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Taxonomic Revision of the  
*Chiliotrichum* Group  
sensu stricto  
(Compositae: Astereae)

*José Mauricio Bonifacino*

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## ABSTRACT

Bonifacino, José Mauricio. Taxonomic Revision of the *Chiliodotium* Group sensu stricto (Compositae: Astereae). *Smithsonian Contributions to Botany*, number 92, vi + 119 pages, 62 figures, 1 table, 2009.—The *Chiliodotium* Group sensu lato (Compositae: Astereae) comprises 11 genera and 31 species distributed from Colombia to Tierra del Fuego, and it is composed of four main clades: the *Chiliodotium* clade (composed of *Aylacophora*, *Chiliodotium*, and *Lepidophyllum*), the *Haroldia* clade (composed of *Haroldia*), the *Llerasia* clade (composed of *Llerasia* and *Ocyroe*), and the *Nardophyllum* clade (composed of *Cabreraea*, *Chiliodotriopsis*, *Katinasia*, and *Nardophyllum*). A taxonomic revision is presented for *Chiliodotium*, *Haroldia*, and *Nardophyllum* clades, which are referred to here as *Chiliodotium* Group sensu stricto. The *Chiliodotium* Group sensu stricto, composed of 9 genera and 16 species, constitutes the most diverse assemblage of taxa in the *Chiliodotium* Group sensu lato. All species in the *Chiliodotium* Group sensu stricto were taxonomically evaluated and circumscribed based on analysis of the protologues, laboratory studies, and careful study of nearly all type material, dried specimen collections, and extensive field observations. Keys for genera in the *Chiliodotium* Group sensu lato and species for the genera treated are provided. Also provided for these species are complete synonymies, detailed descriptions, line drawings, photographs of live specimens and their habitat, and distribution maps. A list of all specimens examined is presented for each species. Three genera are described herein as new: *Cabreraea*, *Katinasia*, and *Haroldia*; and four new combinations are presented: *Chiliodotium fuegianum* (O. Hoffm.) Bonif., *Cabreraea andina* (Cabrera) Bonif., *Katinasia cabreriae* (Bonif.) Bonif., and *Haroldia mendocina* (Cabrera) Bonif. One species name is neotypified (*Barnadesia lanata* Meyen), and six synonyms of accepted taxa are lectotypified. One species, *Chiliodotium rosmarinifolium*, is reduced to the synonymy of *Chiliodotium diffusum*. KEY WORDS: Astereae, Argentina, *Aylacophora*, Bolivia, *Cabreraea* gen. nov., Chile, *Chiliodotium*, *Chiliodotriopsis*, *Chiliodotium*, *Chiliodotium* Group sensu lato, *Chiliodotium* Group sensu stricto, Compositae, *Haroldia* gen. nov., *Katinasia* gen. nov., *Lepidophyllum*, *Llerasia*, morphology, *Nardophyllum*, nomenclature, *Ocyroe*, Peru, taxonomy.

RESUMEN Bonifacino, José Mauricio. Revisión taxonómica del Grupo *Chiliodotium* sensu stricto (Compositae: Astereae). *Smithsonian Contributions to Botany*, número 92, vi + 119 páginas, 62 figuras, 1 tabla, 2009.—El Grupo *Chiliodotium* sensu lato (Compositae: Astereae) se compone de 11 géneros y 31 especies, distribuidas desde Colombia a Tierra del Fuego y esta constituido por cuatro clados principales: el clado *Chiliodotium* (integrado por *Aylacophora*, *Chiliodotium* y *Lepidophyllum*), el clado *Haroldia* (integrado por *Haroldia*), el clado *Llerasia* (integrado por *Llerasia* y *Ocyroe*) y el clado *Nardophyllum* (integrado por *Cabreraea*, *Chiliodotriopsis*, *Katinasia* y *Nardophyllum*). Se presenta aquí la revisión taxonómica de los clados *Chiliodotium*, *Haroldia*, y *Nardophyllum*, que en conjunto se designan Grupo *Chiliodotium* sensu stricto. El Grupo *Chiliodotium* sensu stricto, compuesto por 9 géneros y 16 especies, presenta la mayor diversidad morfológica dentro del Grupo *Chiliodotium* sensu lato. Se evaluaron taxonómicamente todas las especies del Grupo *Chiliodotium* sensu stricto y las mismas fueron definidas en base al análisis de los protólogos, el estudio de casi todo el material tipo, especímenes de herbario y extensas observaciones a campo. Se presentan claves para la identificación de los géneros del Grupo *Chiliodotium* sensu lato y para la identificación de las especies dentro de los géneros del Grupo *Chiliodotium* sensu stricto. Para cada especie tratada se presenta sinonimia completa, descripción morfológica detallada, dibujos, fotografías de especímenes a campo y sus ambientes, mapa de su distribución geográfica, y una lista de todos los especímenes examinados. Tres nuevos géneros son descriptos: *Cabreraea*, *Katinasia* y *Haroldia*. Cuatro nuevas combinaciones son presentadas: *Chiliodotium fuegianum* (O. Hoffm.) Bonif., *Cabreraea andina* (Cabrera) Bonif., *Katinasia cabreriae* (Bonif.) Bonif. y *Haroldia mendocina* (Cabrera) Bonif. El nombre de una especie es neotipificado (*Barnadesia lanata* Meyen) y seis sinónimos de nombres aceptados son lectotipificados. *Chiliodotium rosmarinifolium* es transferido a la sinonimia de *Chiliodotium diffusum*. PALABRAS CLAVE: Astereae, Argentina, *Aylacophora*, Bolivia, *Cabreraea* gen. nov., Chile, *Chiliodotium*, *Chiliodotriopsis*, *Chiliodotium*, *Chiliodotium* Group sensu lato, *Chiliodotium* Group sensu stricto, Compositae, *Haroldia* gen. nov., *Katinasia* gen. nov., *Lepidophyllum*, *Llerasia*, morfología, *Nardophyllum*, nomenclatura, *Ocyroe*, Peru, taxonomía.

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# Taxonomic Revision of the *Chiliotrichum* Group sensu stricto (Compositae: Astereae)

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## INTRODUCTION

The *Chiliotrichum* Group (Compositae: Astereae Cass.) consists of shrubby daisies that grow mainly in the Andean and Patagonian regions of South America. It was defined by Cabrera (1954a) and later modified by Bremer (1994), Nesom (1994), and Bonifacino and Sancho (2004). The group is characterized by its shrubby habit, dense to more rarely laxly disposed coriaceous leaves that are densely tomentose underneath, radiate or discoid capitula, paleate receptacles that are smooth and not alveolate, ray florets with staminodes, tubular corollas, slightly sagittate anther bases, and pappus elements largely composed of flattened bristles or scales.

In certain areas, especially in southern South America, some species—e.g., *Chiliotrichum diffusum* (G. Forst.) Kuntze, *Lepidophyllum cupressiforme* (Lam.) Cass., *Nardophyllum bryoides* (Lam.) Cabrera—can form dense stands constituting the dominant shrub in the Patagonian scrub; they often extend over a considerable area. As for habitat, the *Chiliotrichum* Group grows from sea level up to 4,200 m, and from extremely dry conditions in eastern Patagonia to considerably humid areas such as the southern Andean subantarctic forest and sub-Paramo vegetation. Most species belonging to *Chiliotrichum* Group usually grow in wide open areas or mountain slopes, although *Chiliotrichum diffusum* is also found as an understory element in the subantarctic forests dominated by *Nothofagus* spp., particularly towards the southernmost end of its distribution. *Llerasia Triana* occurs in the low forest that is so characteristic of the sub-Paramo vegetation along the northwestern Andes from Colombia to Bolivia.

Up to the present, there has been no agreement among authors regarding the exact composition of the group (Bremer, 1994; Nesom, 1994; Bonifacino and Sancho, 2004). However, a recent effort (J. M. Bonifacino and V. Funk, Smithsonian Institution, National Museum of Natural History, Department of Botany, unpublished phylogenetic data) to understand the group from a molecular perspective has shed some light on this problem as well as helped to clarify the phylogenetic relationships among its constituent genera and species (see Table 1).

According to Cabrera's (1954a) original circumscription, nine genera were included in *Chiliotrichum* Group: *Aylacophora* Cabrera, *Chiliophyllum* Phil., *Chiliotrichiopsis* Cabrera, *Chiliotrichum* Cass., *Lepidophyllum* Cass., *Nardophyllum*

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**TABLE 1.** Taxonomic history of the *Chilitrichum* Group (Compositae: Astereae). The X's indicate genera considered to be similar or related to each other by different authors. Genera in **boldface** are described herein as new. Abbreviations: CG = *Chilitrichum* Group, s.l. = sensu lato, s.s. = sensu stricto.

Genera	Authors															
	Cassini (1816)	Hook. f. (1847)	Remy (1849)	Weddell (1856)	Gray (1862)	Benth. & Hook. f. (1873)	Cabrera (1954 & 1969)	Blake (1930)	Nesom (1991)	Zhang & Bremer (1993)	Nesom (1993)	Nesom (1994)	Nesom et al. (2001)	Bonif. & Sancho (2004)	Karaman (2006)	This study CG s.l. CG s.s.
<i>Aylacophora</i>							X		X	X	X	X	X			X
<i>Baccharis</i>		X														
<b><i>Cabreraea</i></b>							X		X	X	X	X	X	X	X	X
<i>Chilitophyllum</i> <sup>a</sup>							X		X	X	X	X	X	X	X	X
<i>Chilitrichiopsis</i> <sup>b</sup>							X		X	X	X	X	X	X	X	X
<i>Chilitrichum</i>		X	X		X		X		X	X	X	X	X	X	X	X
<i>Diplostebium</i>					X				X	X	X					
<i>Ericameria</i>					X	X				X	X					
<b><i>Haroldia</i></b>							X		X	X	X	X	X	X	X	X
<i>Hinterhubera</i>										X						
<b><i>Katinasia</i></b>																X
<i>Lepidophyllum</i>	X				X	X	X			X	X	X	X	X	X	X
<i>Llerasia</i>										X	X	X	X	X	X	X
<i>Nardophyllum</i> <sup>c</sup>		X	X	X	X	X	X		X	X	X	X	X	X	X	X
<i>Ocyroe</i>							X		X	X	X	X	X	X	X	X
<i>Oritrophium</i>										X	X	X				
<i>Palaepappus</i> <sup>d</sup>							X			X	X	X	X	X	X	X
<i>Parastrephia</i>			X	X	X	X	X	X	X	X	X					
<i>Pteronia</i>	X						X									

<sup>a</sup> In this study, *Chilitophyllum* includes only *Chilitophyllum densifolium*.

<sup>b</sup> In this study *Chilitrichiopsis mendocina* is excluded from *Chilitrichiopsis*.

<sup>c</sup> In this study *Nardophyllum cabreriae* and *Nardophyllum armatum* are excluded from *Nardophyllum*.

<sup>d</sup> In this study, *Palaepappus* is included in *Nardophyllum*.

(Hook. and Arn.) Hook. and Arn., *Parastrephia* Nutt. emend Cabrera and *Pteronia* L., all of them from southern South America, except for *Pteronia*, which is from South Africa. More recent authors (Cabrera, 1969; Bremer, 1994; Nesom, 1994) added other genera to *Chiliodictyon* Group: *Diplostegium* Kunth., *Ericameria* Nutt., *Llerasia*, *Oritrophium* (Kunth.) Cuatrec., and *Palaepappus* Cabrera, all of them from South America, except for *Ericameria*, which is native to North America.

Nesom (1994) placed all these genera in the subtribe *Hinterhuberinae* Cuatrec. However, morphology as well as molecular data place an important hiatus between *Chiliodictyon* Group sensu lato (Bonifacino and Funk, unpublished data) and the typical elements of the subtribe *Hinterhuberinae* (e.g., *Diplostegium*, *Hinterhubera* Sch. Bip. ex Wedd., *Parastrephia*). According to the molecular studies of Bonifacino and Funk (unpublished data), the genera *Celmisia* Cass., *Oritrophium*, and *Olearia* Moench, are among the closest relatives to the *Chiliodictyon* Group. As a result of these studies, based on both nuclear and chloroplast markers, but also on a careful study of a wide array of morphological characters, the coalescence of the group originally proposed by Cabrera (1954a) was confirmed, with the important addition of *Llerasia*, an idea suggested by Nesom (1994) and more recently by Karaman (2006). Based on the above-mentioned studies, it was evident that some taxon circumscriptions had to be reconsidered. Consequently, several significant taxonomic changes are proposed here, including the description of new genera, designation of new combinations, establishment of new synonyms, and the exclusion of some species.

The *Chiliodictyon* Group sensu lato, as redefined by Bonifacino and Funk (unpublished data), comprises 11 genera (three described herein as new) and 31 species: *Aylacophora*, *Cabreraea* Bonif., *Chiliodictyopsis*, *Chiliodictyophyllum*, *Chiliodictyon*, *Haroldia* Bonif., *Katinasia* Bonif., *Lepidodictyophyllum*, *Llerasia*, *Nardodictyophyllum*, and *Ocyroe* Phil.

*Aylacophora*, *Cabreraea*, *Chiliodictyophyllum*, *Haroldia*, *Katinasia*, *Lepidodictyophyllum*, and *Ocyroe* are monotypic, *Chiliodictyon* comprises two species, *Chiliodictyopsis* three species, *Llerasia* ~14 species, and *Nardodictyophyllum* five species.

The genera in the *Chiliodictyon* Group sensu lato are arranged in four strongly supported clades (Bonifacino and Funk, unpublished data): *Chiliodictyon* clade (composed of *Aylacophora*, *Chiliodictyophyllum*, *Chiliodictyon*, and *Lepidodictyophyllum*), *Haroldia* clade (composed by *Haroldia*), *Llerasia* clade (composed of *Llerasia* and *Ocyroe*), and *Nardodictyophyllum* clade (composed of *Cabreraea*, *Chiliodictyopsis*, *Katinasia*, and *Nardodictyophyllum*). Nested within

the *Chiliodictyon* Group sensu lato there is a monophyletic group that is here referred to as *Chiliodictyon* Group sensu stricto, and which contains the clades *Chiliodictyon*, *Haroldia*, and *Nardodictyophyllum*. Future studies will cover the description of the *Chiliodictyon* Group sensu lato, to be completed in two other contributions: (1) a revision of *Ocyroe*, a recently reinstated genus that now holds a species formerly assigned to *Nardodictyophyllum* (*Nardodictyophyllum armatum* (Wedd.) Reiche) (Bonifacino, 2008); and (2) a taxonomic revision of *Llerasia*, which was recently confirmed as part of the *Chiliodictyon* Group (Karaman 2006; Bonifacino and Funk, unpublished data).

## MATERIALS AND METHODS

This study was based on observation of approximately 50 type specimens and more than 1,200 herbarium specimens belonging to 19 institutions, which are abbreviated as follows for subsequent mention in the text:

- BAA Herbario Gaspar Xuárez, Facultad de Agronomía, Universidad de Buenos Aires, Buenos Aires, Argentina.
- BAB Herbario Instituto de Recursos Biológicos, Centro de Recursos Naturales, Instituto Nacional de Tecnología Agropecuaria, Castelar, Buenos Aires, Argentina.
- BAF Herbario Facultad de Farmacia y Bioquímica, Museo de Farmacobotánica Juan A. Domínguez, Universidad de Buenos Aires, Buenos Aires, Argentina.
- BM Herbarium, Department of Botany, The Natural History Museum, London, UK.
- CONC Herbario Departamento de Botánica, Universidad de Concepción, Concepción, Chile.
- CORD Herbario Facultad de Ciencias Exactas, Físicas y Naturales, Museo Botánico, Universidad Nacional de Córdoba, Córdoba, Córdoba, Argentina.
- E Herbarium, Royal Botanic Garden, Edinburgh, Scotland, UK.
- F Herbarium, Botany Department, Field Museum of Natural History, Chicago, USA.
- G Herbarium, Conservatoire et Jardin botaniques de la Ville de Genève, Genève, Switzerland.
- K Herbarium, Royal Botanic Gardens, Kew, England, UK.

- LIL Herbario Fundación Miguel Lillo, San Miguel de Tucumán, Argentina.
- LP Herbario División Plantas Vasculares, Museo de La Plata, La Plata, Buenos Aires, Argentina.
- MO Herbarium, Missouri Botanical Garden, Saint Louis, Missouri, USA.
- MVFA Herbario Bernardo Rosengurtt, Laboratorio de Botánica, Facultad de Agronomía, Universidad de la República, Montevideo, Uruguay.
- NY William and Lynda Steere Herbarium, New York Botanical Garden, Bronx, New York, USA.
- P Herbier National de Paris, Département de Systématique et Evolution Phanérogamie, Muséum National d'Histoire Naturelle, Paris, France.
- SI Herbario Instituto de Botánica Darwinion, San Isidro, Buenos Aires, Argentina.
- SGO Herbario Sección Botánica, Museo Nacional de Historia Natural, Santiago, Chile.
- US United States National Herbarium, Department of Botany, Smithsonian Institution, Washington, D.C., USA.

In addition, specimens belonging to Natalie Goodall (personal herbarium, Ushuaia, Tierra del Fuego, Argentina) were also studied.

Additionally, extensive fieldwork was conducted throughout almost the whole geographic range of the group. For both the morphological and anatomical studies, the material was reconstituted through boiling and posterior bleaching with sodium hypochlorite at 50% solution and stained with safranin. Drawings of morphological details, unless otherwise noted, were made by the author using a Wild M5 stereoscope with camera lucida, and the anatomical drawings were made using an Olympus CH-2 microscope with camera lucida. The photographs were shot by the author. For plane shapes, terminology follows that proposed by Systematics Association Committee for Descriptive Biological Terminology (Anonymous, 1962), and trichome terminology follows Ramayya (1962) and Freire and Katinas (1995).

## TAXONOMIC HISTORY

1786. Lamark describes the first two species of the group, *Conyza cupressiformis* Lam., and *Conyza bryoides* Lam., based on material from the Straits of Magellan.

1788. Forster describes the species *Amellus diffusus* from material collected by himself in Tierra del Fuego.
1816. Cassini describes *Lepidophyllum* to include *Conyza cupressiformis* without making the combination, and suggests a close relationship between *Lepidophyllum* and *Pteronia* (probably based on the opposite phyllotaxy of both genera).
1817. Cassini describes *Chiliotrichum* to include *Amellus diffusus* G. Forst. without making the combination, and coining a new (illegitimate) name, *Chiliotrichum amelloideum* Cass.
1830. Cassini places *Chiliotrichum* inside a section of “true aster prototypes” together with *Diplostephium* and *Olearia* amid other miscellaneous Astereae genera.
1838. Candolle describes *Dolichogyne* DC. with two species: *Dolichogyne staehelinoides* DC. and *Dolichogyne gnaphalioides* DC., both of which are currently in the synonymy of *Nardophyllum lanatum* (Meyen) Cabrera.
1846. Hooker describes two sections inside *Chiliotrichum*: *Chiliotrichum* section *Euchiliotrichum* Hook. f., which currently corresponds to *Chiliotrichum*, and *Chiliotrichum* section *Anactinia* Hook. f. composed of species now placed in *Nardophyllum*.
1849. Rémy mentions *Baccharis* L., *Chiliotrichum* and *Nardophyllum* as the closest genera to *Dolichogyne* (currently *Nardophyllum* and *Parastrephia*).
1856. Weddell defines two sections within *Dolichogyne*: section *Dolichogyne* (currently *Nardophyllum* and *Ocyroe*) and section *Tola* (currently *Parastrephia*), clearly showing his view of those two taxa as closely related.
1862. Gray mentions *Ericameria* and *Chrysothamnus* Nutt. as the most closely related genera to *Nardophyllum* and *Lepidophyllum* sensu lato (currently *Lepidophyllum* and *Parastrephia*), and shared Rémy's opinion of the close relation between *Nardophyllum* and *Chiliotrichum*.
1873. Bentham mentions the close relationship between *Chiliotrichum* and *Olearia*, and also of these two genera with *Diplostephium*.
1873. Bentham and Hooker mention *Nardophyllum* and *Ericameria* as genera closely related to *Lepidophyllum*.
1898. Kuntze places *Pteronia* close to *Nardophyllum*.
1905. Macloskie agrees with Kuntze on the *Pteronia* and *Nardophyllum* relationship.
1930. Blake synonymizes *Parastrephia* with *Lepidophyllum* largely due to similarities in habit that he could infer from the scanty type material at P.

1953. Cabrera describes *Aylacophora*, noting its similarity with *Nardophyllum*.
1954. Cabrera (1954a) proposes *Chiliotrichum* Group indirectly (without naming it as such) when referring to the South American genera related to *Nardophyllum*, namely *Aylacophora*, *Chiliophyllum*, *Chiliotrichiopsis*, *Chiliotrichum*, *Lepidophyllum*, and *Parastrephia*. Cabrera also pointed out *Pteronia* as the closest genus to *Nardophyllum*.
1969. Cabrera adds the monotypic *Paleaepappus* from central Patagonia to *Chiliotrichum* Group.
1991. Nesom defines a group of closely related South American genera and refers to them as the *Chiliophyllum* Group (tribe Astereae, subtribe Solidagininae O. Hoffm.) which, according to him, includes *Chiliophyllum*, *Chiliotrichiopsis*, *Chiliotrichum*, *Nardophyllum*, *Parastrephia*, and probably *Aylacophora*.
1993. Zhang and Bremer formally define *Chiliotrichum* Group as such, placing it in the tribe Astereae, subtribe Asterinae (Cass.) Dumort., and including the following genera: *Aylacophora*, *Chiliophyllum*, *Chiliotrichiopsis*, *Chiliotrichum*, *Diplostephium*, *Lepidophyllum*, *Nardophyllum*, *Paleaepappus* and *Parastrephia*.
1993. Nesom (1993a and 1993b) agrees to a great extent on the group composition suggested by Cabrera (1954a) and later modified by Zhang and Bremer (1993), but placing the group inside tribe Astereae, subtribe Hinterhuberinae, and further expanding the group circumscription when including genera *Hinterhubera*, *Llerasia*, and *Oritrophium*.
1994. Bremer keeps unmodified the group definition of Zhang and Bremer (1993).
1994. Nesom adds *Ericameria* and excludes *Parastrephia* and *Hinterhubera* from *Chiliotrichum* Group, placing the latter two genera in the *Hinterhubera* Group. Nesom also defines subgroups inside *Chiliotrichum* Group: (a) *Chiliophyllum*, *Chiliotrichiopsis*, *Ericameria*, *Lepidophyllum* and *Nardophyllum* (including *Aylacophora* and *Paleaepappus*); (b) *Chiliotrichum*, *Diplostephium*, and *Oritrophium*; (c) *Llerasia*, and (d) *Pteronia*.
2001. Bonifacino and Sancho discuss the probable generic affinities of *Aylacophora* and *Paleaepappus*, indicating *Chiliophyllum*, *Chiliotrichiopsis*, *Chiliotrichum*, and *Nardophyllum* as the most closely related genera.
2001. Nesom et al. consider *Aylacophora*, *Chiliophyllum*, *Chiliotrichiopsis*, *Chiliotrichum*, *Lepidophyllum*, *Nardophyllum*, and *Paleaepappus* as a group of South American related genera, more distally related to *Diplostephium*, *Hinterhubera*, *Lepidophyllum*, and *Parastrephia*, although they do not mention the *Chiliotrichum* Group explicitly.
2004. Bonifacino and Sancho, exclude *Nardophyllum scoparium* Phil. from *Nardophyllum*, and define *Chiliotrichum* Group sensu stricto as composed by *Aylacophora*, *Chiliophyllum*, *Chiliotrichiopsis*, *Chiliotrichum*, *Lepidophyllum*, *Nardophyllum*, and *Paleaepappus*.
2006. Karaman, based on molecular data, confirms the idea earlier suggested by Nesom (1993a), that *Llerasia* belong to the *Chiliotrichum* Group. This author also establishes the close relatedness of *Lepidophyllum* and *Chiliotrichum*, and the also close relationship between *Chiliotrichiopsis* and *Nardophyllum*. In addition, Karaman also presents molecular evidence of the polyphyletic nature of *Chiliophyllum*.
- Finally, as a result of the present study, but also based on the results of Bonifacino and Funk (unpublished data), the *Chiliotrichum* Group sensu lato is considered to be composed of 11 genera and 31 species arranged in four main clades very strongly supported: *Chiliotrichum* clade (composed of *Aylacophora*, *Chiliophyllum*, *Chiliotrichum*, and *Lepidophyllum*); *Haroldia* clade (composed by *Haroldia*); *Llerasia* clade (composed of *Llerasia* and *Ocyroe*); and *Nardophyllum* clade (composed of *Cabreraea*, *Chiliotrichiopsis*, *Katinasia*, and *Nardophyllum*). The clades *Chiliotrichum*, *Haroldia*, and *Nardophyllum* form a moderately supported clade here referred to as *Chiliotrichum* Group sensu stricto, composed of nine genera and 16 species. Three genera are described herein as new (*Cabreraea*, *Haroldia*, and *Katinasia*); one species is transferred to the synonymy (*Chiliotrichum rosmarinifolium* Less.); four new combinations are coined (*Chiliotrichum fuegianum* (O. Hoffm.) Bonif., *Cabreraea andina* (Cabrera) Bonif., *Haroldia mendocina* (Cabrera) Bonif., and *Katinasia cabreriae* (Bonif.) Bonif.); and one species is excluded from *Nardophyllum* (*Nardophyllum armatum*). Monotypic *Paleaepappus*, in agreement with Nesom (1993b), is here considered as a synonym of *Nardophyllum*.

## MORPHOLOGY

The descriptions that follow are based on the characteristics of the most diverse genera belonging to the

*Chiliotrichum* Group, an assemblage that is here referred to as the *Chiliotrichum* Group sensu stricto, and which includes: *Aylacophora*, *Cabreraea*, *Chiliotrichiopsis*, *Chiliophyllum*, *Chiliotrichum*, *Haroldia*, *Katinasia*, *Lepidophyllum*, and *Nardophyllum*. The treatment of the relatively uniform *Llerasia* is a part of an ongoing project (J. M. Bonifacino, Laboratorio de Botánica, Facultad de Agronomía, Montevideo, Uruguay, unpublished), and the treatment of *Ocyroe* appears in a separate paper (Bonifacino, 2008).

**HABIT.** The taxa belonging to the *Chiliotrichum* Group sensu stricto are small shrubs, usually globose, and sometimes spreading, that vary between 5 cm and 2 m, the branches densely or laxly disposed. *Nardophyllum bryoides* is a rather diverse species regarding habit, since it can be found as globose shrubs with laxly arranged branches or forming dense mats appressed to the ground. Some species (i.e., *Nardophyllum chiliotrichioides* (J. Rémy) A. Gray and *Nardophyllum patagonicum* (Cabrera) G. L. Nesom) present branches tapering towards the end. Growth is notably heteroblastic for *Nardophyllum patagonicum*, which presents both macro- and brachyblasts, while the rest of the species present only macroblasts.

**BRANCHES.** The stems of the *Chiliotrichum* Group sensu stricto present a transverse section with a vascular cylinder showing a well-marked secondary growth, usually presenting a sclerotized pith, and phloem fibers arranged more or less regularly in bundles (Figure 1A–D,F–I). Fibers are also important in the xylem. Additionally, those species that show notable ribs along the stems (i.e., *Aylacophora deserticola* Cabrera and *Nardophyllum chiliotrichioides*) or ribs more or less developed (i.e., *Katinasia cabreræ* and *Nardophyllum lanatum*) have subepidermic fiber bundles reinforcing the ribs (Figures 1A,B; 39A,B).

The branches in most species are covered by a dense tomentose pubescence formed by aseptate-flagellate trichomes (Figure 4E) but also have an important presence of glandular trichomes usually concealed by the tomentose pubescence, which mainly consist of biseriate vesicular glandular trichomes (Figure 4A–C). Some species (i.e., *Chiliotrichiopsis ledifolia* (Griseb.) Cabrera, *Haroldia mendocina*, and *Nardophyllum genistoides* (Phil.) A. Gray, additionally have notable glandular trichomes (biseriate vesicular capitate glandular trichomes, Figure 4D) laxly arranged over the stems. In some species (i.e., *Chiliophyllum densifolium* Phil., *Lepidophyllum cupressiforme*), stems are exclusively gland-dotted, rarely with tomentose pubescence. Some species show a broad variation in stem pubescence, with individuals exclusively gland-dotted and

others profusely tomentose and gland-dotted (*Chiliotrichum diffusum*, *Nardophyllum bryoides*). The base of the leaves extends along the stem for most species, giving the stem a furrowed or ribbed appearance more or less pronounced depending on the species. In *Aylacophora deserticola* Cabrera and *Nardophyllum chiliotrichioides*, the ribs are very notorious and continuous over long segments of the stem; in these species the ribs are broad and shiny with hardly any pubescence. In *Katinasia cabreræ*, the interrib area is wider than each individual rib, and the whole stem is covered by glandular trichomes (biseriate vesicular glandular trichomes) and a dense tomentose pubescence. In *Nardophyllum lanatum* (Meyen) Cabrera, the tomentose pubescence is more important and is not overshadowed by the underlying presence of glandular trichomes. In *Haroldia mendocina* and *Nardophyllum genistoides*, ribs are evident and approximately of the same width as the interrib areas. In the rest of the species, the presence of ribs and/or furrows remains more or less hidden under the dense tomentose pubescence. (e.g., *Chiliotrichiopsis keidelii* Cabrera, *Chiliotrichiopsis peruviana* G. L. Nesom, H. Rob., and A. Granda, *Nardophyllum bryoides*, *Nardophyllum patagonicum*). In *Lepidophyllum cupressiforme* and *Chiliophyllum densifolium* there are no evident ribs along the branches.

**LEAVES: PHYLLOTAXY.** Species belonging to the *Chiliotrichum* Group sensu stricto have alternate phyllotaxy, except for *Lepidophyllum cupressiforme*, which has decussate leaves.

**LEAVES: SHAPE.** Leaf shape presents a broad variation among and within the species belonging to the *Chiliotrichum* Group sensu stricto (Figure 2). Leaves can range from being elliptic to narrowly elliptic (Figure 2A,G,K) (e.g., *Aylacophora deserticola*, *Chiliotrichiopsis ledifolia*, *Chiliotrichum diffusum*, *Chiliotrichum fuegianum*, *Katinasia cabreræ*, *Nardophyllum chiliotrichioides*, *Nardophyllum genistoides*, *Nardophyllum lanatum*); oblong to linear (Figure 2B,D,F) (e.g., *Cabreraea andina*, *Chiliotrichiopsis keidelii*, *Chiliotrichiopsis peruviana*, *Nardophyllum bryoides*, *Nardophyllum chiliotrichioides*, *Chiliotrichum diffusum*); obovate (Figure 2C) to narrowly obovate (Figure 2I,P,Q) (e.g., *Chiliophyllum densifolium*, *Nardophyllum patagonicum*); ovate to narrowly elliptic (Figure 2E,J) (e.g., *Haroldia mendocina*) or ovate-triangular (e.g., *Lepidophyllum cupressiforme*, Figure 2L).

**LEAVES: SIZE.** Leaf size varies both among and within species; shortest leaves (2–4 mm long, Figure 2L) are found in *Lepidophyllum cupressiforme*, and also in *Chiliophyllum densifolium* and *Nardophyllum bryoides*, while the longest leaves in the group (30–50 mm long,

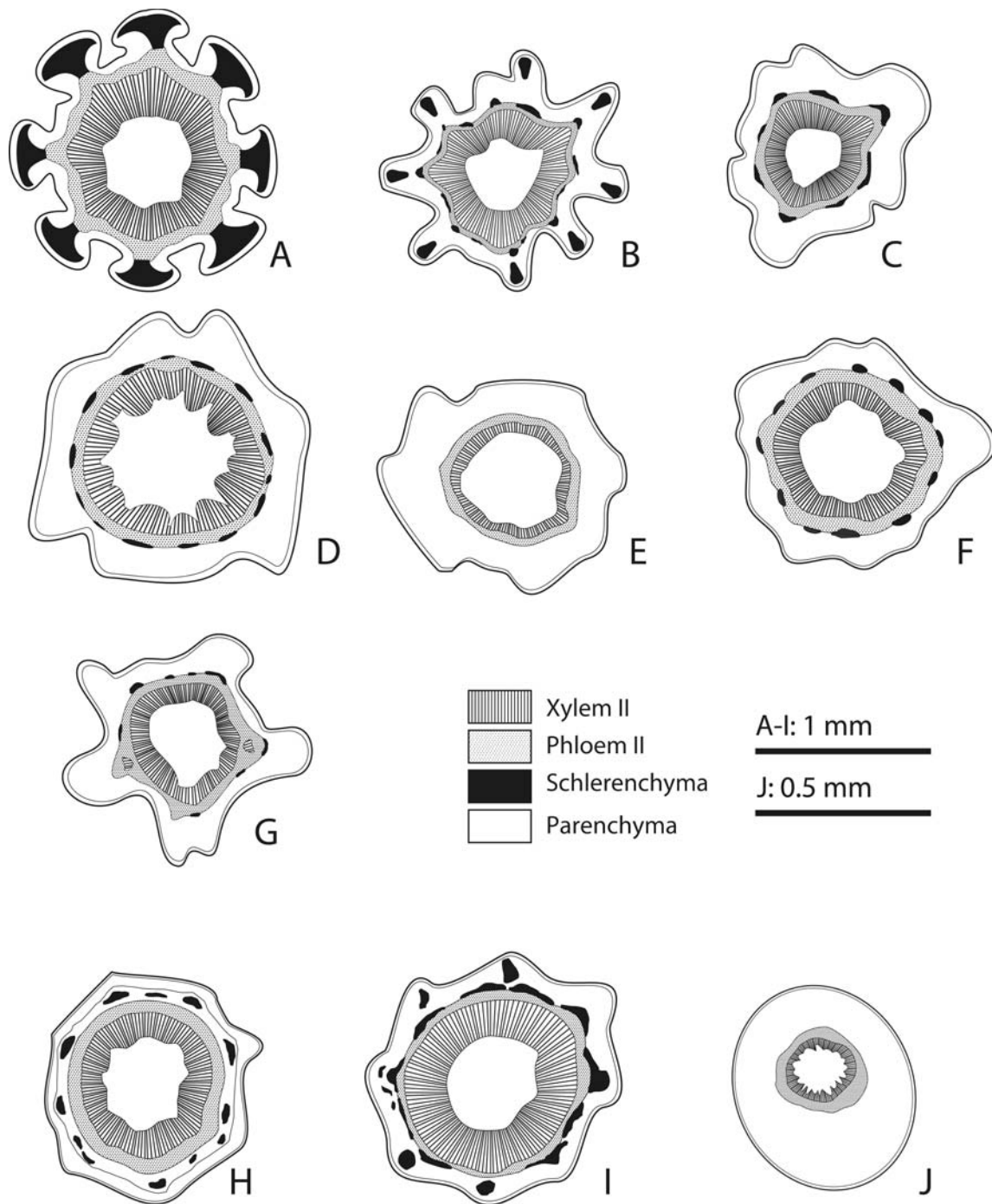


FIGURE 1. Stem anatomy of the *Chilotrichum* Group sensu stricto representative taxa. A. *Aylacophora deserticola*. B. *Nardophyllum chilotrichioides*. C. *Nardophyllum bryoides*. D. *Chilotrichum diffusum*. E. *Chiliophyllum densifolium*. F. *Chilotrichiopsis peruviana*. G. *Cabreraea andina*. H. *Haroldia mendocina*. I. *Nardophyllum patagonicum*. J. *Lepidophyllum cupressiforme*. (A, Bonifacino et al. 335, LP; B, Bonifacino & Donato 791, LP; C, Bonifacino & Donato 699, LP; D, Bonifacino et al. 563, LP; E, Bonifacino et al. 77, LP; F, Flores et al. 2109, LP; G, Simón & Bonifacino 765, LP; H, Simón & Bonifacino 782, LP; I, Bonifacino & Donato 691, LP; J, Bonifacino et al. 787, LP).

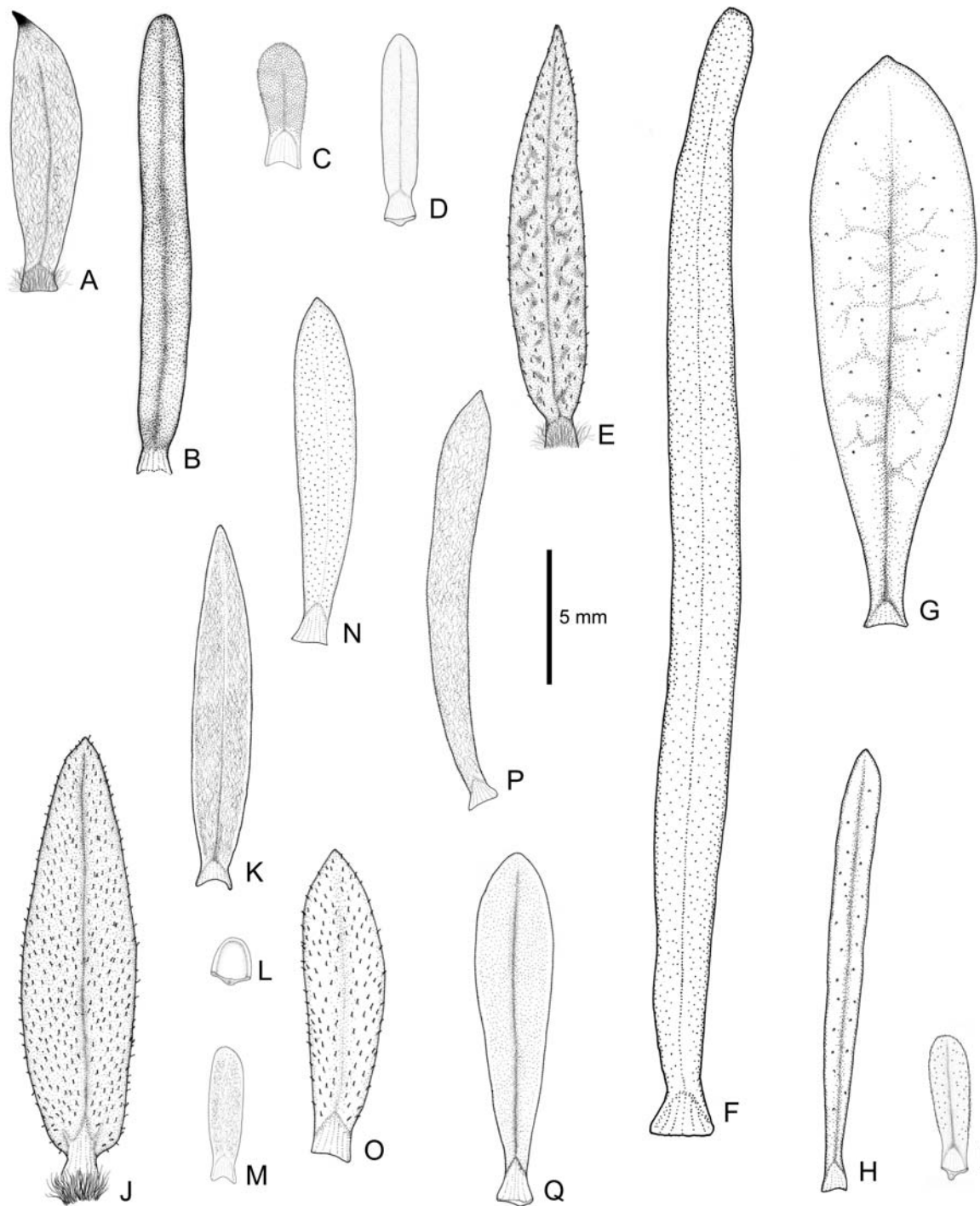


FIGURE 2. Leaf morphology of the *Chilitrichum* Group sensu stricto species, leaves shown as seen on adaxial side. A. *Aylacophora deserticola*. B. *Cabreraea andina*. C. *Chiliophyllum densifolium*. D. *Chilitrichiopsis keidelii*. E. *Chilitrichiopsis ledifolia*. F. *Chilitrichiopsis peruviana*. G, H. *Chilitrichum diffusum*. I. *Chilitrichum fuegianum*. J. *Haroldia mendocina*. K. *Katinasia cabreræ*. L. *Lepidophyllum cupressiforme*. M. *Nardophyllum bryoides*. N. *Nardophyllum chilitrichioides*. O. *Nardophyllum genistoides*. P. *Nardophyllum lanatum*. Q. *Nardophyllum patagonicum*. (A, Bonifacino et al. 335, LP; B, Simón & Bonifacino 765, LP; C, Bonifacino et al. 77, LP; D, Simón & Bonifacino 520, LP; E, Simón & Bonifacino 725, LP; F, Flores et al. 2109, LP; G, Bonifacino et al. 563, LP; H, Bonifacino & Romano 824, LP; I, Bonifacino et al. 595, LP; J, Simón & Bonifacino 782, LP; K, Bonifacino & Romano 825, LP; L, Bonifacino et al. 787, LP; M, Bonifacino & Donato 699, LP; N, Bonifacino & Donato 791, LP; O, Germain s.n., LP; P, Bonifacino & Romano 811, LP; Q, Bonifacino & Donato 691, LP).



Figure 2F) are found in *Chilotrichiopsis ledifolia*, *Chilotrichiopsis peruviana*, *Haroldia mendocina*, and *Chilotrimum diffusum*.

**LEAVES: BASE.** Leaf base can be attenuated (Figure 2Q), slightly attenuated (Figure 2E), or truncate (Figure 2L).

**LEAVES: PETIOLE.** All the species, with the exception of *Lepidophyllum cupressiforme*, have a petiole broadened towards the stem and constricted above; it has a softer texture and is glabrous on the adaxial side. Some species (i.e., *Aylacophora deserticola*, *Chilotrichiopsis ledifolia* y *Haroldia mendocina*) have a noticeable tuft of aseptate-flagellate trichomes in the axil of the leaves. As mentioned above, *Lepidophyllum cupressiforme* does not have a petiole, and the base is not differentiated from the rest of the altogether reduced leaf; the leaves in this species are actually attached to the stems throughout all or most of their length.

**LEAVES: APEX.** Leaf apex varies from acute (e.g., *Aylacophora deserticola*, *Katinasia cabrerae*, Figure 2A,K) to obtuse (e.g., *Chilophyllum densifolium*, *Nardophyllum patagonicum*, Figure 2Q).

**LEAVES: MARGIN.** The margin of the leaves of the *Chilotrimum* Group sensu stricto is always entire, notably varying among the constituent species in the degree of in-rolling, with some species showing notably revolute margins (e.g., *Cabreraea andina*, *Chilotrichiopsis keidelii*, *Chilotrichiopsis peruviana*, *Chilotrimum diffusum*, *Nardophyllum bryoides*, *Nardophyllum chilotrichioides*, *Nardophyllum patagonicum*, Figure 3B,C,E,J,L), some others showing slightly revolute margins (e.g., *Aylacophora deserticola*, *Chilotrichiopsis ledifolia*, *Chilotrimum diffusum*, *Chilotrimum fuegianum*, *Haroldia mendocina*, Figure 3H,K), or some others exhibiting plane, non-revolute margins (e.g., *Chilophyllum densifolium*, *Katinasia cabrerae*, Figure 3D,F). It is important to note that for some species this character might vary from live specimens to herbarium material (e.g., the leaf margin in *Katinasia cabrerae* is totally plane in live specimens, while in herbarium specimens they are slightly revolute).

**LEAVES: TEXTURE.** Most species have coriaceous leaves; *Chilotrichiopsis ledifolia*, *Haroldia mendocina*, and *Nardophyllum genistoides* have chartaceous leaves.

**LEAVES: INDUMENTUM.** The pubescence type and density is extremely variable among and within the species of the *Chilotrimum* Group sensu stricto. Most species have the abaxial side of the leaves densely covered by tomentose pubescence, which is responsible for the discolorous leaves so characteristic of the group; this tomen-

tose pubescence is formed by aseptate-flagellate trichomes (Figure 4E); some species also exhibit some tomentose pubescence on the adaxial surface, although much more laxly arranged (e.g., *Aylacophora deserticola*, *Chilotrichiopsis ledifolia*, *Nardophyllum lanatum*, *Katinasia cabrerae*); *Nardophyllum lanatum* exhibits dense tomentose pubescence on both sides. The leaves of all species have glandular trichomes (biseriate vesicular glandular trichomes, Figure 4A–C) on both sides with variable density, from laxly arranged (e.g., *Chilotrimum diffusum*, *Nardophyllum* spp.) to densely arranged (e.g., *Cabreraea andina*, *Chilotrichiopsis keidelii*, *Nardophyllum bryoides*); some species have leaves densely gland-dotted on both surfaces (e.g., *Chilophyllum densifolium* and *Lepidophyllum cupressiforme*). In addition to the above-mentioned glandular trichomes, some species (i.e., *Chilotrichiopsis ledifolia*, *Haroldia mendocina*, and *Nardophyllum genistoides*) also present noticeable glandular trichomes (biseriate vesicular capitate glandular trichomes, Figure 4D).

**LEAVES: ANATOMY.** The adaxial epidermis on the leaves of the *Chilotrimum* Group sensu stricto is covered in general by a thick cuticle; epidermal cells on adaxial surface in general have a prismatic shape with more or less thick walls (Figure 39G). Abaxial epidermal cells have thinner walls and a more undulate outline than adaxial counterparts (Figure 39E,F). Stomata are usually anomocytic (Figure 39E,F), and in the particular case of *Chilotrimum*, actinocytic (Figure 39H); they are in most cases found on the abaxial epidermis only, but in *Chilotrichiopsis ledifolia*, *Haroldia mendocina*, *Lepidophyllum cupressiforme*, and *Katinasia cabrerae* they are on both sides of the leaves; in most species, stomata are somewhat elevated (Figure 39C), while in *Lepidophyllum cupressiforme* and *Katinasia cabrerae* they are at the same level as the rest of epidermal cells or even slightly sunken (Figure 39D). Mesophyll in most species of the *Chilotrimum* Group sensu stricto is dorsiventral with palisade parenchyma composed of one to three layers of cells in the adaxial side, and diffuse parenchyma on the abaxial side (Figure 3B,C,E,G–L). *Lepidophyllum cupressiforme* also has a dorsiventral mesophyll, but inverted, with the diffuse parenchyma on the adaxial side and the palisade parenchyma on the abaxial side (Figure 3A). In *Katinasia cabrerae*, the mesophyll is isobilateral, with palisade parenchyma on both sides of the leaves and diffuse parenchyma restricted to the center (Figure 3D), while *Chilophyllum densifolium* shows a mesophyll entirely composed of palisade parenchyma (Figure 3F).

**CAPITULA: ARRANGEMENT.** Capitula are solitary and terminal (Figure 5A<sub>1</sub>) for most species in the

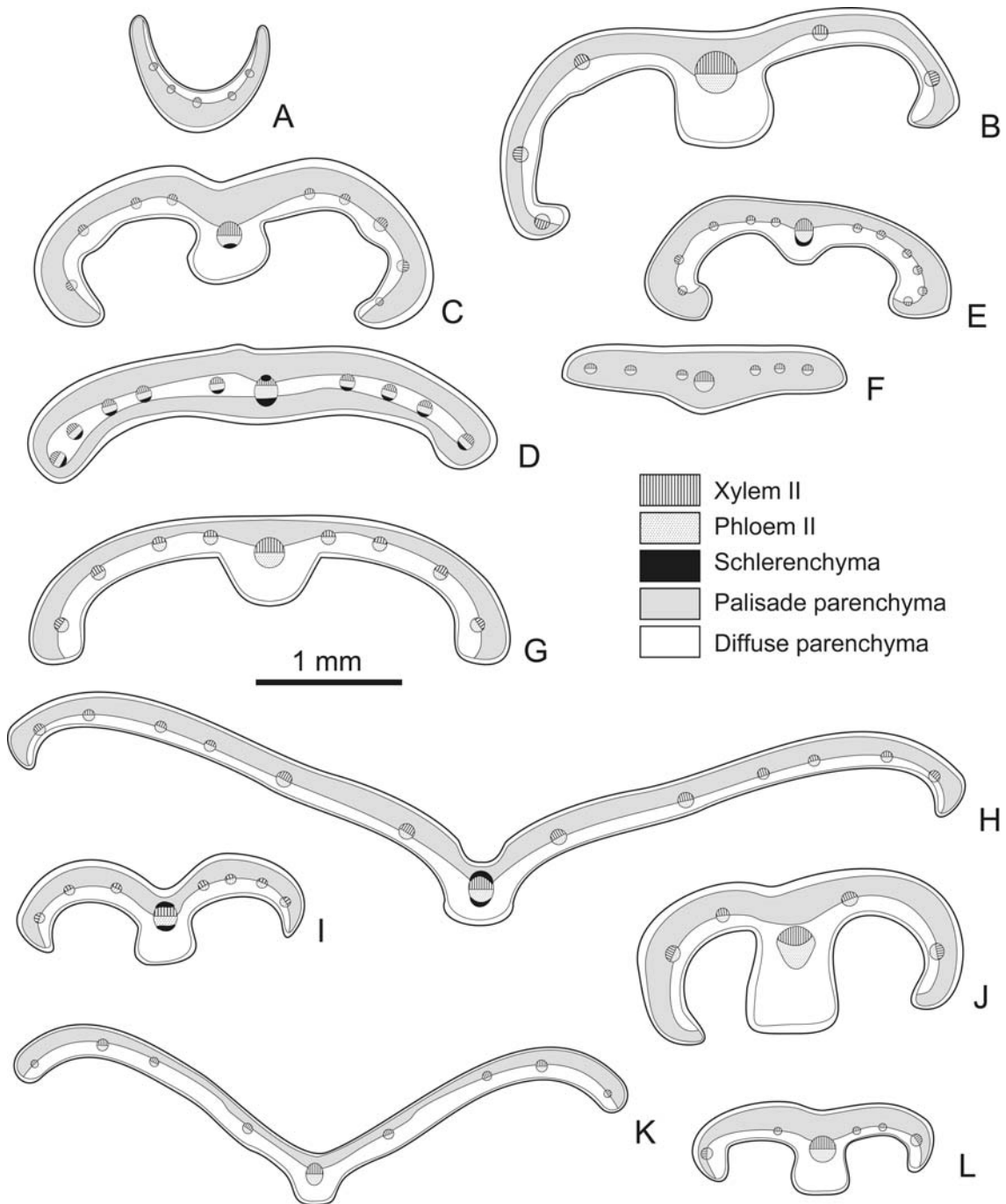
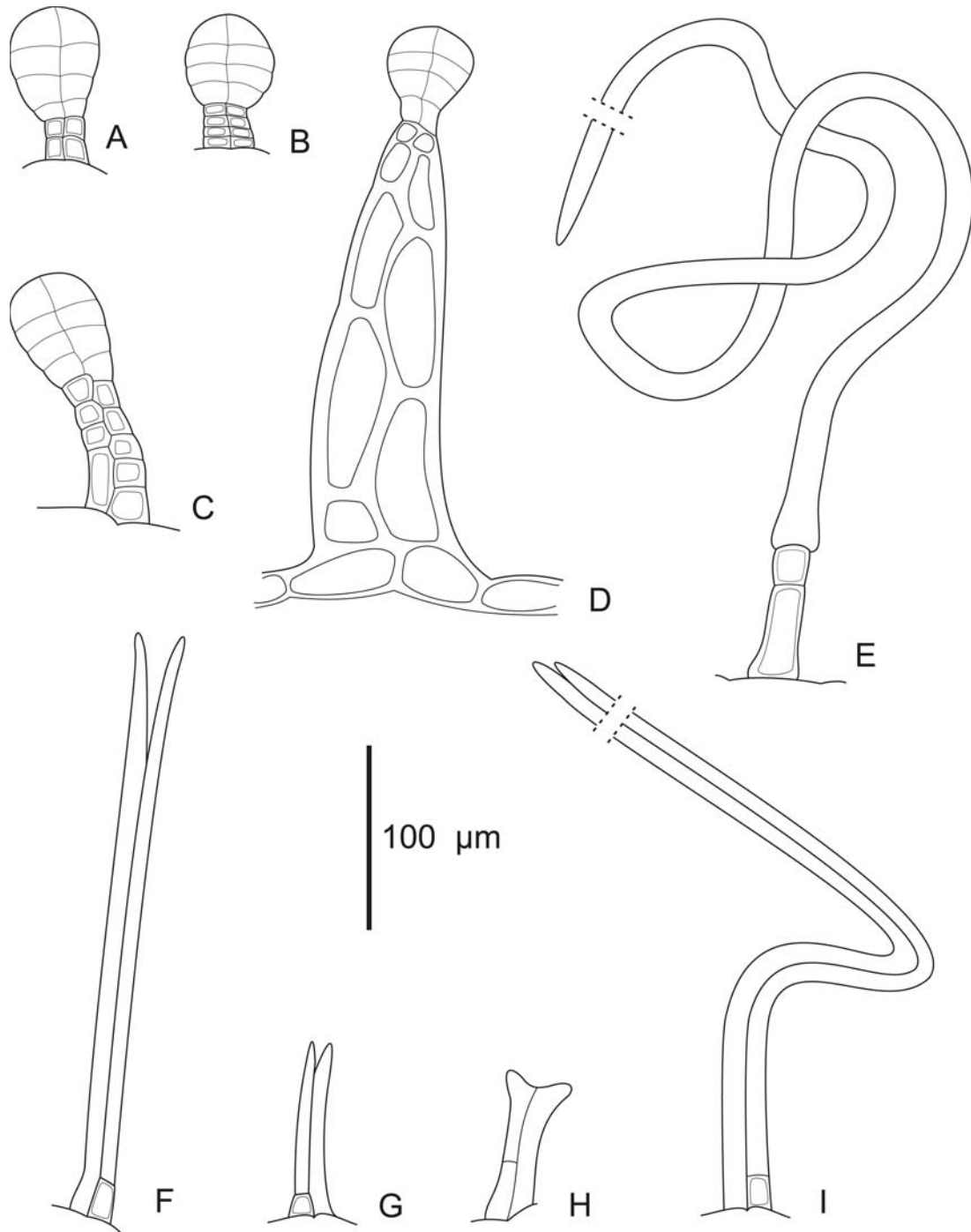


FIGURE 3. Leaf anatomy of the *Chiliotrichum* Group sensu stricto representative taxa. A. *Lepidophyllum cupressiforme*. B. *Chiliotrichiopsis peruviana*. C. *Nardophyllum chiliotrichioides*. D. *Katinasia cabrerae*. E. *Nardophyllum patagonicum*. F. *Chiliophyllum densifolium*. G. *Aylacophora deserticola*. H, I. *Chiliotrichum diffusum*. J. *Cabreraea andina*. K. *Haroldia mendocina*. L. *Chiliotrichiopsis keidelii*. (A, Bonifacino et al. 787, LP; B, Flores et al. 2109, LP; C, Bonifacino & Donato 791, LP; D, Bonifacino & Romano 825, LP; E, Bonifacino & Donato 691, LP; F, Bonifacino et al. 77, LP; G, Bonifacino et al. 335, LP; H, Bonifacino et al. 563, LP; I, Bonifacino & Romano 824, LP; J, Simón & Bonifacino 765, LP; K, Simón & Bonifacino 782, LP; L, Simón & Bonifacino 520, LP).



**FIGURE 4.** Trichomes in the *Chilitrichum* Group sensu stricto. A–C. Biseriate vesicular glandular trichomes present on leaves, stems, achenes, and disk corolla lobes. D. Biseriate vesicular capitate glandular trichomes present on stems, leaves, and outer phyllaries of *Chilitrichiopsis ledifolia*, *Haroldia mendocina*, and *Nardophyllum genistoides*. E. Aseptate-flagellate trichomes present on stems, leaves, and outer phyllaries of all species. F–I. Twin trichomes present on the achenes (A, B, E, *Chilitrichum diffusum*, Bonifacino et al. 563, LP; C–D, *Haroldia mendocina*, Simón & Bonifacino 782, LP; F–I, *Nardophyllum bryoides*, Bonifacino & Donato 699, LP).

