Rocoto, La Puntilla, 22-X-1970, Inostroza & Palma s.n. (CONC 35142). Tomé, El Fuerte, 65 m, 2-XI-1935, Montero 2597 (CONC). Concepción, boca del Bío-Bío, lado N, -XI-1935, Pfister 3558 (CONC). Isla Quiriquina, 7-XI-1948, Pfister 8643 (CONC).

23. *Gamochaeta valparadisea* (Phil.) Anderb., Opera Bot. 104: 157. 1991. ≡ *Gnaphalium valparadiseum* Phil., Linnaea 29: 5. 1858. TYPE. Chile. Valparaíso, -XI-1854, *Germain* s.n. (holotype, SGO 064505!; isotype LP 002551!). Fig. 27.

Perennial herbs, 10-15 cm tall, multistemmed, stems ascending, unbranched or branched at the upper part, uniformly leafy, densely whitish-woolly. Leaves 12-20 mm × 6-8 mm, widely obovate, attenuate at base, apex rounded to obtuse, mucronate, margins flat; concolorous, with adpressed white tomentum on both surfaces; caulinar leaves gradually diminishing in size upwards. Capitula many, in clusters in the axils of the upper leaves, arranged in continuous elongated spikes, interrupted at base. Involucre narrowly campanulate, 4-5 × 2.5-3 mm. Phyllaries 3-4-seriate, lamina reddish to purple at apex; outer phyllaries ca. 3 × 1.5 mm, ovate, apex acute-acuminate, lanuginose; inner phyllaries 4.5-5 × 0.7-0.8 mm, oblong, apex acute, glabrous. Pistillate florets ca. 50, corolla white-yellowish, purplish at apex, filiform, ca. 2.5 mm long. Bisexual florets ca. 4, corolla white-yellowish, purplish at apex, tubular, ca. 2.5 mm long. Achenes ca. 0.5 mm long, pilose, with short globose duplex hairs. Pappus bristles ca. 3 mm long.

PHENOLOGY. Flowering from September to February.

DISTRIBUTION. *Gamochaeta valparadisea* is endemic to central Chile (Coquimbo, Valparaíso, Metropolitana, Maule, Biobío) from sea level to 500 m (Polpaico).

RELATIONSHIPS. *Gamochaeta valparadisea* is closely similar to *G. stachydifolia* in habit, leaves, and inflorescence. However, *G. valparadisea*-V-be differentiated by its uniformly leafy stems (vs. densely leafy at base and more loosely at the upper part in *G. stachydifolia*).

ADDITIONAL MATERIAL EXAMINED. CHILE. Región de Coquimbo. Prov. Limarí: Ovalle, Tongoy, 20 m, 8-IX-1948, Jiles 767 (CONC). Prov. Choapa: Illapel, Huentelauquén, 31°35'S-71°32'W, 60 m, 20-X-1955, Jiles 2815 (CONC). Región de Valparaíso. Prov. San Antonio: San Antonio, 18 m, 16-X-1927, Montero 236 (CONC). Cartagena, -X-1957, Navas 2273 (CONC). Prov. Valparaíso: Quintero, 35 m, XI-1952, Gunckel 24331 (CONC). Quintero, 20 m, 14-22-II-1953, Levi 1492 (CONC). Región Metropolitana de Santiago. Prov. Chacabuco: Polpaico, 26-IX-1947, Barros 7318 (LP). Región del Maule. Prov. Curicó: 8 km al N de la Reserva Nacional Laguna Torca, 34°42'S-72°02'W, 20 m, 13-XII-2000, Finot & Leppe 83 (CONC). Región del Biobío. Prov. Concepción: Hualpén, 10-XII-1937, Barros 2286 (LP).

24. *Gamochaeta villarroelii* (Phil.) Cabrera, Bol. Soc. Argent. Bot. 9: 383. 1961. ≡ *Gnaphalium villarroelii* Phil., Anales Univ. Chile 90: 9. 1895. TYPE. Chile. Santiago. Cajón de San Francisco, -III-1878, *A. Villarroel* s.n. (lectotype, designated here, SGO 064520!; isolectotypes, LP 001947!, LP001948!, LP001949!, SGO 044963!). Fig. 28.

Perennial herbs, 15-20 cm tall, multistemmed, stems ascending to erect, slender, unbranched, uniformly leafy, whitish-lanuginose to grabrescent. Leaves 1-2.2 cm × 3.5-7, oblong-obovate, apex obtuse to subobtuse, mucronate, attenuate at base; concolorous to slightly discolorous, membranous, deep green on upper surface and whitish-green above. Capitula few, in clusters in the axils of the upper leaves. Involucre narrowly campanulate, 3-4 × 2-3 mm. Phyllaries 4-seriate, lamina light brown at apex; outer phyllaries ca. 2.5 × 1.5 mm, ovate, apex acute-acuminate, lanuginose; inner phyllaries ca. 3 × 0.7 mm, oblong-elliptic, apex acute, glabrous. Pistillate florets ca. 38, corolla white-yellowish, purplish at apex, filiform, ca. 2.2 mm long. Bisexual florets ca. 2, corolla white-yellowish, purplish at apex, tubular, ca. 2.5 mm long. Achenes ca. 0.5 mm long, glabrous. Pappus bristles ca. 2.2 mm long.

PHENOLOGY. Flowering from October to February.