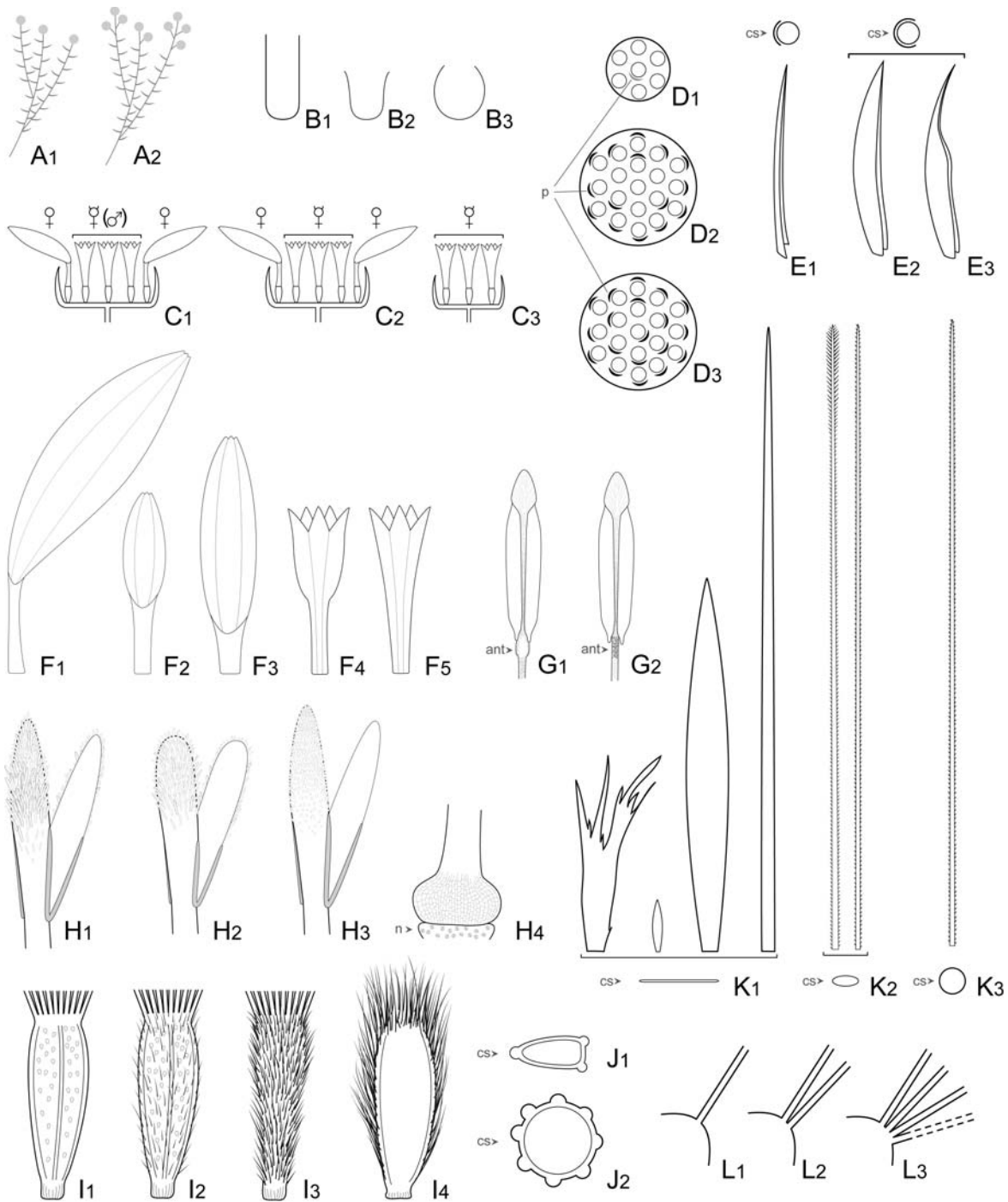


FIGURE 5. Morphology of reproductive features in the *Chilotrichum* Group sensu stricto. A. Capitula arrangement: solitary (A1), or in capitulescences (A2). B. Shape of the involucre: cylindrical (B1), cylindrical-campanulate (B2), or globose (B3). C. Type of capitula and sex arrangement of florets: radiate capitulum with female florets in the periphery and hermaphroditic (functionally male) florets in the disk (C1), radiate capitulum with female florets in the periphery and hermaphroditic florets in the disk (C2), and discoid capitulum with only hermaphroditic florets (C3). D. Type of the receptacle: naked or with 1 or 2 paleae (D1), partially paleate (D2), paleate, and where every floret is subtended by a palea (D3); p = palea. E. General shape of the paleae: only subtending, not embracing the achene (E1), subtending and embracing the achene with acute apex (E2), or subulate apex (E3); cs = cross section. F. Shape of corollas: ray corolla with a well developed limb (F1), ray corolla with limb short or not so well developed (F2, F3), tubular corolla broadened more or less abruptly from mid length (F4), and tubular corolla

*Chiliotrichum* Group sensu stricto, except for *Katinasia cabrerae*, in which they are in capitulescences of two to five (sometimes seven) capitula (Figure 5A<sub>2</sub>). In *Nardophyllum lanatum*, capitula can be either solitary or grouped in capitulescences of two to three capitula. Capitula can be sessile or shortly pedunculate (e.g., *Lepidophyllum cupressiforme*, *Chiliophyllum densifolium*, *Chiliotrichiopsis keidelii*, *Chiliotrichiopsis peruviana*, *Nardophyllum bryoides*) or sometimes the peduncles can be rather long (e.g., *Chiliotrichum diffusum*).

**CAPITULA: TYPE.** Species belonging to the *Chiliotrichum* Group sensu stricto have either radiate capitula (Figure 5C<sub>1</sub>,C<sub>2</sub>) formed by marginal florets with true ray corollas and disk florets with tubular corollas (i.e., *Cabreraea*, *Chiliophyllum*, *Chiliotrichum*, *Haroldia*, and *Lepidophyllum*) or discoid capitula (Figure 5C<sub>3</sub>) formed entirely by disk florets with tubular corollas (i.e., *Aylacophora*, *Katinasia*, and *Nardophyllum*). *Chiliotrichiopsis* has radiate capitula except for *C. peruviana*, which has discoid capitula. Disk florets in the *Chiliotrichum* Group sensu stricto are bisexual (Figure 5C<sub>2</sub>,C<sub>3</sub>), and marginal florets are pistillate (Figure 5C<sub>1</sub>,C<sub>2</sub>), all fertile with the only exception being *Lepidophyllum*, in which disk florets are functionally male, and only the marginal florets produce viable fruits (Figure 5C<sub>1</sub>).

**CAPITULA: INVOLUCRE SHAPE.** The involucre in the *Chiliotrichum* Group sensu stricto can be cylindrical (i.e., *Chiliophyllum*, *Katinasia*, *Lepidophyllum*, and *Nardophyllum*, Figure 5B<sub>1</sub>), campanulate (i.e., *Cabreraea*, *Haroldia*, *Chiliotrichiopsis peruviana*, Figure 5B<sub>2</sub>), or intermediate between campanulate and cylindrical (i.e., *Chiliotrichiopsis keidelii*, *Chiliotrichiopsis ledifolia*, *Chiliotrichum*, and *Nardophyllum patagonicum*); *Aylacophora* presents a globose involucre (Figure 5B<sub>3</sub>). Phyllaries are arranged in three to five series, with variable morphology among and within genera. In some species, the external outer phyllaries show foliaceous apices (i.e., *Chiliotrichiopsis keidelii*, *Chiliotrichiopsis ledifolia*, *Nardophyllum*

*bryoides*, *Nardophyllum lanatum*, *Nardophyllum genistoides*, and *Nardophyllum patagonicum*).

**CAPITULA: RECEPTACLE.** The receptacle in most species is either flat or slightly convex. Nearly all species have paleae in the receptacle, these being totally paleate (i.e., *Aylacophora*, *Cabreraea*, *Haroldia*, *Chiliotrichiopsis*, and *Nardophyllum patagonicum*, Figure 5D<sub>3</sub>) or partially paleate with paleae mostly placed towards the periphery (i.e., *Chiliophyllum*, *Chiliotrichum*, *Katinasia*, *Lepidophyllum*, *Nardophyllum bryoides*, *Nardophyllum chiliotrichioides*, and *Nardophyllum lanatum*, Figure 5D<sub>2</sub>). *Nardophyllum genistoides* is the only species of the group that does not have paleae. In *Katinasia cabrerae* and *Nardophyllum lanatum*, paleae are sometimes absent (Figure 5D<sub>1</sub>). Paleae notably embrace the achenes (i.e., *Aylacophora*, *Chiliotrichiopsis*, *Haroldia*, and *Nardophyllum patagonicum*, Figure 5E<sub>2</sub>,E<sub>3</sub>) or simply subtend, but not enclose them (i.e., *Cabreraea*, *Chiliophyllum*, *Chiliotrichum*, *Katinasia*, *Lepidophyllum*, and *Nardophyllum*, Figure 5E<sub>1</sub>).

**FLORETS: COROLLA TYPE.** Corollas in the *Chiliotrichum* Group sensu stricto could either be true ray or tubular. True ray corollas have a usually short basal tube that expands into a limb of elliptic to narrowly elliptic shape; the tube can be wide (length to width ratio equal or less than four) and then gradually extended into a limb (i.e., *Cabreraea*, *Chiliophyllum*, *Chiliotrichiopsis*, *Haroldia*, and *Lepidophyllum*, Figure 5F<sub>2</sub>,F<sub>3</sub>) or it can be rather narrow (length to width ratio equal or greater than five) and abruptly extended into a limb (i.e., *Chiliotrichum*, Figure 5F<sub>1</sub>). The apex of the limb in the true ray corollas has three minute lobes; glandular trichomes (biseriate vesicular glandular trichomes, Figure 4A–C) can be present or absent; the corollas can be yellow (i.e., *Cabreraea*, *Chiliophyllum*, *Chiliotrichiopsis*, *Haroldia*, and *Lepidophyllum*) or white (i.e., *Chiliotrichum*). Tubular corollas have a narrow funnel shape that expands either gradually towards the apex (i.e., *Cabreraea andina*, *Chiliophyllum*

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gradually broadened towards the apex (F5). G. Shape of anthers showing slightly sagittate thecae and antheropodia well developed and swollen (G1), or developed but not swollen (G2). H. Style diversity: branches acute with long and thin papillae (H1), branches obtuse with long and thin papillae (H2), branches acute with short papillae (H3), and style shaft base swollen seated on top of a stomata-bearing nectary (H4); n = nectary. I. Achene diversity: glandular (I1), glandular and slightly villose (I2), glandular and densely villose (I3), and villose with twin-trichomes restricted to the ribs (I4). J. Achenes in cross section: compressed achene (J1), and terete achene (J2); cs = cross section. K. Type of pappus elements: scales, (from left to right) divided towards the apex, elliptic short, elliptic large, and linear (K1), flattened bristles (from left to right) scabrid and barbellate towards the apex, and scabrid all the way to the apex (K2), terete bristle, and scabrid (K3); cs = cross section. L. Pappus elements arrangement: 1-seriate (L1), 2-seriate (L2), and 3- to 4-seriate (L3).

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*densifolium*, *Chiliotrichiopsis keidelii*, *Chiliotrichiopsis ledifolia*, *Haroldia mendocina*, *Nardophyllum bryoides*, *Nardophyllum chiliotrichioides*, and *Nardophyllum patagonicum*, Figure 5F<sub>3</sub>) or more or less abruptly (i.e., *Aylacophora deserticola*, *Chiliotrichiopsis peruviana*, *Chiliotrichum diffusum*, *Chiliotrichum fuegianum*, *Katinasia cabrerae*, *Lepidophyllum cupressiforme*, *Nardophyllum genistoides*, and *Nardophyllum lanatum*, Figure 5F<sub>4</sub>). The corolla tube is glabrous or has very few glandular trichomes (biseriate vesicular glandular trichome, Figure 4A–C). The apex of the tubular corollas has five triangular lobes, with glandular trichomes (biseriate vesicular glandular trichome, Figure 4A–C) on the adaxial side, usually grouped towards the lobe apices.

**FLORETS: ANDROECIUM.** Size of thecae and apical appendages vary greatly among species of the *Chiliotrichum* Group sensu stricto. The bases of the thecae are for most species slightly sagittate (Figure 5G<sub>1</sub>, G<sub>2</sub>); in *Nardophyllum genistoides* they are sagittate and in *Haroldia mendocina* they are obtuse. Apical appendages vary from ovate to triangular. The upper part of the filament is characterized by the presence of cells with thick walls that define an antheropodium zone; this antheropodium can have the same width as the rest of the filament (Figure 5G<sub>2</sub>) or can be noticeably swollen (Figure 5G<sub>1</sub>). True ray corollas have one to four staminodes more or less developed towards the apical part of the tube.

**FLORETS: GYNOECIUM.** All species present a more or less developed and flattened nectary disc at the base of the style where stomata are present (Figure 5H<sub>4</sub>). Styles vary greatly in shape among species of the *Chiliotrichum* Group sensu stricto; style bases are more or less swollen in all species except for *Lepidophyllum*, in which no appreciable swelling is visible. Style branches are totally free, with the stigmatic surface reduced to two ventro-marginal bands departing from the base and extending 1/2 to 3/4 of the length of the style branches; the style branches are narrowly elliptic to oblong, and the apices vary from acute (Figure 5H<sub>1</sub>, H<sub>3</sub>) to obtuse (Figure 5H<sub>2</sub>). Collecting hairs are present in all species, usually covering the upper 1/2 to 3/4, ranging from short papillae (Figure 5H<sub>3</sub>) to more or less developed thin papillae (Figure 5H<sub>1</sub>, H<sub>2</sub>).

**ACHENES.** The *Chiliotrichum* Group sensu stricto is characterized by its narrowly obovate achenes, more or less terete in transversal section (Figure 5J<sub>2</sub>), except for *Aylacophora*, whose achenes are rather flattened (Figure 5J<sub>1</sub>). All species bear ribs in the achenes, usually from two to ten, more or less developed (Figure 5J<sub>1</sub>, J<sub>2</sub>). Achenes bear biseriate trichomes, glandular and nonglandular (Figure 4A–C, F–I), and they can have either glandu-

lar trichomes only (i.e., *Lepidophyllum*, Figure 5I<sub>1</sub>), mostly glandular trichomes but also some sparse twin trichomes (i.e., *Chiliotrichum*), or lax (Figure 5I<sub>2</sub>) to densely (Figure 5I<sub>3</sub>) disposed twin trichomes with an important presence of glandular trichomes (i.e., *Cabreraea*, *Chiliophyllum*, *Chiliotrichiopsis*, *Haroldia*, *Katinasia*, *Nardophyllum*). *Aylacophora* is particularly interesting regarding the pubescence of the achenes since they bear unusually long twin trichomes for the group (~3 mm long) totally concealing the pappus, and mostly on the ribs only (Figure 5I<sub>4</sub>). Glandular trichomes on the achenes are of the type biseriate vesicular glandular, and the twin trichomes are type basic filiform. All species bear a more or less developed carpodium.

**PAPPUS.** The pappus is one of the characters that shows more variation among genera and facilitates identification of taxa involved. Almost all species within the *Chiliotrichum* Group sensu stricto have pappus elements more or less flattened except for *Cabreraea* and *Katinasia*, which instead have terete awn-like bristles (Figure 5K<sub>3</sub>) than flattened bristles. Pappus elements can either be minute scales somewhat triangular to ovate in shape (i.e., *Aylacophora*, *Chiliotrichiopsis*, *Haroldia*, Figure 5K<sub>1</sub>), large narrowly ovate scales (i.e., *Nardophyllum patagonicum*, Figure 5K<sub>1</sub>), narrowly elliptic to linear scales (i.e., *Lepidophyllum*, Figure 5K<sub>1</sub>), linear scales to flattened bristles (i.e., *Chiliophyllum*, *Chiliotrichum*, *Nardophyllum bryoides*, *Nardophyllum chiliotrichioides*, and *Nardophyllum lanatum*, Figure 5K<sub>1</sub>, K<sub>2</sub>), or as previously mentioned, terete awn-like bristles (i.e., *Cabreraea*, *Katinasia*, and *Nardophyllum genistoides*). All of these pappus elements, especially the linear scales, flattened bristles, and terete bristles are either scabrid along all their length or scabrid and barbellate towards the apex. Pappus elements are arranged in one series (i.e., *Aylacophora*, *Chiliophyllum*, *Chiliotrichiopsis*, *Haroldia*, Figure 5L<sub>1</sub>), in two series (i.e., *Cabreraea*, *Chiliotrichum*, *Lepidophyllum*, *Nardophyllum*, Figure 5L<sub>2</sub>), or in three to four series (i.e., *Katinasia*, Figure 5L<sub>3</sub>).

## CHROMOSOME NUMBERS

Little is known about the chromosome number of the genera included in the *Chiliotrichum* Group sensu stricto. Most chromosome counts are by Moore (1981), who determined the chromosome numbers of *Chiliotrichum diffusum*  $2n = 54$ , *Chiliotrichum fuegianum*  $2n = \sim 54$ , *Lepidophyllum cupressiforme*  $2n = 40$ , and *Nardophyllum bryoides*  $2n = \sim 50$ . In a more recent contribution,

Hunziker et al. (1989) determined the chromosome number for *Chiliotrichopsis keidelii*  $2n = 54$ .

## POLLEN

There are no studies describing the pollen grains for species belonging to the *Chiliotrichum* Group sensu stricto. Pollen grains in the group are echinate like the pollen of most Compositae: Astereae, espheroidal, tricolpate; with colpi tapering towards both ends; the equatorial diameter of the species of the *Chiliotrichum* Group sensu stricto varies between 22 and 34  $\mu\text{m}$ , and the polar diameter between 22 and 31  $\mu\text{m}$ . *Lepidophyllum* has the smallest pollen grains and *Katinasia*, *Chiliotrichopsis*, and *Nardophyllum* have the largest pollen grains in the group (Figures 40–43).

## DISTRIBUTION AND HABITAT

It is useful to look at the distribution of the *Chiliotrichum* Group sensu stricto, in the context of the larger clade, the *Chiliotrichum* Group sensu lato (see Introduction). The *Chiliotrichum* Group sensu lato is distributed along the Andes from Colombia to Tierra del Fuego, extending to both Argentinean and Chilean extra-Andean Patagonia.

Most genera in the *Chiliotrichum* Group sensu stricto are restricted to southern South America, inhabiting areas south of 29° S latitude mostly along the Andes and in both Argentinean and Chilean Patagonia. Only *Chiliotrichopsis* extends northward, reaching southern Peru and southern Bolivia (see Figure 6 and figures with distribution maps for each species for detailed information on their known distribution).

The species belonging to *Chiliotrichum* Group sensu lato grow among an interesting array of habitats ranging from sea level to above 4,000 m. Most of the species occur in semiarid environments so characteristic of Patagonian, Puna, and Monte biogeographic provinces (Cabrera and Willink, 1973), but some such as *Llerasia* occur in the wet sub-Paramo of Colombia, Ecuador, and Peru, and in the upper part of the Yungas in Bolivia. Several taxa of the *Chiliotrichum* Group sensu stricto (e.g., *Aylacophora*,



FIGURE 6. Geographic distribution (shaded area) of the *Chiliotrichum* group sensu stricto (Compositae: Astereae).

*Chiliophyllum*, *Chiliotrichum*, *Katinasia*, *Lepidophyllum*, and *Nardophyllum*) are important elements of the shrubby stratum that characterizes the vegetation in certain areas of Puna, Monte, and Patagonia. They usually grow in open areas. However, *Chiliotrichum diffusum* is a rather ubiquitous species also found in subantarctic forests (dominated by *Nothofagus* spp.), clearings, and even forming part of the understory, and *Llerasia* grows amid dwarf forest close to the tree line along central and northwestern Andes.

## TAXONOMIC TREATMENT

### KEY TO GENERA OF THE *CHILIOTRICHUM* GROUP SENSU LATO (COMPOSITAE: ASTEREAE)

- 1a. Capitula discoid; receptacles naked or sometimes with 1 or 2 paleae (*Llerasia*); disk corollas yellow with glandular trichomes along the tube, gradually broadening, with a globose swelling at the base; pappus (2)3- to 5-seriate, pappus elements terete bristles . . . . . 2
- 1b. Capitula discoid or radiate; receptacles paleate or partially paleate; disk corollas yellow (rarely white) with none or (rarely) very few glandular trichomes along the tube, gradually or abruptly broadening from middle, but never with a globose swelling at the base; pappus 1- or 2-seriate (rarely 3- to 4-seriate, but then corollas white), pappus elements scales or more or less flattened bristles (rarely terete, but then with none of the above characteristics) . . . . . 3
- 2a. Erect shrubs; branches rigid and thorny; leaves minute (up to 12 mm long), arranged in macro- and brachyblasts; capitula solitary; pappus 3- to 5(7)-seriate; achenes densely villose. (San Juan to Jujuy in Argentina, northern Chile, and southern Bolivia) . . . . . *Ocyroe*
- 2b. Scandent shrubs; branches never thorny; leaves large (always more than 40 mm long), arranged in macroblasts only; capitula numerous, arranged in profuse corymbiform capitulescences; pappus (2)3-seriate; achenes gland-dotted. (From Colombia to southern Bolivia) . . . . . *Llerasia*
- 3a. Leaves decussate, triangular, scale-like. (Argentina and Chile, southern Santa Cruz and Magallanes and northern Tierra del Fuego) . . . . . *Lepidophyllum*
- 3b. Leaves alternate, elliptic to narrowly elliptic or narrowly obovate, oblong, or linear; never triangular and scale-like . . . . . 4
- 4a. Pappus 1-seriate . . . . . 5
- 4b. Pappus 2- to 4-seriate . . . . . 8
- 5a. Branches with long and well-defined ribs, noticeably wider than the interrib areas, more or less continuous throughout the stem length; leaves sparsely arranged, early deciduous; involucre globose; capitula discoid. (Argentina, restricted to Neuquén) . . . . . *Aylacophora*
- 5b. Branches with ribs absent or not well marked, if present of the same width or narrower than the interribs, not continuous throughout the length of the stem; leaves more or less densely arranged, persistent; involucre cylindrical to campanulate; capitula radiate (if discoid with none of the above characteristics) . . . . . 6
- 6a. Leaves obovate, margins entire, non-revolute; pappus elements linear scales, not divided towards the apex, scabrid along the margins. (Argentina, restricted to Mendoza) . . . . . *Chiliophyllum*
- 6b. Leaves ovate to linear, never obovate, margins revolute; pappus elements narrowly ovate scales, usually divided towards the apex, if not, then thicker and with protrusions . . . . . 7
- 7a. Paleae subulate, rigid towards the apex; corolla veins thick towards the base, protruding on outer surface when dry; pappus elements coarse and undivided towards the apex. (Argentina, known from northern Mendoza) . . . . . *Haroldia*
- 7b. Paleae acute, not subulate, softer towards the apex; corolla veins not thick, not protruding on corolla surface when dry, pappus elements thin and flat, divided towards the apex. (Southern Peru and Bolivia, and northern Argentina: La Rioja, Catamarca, Salta, Tucumán, and Jujuy) . . . . . *Chiliotrichiopsis*
- 8a. Capitula radiate . . . . . 9
- 8b. Capitula discoid . . . . . 10
- 9a. Leaves linear; ray corollas yellow; pappus elements terete awn-like bristles, not flattened, heteromorphic, outer series slightly shorter, scabrid throughout their length, inner series barbellate towards the apex. (Argentina, La Rioja and Catamarca) . . . . . *Cabreraea*
- 9b. Leaves narrowly elliptic to obovate or linear; ray corollas white; pappus elements linear scales, isomorphic, subequal, scabrid along the margins. (Chile, from Metropolitana Region southwards to Tierra del Fuego, Argentina, from southern Mendoza to Tierra del Fuego) . . . . . *Chiliotrichum*
- 10a. Leaf margins non-revolute, entire; corollas white; pappus 3- to 4-seriate, pappus elements terete bristles, outer series notably shorter. (Argentina, Mendoza and Neuquén) . . . . . *Katinasia*
- 10b. Leaf margins revolute; corollas yellow; pappus 2-seriate, subequal, pappus elements flattened bristles. (Argentina and Chile, widespread) . . . . . *Nardophyllum*



## *Aylacophora* Cabrera

### Taxonomic History

1953. Cabrera describes the genus from material collected in central Neuquén (Argentina), and funds *Aylacophora deserticola*.
1993. Nesom (1993b) transfers *Aylacophora* to the synonymy of *Nardophyllum*, making the combination *Nardophyllum deserticola* (Cabrera) G. L. Nesom.
2001. Bonifacino and Sancho reinstate *Aylacophora* as a distinct genus from *Nardophyllum*.

*Aylacophora* Cabrera, Bol. Soc. Argent. Bot. 4(4): 266, 1953. TYPE: *Aylacophora deserticola* Cabrera, Bol. Soc. Argent. Bot. 4(4): 268, 1953.

**Shrubs** globose; branches more or less densely disposed, ascending, almost leafless, 8-ribbed, interrib furrows densely tomentose, base of branches with triangular, brownish scales. **Leaves** sparsely arranged, early deciduous, alternate, ascending, gradually reduced towards branch apices, with a tuft of woolly trichomes in the axile, narrowly elliptic, base attenuated, petiole broadened towards the stem and constricted above, apex acute, margins slightly revolute, tomentose and gland-dotted on both surfaces, medium vein slightly marked, slightly discoloured, coriaceous. **Capitula** solitary, terminal, pedunculate, homogamous, discoid. **Involucre**s globose; phyllaries arranged in 4 to 5 series, gland-dotted, densely tomentose on abaxial surface, coriaceous, margins membranaceous; outer phyllaries triangular-ovate; inner phyllaries elliptic. **Receptacles** flat to slightly convex, paleate; paleae narrowly elliptic, boat-shaped, embracing the achenes, apex recurved, gland-dotted, margins membranaceous. **Florets** 25 to 40, bisexual; corollas yellow, tubular, 5-lobed, broadened more or less abruptly from mid-length, lobes triangular; anther thecae base slightly sagittate, apical appendages triangular, antheropodium present, not swollen; style bases notably swollen, style branches linear-oblong, apex acute, collecting hairs on upper 1/3 to 1/2. **Achenes** obovate, compressed, 2- or 3-ribbed, with long twin trichomes on ribs only, sparse glandular trichomes towards the apex of achenes inbetween ribs, carpodium present. **Pappus** 1-seriate, formed by small, narrowly elliptic to triangular scales, scabrid.

**Etymology:** Name derived from Greek “aylacos” (furrow), and “phorus” (to carry), referring to the notable furrows that run along the stem.

*Aylacophora* is a monotypic genus restricted to an arid area of western Argentina in Neuquén province. It inhabits sand dunes with a very scanty vegetation cover

amid creosote bushes (*Larrea* spp.) in the Monte biogeographic province (Cabrera and Willink, 1973).

The genus is characterized by its furrowed and almost leafless stems, discoid heads, globose involucre, paleate receptacles, yellow florets, 2- or 3-ribbed achenes compressed with long twin trichomes on the ribs only, and 1-seriate pappus composed of minute scales.

It differs from similar taxa such as *Nardophyllum* and *Katinasia*, most notably in the shape of the involucre, shape and number of ribs of the achene, and the type and size of the pappus. *Aylacophora* appears to be sister to the clade *Lepidophyllum* + *Chiliophyllum* + *Chiliotrichum* (Bonifacino and Funk, unpublished data).

*Aylacophora deserticola* Cabrera, Bol. Soc. Argent. Bot. 4(4): 268, 1953. *Nardophyllum deserticola* (Cabrera) G. L. Nesom, Phytologia 75(5): 362, 1993. TYPE: “Argentina, Neuquén, Plaza Huincul, 4-XII-1952, Cabrera 11053” (holotype: LP 562212-A!; isotypes: GH, LP 562212-B!, LP 562212-C!, US!).

FIGURES 7, 8, 44

**Shrubs** 0.5–1 m tall, globose; branches more or less densely disposed, ascending, branches 8-ribbed, interrib furrows densely tomentose, internodes (0.5–) 1.5–3 cm, scales at the branch bases, 0.8–3 × 1–1.5 mm, triangular, brownish. **Leaves** sparsely arranged, early deciduous, alternate, ascending, gradually reduced toward branch apices, with a tuft of woolly trichomes in the axils, 8–11 × 1.5–2.5 mm, narrowly elliptic, base attenuated, petiole broadened towards the stem and constricted above, apex acute, margins slightly revolute, tomentose and gland-dotted on both surfaces, midvein shallowly marked, coriaceous. **Capitula** solitary, terminal, pedunculate, peduncles 1–3 cm long, homogamous, discoid. **Involucre**s 6–9 × 6–8 mm, globose; phyllaries arranged in 4 to 5 series, gland-dotted, dense tomentose pubescence on abaxial surfaces, coriaceous, margins membranaceous; outer phyllaries 2.5–6.0 × 1–2 mm, triangular-ovate, apex acute; inner phyllaries 6–8 × 2 mm, elliptic, apex acute-mucronate. **Receptacles** flat to slightly convex, paleate; paleae 7–9 × 0.8–1.5 mm, narrowly elliptic, boat-shaped, embracing the achenes, apex acute, recurved, gland-dotted, with small tuft of woolly trichomes towards the apex, margins membranaceous. **Florets** 25 to 40, bisexual; corollas yellow, tubular, 5-lobed, broadened more or less abruptly from mid-length, tube 2–3 mm long, throat 2.5–3 mm long, lobes 1.5–2 × 0.6–1 mm, triangular, gland-dotted abaxially; anther thecae ~2.5 mm long, bases slightly sagittate, apical appendages ~1 × 0.3 mm, triangular, antheropodium present, not swollen; style

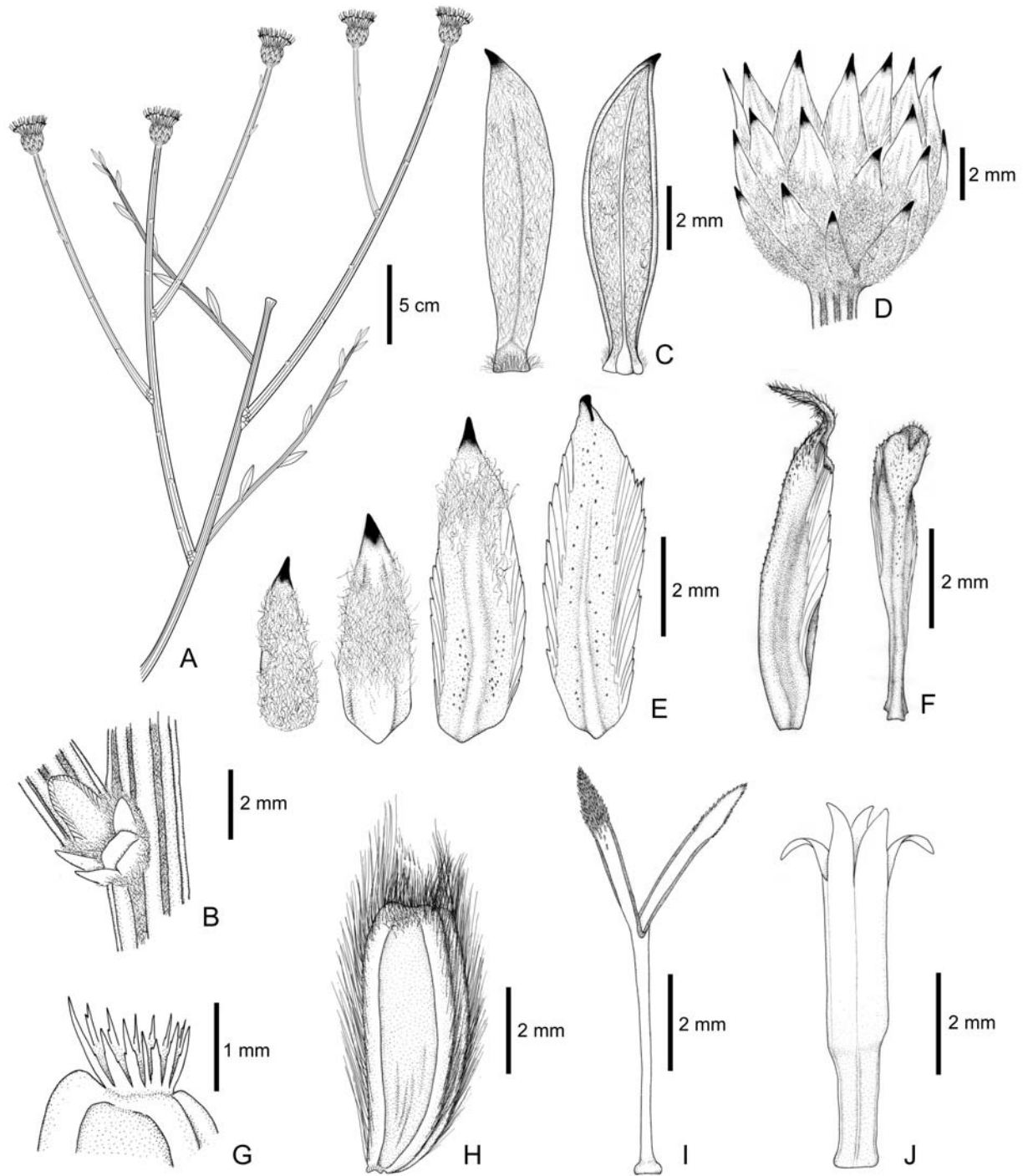


FIGURE 7. *Aylacophora deserticola* Cabrera. A. Habit. B. Detail of stem. C. Leaves, adaxial view (left), abaxial view (right). D. Involucre. E. Outer to inner phyllaries (from left to right). F. Receptacular paleae, lateral view (left), dorsal view (right). G. Detail of pappus (trichomes on upper part of achene not drawn). H. Achene with pappus (pappus occluded by notably long twin trichomes). I. Style. J. Corolla (A–J, Bonifacino et al. 335, LP).

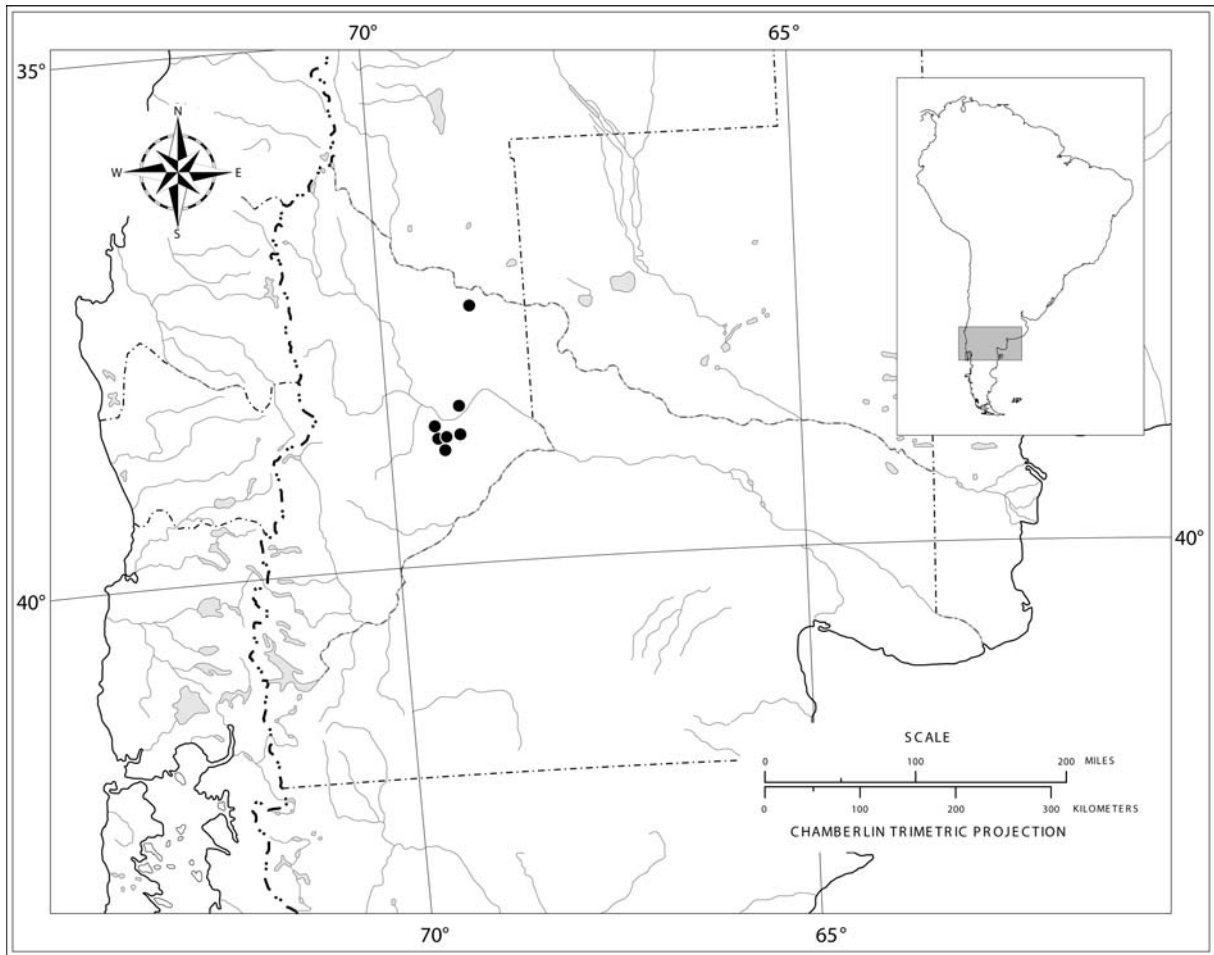


FIGURE 8. Geographic distribution of *Aylacophora deserticola* Cabrera.

shafts 5–6 mm long, base notably swollen, style branches 3–4 mm long, linear-oblong, apex acute, collecting hairs on upper 1/3 to 1/2. **Achenes** 6–6.5 × 2–2.5 mm, obovate, compressed, 2- or 3-ribbed, ribs densely covered with long twin trichomes up to ~3 mm long, glandular trichomes sparsely distributed inbetween nerves towards the apex of achenes, carpodium present. **Pappus** 0.8–1.6 mm long, 1-seriate, composed of 13 to 31 narrowly elliptic to triangular scales, scabrid, usually fused towards the base.

**Vernacular names:** Not known.

**Phenology:** Flowering specimens have been collected from January to February.

**Distribution:** Argentina, endemic to Neuquén province (Figure 8).

**Habitat:** Inhabits arid areas of Monte biogeographic province (Cabrera and Willink, 1973) at 500–650 m, with annual rainfall less than 150 mm the species in-

habits sand dunes with sparse vegetation (~40% cover), associated to *Larrea divaricata* Cav., *Atriplex lampa* Gill. ex Moq., *Prosopis flexuosa* var. *depressa* F. A. Roig, *Senna aphylla* subsp. *divaricata* (Hieron.) L. Bravo, *Chiquiraga erinacea* D. Don, *Gutierrezia solbrigii* Cabrera, *Fabiana patagonica* Speg., and *Larrea cuneifolia* Cav. (Cabrera, 1953; Bonifacino and Sancho, 2001; Roig, 1998; pers. obs.)

**Uses:** Not known.

**Etymology:** The specific epithet *deserticola* refers to the arid areas where the species occurs.

**Additional specimens examined:** ARGENTINA. PROV. NEUQUÉN. **Dpto. Añelo.** Ruta Prov. 17, 38 km al E de Añelo, cerca de la meseta alta, s.date, *Valla s.n.* (BAA 17790). **Dpto. Confluencia.** Plaza Huincul, Junto al Cementerio 38°56'8.2"S, 69°10'50.4"W, 6-I-2002, *Bonifacino et al.* 334 (LP); Ruta 10, entre Cutral-Có y Paso de los Indios,

38°47'23.1"S, 69°16'25.9"W, 6-I-2002, *Bonifacino et al.* 335 (LP); al N de Cutralc6, 38°47'23"S, 69°16'26"W, 630 m, 8-XII-2006, *Bonifacino et al.* 2907 (US); 10 km al W de Cutralc6, 8-II-1983, *Le6n* 3362 (BAA); Plaza Huincul, 27-XI-1943, *Plotnick* 47 (LP); 1–2 km de Plaza Huincul, 530 m, 26-I-1970, *Ruiz Leal* 27108 (LP); Paso de los Indios a Cutral-Co, 5-II-1999, *Steibel & Troiani s.n.* (ex SRFA 14074 in LP); Plaza Huincul, junto al Cementerio, s. date, *Troiani et al. s.n.* (ex SRFA 12503 in LP). **Dpto. Pehuenches.** Paso de las Bardas, 2-II-1999, *Troiani & Steibel s.n.* (ex SRFA 13920 in LP). **Dpto. Zapala.** 15 km al SW de Paso de los Indios, 5-II-1999, *Steibel & Troiani s.n.* (ex SRFA 14069 in LP); 20 km al SE de Paso de los Indios, 5-II-1999, *Steibel & Troiani s.n.* (ex SRFA 14073 in LP).

### ***Cabreraea* Bonif. gen. nov.**

*Cabreraea* Bonif. gen. nov. TYPE: *Chiliophyllum andinum* Cabrera, *Notas Mus. La Plata, Bot.* 19(92): 193, 1959 (≡ *Cabreraea andina* (Cabrera) Bonif. comb. nov.).

*Frutex, ramis teretibus lanuginosus (tomentosis) et glandulo-punctatis. Folia anguste elliptica base amplexicaulia margine revoluta. Capitula pluriflora heterogama radiata solitaria, involucri campanulatis, receptaculis paleatis. Flosculi lutei dimorphi, flosculis peripheralibus femineis radiatis, flosculis disci hermaphroditis; corollae tubiformes glanduliferae 5-lobatae sensim ampliatae; rami stylorum in trientis superioribus papillis collectoribus obsiti. Achenia villosissima. Aristae pappi inaequales scabridae biseriatae.*

**Shrubs** subglobose; branches more or less loosely disposed, ascending, not ribbed, densely tomentose and gland-dotted. **Leaves** densely arranged, persistent, alternate, patent, linear-oblong, base truncate, petiole broadened towards the stem and slightly constricted above, apex obtuse, slightly uncinat, reflexed, margins notably revolute, gland-dotted on both surfaces, densely tomentose on abaxial surface, discolorous, coriaceous. **Capitula** solitary, terminal, shortly pedunculate, heterogamous, radiate. **Involucri** campanulate; phyllaries arranged in 3 to 5 series, coriaceous; outer phyllaries ovate-elliptic to oblong, apex acute, tomentose on abaxial surface, margins membranaceous, the outermost phyllaries with foliaceous apices; inner phyllaries oblong to narrowly elliptic, apex subacute to obtuse, with scanty tomentose pubescence, margins membranaceous, notably broadened towards the apex. **Receptacles** convex, paleate; paleae narrowly elliptic, boat-shaped, not embracing the achenes, apex

acute, villose and gland-dotted, margins membranaceous, fimbriate. **Ray florets** 9 to 13, pistillate; corollas yellow, radiate, limb elliptic, 3-lobed; staminodes present; style base swollen, style branches narrowly ovate, subequal in length. **Disk florets** 20 to 25, bisexual; corollas yellow, tubular, 5-lobed, gradually broadened towards the apex, lobes triangular; anther thecae bases slightly sagittate, apical appendages narrowly ovate, antheropodium present, swollen; style base broadened, style branches narrowly elliptic, apex acute, collecting hairs on upper 1/3. **Achenes** narrowly obovate, terete, 3- to 5-ribbed, densely villose, with very short glandular trichomes, carpopodium present. **Pappus** 2-seriate, formed by awn-like terete bristles, slightly flattened towards the base, external series gradually tapered towards the apex, inner series slightly thicker and barbellate towards the apex, slightly longer than outer series, some fused among each other at the base.

*Etymology:* I dedicate this genus to the late illustrious synantherologist Angel Lulio Cabrera (1908–1999), who made significant contributions to the understanding of Compositae systematics, and established the basis of Compositae floristics in southern South America.

*Cabreraea* is a monotypic genus herein described as new to include the rare *Chiliophyllum andinum*. *Cabreraea* inhabits mountain areas of central-western Argentina in the altitudinal belt between 2,000 and 3,000 m.

Morphological, as well as molecular data (Bonifacino and Funk, unpublished data) support the segregation of *Chiliophyllum andinum* from *Chiliophyllum*, and its placement in a distinct genus. *Cabreraea* has a paleate receptacle, acute style branches, and 2-seriate pappus composed of awn-like terete bristles (versus partially paleate receptacle, obtuse style branches and a 1-seriate pappus composed of flattened bristles in *Chiliophyllum*). In addition, there are important differences in the shape and anatomy of leaves that set *Cabreraea* apart from *Chiliophyllum* (*Cabreraea* has notably revolute leaves with a white tomentose pubescence on the abaxial surface, and has dorsiventral mesophyll (Figure 3J), while *Chiliophyllum* has entire, non-revolute leaf margins, notably glanduliferous on both surfaces, not tomentose, and has a homogeneous palisade mesophyll (Figure 3F). *Cabreraea* clearly belongs to the *Nardophyllum* + *Chiliotrichiopsis* clade, but it is unclear to which of those two genera it is more related (Bonifacino and Funk, unpublished data).

*Cabreraea andina* (Cabrera) Bonif. comb. nov. *Chiliophyllum andinum* Cabrera, *Notas Mus. La Plata, Bot.* 19(92): 193, 1959. TYPE: “[Argentina] San Juan, Quebrada de Gualcamayo, entre Chepical y El Salto, 13-

XII-1957, Ruiz Leal & F. Roig 18960" (holotype: LP 18870!).

FIGURES 9, 10, 45

**Shrubs** up to 2 m tall, subglobose; branches more or less loosely disposed, ascending, not ribbed, internodes short, up to 3 mm long. **Leaves** densely disposed, persistent, alternate, patent, 13–22 × 1.5–2 mm, linear-oblong, base truncate, petiole broadened towards the stem and slightly constricted above, apex obtuse, slightly uncinately reflexed, margins notably revolute, gland-dotted on both surfaces, densely tomentose on abaxial side, discolorous, coriaceous. **Capitula** solitary, terminal, shortly pedunculate, peduncles 3–8 mm long, heterogamous, radiate. **Involucre**s 7–8 × 7–8 mm, campanulate; phyllaries arranged in 3 to 5 series, coriaceous; outer phyllaries 5–6 × 2 mm, ovate-elliptic to oblong, apex acute, tomentose on abaxial surface, margins membranaceous, the outermost phyllaries with foliaceous apices; inner phyllaries 7–9 × 1.8–2 mm, oblong to narrowly elliptic, apex subacute to obtuse, with scanty tomentose pubescence, margins membranaceous notably broadened towards the apex. **Receptacles** convex, paleate; paleae 7–8 × 1.3–1.8 mm, boat-shaped, not embracing the achenes, narrowly elliptic, apex acute, villous and gland-dotted, margins membranaceous, fimbriate. **Ray florets** 9 to 13, pistillate; corollas yellow, radiate, tube 2.5–4 mm long, limb 5–7.5 × 2.5–3.5 mm, elliptic, 3-lobed; staminodes 2 to 4, reduced; style shafts ~ 4 mm long, base swollen, style branches 2.5–2.8 mm long, narrowly ovate, subequal in length. **Disk florets** 20 to 25, bisexual; corollas yellow, tubular, 5-lobed, gradually broadened towards the apex, tube 4.5–9 mm long, lobes 1.2–1.5 × 0.5–0.7 mm, triangular, without glandular trichomes; anther thecae 2–3 mm long, bases slightly sagittate, apical appendages ~ 1 × 0.3 mm, narrowly ovate, antheropodium present, swollen; style shafts 4–7 mm long, base swollen, style branches 2–2.5 mm long, narrowly elliptic, apex acute, collecting hairs short, on upper 1/3. **Achenes** 4.5–5.5 mm long, narrowly obovate, terete, 3- to 5-ribbed, densely villous, with very short glandular trichomes, carpodium present. **Pappus** 5–6.5 mm long, 2-seriate, composed of 42 to 53 awn-like terete bristles, slightly flattened towards the base, external series gradually thinner towards the apex, inner series slightly with awns thicker and barbellate towards the apex, slightly longer than outer series, some fused among each other at the base.

**Vernacular names:** Not known.

**Phenology:** Flowering specimens have been collected from November to February.

**Distribution:** Argentina, mountainous areas of La Rioja and San Juan provinces (Figure 10).

**Habitat:** Scrub dominated areas between 2,000 and 3,000 m in the transition of biogeographic provinces Monte and Puna (Cabrera and Willink, 1973).

**Uses:** Not known.

**Etymology:** The specific epithet *andina* refers to the Andes mountain range, where the species occurs.

**Additional specimens examined:** ARGENTINA. PROV. LA RIOJA. Dpto. Sarmiento. Entre El Peñón y Jagüé, proximalmente a 9 km del primero, Quebrada del Río El Peñón, 15-XII-1996, Biurrun & Molina 4574 (CORD); Quebrada de Ciénaga Grande, 3,100 m, 8-II-1949, Krapovickas & Hunziker 5872 (BAB, LP). PROV. SAN JUAN. Dpto. Angaco. Sierra Pie de Palo, subiendo por el Camino a Mogote de los Corralitos, en la Quebrada del Molle, ca. 2,500 m, 28-XI-1980, Hunziker et al. 23776 (CORD); *id.*, 28-XI-1980, Hunziker et al. 23774 (CORD), *id.*, ca. 2150 m, 28-XI-1980, Hunziker et al. 23747 (CORD); *id.*, ca. 1950–2050 m, 28-XI-1980, Hunziker et al. 23678 (CORD); *id.*, ca. 1,950–2,050 m, 28-XI-1980, Hunziker et al. 23690 (CORD); Sierra Pie de Palo, Camino a Mogote de los Corralitos, 1,800–2,100 m, 13-XI-1982, Kiesling & Saenz 4106 (K, SI); *id.*, 25-I-2001, Simón & Bonifacino 765 (LP). Dpto. Iglesia. Entre Cordón de Punilla y Leoncito, 8-XII-1915, Hosseus 1080 (CORD).

### ***Chiliophyllum* Phil. nom. cons.**

#### **Taxonomic History**

1862. Philippi describes a new species from Mendoza (Argentina): *Chiliophyllum densifolium*.
1900. Hoffmann describes a new species, *Chiliophyllum fuegianum*, based on material from Tierra del Fuego (in the present paper transferred to *Chiliotrichum*).
1935. As a result of changes on the validity of later homonyms after the International Botanical Congress at Cambridge in 1930, Rehder et al. present the list of later homonyms with recommendations on how they should be treated. These authors point out that, given the acceptance by most authors of *Chiliophyllum* DC. as a synonym of *Zaluzania* Pers., and the fact that *Chiliophyllum* Phil. has no synonyms, the name coined by Philippi must be renamed or conserved.
1937. Cabrera renames *Chiliophyllum* Phil., coining it *Phyllochilium* Cabrera, and creates the combination *Phyllochilium densifolium* (Phil.) Cabrera.

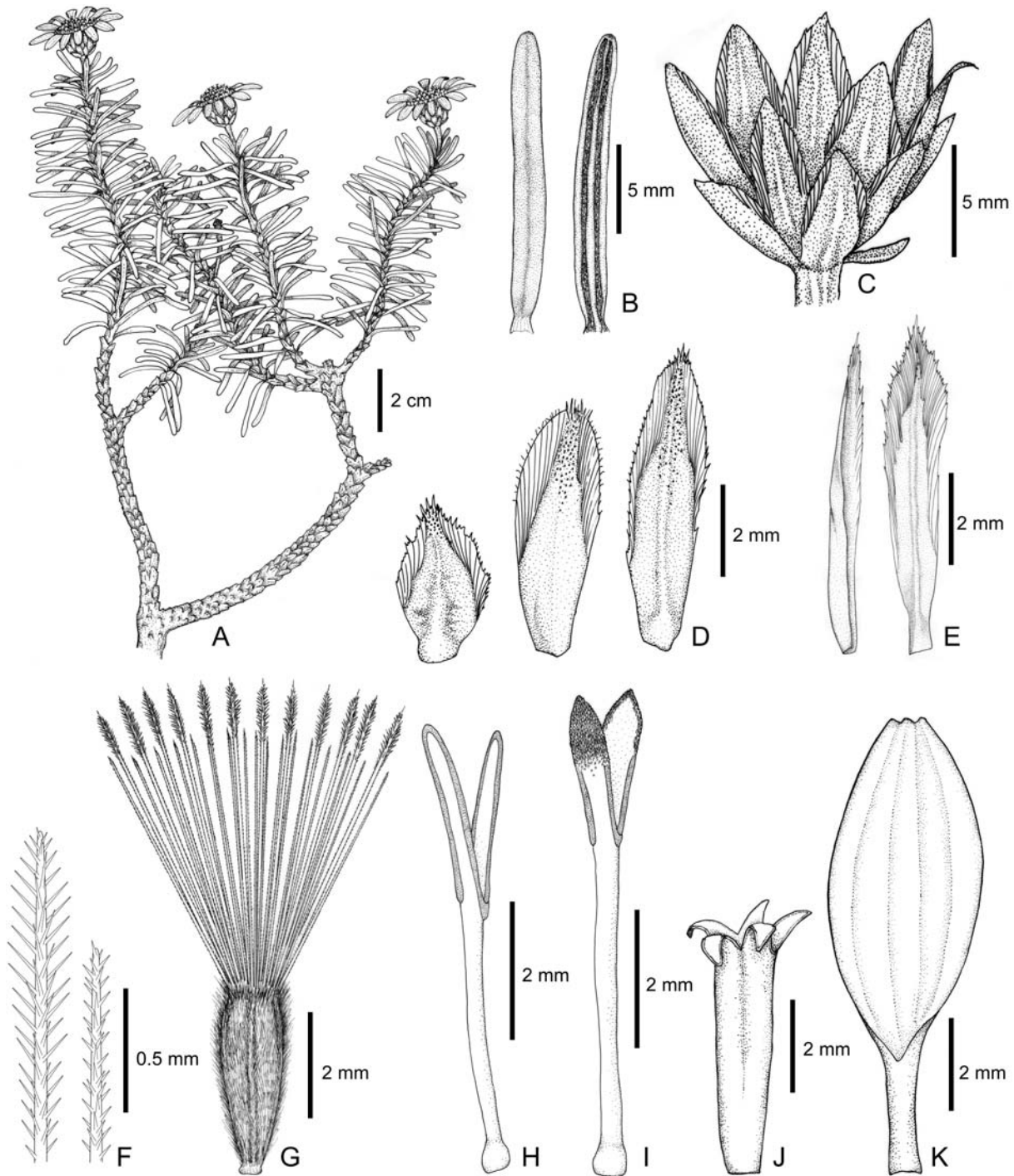


FIGURE 9. *Cabreraea andina* (Cabrera) Bonif. A. Habit. B. Leaves, adaxial view (left), abaxial view (right). C. Involucre. D. Outer to inner phyllaries (from left to right). E. Receptacular paleae, lateral view (left), dorsal view (right). F. Detail of terete bristle from pappus, inner series (left), outer series (right). G. Achene with pappus. H. Style of ray floret. I. Style of disk floret. J. Corolla of disk floret. K. Corolla of ray floret (A–K, Biurrun & Molina 4574, CORD).

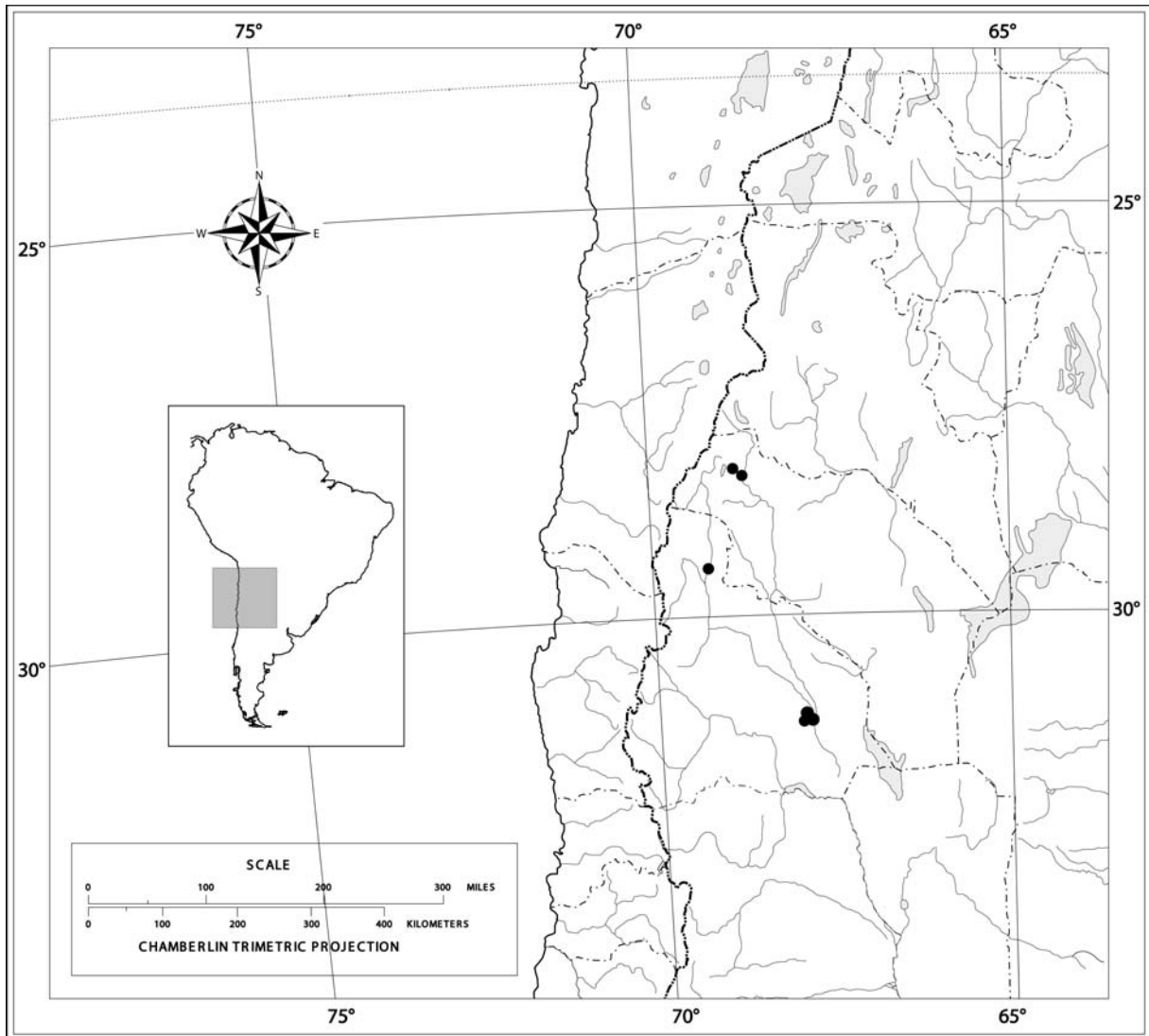


FIGURE 10. Geographic distribution of *Cabreraea andina* (Cabrera) Bonif.

1940. Green et al. present the list of *nomina conservanda*, officially granting *Chiliophyllum* Phil. the status of conserved generic name.
1944. Cabrera recognizes the legitimacy of *Chiliophyllum* Phil. as a conserved name, and places *Phyllochilium* Cabrera in the synonymy of *Chiliophyllum* Phil.
1959. Cabrera describes *Chiliophyllum andinum* from material of San Juan, Argentina (in the present paper placed in its own genus *Cabreraea* Bonif. gen. nov., herein described as new).

*Chiliophyllum* Phil. **nom. cons.**, Anales Univ. Chile 21: 397, 1862 (Non DC., Prodr. 5: 554, 1836).

*Phyllochilium* Cabrera, Notas Mus. La Plata, Bot. 2(16): 171, 1937. TYPE: *Chiliophyllum densifolium* Phil., Anales Univ. Chile 21(2): 397, 1862.

**Shrubs** subglobose, spreading; branches densely disposed, ascending to erect, not ribbed, notably gland-dotted sometimes tomentose. **Leaves** densely arranged, persistent, alternate, patent, obovate, base slightly attenuated, petiole

broadened towards the stem and constricted above, apex obtuse, margins flat (non-revolute), notably gland-dotted on both surfaces, rarely some tomentose pubescence on abaxial side on midvein and margins, midvein elevated on abaxial surface, concolorous, coriaceous. **Capitula** solitary, terminal, shortly pedunculate, heterogamous, radiate. **Involucre**s cylindrical; phyllaries arranged in 3 to 4 series; outer phyllaries elliptic, apex acute, gland-dotted throughout abaxial surface, chartaceous, margins membranaceous; inner phyllaries narrowly elliptic, apex acute, gland-dotted towards the apex, chartaceous, margins membranaceous. **Receptacles** slightly convex, partially paleate; paleae linear to narrowly elliptic, boat-shaped, not embracing the achenes, with a tuft of woolly trichomes towards the apex, apex acute, margins membranaceous-fimbriate. **Ray florets** 4 to 8, pistillate; corollas yellow, radiate, limb elliptic, 3-lobed; staminodes present; style base swollen, style branches oblong, subequal in length. **Disk florets** 7 to 12, bisexual; corollas yellow, tubular, 5-lobed, gradually broadened towards the apex, lobes triangular; anther thecae bases slightly sagittate, apical appendages triangular-ovate, anteropodium notably swollen; style base swollen, style branches oblong, apex obtuse, collecting hairs on upper 1/2. **Achenes** narrowly obovate, terete, 3- to 6-ribbed, gland-dotted, with short twin trichomes sparsely distributed, carpopodium present. **Pappus** 1-seriate, formed by linear scales, minutely scabrid along the margins.

**Etymology:** Name derived from Greek “*chilios*” (thousand), and “*phyllon*” (leaf), referring to the many leaves that characterize the genus.

*Chiliophyllum* is a monotypic genus restricted to the Andes of central Argentina in Mendoza province. It inhabits stony slopes in an ecotonal area between high Andean and Monte biogeographic provinces.

*Chiliophyllum* is characterized by its densely disposed and notoriously gland-dotted leaves with flat (non-revolute) margins, radiate capitula, partially paleate receptacles, yellow ray floret corollas, obtuse style branches and 1-seriate pappus.

Hitherto, *Chiliophyllum* was composed of three species, i.e.: *C. densifolium*, *C. fuegianum*, and *C. andinum*. However, based on morphological and molecular evidence (Karaman, 2006; Bonifacino and Funk, unpublished data), the polyphyletic nature of *Chiliophyllum* has been established. Besides vegetative characters that would set the three species apart, reproductive characters including the paleate nature of receptacle, type of pappus, color of the ray corollas, as well as the shape of style branches support splitting of the genus. As a result, *Chiliophyllum* is rendered monotypic, composed solely of *C. densifolium*.

Molecular evidence (Bonifacino and Funk, unpublished data) place *Chiliophyllum* in close proximity to *Lepidophyllum* and *Chiliotrichum*, as part of the strongly supported *Chiliotrichum* clade. These three genera share the partially paleate receptacle, styles branches obtuse, achenes mostly gland-dotted with no or very few twin trichomes towards the apex, and a pappus composed of linear scales.

*Chiliophyllum densifolium* Phil., Anales Univ. Chile 21(2): 397, 1862. *Phyllochilium densifolium* (Phil.) Cabrera, Notas Mus. La Plata, Bot. 2(16): 172, 1937. TYPE: “[Argentina] Portillo, lado de Mendoza, 1861–1862, W. Díaz [s.n.]” (holotype: SGO!; isotype: LP!).

(FIGURES 11, 12, 46)

**Shrubs** up to 1.7 m tall, subglobose, spreading; branches densely disposed, ascending to erect, glanduliferous to rarely tomentose; internodes shorter than 1 mm long. **Leaves** densely arranged, persistent, alternate, patent, 5–6 × 2–2.5 mm, obovate, base slightly attenuated, petiole broadened towards the stem and constricted above, apex obtuse, margins flat (non-revolute), notably gland-dotted on both surfaces, sometimes aseptate-flagellate trichomes on midveins and margins, midvein prominent abaxially, concolorous, coriaceous. **Capitula** solitary, terminal, shortly pedunculate, peduncles 1–1.5 mm long, heterogamous, radiate. **Involucre**s 7–8 × 4–5 mm, cylindrical; phyllaries arranged in 3 to 4 series; outer phyllaries 5 × 1–1.5 mm, elliptic, apex acute, gland-dotted throughout abaxial surface, chartaceous, margins membranaceous; inner phyllaries 5–6 × 1 mm, narrowly elliptic, apex acute, gland-dotted towards the apex, chartaceous, margin membranaceous. **Receptacles** slightly convex, partially paleate; paleae 3 to 10, 6–7 × 1 mm, linear to narrowly elliptic, boat-shaped, not embracing the achenes, with a tuft of woolly trichomes towards the apex, apex acute, margins membranaceous-fimbriate. **Ray florets** 4 to 8, pistillate; corollas yellow, radiate, tube ~ 2 mm long, limb 4.5–6 × 2–3 mm, elliptic, 3-lobed; staminodes 3 to 5, reduced; style shafts 2–3 mm long, base swollen, style branches 2–3 mm long, oblong, subequal in length. **Disk florets** 7 to 12, bisexual; corollas yellow, tubular, 5-lobed, gradually broadened towards the apex, tube 5–6 mm long, lobes 1.8–2.2 × 0.5–0.8 mm, triangular, gland-dotted abaxially; anther thecae 1.8–2 mm long, bases slightly sagittate, apical appendages 0.3–0.6 × 0.2–0.3 mm, triangular-ovate, antheropodium notably swollen; style shafts 3.5–5 mm long, base swollen, style branches 1–1.2 mm long, oblong, obtuse, collecting hairs on upper



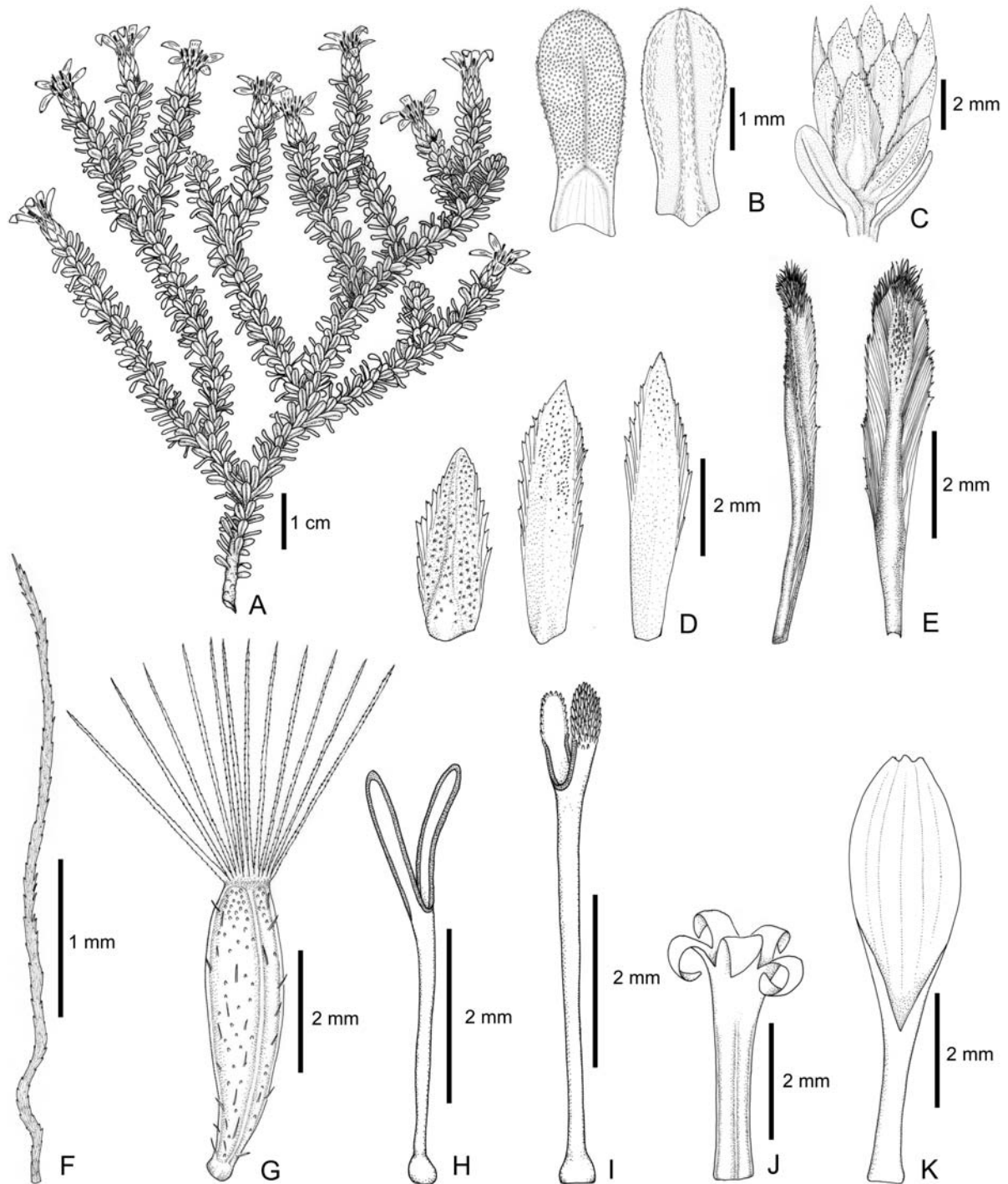


FIGURE 11. *Chliophyllum densifolium* Phil. A. Habit. B. Leaves, adaxial view (left), abaxial view (right). C. Involucre. D. Outer to inner phyllaries (from left to right). E. Receptacular paleae, lateral view (left), dorsal view (right). F. Detail of pappus scale. G. Achene with pappus. H. Style of ray floret. I. Style of disk floret. J. Corolla of disk floret. K. Corolla of ray floret (A–K, Bonifacino et al. 77, LP).

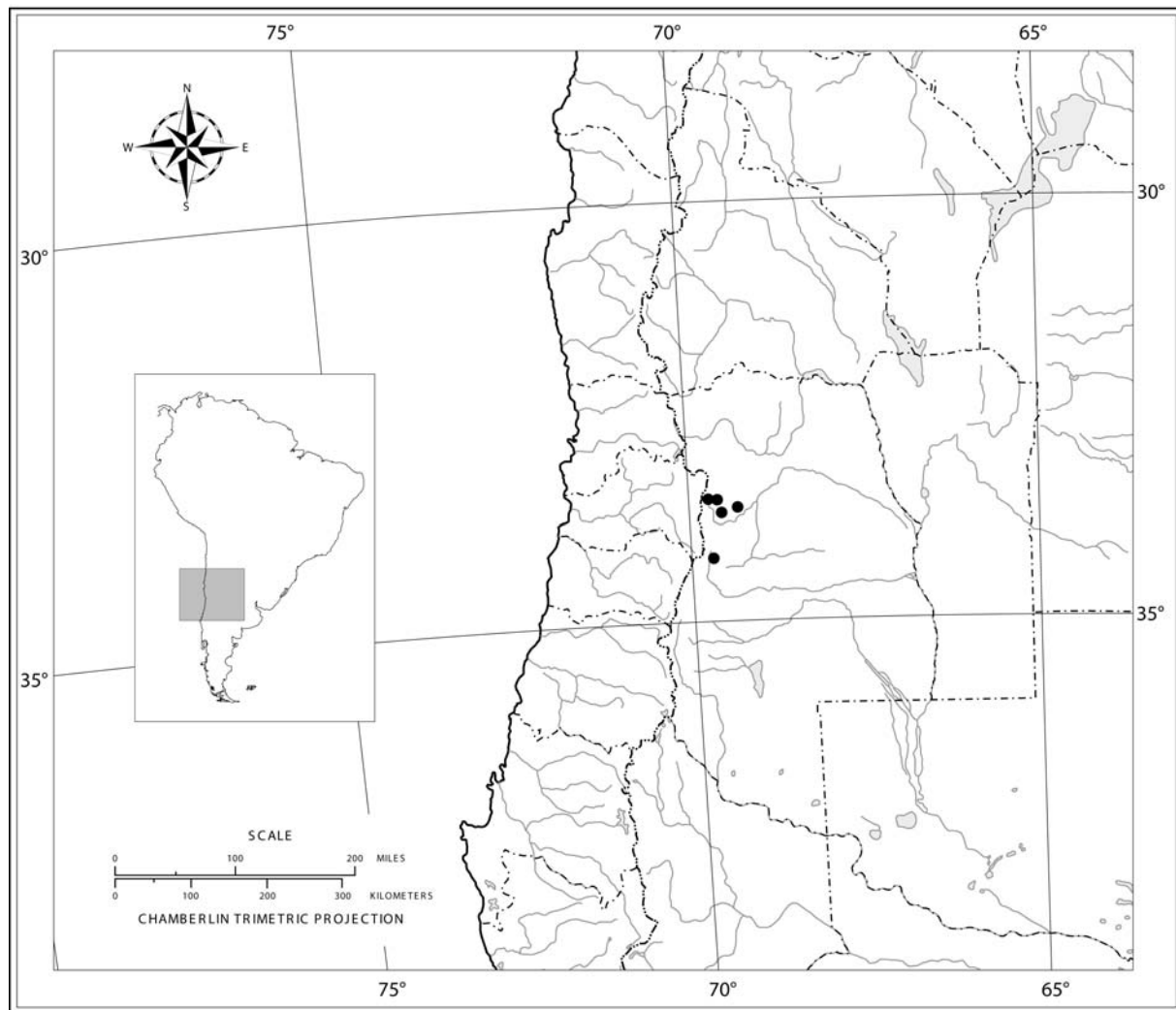


FIGURE 12. Geographic distribution of *Chiliophyllum densifolium* Phil.

1/2. **Achenes** 4–6 mm long, narrowly obovate, terete, 3- to 6-ribbed, gland-dotted, with short twin trichomes very sparsely distributed, carpodium present, conspicuous. **Pappus** 3–4 mm long, 1-seriate, composed of 50 to 60 linear scales, minutely scabrid along the margins.

**Vernacular names:** “Romero del piche” (*Boelcke 10137*, LP); “Romero Pichi” (*Ruiz Leal 7210*, LP), “Romero chico, Piche” (Roig, 2001). In mapuche tongue, “Piche” means small, and it is a name that is also applied to *Fabiana imbricata* Ruiz and Pav. (Roig, 2001).

**Phenology:** Flowering specimens have been collected from January to March.

**Distribution:** Argentina, endemic to the Andes of Central Mendoza (Figure 12).

**Habitat:** Rocky slopes of the ecotonal area between Monte and High Andes biogeographic provinces (Cabrera and Willink, 1973) at 2,000–2,600 m range. It occurs together with *Nassauvia axillaris* D. Don, *Berberis buxifolia* Lam., *Ephedra* spp., *Adesmia* spp. among others.

**Uses:** Diuretic, used with “mate”, infusion of *Ilex paraguariensis* A. St.-Hil. – (*Boelcke 10137*, LP); according to Roig (2001) it is used for “sandstone in kidneys, liver, etc., in infusions taken several times a day”.

**Etymology:** The epithet *densifolium* refers to the leaves densely arranged along the branches.

**Additional specimens examined:** ARGENTINA. PROV. MENDOZA. Dpto. San Carlos. Camino a Laguna Diamante, Refugio militar Gral. Alvarado, 19-I-1963, *Boelcke et al.*

10137 (BAB, LP); *id.*, 27-I-1950, *Cuezzo & Barkley 459* (NY); Arroyo de la Quebrada “Casa de Piedra”, 19-I-1952, *Serra 70* (F, LP); Quebrada del Paso de la Cruz de Piedra, 2,000 m, 20-I-1941, *Ruiz Leal 7279* (LP); *id.*, 18-I-1965, *Ruiz Leal 23530* (LP); Rincón de los leones (Estancia La Plancha), 18-I-1941, *Ruiz Leal 7210* (LP). **Dpto. Tunuyán.** S.loc, I-1950, *s.leg. s.n.* (BA 30237); al W de La Consulta, I-1950, *s.leg. s.n.* (BA 30240); Puesto Gendarmería Alférez Portinari, Arroyo Cascada de la Vieja, 20-I-1963, *Boelcke et al. 10094* (BAB, LP); Arroyo Grande, Puesto Gendarmería Nacional El Portillo, 12-I-2000, *Bonifacino et al. 77* (LP); Bella Vista, 2,400 m, 4-XII-1946, *Covas 18043* (SI); Ruta Prov. 94, Río Grande, Refugio Lemos, 2,250 m, 22-I-1985, *Hunziker et al. 11263* (SI); Rincón Colorado, 2,500 m, 8-III-1933, *Ruiz Leal 1281* (LP); Cordillera de Tunuyán, Vallecito, I-1917, *Sanzin 1313* (BA); Portillo de Tunuyán, 33° 37'S, 69° 36'W, 2,600 m, 27-I-2001, *Simón & Bonifacino 826* (LP); *id.*, 33° 37'S, 69° 35'W, 27-I-2001, *Simón & Bonifacino 817* (US).

### ***Chiliotrichiopsis* Cabrera**

#### **Taxonomic History**

1937. Cabrera describes *Chiliotrichiopsis* to include *Chiliotrichiopsis keidelii*, a new species based on material from Jujuy (Argentina).
1944. Cabrera transfers *Gutierrezia ledifolia* Griseb. to *Chiliotrichiopsis*, making the combination *C. ledifolia* (Griseb.) Cabrera.
1954. Cabrera (1954b) describes *Chiliotrichiopsis mendocina* (*Haroldia mendocina* in this paper) from material collected in northern Mendoza (Argentina).
2001. Nesom et al. describe *Chiliotrichiopsis peruviana*, a new species from southern Peru, based on material collected in Ayacucho.

*Chiliotrichiopsis* Cabrera, Notas Mus. La Plata, Bot. 2(16): 172, 1937. TYPE: *Chiliotrichiopsis keidelii* (i) Cabrera, Notas Mus. La Plata, Bot. 2(16): 172, 1937.

**Shrubs** more or less globose; branches densely disposed, ascending, 6- to 8-ribbed, branches gland-dotted and tomentose. **Leaves** dense to laxly arranged, persistent, alternate, oblong to linear or narrowly elliptic, base slightly attenuated, petiole broadened towards the stem and constricted above, apex obtuse to acute, margins notably revolute, densely tomentose on abaxial surface, discolorous, coria-

ceous or chartaceous. **Capitula** solitary (rarely arranged in 3 or 4 capitula capitulescences), terminal, sessile to shortly pedunculate, homogamous, radiate or discoid. **Involucre** cylindrical-campanulate, phyllaries arranged in 3 to 5 series; outer phyllaries with foliaceous apices, ovate to narrowly ovate, apex acute, tomentose and gland-dotted on abaxial surface, coriaceous; inner phyllaries oblong to narrowly elliptic, apex acute to subacute, tomentose and gland-dotted towards the apex, papery. **Receptacles** convex, paleate; paleae narrowly elliptic to narrowly ovate, embracing the achenes, with or without a small tuft of woolly trichomes towards the apex, apex acute to subacute, margins membranaceous, fimbriated or not. **Ray florets** (when present) 5 to 9 (–13), pistillate; corollas yellow, radiate, limb elliptic to oblong, 3-lobed; staminodes present; style base swollen, style branches linear-triangular, subequal in length. **Disk florets** (11–) 13 to 35, bisexual; corollas yellow, tubular, 5-lobed, broadened gradually or more or less abruptly from mid-length, lobes triangular; anther thecae base slightly sagittate, apical appendages ovate, antheropodium present, not swollen; style base swollen, style branches oblong to narrowly elliptic, apex acute, collecting hairs very short (papillae) on upper 1/2 to 4/5. **Achenes** obovate, terete, 3- to 5-ribbed, dense to laxly villose, gland-dotted, carpodium present. **Pappus** 1-seriate, composed of scales, divided towards the apex, margins fimbriate, somewhat fused among each other at the base.

**Etymology:** Derived from *Chiliotrichum* and Greek “opsis” (similar to), denoting the resemblance of these plants with those belonging to *Chiliotrichum*.

*Chiliotrichiopsis* is distributed along the Andes from southern Peru and Bolivia to La Rioja in Argentina. The genus comprises three species that live in high Andean and Puna biogeographic provinces (Cabrera and Willink, 1973) from 2,200 to 4,200 m.

*Chiliotrichiopsis* is characterized by the presence of external phyllaries with foliaceous apices, a paleate receptacle, gradually or more or less abruptly broadened disk corollas, and a 1-seriate pappus, made of flat pale-like elements, divided and fimbriate towards the apex. *Chiliotrichiopsis* can either have radiate or discoid heads (*Chiliotrichiopsis peruviana*).

*Chiliotrichiopsis* forms together with *Nardophyllum* and *Cabreraea*, a strongly supported polytomy that is difficult to characterize morphologically. The three genera are defined by rather contrasting morphological characters, and I have been unable to find a major morphological character uniting them. Future morphological research focused on microcharacters might yield some interesting results on this respect.

*Chilotrichiopsis mendocina*, a rather enigmatic species, only known from the type and a few recent collections made near the type locality, is here segregated from *Chilotrichiopsis* based on molecular evidence (Bonifacino

and Funk, unpublished data) but also on morphological grounds. It is placed in monotypic *Haroldia* (see discussion under *Haroldia*).

#### KEY TO THE SPECIES OF *CHILOTRICHIOPSIS* CABRERA

- 1a. Capitula discoid; achenes laxly villose throughout the whole surface. (Endemic to Peru: Ayacucho) . . . . . *C. peruwiana*  
 1b. Capitula radiate; achenes densely villose throughout the whole surface or villose pubescence mostly confined to upper part . . . . . 2  
 2a. Branches erect; leaves linear to narrowly elliptic or oblong, coriaceous; tuft of woolly trichomes absent from leaf axils; achenes densely villose throughout the whole surface, most twin trichomes ~ 1 mm long. (Northern Argentina and southern Bolivia) . . . . . *C. keidelii*  
 2b. Branches deflexed; leaves narrowly elliptic, chartaceous; tuft of woolly trichomes present in leaf axils; achenes villose pubescence mostly confined to the upper part, most twin trichomes not longer than 0.5 mm. (Restricted to Argentina: Catamarca and La Rioja) . . . . . *C. ledifolia*

*Chilotrichiopsis keidelii* (i) Cabrera, Notas Mus. La Plata, Bot. 2(16): 172, 1937. TYPE: “[Argentina, Prov. Salta] Quebrada de la Quesera, parte inferior, 3550 m, 12-II-1932, J. Keidel [s.n.]” (holotype: LP 2149!, isotype: LP 60261!).

(FIGURES 13, 14, 47)

**Shrubs** 0.5–1.5 m tall, more or less globose, densely branched; branches erect, 6- to 7-ribbed, tomentose and gland-dotted, internodes 1–3 mm long. **Leaves** densely disposed, persistent, alternate, patent, without a tuft of woolly trichomes on axils, 5–15(–25) × 1–2 (–4) mm, linear to narrowly elliptic or oblong, base attenuated, petiole broadened towards the stem and constricted above, apex obtuse, sometimes acute, margins revolute, densely tomentose, and gland-dotted on abaxial side, densely gland-dotted on adaxial side, discolorous, coriaceous. **Capitula** solitary, terminal, sessile, heterogamous, radiate. **Involucre**s 6–8 × 4–6 mm, cylindrical-campanulate; phyllaries arranged in 3 to 4 series; outer phyllaries 3–4 × 2–2.5 mm, ovate, apex acute, outermost ones with foliaceous apices, tomentose on abaxial surface, gland-dotted towards the apex, coriaceous, margins membranaceous; inner phyllaries 5.5–7 × 1.5–2 mm, oblong to narrowly elliptic, apex subacute, glabrous to slightly gland-dotted, papery, margins membranaceous. **Receptacles** convex, paleate; paleae 7.5–9 × 1–1.5 mm, narrowly obovate, embracing the achenes, apex acute, tomentose and gland-dotted towards the apex, with a tuft of woolly trichomes towards the apex, margins membranaceous. **Ray florets** 5 to 9 (–13), pistillate; corollas yellow, radiate, tube 2–2.5 mm long, limb 6–7 × 1.5–3 mm, narrowly elliptic to elliptic, 3-lobed; staminodes (2–) 3 or 4; style shafts 3–4

mm long, base not swollen, style branches ~2 mm long, triangular, subequal in length. **Disk florets** (11–)13 to 18 (–24), bisexual; corollas yellow, tubular, 5-lobed, gradually broadened towards the apex, tube 4–7 mm long, lobes 1.5–2 × 0.7 mm, triangular, gland-dotted abaxially; anther thecae 2.5–3.5 mm long, bases slightly sagittate, apical appendages 0.5–0.7 × 0.2–0.3 mm, ovate, antheropodium present, not swollen; style shafts 3–5 mm long, base slightly swollen, style branches 2–3 mm long, narrowly elliptic, apex acute, collecting hairs very short (papillae) on upper 3/4. **Achenes** 4–6 mm long, obovate, terete, densely villose and gland-dotted, twin trichomes ~1 mm long, carpodium present; ray florets achenes 3- to 4-ribbed, mainly villose along ribs; disk florets achenes 2 or 3(–4)-ribbed, uniformly villose throughout the achene surface. **Pappus** 2.5–3.5 (–5) mm long, 1-seriate, composed of (11–) 17–22 (–29) scales, divided towards the apex, margins lacinate towards the apex, fused to each other at the base.

**Vernacular names:** “Trompo” (*Venturi* 3012b, LP); “Tola” (*Venturi* 8724, SI); “Tola’e vizcacha”, “Tola tuni” (*Arenas and Martinez s.n.*, SI); “Tola viscacha” (*Claren* 11495, CORD); “legia ploma” (*Massy* 396, US).

**Phenology:** Flowering specimens have been collected from December to April.

**Distribution:** Argentina, common in Jujuy, Salta, and Tucuman, also found in Catamarca. In Bolivia in department of Potosí (Figure 14).

**Habitat:** Puna (Cabrera and Willink, 1973) from 2,200 to 4,300 m, grows on rocky mountain slopes with a poor vegetation cover or associated to tussock grasses formations (*Festuca* spp., *Stipa* spp., etc.). It is usually associated to other Puna shrubs like *Parastrephia* spp., not forming dense consociations.

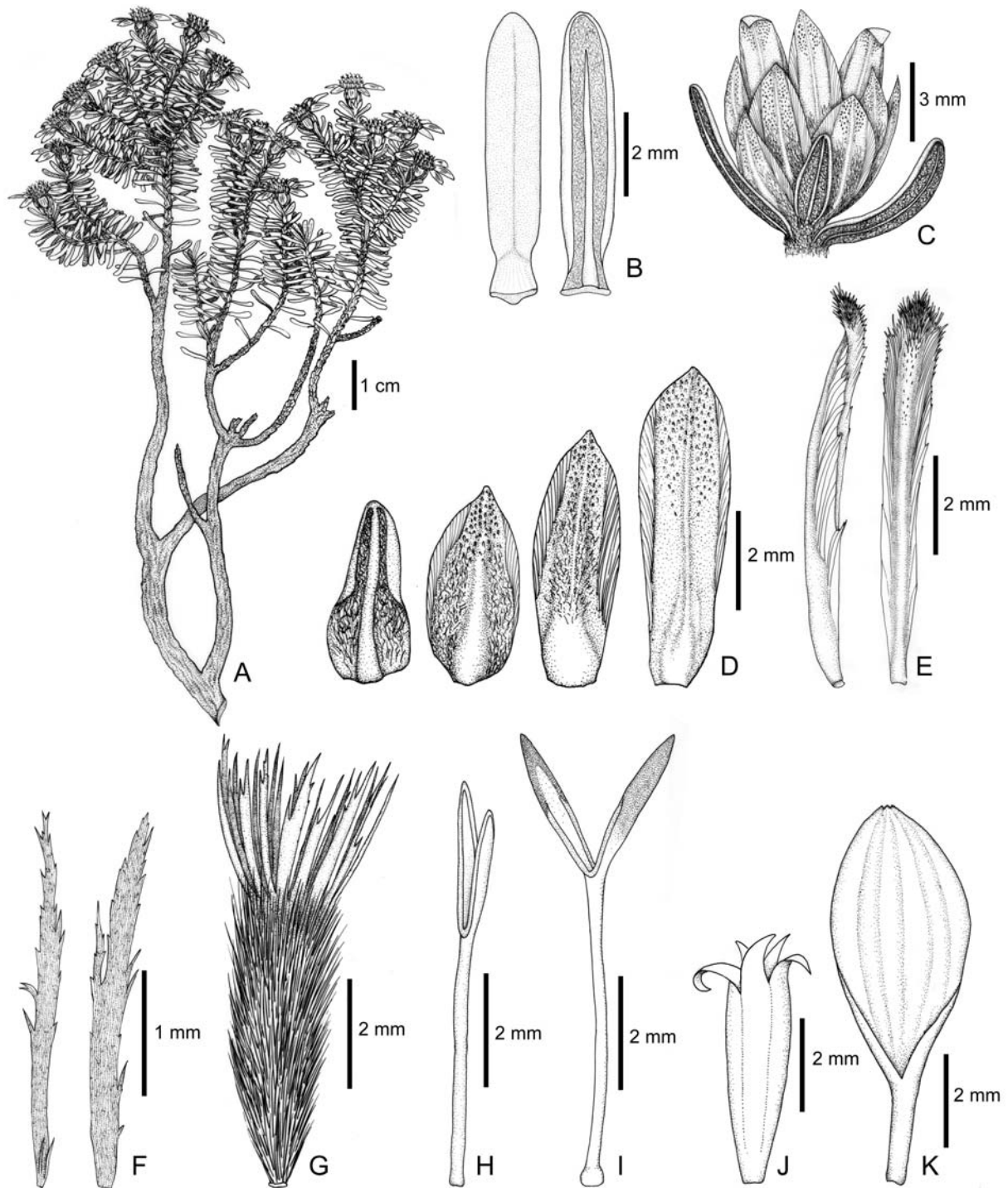


FIGURE 13. *Chilotrichiopsis keidelii* Cabrera. A. Habit. B. Leaves, adaxial view (left), abaxial view (right). C. Involucre. D. Outer to inner phyllaries (from left to right). E. Receptacular paleae, lateral view (left), dorsal view (right). F. Detail of pappus scales. G. Achene with pappus. H. Style of ray floret. I. Style of disk floret. J. Corolla of disk floret. K. Corolla of ray floret (A–K, Simón & Bonifacino 520, LP).

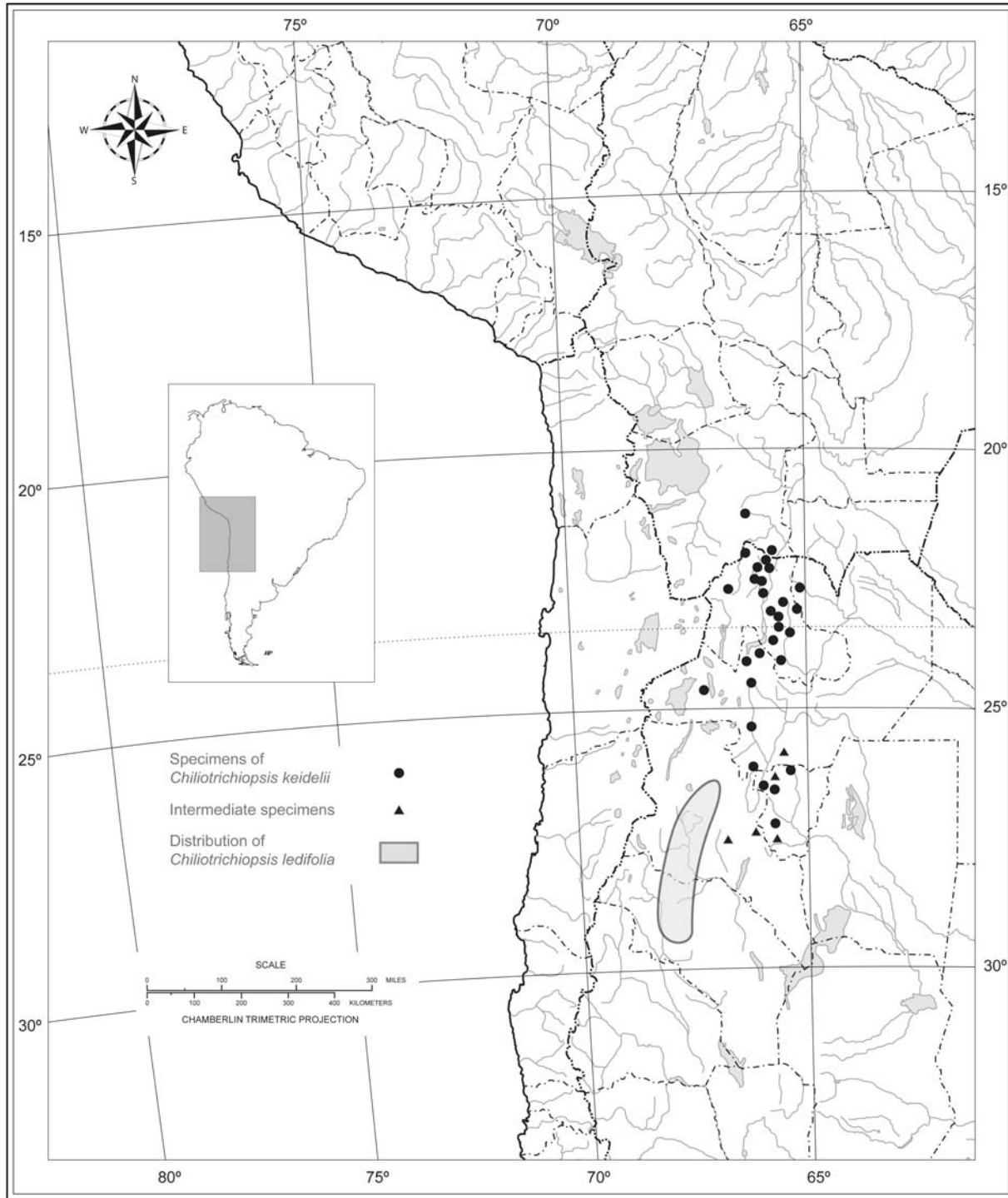


FIGURE 14. Geographic distribution of *Chilotrichiopsis keidelii* Cabrera. Note the distribution of the intermediate specimens (triangles), occupying an area more or less placed inbetween the known distributions for *Chilotrichiopsis keidelii* and *Chilotrichiopsis ledifolia*.

*Uses:* Used as firewood (Burkart and Troncoso 11898, LP).

*Etymology:* The specific epithet honors geologist Juan Keidel, collector of the type specimen.

*Note 1:* There are a few specimens that have characteristics that set them apart from typical *Chiliotrichiopsis keidelii*. In these specimens, most characteristics are like *Chiliotrichiopsis keidelii*, but the shape of the leaves and the pubescence of the achenes are similar to those of *Chiliotrichiopsis ledifolia*. These structurally intermediate specimens have been collected in an area also somewhat intermediate between the geographic distributions of the two species (Figure 14). I consider that given the lack of a complete series of morphologically intermediate populations between both species, they are clearly separate and are maintained as distinct specific entities here.

*Additional specimens examined:* ARGENTINA. PROV. CATAMARCA. Not defined Dpto. Region Andina, 1893, s. leg. (LP). Dpto. Andalgalá. Entre cerro de Las Capillitas y Muschaca, XI-1874, *Schickendantz* 39 (CORD). PROV. JUJUY. Dpto. Capital. Entre León y Nevado de Chañi, Las Cuevas, 3,000 m, III-1963, *Fabris et al.* 4079 (LP, CORD). Dpto. Cochinoca. Peñas de Ascalte, a 10 km aprox. al WSW de Cochinoca, 22° 46'S, 65° 57'W, 21-XII-1980, *Arcipnete s.n.* (NY, SI); Cochinoca, Cerro de la Candelaria, 22° 43'S, 65° 54'W, s. date, *Arenas & Martinez s.n.* (SI); Río Despensa, 4,200 m, 19-I-1971, *Boelcke et al. s.n.* (BAA 7146); Cochinoca, III-1975, *Cabezas* 21 (SI); *id.*, III-1975, *Cabezas* 12 (SI); Abra Pampa, 8 km al S, 3,700 m, 30-I-1971, *Ellenberg* 4282 (US). Dpto. Humahuaca. Tres Cruces, III-1929, *Budin* 10 (BA); El Aguilar, 4,300 m, 14-I-1948, *Cabrera* 9245 (BAB, LP); Mina Aguilar, 4,000 m, 18-II-1970, *Cabrera & Frangi* 20662 (LP); Mina Aguilar, 4,000 m, 11-II-1968, *Cabrera et al.* 18955 (LP); *id.*, 4,200 m, 23-II-1963, *Cabrera et al.* 15463 (LP, NY); Tres Cruces, Puente del Diablo, 4,000 m, 21-II-1959, *Fabris & Marchionni* 1728 (LP); *id.*, 4,000 m, 21-II-1959, *Fabris & Marchionni* 1748 (LP); Mina Aguilar, Arroyo Padrioc, 3,800 m, XII-1964, *Fernandez s.n.* (BAA 4760); Sierra del Mal Paso, entre el pie de la sierra y el cerro Tocante, I-1988, *Fernandez s.n.* (BA 76676); *id.*, I-1988, *Fernandez s.n.* (BA 76677); Mina Aguilar, vega a 4 km al N del Molino, 4,000 m, III-1983, *Hunziker* 10549 et al. (SI); 19 km al E de Humahuaca, ruta prov 73, 5-V-1999, *Krapovickas & Seijo* 47710 (NY); Mina Aguilar, Río Despensas, 4,100 m, 19-I-1971, *Ruthsatz s.n.* (BAA 9987); Mina Aguilar, 4,000–4,300 m, 7-I-1950, *Schwabe* 441 (BAB); Tres Cruces, 3,820 m, 11-I-1950 *Schwabe* 482 (BAB); Mina Aguilar, arriba del molino, 4,300–4,400 m, 16-I-1953, *Sleumer* 3397 (LIL); Tres Cruces, 2-II-1944, *Soriano* 652 (SI); Sierra de Aguilar, 4,000 m,

29-III-1929, *Venturi* 8724 (SI, US). Dpto. Rinconada. Mina Pirquitas, 4,200 m, 20-I-1948, *Cabrera* 9344 (BAB, LP); camino a Abra-Pampa, 4,160 m, 24-I-1971, *Boelcke et al. s.n.* (BAA 7229). Dpto. Santa Catalina. El Alto, W de Santa Catalina, 4,000 m, 21-I-1966, *Cabrera et al.* 17677 (LP, BAA); Mina Perdida, ca. 4,100 m, 25-26-I-1901, *Claren* 11495 (CORD). Dpto. Susques. Al S de Coranzuli, 3937 m, 23°1'41"S, 66°24'11"W, 6-I-2005, *Bonifacino & Muttoni* 1448 (US). Dpto. Tilcara. San Gregorio, above Tilcara, 12,000 ft, 11-II-1939, *Balls* 5996 (K, US); subiendo la Quebrada de Huichaira-Pocollio, 3,210 m, 24-I-1999, *Beck* 26507 (US); Huacalera, Quebrada de Abra de La Cruz, 3,900 m, 2-III-1955, *Cabrera* 12145 (LP); Alto de la Laguna Negra, 4,100 m, 3-III-1961, *Cabrera & Hernández* 13989 (LP); Pampa Corral, 3,800 m, 18-I-1966, *Fabris et al.* 6380 (LP, BAA); Sisilera, 10-I-1974, *Kiesling et al.* 376 (LP); Cimmarrones (cerca de Co. Mudana), 16-I-1974, *Kiesling et al.* 390 (LP); Cerro al E de Huacalera, 3,900 m, 20-III-1967, *Löerner* 395 (LP); Cerro Alto de Lima, W de Huacalera, 4,200 m, 27-III-1967, *Löerner* 636 (LP); Tilcara, arriba de San Gregorio, 3,850 m, 29-XII-1952, *Sleumer* 3127 (SI); 28 km W of junction routes 9 and 52, 3,350 m, 20-II-1993, *Stuessy & Morales* 12980 (LP). Dpto. Tumbaya. camino al Abra de Lipan, 3,900 m, III-1979, *Cabrera et al.* 30553 (SI); Subida al Abra de Lipan, 3,800 m, 15-II-1980, *Cabrera et al.* 31657 (SI); Purmamarca a Abra de Pibes, 17-II-1937, *Castellanos s.n.* (LP, BA 20202); Tumbaya, camino de Purmamarca a Abra de Lipán, 3,900 m, 14-II-1985, *Kiesling et al.* 5230 (SI); Peñarco, Volcan, II-1931, *Pastore s.n.* (BA 31/84); desde Purmamarca a intersección con ruta 40, 3,450 m, 5-I-2001, *Simon & Bonifacino* 519 (LP); camino a Lipan, a aprox. 30 km de Purmamarca, 23°42'S, 65°38'W, 3950 m, 5-I-2001, *Simon & Bonifacino* 520 (LP); San Antonio de los Pibes, 3,850 m, 5-I-1953, *Sleumer* 3222 (SI); 28 km W of Purmamarca on gravel road, Cuesta de Lipán, 3,600 m, 21-II-1993, *Stuessy & Morales* 12986 (LP). Dpto. Valle Grande. Caspalá, cerros a 3,200 m, 1-III-1940, *Burkart & Troncoso* 11898 (SI, LP); Caspalá, 3,000 m, 25-XII-1962, *Fabris* 3613 (LP); Abra Colorada, 20 km W Caspalá, 4,200 m, 26-XII-1962, *Fabris* 3645 (LP); Ciénaga Grande, entre Abra Colorada y Caspalá, 11-III-1967, *Fabris & Crisci* 6884 (LP); Caspalá, 12-III-1967, *Fabris & Crisci* 6995 (LP). Dpto. Yavi. Cuesta de Toquero, camino a Santa Catalina, 4,000 m, 31-I-1943, *Cabrera* 7797 (BAB, LP); Cerrillos a Escaya, 6-II-1937, *Castellanos s.n.* (LP, BA 20212). PROV. SALTA. Dpto. Cachi. Cerro de Cachi, I-1897, *Spegazzini s.n.* (ex LPS 17184 in LP); Cerro de Cachi, I-1897, *Spegazzini s.n.* (ex LPS 17179 in LP). Dpto. Cafayate. Sierra de los Quilmes, 29-I-1943, *Castellanos s.n.* (BA 47093). Dpto. Caldera. Alrededores del Nevado

del Castillo, 19-23-III-1873, *Lorentz & Hieronymus* 92 (CORD); Subida al Nevado del Castillo, Tres Lagunas-Las Cuevas, 4,100–4,200 m, 16-III-1952, *Sleumer & Verveer* 3011 (LP). **Dpto. Iruya.** Quebrada de Iruya, 3,750 m, 27-III-1972, *Suti & Montaña s.n.* (LP). **Dpto. Los Andes.** Quebrada de Polvorillas, 4,000 m, 2-II-1944, *Cabrera* 8393 (LP); *id.*, 4,300 m, 11-II-1945, *Cabrera* 8635 (LP, US); Región de La Puna, camino a Mina Concordia, 23-I-1949, *Cabrera & Schwabe* 55 (BAB, LP). **Dpto. Poma.** Ruta 51, punto más alto de Abra de Muñano, 4,050 m, 23-I-1989, *Arriaga et al.* 504 (BA); Abra de Muñano, 4,200 m, 9-II-1946, *Cabrera* 8986 (LP). **Prov. TUCUMÁN. Dpto. Chicligasta.** Ea Santa Rosa, 4,000 m, 18-I-1927, *Venturi* 4757 (LP, SI). **Dpto. Tafi del Valle.** Abra de Lara, 4,000 m, II-1903, *Baer* 136 (BAB); Cuesta de Los Cardones, 3,500 m, 30-I-1933, *Burkart* 5225 (LP, SI); Quebrada del Barón, Los Planchones, 3,300 m, 7-II-1958, *Fabris* 1380 (LP); Cerro Muñoz, ladera oriental, 14-II-1958, *Fabris* 1548 (LP); Cerro El Negrito (ladera SE) +/- 3,800 m, 26°37'S, 65°44'W, 19-I-1964, *Giusti et al. s.n.*, (BAA 3861); Cerro Muñoz, 3,300–4,000 m, 22-II-1905, *Lillo* 4201 (US); Cañada del Alegau, 3,800 m, 5-IV-1926, *Schreiter* 4252 (NY); El Infiernillo, Cerro El Negrito, 26°43'S, 65°46'W, 3,200 m, 5-I-2001, *Simon & Bonifacino* 443 (LP); Quebrada del Chorro, 3,100 m, 23-IV-1926, *Venturi* 4105 (LP, SI); Sierra del Cajón, 3,400 m, 27-IV-1926, *Venturi* 6229 (US); Cumbres Calchaquíes, km 93, entre Zanja de los Cardones y Alto del Tío, 2,800 m, 15-XII-1969, *Verveer* 7635 (LIL); Sierras Calchaquíes, Peñas Azules, 19-III-1974, *Zardini* 330 (LP). **Dpto. Tafi Viejo.** La Cienaguita, Cumbres Calchaquíes, 2,200 m, 4-I-1913, *Rodríguez* 1240 (LP). **Dpto. Trancas.** Trancas, Cuesta del Arca, XII-1896, *Spegazzini s.n.* (ex LPS 17186 in LP). **BOLIVIA. NOT DEFINED DPTO.** Buen Retiro, 4,000 m, XII-1901, *Cárdenas* 46 (LP). **Dpto. POTOSÍ.** Tupiza, 3,700 m, II-1904, *Fiebrig* 3003 (BM); Salitre pr. Yavi in Argentina, 6-I-1902, *Fries* 1043 (CORD); 8 km al E de Chuqui, 4,000 m, 30-VII-1999, *Massy* 396 (US).

*Additional specimens examined with intermediate characteristics between *Chiliotrichiopsis keidelii* and *Chiliotrichiopsis ledifolia*:* ARGENTINA. **Prov. CATAMARCA. Not defined Dpto.** Vayas altas, alpen von Catamarca, 9,000–11,000 ft, I-1872, *Lorentz* 609 (CORD). **Dpto. Ambato.** Sierra de Ambato, Falda E, subiendo desde El Rodeo hacia el Cerro Manchado, 2,700–2,900 m, 23-25-II-1967, *Hunziker* 19162 (CORD); Sierra de Ambato (falda E, frente a El Rodeo), Los Cajones, ~3,100 m, 15-17-XII-1971, *Hunziker* 21667 (CORD); Sierra de Ambato, Falda E, subiendo desde El Rodeo hacia el Cerro Manchado, 2,600–2,700 m, 23-25-II-1967, *Hunziker* 19125 (CORD); *id.*, 2,700–2,900 m, 23-25-II-1967,

*Hunziker* 19179 (CORD); *id.*, 2,900–3,100 m, 23-25-II-1967, *Hunziker* 19286 (CORD); *id.*, rumbo a Casa de Cubas, 3,100–3,200 m, 28-30-I-1968, *Hunziker & Di Fulvio* 19737 (CORD, F); *id.*, rumbo a Casa de Cubas, 3,000 m, 28-30-I-1968, *Hunziker & Di Fulvio* 19821 (CORD). **Dpto. Andalgalá.** Candado, 6-XII-1896, *Bruch s.n.* (US); El Candado, 2,700 m, II-1915, *Jørgensen* 1272 (BA, BAB, SI, US). **Prov. SALTA. Dpto. Guachipas.** Pampa Grande, XII-1897, *Spegazzini s.n.* (ex LPS 17187 in LP). **Prov. TUCUMÁN. Dpto. Chicligasta.** Estancia Las Pavas, en faldas de cerro, 2,650 m, 15-III-1924, *Venturi* 3012b (BAB, LP); Estancia Las Pavas, Puesto La Cascada, 2,600 m, 10-III-1924, *Venturi* 3012 (NY, SI); Estancia Santa Rosa, 3,000 m, 2-XII-1926, *Venturi* 4639 (BA, BAB, F, LP, SI); Estancia Santa Rosa, 4,000 m, 18-I-1927, *Venturi* 4757 (BA, BAB). **Dpto. Tafi del Valle.** Abra de Lara, 4,000 m, II-1902, *Baer s.n.* (BA 24906); Sierras Calchaquíes, Peñas Azules, 3,400 m, s. date, *Burkart* 5210 (LP, SI); Cumbres Calchaquíes, Quebrada del Barón, 3,400 m, 26°45'S, 65°46'W, 16-III-1984, *Gómez-Soza & Múlgura* 244 (SI); Lara, 3,200 m, 25-I-1912, *Rodríguez* 275 (BA, SI). **Dpto. Tafi Viejo.** Alto de Anfamá, I-1943, *Descole* 1618 (BAB, BM).

*Chiliotrichiopsis ledifolia* (Griseb.) Cabrera, *Notas Mus. La Plata, Bot.* 9(46): 244, 1944. *Gutierrezia ledifolia* Griseb., *Pl. Lorentz.*: 125, 1874. TYPE: “[Argentina, Prov. Catamarca] Vayas altas, alpen von Catamarca, 9,000–11,000 ft, mitte Jan 1872, *Lorentz* 610” (lectotype: CORD!, isolectotype: CORD!, designated by Cabrera, 1944).

(FIGURES 15, 16, 48)

**Shrubs** up to 1.5 m tall, more or less globose, spreading, densely branched; branches deflexed, 6- to 7-ribbed, gland-dotted, slightly tomentose, internodes 3–7 mm long. **Leaves** laxly disposed, persistent, alternate, ascending with a tuft of woolly trichomes on leaves axils, 17–30 × 2–4 mm, narrowly elliptic, base attenuated, petiole broadened towards the stem and constricted above, apex acute, margins revolute, tomentose on abaxial side, and laxly tomentose on adaxial side, gland-dotted on both surfaces with prominent vesicular capitate glandular trichomes, discolorous, chartaceous. **Capitula** solitary, terminal, pedunculate, peduncles 5–20 mm long, heterogamous, radiate. **Involucre**s 7–8 × 4–5 mm, cylindrical-campanulate; phyllaries arranged in 3 to 4 series; outer phyllaries 5–6 × 1.5–1.7 mm, narrowly ovate, apex acute, outermost ones with foliaceous apices, tomentose and



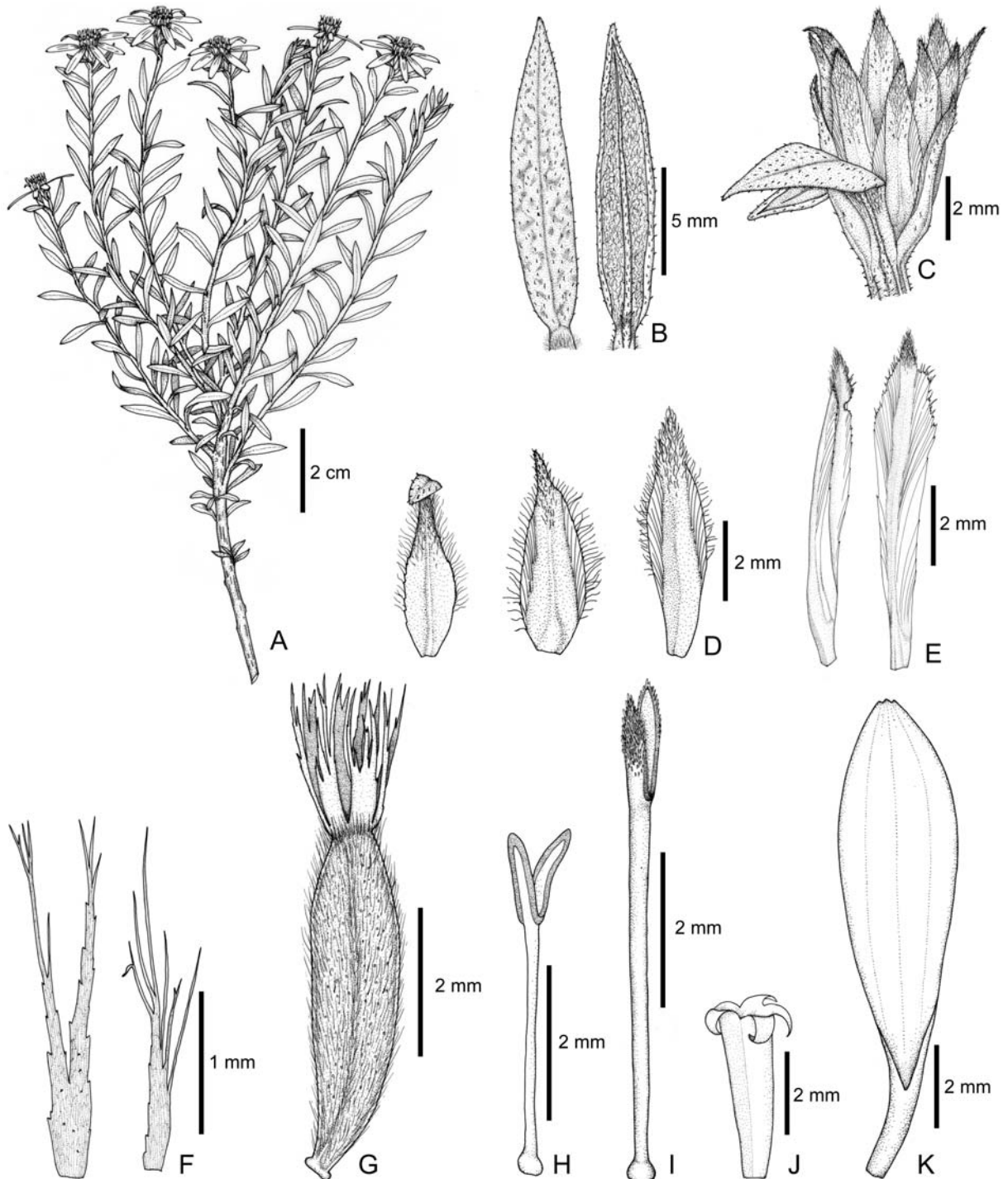


FIGURE 15. *Chilotrichiopsis ledifolia* (Griseb.) Cabrera. A. Habit. B. Leaves, adaxial view (left), abaxial view (right). C. Involucre. D. Outer to inner phyllaries (from left to right). E. Receptacular paleae, lateral view (left), dorsal view (right). F. Detail of pappus scales. G. Achene with pappus. H. Style of ray floret. I. Style of disk floret. J. Corolla of disk floret. K. Corolla of ray floret (A–K, Simón & Bonifacino 725, LP).

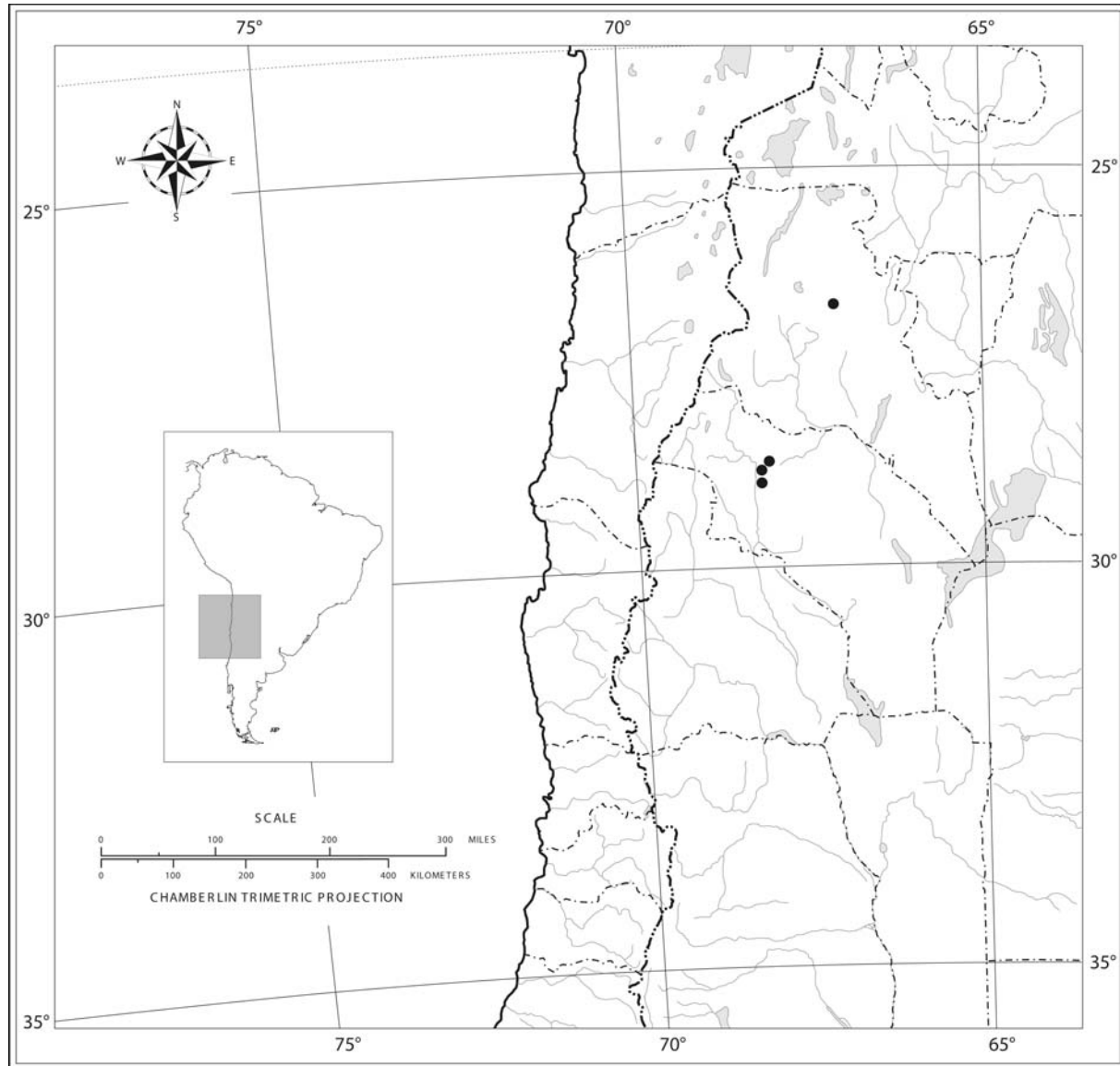


FIGURE 16. Geographic distribution of *Chiliotrichiopsis ledifolia* (Griseb.) Cabrera.

gland-dotted on abaxial surface, coriaceous, margins membranaceous, fimbriate; inner phyllaries 6–7 × 1.7–2 mm, oblong to narrowly elliptic, apex acute, with a small tuft of woolly trichomes towards the apex, tomentose and gland-dotted towards the apex, papery, margins membranaceous, fimbriate. **Receptacles** slightly convex, paleate; paleae 7–8 × 1.5 mm, narrowly obovate, embracing the achenes, apex acute, tomentose and gland-dotted towards the apex, margins membranaceous, fimbriate towards the apex. **Ray florets** 7 to 8, pistillate; corollas yellow, radiate, tube 1–2 mm long, limb 6–9 × 3–4 mm, narrowly elliptic, 3-lobed; staminodes 2 to 3; style shafts

4–5 mm long, base swollen, style branches ~2 mm long, triangular, subequal in length. **Disk florets** 13 to 19, bisexual; corollas yellow, tubular, 5-lobed, gradually broadened towards the apex, tube 4.5–7 mm long, lobes 1.5–2 × 0.6–0.8 mm, triangular, gland-dotted abaxially; anther thecae 2.3–3.0 mm long, bases slightly sagittate, apical appendages 0.5–0.8 × 0.2–0.3 mm, ovate-triangular, antheropodium present, swollen; style shafts 4–6 mm long, base slightly swollen, style branches 2–2.3 mm long, triangular ovate, apex acute, collecting hairs short on upper 1/2 to 3/4. **Achenes** similar in disk and ray florets, 3.5–5 mm long, obovate, terete, 3- to 5-ribbed, laxly vil-

lose and gland-dotted, twin trichomes denser towards the apex, twin trichomes shorter than 0.5 mm long. **Pappus** 1.5–2.5 mm long, 1-seriate, composed of 19 to 25 scales, triangular ovate, divided towards the apex, margins lacinate towards the apex, somewhat fused to each other at the base.