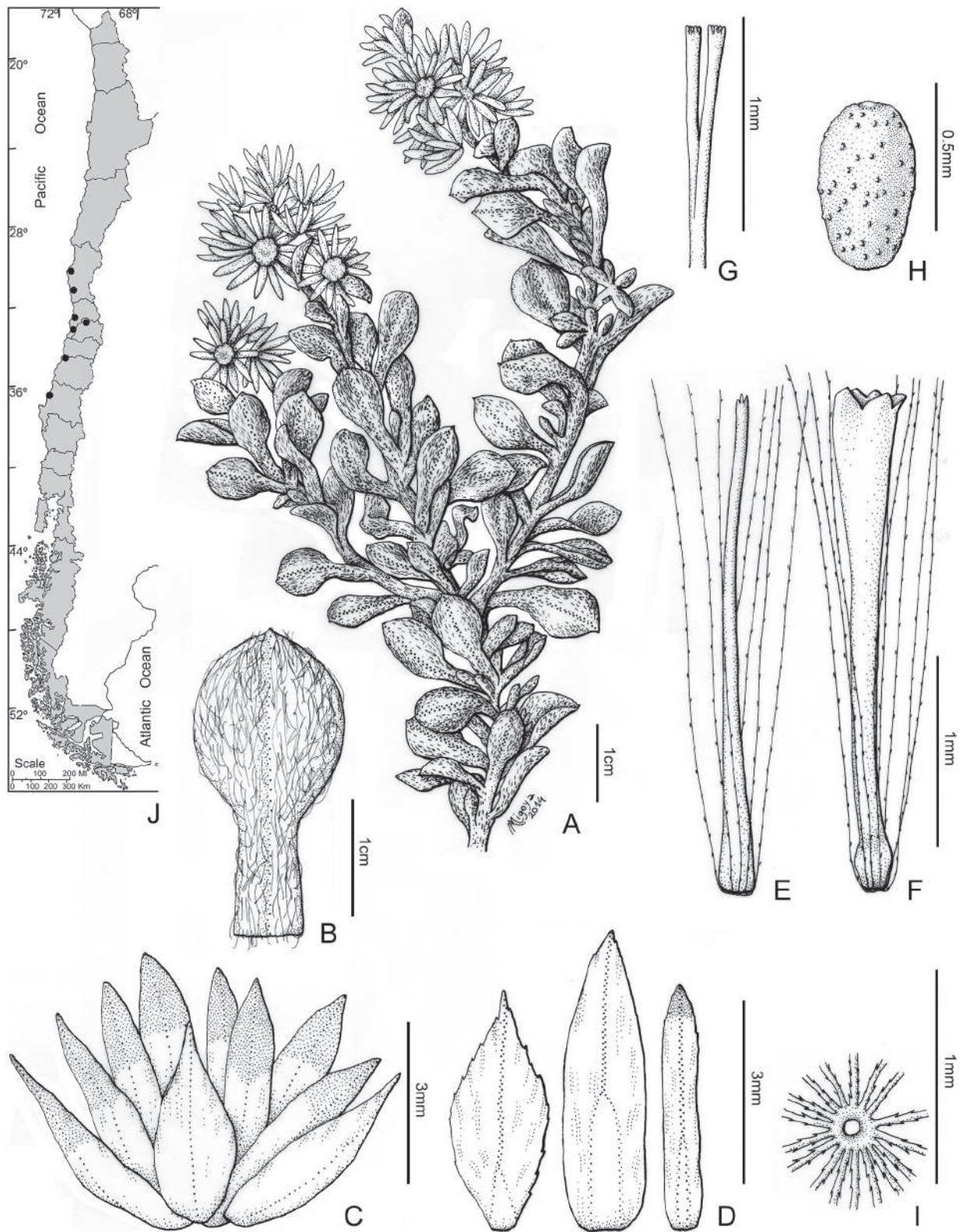


FIGURE 27. *Gamochaeta valparadisea*. A, Habit; B, Leaf; C, Involucre; D, Phyllaries; E, Pistillate floret without ovary; F, Bisexual floret without ovary; G, Style branches; H, Achene; I, Pappus; J, Distribution [A-I, Germain in 1854, LP].

FIGURA 27. *Gamochaeta valparadisea*. A, Planta; B, Hoja; C, Involucro; D, Filarios; E, Flor pistilada sin ovario; F, Flor bisexual sin ovario; G, Ramas del estilo; H, Aquenio; I, Pappus; J, Distribución [A-I, Germain en 1854, LP].