**Vernacular names:** Not known.

**Phenology:** Flowering specimens have been collected from January to February.

**Distribution:** Argentina, restricted to central mountains in Catamarca and La Rioja (Figure 16).

**Habitat:** Puna and Puna-like vegetation (Cabrera and Willink, 1973) from 2,200 to 3,300 m, grows associated to tussock grasses formations (*Festuca* spp., *Stipa* spp., etc.), isolated or forming dense consociations.

**Uses:** Not known.

**Etymology:** The specific epithet is derived from Greek “*ledon*”, shrub belonging to genus *Cistus* from Cyprus, from which a particular kind of resin is obtained. Apparently, the name would refer to the similarity between the shape and smell of the leaves of *Chiliotrichiopsis ledifolia* with those of *Cistus*.

**Note 1:** At CORD there are two specimens collected by Lorentz (*Lorentz 609* and *Lorentz 610*) whose labels perfectly match the type locality mentioned in the protologue of *Gutierrezia ledifolia* and that were identified as such by Grisebach (1874). When transferring the species to *Chiliotrichiopsis*, Cabrera (1944) noticed that only one of those specimens (*Lorentz 610*) corresponded with *Chiliotrichiopsis ledifolia* and was selected as lectotype. The other specimen, *Lorentz 609*, clearly belongs to *C. keidelii*, although it presents some characteristics intermediate between this species and *C. ledifolia* (see Note 1 under *C. keidelii*).

**Additional specimens examined:** ARGENTINA. PROV. CATAMARCA. **Dpto. Belén.** Las Bayas, en cerros al W de Granadillas, 2,800 m, 26-I-1952, *Sleumer & Verveorst 2566* (LP, US). PROV. LA RIOJA. **Dpto. Chilecito.** Río del Oro, I-1912, *Bodenbender 16267* (CORD); proximidades de Mina El Oro, 29° 6' 49.9"S, 67° 40' 21.7", 2222 m, 3-XII-2006, *Bonifacino et al. 2847* (US); W Sierra de Famatina, Mina El Oro, 3,200 m, 7-II-1956, *Calderón 1141* (BAA, CORD, SI); Camino a Mina El Oro, 10-I-1959, *Dawson & Guarrera 3132* (LP, BA); Chilecito, Camino a Mina El Oro, 29° 06'S, 67° 42'W, 2,300–2,500 m, 23-I-2001, *Simon & Bonifacino 725* (LP); *id.*, 23-I-2001, *Simon & Bonifacino 740* (LP). **Dpto. Famatina.** Sierra Famatina, entre la Mina Teresa y la altura del Espíritu Santo, 25-I-1879, *Hieronymus & Niederlein 787* (CORD); Sierra Famatina, en las cercanías del Pie de la Cuesta, más arriba del Vallecito, 16-20-I-1879, *Hieronymus & Niederlein 765* (CORD); Sierra

de Famatina, arriba del Vallecito: La Hoyada, ~2,500 m, 10-16-I-1908, *Jiménez 14948* (CORD); *id.*, 10-16-I-1908, *Jiménez 14966* (CORD); Sierra de Famatina, La Vega de la Hoyada, 22-I-1908, *Jiménez 15132* (CORD); Sierra de Famatina, arriba de Vallecito, La Hoyada, ca. 2,500 m, 31-I-1908, *Kurtz 15001* (CORD).

***Chiliotrichiopsis peruviana*** G. L. Nesom, H. Rob. and A. Granda, *Brittonia* 53: 430, 2001. TYPE: “Peru. Ayacucho: prov. Puquio, Puente Torre Muestre at 76 km on rd. Nazca-Puquio, sep quebrada, N facing, 3,600 m, 2-XII-1997, M. Weigend & H. Förther 97/676” (holotype: US!, isotypes: USM, MSB-n.v.; isoparatype: “Perú, Dpto. Ayacucho, Prov. Lucanas, carretera Nazca-Puquios, 7-VIII-1997, Flores et al. 2109”: LP!).

(FIGURES 17, 18, 49)

**Shrubs** up to 1.5 m tall, more or less globose, lax to densely branched; branches erect, 6- to 8-ribbed, ribs discontinuous more or less evident, tomentose and gland-dotted, internodes 1–5 mm long. **Leaves** laxly disposed, persistent, alternate, patent, without a tuft of woolly trichomes on axils, 15–45 (–50) × 1.5–2.5 mm, linear, base attenuated, petiole broadened towards the stem and constricted above, apex obtuse, recurved and slightly mucronate, margins revolute, densely tomentose and gland-dotted on abaxial side, densely gland-dotted on adaxial side, discolorous, coriaceous. **Capitula** solitary or more often arranged in capitulescences of 2 to 3 capitula, terminal, pedunculate, peduncles up to ~8 mm long, homogamous, discoid. **Involucres** 10–12 × 8–10 mm, campanulate; phyllaries arranged in 4 to 5 series; outer phyllaries 6 × 2–3 mm, narrowly ovate, apex acute, coriaceous, tomentose and gland-dotted on abaxial surface, margins membranaceous; inner phyllaries 7–10 × 2.5–3 mm, narrowly elliptic, apex acute, gland-dotted towards the apex, papery, margins membranaceous, broad. **Receptacles** convex, paleate; paleae 10–11 × 1–2 mm, narrowly elliptic, embracing the achenes, apex acute-subulate, gland-dotted towards the apex, margins membranaceous. **Florets** 30 to 35, bisexual; corollas yellow, tubular, 5-lobed, more or less abruptly broadened from mid-length, tube ~3 mm long, throat 2–3 mm long, lobes 1.5–2.2 × 0.8–1 mm, triangular, gland-dotted abaxially; anther thecae 2.3–2.5 mm long, bases slightly sagittate, apical appendages 0.7–1 × 0.5 mm, ovate, antheropodium present, not swollen; style shafts 4–6 mm long, base notably swollen, style branches 2.7–3.2 mm long, oblong, apex acute, collecting hairs very short (papillae) on upper 3/4 to 4/5. **Achenes** 6–8 mm long, narrowly obovate, terete, 3- to 4-ribbed, laxly

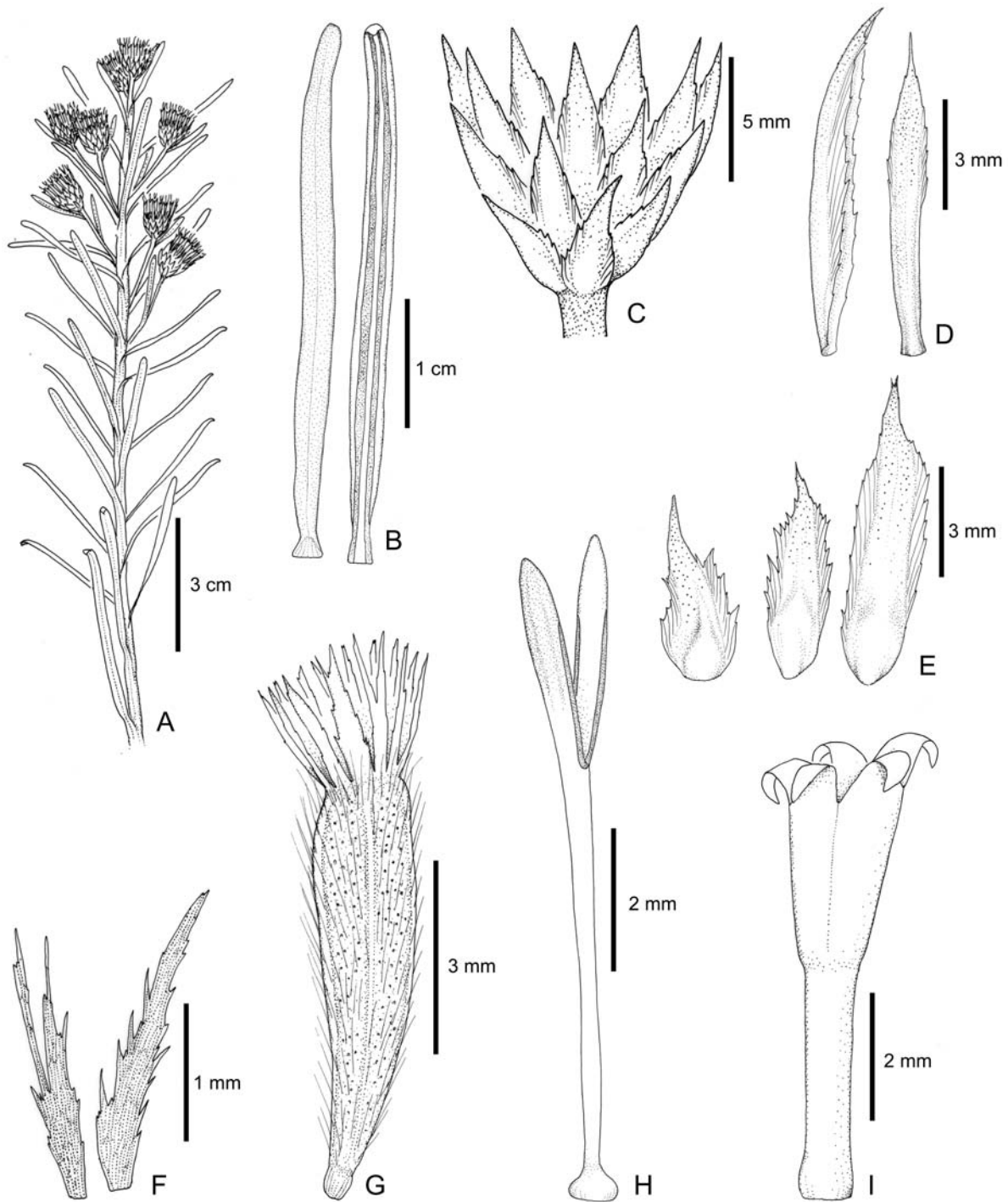


FIGURE 17. *Chilotrichiopsis peruviana* G. L. Nesom, H. Rob., and A. Granda. A. Habit. B. Leaves, adaxial view (left), abaxial view (right). C. Involucre. D. Receptacular paleae, lateral view (left), dorsal view (right). E. Outer to inner phyllaries (from left to right). F. Detail of pappus scales. G. Achene with pappus. H. Style. I. Corolla (A–I, Flores 2109, LP).

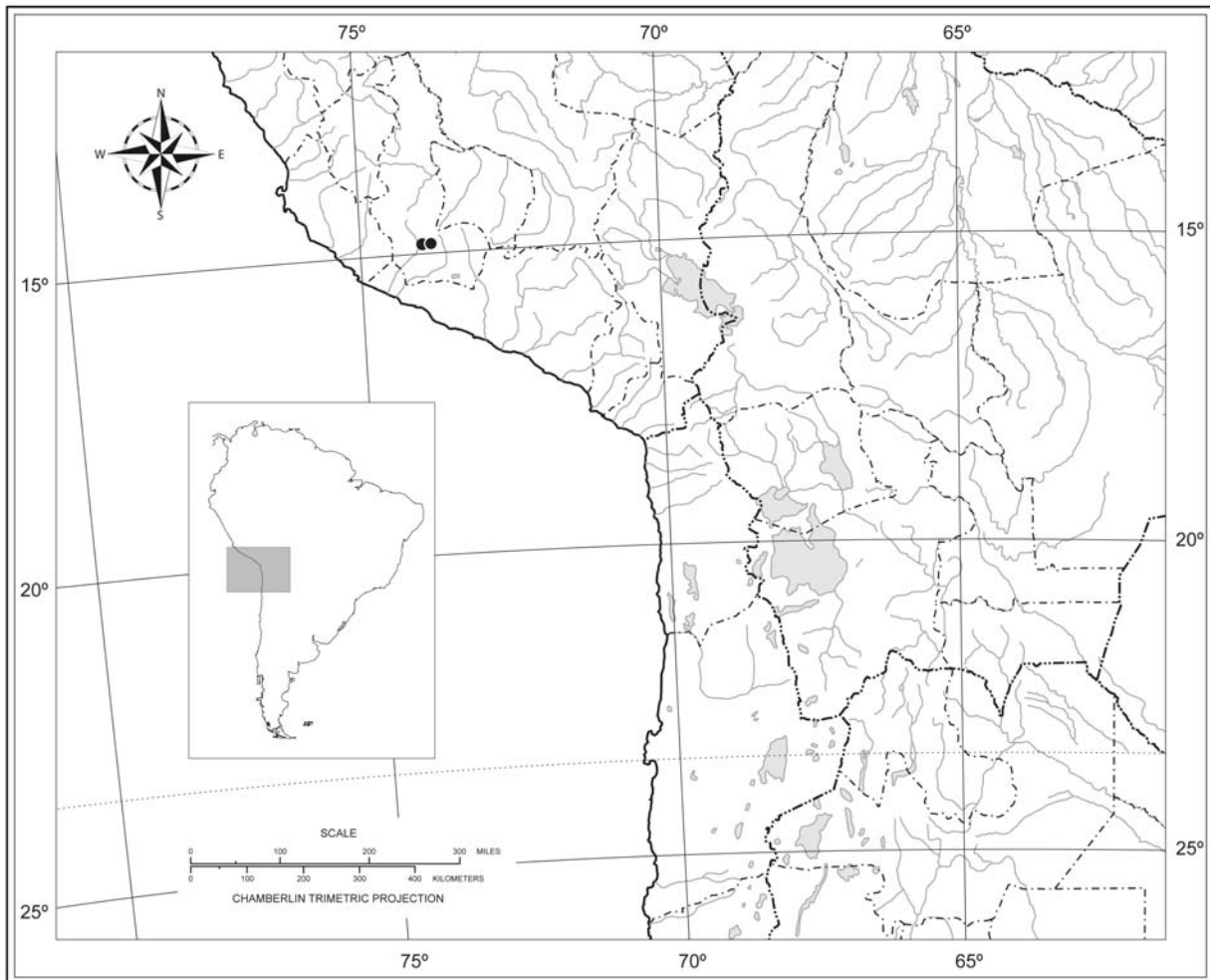


FIGURE 18. Geographic distribution of *Chilotrichiopsis peruviana* G. L. Nesom, H. Rob., and A. Granda.

villose and gland-dotted throughout the whole surface, twin trichomes shorter than 0.5 mm long, carpodium present. **Pappus** ~2.5 mm long, 1-seriate, composed of 11–16 scales, triangular to narrowly elliptic, margins lacinate towards the apex, somewhat fused among each other at the base.

**Vernacular names:** Not known.

**Phenology:** Flowering specimens have been collected from August to December.

**Distribution:** Peru, restricted to department of Ayacucho (Figure 18).

**Habitat:** Puna (Cabrera and Willink, 1973) from 3,500 to 3,600 m, along steep mountain slopes dominated by shrubs amid *Polylepis* spp. (Nesom et al., 2001).

**Uses:** Not known.

**Etymology:** The specific epithet refers to the country to which this species is an endemic.

### ***Chilotrichum* Cass.**

#### **Taxonomic History**

1788. Forster describes the species *Amellus diffusus* from material collected by himself in Tierra del Fuego.

1817. Cassini establishes *Chilotrichum* and creates the species *Chilotrichum amelloideum*. Cassini based his description on Forster species but did not employ the epithet used by Forster creating in consequence an illegitimate name.

1826. Sprengel transfers *Amellus diffusus* to *Aster* L. (*Aster magellanicus* Spreng.) without taking Forster's epithet and then creating a superfluous name.

1829. Tausch considers that the differences between the species described by Forster (1787) as *Amellus*

*diffusus* and the rest of the species belonging to the genus *Amellus* are enough to create a new genus, and apparently unaware of the genus created by Cassini in 1817 (*Chiliotrichum*), describes *Tropidolepis* Tausch, making the combination *Tropidolepis diffusa* (G. Forst.) Tausch.

1831. Lessing, based on material collected by Poeppig in Chile, describes *Chiliotrichum rosmarinifolium* Less., pointing out that the main difference of his new species from the previous one (*Chiliotrichum amelloideum*) is in the shape of the leaf.
1833. Nees lowers the rank of the two species described to the date, *Chiliotrichum amelloideum* y *C. rosmarinifolium*, to varieties of *Chiliotrichum amelloideum*, *C. amelloideum* var. *rosmarinifolium*, *C. amelloideum* var. *diffusum* and adds a third variety, *C. amelloideum* var. *lanceolatum*.
1836. Candolle (1836a), in agreement with Nees, accepts only one species, *Chiliotrichum amelloideum*, but only two of Nees' varieties, *C. amelloideum* var. *rosmarinifolium* and *C. amelloideum* var. *lanceolatum*.
1848. Hombron and Jacquinot name and present analytical illustrations for two new species, *Chiliotrichum ovatifolium* and *C. feliciae*, and one variety *C. ovatifolium* var. *retortum*.
1858. Mueller places the two names created by Hombron and Jacquinot, and *C. rosmarinifolium* in the synonymy of *Chiliotrichum amelloideum*.
1873. Philippi describes a new species, *Chiliotrichum virgatum*.
1894. Philippi describes three new species, *Chiliotrichum angustifolium*, *C. longifolium*, and *C. tenue* and a variety of *Chiliotrichum rosmarinifolium*, *C. rosmarinifolium* var. *glabrescens*.
1898. Kuntze gives priority to the name coined by Forster (1788) and makes the combination *Chiliotrichum diffusum*.
1899. Spegazzini describes three forms in *Chiliotrichum diffusum*, *C. diffusum* f. *typica*, *C. diffusum* f. *media*, and *C. diffusum* f. *angustifolium* ("angustifolia").
1901. Reiche accepts only two species in *Chiliotrichum*, *C. diffusum* and *C. rosmarinifolium*.
1971. Cabrera also accepts only two species, *Chiliotrichum diffusum* and *C. rosmarinifolium*, pointing out that the main difference between them is the leaf width.

*Chiliotrichum* Cass., Bull. Sci. Soc. Philom. Paris 4(2): 69, 1817. *Tropidolepis* Tausch, Flora 12 (5): 68, 1829. *Chi-*

*liotrichum* sect. *Euchiliotrichum* Hook. f., Bot. Antarct. Voy., Vol. 1, Fl. Antarct. 2: 304, 1846 [1847]. TYPE: *Amellus diffusus* G. Forst., Fasc. Plant. Magellan.: 39, 1788 ( $\equiv$  *Chiliotrichum diffusum* (G. Forst.) Kuntze, Rev. Gen. Pl. 3(2): 141, 1898).

**Shrubs** hemispheric to globose; branches densely disposed, ascending, not ribbed young branches gland-dotted to tomentose and gland-dotted. **Leaves** densely arranged, persistent, alternate, patent to ascending, linear to elliptic, narrowly elliptic or obovate, base attenuated, petiole broadened towards the stem and constricted above, apex obtuse to acute, margins revolute to slightly revolute, densely tomentose on abaxial surface, and sparsely tomentose on adaxial surface or with no aseptate-flagellate trichomes on this surface, gland-dotted on both sides, midvein sunken on adaxial side, discolorous, coriaceous. **Capitula** solitary, terminal, pedunculate, heterogamous, radiate. **Involucres** cylindrical-campanulate, phyllaries arranged in 3 to 5 series; outer phyllaries triangular to ovate, apex acute, tomentose towards the apex on abaxial side, coriaceous; inner phyllaries narrowly elliptic, apex acute, glabrous with a tuft of woolly trichomes towards the apex, membranaceous. **Receptacles** convex to slightly convex, partially paleate; paleae linear to narrowly elliptic, not embracing the achenes, with a tuft of woolly trichomes towards the apex, apex acute, margins narrow, membranose-fimbriate. **Ray florets** 3 to 14, pistillate; corollas white, radiate, limb narrowly elliptic, 3-lobed; staminodes present; style base slightly swollen, style branches narrowly ovate, subequal in length. **Disk florets** 7 to 27, bisexual; corollas yellow, tubular, 5-lobed, more or less abruptly broadened from about mid-length, lobes triangular; anther thecae base slightly sagittate, apical appendages ovate, antheropodia present, not swollen; style base swollen, style branches oblong, apex subacute to obtuse, collecting hairs on upper 2/5 to 1/2. **Achenes** narrowly obovate, terete, 4- to 6-ribbed, gland-dotted, sometimes with few twin trichomes sparsely distributed towards the apex, carpopodium present, conspicuous. **Pappus** 2- to 3-seriate, composed of linear scales, scabrid along the margins.

**Etymology:** Name derived from Greek "*chilios*" (thousand) and "*trich*" (hair). Cabrera (1971) explained that Cassini was probably referring to the tomentose indument on the abaxial surface of the leaves. On the original description, Cassini was rather emphatic on the "très nombreuses" elements of the pappus, so it is also likely that the French synantherologist might have been referring to this trait instead of the leaf pubescence when coining the name for his new genus.

*Chiliotrichum* is composed of two species distributed from central Argentina and Chile, to Tierra del Fuego along the Andes and in Patagonia. This includes the vast archipelago west of Chile and Islas Malvinas. The genus is the most evenly and continuously distributed of the *Chiliotrichum* group, and it occurs in very different habitats that range from Andean meadows above the tree line to the windswept barren grasslands of northern Tierra del Fuego.

*Chiliotrichum* is morphologically well defined, with radiate heads, partially paleate receptacles, white ray corollas, and 2- to 3-seriate pappus formed by linear scales.

Traditionally, *Chiliotrichum* was considered to be composed of two species, *C. diffusum* and *C. rosmarinifolium*. Nees (1833), Candolle (1836a), and more recently Skottsberg (1916) suggested that these two names should be regarded as heterotypic synonyms instead. However, later authors (Mueller, 1858; Reiche, 1901; Cabrera, 1971) considered the species as distinct entities. The study of many herbarium specimens, and field observations carried out throughout the geographic range of *Chiliotrichum* has led me to confirm that the two traditionally recog-

nized species of *Chiliotrichum*, namely *C. diffusum* and *C. rosmarinifolium*, are one vegetatively variable species that shows a morphological cline that follows a latitudinal gradient.

In addition to this, I have observed that one of the species of *Chiliophyllum*, *Chiliophyllum fuegianum*, could be better treated as a species belonging to the genus *Chiliotrichum*. This hypothesis is supported by several major morphological traits such as the color of ray corollas (white), the partially paleate receptacles, the style branches obtuse, the pappus composed of linear scales arranged in 2 to 3 series, and also molecular data (Bonifacino and Funk, unpublished data). On the basis of these molecular data as well as on morphological grounds (i.e.: paleate nature of the receptacle, radiate capitula, and pappus composed of linear scales), the closest allies to *Chiliotrichum* among the core *Chiliotrichum* Group are *Chiliophyllum* and *Lepidophyllum*.

In this study, *Chiliotrichum* is considered to have two species: *Chiliotrichum diffusum*, a widely distributed species in southern South America, and *Chiliotrichum fuegianum* restricted to northern Tierra del Fuego.

#### KEY TO THE SPECIES OF *CHILIOTRICHUM* CASS.

- 1a. Leaves patent, margins revolute, generally 10–40 mm long; capitula notably pedunculate, peduncles (5–) 25–40 mm long. (Widespread along the Andes and Patagonia, from Mendoza in Argentina and Libertador O'Higgins in Chile to Tierra del Fuego archipelago and Islas Malvinas). . . . . *C. diffusum*
- 1b. Leaves ascendent, margins flat to slightly revolute, generally 4–6 mm long; capitula sessile to shortly pedunculate, peduncles up to 1.5 mm long. (Restricted to northern Tierra del Fuego in Argentina and Chile). . . . . *C. fuegianum*

*Chiliotrichum diffusum* (G. Forst.) Kuntze, Rev. Gen. Pl. 3(2): 141, 1898. *Amellus diffusus* G. Forst., Fasc. Plant. Magellan.: 39, 1788. *Chiliotrichum amelloideum* Cass. **nom. illeg.**, in Cuvier, Dict. Sci. Nat. 8: 577, 1817. *Aster magellanicus* Spreng. **nom. illeg.**, Syst. Veg. 3: 526, 1826. *Tropidolepis diffusa* (G. Forst.) Tausch, Flora 12 (5): 68, 1829. *Chiliotrichum amelloideum* var. *diffusum* (G. Forst.) Nees, Gen. Spec. Aster.: 240, 1833. *Chiliotrichum diffusum* f. *typica* Speg. **nom. illeg.**, Anales Soc. Ci. Argent. 48: 186, 1899. TYPE: "Terra del Fuego, J. R. & G. Forster [s.n]" (Lectotype: BM 528784!, designated here).

*Chiliotrichum rosmarinifolium* Less., Linnaea 6: 109, 1831. *Amellus rosmarinifolius* Poepp. ex Less. **pro syn.**, Linnaea 6: 109, 1831. *Chiliotrichum amelloideum* var. *rosmarinifolium* (Less.) Nees, Gen. Spec. Aster.: 240, 1833. TYPE: "Flos chilens in rapibus Pico de Pilque ad pagum Antuco summis, frigides [7100'] Jan. 1829, Poeppig 870" (holotype: W; isotypes: BM!, G, NY!, W; scanned image of holotype at W: LP!; photo of isotype at G: LP!).

*Chiliotrichum amelloideum* var. *lanceolatum* Nees, Gen. Spec. Aster.: 240, 1833. IND. LOC. TYPE: "in Rigni Chilensis montibus, Poeppig [s.n.]" TYPE: not found.

*Chiliotrichum feliciae* Hombr. and Jacquin., in d'Urv., Voy. Pôle Sud, Atlas: 28, 1848. TYPE: "Silvarum ad oras, D'Etroit de Magellan, Port Famine, 1838–1840, Hombron [s.n.]" (holotype: P 222878, scanned image of holotype at P: LP!).

*Chiliotrichum ovatifolium* Hombr. and Jacquin., in d'Urv., Voy. Pôle Sud, Atlas: 28, 1848. TYPE: "In locis apertis arenosisque, D' Etroit de Magellan, Havre Pecket, 1838–1840, Hombron [s.n.]" (holotype: P 222877, scanned image of holotype at P: LP!).

*Chiliotrichum ovatifolium* var. *retortum* Hombr. and Jacquin., in d'Urv., Voy. Pôle Sud, Atlas: 28, 1848. TYPE: "in abruptis littoribus Porteis Gallant et in locis a vento soud [defansix ?] Porteis famis, H. Hombron [s.n.]" (holotype: P, scanned image of holotype at P: US!).

*Chiliotrichum virgatum* Phil., *Anales Univ. Chile* 43: 485, 1873. TYPE: “[Chile] Magallanes, aestate 1864–1865 [s. leg. s.n.]” (holotype: SGO!; isotypes: B destroyed, NY!, SGO!; photo of the isotype at B: F!).

*Chiliotrichum angustifolium* Phil., *Anales Univ. Chile* 87: 401, 1894. TYPE: “[Chile] Andes Prov. Curicó, aestate 1889 [s. leg. s.n.]” (holotype: SGO!).

*Chiliotrichum longifolium* Phil., *Anales Univ. Chile* 87: 401, 1894. TYPE: “[Chile] Trancura, Feb. 1891, *O. Philippi* [s.n.]” (lectotype: SGO 44760!, designated here; syntype: “Trapatrapa, Febr. 89, *Rabmer* [s.n.]”, SGO 44761!, SGO 65012!).

*Chiliotrichum rosmarinifolium* var. *glabrescens* Phil., *Anales Univ. Chile* 87: 401, 1894. TYPE: “[Chile] Araucania, *C. Sage* [s.n.]” (holotype: SGO 65011!).

*Chiliotrichum tenue* Phil., *Anales Univ. Chile* 87: 402, 1894. TYPE: “[Chile] Andibus prov. Curicó, 1892, *Manuel Vidal* [s.n.]” (holotype: SGO 65013!).

*Chiliotrichum diffusum* f. *angustifolium* (“*angustifolia*”) Speg., *Anales Soc. Ci. Argent.* 48: 186, 1899. TYPE: “[Argentina] Nahuel Huapi [Spegazzini s.n.]” (holotype: LPS 17189 in LP!).

*Chiliotrichum diffusum* f. *media* Speg., *Anales Soc. Ci. Argent.* 48: 186, 1899. IND. LOC. TYPE: “[Argentina] Hab. In Chubut centrali, Nov. 1898, *J. Koslowsky s.n.*” (holotype: not found).

(FIGURES 19, 20, 50, 51)

**Shrubs** (0.1–) 0.3–1.5 (–2) m tall, globose; branches densely disposed, ascending, not ribbed, tomentose and gland-dotted, internodes 1–3 (–10) mm long. Leaves densely arranged, persistent, alternate, patent, (6–)10–40 × (0.8–)1–5 (–8.5) mm, linear to narrowly elliptic or narrowly obovate, base attenuated, petiole broadened towards the stem and constricted above, apex acute to obtuse, margins revolute, densely tomentose on abaxial side, glabrous to arachnoid on adaxial side, gland-dotted in both sides, midvein impressed on adaxial side, discoloured, coriaceous. **Capitula** solitary, terminal, notably pedunculate, peduncles (5–) 25–40 mm long, heterogamous, radiate. **Involucre**s 6–10 × 4–5 mm, cylindrical-campanulate; phyllaries arranged in 4 to 5 series; outer phyllaries 4–5 × 1–2.3 mm, triangular, apex acute, tomentose abaxially, coriaceous, margins membranaceous, fimbriate; inner phyllaries 5.5–8.5 × 1.5–2 mm, narrowly elliptic, apex acute, with a tuft of woolly trichomes towards the apex, membranaceous, margins membranaceous, fimbriate. **Receptacles** convex, partially paleate; paleae 9 to 16, 8.5–9 × 0.5–1 mm, linear to narrowly

elliptic, not embracing the achenes, apex acute, with a tuft of woolly trichomes towards the apex, margins membranaceous, fimbriate. **Ray florets** 8 to 14, pistillate; corollas white, radiate, tube 3.5–5 mm long, limb (5–) 7–14 × 2.8–5 (–6) mm, elliptic, 3-lobed; staminodes 3 or 4; style shafts 4.5–5 mm long, base slightly swollen, style branches 1–2 mm long, narrowly ovate, subequal in length. **Disk florets** 12 to 27, bisexual; corollas yellow, tubular, 5-lobed, broadened more or less abruptly from mid-length, tube 2.5–3 mm long, throat 2.5–3 mm long, lobes 0.7–2 × 0.4–0.5 mm, triangular, gland-dotted abaxially; anther thecae 1.5–1.8 mm long, bases slightly sagittate, apical appendages 0.5–0.7 mm long, ovate, antheropodium present, not swollen; style shafts 3.5–6 mm long, base swollen, style branches 1.8–3.2 mm long, oblong, apex acute, collecting hairs on upper 2/5 to 1/2. **Achenes** 3.5–6.5 mm long, narrowly obovate, terete, 4- to 6-ribbed, gland-dotted, sometimes with few twin trichomes sparsely distributed towards the apex, carpodium present, conspicuous. **Pappus** (3.5–) 4–7 mm long, (1) 2 to 3-seriate, composed of 50 to 70 linear scales, outer series slightly shorter, scabrid along the margins.

**Vernacular names:** “Mata negra,” “Inciense” (*Rothkogel s.n.*, SI 8466), “Fachine” (in Islas Malvinas; Moore, 1968), “Margarita” (*Kurtz 5942*, CORD), “Mata azul” (*Cozzo s.n.*, BA 53064), “Mata negra o Romerillo” (*Villagrán et al. 8133*, CONC); “Kó’or” or “Kóor” (lengua Ona; Haloua and Padín, 1999); “Gorhji” (Borla and Vereda, 2001).

**Phenology:** The species shows a wide blooming season, and flowering specimens have been collected from October to April.

**Distribution:** *Chiliotrichum diffusum* occupies a wide latitudinal range extending from southern Mendoza Province in Argentina and Libertador O’Higgins in Chile to Tierra del Fuego, along the Andes including the immense archipelago west of Chile, Isla de los Estados and Islas Malvinas. It is an important element in the Patagonian steppe of southern Santa Cruz and northern Tierra del Fuego (Figure 20).

**Habitat:** *Chiliotrichum diffusum* inhabits high Andean, Insular, Patagonian, and subantarctic biogeographic provinces (Cabrera and Willink, 1973). It is a quite ubiquitous species that grows at full sun on dry sandy soils in northern Mendoza and Neuquén or in moister areas such as the NW coast of Tierra del Fuego. *Chiliotrichum diffusum* can occur in rather scattered populations or forming denser associations, constituting the dominant species (NW and S Tierra del Fuego). In Tierra del Fuego, a considerable part of the Patagonian steppe is covered by associations



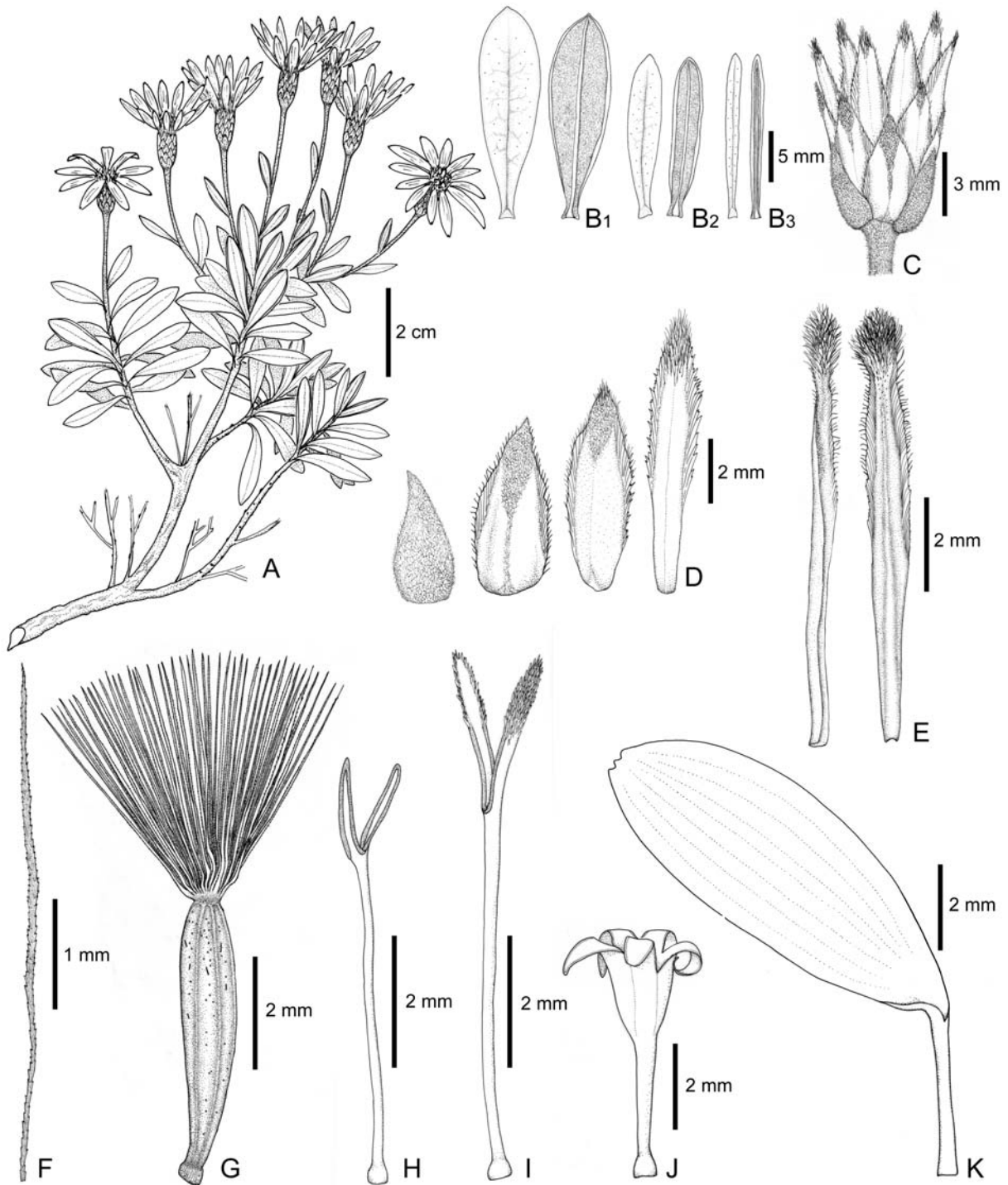


FIGURE 19. *Chilotrichum diffusum* (G. Forst.) Kuntze. A. Habit. B. Leaves, for each pair, adaxial view (left), abaxial view (right). C. Involucre. D. Outer to inner phyllaries (from left to right). E. Receptacular paleae, lateral view (left), dorsal view (right). F. Detail of pappus scales. G. Achene with pappus. H. Style of ray floret. I. Style of disk floret. J. Corolla of disk floret. K. Corolla of ray floret (A, B1, C–K, Bonifacino et al. 563, LP; B2, Bonifacino et al. 336, LP; B3, Maldonado 650, LP).

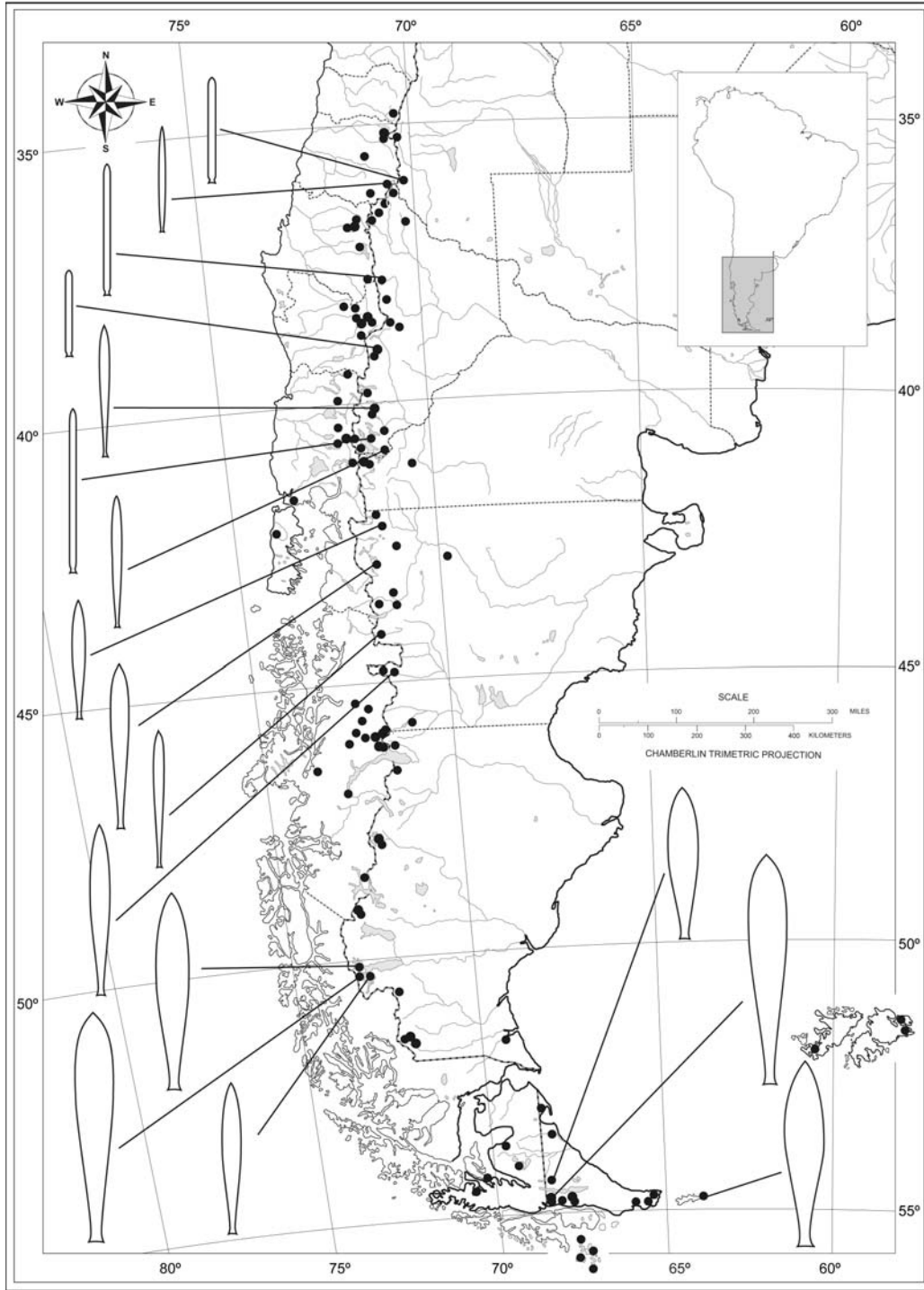


FIGURE 20. Geographic distribution of *Chiliotrichum diffusum* (G. Forst.) Kuntze. Note leaf shape and size variation along the latitudinal gradient.

of *Chiliodrimum diffusum* and *Festuca gracillima* Hook. f. (Tuhkanen et al., 1989, 1990; pers. obs.). It can also grow in the shade in the understory of the *Nothofagus* spp. forest and also in very swampy areas at the ecotonal area between subantarctic forest and the high Andean vegetation (Moore, 1983; Roig, 1998; pers. obs.). It can grow scattered or form dense associations intermingled with other shrubs typical of subantarctic forest such as *Berberis buxifolia* Lam., *Ribes magellanicum* Poir., and *Pernettya mucronata* Gaudich. ex G. Don. (Pisano, 1977; León et al. 1998; pers. obs.). *Chiliodrimum diffusum* grows from sea level in Tierra del Fuego to 2,700 m in Mendoza (Argentina) and neighboring areas in Chile. According to Davis and McAdam (1989), *Chiliodrimum diffusum* used to be much more common in Islas Malvinas than it is today, having diminished because of intense grazing; however, it still remains an important element of the native vegetation of this archipelago, being among the few plant species that grow to almost 2 m tall. Moore (1968) points out that *Chiliodrimum diffusum* is common in Islas Malvinas, on wet soils beside streams together with *Cortaderia pilosa* (d'Urv.) Hack., growing from sea level to 300 m, but it can also grow on sandy soils near the coast and on occasion forms dense thickets away from streams. Woods (2000) reports it as a species used in certain areas as song perches by “Falkland Grass Wren” *Cistothorus platensis*.

**Uses:** The Onas (aboriginal tribes from Tierra del Fuego) used branches to make a particular kind of tatoo known as “lóiste” (Haloua and Padín, 1999). They also used *Chiliodrimum diffusum* to make arrows, and the flowers were used to remediate vision problems by means of rubbing the florets in the eyes (Borla and Vereda, 2001). It is cultivated and commercialized in the United Kingdom for ornamental purposes (Bean, 1981). Brander (1977) selected and named one cultivar of *Chiliodrimum diffusum*, “*Chiliodrimum diffusum* SSKA”. This cultivar is widely offered online in European nurseries because of its impressive and attractive blossoms.

**Etymology:** The epithet *diffusum*, derived from Latin, refers to the irregular and widely spreading branching pattern that characterizes the species.

**Note 1:** The branches of *Chiliodrimum diffusum* exhibit a clearly marked seasonal growth, as evidenced by irregular intervals of modified leaves with a scale-like appearance followed by elliptic to narrowly obovate leaves.

**Note 2:** Forster (1788), in the original diagnosis of *Amellus diffusus*, stated “Habitat in Terra Ignis, Insulisque Noui Anni, in scopulis mari imminentibus” as the type locality. The *Resolution* sailed by Tierra del Fuego between December 21, 1774 and January 3, 1775, and anchored apparently at two locations: west of Navarino in Christmas

Sound (Chile) and in New Year’s Island north of Isla de los Estados (Argentina). By that time, *Chiliodrimum diffusum* should have been in full blooming season, and being such an attractive and fairly common species it is not unlikely that the Forsters might have collected it profusely on both land excursions. There is a wealth of type material related to this species distributed in several herbaria (Nicolson and Fosberg, 2004), however BM holds the richest collection of the Forsters’ materials. I have studied two specimens deposited at BM (BM 528784 and BM6082) that perfectly match the original diagnosis, and that have been identified by BM staff, and by Nicolson and Fosberg (2004) as type material. Therefore, one of this specimens (BM 528784), which holds more information on the scanty label “Terra del Fuego, J. R. & G. Forster [s.n]” is selected here as the lectotype.

**Note 3:** When transferring *Amellus diffusus* to *Aster*, Sprengel (1826) did not consider the original epithet and instead coined a new and superfluous (i.e.: illegitimate) name.

**Note 4:** Cassini (1817) gave a detailed explanation about the reason why he created *Chiliodrimum* in order to transfer the species *Amellus diffusus* to this new genus. However, Cassini did not take the original epithet and coined a new and illegitimate name. Based on this observation, it should be noted that the names of varieties of *Chiliodrimum amelloideum* by Nees (1833) would have to be corrected using the correct name of the species. However, given the fact that none of the varieties are recognized here, there is no need to further clutter the synonymy of this taxon.

**Note 5:** In the original diagnosis of *Chiliodrimum longifolium*, Philippi (1894) mentions two specimens: “Habitat in Andibus Araucaniæ ad Trapatrapa, (C. Rabmer) et Valdiviæ l. D. Trancura (O. Philippi)”. I’ve seen both specimens at SGO, and they perfectly match the original diagnosis. I choose as lectotype the specimen collected by Otto Philippi (grandson of R. A. Philippi).

**Note 6:** According to Stafleu and Cowan (1976), the publication date of the *Fasciculus plantarum magellanicarum*, when *Amellus diffusus* G. Forst. was described, was after September 18, 1787. The year 1787 is the date that most commonly appears in the literature relevant to this species (e.g.: Cabrera, 1971; Moore, 1983; Sancho and Ariza Espinar, 2003), while Moore (1968) gives 1789 as the original publication date. However, according to Nicolson and Fosberg (2004), the date of the publication would have been between March and April 1788, time when paged preprints that appeared between January 16 and 17, 1788 were distributed.

*Additional specimens examined:* ARGENTINA. PROV. CHUBUT. **Dpto. Cushamen.** Cerro Hielo Azul, 28-XII-2000, *Angelino 14* (BAA); Ruta 15, 2 km al W de intersección con Ruta 40, 42°23'37"S, 71°9'54"W, 11-I-2002, *Bonifacino et al. 404* (US); Valle de la Laguna Blanca, 42°52'S, 71°15'W, s. date, *Koslowsky 258* (SI). **Dpto. Futaleufu.** Región Río Corcovado, s. date, *Illin 65* (SI, CORD); Valle de la Laguna Blanca, 42°52'S, 71°15'W, 10-I-1901, *Koslowsky 129* (BAF, SI, CORD); Cerro Cucho, 28-I-1947, *Soriano 2509* (LP, BAA); Lago Futalaufquen, 26 -II-1950, *Soriano 4297* (LP); Parque Nacional Los Alerces, Lago Futalaufquen, 9-I-1948, *Soriano 2907 K* (BAA); Lago Futalaufquen. Parque Nacional Los Alerces, 18-II-1950, *Soriano 4177* (BAA). **Dpto. Languineo.** Carrenleufu, 1-III-1900, *Illin s.n.* (LP); Ruta 13, 21 km al SW de Paso del Sapo, 12-IV-1988, *León 4018* (BAA); Río Tecka, Estancia Pampa Chica, 25-I-1947, *Soriano 2482* (LP). **Dpto. Río Senguerr.** Lago La Plata, 26-I-1969, *Guerrero 56* (SI); márgenes y alrededores del Arroyo Blanco, costa S del Lago Fontana, 20-22-II-1999, *Gutiérrez 108* (US); Río Unión (Lago La Plata), 10-I-1969, *Iglesias & Scotbeer 10* (LP); Río Union, Lago La Plata, 13-I-1969, *Iglesias & Scotbeer 23* (LP); Estancia La Pepita, 11-II-1945, *Soriano 1510* (SI); Lago Fontana, 14-II-1947, *Soriano 2601* (BAA); Lago Fontana, Estancia Pepita, 29-I-1960, *Soriano 5656* (BAA); Pampa de Chalia, Estancia La Media Luna, 3-XII-1981, *Villamil et al. 2205* (SI). **Dpto. Tehuelches.** Lago Gral. Paz, 4-III-1903, *Gerling s.n.* (SI 8461); Río Pico, campo del Sr. Torres, 23-I-1960, *Soriano 5568* (BAA). PROV. MENDOZA. **Not defined Dpto.** Entre Piedra Parada y Valle Rahuí, 14-II-1888, *Kurtz 6046* (CORD); Entre Río Grande y Arroyo Calquegue, 30-I-1888, *Kurtz 5942* (CORD); Planchón de los Ciegos, I-1897, *Stuckert 2851* (CORD). **Dpto. Malargue.** Valle de Calmuco, 14-II-1942, *Burkart et al. 14359* (SI, LP); Calmuco, 14-II-1942, *Covas 225* (LP); Calmuco, 14-II-1942, *Covas 478* (LP). PROV. NEUQUEN. **Not defined Dpto.** Mallín Hue Culle, Parque Nacional Lanín, 1-III-1985, *Cusato 3973* (BAA); a 2 km de Bajada de Sainuco, 14-I-1968, *Ruiz Leal 25813* (LP). **Dpto. Aluminé.** Entre Sainuco y Lago Aluminé, 7-XII-1981, *Cabrera et al. 32893* (SI, LP); Valle Escondido, Ñorquinco, 12-XII-1925, *Comber 348* (E); Parque Nacional Lanín, subida a Quillen a Ruca Choroi, 28-II-1985, *Cusato 3909* (BAA); Laguna Ruca Choroi, 1-II-1968, *Eskuche & Klein 109* (SI). **Dpto. Catan Lil.** Estancia Yao Yao, 8-XII-1946, *Dawson 1178* (BAA); Sierra del Chachil, 29-I-1965, *Rúgolo & Agrasar 407* (BAA). **Dpto. Chos Malal.** Riscos Bayos, Valle Arroyo Olletas, 36°51'S, 70°20'W, 25-I-1964, *Boelcke & Correa 11183* (SI, BAA). **Dpto. Huiliches.** Parque Nacional Lanín, Lago Huechulafquen, subida a Cerro Los Angeles, 7-II-1948, *Dawson & Schwabe 2603*

(BAA); Parque Nacional Lanín, Lago Huechulafquen, subida al Cerro de los Angeles, 7-II-1948, *Dawson & Schwabe 2611* (BAA); Potrero del Tromen, Parque Nacional Lanín, 8-II-1983, *Tarak s.n.* (BAA). **Dpto. Lacar.** San Martín de los Andes, I-1941, *Bridarolli 2069* (LP); San Martín de los Andes, Cerro Chapelco, 16-II-1968, *Cabrera & Crisci 19157* (LP); Cerro Chapelco, laderas encima de refugio, expuestas al N, 23-XI-1974, *Correa 5893* (LP); Parque Nacional Lanín, Cerro Chapelco, 12-II-1961, *León & Calderon 869* (BAA); Parque Nacional Lanín, Lago Lacar, Cerro Malo, malliPueston en ladera SW, 22-II-1961, *León & Calderon 1332* (BAA); Cordón Chapelco, entre Cerro Chapelco y Cerro Negro, Parque Nacional Lanín, 20-III-1983, *Mermoz s.n.* (BAA). **Dpto. Loncopué.** Cajón Chenque Pehuen. Valle a la entrada del Cajón, 14-I-1965, *Rúgolo & Agrasar 142* (BAA); Chenque Pehuen, 8-I-1967, *Schajovskoy s.n.* (LP). **Dpto. Los Lagos.** Puesto Manzano, Cerro Cortinario, 19-I-1965, s. leg. s.n. (BAA 11273); Parque Nacional Nahuel Huapi, Laguna Ortiz Basualdo, 7-I-1952, *Boelcke & Correa 5365* (BAA, SI); Parque Nacional Nahuel Huapi, Refugio Cerro Colorado, 14-II-1953, *Boelcke & Correa 6899* (BAA); Paso Cardenal A. Samoré, 40°42'48"S, 71°56'37"W, 24-I-2003, *Bonifacino & Romano 824* (LP); Cerro Belvedere en Correntoso, 5-II-1934, *Burkart 6401* (LP); Laguna del Toro, Rincón Grande, I-1942, *De Jones 67* (LP); Parque Nacional Nahuel Huapi, cerca del refugio Cerro Colorado, 5-II-1951, *Diem 1824* (SI); s. loc., 10-I-1993, *González Arzac 977* (LP); Correntoso, 6-II-1934, *Parodi 11694* (BAA); Parque Nacional Nahuel Huapi, Punta Inferior Mallín Grande, Río Manso Superior, XII-1974, *Richencq 204* (SI); Lago Nahuel Huapi, cuenca del Río Machete, 1-II-1914, *Rothkugel 43* (SI); Lago Nahuel Huapi, Cerro Belvedere, 21-III-1934, *Spegazzini s.n.* (LP 61233). **Dpto. Minas.** 18 km de las Ovejas camino a Laguna Epu-Lauquen, Mallín de la Culebra, 36°54'S, 70°55'W, 14-I-1964, *Boelcke et al. 10780* (SI); Paso del Macho, bajada a laguna proxima al paso, 36°26'S, 70°46'W, 26-I-1970, *Boelcke et al. 13951* (SI); Confluencia de los Ríos Pichi-Neuquén y Neuquén, Cerro de Las Yeguas, 36°35'S, 70°45'W, 23-I-1970, *Boelcke et al. 13767* (BAA); Paso del Macho, bajada a la laguna, 36°27'S, 70°40'W, 26-I-1970, *Boelcke et al. 13957* (BAA); Sierra de Cochicó, Cajón de la Botica, 36°21'22"S, 70°34'36"W, 29-I-1970, *Boelcke et al. 14117* (SI); Extremo N Laguna Varvarco Campos, Arroyo Benitez, curso medio, 36°17'S, 70°39'W, 30-I-1970, *Boelcke et al. 14264* (BAA, LP, SI). **Dpto. Ñorquin.** Termas de Copahue, 17-II-1940, *Cabrera 6156* (LP); along the road from Baños de Copahue, ~5 km of the town, 12-I-1985, *King 9399* (SI); Trollope, 26-XII-1944, *O'Donell 2134* (BM); Parque Nacional Copahue, Estancia