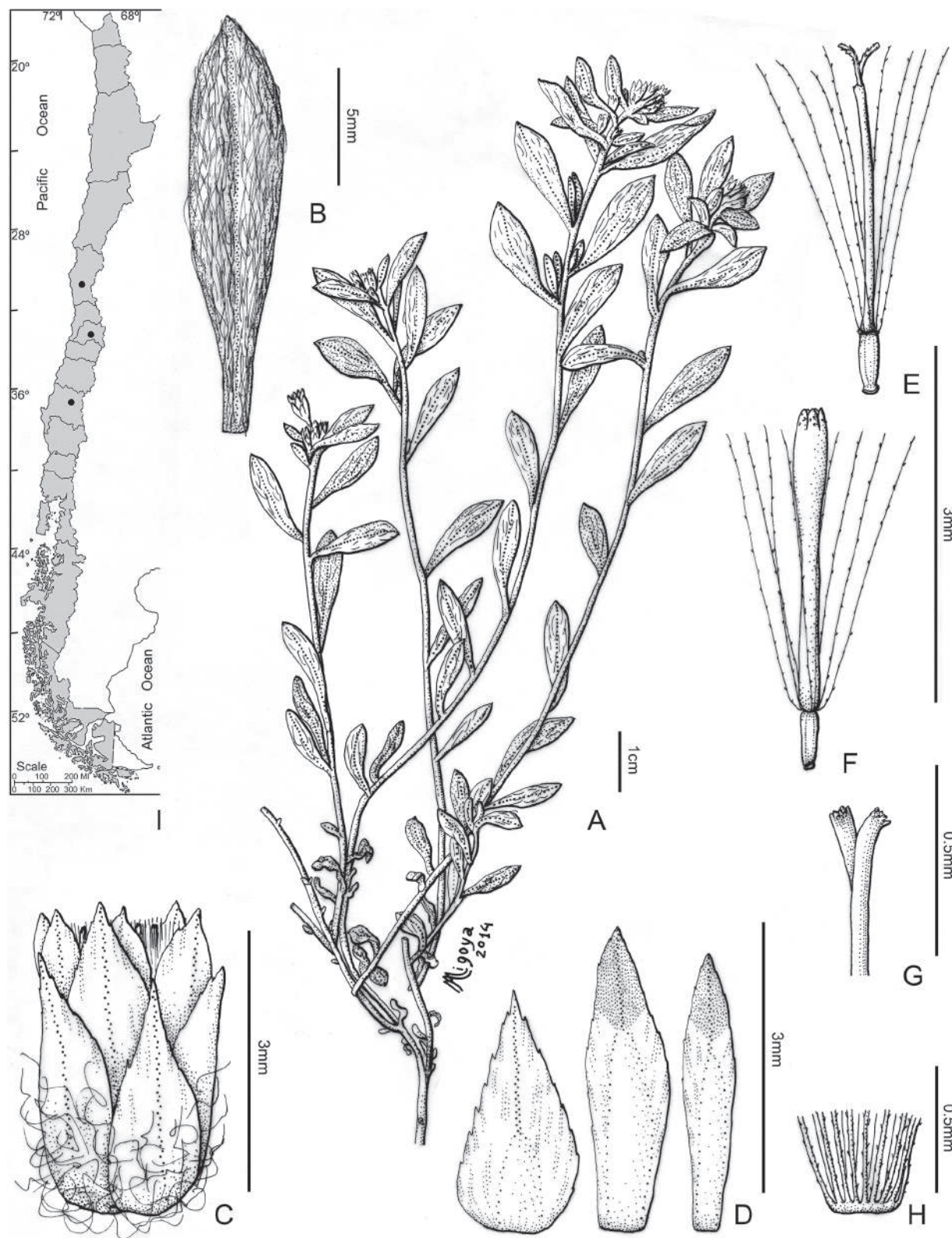


FIGURE 28. *Gamochoaeta villarroelii*. A, Habit; B, Leaf; C, Capitulum; D, Phyllaries; E, Pistillate floret; F, Bisexual floret; G, Style branches; H, Pappus; I, Distribution [A-H, Villarroel in 1878, LP].

FIGURA 28. *Gamochoaeta villarroelii*. A, Planta; B, Hoja; C, Capítulo; D, Filarios; E, Flor pistilada; F, Flor bisexual; G, Ramas del estilo; H, Papus; I, Distribución [A-H, Villarroel en 1878, LP].

DISTRIBUTION AND HABITAT. *Gamochaeta villarroelii* is endemic to central Chile (Coquimbo, Metropolitana, Biobío), growing from 750-1200 m.

RELATIONSHIPS. *Gamochaeta villarroelii* appears to occupy an isolated position in the genus by its distinctive weak stems, membranous leaves, and glabrous achenes.

ADDITIONAL MATERIAL EXAMINED. CHILE. Región de Coquimbo. Prov. Coquimbo: Combarbalá (Ramadilla), 1200 m., 9-X-1971, Jiles 5671 (CONC). Región Metropolitana de Santiago. Prov. Santiago: Co. San Cristóbal, 750 m, 11-X-1950, Gunkel 26381 (CONC). Santiago, Co. San Cristóbal, 10-X-1951, Gunckel 46248 (CONC). Santiago, Q. de Macul, 1200 m, 18-X-1942, Pisano & Baraona 1578 (CONC). Región del Biobío. Prov. Ñuble: Fundo Atacalco, 25-II-1944, Pfister 1004 (CONC).

DUBIOUS SPECIES IN CHILE

Gamochaeta sphacelata (Kunth) Cabrera, Bol. Soc. Argent. Bot. 9: 380. 1961. \equiv *Gnaphalium sphacelatum* Kunth, Nov. Gen. Sp. Pl. (folio ed.) 4: 67. 1818. TYPE. Mexico. 'Crescit inter urbem Mexici et pagum Huehuetoque', *F. W. H. A. Humboldt & A. J. A. Bonpland s.n.* (holotype, P 00322316!).

Rémy (1849) mentioned that *Gnaphalium sphacelatum* Kunth occurs in 'cerros de la Serena' (Chile). According to this author, *G. sphacelatum* has oblong-spathulate leaves, 8-16 \times 2-4 mm. In contrast, the protologue of *G. sphacelatum* reads 'Folia ... linearis ... sesqui- aut bipollicaria, lineam aut sesquilineam lata' (= 1.2-5 cm \times 1-2 mm). Unfortunately, there was no material available from Chile with these characteristics. For this reason, until any materials can be provided, the mention of *Gamochaeta sphacelata* (Kunth) Cabrera from Chile is uncertain.



FIGURE 29. A, *Gamochaeta alpina* (photo M. C. Baeza); B, *Gamochaeta nivalis* (photo E. Urtubey); C, *Gamochaeta procumbens* (photo M. C. Baeza); D, *Gamochaeta spiciformis* (photo D. Gutiérrez).

FIGURA 29. A, *Gamochaeta alpina* (foto M. C. Baeza); B, *Gamochaeta nivalis* (foto E. Urtubey); C, *Gamochaeta procumbens* (foto M. C. Baeza); D, *Gamochaeta spiciformis* (foto D. Gutiérrez).

NAMES OF DUBIOUS IDENTITY

Gnaphalium spicatum Lam. var. *hololeuca* Phil., Anales Univ. Chile 90: 21, 1895. Hacienda Renaico, R. A. *Philippi s.n.* TYPE. Not located.

According to the protologue *Gnaphalium spicatum* var. *hololeuca* was based on specimens from Chile, "Renaico" (R.A. *Philippi s.n.*) and characterized by its concolorous leaves, white on both surfaces. Two specimens were located at SGO (SGO 44918 and SGO 076310) from Renaico. Both have strongly discolorous leaves, a fact that is in contradiction with the protologue. Since no other original material was found, the identity of *G. spicatum* var. *hololeuca* remains unclear.

ACKNOWLEDGEMENTS

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INDEX OF SCIENTIFIC NAMES

Synonyms are in *italics*, accepted names in **bold face**. Figures in underlined numbers and description of the species in **bold** numbers. Sinónimos en *itálicas*, nombres aceptados en **negritas**. Figuras en números subrayados y descripciones de las especies en números en **negritas**.

Gamochaeta Wedd. 296
Gamochaeta aliena (Hook. & Arn.) Cabrera **298, 299, 312, 316**
Gamochaeta alpina (Poepp.) S.E. Freire & Anderb. **298, 300**
Gamochaeta americana (Mill.) Wedd. 296, **301, 304, 331**
Gamochaeta andina (Phil.) Cabrera **303, 305**
Gamochaeta axillaris (J. Rémy) Cabrera **306, 308**
Gamochaeta bellidifolia 316
Gamochaeta berteroaana (DC.) Cabrera 312
Gamochaeta capitata Wedd. 296
Gamochaeta chamissonis (DC.) Cabrera **306, 307, 309, 317**

Gamochaeta coarctata (Wild.) Kerguélen 301
Gamochaeta depilata (Phil.) Cabrera **307, 310, 311**
Gamochaeta deserticola Cabrera **311, 313, 334**
Gamochaeta erythraetis 311
Gamochaeta falcata (Lam.) Cabrera 298, **312, 314**
Gamochaeta fernandeziana (Phil.) Anderb. 306
Gamochaeta filaginea (DC.) Cabrera 298, 307, **312, 315, 316, 318, 337**
Gamochaeta foliosa (Phil.) Anderb. 331
Gamochaeta guatemalensis (Gand.) Cabrera 301