Trolope, 9-I-1973, *Rúgolo de Agrasar et al. s. n.* (BAA 12272). **Dpto. Picunches.** Paso Pino Hachado, cerca de la frontera con Chile, 38° 39'S, 70° 53'W, 16-I-2000, *Bonifacino et al. 191* (LP); Pino Hachado, 6-III-1939, *Burkart 9696* (SI); Pino Hachado, 24-I-1948, *Dawson & Schwabe 2232* (BAA); Paso Pino Hachado, 30-I-1974, *Gentili 148* (LP); Portezuelo Sanguileo, SW de Paso Pino Hachado, 20-II-1983, *León 3410* (BAA); Pino Hachado, 5-II-1920, *Parodi 2236* (BAA). **PROV. RÍO NEGRO. Dpto. 25 de Mayo.** Pendiente Norte del Cerro Anecón Grande, 22-XII-1938, *Ferruglio 29* (LP); Cerro Anecón, pendiente norte, 11-I-1939, *Ferruglio 43* (LP). **Dpto. Bariloche.** Bariloche, Cerro Ñireco, II-1946, *Bernasconi s.n.* (SI 15936); Cerro Otto, Parque Nacional Nahuel Huapi, 7-I-1946, *Boelcke 1746* (LP, BAA); Parque Nacional Nahuel Huapi, Cumbre Cerro Rigi, 11-I-1952, *Boelcke & Correa 5476* (BAA); Parque Nacional Nahuel Huapi, Cerro Tronador, entre Mallin Chileno y Refugio, 17-I-1952, *Boelcke & Correa 5705* (SI); Parque Nacional Nahuel Huapi, Cerro Tronador, Mallin Chileno, 18-I-1952, *Boelcke & Correa 5785* (SI); Parque Nacional Nahuel Huapi, subida al Granito, 22-I-1952, *Boelcke & Correa 5898* (BAA, SI); Parque Nacional Nahuel Huapi, faldeos Cerro Santa Elena, 31-I-1952, *Boelcke & Correa 6208* (SI); Cerro Catedral, 1584 m, 41°10'40.6"S, 71°27'36.6W, 9-XII-2006, *Bonifacino et al. 2922* (US); Parque Nacional Nahuel Huapi, Tronador, Picada a Laguna Los Césares, 26-I-1983, *Cusato 2453* (BAA); Cerro Catedral, II-1954, *Cabrera 11501* (LP); Parque Nacional Nahuel Huapi, 13-II-1978, *Corte 160* (LP); Cerro Lopez, I-1960, *Fabris 2175* (LP); Cerro Catedral, I-1960, *Fabris 2236* (LP, BAA); Lago Nahuel Huapi, s. date, *Grüner 140* (LP); Sierra de Lopez, 14-II-1914, *Hosseus 301* (CORD); Lago Nahuel Huapi, Cerro Utne, 20-II-1914, *Hosseus 487* (CORD); Lago Nahuel Huapi, Sierra Lopez, II-1933, *Ljungner 259* (BM); Parque Nacional Nahuel Huapi, Cerro Riggi, Limite Arg-Chile, II-1958, *Marchionni s.n.* (LP); Cerro Catedral, 17-I-1946, *Montiel 211* (LP); Nahuel Huapi, 1915, *Rothkogel s.n.* (SI 8466). **Dpto. Pilcaniyeu.** Cerro Colorado, 2-II-1914, *Hosseus 1356A* (CORD). **SANTA CRUZ. Dpto. Guer Aike.** Estancia Las Viscachas, Cerro Sin Nombre, Faldeo NE, 50°46'S, 72°8'W, 29-I-1977, *Arroyo & Boelcke TBPA 2631* (SI); La Balsa, sobre Río Gallegos, I-1967, *Boelcke 12418* (BAA); Estancia Sofía, 3 km W del Casco, ladera exp. SW, 51°44'S, 71°20'W, 8-II-1978, *Boelcke & Correa TBPA 2977* (SI); Estancia Stag River, 10 km N casco sobre río Venados, 51°38'S, 71°57'W, 13-II-1978, *Boelcke & Correa TBPA 3172* (SI); Estancia Stag River, afl. W del río Venados, SE Meseta la Torre, 51°34'S, 71°57'W, 17-II-1978, *Boelcke & Correa TBPA 3305* (SI); Ruta 293, Punta Alta, 14-I-1967, *Boelcke et al. 12418* (SI, BAA); Río Gallegos, al frente del cerro Buitres, 15 leguas de la costa, II-1899, *Hauthal s.n.* (CORD); Estancia Glencross, Río Turbio, 100 m, 6-XII-1950, *Sleumer 1004* (US); s. loc., 19-XII-1967, *Zeballos s.n.* (BAA 10650); Río Gallegos, 19-XII-1967, *Zeballos s.n.* (BAA 10680). **Dpto. Lago Argentino.** Lago Argentino, Brazo Norte, Ventisquero Upsala, Bahía Cipres, 50°0'S, 73°20'W, 19-I-1967, *Boelcke et al. 12577* (SI, BAA); Parque Nacional Los Glaciares, 291 m, 50°28'24.1"S, 72°59'41.2"W, 12-XII-2006, *Bonifacino et al. 3000* (US); Lago Argentino, canal de los Témpanos, Glaciar Ameghino, 10-XII-1963, *Correa 3098* (BAA); Ventisquero Perito Moreno, Parque Nacional los Glaciares, 17-XII-1981, *Cusato s.n.* (BAA 17883); Lago Roca, 16-XII-1969, *Guerrero 58* (SI); Lago Argentino, 17-XII-1968, *Guerrero 63* (SI); Lago Argentino, XII-1958/III-1959, *James 144* (SI); Cerro Buenos Aires y Ventisquero Moreno, 4-I-1959, *James 666* (BM); Lago Frío, southern arm of Lago Argentino, 13-I-1959, *James 818* (BM); Lago Argentino, near Ventisquero Uppsala, Estancia Master's, 21-XII-1958, *James 1441* (BM); s. loc., 1904-1905, *Koslowsky 75* (CORD); Lago San Martin, 8-XII-1914, *Pemberton 2* (SI); Parque Nacional Los Glaciares, 29-II-1953, *Perez Moreau s.n.* HERB B. RIV. 70004 (CORD); Parque Nacional Los Glaciares, zona Lago Argentino, 29-III-1953, *Perez Moreau s.n.* (BAA); Lago Argentino, II-1982, *Suarez s.n.* (SI 432); Fitz Roy, entre Río Blanco y Lago de Los Tres, 7-II-1957, *Suti 3680* (CORD); Glaciar Perito Moreno, 26-XI-1984, *Valla s.n.* (BAA 19251). **Dpto. Lago Buenos Aires.** Ing. Pollavicini, X-1973, *Suarez 823* (SI); Río Jeinemeni, 5-II-1903, *Von Platen & Greiner 42* (SI). **Dpto. Río Chico.** Lago Belgrano, 1-III-1903, *Von Platen & Greiner 44* (SI). **PROV. TIERRA DEL FUEGO. Not defined Dpto.** Arroyo Pico, 28-XII-1918, *Parodi 2931* (BAA). **Dpto. Río Grande.** Ruta 3, km 2775, 53°29'53"S, 68°6'14"W, 28-I-2002, *Bonifacino et al. 589* (US). **Dpto. Ushuaia.** Isla de los Estados, Puerto Cook, 20-I-1912, *s. leg. s.n.* (SI); Ushuaia, 5-II-1896, *Alboff s.n.* (CORD); Ushuaia, 6-II-1896, *Alboff s.n.* (SI 8460); Bahía Buen Suceso, 22-XI-1998, *Biganzoli 465* (SI); Parque Nacional Tierra del Fuego, Cerro Guanaco, 54°47'48"S, 68°33'29"W, 24-I-2002, *Bonifacino et al. 538* (US); *id.*, 54°47'48"S, 68°33'29"W, 24-I-2002, *Bonifacino et al. 549* (US); Ruta costera al E de Ushuaia, a 7 km del Puerto, 54°49'3"S, 68°11'19"W, 25-I-2002, *Bonifacino et al. 562* (US); *Paso Garibaldi*, 54°41'22"S, 67°50'29"W, 26-I-2002, *Bonifacino et al. 563* (US); Ruta J, al E de Estancia Harberton, 81 m, 54°54'11.5"S, 67°6'48.2"W, 14-XII-2006, *Bonifacino et al. 3026* (US); Parque Nacional Tierra del Fuego, Bahía La Pataia, 54°51'20"S, 68°34'24"W, 16-XII-2006, *Bonifacino et al. 3049* (US); La Pataia, 12-II-1962, *Crespo s.n.* (SI 21548); Península Mitre, Bahía Buen

Suceso, N facing slopes at S end of the Bahía, 13-X-1971, *Dudley & Goodall* 149 (SI); Península Mitre, Bahía Buen Suceso, 54°48'S, 65°15'W, 14-X-1971, *Dudley & Goodall* 172 (SI); Península Mitre, Bahía Valentín near Punta Blanca, 54°53'S, 65°25'W, 15-X-1971, *Dudley & Goodall* 413 (SI); Puerto Cook, 54°45'S, 64°3'W, 24-X-1971, *Dudley & Goodall* 829 (SI); Rabbit island, Estancia Harberston, 14-XII-1967, *Goodall* 1056 (SI); Top Mountain, 15-XII-1967, *Goodall* 1066 (SI); Bahía Thetis, N of the settlement towards Cabo San Vicente, 54°40'S, 65°0'W, 20-XI-1969, *Goodall* 2307 (SI); Gable Island, near Estancia Harberston, 12-III-1970, *Goodall* 2477 (SI); Pampa de los Indios, Canal del Beagle, 14-I-1960, *Grondona s.n.* (BAA 12974); alrededores del Aeropuerto de Ushuaia, 10-I-1955, *Grondona* 4185 (BAA); cerca del río Pipo, orillas del Canal Beagle, 13-I-1959, *Grondona* 7094 (BAA); Bahía Thetis, Estancia El Arroyo, 10 km camino a Lago Fagnano, 16-I-1959, *Grondona* 7119 (BAA); camino a La Pataia, 13-XII-1985, *Hermann s.n.* (SI); Ushuaia, 3-I-1904, *Hicken* 11 (SI); Ushuaia, alrededores del Matadero-Frigorífico, 21-XII-1949, *Luti Herbera* 1417 (CORD); Isla de los Estados, Puerto Cook, ladera E, 54°45'S, 64°05'W, 25-XI-1967, *Nicora & Crespo* 7200 (BAA, SI); Isla de los Estados, Bahía Porto Roca, 12-I-1974, *Ristori* 7449 (SI); Ushuaia, 12-II-1953, *Ruiz Leal & Roig* 1810 (CORD); Hills 1 km NW of Ushuaia, 18-III-1979, *Solomon* 4751 (SI); Estancia Sara, Bahía La Pataia, 2-III-1962, *Vallerini* 39 (BAA). **Islas Malvinas.** Puerto Stanley, 12-II-1979, *Dimitri & Orfila* 318 (SI); Isla Soledad, Puerto Stanley, 27-XII-1903, *Hicken* 23 (SI); near Port Stanley, s. date, *Lellman s.n.* (US); East Falkland, Sparrow Cove, N of Port Stanley, 5-I-1950, *Sladen s.n.* (BM 608566); Isla Soledad, Puerto Stanley, 12-II-1979, *Ulibarri & Dimitri* 1214 (SI). **CHILE. REG. DE AISEN. Prov. Coihaique.** Balmaceda, camino a Coihaique. Puente El Ministro, 7-I-1989, *Bartoli & Rua s.n.* (BAA 21589); Río Coihaique, 22-I-1939, *Von Rentzell* 6210 (SI). **Prov. General Carrera.** Región del Lago Bs As, fin del Valle León, 13-II-1939, *Von Rentzell* 6262 (SI). **REG. DEL BÍO BÍO. Prov. Ñuble.** Termas de Chillán, Cerro Pirigallo, 6-II-1936, *Cabrera* 3641 (LP); Chillan, s. date, *s.leg.* 933 (US); Baños de Chillan, Nieblas, III-1927, *Werdermann* 1326 (SI, US). **REG. DE LA ARAUCANÍA. Prov. Malleco.** Cordillera Las Raíces, Lonquimay, 2-III-1939, *Burkart* 9537 (SI); Malleco, Angol, Parque Nacional Nahuelbuta, 5-XII-1971, *Mahu* 8112 (LP). **REG. DE LOS LAGOS. Prov. Llanquihue.** Puerto Montt, II-1973, *Lagiglia* 3851 (SI). **REG. DE MAGALLANES. Prov. Antártica Chilena.** Cape Horn, Hermite island, 1839-1843, *Hooker s.n.* (BM 608555); Canal Beagle, Puerto Villarino, 28-II-1903, *Pennington* 211 (SI, CORD). **Prov. Magallanes.** Punta Arenas, 25-XI-1950, *Brooke* 7051 (BM); 70 km NW of Punta

Arenas, 4-I-1939, *Eyerdam & Beetle* 24098 (SI); Punta Arenas, II-1927, *Guiñazú* 274 (BAA); Punta Arenas, I-1911, *Hauman s.n.* (BAA 8156); Punta Arenas, 5-XII-1910, *Hicken* 349 (SI); Punta Arenas, 10-I-1904, *Hicken* 1 (SI); Punta Arenas, 14-II-1863, *Isern* 8509 (SI); Punta Arenas, 14-II-1863, *Isern* 8511 (SI); Puerto del Hambre, 21-II-1863, *Isern* 8520 (SI); Strait of Magellan, Elizabeth Island, 19-I-1888, *Lee s.n.* (US); Río Pescado, 40 km al N de Punta Arenas, 2-XI-1985, *León* 3716 (BAA); Punta Arenas, 16-II-1906, *Sargent s.n.* (US). **Prov. Tierra del Fuego.** Tierra del Fuego, I-1769, *Banks & Solander s.n.* (BM 608544); Tierra del Fuego, Estrecho de Magallanes, III-1930, *Canessa s.n.* (BAA); Porvenir, 16-I-1904, *Hicken* 206 (SI). **Prov. Ultima Esperanza.** Estancia Eberhard, a aprox. 10 km camino a Puerto Natales, 24-XI-1955, *Boelcke* 7477 (BAA); Estancia Cerro Castillo, Lago Maravilla, NE shore, 51°19'S, 72°43'W, 21-XII-1975, *Dollenz & Moore TBPA* 827 (SI); Seno Unión, N side, Ancon Sin Salida, 52°9'S, 73°21'W, 10-I-1976, *Dollenz & Moore TBPA* 875 (SI); Seno Unión, N side, Ancon Sin Salida, 52°9'S, 73°21'W, 10-I-1976, *Dollenz & Moore TBPA* 909 (SI); Isla Piazzzi, Caleta Ocaión, Abra Leackey's retreat, 51°44'S, 74°1'W, 16-I-1976, *Dollenz & Moore TBPA* 1028 (SI); Isla Rennel N, Canal Smith, 51°54'S, 74°12'W, 23-I-1976, *Dollenz & Moore TBPA* 1136 (SI); Isla Vidal Gormaz, Seno Nantuel, Bahía María Angélica, 51°53'S, 74°41'W, 1-II-1976, *Dollenz & Moore TBPA* 1254 (SI); Río Verde, 150 km al N del estrecho, XII-1926, *Guiñazú* 129 (BAA); Puerto Prat, 4-II-1904, *Hicken* 150 (SI); Seno Ultima Esperanza, Puerto Toro, Río Serrano, 2 km from mouth, 51°24'S, 73°5'W, 17-I-1977, *Moore & Pisano TBPA* 1777 (SI); Seno Ultima Esperanza, Puerto Toro, W of río Serrano, N of ventisquero Balmaceda, 51°25'S, 73°5'W, 18-I-1977, *Moore & Pisano TBPA* 1810 (SI); Seno Ultima Esperanza, Puerto Toro, costa E río Serrano, 51°25'S, 73°4'W, 22-I-1977, *Moore & Pisano TBPA* 1866 (SI); Seno Ultima Esperanza, Península Roca, Seno Resi, 51°51'S, 73°2'W, 21-I-1978, *Pisano s.n. TBPA* 2802 (SI); Seno Ultima Esperanza, Península Roca, Seno Resi, 51°51'S, 73°2'W, 24-I-1978, *Pisano s.n. TBPA* 2875 (SI); Seno Ultima Esperanza, Puerto Bella Vista, 51°31'S, 73°16'W, 11-I-1977, *Pisano* 74 (SI). **REG. DEL MAULE. Prov. Curicó.** Cord. Volcán Peteroa, I-1925, *Werdermann* 607 (SI, BM). **Prov. Talca.** Cordillera Talca-Picazo, 26-I-1939, *Barros* 1858 (SI); Laguna del Maule, 30-I-1963, *Boelcke & Bacigalupo* 10336 (BAA, LP, SI); Laguna del Maule, 36°01'S, 70°33'W, 24-I-1990, *Gardner & Knees* 4528 (E); Cordillera del Maule, 1855, *Germain s.n.* (BM); Laguna del Maule, 24-I-1981, *Grau* 2828 (BM). **REG. LIBERTADOR O'HIGGINS. Prov. Conchagua.** El Flaco, 26-I-1948, *Barros* 7366 (LP). **Specimens from cultivation:** England,

Hampshire, Ampfield, Hillier's Arboretum, 14-V-1974, *s. leg.* 853 (BM); Royal Botanic Garden Edinburgh, V-1956, *s. leg.* C1258 (BM).

*Chiliotrichum fuegianum* (O. Hoffm.) Bonif. **comb. nov.** *Chiliophyllum fuegianum* O. Hoffm., in Dusén, Wissench. Erg. Schwed. Exped. Magellansländer 1895–1897, 3 (5): 96, 1900. TYPE: “[Argentina] Tierra del Fuego, Río Cullen, 1891, *B. Ansoorge* 429” (holotype: UPS; photo of holotype at UPS: LP!).

(FIGURES 21, 22, 52)

**Shrubs** up to 1 m tall, globose, spreading; branches densely disposed, ascending, not ribbed, tomentose, internodes short, up to 1 (–2) mm long. **Leaves** densely disposed, persistent, alternate, ascending, 4–6 (–8) × 1–1.5 mm, elliptic to obovate, base attenuated, petiole broadened towards the stem and constricted above, apex obtuse, margins flat to slightly revolute, gland-dotted in both surfaces, laxly to densely tomentose on abaxial surface, midvein notorious on abaxial side, forming furrow on adaxial side, discolorous, coriaceous. **Capitula** solitary, terminal, peduncles short, up to 1.5 mm long, heterogamous, radiate. **Involucre**s 7–8 × 3.5–4.5 mm, cylindrical-campanulate; phyllaries arranged in 3 to 4 series; outer phyllaries 3.0–5.0 × 1.5–2.5 mm, triangular-ovate, apex acute, gland-dotted to slightly tomentose abaxially, coriaceous, margins membranaceous, fimbriate; inner phyllaries 5–8 × 1.2–2 mm, narrowly elliptic, apex acute, gland-dotted abaxially with a tuft of woolly trichomes towards the apex, membranaceous, margins slightly fimbriate. **Receptacles** slightly convex, partially paleate; paleae 4 to 7, 7–9 × 0.5–1 mm, linear to narrowly elliptic, not embracing the achenes, apex acute, gland-dotted towards the apex, margins membranaceous, fimbriate. **Ray florets** 3 to 6 (–8), pistillate; corollas white, radiate, tube 3–4.2 mm long, limb 5–8.3 × 1–2.6 mm, narrowly elliptic, 2- to 3-lobed; staminodes 1 to 2, very reduced; style shafts 4–4.2 mm long, base slightly swollen, style branches 2–3 mm long, narrowly ovate, subequal in length. **Disk florets** 7 to 15, bisexual; corollas yellow, tubular, 5-lobed, broadened more or less abruptly from mid-length, tube 2–4 mm long, throat 1.5–2 mm long, lobes 1.5–2.1 × 0.5–0.7 mm, triangular, gland-dotted abaxially; anther thecae 2–2.3 mm long, bases slightly sagittate, apical appendages 0.4–0.7 mm long, triangular-ovate, antheropodium present, not swollen; style shafts 3.7–6 mm long, base swollen, style branches 1.8–2.5 mm long, narrowly obovate, apex acute, collecting hairs on upper 1/2 to

2/3. **Achenes** 4.5–5.5 mm long, narrowly obovate, terete, 4- to 6-ribbed, gland-dotted, sometimes with few twin trichomes sparsely distributed towards the apex, carpodium present, conspicuous. **Pappus** 4–5 (–6) mm long, 2- to 3-seriate, composed of 65 to 70 linear scales, outer series slightly shorter, scabrid along the margins.

**Vernacular names:** Not known.

**Phenology:** Flowering specimens have been collected from December to February. Specimens with mature fruits have been collected in May and July.

**Distribution:** Argentina and Chile, endemic to northern Tierra del Fuego (Figure 22)

**Habitat:** Sand dunes and clay-sandy soil depressions in Patagonian steppe (Cabrera and Willink, 1973). It grows in coastal grasslands together with *Lepidophyllum cupressiforme* and *Chiliotrichum diffusum*.

**Uses:** Not known.

**Etymology:** The specific epithet *fuegianum* refers to the geographic area where the species occurs.

**Note 1:** *Chiliotrichum fuegianum* (O. Hoffm.) Bonif., was originally described in *Chiliophyllum* DC. (= *Zaluzania* Pers.). However, Hoffmann (1900) was unequivocally referring to *Chiliophyllum* Phil. since in the same publication of the new species he mentioned the differences between the new species and *Chiliophyllum densifolium* Phil. It is important to highlight that Hoffmann himself was aware of the differences between *Chiliophyllum fuegianum* and *Chiliophyllum densifolium*, especially those concerning the pappus (2- to 3-seriate in *C. fuegianum* versus 1-seriate in *C. densifolium*). Reiche (1901) also noticed that the characteristics described for this species were not totally congruent with those of the genus in which it was placed.

**Note 2:** As mentioned before, morphological characters such as the type of pappus, pubescence of achenes, color of marginal florets corolla as well as molecular characters (Bonifacino and Funk, unpublished data) put this species in close vicinity to *Chiliotrichum diffusum*.

**Additional specimens examined:** ARGENTINA. PROV. TIERRA DEL FUEGO. Dpto. Río Grande. Ruta 3, Bahía San Sebastián, 53°14'1"S, 68°34'6"W, 28-I-2002, *Bonifacino et al.* 595 (LP); al N de Bahía San Sebastián, próximo a planta “TOTAL”, 52°53'19"S, 68°21'38"W, 13-XII-2006, *Bonifacino et al.* 3017 (US); Estancia Cullen, Puesto Beta, 7-I-1971, *Goodall* 3249 (BAB, SI, herb. Goodall); Estancia Cullen, Arroyo Alfa, 20-V-1972, *Goodall* 4301 (BAB, herb. Goodall); Estancia Cullen, Arroyo Alfa, 20-V-1972, *Goodall* 4302 (BAB, herb. Goodall); Estancia Cullen, beach near outlet of Río Cullen, 19-V-1972, *Goodall* 4296 (BAB, herb. Goodall); Estancia Cullen,

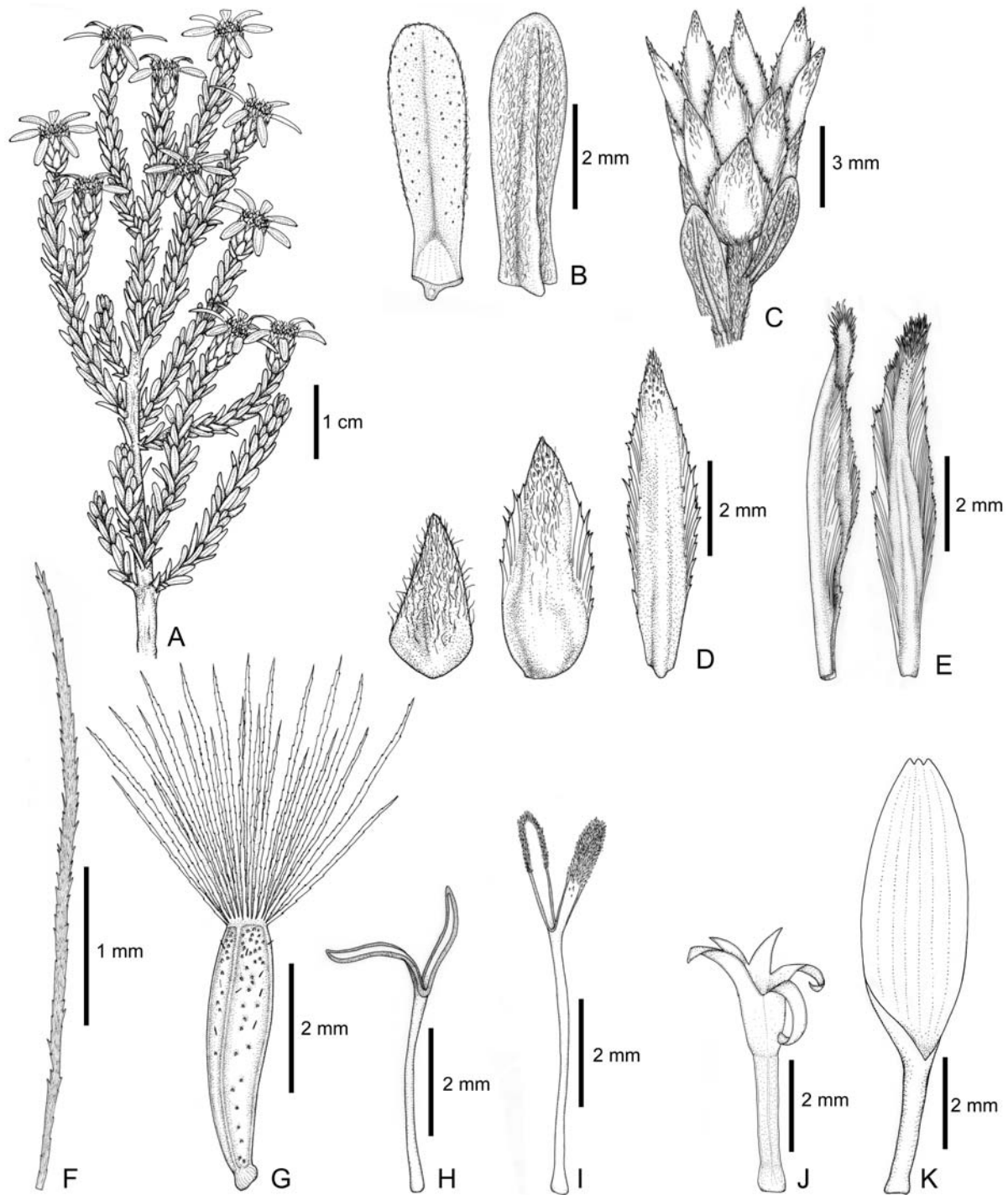


FIGURE 21. *Chiliotrichum fuegianum* (O. Hoffm.) Bonif. A. Habit. B. Leaves, adaxial view (left), abaxial view (right). C. Involucre. D. Outer to inner phyllaries (from left to right). E. Receptacular paleae, lateral view (left), dorsal view (right). F. Detail of pappus scales. G. Achene with pappus. H. Style of ray floret. I. Style of disk floret. J. Corolla of disk floret. K. Corolla of ray floret (A–K, Bonifacino et al. 595, LP).



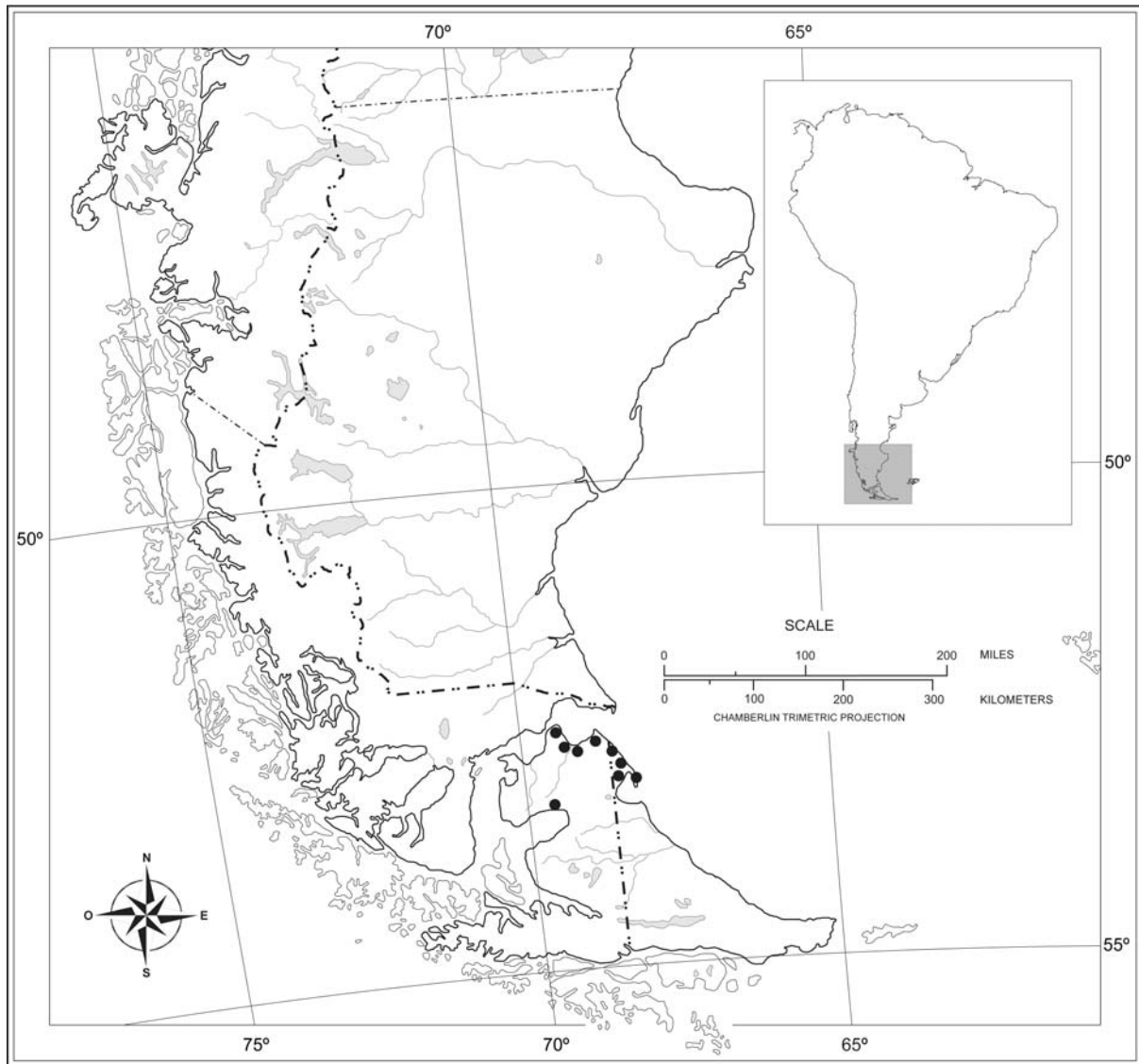


FIGURE 22. Geographic distribution of *Chilitrichum fuegianum* (O. Hoffm.) Bonif.

Arroyo Beta, 20-XII-1975, *Goodall 5033* (herb. Goodall); Estancia Cullen, 1-VI-1977, *Goodall 5167* (herb. Goodall); Estancia San Martín, Golfo San Sebastián, 6-II-1955, *Grondona 4477* (BAB); Bahía San Sebastián, Estancia San Martín, 6-II-1955, *Hunziker 6827* (BAB, LP); Estancia Cullen, Arroyo Beta, 52°44'S, 68°35'W, I-1972, *Moore & Goodall 338* (LP, BAB, herb. Goodall); Estancia Cullen, N side of Río Cullen, 52°51'S, 68°24'W, 5-I-1972, *Moore & Goodall 356* (BAB, K, herb. Goodall). CHILE. REG. DE MAGALLANES. Prov. Tierra del Fuego. Bahía Inútil, first line of hills to the S of Río Marazzi, 25-VII-

1977, *Goodall 5168* (herb. Goodall); NE end of Bahía Inútil, road to Porvenir, 7 km west of Puerto Nuevo, 26-VII-1977, *Goodall 5171* (herb. Goodall); Bahía Lomas, S side of bay, just E of Estancia Cuarto Chorrillo, 29-V-1978, *Goodall 5207* (herb. Goodall); Estancia Pepita, NW part of Bahía Lomas, 29-V-1978, *Goodall 5210* (herb. Goodall); Estrecho de Magallanes, Primera Angostura, Punta Espora, 29-V-1978, *Goodall 5211* (herb. Goodall); Bahía Lomas, SE part of the bay, 28-V-1978, *Goodall 5294* (herb. Goodall); Puerto Sara, I-1954, *Magens s.n.* (F, SGO).

***Haroldia* Bonif. gen. nov.**

*Haroldia* Bonif. gen. nov. TYPE: *Chiliotrichiopsis mendocina* Cabrera, Notas Mus. La Plata, Bot. 17(84): 73, 1954 (≡ *Haroldia mendocina* (Cabrera) Bonif. comb. nov.).

*Frutex, ramis teretibus glandiferis, folia anguste elliptico-ovata base amplexicaulia margine revoluta, insigniter glandulifera. Capitula pluriflora heterogama radiata solitaria, involucris campanulatis, receptaculis paleatis, paleis ad corollam disci aequalibus vel longioribus apicibus subulatis. Flosculi lutei dimorphi, flosculis peripheralibus femineis radiatis, flosculis disci hermaphroditis. Corollae tubiflorae glanduliferae 5-lobatae abrupte ampliatae in venis basim versus incrassatis; thecae antherarum base non breviter sagittatis; rami stylorum in quadrantibus superioribus papillis collectoribus obtecti. Achenia ad extremum constricta, base stipitata, villosa; squamae pappi crassae scabridae 1-seriatae.*

**Shrubs** more or less globose; branches densely disposed, ascending, 6- to 8-ribbed, with notable glandular vesicular capitate trichomes. **Leaves** laxly disposed, persistent, alternate, ascending with a tuft of woolly trichomes on leaves axils, gradually reduced towards the apex, narrowly elliptic to narrowly ovate, base attenuated, petiole broadened towards the stem and constricted above, apex acute, margins revolute, notable glandular vesicular capitate trichomes on both sides, laxly tomentose pubescence on abaxial side, discolorous, chartaceous. **Capitula** solitary, terminal, pedunculate, heterogamous, radiate. **Involucres** campanulate, phyllaries arranged in 2 to 3 series; outer phyllaries linear-triangular to oblong, apex acute, notable glandular vesicular capitate trichomes on abaxial surface, chartaceous, margins membranaceous; inner phyllaries, narrowly elliptic, apex subulate, notable glandular vesicular capitate trichomes on abaxial surface, chartaceous, margins broadly membranaceous. **Receptacles** slightly convex, paleate; paleae linear to narrowly elliptic, embracing the achenes, apex subulate, rigid, when dry equaling or surpassing the corolla, notable glandular vesicular capitate trichomes towards the apex, margins membranaceous. **Ray florets** ~9, pistillate; corollas yellow, radiate, limb elliptic, 3-lobed; staminodes present; style base swollen, style branches oblong, subequal in length. **Disk florets** 21 to 30, bisexual; corollas yellow, tubular, gradually broadened towards the apex, 5-lobed, lobes triangular, corolla veins thick towards the base, protruding on outer surface when dry; anther thecae bases obtuse, not sagittate, apical appendages triangular, antheropodium

present, not swollen; style base swollen, style branches ovate-oblong, apex acute, collecting hairs on upper 3/4. **Achenes** narrowly obovate, terete, (3)4- to 6-ribbed, with a noticeable constriction towards the apex, laxly and uniformly villose and gland-dotted. **Pappus** 1-seriate, composed of scales, triangular ovate, seldom divided towards the apex, notably scabrid.

**Etymology:** I dedicate this genus to Harold Robinson, renowned synantherologist who has made notable contributions to the taxonomy and systematics of the Compositae.

*Haroldia* is a new monotypic genus described herein, only known from northern Mendoza (Argentina), although probably extending over neighboring San Juan province. It inhabits dry rocky slopes in the ecotonal range between the high Andean and Monte biogeographic provinces (Cabrera and Willink, 1973).

The genus is characterized by its minute pappus made of coarse scales, radiate heads, campanulate involucre, paleate receptacles, and yellow corollas with noticeable veins towards the base.

Although similar to *Chiliotrichiopsis*, *Haroldia* differs in the above mentioned characteristics, and also in the subulate and stiff nature of the receptacular paleae apices (versus acute and soft textured in *Chiliotrichiopsis*), the usually apically constricted achenes, and the stouter appearance of the twin trichomes on the achenes, very shortly divided towards the apex (versus twin trichomes, thinner and delicate and usually deeply divided towards the apex in *Chiliotrichiopsis*).

The systematic position of *Haroldia* is somewhat unresolved according to current molecular data (Bonifacio and Funk, unpublished data). Although forming part of the *Chiliotrichiopsis* + *Nardophyllum* + *Cabreraea* + *Katinasia* clade, it is clear that it does not belong to *Chiliotrichiopsis*.

***Haroldia mendocina* (Cabrera) Bonif. comb. nov.** *Chiliotrichiopsis mendocina* Cabrera, Notas Mus. La Plata, Bot. 17(84): 73, 1954. TYPE: “[Argentina, Mendoza, Quebrada Chacay, Cordillera del Tigre, 2200 m, 9-XII-1927, D. O. King 333” (holotype: LP 561922!).

(FIGURES 23, 24, 53)

**Shrubs** up to 1 m tall, more or less globose; branches densely disposed, ascending, 6- to 8-ribbed, with notable glandular vesicular capitate trichomes, internodes 3–6 mm long. **Leaves** laxly disposed, persistent, alternate, ascending with a tuft of woolly trichomes on leaves axils,

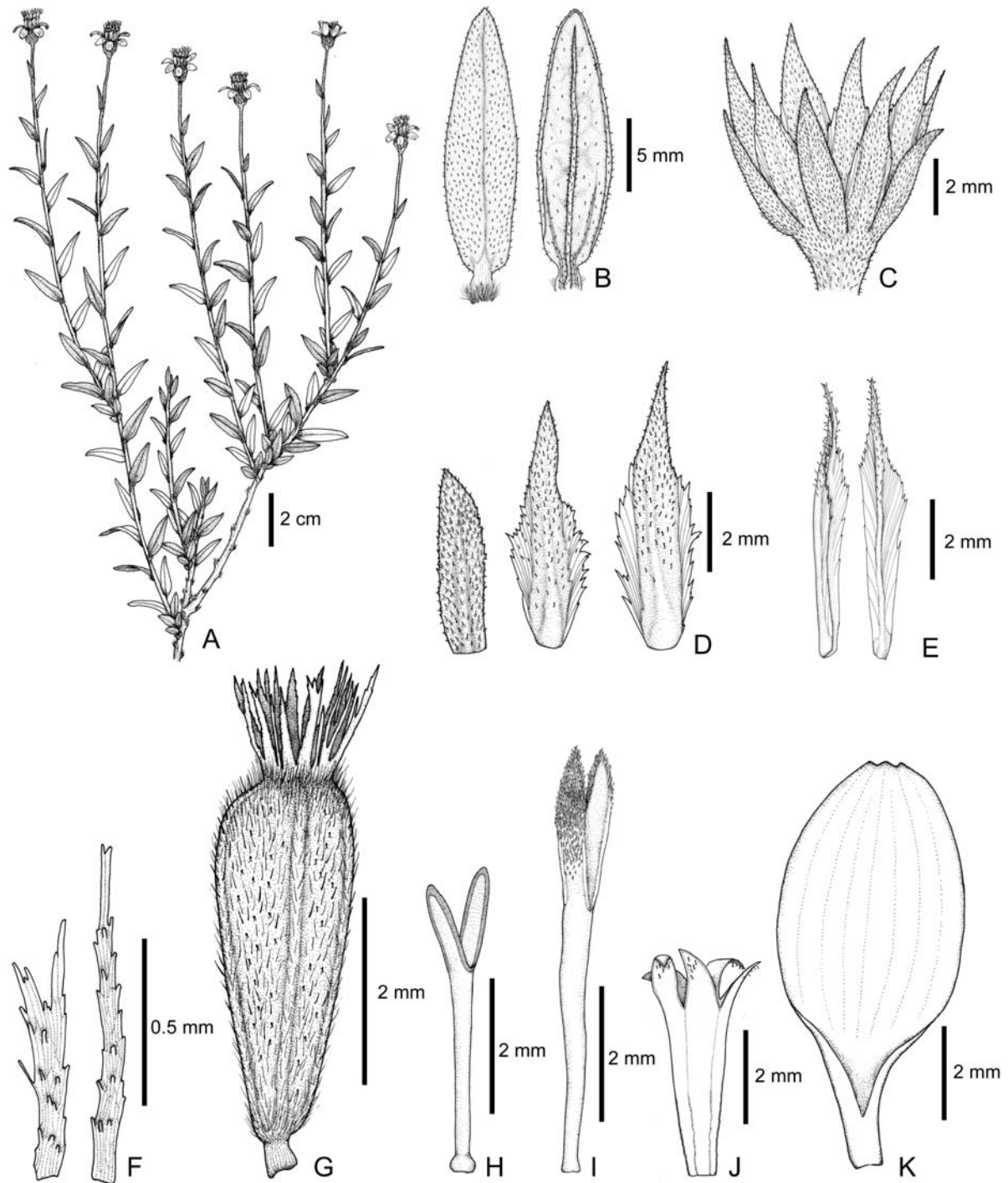


FIGURE 23. *Haroldia mendocina* (Cabrera) Bonif. A. Habit. B. Leaves, adaxial view (left), abaxial view (right). C. Involucre. D. Outer to inner phyllaries (from left to right). E. Receptacular paleae, lateral view (left), dorsal view (right). F. Detail of pappus scales. G. Achene with pappus. H. Style of ray floret. I. Style of disk floret. J. Corolla of disk floret. K. Corolla of ray floret (A–K, Simón & Bonifacino 782, LP).

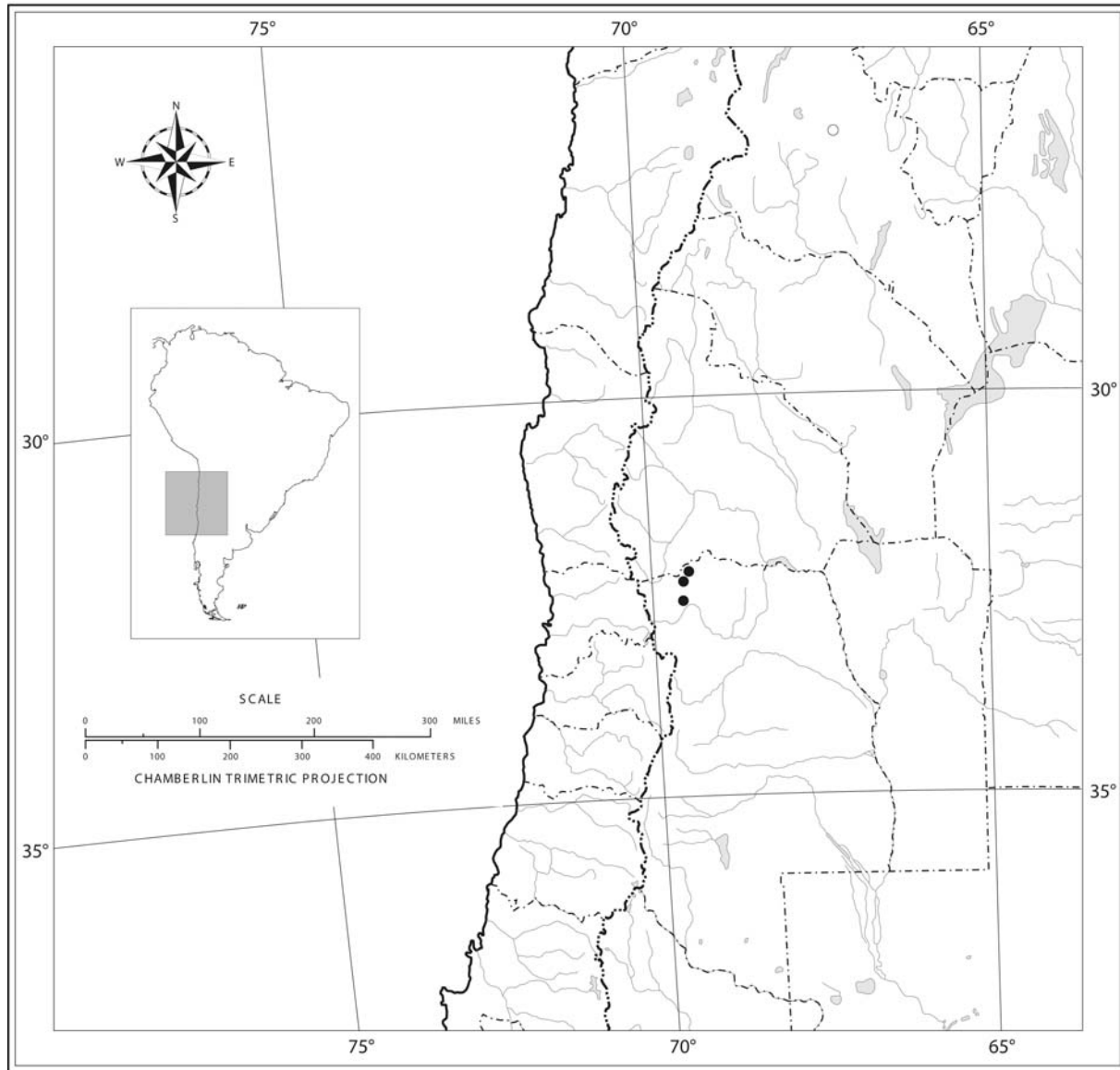


FIGURE 24. Geographic distribution of *Haroldia mendocina* (Cabrera) Bonif.

10–20(–27) × 3–5(–6.5) mm, gradually reduced towards the apex, narrowly elliptic to narrowly ovate, base attenuated, petiole broadened towards the stem and constricted above, apex acute, margins revolute, with notable glandular vesicular capitate trichomes on both sides, laxly tomentose pubescence on abaxial side, chartaceous. **Capitula** solitary, terminal, pedunculate, peduncles (5–)10–15 mm long, heterogamous, radiate. **Involucre**s 5–6 × 4–5 mm, campanulate; phyllaries arranged in 2 to 3 series; outer phyllaries 3–4 × 0.5–1 mm, linear-triangular to oblong, apex acute, with notable glandular vesicular capitate trichomes on abaxial surface, coriaceous, margins membra-

naceous; inner phyllaries 4–6.5 × 1–1.5 mm, narrowly elliptic, apex subulate, with notable glandular vesicular capitate trichomes on abaxial surface, margins broadly membranaceous. **Receptacles** slightly convex, paleate; paleae 6–7 × 1–1.5 mm, linear to narrowly elliptic, embracing the achenes, apex subulate, rigid, when dry equaling or surpassing the corolla, with notable glandular vesicular capitate trichomes towards the apex, margins membranaceous. **Ray florets** ~9, pistillate; corollas yellow, radiate, tube 1–1.5 mm long, limb 4–7 × 2.5–4 mm, elliptic, 3-lobed; staminodes 2 or 3; style shafts 1.8–3 mm long, base swollen, style branches 1.5–4.5 mm long, oblong,

subequal in length. **Disk florets** 21 to 30, bisexual; corollas yellow, tubular, 5-lobed, gradually broadened towards the apex, tube 4.5–5 mm long, lobes 1.5–1.7 × 0.7–0.8 mm, triangular, gland-dotted abaxially, corolla veins thick towards the base, protruding on outer surface when dry; anther thecae 2–2.5 mm long, bases obtuse, not sagittate, apical appendages 0.5–0.6 × 0.3 mm, triangular, antheropodium present, not swollen; style shafts 3.5–4.5 mm long, base slightly swollen, style branches 1.5–2 mm long, ovate-oblong, apex acute, collecting hairs on upper 3/4. **Achenes** 3.5–5 mm long, narrowly obovate, terete, (3)4- to 6-ribbed, with a noticeable constriction towards the apex, laxly and uniformly villose and gland-dotted. **Pappus** 1–1.5 mm long, 1-seriate, composed of 18 to 25 flattened bristles, triangular ovate, seldom divided towards the apex, notably scabrid.

*Vernacular names:* Not known.

*Phenology:* Flowering specimens have been collected from December to January.

*Distribution:* Argentina, endemic to Mendoza province, probably extending into southern San Juan (Figure 24).

*Habitat:* Ecotonal area between Monte and high Andean vegetation (Cabrera and Willink, 1973), from 2,200 to 2,600 m, along rocky mountain slopes, not forming big consociations

*Uses:* Not known.

*Etymology:* The specific epithet refers to the geographic area where the type specimen was collected.

*Additional specimens examined:* ARGENTINA. PROV. MENDOZA. Dpto. Las Heras. Cordillera del Tigre, Estancia San Alberto, 32°27'49"S, 69°25'47"W, 2,500 m, 21-I-2005, *Bonifacino & Muttoni* 1646 (US); Cordillera del Tigre, Estancia San Alberto, 32°24'37"S, 69°28'21"W, 2,970 m, 22-I-2005, *Bonifacino & Muttoni* 1656 (US); tres km al W de Uspallata, camino al NW, 32°31.7'S, 69°30.5'W, 2,600 m, 26-I-2001, 26-I-2001, *Simon & Bonifacino* 775 (LP); *id.*, *Simon & Bonifacino* 782 (LP); *id.*, 26-I-2001, *Simon & Bonifacino* 791 (LP).

### ***Katinasia* Bonif. gen. nov.**

*Katinasia* Bonif. gen. nov. TYPE: *Nardophyllum cabrerarum* Bonif., Taxon 54(3): 688–689 (≡ *Katinasia cabrerarum* (Bonif.) Bonif. comb. nov.).

*Frutex, ramis teretibus lanuginosis (tomentosis) et glanduliferis. Folia base amplexicaulia, marginibus integris non revolutis. Capitula pluriflora homogama discoida solitaria vel 2–5 (–7) in corymbis terminalibus laxe disposita, involucris cylindricis, receptaculis paleatis vel*

*nudis. Flosculi hermaphroditi, corollis tubiformibus albis glanduliferis 5-lobatis abrupte ampliatis; rami stylorum in dimidiis superioribus papillis collectoribus obsiti. Achenia glandulo-punctata etiam in pilis geminatis brevibus leviter pubescentia; aristae pappi inaequales scabridae 3- vel 4-seriatae.*

**Shrubs** hemispheric; branches more or less densely disposed, ascending, 8-ribbed, tomentose and gland-dotted. **Leaves** more or less laxly arranged, persistent, alternate, ascending, narrowly elliptic, base slightly attenuated, base attenuated, petiole broadened towards the stem and slightly constricted above, apex acute, margins entire, non-revolute, tomentose and gland-dotted on both sides, secondary veins evident (one at each side of midvein), concolorous, coriaceous. **Capitula** arranged in corymbiform capitulescences composed by 2 to 5 (7) heads, sometimes solitary, terminal, sessile or pedunculate, homogamous, discoid. **Involucres** cylindrical; phyllaries arranged in 5 to 6 series; outer phyllaries ovate-elliptic, apex acute-acuminate, gland-dotted to slightly tomentose on abaxial surface, coriaceous; inner phyllaries narrowly-elliptic to oblong, apex acute-acuminate, gland-dotted towards the apex, papery. **Receptacles** flat, naked, occasionally with 1 or 2 paleae; paleae linear to narrowly elliptic, not embracing the achenes, apex acute, margins membranaceous. **Florets** 4 to 6, bisexual; corollas white, tubular, 5-lobed, broadened more or less abruptly from mid-length, lobes triangular; anther thecae bases slightly sagittate, apical appendages triangular, antheropodium present, not swollen; style bases slightly swollen, style branches linear to oblong, apex acute, collecting hairs on upper 1/3. **Achenes** obconic, terete, 5- to 8-ribbed, sparsely villose and gland-dotted, villose pubescence mostly on the ribs, carpopodium present. **Pappus** 3- to 4-seriate, composed of terete bristles, scabrid, the inner series shortly barbellate towards the apex, outer series notably shorter.

*Etymology:* I dedicate this genus to Liliana Katinas, leading Argentinean synanthrologist, who has worked extensively on southern South American Compositae.

*Katinasia* is a new monotypic genus described herein, that it is restricted to an arid area of western Argentina in both southern Mendoza and Neuquén provinces. It inhabits the ecotonal area between Patagonian and Monte biogeographic provinces (Cabrera and Willink, 1973).

The genus is characterized by its discoid heads with 4 to 6 florets, white corollas and a 3- to 4-seriate pappus, composed of scabrid terete bristles, the outer series noticeably shorter, and the leaves having entire (non-revolute) margins.

Specimens belonging to this genus had been traditionally identified as *Nardophyllum lanatum*, a species endemic

to Chile, mainly because of the resemblance in the shape of the involucre (Cabrera, 1954a, 1971; Bonifacino and Sancho, 2001; Sancho and Ariza Espinar, 2003). After a detailed study of all available specimens and detailed field observations by Bonifacino (2005), it was concluded that the Argentinean populations ascribed to *Nardophyllum lanatum* actually belonged to a distinct undescribed species, which was described as *Nardophyllum cabreræ* Bonifacino. *Nardophyllum cabreræ* differed from the rest of *Nardophyllum* species, in several noticeable characteristics, the most notable being the white color of the corollas and the nature of the pappus. Notwithstanding those differences, from the narrow phylogenetic information available in 2005, segregation from *Nardophyllum* did not seem needed. Recent molecular research on the whole *Chiliotrichum* Group (Bonifacino and Funk, unpublished data) has yielded interesting results concerning the position of this species, clearly showing its distinction from *Nardophyllum*, and placing it as the sister group to the *Nardophyllum* + *Chiliotrichiopsis* clade. The characteristics that marked this species as new, when looked at in a broader phylogenetic context (i.e.: the whole *Chiliotrichum* Group), proved sufficient to support a generic segregation on morphological grounds. Further, *Katinasia* is the only genus inside *Chiliotrichum* Group with iso-bilateral mesophyll in the leaves.

*Katinasia cabreræ* (Bonif.) Bonif. **comb. nov.** *Nardophyllum cabreræ* Bonif., Taxon 54(3): 688–689. TYPE: “Argentina, Prov. Neuquén, Dpto. Catan Lil, al W de Ruta 40, cerca de Arroyo China Muerta, 39°31'26.9"S, 70°18'49.6"W, 29-I-2003, Bonifacino & Romano 825” (holotype: LP!; isotypes: MVFA!, SI!).

(FIGURES 25, 26, 54)

**Shrubs** 40–100 cm tall, hemispheric; branches more or less densely disposed, ascending, branches 8-ribbed, tomentose and gland-dotted, internodes 1–6 mm long. **Leaves** more or less laxly arranged, persistent, alternate, ascending, 7–17 × 0.6–2.5 mm, gradually reduced towards the branch apex, narrowly elliptic, base slightly attenuated, petiole broadened towards the stem and slightly constricted above, apex acute, margins entire, non-revolute, slightly tomentose and gland-dotted on both sides, secondary veins evident (one at each side of midvein), concolorous, coriaceous. **Capitula** arranged in corymbiform capitulescences composed by 2 to 5 (7) heads, sometimes solitary, terminal, sessile or with peduncles up to 15 mm long, homogamous, discoid. **Involucres** 10–12 × 2–4 mm, cylindrical; phyllaries arranged in 5 to 6 series; outer phyllaries 4–5 × 0.5–2 mm, ovate-elliptic, apex acute-acuminate, gland-dotted to slightly tomentose

on abaxial surface, coriaceous; inner phyllaries 6–10 × 1–2 mm, narrowly-elliptic to oblong, apex acute-acuminate, gland-dotted towards the apex, papery. **Receptacles** flat, naked, occasionally partially paleate; paleae 1 or 2, ~10 × 1 mm, linear to narrowly elliptic, not embracing the achenes, apex acute, margins membranaceous. **Florets** 4 to 6, bisexual; corollas white, tubular, 5-lobed, broadened more or less abruptly from mid-length, tube 2.5–3.5 mm long, throat 3.5–5 mm long, lobes 1–1.6 × 0.5 mm, triangular, gland-dotted abaxially; anther thecae 2–2.5 mm long, bases slightly sagittate, apical appendages 0.8–1.1 × 0.2–0.3 mm, triangular, antheropodium present, not swollen; style shafts 8–12 mm long, base slightly swollen, style branches 2.5–3.5 mm long, linear to oblong, acute, collecting hairs on upper 1/3. **Achenes** 4.5–6 mm long, obconic, terete, 5- to 8-ribbed, sparsely villose and gland-dotted, villose pubescence mostly on the ribs, carpopodium present. **Pappus** 6–8 mm long, 3- to 4-seriate, composed of 110 to 140 terete bristles, scabrid, the inner series shortly barbellate towards the apex, outer series shorter, 2–3 mm long.

**Vernacular names:** Not known.

**Phenology:** Flowering specimens have been collected from December to February.

**Distribution:** Argentina, endemic to southern Mendoza and Neuquén (Figure 26).

**Habitat:** Semiarid steppes between 700 and 1,580 m in the Patagonia-Monte ecotonal range (Cabrera and Willink, 1973). Considering the relatively few previous collections, *Katinasia cabreræ* seems to be a rare species. However, it is locally abundant at the type locality. It grows associated with *Colliguaja integerrima* Gill. and Hook., *Larrea nitida* Cav., *Prosopis denudans* Benth., *Nassauvia glomerulosa* D. Don, *Tetraglochin ameghinoii* Speg., and *Schinus* spp.

**Uses:** Not known.

**Etymology:** The specific epithet refers to late great synantherologist Angel Lulio Cabrera (1908–1999).

**Additional specimens examined:** ARGENTINA. PROV. MENDOZA. Dpto. Malargue. Ruta 40, 20 km S de Calmuco, 1-II-1963, Boelcke et al. 10420 (BAA, LP, SI); Laguna de Coipo Lauquen, 36°35'19"S, 69°49'40.6"W, 1555 m, 8-XII-2006, Bonifacino et al. 2906 (US); Laguna de Coipo Lauquen, al Sur de Calmuco, 15-I-1942, Burkart et al. 14425 (LP, SI); Laguna de Coipo Lauquen, 11-I-1973, Cabrera et al. 22843 (LP); entre Calmuco y Río Barrancas, 15-II-1942, Covas 280 (LP); entre Ranquil Norte y Río Barrancas, 5-I-1966, Ruiz Leal 24371 (LP); El Manzano, 1580 m, 27-I-1941, Ruiz Leal 7430 (LP); Laguna de Coipo Lauquen, 36°34.5'S, 69°49.5'W, 1,500 m, 30-I-2001, Simón & Bonifacino 847 (LP). PROV. NEUQUÉN. Dpto. Pehuenches. Entre Río Barrancas y Buta Ranquil, 8-II-1950, Boelcke 4235 (BAA, LP).

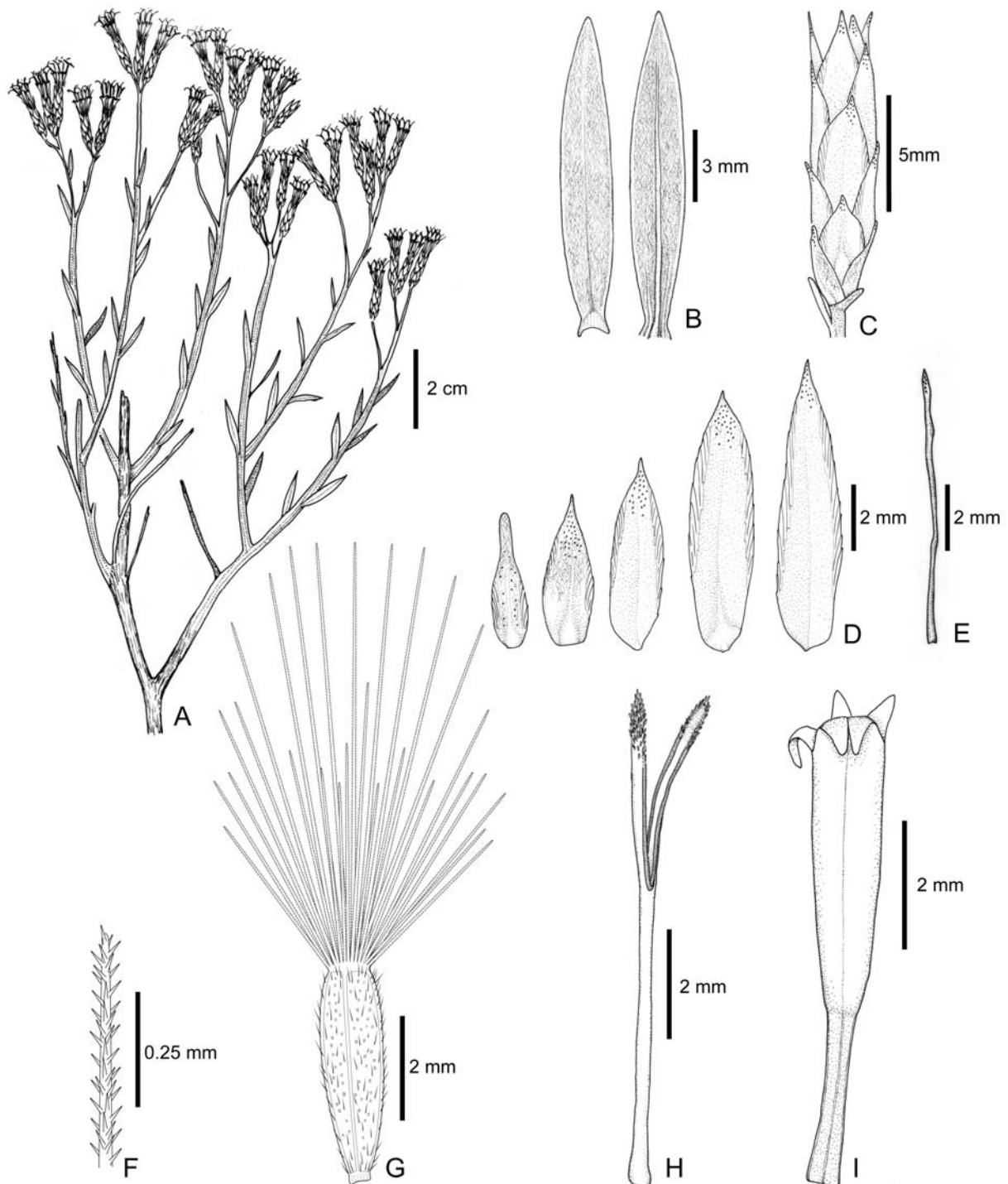


FIGURE 25. *Katinasia cabreræ* (Bonif.) Bonif. A. Habit. B. Leaves, adaxial view (left), abaxial view (right). C. Involucre. D. Outer to inner phyllaries (from left to right). E. Palea. F. Detail of pappus terete bristle. G. Achene with pappus. H. Style. I. Corolla (A–I, Bonifacino & Romano 825, LP).

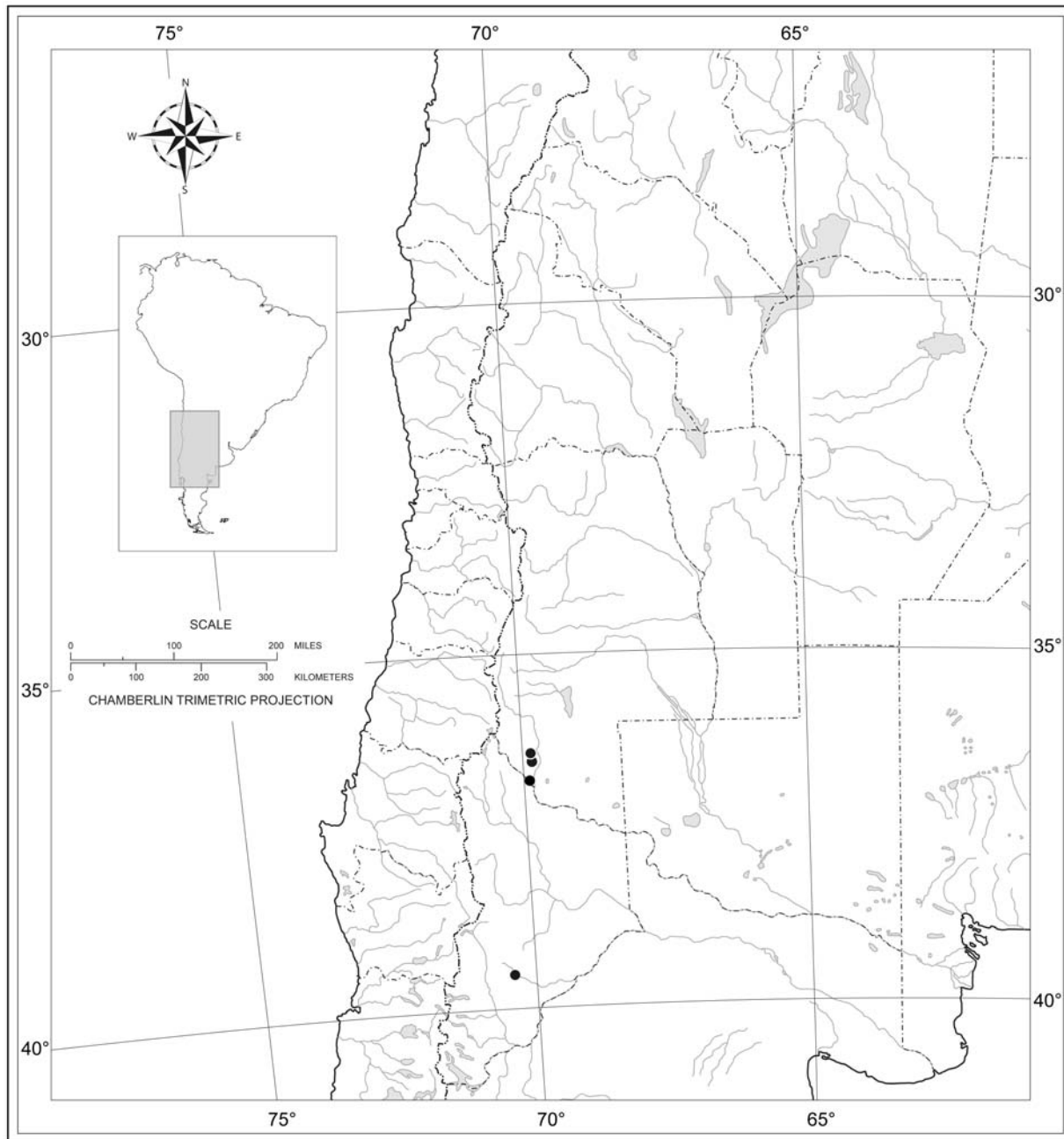


FIGURE 26. Geographic distribution of *Katinasia cabrerai* (Bonif.) Bonif.

### ***Lepidophyllum* Cass.**

#### **Taxonomic History**

1816. Cassini creates *Lepidophyllum* to include a species originally described by Lamarck from the Straits of Magellan in 1786 as *Conyza cupressiformis*.

1823. Cassini makes the combination *Lepidophyllum cupressiforme*.

1839. Meisner does not accept Cassini's *Lepidophyllum* and, without explanation, coins *Brachyridium* to replace Cassini's name; presents also the combination *Brachyridium cupressiforme* (Lam.) Meisner.



1855. Schultz Bipontinus (1855a) creates the combination *Gutierrezia cupressiformis* (Lam.) Sch. Bip.
- 1862–1931. Several authors (see “Excluded Species”) coin species names or made combinations in *Lepidophyllum*; however, all those taxa are now referred to the genus *Parastrephia* Nutt. emend. Cabrera.
1945. Cabrera presents a synopsis for *Lepidophyllum* (which includes *Parastrephia* Nutt. emend. Cabrera) and creates two sections, *Eulepidophyllum* and *Tola* to place current *Lepidophyllum* and *Parastrephia* respectively.
1954. Cabrera (1954a), in his revision of the genus *Nardophyllum*, and after detailed studies of related South American Compositae revises the circumscription of *Lepidophyllum*, excluding the species from the Puna region and transferring them to *Parastrephia*, thus rendering *Lepidophyllum* monotypic, with the single species, *L. cupressiforme*.

*Lepidophyllum* Cass., Bull. Sci. Soc. Philom. Paris 1: 199, 1816. *Brachyridium* Meisn. **nom. illeg.**, Pl. Vasc. Gen., Diagn., 187, 1839. *Lepidophyllum* sect. *Eulepidophyllum* Cabrera **nom. illeg.**, Bol. Soc. Argent. Bot. 1: 49, 1945. TYPE: *Conyza cupressiformis* Lam., Encycl. 2: 91, 1786 (≡ *Lepidophyllum cupressiforme* (Lam.) Cass., in Cuvier, Dict. Sci. Nat., ed. 2, 26: 37, 1823).

**Shrubs** globose; branches densely disposed, ascending, not ribbed, gland-dotted. **Leaves** very densely arranged, persistent, opposite, decussate, sessile, triangular-ovate, base truncate, apex obtuse, margins slightly involute, mostly glabrous, with a few aseptate-flagellate trichomes along margins in younger leaves, coriaceous. **Capitula** solitary, terminal, sessile, heterogamous, radiate. **Involucres** cylindrical-ovoid, phyllaries arranged in 3 to 4 series; outer phyllaries ovate-elliptic, boat-shaped, apex obtuse, with a few glandular trichomes towards the apex, coriaceous, margins membranaceous; inner phyllaries narrowly obovate, apex obtuse, with a few glandular trichomes towards the apex, papery, margins membranaceous. **Receptacles** flat, partially paleate; paleae 1 (2), linear to narrowly obovate, not embracing the achenes, sometimes reduced to a single awn, apex obtuse, sometimes acute, with a few glandular trichomes towards the apex, margins membranaceous. **Ray florets** (1) 3 to 6, pistillate; corollas yellow, radiate, limb elliptic to oblong, 3-lobed; staminodes present; style base not swollen, style branches linear-triangular, subequal in length. **Disk florets** (3) 4 to 7, bisexual, functionally male; corollas yellow, tubular, 5-lobed, tube

broadened more or less abruptly from mid-length, lobes triangular; anther thecae bases slightly sagittate, apical appendages ovate, anteropodium present, swollen; style base slightly swollen, style branches oblong, obtuse, collecting hairs on upper 1/2. **Achenes** narrowly obovate, terete, 7- to 8-ribbed, gland-dotted, carpopodium present. **Pappus** 2- to 3-seriate, composed of linear scales, scabrid along the margins, slightly shorter on ray florets.

**Etymology:** Name derived from Latin *lepidō* (scale) and *phyllum* (leaves).

*Lepidophyllum* is monotypic and is distributed in Argentina from northern Santa Cruz to Tierra del Fuego, and in Chile in the provinces of Magallanes and Tierra del Fuego of Region de Magallanes. It inhabits both coastal and interior saline plains in the Patagonian biogeographic province (Cabrera and Willink, 1973). It has also been found on rocky slopes in northern Santa Cruz.

*Lepidophyllum* is characterized by the reduced, opposite and decussate leaves, radiate capitula, partially paleate receptacle, yellow ray corollas and gland-dotted achenes. According to molecular evidence (Bonifacino and Funk, unpublished data), the closest relatives to *Lepidophyllum* are *Chiliophyllum* and *Chiliotrichum*. It differs from *Chiliotrichum* and *Chiliophyllum* (most notably) in the opposite phylotaxy, a unique feature in the *Chiliotrichum* Group. *Lepidophyllum* Cass. is monotypic, and composed of the species *Lepidophyllum cupressiforme* (Lam.) Cass.

*Lepidophyllum cupressiforme* (Lam.) Cass., in Cuvier, Dict. Sci. Nat., ed. 2, 26: 37, 1823. *Conyza cupressiformis* Lam., Encycl. 2: 91, 1786. *Baccharis cupressiformis* (Lam.) Pers., Syn. Pl. 2: 425, 1807. *Athanasia cupressiformis* (Lam.) Commerson ex Cass., in Cuvier **pro syn.**, Dict. Sci. Nat., ed. 2, 26: 37, 1817. *Brachyridium cupressiforme* (Lam.) Meisn. **nom illeg.**, Pl. Vasc. Gen., Comment., 127, 1839. *Gutierrezia cupressiformis* (Lam.) Sch. Bip., Flora 8: 114, 1855. *Grindelia cupressiformis* (Lam.) Sch. Bip. ex Reiche **pro syn.**, Anales Univ. Chile 109: 25, 1901. TYPE: “[Chile] Magellan, au cotè du patagons, Baye Boucault, M. Commerson s.n.” (holotype: P 279523; scanned image of holotype at P: LP!; isotype: P 222885; photos of isotype: F!, SI!, LP!).

(FIGURES 27, 28, 55)

**Shrubs** up to 1.5 m tall, globose; branches densely disposed, ascending, not ribbed, gland-dotted, internodes short, shorter than 0.5 mm. **Leaves** very densely arranged, persistent, opposite, decussate, sessile, 1.5–3 × 1.3–2.2 mm, triangular-ovate, base truncate, apex obtuse,

margins slightly involute, mostly glabrous, with a few aseptate-flagellate trichomes along margins in younger leaves, coriaceous. **Capitula** solitary, terminal, sessile, heterogamous, radiate. **Involucre**s 5–7 × 3–4 mm, cylindrical-ovoid, phyllaries arranged in 3 to 4 series; outer phyllaries 3–5.5 × 2–2.5, ovate-elliptic, boat-shaped, apex obtuse, glabrous, with a few glandular trichomes towards the apex, coriaceous, margins membranaceous; inner phyllaries 5–7 × 1.2–1.6 mm, narrowly obovate, apex obtuse, with a few glandular trichomes towards the apex, papery, margins membranaceous. **Receptacles** flat, partially paleate; paleae 1 (–2), 5.5–7 × 1 mm, linear to narrowly obovate, not embracing the achenes, sometimes reduced to a single awn, apex obtuse, sometimes acute, margins membranaceous, with a few glandular trichomes towards the apex. **Ray florets** (1–) 3 to 6, pistillate; corollas yellow, radiate, tube 2–3.6 mm long, limb 2–4 × 1–1.2 mm, elliptic to oblong, 3-lobed; staminodes 1, very reduced; style base not swollen, style branches ~2 mm long, linear-triangular, subequal in length. **Disk florets** (3–) 4 to 7, bisexual, functionally male; corollas yellow, tubular, 5-lobed, broadened more or less abruptly from mid-length, tube 3–3.5 mm long, throat 1–1.5 mm long, lobes 1.5 × 0.6–0.7 mm, triangular, gland-dotted abaxially; anther thecae ~2 mm long, anther bases slightly sagittate, apical appendages 0.5 × 0.2–0.3 mm, ovate, antheropodium present, notably swollen; style shafts 5–6 mm long, base slightly swollen, style branches 1–1.3 mm long, oblong, apex obtuse, collecting hairs on upper 1/2. **Achenes** 4–6 mm long, narrowly obovate, terete, 7- to 8-ribbed, gland-dotted towards the apex, carpopodium present. **Pappus** 3.5–5 mm long, 2- to 3-seriate, composed of linear scales, scabrid along the margins, slightly shorter on ray florets.

**Vernacular names:** “Mata verde” (*Morrison s.n.*, SI); “Pichi” (*Philippi s.n.*, SGO); “Mata negra” (Haloua and Padín, 1999); “Pine scented daisy” (Borla and Vereda, 2001).

**Phenology:** Flowering specimens have been collected from October to April.

**Distribution:** Argentina, provinces of Santa Cruz and Tierra del Fuego, and Chile in the Región of Magallanes in the provinces of Magallanes and Tierra del Fuego (Figure 28).

**Habitat:** Coastal and interior saline plains, however it has also been found on rocky slopes of Bosques Petrificados National Monument in Santa Cruz province (Argentina), always in the Patagonian biogeographic province (Cabrera and Willink, 1973). The commonest habitat is along estuary banks where it can form dense consocia-

tions. It can also grow associated to *Berberis buxifolia* Lam., *Senecio patagonicus* Hook. and Arn., *Anarthrophyllum desideratum* (DC.) Benth., *Acaena* spp. *Festuca gracilima* Hook. f., *Chiliotrichum diffusum* (G. Forst.) Kuntze, *Chiliotrichum fuegianum* (O. Hoffm.) Bonif. (Roig, 1998; Pisano, 1977; pers. obs.). On the coastal saline plains where grasses are nonexistent or very sparse *Lepidophyllum cupressiforme* grows associated to *Sarcocornia perennis* (Mill.) A.J. Scott.

**Uses:** This species is highly promissory as a resin producer, given the impressive amounts of this substance in the leaves. Used as ornamental (Goodall, pers. comm.; Haloua and Padín, 1999). Branches used as fuel (Haloua and Padín, 1999).

**Etymology:** The specific epithet refers to the resemblance of the leaves to those of *Cupressus* L.

**Note 1:** In the original description of *Conyza cupressiformis*, Lamarck (1786) indicated: “Cette plante a été découverte dans les terres de Magellan par M. Commerson”. I have observed two scanned images of specimens at P that, corresponding entirely with the diagnosis, bear the following labels: “Magellan, au coté du patagons, Baye Boucault, M. Commerson s.n, 1767” (P 279532), and “Magellan, Coste des Patagons. Baye Boucault, sur les collines, M. Commerson, 1767” (P 222895). Both specimens have a handwritten description by Commerson where the species is named *Athanasia cupressiformis*. Given the total conformity of these specimens with the species characteristics, as well as the locality data, they are identified as holotype (P279532) and isotype (P222895). The image distributed by F as the type of the species corresponds with the holotype specimen (P279532) at P.

**Note 2:** The publication date for *Lepidophyllum cupressiforme* has traditionally been associated to the date in which Cassini published *Lepidophyllum* (1816) in “Bulletin des Sciences, par la Societe Philomatique”. However, Cassini made the combination *Lepidophyllum cupressiforme* (Lam.) Cass. in Cuvier in 1823 in “Dictionnaire des Sciences Naturelles, ed. 2”.

**Note 3:** C. Meisner (1839) did not accept Cassini’s *Lepidophyllum* and without explanation he coined *Brachyridium*. According to article 52.1 of the present code (Vienna Code, McNeill et al, 2006) *Brachyridium* represents a superfluous renaming and therefore constitutes an illegitimate name. In the same publication, Meisner also created the combination *Brachyridium cupressiforme* (Lam.) Meisner which also bears the status of illegitimate. It is interesting that Meisner’s description of *Brachyridium* is a word-by-word re-shuffled copy of Candolle’s (1836b) description of *Lepidophyllum*, even including an erroneous description

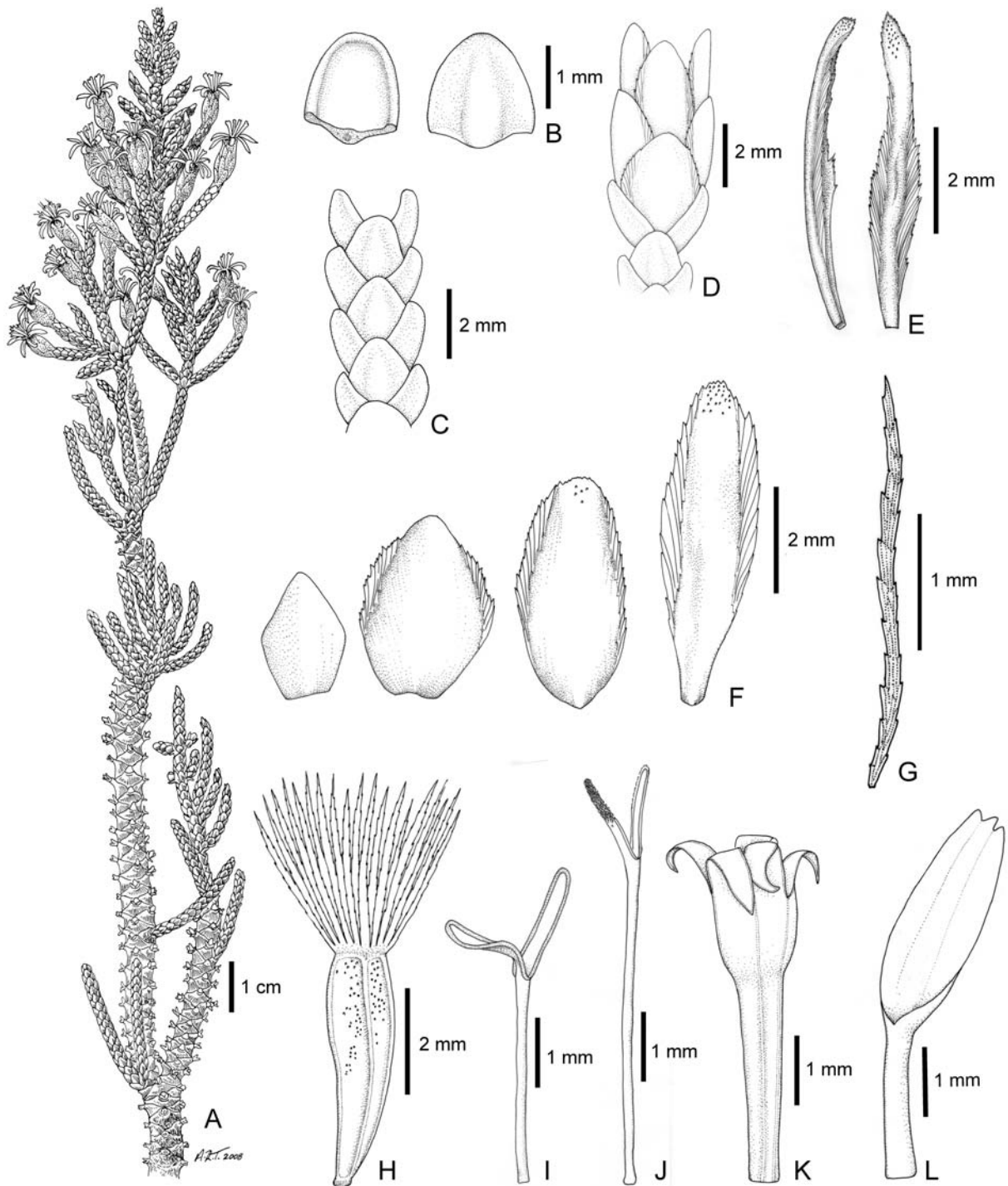


FIGURE 27. *Lepidophyllum cupressiforme* (Lam.) Cass. A. Habit. B. Leaves, adaxial view (left), abaxial view (right). C. Detail of a branch showing opposite phyllotaxy. D. Involucre. E. Receptacular paleae, dorsal view (left), lateral view (right). F. Outer to inner phyllaries (from left to right). G. Detail of pappus scales. H. Achene with pappus. I. Style of ray floret. J. Style of disk floret. K. Corolla of disk floret. L. Corolla of ray floret (A–L, Bonifacino et al. 787 L; FIGURE 27A by Alice Tangerini).

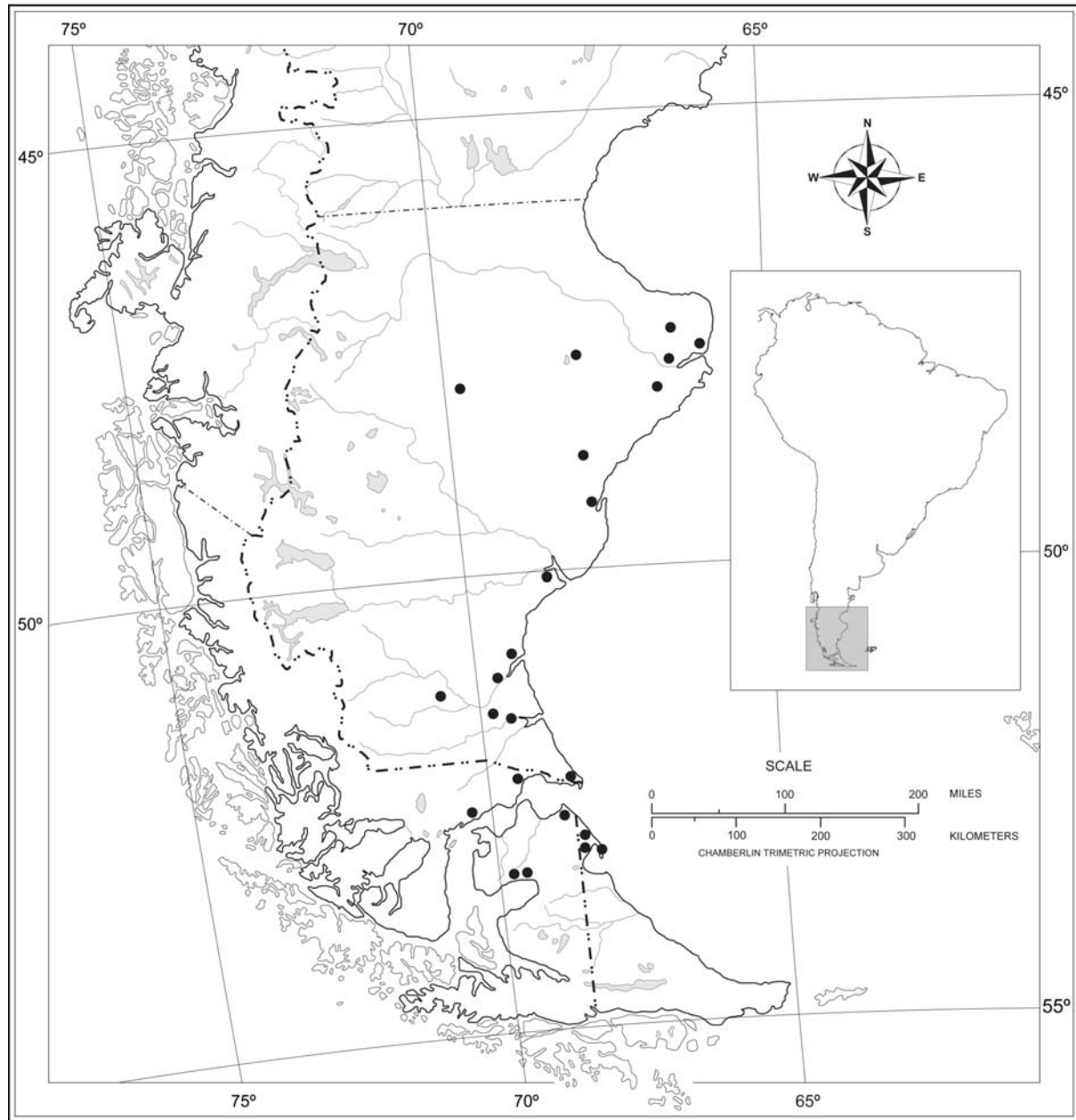


FIGURE 28. Geographic distribution of *Lepidophyllum cupressiforme* (Lam.) Cass.

of the pappus by the Swiss botanist. The description of the pappus presented by Cassini perfectly matches the specimen. In the description that Candolle presents in his prodomus, he comments on the similarities of *Lepidophyllum* with *Brachyris*, and it is probably from this assertion that Meisner took the idea for the new name.

**Note 4:** In his synopsis for *Lepidophyllum* (which included *Parastrephia* Nutt. emend. Cabrera) Cabrera (1945) created two sections, *Eulepidophyllum* and *Tola*,

to contain current *Lepidophyllum* and *Parastrephia* respectively. However, he did not provide a Latin diagnosis and so the names he created are rendered illegitimate under article 36.1 of the current Vienna Code (McNeill et al., 2006).

**Note 5:** When capitula have a reduced number of florets (2 or 3 ray florets, and ~3 disk florets) palea are absent.

**Additional specimens examined:** ARGENTINA. PROV. SANTA CRUZ. Not defined Dpto. Patagonia, II-1891, *Beaufils* 603 (NY); Río Santa Cruz, 24-XII-1896, *Hatcher* 119

(NY); Patagonia, 1911, *Marelli s.n.* (SI); *id.*, *Moreno & Tonini 161* (NY); *id.*, 1904, *Tessleff s.n.* (BAB). **Dpto. Corpen Aike.** Santa Cruz, s. date, *Burmeister s.n.* (SI); *id.*, 4-XII-1932, *Castellanos s.n.* (BA 7928); Puerto Santa Cruz, 12-XII-1975, *Correa et al. 6577* (BAB); Santa Cruz, I-1914, *Hicken & Haumann 823* (SI); Puerto Santa Cruz, 7-XII-1945, *O' Donnell 3943* (BAA, NY); Meseta del Río Santa Cruz y Chico, 12-XII-1902, *Spegazzini s.n.* (BAB). **Dpto. Deseado.** Puerto Deseado, 25-I-1896, *Alboff s.n.* (LP); Monumento Bosques Petrificados, cañadón al NE de la estación del Parque, 47°39'17"S, 67°58'37"W, 3-XII-2002, *Bonifacino & Donato 772* (LP); Ruta prov 47, 48°9'23"S, 67°17'32"W, 3-XII-2002, *Bonifacino & Donato 785* (LP); Ruta prov 47, 47°45'37"S, 66°10'59"W, 3-XII-2002, *Bonifacino & Donato 787* (LP); Puerto Deseado, camino Cabo Blanco a Tellier, 13-XI-1965, *Correa & Nicora 3358* (BAB); a 12 km de Puerto Deseado camino a Cabo Blanco, 19-XI-1963, *Correa et al. 2630* (BAB); Puerto Deseado, 13-I-1914, *Hicken & Haumann 140* (LP); Puerto Deseado, 13-I-1914, *Hicken & Haumann 143* (SI); Deseado, 1899–1900, *Spegazzini s.n.* (BA 5116); Antonio de Biedma, 25-XI-1969, *Vidal 29* (LP). **Dpto. Güer Aike.** margen derecha Río Coyle, junto a puente sobre Ruta 3, 13-I-1970, s. leg. (LP); Márgenes del Río Gallegos, 26-XI-1976, *Ambrosetti 26618* (BAB); Cabo Virgenes, 26-IV-1968, *Anliot 6051* (SGO); Río Gallegos, Estancia Los Pozos, 51°33'S, 69°20'W, 5-XII-1975, *Arroyo et al.* (BAB); Estación exp. Río Chico, s. date, *Boelcke et al. 12325* (BAA, SI); Río Gallegos, *Boelcke et al. 15297* (BAB); Río Gallegos, 22-III-1917, *Bonarelli s.n.* (BA 5115); Ruta prov 57, Cañadón Boliche 51°0'37"S, 69°21'25"W, 29-I-2002, *Bonifacino et al. 600* (LP); Río Gallegos, s. date, *Brown 85* (NY); *id.*, 5-XII-1932, *Castellanos 7937* (LP); *id.*, 5-XII-1932, *Castellanos s.n.* (BA 7937); *id.*, 6-I-1960, *Correa & Perez Moreau 1789* (BAB, LP); camino Lemarchand a Puerto Coig, 24-XI-1963, *Correa et al. 2791* (BAB); Estancia Cabo Buen Tiempo, 2-XII-1975, *Correa et al. 6559* (BAB); Río Gallegos, 10 m, 20-XI-1975, *Gentili 324* (BAB, LP, SI); Río Gallegos, 5-X-1971, *Goodall 3897* (BAB); Río Gallegos, Ruta 3 sobre el río, 17-XII-1985, *Hermann s.n.* (SI); Río Gallegos, 27-III-1914, *Hicken & Hauman s.n.* (SI 9386); Estancia Montedinerero, Cabo Virgenes, XI-1974, *Molina 6* (LP); Estancia Las Vegas, valle del Río Coyle, I-1914, *Morrison s.n.* (SI); S. loc., 15-XII-1945, *O'Donnell 4079* (US); Río Gallegos, 12-XII-1945, *O'Donnell 4086* (LP); *id.*, 28-II-1959, *Perrone s.n.* (BA 58435); Río Gallegos, 28-II-1959, *Perrone s.n.* (BA 70460); a 70 km de Gallegos rumbo a Esperanza, 8-III-1936, *Scott 231* (LP); entre Gallegos y Coyle, Monte Tigre, 12-III-1936, *Scott & Biraben 239* (LP); entre Gallegos y Monte Aymond, 22-I-1949, *Soriano 3280* (BAB); Río Gallegos, 5-I-1941, *Spegazzini s.n.* (BAB). **Dpto. Lago Buenos**

**Aires.** Ruta provincial 502, a 28 km al N de Dos Mantiales, 48°00'S, 69°43'W, 8-II-975, *Boelcke et al. 16227* (BAB, LP). **Dpto. Magallanes.** A 52 km de El Salado, sobre Ruta 3, 170 m, 13-I-1970, s. leg. (LP); Puerto San Julián, XII-1933, *Blake 208* (LP); San Julián, 22-II-1944, *Blake 437* (MO, SI); Puerto San Julián, s. date, *Carette s.n.* (LP); San Julián, 20 km al S de San Julián, Ruta 3, 22-XI-1963, *Correa et al. 2686* (BAB); 35 km N of San Julián, road to puerto Deseado, 20 m, s. date, *Eyerdam et al. 23975* (F, SI); San Julián, a 3 km camino a Piedra Buena, 18-I-1949, *Grondona 2008* (BAB). **Prov. TIERRA DEL FUEGO. Dpto. Río Grande.** Caleta Josefina, 8-IV-1921, s. leg. 53 (BA 5113); Ruta 3, Bahía San Sebastián 53°14'01"S, 68°34'6"W, 28-I-2002, *Bonifacino et al. 590* (LP); Extremo N de Península Páramo, 52°59'14"S, 68°16'12"W, 28-I-2002, *Bonifacino et al. 594* (LP); Ruta 3 Bahía San Sebastián, 53°14'1"S, 68°34'6"W, 28-I-2002, *Bonifacino et al. 598* (LP); al N de Bahía San Sebastián, 52°53'19"S, 68°21'38"W, proximo a planta "TOTAL, 13-XII-2006, *Bonifacino et al. 3016* (US); al N de San Sebastián, 16-I-1933, *Castellanos s.n.* (LP, BA 7946); desembocadura del Arroyo Alfa, 20-II-1942, *Castellanos s.n.* (BA 45793); borde de playa sobre Bahía San Sebastián, 53°17'S, 68°26'W, 29-I-1995, *Fortunato & Elechosa 4892* (NY, US); Bahía San Sebastián, Estancia San Martín, 6-II-1955, *Hunziker 6828* (BAB, LP); Estancia Cullen, 7-IV-1968, *Goodall 1718* (NY); Estancia Cullen, NW edge of San Sebastian Bay, north end of salt plateau, 14-XI-1970, *Goodall 2572* (SI); Bahía San Sebastián, Estancia San Martín, near Cullen, 19-V-1972, *Goodall 4292* (BAB); Bahía San Sebastián, Estancia San Martín, 6-II-1955, *Grondona 4475* (BAB); Estancia Cullen, 52°54'S, 68°25'W, 13-I-1968, *Moore 1467* (LP); Estancia Cullen, Arroyo Beta, 52°44'S, 68°33'W, 5-I-1972, *Moore & Goodall 339* (BAB). **Dpto. Ushuaia.** Isla de los Estados y Canal de Beagle, 7-VIII-1913, *Hogberg 180* (BAB); Isla de los Estados y Canal de Beagle, verano-otoño-1902, *Rodriguez 31* (BAB). **CHILE. REG. DE MAGALLANES. Prov. Magallanes.** Estrecho de Magallanes, próximo Primera Angostura, 52°27'28"S, 69°32'56.3"W, 2 m, 13-XII-2006, *Bonifacino et al. 3014* (US); San Gregorio, 26-X-1968, *Cekalovic s.n.* (BAB, LP); Angostura, 300 m, 14-I-1930, *Donat 213* (F, NY); Ruta 255, 120 km E of Punta Arenas, 2 km E of Bahía San Gregorio, 52°32'–34'S, 52°32'–34'W, 9-X-1971, *Dudley et al. 82* (MO, SGO); Cabo Fairweather, s. date, *King 2* (BM); Gregory Bay, Strait of Magellan, 19-I-1888, *Lee s.n.* (US); Estancia Punta Delgada, ~180 km NE of Punta Arenas, coast of Bahía Posesión, 18-III-1964, *Moore 1058* (K, SGO); próximo a Primera Angostura, 52°20'S, 69°40'W, 22-XII-1976, *Seibert et al.* (BAB). **Prov. Tierra del Fuego.** Bahía Inútil, 1-III-1917, *Bonarelli s.n.* (SI 9385); Bahía Inútil, extremo N, 53°20'S, 69°35'W, 14-III-1968, *Moore 2253* (LP); SW de Punta

Catalina, Cuarto Chorillo, 52°39'S, 68°59'W, 7-XI-1971, Moore 2355 (LP); Fuegia ad litt. Maris, II-1879, *Philippi s.n.* (SGO); 84.7 km from Porvenir along road to San Sebastián, 31-III-1985, *Wallace & Forlonge 039/85* (SGO).

***Nardophyllum* (Hook. and Arn.)  
Hook. and Arn.**

**Taxonomic History**

1786. Lamarck describes *Conyza bryoides* based on material collected by Commerson in the Straits of Magellan.
1807. Persoon includes Lamarck's species in *Baccharis*, coining *Baccharis bryoides* (Lam.) Pers.
1834. Meyen describes *Barnadesia lanata* based on material from "Río del Volcán", in the Andes of Region Metropolitana, Chile.
1835. Hooker and Arnott describe *Gochnatia revoluta*. They were uncertain about the placement of this species in *Gochnatia* so they described *Gochnatia* subgenus *Nardophyllum?* (with a question mark) to accommodate the species.
1836. Hooker and Arnott elevate *Gochnatia* subg. *Nardophyllum* to generic status, and provide a more detailed description of the taxon. They also publish the combination *Nardophyllum revolutum* (Hook. and Arn.) Hook. and Arn., and describe a new species, *Nardophyllum obtusifolium*.
1838. Candolle describes *Dolichogyne*, apparently unaware that it corresponds with the same taxonomic entity described earlier by Hooker and Arnott (1836) as *Nardophyllum*, along with which he also describes two new species, *Dolichogyne staehelinoides* and *D. gnaphalioides*.
1846. Hooker describes *Chiliotrichum* sect. *Anactinia*, and describes three new species: *Chiliotrichum humile*, *C. kingii*, and *C. darwinii*. He commented on the similarities between the typical section of *Chiliotrichum* and the newly described section pointing out that the difference was mainly in the absence of ray florets in *Chiliotrichum* sect. *Anactinia*.
1849. Rémy elevates *Chiliotrichum* sect. *Anactinia* to genus rank creating *Anactinia* (Hook. f.) J. Rémy, and proposes *Anactinia hookeri* for *Chiliotrichum humile*, creating an illegitimate name. Rémy also describes a new species, *Dolichogyne chiliotrichioides*, from material collected in Sotaqui. In the same publication, Rémy also considers *Dolichogyne staehelinoides* and *D. gnaphalioides* to be heterotypic synonyms, proposing a new and illegitimate name to refer to these taxa: *Dolichogyne candollei*.
1855. Schultz Bipontinus (1855b) creates the combination *Microchaete humilis* (Hook. f.) Sch. Bip.
1856. Philippi describes *Dolichogyne genistoides* based on material collected by Germain in the Andes of Santiago (Chile).
1856. Weddell describes *Dolichogyne armata* (currently placed in *Ocyroe*) based on material from Bolivia.
1862. Gray makes an important contribution to the understanding of *Nardophyllum*, identifying synonyms and making several combinations. He identifies *Dolichogyne staehelinoides*, *D. gnaphalioides*, and *D. candollei* as heterotypic synonyms of *Nardophyllum revolutum*. Gray also recognizes the identity between *Nardophyllum* and *Chiliotrichum* sect. *Anactinia*, forming the combinations *Nardophyllum kingii*, *N. humile*, and *N. darwinii*. Finally, he notices that *Dolichogyne chiliotrichioides* also belongs to *Nardophyllum*, and accordingly makes the new combination.
1873. Gray notes similarities between *Dolichogyne genistoides* and the rest of *Nardophyllum* species and makes the combination *Nardophyllum genistoides*.
1894. Philippi describes three new species of *Nardophyllum*: *Nardophyllum scoparium*, *N. parvifolium*, and *N. paniculatum*.
1898. Kuntze places *Nardophyllum* in the synonymy of *Aster*, publishes the new species *Aster nardophyllum*, and makes the combination *Aster staehelinoides* (DC.) Kuntze.
1901. Reiche includes *Dolichogyne armata* in *Nardophyllum*, and makes the combination *Nardophyllum armatum* (currently placed in *Ocyroe*). Reiche also places *Ocyroe spinosa* Phil. in the synonymy of *N. armatum*, and *Microchaete humilis* (Hook. f.) Sch. Bip. in the synonymy of *Nardophyllum humile* (Hook. f.) A. Gray.
1905. Macloskie makes the combination *Nardophyllum staehelinoides* (DC.) Macloskie. However, the specimen which he refers to this new combination was collected in Santa Cruz (Argentina) and does not belong to the taxon coined by Candolle (1838), *Dolichogyne staehelinoides*.
1918. Hauman describes *Nardophyllum bracteolatum* based on material from Mendoza (Argentina).
1954. Cabrera (1954a) writes the most complete generic revision of *Nardophyllum*. In this important contribution, he establishes several synonymies, makes new combinations and excludes species,

drastically reducing the number of valid names in *Nardophyllum* from ~15 to only 7: *Nardophyllum armatum* (Wedd.) Reiche, *N. bracteolatum* Hauman, *N. bryoides* (Lam.) Cabrera, *N. chiliotrichioides* (J. Rémy) A. Gray, *N. genistoides* (Phil.) A. Gray, *N. lanatum* (Meyen) Cabrera, and *N. obtusifolium* Hook. and Arn.

1993. Nesom (1993b) places the monotypic genera *Aylacophora* and *Paleaepappus* in the synonymy of *Nardophyllum*, coining the combinations *Nardophyllum deserticola* and *Nardophyllum patagonicum*. Nesom also reinstates Philippi's species *Nardophyllum scoparium* after its exclusion from the genus by Cabrera (1954a).

2001. Bonifacino and Sancho reinstate monotypic *Aylacophora* and *Paleaepappus*, returning to Cabrera's definition of *Nardophyllum*.

2004. Bonifacino and Sancho exclude *Nardophyllum scoparium* from *Nardophyllum*, placing this latter species in monotypic *Guynesomia* Bonif. and Sancho, coining the name *Guynesomia scoparia* (Phil.) Bonif. and Sancho.

2005. Bonifacino points out differences between Argentinean and Chilean populations assigned to *Nardophyllum lanatum*, describing new species *Nardophyllum cabrerae* to refer to the populations on the eastern side of the Andes. In the same publication, he places *Nardophyllum obtusifolium* and *Nardophyllum bracteolatum* in the synonymy of *Nardophyllum bryoides* and *N. chiliotrichioides* respectively.

Finally, in this treatment, and as a result of recent molecular evidence (Bonifacino and Funk, unpublished data) but also based on morphological grounds, the composition of *Nardophyllum* is reconsidered. *Nardophyllum* is composed of five species: *Nardophyllum chiliotrichioides*, *N. lanatum*, *N. bryoides*, *N. genistoides*, and *N. patagonicum* (see discussion under *N. patagonicum* and *N. genistoides* for evidence supporting their inclusion, and discussion under *Katinasia cabrerae* ( $\equiv$  *Nardophyllum cabrerae*) for evidence supporting its exclusion).

*Nardophyllum* (Hook. and Arn.) Hook. and Arn. in Hooker, Comp. Bot. Mag. 2: 44, 1836. *Gochmatia* subg. *Nardophyllum* Hook. and Arn. in Hooker, Comp. Bot. Mag. 1: 109, 1835. TYPE: *Gochmatia revoluta* D. Don ex Hook. and Arn. in Hooker, Comp. Bot. Mag. 1:109, 1835 (= *Barnadesia lanata* Meyen, Reise Erde I: 347,

1834  $\equiv$  *Nardophyllum lanatum* (Meyen) Cabrera, Notas Mus. La Plata, Bot. 17(83): 63, 1954).

*Dolichogyne* DC., Prodr. (DC.) 7(1): 256, 1838. TYPE: *Dolichogyne staehelinoidea* DC., Prodr. 7(1): 256, 1838 (= *Barnadesia lanata* Meyen, Reise Erde I: 347, 1834  $\equiv$  *Nardophyllum lanatum* (Meyen) Cabrera, loc. cit.).

*Chiliotrichum* sect. *Anactinia* Hook. f., Bot. Antarct. Voy., Vol. 1, Fl. Antarct. 2: 304, 1846 [1847]. *Anactinia* (Hook. f.) J. Rémy in Gay, Fl. Chil. 4: 8, 1849. TYPE: *Chiliotrichum humile* Hook. f., Bot. Antarct. Voy., Vol. 1, Fl. Antarct. 2: 304, 1846 [1847] (= *Coryza bryoides* Lam., Encycl. 2: 91, 1786  $\equiv$  *Nardophyllum bryoides* (Lam.) Cabrera, Notas Mus. La Plata, Bot. 17(83): 61, 1954).

*Paleaepappus* Cabrera, Bol. Soc. Argent. Bot. 11(4): 273, 1969. TYPE: *Paleaepappus patagonicus* Cabrera, Bol. Soc. Argent. Bot. 11(4): 273, 1969 ( $\equiv$  *Nardophyllum patagonicum* (Cabrera) G. L. Nesom, Phytologia 75(5): 358–365, 1993).

**Shrubs** cushion shaped to globose; branches dense to sparsely disposed, gland-dotted to densely tomentose and gland-dotted, 5- to 8-ribbed, sharp-ended or not. **Leaves** dense to laxly arranged, persistent, alternate, narrowly obovate, elliptic or oblong, base slightly attenuated, petiole broadened towards the stem and slightly constricted above, apex obtuse, lax to densely tomentose on abaxial surface, gland-dotted on both surfaces, margins notably revolute, concolorous or discolorous, coriaceous or chartaceous. **Capitula** solitary, terminal, sessile to shortly pedunculate, homogamous, discoid. **Involucre**s cylindrical, phyllaries arranged in 3 to 6 series; outer phyllaries with foliaceous apices, ovate to narrowly triangular, apex subacute to subulate, laxly tomentose and gland-dotted on abaxial surface, rarely with notable glandular vesicular capitate trichomes (in *N. genistoides*), coriaceous; inner phyllaries narrowly elliptic to narrowly ovate, apex acute to subulate, laxly tomentose and gland-dotted towards the apex on abaxial surface, papery. **Receptacles** flat to convex, paleate to partially paleate, rarely naked (*N. genistoides*); paleae narrowly elliptic to narrowly ovate, not embracing the achenes (except in *N. patagonicum*), gland-dotted towards the apex, margins membranaceous. **Florets** 5 to 22, bisexual; corollas yellow, tubular, 5-lobed, tube gradually broadened or more or less abruptly broadened from mid-length, lobes triangular; anther thecae bases slightly sagittate, apical appendages ovate, antheropodia present not swollen; style bases swollen, style branches oblong to narrowly elliptic, apex acute to subacute, collecting hairs very short on upper 1/2 to 3/4. **Achenes** narrowly obovate, terete, 5- to 10-ribbed, laxly villose and gland-dotted, to

densely villose, carpopodium present. **Pappus** 2(3)-seriate, composed of flattened bristles (scales narrowly ovate in *N. patagonicum*), scabrid, sometimes barbellate towards the apex.

**Etymology:** From “*Nardus*” (genus belonging to Poaceae) and the Latin “*phyllum*” (leaf), denoting the resemblance of this genus with *Nardus* L.

*Nardophyllum* is the largest genus in the *Chiliotrichum* Group sensu stricto, with five species distributed from southern San Juan in Argentina and neighboring areas in Chile to Tierra del Fuego throughout the southern Andes and Patagonia. Its habitats diverge greatly, ranging from sea level up to ~3,800 m occurring in high Andean, Patagonian, Monte, and subantarctic biogeographic provinces (Cabrera and Willink, 1973).

The genus is characterized by discoid heads, cylindrical involucre, paleate to partially paleate receptacles, and yellow corollas. Molecular evidence (Bonifacino and Funk, unpublished data) suggests that its closest relatives are *Chiliotrichopsis* and *Cabreraea*, from which it differs mainly in the absence of ray florets (i.e. discoid heads) and the nature of the pappus.

Phylogenetic analysis based on both nuclear and chloroplast data (Bonifacino and Funk, unpublished data)

firmly indicate the position of monotypic *Paleaeappus* deeply nested inside *Nardophyllum*. Although being a highly derived taxon, *Paleaeappus* is actually part of *Nardophyllum*, an idea earlier proposed by Nesom (1993a and 1993b), who actually coined the combination *Nardophyllum patagonicum* (Cabrera) Nesom. *Nardophyllum armatum*, a very interesting species from the Puna region in northern Argentina extending to neighboring areas in Chile and Bolivia is here excluded from *Nardophyllum* and also from *Chiliotrichum* Group, an idea that is supported on both morphological and molecular grounds (Bonifacino and Funk, unpublished data; Bonifacino, 2008). *Nardophyllum genistoides*, a rare species from central Chile, is maintained in *Nardophyllum* until more specimens are available to study the morphology of this species that it is only known from two collections made in the mid-1800s.

In light of molecular evidence, and after careful re-evaluation of its diagnostic characteristics, *Nardophyllum cabreriae*, a recently described species from northern Patagonia (Bonifacino, 2005), is here excluded from *Nardophyllum* and placed in its own genus (see discussion under *Katinasia* Bonif.).

#### KEY TO THE SPECIES OF *NARDOPHYLLUM* (HOOK. AND ARN.) HOOK. AND ARN.

- 1a. Leaves more or less laxly arranged, both macro and brachyblasts present; pappus elements flat scales, narrowly ovate 0.4–1.2 mm wide, smooth. (Restricted to Chubut, Argentina) . . . . . *N. patagonicum*
- 1b. Leaves more or less densely arranged, brachyblasts absent; pappus elements flattened bristles, up to 0.1 mm wide, scabrid . . . . . 2
- 2a. Leaves chartaceous, with evident glandular trichomes (biseriate vesicular capitate glandular trichomes); involucre ~8 mm wide; receptacles naked. (Endemic to the Andes near Santiago, Chile) . . . . . *N. genistoides*
- 2b. Leaves coriaceous, with no such evident glandular trichomes (only biseriate vesicular glandular trichomes); involucre up to 5 mm wide; receptacles partially paleate . . . . . 3
- 3a. Branches tapering towards the end, sometimes ending in sharp tips, with notable ribs separated by narrow furrows; leaves laxly arranged. (Widespread along W and S Argentina and central Chile) . . . . . *N. chiliotrichioides*
- 3b. Branches not evidently tapering towards the end, never ending in sharp tips, with very narrow ribs and wide furrows, sometimes not visible due to abundant tomentose pubescence; leaves densely to more laxly disposed . . . . . 4
- 4a. Ribs on stems not evident, usually hidden under dense tomentose pubescence; leaves densely disposed, notably discolorous, with a dense tomentose pubescence on abaxial surface only, sometimes with lax tomentose pubescence on adaxial side; involucre 9–13 × 4–5 mm; phyllary apices subacute to obtuse; florets 8 to 15 (–20). (Widespread in Patagonia, southern Chile and western and southern Argentina) . . . . . *N. bryoides*
- 4b. Ribs on stems narrow and noticeable; leaves laxly disposed, more or less concolorous, with tomentose pubescence uniformly covering the branches and both surfaces of the leaves; involucre 10–15 (–17) × 2.5–4.5 mm; phyllary apices acute to subulate; florets 4 to 6. (Restricted to central Chile) . . . . . *N. lanatum*

*Nardophyllum bryoides* (Lam.) Cabrera, Notas Mus. La Plata, Bot. 17(83): 61, 1954. *Conyza bryoides* Lam., Encycl. 2: 91, 1786. *Baccharis bryoides* (Lam.) Pers., Syn. Pl. 2: 425, 1807. TYPE: “[Chile] Magellan, côte des Pa-

tagons, baye Boucault, XII-1767, *M. Commerson* [s.n.]” (holotype: P 226751; scanned image of holotype at P: LP!; isotype: P 222887; scanned image of isotype at P: LP!).



*Nardophyllum obtusifolium* Hook. and Arn., in Hooker, Comp. Bot. Mag. 2: 44, 1836. TYPE: “[Argentina] Port Desire, C. Darwin 325” (holotype: CGE; isotype: K!).

*Chiliotrichum humile* Hook. f., Bot. Antarct. Voy., Vol. 1, Fl. Antarct. 2: 304, 1846 [1847]. *Nardophyllum humile* (Hook. f.) A. Gray, Proc. Amer. Acad. Arts, 5: 123, 1862. *Anactinia hookeri* J. Rémy **nom. illeg.**, in Gay, Fl. Chil. 4: 8, 1849. *Microchaete humilis* (Hook. f.) Sch. Bip., Flora 38(8): 121, 1855. TYPE: “Port Gregory, Capt. King’s exp. 13” (lectotype: BM 608512!, designated here; isolectotypes: BM!, K!; paratype: “Cape Fairwarther 9”, BM 608514!; isoparatypes: BM!, K!).

*Chiliotrichum kingii* Hook. f., Bot. Antarct. Voy., Vol. 1, Fl. Antarct. 2: 305, 1846 [1847]. *Nardophyllum kingii* (Hook. f.) A. Gray, Proc. Amer. Acad. Arts 5: 123, 1862. TYPE: “Patagonia, Capt. Middleton [s.n.]” (lectotype: K!, designated here; isolectotype: K!; syntype: “port St. Elena, Capt. King 2”, K!).

*Chiliotrichum darwinii* Hook. f., Bot. Antarct. Voy., Vol. 1, Fl. Antarct. 2: 305, 1846 [1847]. *Nardophyllum darwinii* (Hook. and Arn.) A. Gray, Proc. Amer. Acad. Arts 5: 123, 1862. TYPE: “Port Desire, C. Darwin [s.n.]” (holotype: K!).

*Nardophyllum parvifolium* Phil., Anales Univ. Chile 87: 434, 1894. *Dolichogyne parvifolia* Phil. ex Kuntze **pro. syn.**, Revis. Gen. Pl. 3(3): 130, 1898. TYPE: “[Chile] Pucaullu, Feb, 1887, Otto Ph[ilippi] [s.n.]” (holotype: SGO 62035!; isotypes: 43809 SGO!, LP!, B, destroyed; photos of isotype at B: F 14799!, SGO!, US!).

*Aster nardophyllum* Kuntze, Revis. Gen. Pl. 3(3): 130, 1898. *Nardophyllum nardophyllum* (Kuntze) Macloskie **nom. illeg.**, Rep. Princeton Univ. Exp. Patagonia, Botany, 8: 784, 1905. TYPE: “Aster Nardophyllum, Patagon. 50/3°, 1882/4, F. P. Moreno & Tonini [s.n.]” (lectotype: NY 162130!, designated here; isolectotype: US!; syntype: “Aster nardophyllum OK Patagonien, Sa. Cruz, 1891/2, legit *Beaufils* 604”, NY 162129!).

(FIGURES 29, 30, 56, 57)

**Shrubs** 5–100 cm tall, cushion shaped to globose; branches densely to sparsely disposed, ascending, (in dense cushion shaped individuals the branches creeping along the soil, ascending distally), gland-dotted to densely tomentose and gland-dotted, 5-ribbed (sometimes ribs concealed by dense tomentum), internodes very short up to 2(–4) mm long. **Leaves** densely arranged, persistent, alternate, patent to slightly ascendant, (1–)2–9 × 1–1.5 mm, narrowly elliptic to narrowly obovate, base slightly attenuated, petiole broadened towards the stem and slightly constricted above, apex obtuse, margins notably revolute, gland-dotted to tomentose and gland-dotted on adaxial

surface, densely tomentose and gland-dotted on abaxial surface, discolorous, coriaceous. **Capitula** solitary, terminal, sessile to shortly pedunculate, peduncles up to 4 mm long, homogamous, discoid. **Involucre**s 9–13 × 4–5 mm, cylindrical, phyllaries arranged in 4 or 5 series; outer phyllaries with foliaceous apices, 2.5–6 × 1.5–2.5 mm, ovate to elliptic, with a notorious longitudinal mid-ridge towards the base, apex acute to subacute, laxly tomentose and gland-dotted on abaxial surface, coriaceous, margins membranaceous, fimbriate towards the apex; inner phyllaries 6–12 × 1–2 mm, narrowly elliptic, apex subacute, gland-dotted towards the apex on abaxial surface, papery, margins membranaceous, fimbriate towards the apex. **Receptacles** flat to slightly convex, partially paleate; paleae 1 to 6, 8–13 × 0.5–1 mm, linear to oblong, boat-shaped, not embracing the achenes, apex acute, gland-dotted towards the apex, margins membranaceous, fimbriate. **Florets** 8 to 15 (–20), bisexual; corollas yellow, tubular, 5-lobed, gradually broadened towards the apex, tube 4.5–9 mm long, lobes 1.2–1.7 × 0.5–0.8 mm, triangular, gland-dotted abaxially; anther thecae 2.5–3 mm long, bases slightly sagittate, apical appendages 0.5–0.7 × 0.2–0.3 mm, triangular-ovate, antheropodium present, not swollen; style shafts 3.5–7 mm long, base swollen, style branches 3.5–5 mm long, narrowly elliptic to oblong, subacute, collecting hairs very short on upper 3/5 to 2/3. **Achenes** 4–6.5 mm long, narrowly obovate, terete, 5- to 7-ribbed, gland-dotted, sparsely villose, carpopodium present. **Pappus** (4.5–)6–8 mm long, 2-seriate, composed of 40 to 70 flattened bristles, up to 0.1 mm wide, some fused among each other at the base, outer series slightly shorter, scarbrid, inner series barbellate towards the apex.

**Vernacular names:** “Leña de pobre” (*Hicken s.n.*, SI 1862); “Mata torcida” (León et al., 1998).

**Phenology:** Flowering specimens have been collected from October to February.

**Distribution:** Argentina, broadly distributed through Río Negro, Nequen, Chubut, Santa Cruz and Tierra del Fuego. In Chile, it is common in Región de Aisén and Región de Magallanes (Figure 30).

**Habitat:** It grows from sea level up to 1,200 m. *Nardophyllum bryoides* is a common species in both Andean and extra-Andean Patagonia provinces (Cabrera and Willink, 1973), constituting in certain areas the dominant species of the shrub stratum, like in SW Santa Cruz, Argentina, where it occurs associated with *Festuca pallescens* (St.-Yves) Parodi (León et al. 1998; Bonifacino, 2005). Further, the arid steppe that covers most of the extra-Andean Patagonia is characterized by the abundance of *Nassauvia glomerulosa* D. Don and *Nassauvia ulicina* Macloskie, which depending on the particular area are associated

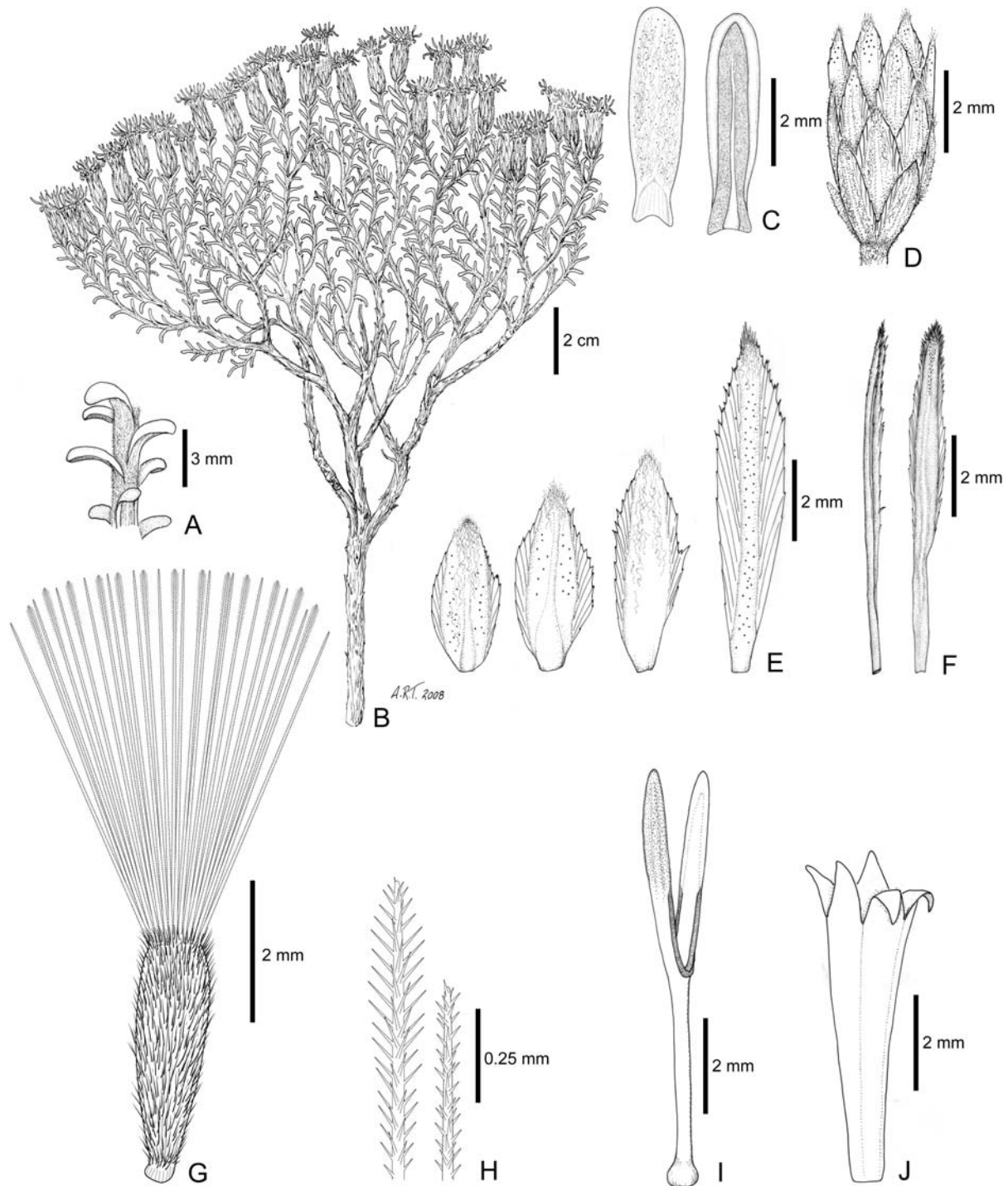


FIGURE 29. *Nardophyllum bryoides* (Lam.) Cabrera. A. Detail of a branch. B. Habit. C. Leaves, adaxial view (left), abaxial view (right). D. Involucre. E. Outer to inner phyllaries (from left to right). F. Receptacular paleae, dorsal view (left), lateral view (right). G. Achene with pappus. H. Detail of pappus bristles (left, from inner series; right, from outer series). I. Style. J. Corolla (A–J, Bonifacino & Donato 699, LP; Figure 29B by Alice Tangerini).