- Gamochaeta humilis*** Wedd. **317**, [319](#)
Gamochaeta irazuensis G.L. Nesom 301
Gamochaeta julietii (Phil.) Anderb. 306
Gamochaeta longipedicellata Cabrera **317**, 318, [320](#)
Gamochaeta monticola (Phil. ex Reiche) Cabrera 323
Gamochaeta munnozii Cabrera 325
Gamochaeta neuquensis Cabrera **318**, [321](#)
Gamochaeta nivalis Cabrera 311, **318**, [322](#), 324, 325
Gamochaeta oligantha (Phil.) L.E. Navas 318, **323**, [326](#)
Gamochaeta pensylvanica 306
Gamochaeta peteroana (Phil.) Anderb. 331
Gamochaeta polybotrya (Phil.) Cabrera 306
Gamochaeta procumbens (Phil.) Cabrera **324**, [327](#)
Gamochaeta ramosa (Phil.) S.E. Freire, N. Bayón & C. Baeza **324**, [328](#)
Gamochaeta serpyllifolia Wedd. 298, 318, **325**, [329](#), 332
Gamochaeta serranoi (Phil.) Cabrera 306
Gamochaeta simplicicaulis (Willd. ex Spreng.) Cabrera 301, [330](#), **331**,
Gamochaeta sphacelata (Kunth) Cabrera 340
Gamochaeta spicata Cabrera 301
Gamochaeta spiciformis (Sch. Bip.) Cabrera **331**, 332, [333](#)
Gamochaeta spiciformis (Sch. Bip.) Cabrera var. *subaffinis* Cabrera 318
Gamochaeta stachydifolia (Lam.) Cabrera **334**, [335](#), 337
Gamochaeta subfalcata (Cabrera) Cabrera 311, 312, 316, **334**, [336](#), 337
Gamochaeta suffruticosa (Phil.) Anderb. 306
Gamochaeta valparadisea (Phil.) Anderb. **337**, [338](#)
Gamochaeta villarroelii (Phil.) Cabrera **337**, [339](#), 340
Gamochaetopsis Anderb. & S.E. Freire 296
Gamochaetopsis alpina (Poepp.) Anderb. & S.E. Freire 296, 298
Gnaphalium affine D'Urv. var. *medium* Speg. 331
Gnaphalium affine D'Urv. var. *pusillum* Speg. 318, 323
Gnaphalium agreste Phil. 334
Gnaphalium alienum Hook. & Arn. 298
Gnaphalium americanum Mill. 296, 301
Gnaphalium andinum Phil. 303
Gnaphalium axillaris J. Rémy 306
Gnaphalium bellidifolium Phil. 312
Gnaphalium berteroaenum DC. 312, 316
Gnaphalium chamissonis DC. 306
Gnaphalium chilense Hook. et Arn. 312
Gnaphalium chilense Spreng. 312
Gnaphalium coarctatum Willd. 301
Gnaphalium consanguineum Gaudich. 301
Gnaphalium depilatum Phil. 307
Gnaphalium falcatum Lam. 312
Gnaphalium fernandezianum Phil. 306
Gnaphalium filagineum DC. 312, 316
Gnaphalium foliosum Phil. 331, 332
Gnaphalium guatemalense Gand. 301
Gnaphalium julietii Phil. 306
Gnaphalium L. sect. *Gamochaeta* (Wedd.) Benth. & Hook. f. 296
Gnaphalium L. sect. *Gamochaeta* (Wedd.) O. Hoffm. 296
Gnaphalium L. subgen. *Gamochaeta* (Wedd.) Gren. 296
Gnaphalium monticola Phil. ex Reiche 323
Gnaphalium mucronatum Phil. 332
Gnaphalium nivale Phil. 318
Gnaphalium obscurum Phil. 307
Gnaphalium oliganthum Phil. 323
Gnaphalium peteroanum Phil. 331, 332
Gnaphalium petraeum Phil. 303
Gnaphalium polybotryum Phil. 306
Gnaphalium procumbens Phil. 324
Gnaphalium purpureum L. var. *americanum* (Mill.) Klatt 301
Gnaphalium purpureum L. var. *chamissonis* (DC.) Klatt 306
Gnaphalium purpureum L. var. *falcatum* (Lam.) Torr. & Gray 312
Gnaphalium purpureum L. var. *julietii* (Phil.) Reiche 306
Gnaphalium purpureum L. var. *mucronatum* (Phil.) Skotts. 332
Gnaphalium purpureum L. var. *simplicicaule* (Willd. ex Spreng.) Klatt 331
Gnaphalium purpureum L. var. *spicatum* Baker 301
Gnaphalium purpureum L. var. *spicatum* Klatt 301
Gnaphalium purpureum L. var. *stachydifolium* (Lam.) Baker 334
Gnaphalium ramosum Phil. 324
Gnaphalium serpyllifolium J. Rémy 325
Gnaphalium serranoi Phil. 306
Gnaphalium simplicicaule Willd. ex Spreng. 331
Gnaphalium sphacelatum Kunth 340
Gnaphalium spicatum Lam. 301
Gnaphalium spicatum Mill. var. *chonoticum* Hook.f. 301
Gnaphalium spicatum Lam. var. *hololeuca* Phil. 341
Gnaphalium spiciforme Sch. Bip. 331
Gnaphalium stachydifolium Lam. var. *berteroaenum* (DC.) DC. 312
Gnaphalium stachydifolium Lam. var. *falcatum* (Lam.) Klatt 312
Gnaphalium stachydifolium Lam. 334
Gnaphalium subfalcatum Cabrera 312, 334
Gnaphalium suffruticosum Phil. 306, 307
Gnaphalium valparadiseum Phil. 334, 337
Gnaphalium villarroelii Phil. 337
Laennecia alpina Poepp. 296, 298
Lucilia alpina (Poepp.) Cabrera 298
Stuckertiella Beauverd 296
Stuckertiella capitata (Wedd.) Beauverd 296

INDEX TO NUMBERED COLLECTIONS EXAMINED

- Acevedo s.n.*-XI-1949 (oligantha). *Aedo* 7462 (spiciformis).
Arancio 14867 (oligantha). *Aravena* 342 (americana). *Aravena & al.* 925 (spiciformis). *Arriaga* 8106 (filaginea). *Arroyo* 850023 (nivalis). *Arroyo & Humaña* 992233 (oligantha). *Arroyo & Pliscoff* 203010 (oligantha). *Arroyo & al.* 92-73, 92-118 (nivalis). *Arroyo & al.* 92-394 (alpina). *Arroyo & al.* 201106 (procumbens). *Artigas* 19555 (filaginea). *Avendaño* 0-189 (aliena)
Baeza 4350 A, 4351 (chamissonis). *Baeza* 4356 (procumbens).
Baeza 4357 (serpyllifolia). *Baeza & Kottirsch* 777, 1116 (simplicicaulis). *Baeza & Kottirsch* 1262 (falcata). *Baeza & Kottirsch* 1342 (simplicicaulis). *Baeza & Kottirsch* 1559, 1640 (filaginea). *Baeza & López* 1812, 2783 (americana). *Baeza & al.* 3623 (americana). *Baeza & al.* 3211 (serpyllifolia). *Barnier* 39, 261, 381, 415 (filaginea). *Barrientos* 25770, s.n.-I-1951 (americana). *Barrientos s.n.*-II-1954 (spiciformis). *Barrientos s.n.* 15-I-1956 (filaginea). *Barros* 2, 4 (oligantha). *Barros* 13

(depilata). *Barros 14* (serpyllifolia). *Barros 16* (oligantha). *Barros 37* (chamissonis). *Barros 41* (serpyllifolia). *Barros 48* (filaginea); *Barros 49* (aliena). *Barros 188* (filaginea). *Barros 395* (simplicicaulis). *Barros 894, 902, 1032* (americana). *Barros 2086* (chamissonis). *Barros 2271* (subfalcata). *Barros 2278* (filaginea). *Barros 2286* (valparadisea). *Barros 2287* (serpyllifolia). *Barros 2289* (ramosa). *Barros 2297* (depilata). *Barros 2298* (oligantha). *Barros 2308* (filaginea). *Barros 2326* (oligantha). *Barros 2329* (depilata). *Barros 2902* (subfalcata). *Barros 2905* (stachydifolia). *Barros 2911, 3138, 3142* (deserticola). *Barros 3241* (chamissonis). *Barros 3298* (aliena). *Barros 3312* (americana). *Barros 3322, 3348* (oligantha). *Barros 3364* (aliena). *Barros 3468* (simplicicaulis). *Barros 4316* (spiciformis). *Barros 4334* (americana). *Barros 7313, 7316* (oligantha). *Barros 7318* (valparadisea). *Barros 7319* (oligantha). *Barros 7324* (depilata). *Barros 7330, 7331* (procumbens). *Barros 10360* (americana). *Barros 24042, 24695* (americana). *Barros s.n.-I-1926* (filaginea). *Barros s.n. 4-XI-1925* (simplicicaulis). *Barros s.n.-XI-1930* (americana). *Barros s.n.-II-1946* (aliena). *Barros s.n. -Herb. Gunckel 18648* (aliena). *Barros s.n. -Herb. Gunckel 23185* (nivalis). *Behn 110* (spiciformis). *Behn 20868* (filaginea). *Behn s.n.-I-1933* (serpyllifolia). *Behn s.n.-I-1936* (nivalis). *Behn s.n. 21-XII-1947* (americana). *Behn s.n. 28-XI-1937* (americana). *Bliss 712* (deserticola). *Bliss 724* (deserticola). *Von Bohlen & Cavieres 92-361* (spiciformis). *Bravo 193* (oligantha). *Bravo 201* (ramosa). *Bravo 401* (filaginea). *Bravo 402* (americana).

Cabrera 3590, 3648 (procumbens). *Cabrera 12525* (filaginea). *Carrasco 332* (americana). *Castillo 18647* (simplicicaulis). *Cea & Ugarte s.n. 16-XII-1967* (americana). *Cekalovic 75* (spiciformis).

Deltor 2101 (depilata). *DeVore 1337* (nivalis). *Díaz s.n.-XII-1936* (spiciformis). *Dollenz 606* (spiciformis). *Domínguez 984* (spiciformis). *Durán 24291* (filaginea). *Durán s.n. 3-XI-1957* (americana).

Escuela Agrícola "El Vergel" 53 (americana). *Eyerdam 10341* (oligantha).

Figuroa 5 (filaginea). *Finger & al. 49* (deserticola). *Finot 593* (chamissonis). *Finot 1412* (filaginea). *Finot & Leppe 83* (valparadisea). *Finot & López 1620, 2034* (chamissonis). *Finot & López 1962* (serpyllifolia).

Gajardo & González s.n. 7-XI-1972 (filaginea). *Garaventa 369* (ramosa). *García 89* (spiciformis). *García 652* (ramosa). *García 3008* (subfalcata). *García 3921* (spiciformis). *García & Knees 3961* (depilata). *Gardner 3593* (americana). *Gardner 6942* (spiciformis). *Gardner & Knees 6872* (americana). *Goodall 1760* (spiciformis). *Grandjot 51-C* (axillaris). *Gunckel 5011* (americana). *Gunckel 12410* (falcata). *Gunckel 15751* (filaginea). *Gunckel 16519* (depilata). *Gunckel 22386, 22793* (americana). *Gunckel 23441, 23803* (spiciformis). *Gunckel 23902* (spiciformis). *Gunckel 24331* (valparadisea). *Gunckel 24664* (americana). *Gunckel 26379* (filaginea). *Gunckel 26381* (villarroelii). *Gunckel 27398* (deserticola). *Gunckel 36656* (americana). *Gunckel 37450, 37992* (filaginea). *Gunckel 38815, 39459* (americana). *Gunckel 39517, 40586* (spiciformis). *Gunckel 41442* (americana). *Gunckel 42415* (filaginea). *Gunckel 42828* (americana). *Gunckel 46248* (villarroelii). *Gunckel 50722*

(americana). *Gunckel 71253* (alpina). *Gunckel s.n. 21-X-1950, s.n. 8-XII-1950* (spiciformis). *Gunckel s.n. 14-XI-1951* (americana). *Gunckel s.n.-XI-1953* (spiciformis).

Hernández 20728 (serpyllifolia). *Hollermayer 18b* (americana). *Hollermayer 496 a* (spiciformis). *Hollermayer 496* (depilata). *Hollermayer 646a* (americana). *Hollermayer 683* (spiciformis). *Hollermayer 816* (simplicicaulis).

Ibáñez & Kuschel s.n. 15-IX-1947 (oligantha). *Inostroza & Palma s.n. 22-X-1970* (subfalcata).