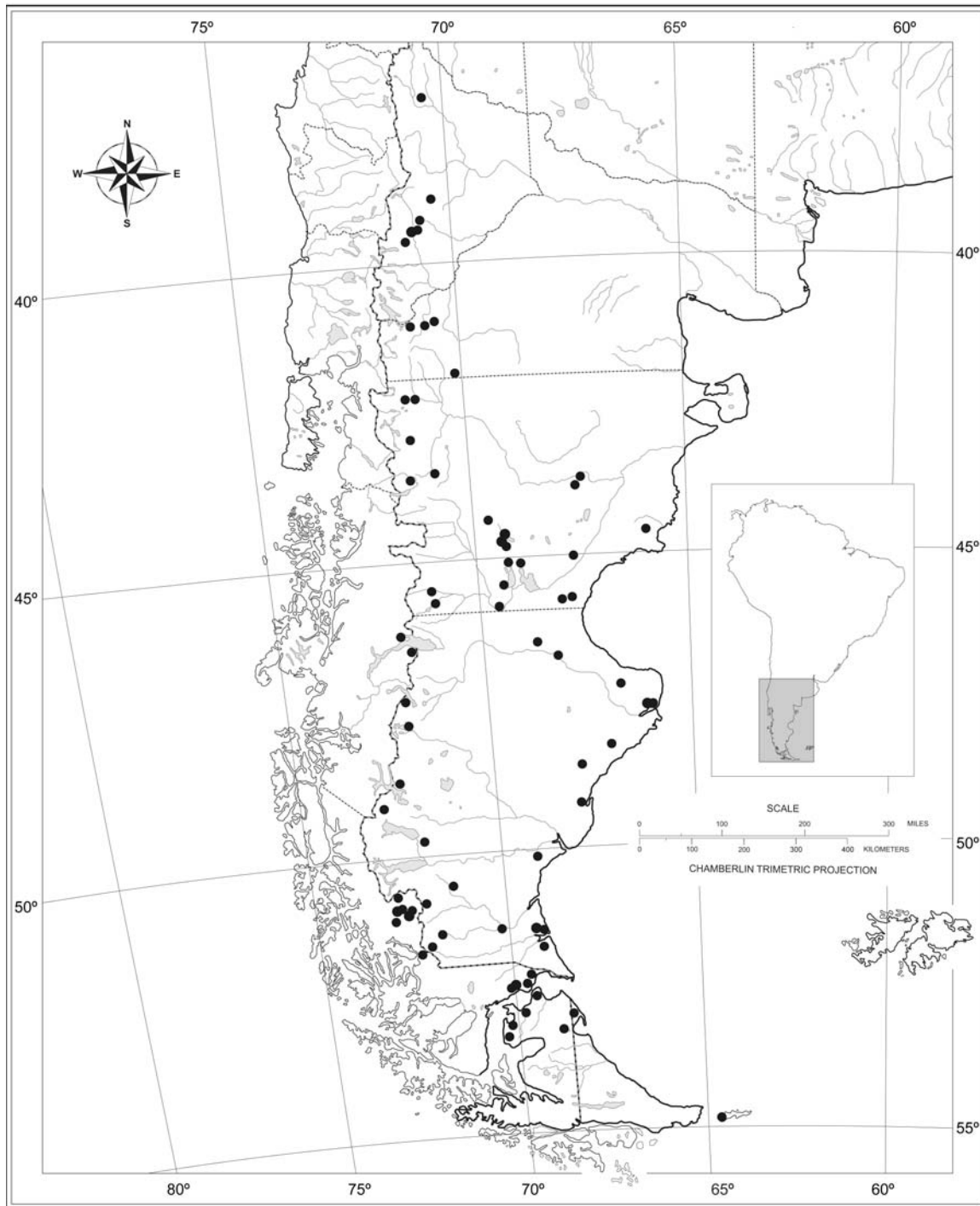


FIGURE 30. Geographic distribution of *Nardophyllum bryoides* (Lam.) Cabrera.

with variable amounts of *Nardophyllum bryoides* (Lam.) Cabrera, *Ephedra frustillata* Miers, *Chuquiraga aurea* Skottsbo., *Brachyclados caespitosus* Speg., *Tetraglochin caespitosum* Phil., etc. (Roig, 1998; Bonifacino, 2005). Bonifacino (2005) comments on the variable habitat of this

species, and hypothesizes about the apparent association of the dense cushion shaped habit with areas with notable water and temperature stresses (high altitude and coastal areas), and the more spreading branching pattern with less stressful conditions (interior of Patagonian steppe).

*Uses:* Cultivated in the United Kingdom as a species suitable for rock gardens.

*Etymology:* The specific epithet refers to the resemblance of the plant (especially in pulvinate populations) with Bryophytes.

*Note 1:* In the protologue of *Chiliotrichum humile*, Hooker (1846) mentions “Strait of Magalhaens [sic], Cape Gregory; *Capt. King*”. Additionally but apart from the diagnosis, Hooker also points out that the species is also present at “Cape Fairweather on the east cost of Patagonia”. I’ve studied six specimens from BM mounted on the same sheet with the headline “Strait of Magellan, Anderson in King’s voyage”, with the following individual labels 1) “*Cape Gregory, 13*”, 2) “*Port Gregory, Capt. King’s exped., 13. Herb. John Miers, bequeathed 1879*”, 3) “*Cape Fairweather, 9*”, 4) “*Cape Fairweather, Capt. King’s exped., 13. Herb. John Miers, bequeathed 1879*”, 5) “*Nardophyllum humile, Magallanes, 1800, Temperate South America, comm. F. Philippi 1904*”, and 6) “*Port. St. Elena, 34. Collected by James Anderson on Capt. P. P. King’s Voyage to South America in H. M. S. Adventure*” 1826–1830”. Further, I’ve studied another specimen at K with no label but with the following annotation on the sheet: “*Voyage of the Beagle 1826–1830, Cape Fairweather, E Patagonia and Port Gregory, Capt. King*”. All these materials match the original diagnosis. I select specimen 1 (BM 608512) as lectotype since it is the one that is more in agreement with the diagnosis. Specimen 2 (also holding BM 608512) apparently was formerly in a different herbarium and it is considered a duplicate of the lectotype designated here. Specimens 3 and 4 (BM 608514) are considered paratypes since they were mentioned apart from the diagnosis in the original publication. Specimens 5 (BM 608513) and 6 (BM 608515) correspond with material not directly related to the original description. As regards the material deposited at K, I consider it to be a set of mixed isotype and isoparatype mounted on the same sheet.

*Note 2:* Regarding the type of *Chiliotrichum kingii* Hook. f., I’ve studied four specimens deposited at K, all of which match the original diagnosis and the labels have the same localities that appear on the protologue. I select the specimen with label “*Patagonia, Capt. Middleton s.n.*” as lectotype since it is the more complete and with more abundant reproductive material. Additionally, two sheets deposited at K with material assigned to King and collected in St. Elena, one with “2” and the other with “34” written on the labels, are identified as syntypes.

*Note 3:* In the protologue of *Chiliotrichum darwinii* Hook. f., J. D. Hooker cites a specimen from “Patagonia; Port Desire, *C. Darwin*”. I’ve studied a specimen originally

belonging to Hooker’s personal herbarium, deposited at K with no label but with annotations made by K staff “Port Desire, Darwin”. The specimen match the original diagnosis and is considered here as the holotype.

*Note 4:* Kuntze (1898) mentions at least two specimens in the protologue of *Aster nardophyllum*: “490; 604 Moreno and Tonini, Beaufls”. I’ve studied two specimens deposited at NY, one with the label “*Aster Nardophyllum, Patagon. 50/3°, 1882/4, F. P. Moreno and Tonini [s.n.]*”, and the other “*Aster nardophyllum OK Patagonien, Sa. Cruz, 1891/2, legit Beaufls 604*”. Both specimens match the original diagnosis, however the numeration seems to have been somehow misplaced in the publication, since number “604” appears in the Beaufls specimen, while in Moreno and Tonini specimen there is no collection number on the label. The most complete specimen is the one collected by Moreno and Tonini, and it is here selected as the lectotype.

*Note 5:* Bonifacino (2005), when transferring *Nardophyllum obtusifolium* to the synonymy of *Nardophyllum bryoides* commented: “In his revision of *Nardophyllum*, Cabrera (1954a) stated that the only differences between *N. bryoides* and *N. obtusifolium* were: (1) habit, plants dwarf, cushion-shaped (*N. bryoides*), versus plants taller, non-cushion-shaped but frequently forming hemispheric shrubs (*N. obtusifolium*), and (2) receptacle paleate (*N. bryoides*) versus epaleate (*N. obtusifolium*). Moore (1983) pointed out that “Fuegian plants vary from dense cushions to rather lax mats, apparently dependent upon soil moisture and exposure, and perhaps the intensity of grazing, while receptacular bracts may be present or absent in adjacent plants, clearly showing no certainty of the need to keep such species as two distinct taxa”. My observations have led me to consider *Nardophyllum obtusifolium* and *Nardophyllum bryoides* as morphological extremes of a polymorphic species distributed throughout a large area characterized by very diverse habitats. The habit varies from hemispheric shrubs with branches laxly arranged to dwarf shrubs with branches densely disposed and even appressed to the soil. This trend towards plants with a denser branching pattern is particularly marked along the altitude gradient. Plants at high altitude exhibit denser branching, although as explained above, dwarf-looking plants also occur in open areas of the southernmost tip of the Patagonian scrub. The stem and leaf indument is extremely variable, from entirely covered with aseptate-flagellate and biserial vesicular glandular trichomes, which render a whitish tomentose and gland-dotted nature to both organs, or entirely glanduliferous (only biserial vesicular glandular trichomes), even in individuals growing in close proximity.

The receptacles are partially paleate, both in dwarf-cushion shaped individuals and hemispheric shrubs.”

*Note 6:* In dried herbarium specimens, the involucre usually adopts an obconic shape.

*Additional specimens examined:* ARGENTINA. NOT DEFINED PROV. Laguna Amarga, 300 m, 14-I-1931, *Donat 366A* (SI); Cañadon León, 30-XII-1955, *Fischer s.n.* (CONC 19082). PROV. CHUBUT. Not defined Dpto. Meseta de Espinosa, 1929, *Feruglio 100* (BA). Dpto. Ameghino. Estancia Lochiel, 30 km al W de Camarones, 25-X-1946, *Soriano 1995* (LP, SI). Dpto. Cushamen. Ruta 15, 2 km al oeste de intersección de Ruta 15 y Ruta 40, 42°23'37.1"S, 71°09'54.3"W, 11-I-2002, *Bonifacino et al. 403* (LP); *id.*, 11-I-2002, *Bonifacino et al. 405* (LP); al S de Leleque, 12-XII-1981, *Cabrera et al. 33076* (SI); Leleque, 13-I-1947, *Soriano 2341* (LP). Dpto. Escalante. Ruta 27, entre Estancia Las Mellizas y Estancia La Guillermina, 45°10'34.4"S, 67°57'51.4"W, 14-I-2002, *Bonifacino et al. 433* (LP); Mantiales Behr, 26-I-1932, *Castellanos s.n.* (BA 6272); Pampa del Castillo, 15-XII-1929, *Feruglio 48* (BA); Comodoro Rivadavia, Alta Pampa del Castillo, 17-XII-1952, *Ruiz Leal 14686* (LP). Dpto. Futaleufú. Esquel, XI-1940, *Kühnemann s.n.* (BA 37419); *id.*, 5-XII-1941, *Kühnemann 592* (BA); *id.*, 2-IV-1946, *Scolnik 306* (LP); *id.*, 30-I-1945, *Soriano 1409* (LP, SI). Dpto. Languineo. 10 km al E de Tecka, 12-XII-1981, *Cabrera et al. 33115* (SI); Región Río Corcovado, 43°S, 71°W, 5-I-1901, *Illin 203* (CORD, SI); Quinta experimental Río Corcovado, s. date, *Illin 98* (CORD). Dpto. Mártires. Valle de las Plumas, s.date, *Hosseus 96* (CORD). Dpto. Paso de Los Indios. R 24 a 50 km S de Paso de Los Indios, desvío a 23 km al SW, Estancia Laguna Blanca, 44°28'S, 69°33'W, 30-XI-1976, *Arroyo et al. 160* (SI); Ruta 24, al S de Paso de Los Indios, 760 m, 44°21'32"S, 69°22'56.7"W, 10-XII-2006, *Bonifacino et al. 2966* (US); Ruta Prov 53, 44°05'48.2"S, 67°58'15.2"W, 26-XI-2002, *Bonifacino & Donato 699* (LP). Dpto. Río Senguerr. Valle del Lago Blanco, 1901, *Koslowsky s.n.* (BA 5138); Valle de la Laguna Blanca, 45°52'S, 71°15'W, 15-II-1901, *Koslowsky s.n.* (BA 5132); *id.*, 15-XII-1901, *Koslowsky 174* (SI); 60 km al S de Alto Río Senguerr, Estancia Pepita, 13-II-1947, *Soriano 2585* (LP); 60 km al S de Alto Río Senguerr, 21-I-1948, *Soriano 3175* (LP, SI). Dpto. Sarmiento. Ruta 24, 91 km al norte de Sarmiento, laderas al oeste de Laguna Seca, 44°53'17.3"S, 69°12'51.6"W, 15-I-2002, *Bonifacino et al. 443* (LP); Ruta Prov 24, Laguna Palacios, cerros al N, 44°44'28.4"S, 69°7'13.0"W, 27-XI-2002, *Bonifacino & Donato 709* (LP); Ruta Prov 24, Cerros al W de Laguna Seca, 44°53'10.9"S, 69°13'25.6"W, 27-XI-2002, *Bonifacino & Donato 718* (LP); Bajo del Avestruz, 45°15'29.2"S, 68°58'1.6"W, 28-XI-2002, *Bonifacino & Donato 726* (LP);

Ruta Prov 23, 45°10'39.5"S, 69°15'52.4"W, 28-XI-2002, *Bonifacino & Donato 742* (LP); Margen SW Lago Musters, 15-XII-1981, *Cabrera et al. 33205* (LP, SI); Sierra de San Bernardo, 15-XII-1981, *Cabrera et al. 33221* (SI); NNW del Lago Musters, alrededores de la Laguna Colorada, 28-XII-1939, *Feruglio s.n.* (BA 34784); NNW del Lago Musters, alrededores del puesto B. Crespo, 15-I-1940, *Feruglio s.n.* (BA 34783). PROV. NEUQUÉN. Not defined Dpto. Charahuilla, Arroyo Lapa, 13-II-1939, *Chicchi 123* (LP). Dpto. Aluminé. Rahue, 17-II-1942, *Perez Moreau s.n.* (BA 47267). Dpto. Catan Lil. Casa de Lata, I-1972, *Cabrera 21886* (CONC, LP); Cumbre de la Bajada de Rahue, 20-I-1948, *Dawson & Schwabe 2099* (BAA, CONC); Espinazo del Zorro, 17-II-1941, *Perez Moreau s.n.* (BA 47266); Cuesta de Rahue, II-1942, *Perez Moreau s.n.* (BA 48796); camino Aluminé-Las Coloradas, más adelante del puente sobre el Río Picún Leufú, 1485 m, 6-I-1970, *Ruiz Leal 26764* (LP). Dpto. Collon Curá. Piedra Pintada, II-1940, *Castagnet 148* (LP). Dpto. Huiliches. Ruta 23, entrada a Reserva Indígena Aucapan, 39°41'38.4"S, 70°59'51.3"W, 7-I-2002, *Bonifacino et al. 355* (LP). Dpto. Lacar. Parque Nacional Nahuel Huapí, estancia Chacabuco, 800 m, 26-I-1946, *Boelcke 1939* (BAA, LP). Dpto. Los Lagos. Rincón Grande, 1,000 m, 22-XII-1940, *Neumeyer 366* (LP). Dpto. Minas. Cordillera del Viento, Arroyo Piedra Blanca, 15-III-1912, *Hicken 38* (SI). Dpto. Zapala. Parque Nacional Laguna Blanca, 33 km al SW de Zapala, II-1958, *Perrone s.n.* (BA 58874); Laguna Blanca, 9-I-1966, *Ruiz Leal 24451* (LP). PROV. RÍO NEGRO. Dpto. Ñorquinco. Cerca de Río Chico, hacia Ñorquinco, 11-XII-1981, *Cabrera et al. 33063* (SI). Dpto. Pilcaniyeu. Pilcaniyeu, Estancia Rayhman, 26-I-1951, *Boelcke 4473* (BAA, LP); Cerro Leones, al E de San Carlos de Bariloche, 41°05'S, 71°08'W, 21-I-2000, *Bonifacino et al. 265* (LP, MVFA); Cerro Leones, al E de San Carlos de Bariloche, 1-II-1934, *Burkart 6225* (BA); Comallo, 8-XII-1938; *Cabrera 4848* (F, LP); Camino a Ñirihuau, 16-I-1935, *Cabrera & Job 353* (LP); Río Pichi Leufú, 5 km más abajo del camino de Bariloche a Pilcaniyeu, IV-1914, *Hosseus 1217* (CORD); 21 km de Pilcaniyeu, 27-I-1944, *Nicora 3661* (SI); 6 km de Pilcaniyeu camino a Bariloche, 28-I-1944, *Nicora 3681* (SI). PROV. SANTA CRUZ. Not defined Dpto. Río Santa Cruz, XII-1896, *Hatcher s.n.* (NY). Dpto. Corpen Aike. Ruta 3, 20 km al N de Piedra Buena, 3-XII-1971, *Boelcke et al. 15339* (BAA, LP); al S de Puerto San Julián, 159 m, 49°40'27"S, 68°14.5'55.8"W, 16-XII-2006, *Bonifacino et al. 3037* (US); ~24 km S of Comandante Piedrabuena, road to Río Gallegos, 60 m, 1-I-1939, *Eyerdam et al. 24014* (K, SI). Dpto. Deseado. Colonia Gral. Las Heras, 19-I-1914, s. leg. s.n. (SI); Puerto Deseado, 24-I-1896, *Alboff s.n.* (CORD); Deseado y Golfo San Jorge,

1899–1900, *Ameghino* 145 (BA); entre Tellier y San Julián (km 108/109), a aprox. 39 km al S de Río Deseado, 18-XII-1979, *Bernardello & Figueroa* 336 (CORD); Ruta Prov. 281, km 14, alrededores de la gruta de Lourdes, 8-I-1967, *Boelcke* 12143 (BAA, SI); Puerto Deseado, 26-III-1917, *Bonarelli s.n.* (BA 5136); Ruta prov 12, 46°51'54.8"S, 68°3'11.2"W, 2-XII-2002, *Bonifacino & Donato* 763 (LP); Ruta prov 12, 46°53'41.5"S, 68°11'7.1"W, 2-XII-2002, *Bonifacino & Donato* 776 (LP); Jaramillo a Cerro Blanco, Ruta 281, 8-XII-1970, *Crepe & Troncoso* 1685 (SI); Tehuelches, 300 m, 15-XII-1928, *Donat* 126 (F, NY); Puerto Deseado, 13-I-1914, *Hicken & Hauman* 144 (SI); Puerto Deseado, 21-XI-1945, *O' Donnell* 3600 (F); Holdich a Colonia Las Heras, 11-II-1936, *Scott & Birabén* 6 (LP). **Dpto. Güer Aike.** Estancia Stag River, 51°34'S, 72°00'W, 670 m, 2-II-1978, *Ambrosetti & Mendez s.n.* (BAB); Estancia Las Viscachas, Laguna Viscachas, ladera SSE de la laguna, 50°43'S, 71°58'W, 1,200 m, 28-I-1977, *Arroyo et al.* 526A (SI); Estancia Cabo Buen Tiempo, 51°35'S, 69°06'W, 3-XII-1975, *Arroyo et al. s.n.* (SI); Río Gallegos, Estancia La Angélica, 51°27'S, 69°07'W, 4-XII-1975, *Arroyo et al. s.n.* (BAB); Estancia La Verdadera Argentina, S del Co León, 50°53'S, 72°13'W, 16-I-1977, *Arroyo et al. s.n.* (SI); Estancia La Verdadera Argentina, Cerro de la Virgen, laderas y filo N, 50°50'S, 72°14'W, 525 m, 17-I-1977, *Arroyo et al. s.n.* (SI); Estancia La Verdadera Argentina, Cerro de la Virgen, 50°49'S, 72°14'W, 900 m, 18-I-1977, *Arroyo et al. s.n.* (SI); Estancia Las Viscachas, Cerro Viscachas, 50°46'S, 72°01'W, 850 m, 25-I-1977, *Arroyo et al. s.n.* (SI); Estancia Las Viscachas, Cerro Viscachas, en el filo, 50°46'S, 72°01'W, 850 m, 25-I-1977, *Arroyo et al. s.n.* (SI); Estancia Las Viscachas, Cerro Viscachas, lomada a 2 km de Laguna Viscachas, 50°44'S, 71°58'W, 23-I-1977, *Arroyo et al. s.n.* (SI); Estancia Las Viscachas, ladera SSE de la Laguna, 50°43'S, 71°58'W, 1,200 m, 28-I-1977, *Arroyo et al. s.n.* (SI); Estancia Las Viscachas, lomada a 2 km de Laguna Viscachas, 50°44'S, 71°58'W, 23-I-1977, *Arroyo et al. s.n.* (BAB); Estancia Stag River, ladera superior S y filo de meseta Latorre, 51°34'S, 72°01'W, 750 m, 15-II-1978, *Boelcke et al. s.n.* (BAB); Ruta 40, a 25 km de El Cerrito, 50°45'S, 71°27'W, 17-I-1967, *Boelcke* 12499 (BAA, BAB, SI); Próximo a intersección Rutas 3 y 40, 43 m, 51°36'59"S, 69°37'36.9"W, 16-XII-2006, *Bonifacino et al.* 3031 (US); Río Gallegos, 5-XII-1932, *Castellanos s.n.* (BA 7938, LP); Estancia Cabo Buen Tiempo, 2-XII-1975, *Correa et al.* 6563 (BAB); Estancia Las Vegas, Río Coyle, 18-I-1917, *Dauber* 150 (BAA, CORD); 26 km SW of Río Gallegos, road to Punta Arenas, 30 m, 4-I-1939, *Eyerdam et al.* 24083 (SI); Estancia Flora, ruta prov. 7, a 2.5 km al N del cruce con ruta prov. 2, 50°59'S, 70°47'W, 80 m, 2-II-1995, *Fortunato & Elechosa* 4928 (NY); Can-

cha Carrera, 240 m, 26-I-1976, *Gentili* 397 (LP); Río Gallegos airport, 26-X-1969, *Goodall* 2187 (herb. Goodall); Estancia Cabo Buen Tiempo, Punta El Gancho, 7-XII-1975, *Goodall* 4903 (herb. Goodall); Estancia Cabo Buen Tiempo, Río Gallegos in front of Isla Deseada, 4-XII-1975, *Goodall* 4964 (herb. Goodall); Estancia Los Pozos, hills N of cliffs on N side of Río Gallegos, 5-XII-1975, *Goodall* 4981 (herb. Goodall); Sud de Río Gallegos, 22-I-1949, *Grondona* 2067 (BAB); 10 km camino Río Gallegos a Río Turbio, 23-I-1949, *Grondona* 2159 (LP); Estancia Montediner, Cabo Vírgenes, XI-1974, *Molina* 1 (LP); Sección San Antonio, 51°24'S, 71°34'W, 19-I-1978, *Roig et al. s.n.* (SI); Estancia Stag River, 25-I-1958, *Tweedie* 298 (K); *id.*, 25-I-1958, *Tweedie* 297 (K); *id.*, 14-I-1958, *Tweedie* 252 (LP). **Dpto. Lago Argentino.** Alrededores de Co Fitz Roy, II-1932, *Agostini B-46* (LP); Lago San Martín, Estancia La Federica, 48°54'S, 72°18'W, 12-II-1975, *Boelcke et al.* 16363 (LP); Lago Argentino, Península Magallanes, Estancia Co Buenos Aires, 900–1,000 m, 17-II-1975, *Boelcke et al.* 16498 (BAB, LP); Lago San Martín, Brazo de la Lancha, 48°59'26.9"S, 72°13'26.0"W, 19-I-2002, *Bonifacino et al.* 514 (LP); *id.*, 19-I-2002, *Bonifacino et al.* 515 (LP); Parque Nacional Los Glaciares, Fitz Roy, 14-II-1975, *Cabrera et al.* 25864 (LP, SI); entrada a Parque Nacional Los Glaciares, 120 m, 3-II-1995, *Fortunato & Elechosa* 4935 (BAB); South shore of Lago Argentino, from 30–50 km westward from Santa Cruz river, XI-1907, *Furlong* 153 (NY); Lago Argentino, 1904–1905, *Koslowsky* 26 (CORD); *id.*, 1904–1905, *Koslowsky* 29 (CORD); ca. 90 km da Monte León, lungo la strada per Calafate, 12-I-1974, *Pichi Sermolli & Bizzarri* 7429 (K); Burmeister Penninsula, Lake Argentino, I-1900, *Prichard s.n.* (BM, NY). **Dpto. Lago Buenos Aires.** Ruta nacional 520, a 21 km al W de Perito Moreno, 46°47'S, 71°09'W, 4-II-1975, *Boelcke et al.* 16090 (BAA, LP); al S de Perito Moreno, 597 m, 47°3'19.9"S, 70°46'27.3"W, 11-XII-2006, *Bonifacino et al.* 2984 (US); Los Antiguos camino a Perito Moreno, 24-XI-1965, *Correa & Nicora* 3638 (BAA, LP); Lago Buenos Aires, III-1928, *Guiñazú s.n.* (BA 31/1725); Lago San Martín, 8-XII-1914, *Hicken s.n.* (SI 1862); entre Arroyo Telca y Perito Moreno, 640 m, 12-XII-1965, *Ruiz Leal* 24219 (LP); Patagonia andina, Lago Buenos Aires, 12-XII-1908, *Skottsberg s.n.* (SGO 58893). **Dpto. Magallanes.** San Julián, 15-XII-1926, *Blake* 71 (K); *id.*, II-1933, *Blake* 219 (K); *id.*, 10-XII-1944, *Blake* 378 (SI); *id.*, 10-XII-1944, *Blake* 382 (SI); *id.*, 3-XII-1944; *Blake* 438 (SI); San Julián, 25-III-1917, *Bonarelli s.n.* (BA 5133); *id.*, XII-1917, *Bonarelli s.n.* (BA 5139); Puerto San Julián, 1915, *Carette s.n.* (LP); 50 km N San Julián, road to Puerto Deseado, 30-XII-1938, *Eyerdam et al.* 23896 (K, SI); Puerto San Julián, 19-I-1949, *Grondona* 2026

(LP); San Julián, 24-XI-1945, *O' Donnell* 3709 (BM, F, K). **Dpto. Río Chico.** Lago Pueyrredón, cerros al norte de Río Oro, 47°24'25.4"S, 71°59'30.4"W, 17-I-2002, *Bonifacino et al.* 464 (LP); Parque Nacional F. P. Moreno, Estancia La Oriental, Lago Belgrano, 29-I-1971, *Capurro* 1587 (BA); entre Estancia Tres Cerritos y Lago Cardiel, 9-XII-1965, *Ruiz Leal* 24115 (LP); entre Las Horuquetas y Río Olnie, 1,000 m, 11-XII-1965, *Ruiz Leal* 24245 (LP); Parque Nacional F. P. Moreno, Estancia La Oriental, 12-II-1973, *Rumball s.n.* (BA 69248); *id.*, 8-II-1973, *Rumball s.n.* (BA 69244); *id.*, 15-II-1973, *Rumball s.n.* (BA 69188); Lago Belgrano, Península de los Ciervos, 46°10'–48°15'S, 71°–72°20'W, 800 m, 1-III-1903, *Von Platen & Greiner* 53 (SI). **PROV. TIERRA DEL FUEGO. Dpto. Río Grande.** Estancia Cullen, tall steep hill halfway between Argentine-Chilean limit and the Arroyo Alfa, 6-I-1971, *Goodall* 3110 (BAB, herb. Goodall); Estancia Cullen, Puesto Beta along Arroyo Beta, near its mouth, 7-I-1971, *Goodall* 3244 (BAB, herb. Goodall); Estancia Cullen, beyond and N of Arroyo Alfa, 20-V-1972, *Goodall* 4299 (BAB, herb. Goodall); Estancia Cullen, Arroyo Beta, 52°44'S, 68°33'W, 5-I-1972, *Moore & Goodall* 336 (herb. Goodall, K, LP); Estancia Cullen, hills to W of Río Alfa, 52°43'S, 68°36'W, 5-I-1972, *Moore & Goodall* 354 (herb. Goodall, SI). **Dpto. Ushuaia.** Isla de los Estados, Canal de Beagle, verano-1902, *Rodríguez* 25 (BAB). **CHILE. REG. DE AISÉN. Prov. Gral. Carrera.** Camino de Cerro Castillo a Puerto Ibañez, 46°15'S, 72°00'W, 700 m, 15-III-1977, *Schlegel* 6997 (CONC); Chile Chico, 46°33'S, 71°44'W, 20 m, 12-III-1967, *Seki* 403 (CONC). **REG. DE MAGALLANES. Prov. Magallanes.** San Gregorio, 26-X-1968, *Cekalovic s.n.* (LP); *id.*, 25-X-1968, *Cekalovic s.n.* (CONC 33903); *id.*, II-1954, *Díaz s.n.* (CONC 93942); Ruta 255, 120 km E of Punta Arenas, 2 km E of Bahía San Gregorio, 9-X-1971, *Dudley et al.* 84 (CONC, SGO); NW face of Mt. Aymond on Chile-Argentina Border, ca. 2 km on right side of Route 255-N heading to Río Gallegos, 52°09'–10'S, 69°25'–29'W, 9-X-1971, *Dudley et al.* 107 (herb. Goodall); 67 km E of Punta Arenas-Puerto Natales Road, just past entrance to Est. San Gregorio, 52°30'S, 70°00'W, 10 m, 26-XII-1994, *Landrum & Landrum* 8427 (CONC); San Gregorio, I-1953, *Magens s.n.* (SGO); San Gregorio, Estrecho de Magallanes, I-1954, *Magens s.n.* (CONC 14817); Estancia Punta Delgada, ca. 180 km NE of Punta Arenas, Cañadón Grande, 30 km ENE of settlement, 18-III-1964, *Moore* 1053 (K). **Prov. Tierra del Fuego.** 30 km al S de Manantiales, 2-XI-1973, *Dollenz* 78 (CONC); Bahía Lee, 52°52'S, 70°16'W, 6-XI-1971, *Moore* 2339 (LP); Bahía Felipe, 23-I-1952, *Pfister s.n.* (CONC 12264); Bahía Lee, 6-XI-1971, *Pisano* 3157 (CONC); Punta Espora, XII-1975, *Pisano & Dollenz* 4502 (CONC); Estrecho de Magallanes, I-1966,

*Tsujii* 679 (CONC). **Prov. Última Esperanza.** Estancia Cerro Castillo, 30 km N Rincón Negro, 51°00'S, 72°16'W, 400 m, 16-XII-1975, *s. leg. s.n.* (CONC 50915); Sierra del Toro, 51°10'S, 72°50'W, 700–750 m, 9-II-1992, *Arroyo et al.* 92-39 (CONC); Sierra de los Baguales, Cerro Santa Lucía, 50°44'S, 72°20'W, 750 m, 6-I-1985, *Arroyo* 850092 (CONC); Cerro Donoso, sector Río de las Chinas, 50°44'S, 72°31'W, 900 m, 9-II-1987, *Arroyo et al.* 870322 (CONC); Estancia Cerro Castillo, 51°11'S, 72°22'W, 700 m, 14-XII-1975, *Boelcke et al. s.n.* (SI); Estancia Cerro Castillo, 51°00'S, 72°16'W, 400 m, 16-XII-1975, *Boelcke et al. s.n.* (SI); Sierra de los Baguales, Estancia La Cumbre, Cerro Sin Nombre, 50°42'S, 72°22'W, 800 m, 18-XII-1975, *Boelcke et al. s.n.* (BAB, CONC, SI); Parque Nacional Torres del Paine, 1 km E of E end of Lago Nordenskjöld, 51°00'S, 72°51'W, 100 m, 24-XI-1996, *Elvebakk* 96:667 (CONC); Sierra de los Baguales, Estancia La Cumbre, Campo de la Tropilla, 50°44'S, 72°51'W, 800 m, 15-XII-1986, *Landero* 686 (CONC); Near Guardaparque's house, Paine, 25-III-1972, *Leontsinis* 23 (herb. Goodall); Torres del Paine, 50°58'S, 73°02'W, 8-XII-1962, *Matte s.n.* (CONC 40418); Salto Grande del Paine, 22-XII-1969, *Pisano* 2330 (CONC, herb. Goodall, LP); Estancia La Cumbre, Sierra de los Baguales, 600 m, 18-III-1972, *Pisano* 3639 (CONC); Puesto Weber, Estancia Paine, 20-II-1974, *Pisano* 4300 (CONC); Estancia Guido, Cerro Guido, 700–900 m, 16-I-1952, *Pfister & Ricardi s.n.* (CONC 12155); Las Cumbres, Baguales, 550–850 m, 6-II-1962, *Ricardi & Matthei* 399 (CONC); Angostura, cerca de Lago Sarmiento, 8-II-1962, *Ricardi & Matthei* 466 (CONC).

*Nardophyllum chiliotrichioides* (J. Rémy) A. Gray, Proc. Amer. Acad. Arts 5: 123, 1862. *Dolichogyne chiliotrichioides* J. Rémy, in Gay, Fl. Chile, 4: 104, 1849. TYPE: "Cordillere de Sotaqui, Chili, M. Cl. Gay [s.n.]" (holotype: P 222883, scanned image of holotype at P: LP!; isotypes: P 222884, F!, NY!; scanned image of isotype at P: LP!; photos of isotype at P: F 37660!, LP!, SI!).

*Nardophyllum bracteolatum* Hauman, Anales Soc. Ci. Argent. 86: 324, 1918. TYPE: "[Argentina, Prov. Mendoza] Pederal, Cordillera de San Carlos, 3,700 m, 26-III-1918, R. Sanzin 1810" (holotype: BRLU?; isotype: BA!, LP!; photo of holotype at BRLU: BA!).

(FIGURES 31, 32, 58, 59)

**Shrubs** 40–100 cm tall, globose; branches densely disposed, ascending, tapering towards the end, 8-ribbed, interrib areas densely tomentose, internodes (2–)4–9 mm long. **Leaves** laxly arranged, persistent, alternate, (3–)8–16 × (0.5–)1–2 mm, narrowly elliptic to narrowly

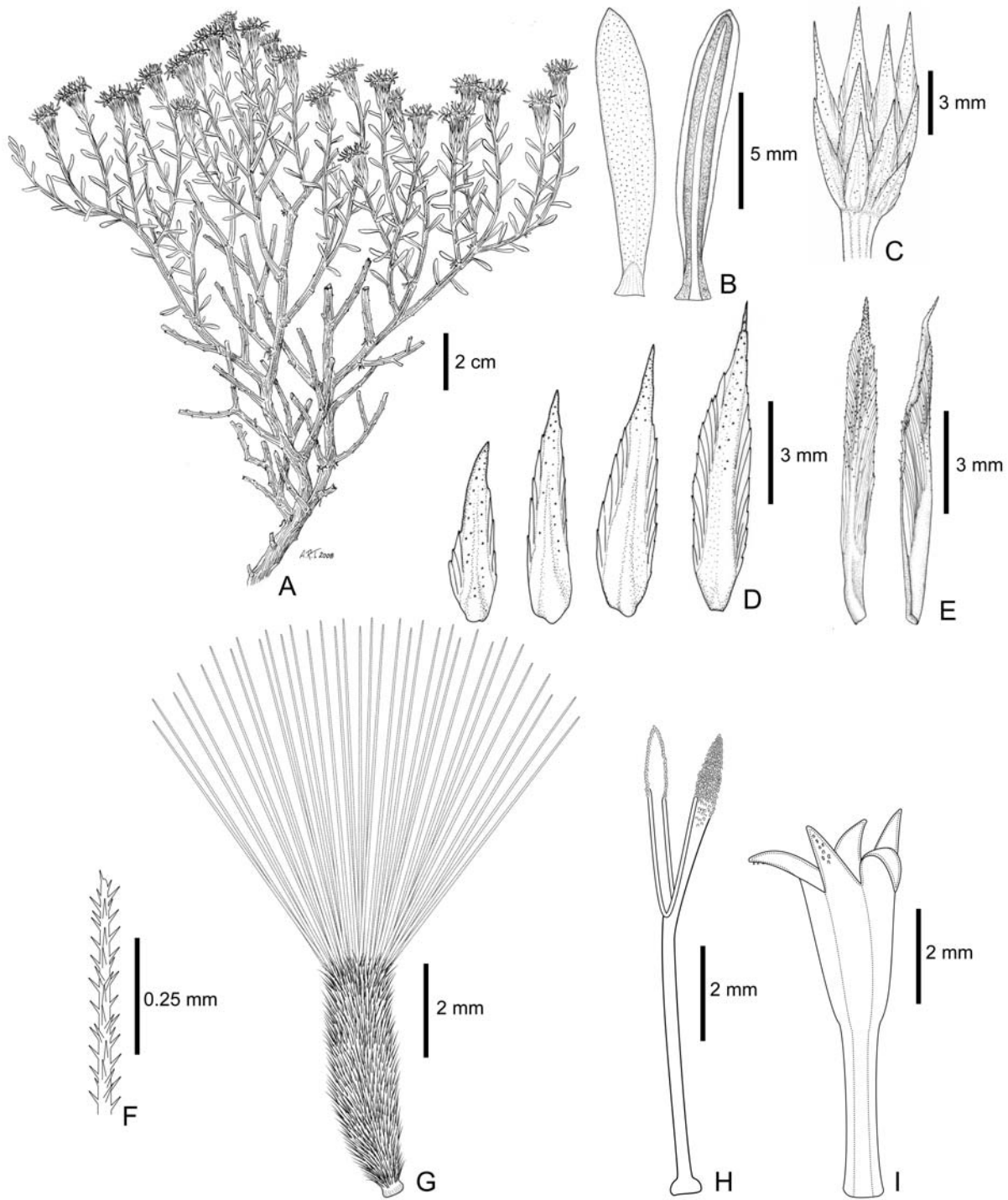


FIGURE 31. *Nardophyllum chilotrichioides* (J. Rémy) A. Gray. A. Habit. B. Leaves, adaxial view (left), abaxial view (right). C. Involucre. D. Outer to inner phyllaries (from left to right). E. Receptacular paleae, dorsal view (left), lateral view (right). F. Detail of pappus bristle. G. Achene with pappus. H. Style. I. Corolla (A–I, Bonifacino et al. 407, LP; Figure 31A by Alice Tangerini).



obovate, base slightly attenuated, petiole broadened towards the stem and constricted above, apex acute, recurved, margins notably revolute, densely tomentose and gland-dotted on abaxial side, gland-dotted on adaxial side, discolorous, coriaceous. **Capitula** solitary, terminal, pedunculate, peduncles 3–15 mm long, homogamous, discoid. **Involucre**s 7–8 × 4–5 mm, cylindrical; phyllaries arranged in 3 to 4 series; outer phyllaries 3–6 × 0.7–1.8 mm, triangular-ovate, mid-ridge clearly marked, apex acute-subulate, gland-dotted on abaxial surface, coriaceous, margins membranaceous; inner phyllaries 6–7 × 1.3–2 mm, narrowly elliptic to narrowly ovate, apex acute-subulate, gland-dotted towards the apex on abaxial surface, papery, margins membranaceous. **Receptacles** flat to slightly convex, partially paleate; paleae 8 to 12, 6–8.5 × 1.5 mm, narrowly ovate to ovate-triangular, boat-shaped, not embracing the achenes, apex acute, membranaceous, gland-dotted on adaxial surface, margins membranaceous. **Florets** 10 to 22, bisexual; corollas yellow, tubular, 5-lobed, broadened more or less abruptly from mid-length, tube 2.5–5 mm long, throat 3–5 mm long, lobes 0.8–2 × 0.5–0.7 mm, triangular, gland-dotted abaxially; anther thecae 1.8–2.5 mm long, bases slightly sagittate, apical appendages 0.8–1.2 × 0.3 mm, triangular, antheropodium present, not swollen; style shafts 4–6 mm long, base swollen, style branches 4–5 mm long, narrowly elliptic to oblong, subacute, collecting hairs short on upper 1/2. **Achenes** 3–6.5 mm long, narrowly obovate, terete, 6- to 8-ribbed, sparse to densely villose and gland-dotted, carpodium present. **Pappus** 6–8.5 (–10) mm long, 2-seriate, composed of 55 to 70 flattened bristles, up to 0.1 mm wide, scabrid, outer bristles somewhat shorter.

*Vernacular names:* Not known.

*Phenology:* Flowering specimens have been collected from October to February. There seems to be a correlation between the time of blooming and the geographic distribution, with populations towards the north flowering before the southern populations, and populations close to the Atlantic ocean flowering before those close to the Andes.

*Distribution:* Argentina: very common in Chubut, but also present in Mendoza, Neuquén, San Juan, and Santa Cruz. Chile: present in Coquimbo and Metropolitana regions (Figure 32). The scattered distribution shown in Figure 32 probably reflects an incomplete sampling rather than the actual distribution.

*Habitat:* *Nardophyllum chilotrichioides* occurs from sea level to 3,800 m in San Juan and Mendoza provinces (Argentina) in the high Andean and Patagonian biogeographic provinces (Cabrera and Willink, 1973). In Chile it grows above 2,500 m. It is a common species in

the patagonian steppe of Chubut where it occurs associated with *Nassauvia axillaris* D. Don, *Nassauvia glomerulosa* D. Don, *Nassauvia ulicina* Macloskie, and *Junellia* spp. In many areas it is the dominant species in the shrub stratum.

*Uses:* Not known.

*Etymology:* The specific epithet refers to the similarity of this species with *Chilotrichum*, especially on the leaves and the habit.

*Note 1:* In the original publication of *Dolichogyne chilotrichioides*, J. Rémy (1849) stated that the species was from “Cordilleras de Sotaqui” in Chile. I’ve studied images of two specimens deposited at P (P 222883 and P 222884). Both specimens match perfectly the original diagnosis, however their labels are slightly different. One of the labels (specimen P 222883) reads “Cordilleras de Sotaqui”, while the other (specimen P 222884) reads “Chili, Prov. Coquimbo”. While both specimens are from Coquimbo, the locality on specimen P 222883 is exactly the same that appears in the original description and it is therefore identified as the holotype, and specimen P 222884 as isotype. The photograph distributed by F as phototype of *Dolichogyne chilotrichioides* corresponds with the isotype at P.

*Note 2:* According to Stafleu and Cowan (1979) and the staff at BA, Hauman deposited most of his types at BRLU. I have studied a photograph at BA that apparently would correspond with a photo of the holotype of *Nardophyllum bracteolatum* Hauman, but since I have not received confirmation of its presence at BRLU, I am leaving the location of the holotype at BRLU as probable. I have studied two other specimens, one at BA and the other at LP. Both specimens match the original diagnosis and the data that appear on the labels match those of the protologue, therefore, I identify them as isotypes. However, the label of the specimen deposited at LP has some inconsistencies in the collection data: the date and elevation are different (25-III-1916, 3600 m). It is my opinion that these differences are due to errors when transcribing the label since both specimens have the same collector and collection number as well as the locality that appeared in the original description.

*Note 3:* Bonifacino (2005), when transferring *Nardophyllum bracteolatum* to the synonymy of *Nardophyllum chilotrichioides* commented: “*Nardophyllum chilotrichioides* is a highly polymorphic species occurring on both sides of the Andes Mountain Range in Chile (Coquimbo and Metropolitana regions) and in Argentina (Santa Cruz, Chubut, Neuquén, Mendoza, and San Juan provinces). Hauman (1918) described *Nardophyllum bracteolatum* based on herbarium material from Mendoza (Argentina) and made explicit his doubts concerning the distinctness of his new species when compared to *Nardophyllum*

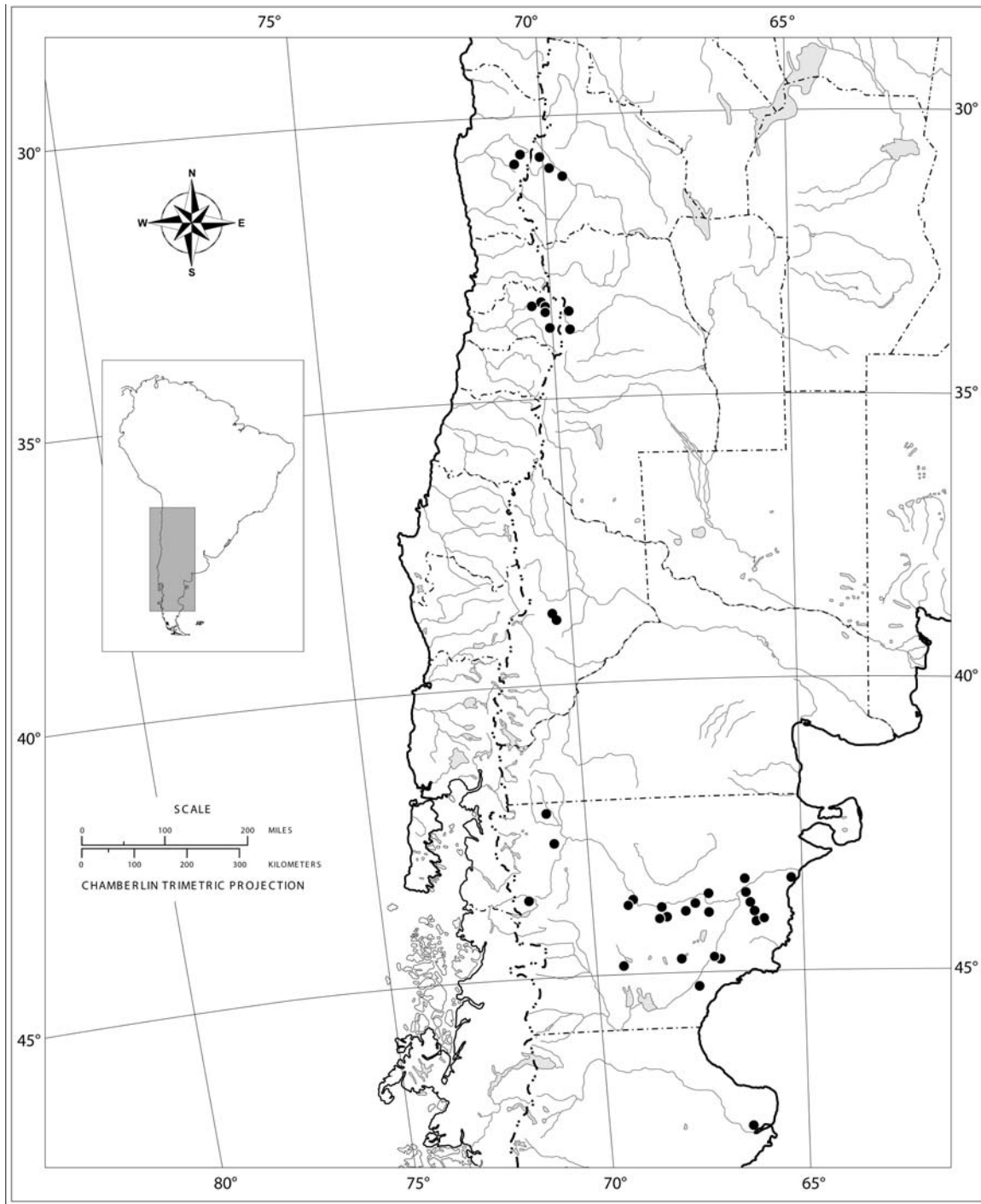


FIGURE 32. Geographic distribution of *Nardophyllum chilotrichioides* (J. Rémy) A. Gray.

*chilotrichioides* ["Il existe dans l'Herbier [BA] un fragment (Ameghino 205), ne présentant qu'un seul capitule en mauvais état, mais qui me semble appartenir à une espèce extrêmement voisine, si pas identique, à la mienne"]. I have studied the specimen Ameghino 205 at BA and it perfectly

corresponds with typical *Nardophyllum chilotrichioides* and matches the characteristics of southern populations. Bonifacino (2005) added: "Cabrera (1954a) pointed out the great similarity between *Nardophyllum bracteolatum* and *Nardophyllum chilotrichioides*, noting that the only

difference between those species was the number of florets per capitulum. My observations, based on a large number of specimens collected throughout the whole geographic range of the species, indicate that the number of florets per capitulum in *Nardophyllum chilotrichioides* and *Nardophyllum bracteolatum* populations overlaps, although northern populations (*Nardophyllum bracteolatum*) tend to exhibit larger numbers of florets per capitulum (15–22) than southern populations (*Nardophyllum chilotrichioides*, 10–18 florets per capitulum). *Nardophyllum chilotrichioides* is a fairly common species in the Patagonian scrub of Chubut (Argentina) and is the dominant species in the shrub stratum of certain areas. In Mendoza and San Juan, the species has only been collected above 2,200 m; these populations are more similar to Chilean populations and exhibit leaves smaller than the populations from Chubut and Santa Cruz. The only difference between northern (central Chile, San Juan, and Mendoza in Argentina) and southern populations (Chubut and Santa Cruz in Argentina) lie in the branching pattern (branches form sharper angles in northern populations than in southern ones). According to my observations, there are no clear boundaries between the northern and southern populations, and therefore there is no evidence to support *Nardophyllum bracteolatum* and *N. chilotrichioides* as distinct taxa. The latter name has priority prescribing the treatment of *Nardophyllum bracteolatum* as its heterotypic synonym". Molecular evidence (Bonifacino and Funk, unpublished data) seems to suggest that material originally ascribed to *N. bracteolatum* would slightly differ from *N. chilotrichioides*, but at the light of morphological evidence mentioned above, until more specimens are obtained from the Andes of Mendoza, I reaffirm my earlier hypothesis (Bonifacino, 2005) of adopting a broad concept of this taxon, keeping *N. bracteolatum* in the synonymy of *N. chilotrichioides*.

*Additional specimens examined:* ARGENTINA. PROV. CHUBUT. Not defined Dpto. Río Chico, aut-1900, *Ameghino s.n.* (LP); Travesía del Chubut, XII-1903, *Illín s.n.* (BAB). Dpto. Ameghino. Ameghino, 380 m, 24-XII-1967, *Ruiz Leal 25672* (LP). Dpto. Cushamen. Ruta Prov. 12, entre Ruta Nac. 40 y Gualjaina, 42°43'50.8"S, 70°47'16.8"W, 12-I-2002, *Bonifacino et al. 407* (LP); 20 km al E de Cushamen, 31-XII-1947, *Soriano 2786* (LP). Dpto. Escalante. 100 km N of Comodoro Rivadavia, 200 m, 23-XII-1938, *Eyerdam et al. 23776* (K, SI). Dpto. Florentino Ameghino. Próximo a Garayalde, 417 m, 44°38'29.1"S, 66°34'32.1"W, 17-XII-2006, *Bonifacino et al. 3046* (US); Ruta Prov. 29, entre Garayalde y Estancia La Chiquita, 44°36'33.6"S, 66°52'21.3"W, 4-XII-2002, *Bonifacino & Donato 788* (LP); Ruta Prov 31, entre Ruta Nac. 3 y Dique

Ameghino, 44°03'21.2"S, 66°10'10.2"W, 4-XII-2002, *Bonifacino & Donato 789* (LP); Ruta Prov 31, entre Ruta Nac. 3 y Dique Ameghino, 44°01'13.4"S, 66°09'36.0"W, 4-XII-2002, *Bonifacino & Donato 790* (LP); Ruta 3 a 129 km al NW de Camarones, 15-I-1978, *Romanzuk et al. 895* (BAB). Dpto. Gaiman. Ruta Prov 31, entre Ruta Nac. 3 y Dique Ameghino, 43°46'16.2"S, 66°17'3.8"W, 4-XII-2002, *Bonifacino & Donato 791* (LP); Ruta Nac. 25, 43°35'45.2"S, 66°29'17.1"W, 5-XII-2002, *Bonifacino & Donato 799* (LP). Dpto. Languiñeo. Río Corcovado, I-1904, *Illín s.n.* (BA 26041). Dpto. Martires. Ruta Prov 53, ~1 km al SW de Intersección con Ruta 25, 43°46'28.1"S, 67°29'26.2"W, 26-XI-2002, *Bonifacino & Donato 679* (LP); Ruta Prov 53, ~1 km al SW de Intersección con Ruta 25, 43°46'28.1"S, 67°29'26.2"W, 26-XI-2002, *Bonifacino & Donato 683* (LP); Ruta Prov 53, ca. Sierra Negra, 43°59'24.0"S, 67°35'32.2"W, 26-XI-2002, *Bonifacino & Donato 692* (LP); Ruta Prov. 48, 30 km al sur de intersección con Ruta Prov. 25, 43°58'17.0"S, 67°16'24.6"W, 13-I-2002, *Bonifacino et al. 425* (LP); Ruta Nac. 3, km 1661, 44°44'30.1"S, 66°40'30.4"W, 30-I-2002, *Bonifacino et al. 602* (LP); alta planicie cerca de la Estación Las Plumas, 4-XI-1925, *Hosseus 152* (CORD). Dpto. Paso de los Indios. Ruta Prov. 12, entre Paso Berwin y Ruta Prov. 25, 43°42'30.8"S, 68°56'12.1"W, 12-I-2002, *Bonifacino et al. 419* (LP); Ruta Prov. 27, 3 km al sur de intersección con Ruta Prov. 29, 44°37'50.2"S, 67°50'00.0"W, 14-I-2002, *Bonifacino et al. 430* (LP); Valle de los Altares, 19-XII-1981, *Cabrera et al. 33291* (LP, SI); El Sombrero, 6-I-1948, *Krapovickas 3893* (BAB); a 5 km de Paso de los Indios, en el cruce con Yacimiento Condor, 19-XII-1993, *Molina et al. 4670* (NY); entre Estancia Cañadón Grande 900 m y Paso de los Indios 520 m, 28-XII-1967, *Ruiz Leal 25696* (LP); 23 km al E de El Sombrero, 6-I-1948, *Soriano 2840* (LP). Dpto. Rawson. 10 km al S de Trelew, 18-XII-1981, *Cabrera et al. 33268* (LP, SI); Trelew, 12 km al S, 7-XII-1980, *Castroviejo & Lopez 2313* (SI). Dpto. Sarmiento. Ruta Prov. 24, 91 km al norte de Sarmiento, laderas al oeste de Laguna Seca, 44°53'17.3"S, 69°12'51.6"W, 15-I-2002, *Bonifacino et al. 447* (LP). PROV. MENDOZA. Dpto. San Carlos. Arroyo de la Quebrada Casa de Piedra, 17-I-1952, *Serra 77* (LP); Rincón de los Leones, 18-I-1941, *Ruiz Leal 7212* (LP). Dpto. Tunuyán. Portillo, de Tunuyán, 33°37'17"S, 69°35'57"W, 2,800 m, 27-I-2001, *Simón & Bonifacino 819* (LP); Portillo, Cuesta de los Afligidos, 29-I-1934, *Ruiz Leal 2052* (LP). PROV. NEUQUÉN. Dpto. Zapala. Alrededores de Cerro Lotena, 20-XI-1983, *Correa et al. 8837* (BAB); Zapala, II-1920, *Hauman s.n.* (BA 5144). PROV. SANTA CRUZ. Dpto. Deseado. Deseado, 1899-1900, *Ameghino 205* (BA). PROV. SAN JUAN. Dpto. Calingasta. Quebrada Los

Avestruces, W de Cerro Castaño, II-1960, *Fabris & Marchionni 2354* (LP); Río Manrique a portezuelo de Potrerillos, 31°00'S, 69°50'W, ~3,000 m, 23-I-1991, *Kiesling et al. 7689* (SI); Río Mondaca (o Río Blanco o Patillos), Aloj de Mondaca, 30°50'S, 70°10'W, 2,900 m, 19-II-1990, *Kiesling et al. 7539* (MO, SI). CHILE. REG. DE COQUIMBO. Prov. Limari. Cordillera San Miguel, 2,800 m, 12-I-1959, *Jiles 3599* (CONC); Los Molles, 3,000 m, 17-I-1972, *Zöllner 5567* (CONC). REG. METROPOLITANA. Not defined Prov. Cordillera de las Arañas, I-1861, *Lambert s.n.* (SGO 43816). Prov. Area Metropolitana. Entre Farellones y Valle Verde, 33°22'12.1"S, 70°16'44.2"W, 16-I-2003, *Bonifacino & Romano 809* (LP); Fierro Carrera, 2,800–3,800 m, I-1930, *Montero 1035* (CONC); Las Condes, XII-1948, *Morales s.n.* (CONC 93945); entre Farellones y La Parva, hasta 2,700 m, 18-I-1980, *Muñoz 1582* (SGO); La Parva, faldeo norte hacia el Cerro Colorado, 7-I-1979, *Muñoz & Meza 1399* (SGO); Río San Francisco, Fierro Carrera, ~3,000 m, I-1925, *Weerderman 621* (F, K, LP, NY, SI). Prov. Cordillera. Parque Nacional El Morado, 33°49'S, 70°05'W, 14-I-1991, *Teillier et al. 2410* (MO).