Jaffuel 893 (filaginea). *Jaffuel 904-03165* (deserticola). *Jaffuel s.n.-IX-1914* (americana). *Jiles 767* (valparadisea). *Jiles 911* (spiciformis). *Jiles 1778-a* (filaginea). *Jiles 2405* (subfalcata). *Jiles 2815* (valparadisea). *Jiles 3174* (deserticola). *Jiles 5107* (chamissonis). *Jiles 5671* (villarroelii). *Joseph 1442* (filaginea). *Joseph 2632* (falcata). *Joseph 4329* (oligantha). *Joseph 5849* (depilata). *Junge 1719* (americana). *Junge 5164, 5188, 5554* (filaginea). *Junge 5730* (chamissonis). *Junge 5839* (filaginea). *Junge 6854* (subfalcata). *Junge s.n. 27-II-1935, s.n. 2-XI-1935, s.n. 21-XI-1936* (americana). *Junge s.n. 12-XII-1936* (simplicicaulis). *Junge s.n. 9-III-1940* (simplicicaulis).

Klenner s.n. 20-I-1952 (americana).

Lammers & al. 7782 (filaginea). *Ledezma 677* (depilata). *Leuenberger & al. 4035* (chamissonis). *Levi 179* (spiciformis). *Levi 240* (deserticola). *Levi 519* (subfalcata). *Levi 654* (simplicicaulis). *Levi 1492* (valparadisea). *Levi 3163* (deserticola). *Levi s.n.-X-1956* (ramosa). *López & al. 2176* (americana). *Luebert 5522* (chamissonis). *Luebert & Teillier 2290* (andina).

Magens s.n. 18-III-1955 (americana). *Mahu 5617* (filaginea). *Mahu 7675, 9871* (deserticola). *Mahu 10203* (oligantha). *Marticoarena 560* (chamissonis). *Marticoarena 1008* (americana). *Marticoarena & Furet 10* (filaginea). *Marticoarena & Jiménez 181* (simplicicaulis). *Marticoarena & Jiménez 491* (nivalis). *Marticoarena & al. 52, 112* (americana). *Marticoarena & al. 176* (spiciformis). *Marticoarena & al. 531* (filaginea). *Marticoarena & al. 657* (spiciformis). *Marticoarena & al. 969, 1267* (americana). *Marticoarena & al. 1415* (deserticola). *Marticoarena & al. 1451, 1968, 1989, 2011* (americana). *Martínez 52555* (americana). *Martínez s.n.-I-1973* (chamissonis). *Matthei s.n. 2-II-1959* (americana). *Matthei & Quezada 1053* (americana). *Meza 994* (spiciformis). *Meza & Valenzuela 5075* (americana). *Mihoc 36, 66* (chamissonis). *Mihoc 3146* (filaginea). *Mihoc & al. 3435* (americana). *Mihoc & al. 4092* (depilata). *Mihoc & al. 4332, 4336* (serpyllifolia), *4341* (nivalis). *Montero 236* (valparadisea). *Montero 1129* (americana). *Montero 1361, 1428* (filaginea). *Montero 1432* (neuquensis). *Montero 1851* (deserticola). *Montero 2197* (filaginea). *Montero 2247* (americana). *Montero 2597* (subfalcata). *Montero 3357, 3570* (americana). *Montero 6089* (subfalcata). *Montero 6253* (nivalis). *Montero 7706* (filaginea). *Montero 10950* (stachydifolia). *Montero 11952* (deserticola). *Montero 12239* (americana). *Moreira 1395* (procumbens). *Moreira 1957* (chamissonis). *Moreira & al. 1621* (humilis). *Muñoz 1431* (aliena). *Muñoz 6252, Muñoz s.n.-IX-1970* (spiciformis). *Muñoz & Sierra 7095* (americana).

Navas 156 (americana). *Navas 2273* (valparadisea). *Navas s.n. 20-*

I-1954 (americana), Navas s.n. 20-IX-1954, (americana); 5-I-1957 (humilis).

Oehrens s.n. 20-XII-1977 (chamissonis). *Olea* 49 (americana).

Palacios 14668 (filaginea). *Parra & Rodríguez* 89 (filaginea). *Parra & Rodríguez* 145 (simplicicaulis). *Parra & Torres* 160, 430, 543, 674, 959 (americana). *Paschke* s.n. 19-I-1952 (nivalis). *Pennell* 12751 (serpyllifolia). *Peñailillo & Rojas* 4 (falcata). *Peñailillo & Rojas* s.n. 24-X-2001 (subfalcata). *Pfanzelt* 174 (falcata). *Pfanzelt* 285 (oligantha). *Pfister* 553 (americana). *Pfister* 1004 (villarroelii). *Pfister* 1260 (filaginea). *Pfister* 3558 (subfalcata). *Pfister* 4271 (americana). *Pfister* 4280, 4950 (filaginea). *Pfister* 4953 (americana). *Pfister* 4978 (falcata). *Pfister* 7491 (serpyllifolia). *Pfister* 7861 (alpina). *Pfister* 7879 (filaginea). *Pfister* 8140 (nivalis), 8142 (serpyllifolia). *Pfister* 8643 (subfalcata). *Pfister* 10289 (simplicicaulis). *Pfister* 12995 (filaginea). *Pfister* 13014 (ramosa). *Pfister* 13591 (alpina). *Pfister* 14565, 18027 (filaginea). *Pfister* 19058 (spiciformis). *Pfister* s.n. 21-XI-1943, s.n. 17-XI-1945 (americana), s.n. 21-XI-1945 (filaginea). *Pfister* s.n. 2-XII-1945 (simplicicaulis). *Pfister* s.n. 13-I-1946, s.n. 11-XI-1950, s.n. 20-XII-1950, s.n. 3-I-1951 (americana). *Pfister* s.n. 30-XII-1951 (serpyllifolia). *Pfister* s.n. 1-XI-1952 (americana). *Pfister* s.n. 14-I-1953 (spiciformis). *Pfister* s.n. 16-II-1956 (americana). *Pfister & Ricardi* 9764 (subfalcata). *Pfister & Ricardi* s.n. 31-XII-1952 (spiciformis). *Philippi* s.n.-I-1863 (aliena). *Philippi* s.n.-I-1878, (andina). *Philippi* s.n.-II-1879 (serpyllifolia). *Philippi?* s.n.-I-1884 p.p. (axillaris). *Philippi* s.n.-III-1885 (aliena). *Philippi* s.n. 21-IX-1893 (oligantha). *Philippi* s.n. year 1898 (aliena). *Pinto* s.n. 13-I-1949, s.n. 6-II-1953 (americana). *Pisano* 2172, 3019, 4337 (spiciformis). *Pisano* 8835 (alpina). *Pisano & Baraona* 1578 (villarroelii). *Pisano & Bravo* 407 (deserticola). *Puentes* s.n. 20-I-1936 (procumbens). *Pisano & al.* 8452 (alpina).

Quirós s.n.-XI-1961 (filaginea).

Ramírez 5, 171 (americana). *Rechinger* 63035 (ramosa). *Ricardi* 521 (deserticola). *Ricardi* 613 (americana). *Ricardi* 694 (chamissonis). *Ricardi* 787 (filaginea). *Ricardi* 963 (procumbens). *Ricardi* 2872 (chamissonis). *Ricardi* 5218 (oligantha). *Ricardi* 5296 (simplicicaulis). *Ricardi* 9875 (filaginea). *Ricardi* 10009 (ramosa). *Ricardi* s.n. 11-XII-1950 (americana). *Ricardi & Marticorena* 4239/624 (spiciformis). *Ricardi & Marticorena* 4767/1152 (americana). *Ricardi & Marticorena* 4952 (oligantha).

Ricardi & Marticorena 5031/1415, 5084/1468 (nivalis). *Ricardi & Marticorena* 5168/1552 (andina). *Ricardi & Matthei* 5310/114 (depilata). *Ricardi & al.* 1202 (americana). *Ricardi & al.* 1910 (falcata). *Ricardi & al.* 1935 (deserticola). *Richter* 21613 (filaginea). *Rodríguez* 222 (americana). *Rodríguez* 669 (filaginea). *Rodríguez & Marticorena* 2916 (americana). *Rodríguez & al.* 5489 (chamissonis). *Rojas* SAGH-1913 (subfalcata). *Romero & Aldunate* 34 (andina). *Romero & Aldunate* 35 (filaginea). *Romero & Aldunate* 36, 37 (chamissonis). *Romero & Aldunate* 38 (simplicicaulis). *Ruiz & López* 888 (simplicicaulis). *Ruiz & López* 947 (filaginea). *Ruiz & López* 959 (simplicicaulis). *Ruiz & López*. 965 (chamissonis). *Ruiz & López* 1185 (americana). *Ruiz & López* 1203 (simplicicaulis).

Sanfurgo s.n.-I-1878 (aliena). *Sayago* s.n. (serpyllifolia). *Schlegel* 2917 (oligantha). *Schlegel* 3212 (filaginea). *Schlegel* 3497 (andina). *Schlegel* 4071 (deserticola). *Schwabe* 50, s.n. 27-XII-1939, s.n. 19-X-1952 (americana). *Seki* 283 (chamissonis). *Seki* 211 (serpyllifolia). *Seki* 496, 529 (americana). *Seki* 574 (nivalis). *Silva* 19690 (filaginea). *Sparre* 10707 (spiciformis). *Sparre & Constance* 10685 (depilata). *Sparre & Constance* 10707, 10719 (americana). *Stuessy & al.* 5078 (americana). *Stuessy & al.* 11772 (filaginea). *Sunckel* 28973 (chamissonis).

Teillier 3273 (longipedicellata). *Teillier* 5319 (serpyllifolia). *Teillier & Márquez* 4905 (ramosa). *Teillier & Pauchard* 2550 (andina). *Tepe & al.* 1932 (subfalcata). *Tepe & al.* 1996 (filaginea). *Torres* 10450 (filaginea). *Torres* 14157 (oligantha).

Ugarte 162 (filaginea). *Ugarte* 206 (americana).

Veblen 355 (neuquensis). *Villagrán* 3867 (spiciformis). *Villagrán* 8647 (aliena). *Villarroel & Weldt* 91 (americana). *Villarroel & Weldt* 162 (chamissonis). *Vinet* 23-A (americana). *Vogel* 542 (spiciformis). *Volkman* s.n. (aliena).

Weinberger 1462/19 (simplicicaulis). *Werdermann* 35 (filaginea). *Werdermann* 1294 (serpyllifolia). *Weldt-Rodríguez* 942/237 (americana).

Zollitsch 190 (americana). *Zollitsch* 252 (simplicicaulis). *Zöllner* 5197 (filaginea). *Zöllner* 1388 (serpyllifolia). *Zöllner* 5315 (serpyllifolia). *Zöllner* 9055 (simplicicaulis). *Zöllner* 9867 (aliena). *Zöllner* 9929, 10408 (filaginea).

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