*Nardophyllum genistoides* (Phil.) A. Gray, Proc. Amer. Acad. Arts 8: 636, 1873. *Dolichogyne genistoides* Phil., Linnaea 28: 738, 1856. TYPE: “[Chile] *Dolichogyne genistoides* Phil., Cordillera de Santiago, Febr. 1857, *Germ.* [s.n.]” (holotype: SGO 62028!; isotypes: BM 608509!, LP!).

(FIGURES 33, 34, 60)

**Shrubs** 10–30 cm tall, branches more or less densely disposed, ascending, 8-ribbed, tomentose when young, later covered with notable glandular vesicular capitate trichomes, internodes short, up to 3 mm long. **Leaves** densely arranged, persistent, ascending, alternate, 11–15 × 2–3 mm, narrowly elliptic to obovate, base slightly attenuated, petiole broadened towards the stem and constricted above, apex acute, margins notably revolute, densely covered by notable glandular vesicular capitate trichomes on both surfaces, concolorous, chartaceous. **Capitula** solitary, terminal, shortly pedunculate, peduncles 3–12 mm long, homogamous, discoid. **Involucre**s ~18 × 8 mm, cylindrical-campanulate; phyllaries arranged in 3 to 4 series; outer phyllaries with foliaceous apices, 8–10 × 3 mm, or narrowly triangular-ovate to narrowly elliptic, apex acute, gland-dotted on abaxial surface with notable glandular vesicular capitate trichomes, coriaceous; inner phyllaries 15–17 × 2–3 mm, narrowly ovate-elliptic, apex acute-subulate, gland-dotted towards the apex on abaxial sur-

face, papery, margins membranaceous. **Receptacles** flat, naked. **Florets** ~20, bisexual; corollas yellow, tubular, 5-lobed, gradually broadened towards the apex, tube 10–14 mm long, lobes 1.7–2 × 0.7–0.8 mm, triangular, gland-dotted abaxially; anther thecae ~3 mm long, bases slightly sagittate, apical appendages 1–1.5 × 0.5 mm, triangular, antheropodium present, not swollen; style shafts ~9 mm long, base swollen, style branches 4–5 mm long, narrowly obovate, apex acute, collecting hairs very short on upper 2/3. **Achenes** 6–8 mm long, obconic, terete, ~6-ribbed, gland-dotted, sparsely villose (long twin trichomes of up to 1.5 mm long), carpodium present. **Pappus** 12–13 mm long, 2-seriate, composed of 33 to 53 flattened bristles, up to 0.1 mm wide, scabrid, barbellate towards the apex.

**Vernacular names:** Not known.

**Phenology:** Flowering specimens have been collected from January to February.

**Distribution:** Chile, the only three collections are from Región Metropolitana (Figure 34).

**Habitat:** Little is known about this species whose only three collections are from the mid-19th century. Probably it occurs at mid elevations in the ecotonal zone between Central Chile and high Andean biogeographical provinces (Cabrera and Willink, 1973).

**Uses:** Not known.

**Etymology:** The specific epithet probably refers to the similarity of this species with those of the genus *Genista* L. (Leguminosae), which have yellow flowers and small elliptic leaves.

**Note 1:** The photograph distributed by F as the phototype of *Dolichogyne genistoides* (negative number 37661) taken from material deposited at P (P 279524), doesn't match the description of this species, nor the characteristics of the holotype at SGO. This specimen at P notably resembles genus *Nassauvia* Comm. ex Juss., and it probably corresponds with species *Nassauvia planifolia* Wedd.

**Additional specimens examined:** CHILE. REG. METROPOLITANA. Not defined Dpto. Andes de Santiago, s. date, s. leg. s.n. (K); Cordillera de las Arañas, I-1861, *Lambert s.n.*, (SGO 71787).

*Nardophyllum lanatum* (Meyen) Cabrera, Notas Mus. La Plata, Bot. 17(83): 63, 1954. *Barnadesia lanata* Meyen, Reise Erde I: 347, 1834. TYPE: B, destroyed (NEOTYPE, designated here: “CHILE, Región Metropolitana, Prov. Area Metropolitana, entre Farellones y Corral Quemado, 33°21'21.2"S, 70°19'38.8"W, 16-I-2003, *Bonifacino & Romano 811*” (neotype: SGO 154610!; isoneotypes: LP!, SI!).

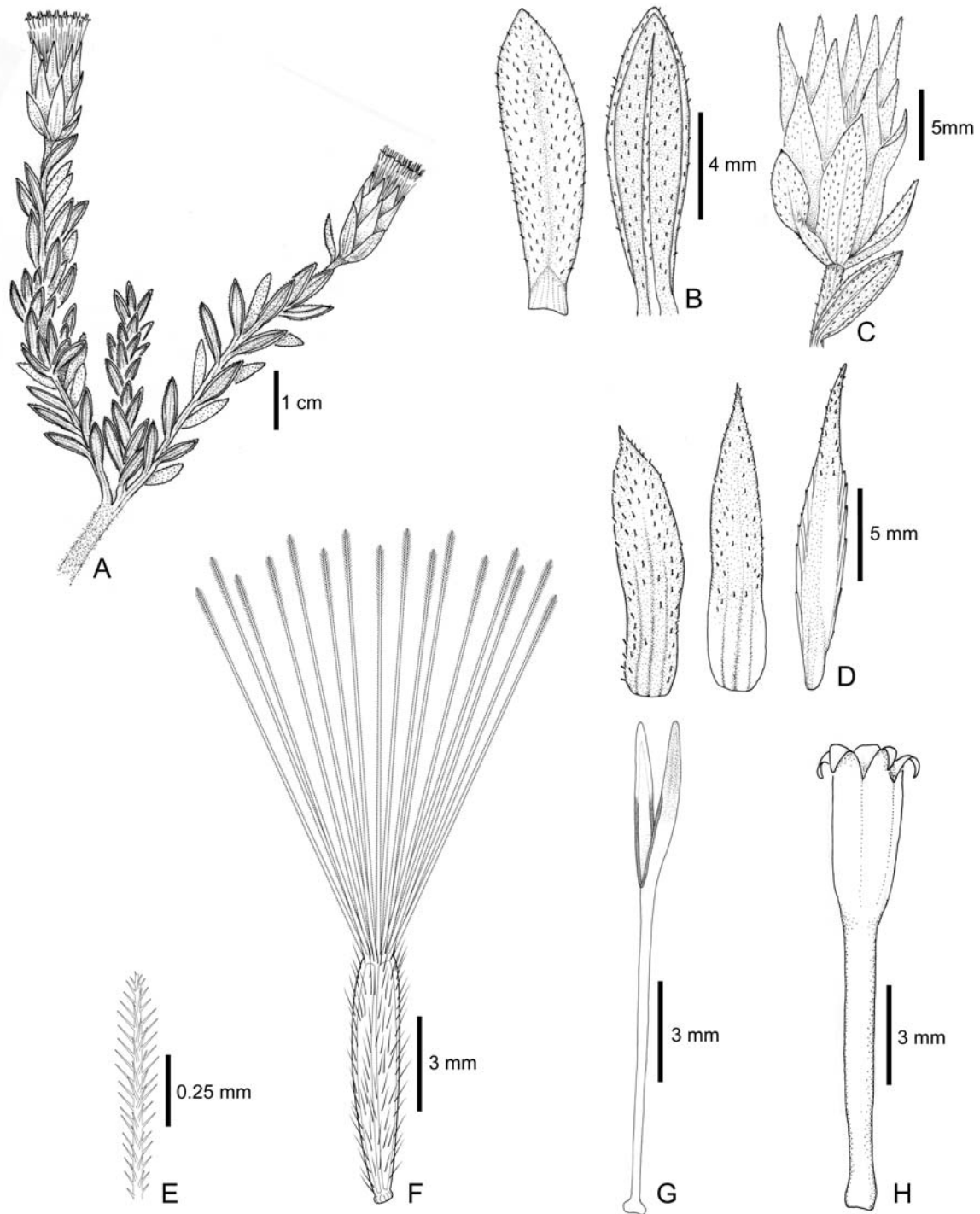


FIGURE 33. *Nardophyllum genistoides* (Phil.) A. Gray. A. Habit. B. Leaves, adaxial view (left), abaxial view (right). C. Involucre. D. Outer to inner phyllaries (from left to right). E. Detail of pappus bristle. F. Achene with pappus. G. Style. H. Corolla (A, Germain s.n., BM; B–H, Germain s.n., LP).

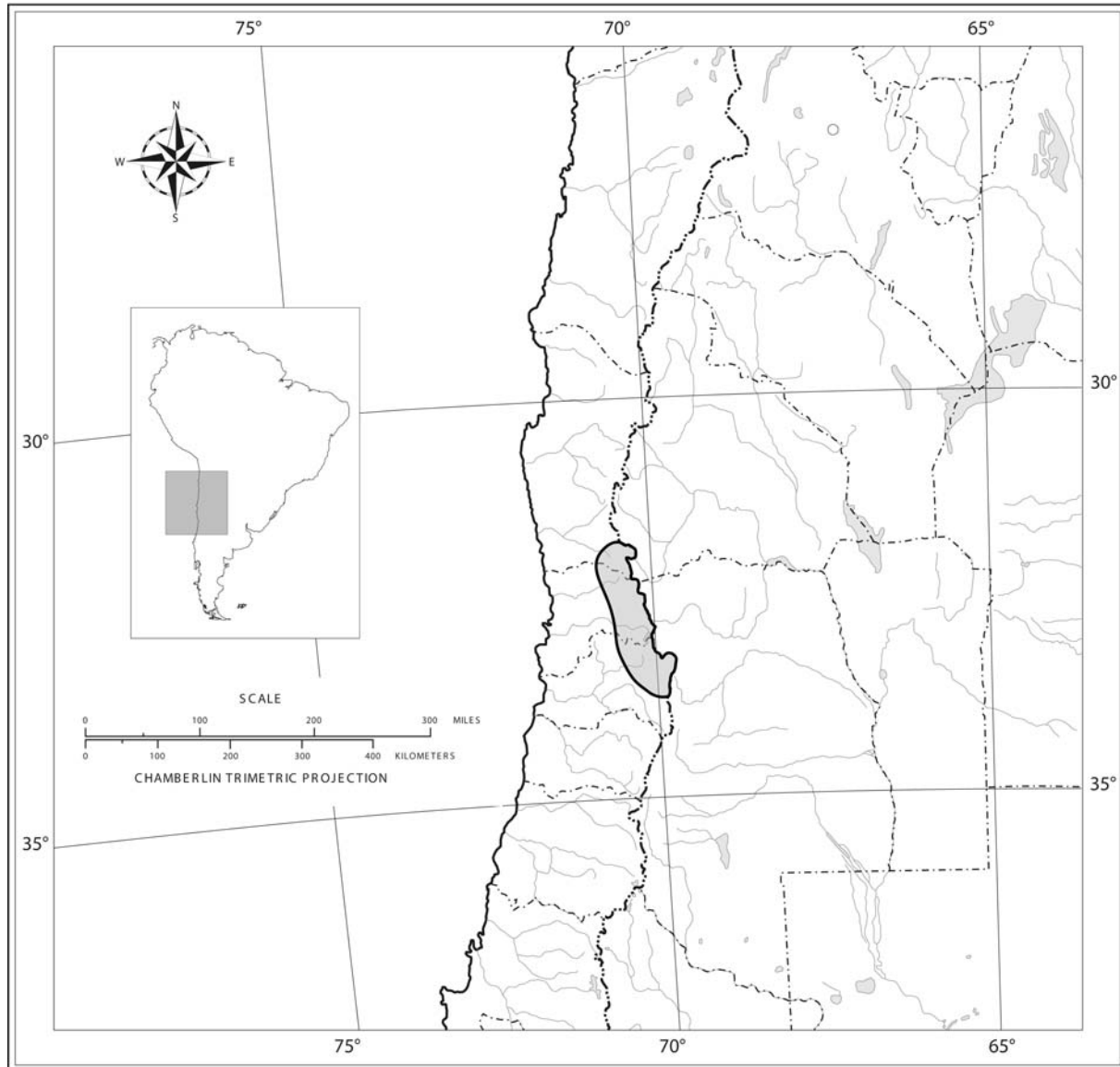


FIGURE 34. Geographic distribution (shaded area) of *Nardophyllum genistoides* (Phil.) A. Gray.

*Gochmatia revoluta* D. Don ex Hook. and Arn., in Hooker, Comp. Bot. Mag. 1: 109, 1835. *Nardophyllum revolutum* (D. Don ex Hook. and Arn.) Hook. and Arn., in Hooker, Comp. Bot. Mag. 2: 44, 1836. *Pentaphorus rosmarinifolius* Gill. ex Hook. and Arn. pro syn., Comp. Bot. Mag. 1: 109, 1835. TYPE: “*Gochmatia revoluta* Don, but it differs from *Gochmatia* by the branches of style pret long and slightly acute and pappus deciduous plumose, ca. on bud, Compos. Cordillera, *Cuming 185*” (lectotype: K!, designated here; isolectotype: K!; syntype: “*Vernonia*, *Gochmatia revoluta* Don., Travesia Provincia San Luis, *Dr. Gillies 153*”, K!; isosyntype: BM!).

*Dolichogyne staehelinoides* DC., Prodr. 7(1): 256, 1838. *Dolichogyne candollei* J. Rémy nom. illeg., in Gay, Fl. Chile 4: 103, tab. 45, 1849. *Nardophyllum candollei* (J. Rémy) F. Meigen nom. illeg., Bot. Jahrb. Syst. 17: 281, 1893. *Aster staehelinoides* (DC.) Kuntze, Revis. Gen. Pl. 3(3): 131, 1898. *Nardophyllum staehelinoides* (DC.) Macloskie, Rep. Princeton Univ. Exp. Patagonia, Botany, 8: 784, 1905. TYPE: “De Peña Blanca al Cerro en las Pampas, *Nee* [s.n.], herb. Thibaud.” (holotype: G; scanned image of holotype at G: LP!; photos of holotype at G: LP!, SI!).

*Dolichogyne gnaphalioides* DC., Prodr. 7(1): 256, 1838. *Dolichogyne candollei* J. Rémy **nom. illeg.**, in Gay, Fl. Chile 4: 103, tab. 45, 1849. *Nardophyllum candollei* (J. Rémy) F. Meigen **nom. illeg.**, Bot. Jahrb. Syst. 17: 281, 1893. TYPE: “[Chile] Hab. Cordillera de Talcaragné, D. C. Gay de Draguignan, 1833” (holotype: G; scanned image of holotype at G: LP!; isotypes: F!, US!).

(FIGURES 35, 36, 61)

**Shrubs** 30–100 cm tall, globose, usually spreading; branches densely disposed, ascending, 8-ribbed, internodes up to 3 mm long. **Leaves** densely arranged, persistent, alternate, ascending, 9–18 × 1.3–2 mm, narrowly obovate, base slightly attenuated, petiole broadened towards the stem and constricted above, apex acute to subacute, margins notably revolute, densely tomentose and gland-dotted on both surfaces, more or less concolorous, coriaceous. **Capitula** solitary, more rarely arranged in cimose synflorescences composed of 2 to 3 capitula, terminal, sessile to shortly pedunculate, peduncles up to 10 mm long, homogamous, discoid. **Involucres** 10–15(–17) × 2.5–4.5 mm, cylindrical; phyllaries arranged in 4 to 6 series; outer phyllaries with foliaceous apices, 4.5–7 × 1.5–2.5 mm, triangular-ovate to elliptic, with a notorious longitudinal mid-ridge towards the base, apex acute to subulate, tomentose and gland-dotted on abaxial surface, coriaceous, margins membranaceous; inner phyllaries 9–16 × 2–3 mm, narrowly elliptic, apex acute to subulate, tomentose gland-dotted towards the apex on abaxial surface, papery, margins membranaceous. **Receptacles** flat, naked or rarely partially paleate; when present, paleae 1, ~ 10–15 × 1 mm, narrowly elliptic, not embracing the achenes, apex acute, gland-dotted towards the apex on abaxial surface, margins membranaceous. **Florets** 4 to 6, bisexual; corollas yellow, tubular, 5-lobed, broadened more or less abruptly from mid-length, tube 5–6 mm long, throat 4–5 mm long, lobes 1.4–3 × 0.6–0.9 mm, triangular, gland-dotted abaxially; anther thecae 3–4 mm long, bases slightly sagittate, apical appendages 1–1.5 × 0.3–0.4 mm, triangular, antheropodium present, not swollen; style shafts 8–10 mm long, base swollen, style branches 4–6.5 mm long, narrowly elliptic to oblong, subacute, collecting hairs short on upper 1/2. **Achenes** 6.5–9 mm long, obconic, terete, ~ 6-ribbed, gland-dotted, sparsely villose, carpodium present. **Pappus** 9–13 mm long, 2 (3)-seriate, composed of 50 to 110 flattened bristles, up to 0.1 mm wide, scabrid, barbellate towards the apex.

**Vernacular names:** Not known.

**Phenology:** Flowering specimens have been collected from October to April.

**Distribution:** Restricted to Chile in Regions of Atacama, Coquimbo, Valparaíso, Metropolitana, and General O’Higgins (Figure 36).

**Habitat:** *Nardophyllum lanatum* occurs in rocky slopes between 1,200 and 3,200 m in the ecotonal zone between Central Chile and high Andean biogeographical provinces (Cabrera and Willink, 1973). I have seen it growing amid sparse vegetation in close proximity to chaparral vegetation characterized by *Lithraea caustica* Hook. and Arn. and *Quillaja saponaria* Molina.

**Uses:** Not known.

**Etymology:** The specific epithet refers to the dense and profuse tomentose pubescence that covers leaves and stems.

**Note 1:** The type of *Barnadesia lanata* Meyen, was collected near Queseria and Río del Volcán in the Andes of the Metropolitan Region in Chile. According to Stafleu and Cowan (1981) Meyen’s herbarium was acquired by B. However, according to B staff (pers. comm.) this specimen is not present at B, and it was probably destroyed during the fires caused by the bombing of Berlin-Dahlem in March 1943. I’ve been unable to locate photos of this material in the F collection of negatives of material originally deposited at B. I therefore think designation of a neotype is in order. I’ve selected a specimen collected near the area where the holotype was collected. The material here proposed as neotype has abundant reproductive material and has duplicates distributed in SGO, SI, and LP.

**Note 2:** Hooker and Arnott (1835) in the protologue of *Gochnatia revoluta* mentioned two specimens “La travesia and La Punta, Province of San Luis, Dr. Gillies” and “Cordillera of Chili, Cuming (185)”. I have studied both specimens deposited at K and they perfectly match the original diagnosis. I select *Cuming 185* as Lectotype since is the material utilized by Hooker and Arnott in the original description since Gillies’ specimen was not available to them. Cuming’s material is immature but it doesn’t pose any doubts regarding his taxonomic identity, and is more abundant than Gillie’s material.

**Note 3:** Regarding the syntype of *Gochnatia revoluta* D. Don ex Hook. and Arn., the label of Gillie’s material at K says: “*Vernonia*, 153, *Gochnatia revoluta* Don [an illegible word between parenthesis], Travesia Province San Luis, Gillies”. The information on the labels match to a great extent what appears on the original publication by Hooker and Arnott (1835); however, a special comment should be made on the locality of this specimen. Province of San Luis in Argentina is mentioned as the locality for this specimen, while all the rest of ancient and

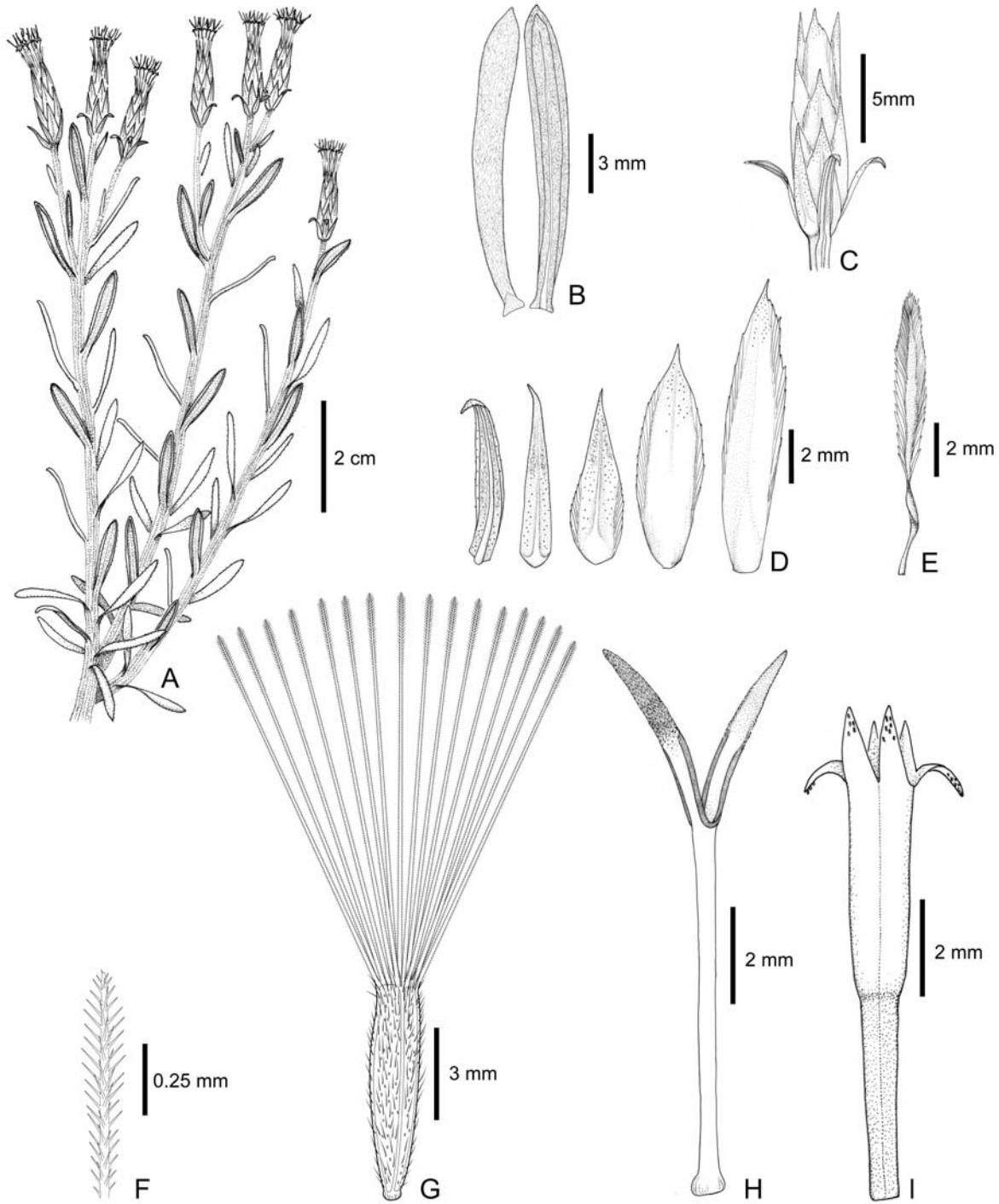


FIGURE 35. *Nardophyllum lanatum* (Meyen) Cabrera. A. Habit. B. Leaves, adaxial view (left), abaxial view (right). C. Involucre. D. Outer to inner phyllaries (from left to right). E. Palea (dorsal view). F. Detail of pappus bristle. G. Achene with pappus. H. Style. I. Corolla (A–I, Bonifacino & Romano 811, LP).



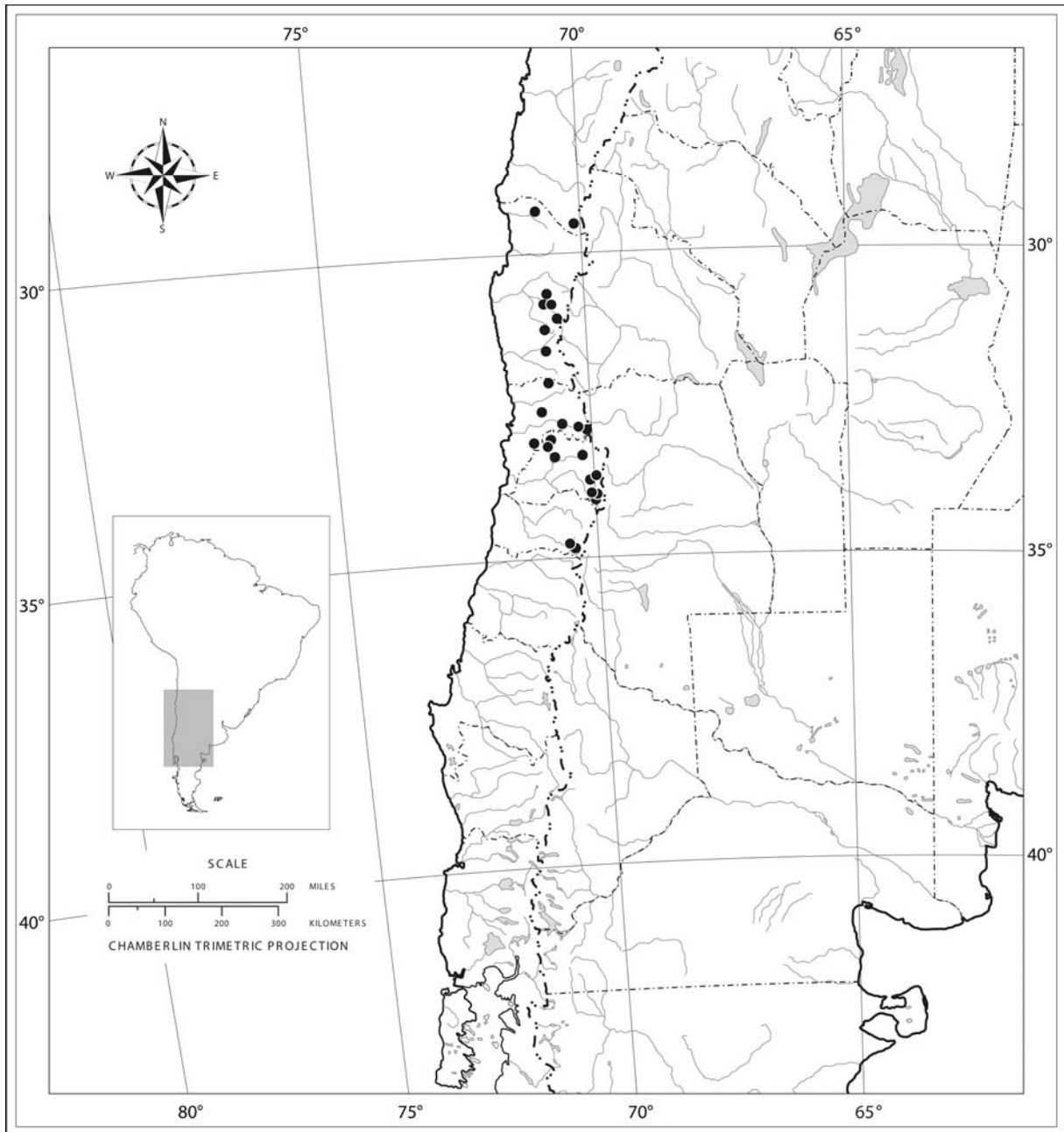


FIGURE 36. Geographic distribution of *Nardophyllum lanatum* (Meyen) Cabrera.

modern records for the species on the herbaria to which I have access are restricted to the western side of the Andes. According to Britten and Boulger (1893), Gillies resided in Mendoza and traveled widely between Argentina and Chile, as well as in the provinces of Mendoza, San Luis, and Cordoba, so it is probable that the locality for this specimen might have been somehow incorrectly noted on the label. There is a specimen deposited at BM (BM

608510) with a handwritten label “N° 153, *Vernonia*”, and with a printed label “Mendoza Dr. Gillies”. This specimen at BM, although holding a different locality, has the same ID and number of specimen attributed to Gillies, however the locality doesn’t match the locality mentioned in the protologue. It is very likely that this printed label was added at a later time when the material was distributed and incorrectly assigned to the specimen. Since the

specimen matched the original diagnosis and the handwritten label matched the one in the specimen identified as syntype at K, the specimen at BM (BM 608510) is here identified as isosyntype.

*Note 4:* J. Rémy (1849) considered *Dolichogyne gnaphalioides* DC. and *Dolichogyne staehelinoides* DC. heterotypic synonyms and instead of considering only one and transferring the other to the synonymy, he decided to coin a new and illegitimate superfluous name *Dolichogyne candollei* J. Rémy. Because Rémy's name applies to *Dolichogyne gnaphalioides* DC. and *Dolichogyne staehelinoides* DC. the superfluous name appears under the synonymy of both names.

*Additional specimens examined:* CHILE. NOT DEFINED REG. s. loc., s. date, *Gay s.n.* (F). REG. DE ATACAMA. **Prov. Huasco.** Km 28, Río del Estrecho, 29°12'S, 70°09'W, 3,150 m, 19-I-1994, *Arancia et al.* 94180 (CONC). REG. DE COQUIMBO. **Prov. Elqui.** Estación Junta de Chingoles, I-1944, *Pizarro de Urizar s.n.* (SGO). **Prov. Limari.** Camara de Carga, Los Molles, 12-I-1975, *Bassano s.n.* (SGO); Tulahuen, s. date, *Geisse s.n.* (SGO 43814); La Hualtata, 16-I-1949, *Jiles 1225* (CONC, LP); Río Molles, 2450 m, 7-III-1951, *Jiles 1963* (CONC, LP); Gordito, 3,000 m, 1-II-1954, *Jiles 2569* (CONC); La Hualtata, 2,400 m, 30-III-1956, *Jiles 2982* (CONC); Río Illapel, 2,800 m, 16-II-1962, *Jiles 4171* (CONC); Cordillera de Ovalle, Río Mostazal, 30°50'S, 70°47'W, 2,600 m, 25-IV-1962, *Jiles 4280-a* (CONC); Potrero Grande, 2,700 m, 19-II-1965, *Jiles 4562* (CONC). REG. DE VALPARAISO. **Prov. Los Andes.** Entre Caracoles de Portillo y Juncal, 32°50'S, 70°12'W, 2,300–2,800 m, 12-I-1981, *Arroyo 81336* (CONC); Uspallata Pass der Chilenishen Hochcordillere (33°S breite) Juncal, auf den Bergen 2,100 m, 8-II-1903, *Buchtien s.n.* (SI 8565); Juncal, 8,000–9,000 ft, I-1930, *Elliott 635* (K); Paso Aconcagua, Llano de Juncalillo, 2,600–2,700 m, 9-III-1954, *Ricardi 2918* (CONC); Paso Aconcagua, Juncal, Quebrada Chépica, 2,400–2,500 m, 10-III-1954, *Ricardi 2963* (CONC); Camino a la Laguna Negra, 2,130 m, 15-I-1990, *Teillier et al.* 1979 (CONC); Río Colorado, 2,500 m, 24-II-1967, *Zöllner 1403* (LP). Maitencillo, Río Blanco, 3,000 m, 18-II-1972, *Zöllner 5522* (CONC). **Prov. Petorca.** Río Sobrante above Chincolco, 2,500 m, 14-II-1939, *Morrison 17321* (K). **Prov. Valparaíso.** Colliguay, 1928, *Jaffuel s.n.* (CONC 51957); Co Roble, Cordillera de la costa, 6-III-1966, *Zöllner 1402* (LP). REG. METROPOLITANA. **Not defined** **Prov. Alhué,** Monte Cantillana, 2-I-1939, *Barros 2587* (LP); Cordillera de Santiago, 1856–1857, *Germain s.n.* (F); Mountains near Santiago, Morro El Buey, ~8,000 ft, 21-IX-1958, *Godley 28a* (BM); Cordillera,

Paso Cruz, 34°S, 1,500 m, s. date, *Kuntze 192* (NY). **Prov. Area Metropolitana.** Entre Farellones y Paso de Jorquera, 2,000–2,200 m, 9-II-1957, *Garaventa 5347* (CONC); Cerro San Ramón, 2,250 m, II-1933, *Grandjot s.n.* (CONC 1078, SGO); Colorado, Tal bei, I-1939, *Grandjot s.n.* (SI); Potrero Grande, I-1936, *Grandjot s.n.* (CONC 20773); Cerro Abanico, 2,200 m, II-1950, *Gunckel 22071* (CONC); Cordillera del Abanico, 2,220 m, 30-XII-1928, *Looser 687* (CONC); Refugio de Farellones, Cordillera de Las Condes, 2,300 m, 9-II-1957, *Looser 5754* (LP); Farellones, en faldeos, 2,100–2,300 m, 3-III-1942, *Pisano 1395* (CONC); Cerro Noviciado, cumbre, 33°23'S, 70°57'W, 2,000 m, 4-II-1956, *Schlegel 1004* (CONC). **Prov. Chacabuco.** Tilttil, I-1920, *Jaffuel s.n.* (CONC 46297); Cerros de Tilttil, XII-1950, *Moreno s.n.* (CONC 93936); road to Laguna Chicauma, 10 km from the lake, 30 km SW of Tilttil, 1,960 m, 21-I-1939, *Morrison & Wagenknecht 17123* (K, SI). **Prov. Cordillera.** Cajón del Maipo, 11-I-1924, *Jaffuel s.n.* (CONC 51954); Cajón del Maipo, Tramo Estero Coyanco-El Manzano, Estero El Sauce, 1,380 m, 23-III-1995, *Muñoz & Moreira 3745* (SGO); Bajando hacia el Embalse del Yeso, zona árida cerca de Campamento Minero, 20-I-1995, *Muñoz et al.* 3645 (SGO); Bajando hacia el Embalse del Yeso, zona árida cerca de Campamento Minero, 20-I-1995, *Muñoz et al.* 3656 (SGO); Cajón del Yeso, Las Romazas, 2,100 m, 22-I-1995, *Muñoz et al.* 3668 (SGO); Lagunillas, Cajón del Volcán San José, 2,200 m, 19-II-1966, *Peña 10* (CONC); Lo Valdes, Cajón Morales, 2,200 m, 6-III-1953, *Ricardi 2435* (CONC); Entre Lo Valdes y la Yesera, 2,450 m, 11-II-1963, *Ricardi et al.* 864 (CONC); Aguas Negras, El Volcán, 2,300 m, II-1967, *Richter s.n.* (CONC 93937); Parque Nacional El Morado, 2,200–2,800 m, 14-II-1978, *Romero & Flores 24* (SGO); Parque Nacional El Morado, 33°49'S, 70°05'W, 2,150 m, 14-I-1991, *Teillier et al.* 2409 (SGO); Cajón del Maipo, Trayecto Campamento Cruz de Piedra hasta 2,100 m, 2,100–2,400 m, 19-II-1995, *Villagrán et al.* 8567 (SGO). **REG. GRAL O'HIGGINS. Prov. Colchagua.** Vegas del Flaco al E de la Quebrada de los Ríos, 1,800 m, 7-II-1974, *Mahu 9858* (LP); San Fernando, Termas del Flaco, lado sur, 1,700 m, 15-II-1983, *Montero 12486* (CONC); Termas del Flaco, 34°56'S, 70°25'W, 1,800 m, 3-II-1989, *Niemeyer & Fernández 8907* (CONC); *id.*, ribera norte del río Tinguiririca, II-1986, *Núñez & Labra s.n.* (SGO 105284); San Fernando, Vegas del Flaco, Cerro del Arroyo, 2,300 m, 9-II-1955, *Ricardi 3209* (CONC); junto al Río Tinguiririca y Río Azufre, 34°49'S, 70°34'W, 1,220 m, 9-III-1979, *Villagrán & Arroyo s.n.* (CONC 55922); Termas del Flaco, 19-II-1966, *Zöllner 833* (LP); *id.*, 2,500 m, 19-II-1966,

Zöllner 891 (CONC); near of the baths El Flaco, 2,500 m, 9-IV-1977, Zöllner 10168 (MO).

*Nardophyllum patagonicum* (Cabrera) G. L. Nesom, *Phytologia* 75(5): 358–365, 1993. *Paleaepappus patagonicus* Cabrera, *Bol. Soc. Argent. Bot.* 11(4): 273, 1969. TYPE: “Chubut, Río Chico, Aut. 1900, *Ameghino* [s.n.]” (holotype: LP!).

(FIGURES 37, 38, 62)

**Shrubs** 10–40 cm tall, irregular to globose, with thick and notably twisted stems; branches densely disposed and intricate, ascending, tapering towards the end, 8-ribbed (ribs occluded by dense tomentum), densely tomentose. **Leaves** arranged in macroblasts and brachyblasts, when in macroblasts more or less laxly arranged, internodes up to 5 mm long, persistent, alternate, ascending, (3.5–)8–13 × 1–2.5 mm, narrowly obovate, base slightly attenuated, petiole broadened towards the stem and constricted above apex, obtuse, margins notably revolute, tomentose on abaxial surface, glabrous to sparsely tomentose on adaxial surface, discolorous, coriaceous. **Capitula** solitary, terminal, sessile to shortly pedunculate, peduncles up to 10 mm long, homogamous, discoid. **Invulcres** 9–10 × 6–8 mm, cylindrical-campulate; phyllaries arranged in 3 to 4 series; outer phyllaries with foliaceous apices, 7–8 × 1.5–2 mm, narrowly ovate, mid-ridge clearly marked, apex acute-subulate, tomentose and gland-dotted on abaxial surface, coriaceous; inner phyllaries 9–10 × 2–2.5 mm, narrowly ovate, apex acute-subulate, laxly tomentose and gland-dotted towards the apex on abaxial surface, papery, margins membranaceous. **Receptacles** convex, paleate; paleae 9–10 × 2–2.5 mm, narrowly ovate and boat-shaped, embracing the achenes, apex acute-subulate, recurved, tomentose and gland-dotted on upper adaxial surface, margins membranaceous. **Florets** 25 to 40, bisexual; corollas yellow, tubular, 5-lobed, gradually broadened towards the apex, tube 5–6.5 mm long, lobes 1.5–2 × 0.8–1 mm, triangular, gland-dotted abaxially; anther thecae 1.8–2 mm long, bases slightly sagittate, apical appendages 1–1.2 × 0.3–0.4 mm, triangular-ovate, antheropodium present, swollen; style shafts 4.5–5 mm long, base swollen, style branches 3–5 mm long, narrowly obovate to oblong, apex acute, collecting hairs very short on upper 2/3 to 3/4. **Achenes** 3–7 mm long, narrowly obovate, terete, 8- to 10-ribbed, gland-dotted and densely villose, carpodium present. **Pappus** 4–7 mm long, 2-seriate, composed of 9 to 11 narrowly ovate scale 0.4–1.2 mm wide, scabrid along the margins.

**Vernacular names:** Not known.

**Phenology:** Flowering specimens have been collected from November to December.

**Distribution:** Argentina, endemic to central Chubut (Figure 38).

**Habitat:** *Nardophyllum patagonicum* occurs in the Patagonian biogeographic province (Cabrera and Willink, 1973), in an area of reduced annual rainfall, close to 200 mm (Conti, 1998). It grows in rocky areas with very scarce vegetation cover, and associated with *Chuquiraga* spp., *Nassauvia* spp., *Lycium* sp., *Fabiana patagonica* Speg., *Junellia* spp., *Nardophyllum chiliotrichioides* (J. Rémy) A. Gray, etc.

**Uses:** Not known.

**Etymology:** The specific epithet refers to the geographic area where the species occur.

**Note 1:** Nesom (1993b) proposed the inclusion of monotypic *Paleaepappus* in *Nardophyllum*. Later, Bonifacino and Sancho (2001) reinstated *Paleaepappus* as a distinct genus, an idea also shared by Nesom et al. (2003). Additional morphological evidence enriched with specific field observations, together with molecular evidence (Bonifacino and Funk, unpublished data) strongly suggest that, in spite of distinctive features, this taxon belongs to *Nardophyllum*. In the light of the phylogenetic tree generated via molecular data, it has been possible to reexamine certain characters and discover morphological traits that fit the new *Nardophyllum* circumscription here presented.

**Additional specimens examined:** ARGENTINA. PROV. CHUBUT. Dpto. Sarmiento. Bajo del Avestruz 45°15'29"S, 68°58'2"W, 15-I-2002, *Bonifacino et al.* 451 (LP); Ruta Prov. 24, al S de Paso de Los Indios, 346 m, 44°44'25.8"S, 69°11'50.4"W, 10-XII-2006, *Bonifacino et al.* 2967 (US); Ruta Prov 24, Lado W de Laguna Palacios, 44°44'26"S, 69°12'46"W, 27-XI-2002, *Bonifacino & Donato* 713 (LP); Ruta Prov. 24, Lado W de Laguna Palacios, 44°46'42"S, 69°15'23"W, 27-XI-2002, *Bonifacino & Donato* 716 (LP); Ruta Prov. 24, Cerros al W de Laguna Seca, 44°53'11"S, 69°13'26"W, 27-XI-2002, *Bonifacino & Donato* 717 (LP); Bajo del Avestruz, 45°15'29.2"S, 68°58'1.6"W, 28-XI-2002, *Bonifacino & Donato* 721 (LP); Ruta Prov. 24, 45°16'0.5"S, 69°01'50"W, 28-XI-2002, *Bonifacino & Donato* 727 (LP); Colinas arcillosas al W de Lag. Seca, 94 km al N de Sarmiento, 12-XII-1987, *León* 3846 (BAA). Dpto. Mártires. Ruta Prov. 53, ~Sierra Negra, 43°59'24"S, 67°35'32"W, 26-XI-2002, *Bonifacino & Donato* 691 (LP).

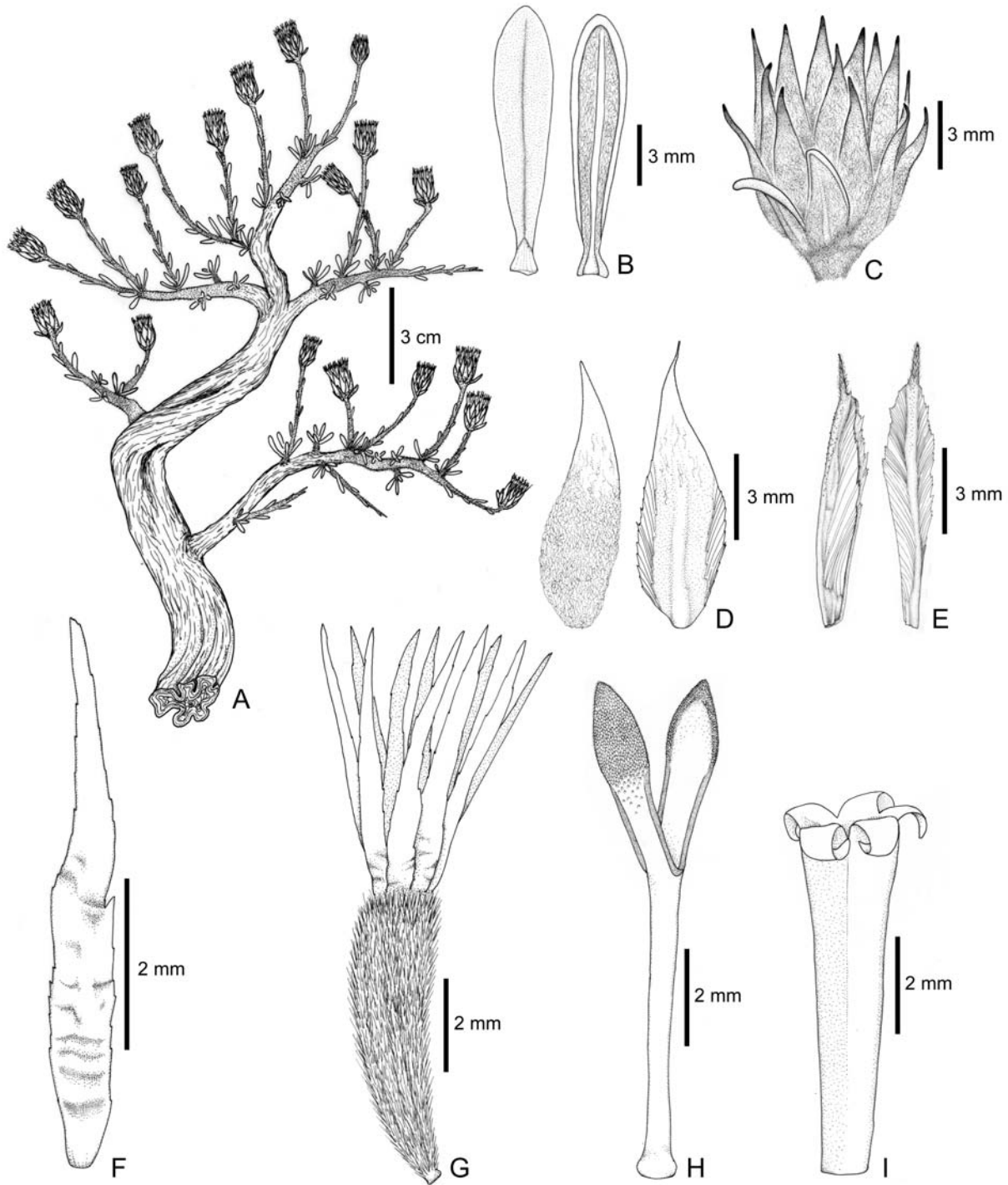


FIGURE 37. *Nardophyllum patagonicum* (Cabrera) G. L. Nesom. A. Habit. B. Leaves, adaxial view (left), abaxial view (right). C. Involucre. D. Outer to inner phyllaries (from left to right). E. Receptacular paleae, lateral view (left), dorsal view (right). F. Detail of pappus scale. G. Achene with pappus. H. Style. I. Corolla (A–I, Bonifacio & Donato 691, LP).

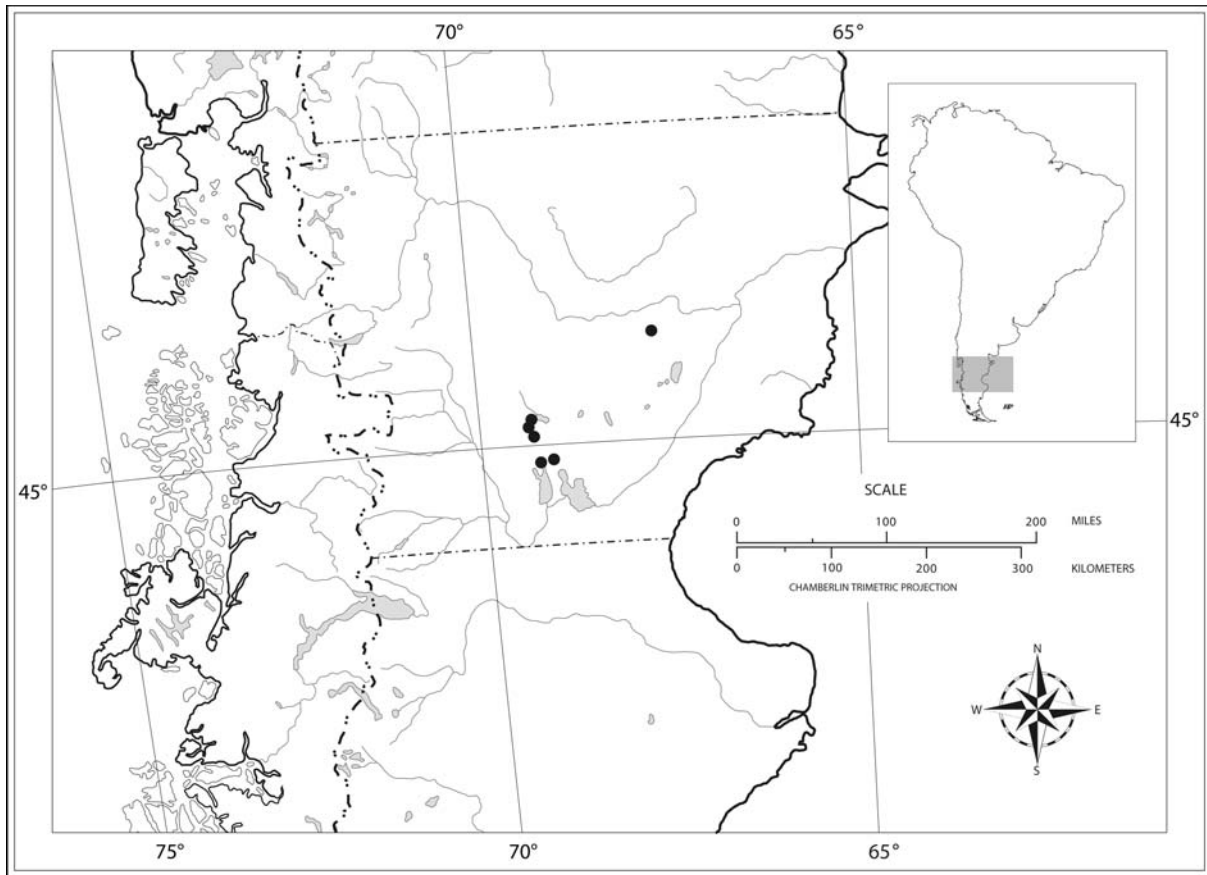


FIGURE 38. Geographic distribution of *Nardophyllum patagonicum* (Cabrera) G. L. Nesom.

### SPECIES EXCLUDED FROM CHILIOTRICHUM GROUP SENSU STRICTO

*Dolichogyne acaulis* Wedd. ex Benth. and Hook. f., Gen. Pl. 2(1): 258, 1873. *Lepidophyllum acaule* (Wedd. ex Benth. and Hook. f.) Benth. and Hook. f. ex Jackson, Index Kew. 2(3): 58, 1894. TYPE: “[Bolivia] Prov. Larecaja, Viciniis Sorata, via ad Lacatia ad frontes rivi Aparasiri, in graminosis, Alt. Reg. Alpina, 3,900 m, 8bre 1858-Mai 1859, *Mandon 211*”, lectotype: BM, isolectotype: K, P, US! (= *Novenia acaulis* (Wedd. ex Benth. and Hook. f.) S. E. Freire and F. Hellwig, Taxon, 39 (1): 125, 1990).

*Dolichogyne glabra* Phil., Anal. Mus. Nac. Chile, Sec. 2, Bot. 8: 39, 1891. TYPE: “[Chile] Loroahuasi, Jan 1885, F. Ph[ilippi s.n.]”, holotype: SGO! (= *Parastrephia lucida* (Meyen) Cabrera, Notas Mus. La Plata, Bot. 17(83): 57, 1954).

*Dolichogyne lepidophylla* Wedd., Chlor. And. I: 182, 1856. IND. LOC. TYPE: “Perou: departement de Tacna, sur le plateau de la Cordillere de Tacora, h. 4,000 a 5,000 metres, *Pentland, Wedd.* [s.n.]; de departement d’Arequipa, Meyen. Bolivie: Cordilleres du departement de La Paz, *Pentland, Wedd.* [s.n.]; punas entre Oruro et Potosi, *d’Orbigny* [s.n.]”, syntypes: P, scanned images of syntypes at P: LP! (= *Parastrephia quadrangularis* (Meyen) Cabrera, Notas Mus. La Plata, Bot. 17(83): 57, 1954).

*Dolichogyne rigida* Wedd., Chlor. And. I: 182–183, 1856. IND. LOC. TYPE: “Perou Austral. (Cordillera de Tacora), *Wedd.* [s.n.]”, holotype: P, scanned image of holotype at P: LP!, isotypes: US!, F!, P (= *Parastrephia lucida* (Meyen) Cabrera, Notas Mus. La Plata, Bot. 17(83): 57, 1954).

*Dolichogyne rupestris* Wedd., Chlor. And. I: 183, 1856. TYPE: “Bolivie, Potosi, *d’Orbigny 1382*”, holotype: P, scanned image of holotype at P: LP!, isotypes: F!, P

- (= *Parastrephia lucida* (Meyen) Cabrera, Notas Mus. La Plata, Bot. 17(83): 57, 1954).
- Lepidophyllum abietinum* (Phil.) Reiche, Anal. Univ. Chile 109: 26, 1901. *Polyclados abietinus* Phil., Anal. Univ. Chile 43: 492, 1873. TYPE: “[Chile] Salitreras de Antofagasta, 1872, W. Doell [s.n.]”, holotype: SGO! (= *Parastrephia lucida* (Meyen) Cabrera, Notas Mus. La Plata, Bot. 17(83): 57, 1954).
- Lepidophyllum cupressinum* (Phil.) Kuntze, Rev. Gen. Pl. 3(2): 162, 1898. *Polyclados cupressinus* Phil., Viage Atacama: 208, 1860. TYPE: “[Chile] Alto de Puquios, in deserto Atacamensi, Febrero 1854, Ph[ilippi] [s.n.]”, holotype: SGO!, isotype: SGO! (= *Parastrephia quadrangularis* (Meyen) Cabrera, Notas Mus. La Plata, Bot. 17(83): 57, 1954).
- Lepidophyllum lucidum* (Meyen) Cabrera, Bol. Soc. Argent. Bot 1(1): 51, 1945. *Baccharis lucida* Meyen, Reise um die Erde 1: 460, 1834. TYPE: “Peru, circa Tacora, 14,000–17,000, 31-IV-1833, Meyen”, holotype: B, destroyed; photo of the holotype at B: F! (= *Parastrephia lucida* (Meyen) Cabrera, Notas Mus. La Plata, Bot. 17(83): 57, 1954).
- Lepidophyllum meyenii* A. Gray **nom. illeg.**, Proceed. Amer. Acad. Arts and Sci. 5: 122, 1862. (= *Parastrephia quadrangularis* (Meyen) Cabrera, Notas Mus. La Plata, Bot. 17(83): 57, 1954).
- Lepidophyllum phylicaeforme* (Meyen) Hieron. ex R. E. Fr., Nov. Acta Reg. Soc. Scient. Upsaliensis, Ser. 4, 1 (1): 77, 1905. *Baccharis phylicaeformis* Meyen, Reise um die Erde 2: 31, 1835. TYPE: “Peru: Arequipa, 14,000–16,000, 31-IV-1833, Meyen”, holotype: B, destroyed; photos of the holotype at B: US!, F! (= *Parastrephia lucida* (Meyen) Cabrera, Notas Mus. La Plata, Bot. 17(83): 57, 1954).
- Lepidophyllum phylicaeforme* var. *resinosum* (Walp.) Blake, Washington Acad. Scien. Journ. 21(14): 326, 1931. *Vernonia phylicaeformis* var. *resinosa* Walp., Nov. Act. Acad. Caes. Leop. Carol., 19(suppl. 1): 253, 1843. IND. LOC. TYPE: “Peruvia: in planitie circa Tocoram, alt. 14–17,000 ped. [s. leg., s.n.]”, holotype: not seen, unknown location (= *Parastrephia lucida* (Meyen) Cabrera, Notas Mus. La Plata, Bot. 17(83): 57, 1954).
- Lepidophyllum quadrangulare* (Meyen) Benth. and Hook. f., Genera Plantarum 2(1): 258, 1873. *Baccharis quadrangularis* Meyen, Reise um die Erde 1: 460, 1834. IND. LOC. TYPE: “[Peru] Tacora”, holotype: B, destroyed; photos of the holotype at B: F!, US! (= *Parastrephia quadrangularis* (Meyen) Cabrera, Notas Mus. La Plata, Bot. 17(83): 57, 1954).
- Lepidophyllum rigidum* (Wedd.) Benth. and Hook. f., Genera Plantarum 2(1): 258, 1873. *Dolichogyne rigida* Wedd., Chlor. And. I: 182–183, 1856. TYPE: See entry under *Dolichogyne rigida* Wedd. (= *Parastrephia lucida* (Meyen) Cabrera, Notas Mus. La Plata, Bot. 17(83): 57, 1954).
- Lepidophyllum teretiusculum* Kuntze, Rev. Gen. Pl. 3(2): 162, 1898. TYPE: “[Chile] Conchi-Ascotan, 3,000–3,900, 7-III-1892, Otto Kuntze [s.n.]”, holotype: NY! (= *Parastrephia teretiuscula* (Kuntze) Cabrera, Notas Mus. La Plata, Bot. 17(83): 57, 1954).
- Lepidophyllum tola* Cabrera, Bol. Soc. Argent. Bot 1(1): 51, 1945. *Dolichogyne lepidophylla* Wedd., Chlor. And. I: 182, 1856. TYPE: See entry under *Dolichogyne lepidophylla* Wedd. (= *Parastrephia quadrangularis* (Meyen) Cabrera, Notas Mus. La Plata, Bot. 17(83): 57, 1954).
- Nardophyllum armatum* (Wedd.) Reiche, Anales Univ. Chile, 109: 29, 1901. *Dolichogyne armata* Wedd., Chlor. And. I: 181, 1856. TYPE: “Dolichogyne armata Wedd. Chloris, frutex graveolens 1–2 metres flor. lut. Potosi (Bolivie) M. Weddell # 4084”, lectotype: P, designated by Bonifacino, 2008; scanned image of lectotype: LP; isolectotype: P, F! (= “*Ocyroe armata*” (Wedd.) Bonif., Brittonia 60(3): 207, 2008; = *Ocyroe spinosa* Phil., Anales Mus. Nac. Chile, Bot. 8: 33, tab. I, fig. 5, 1891).
- Nardophyllum paniculatum* Phil., Anal. Univ. Chil. 87: 435, 1894. TYPE: “[Chile] Mansel, April 1892, Julius Philippi [s.n.]”, holotype: SGO!, isotype: SGO! (= *Baccharis philippii* Heering, Jahrb. Hamb. Wiss. Anst. 1913, 21 Beih. 80, 1914).
- Nardophyllum scoparium* Phil., Anal. Univ. Chil. 87: 434, 1894. *Hinterhubera scoparia* (Phil.) Cabrera, Notas Mus. La Plata 17: 65, 1954. TYPE: “[Chile] in parte superiore vallis de Huanta dicti provinciae Coquimbo, F. Philippi s.n.”, holotype: SGO!, isotype: LP! (= *Guynesomia scoparia* (Phil.) Bonif. and Sancho, Taxon 53(3): 677, 2004).

## FIGURES 39–62

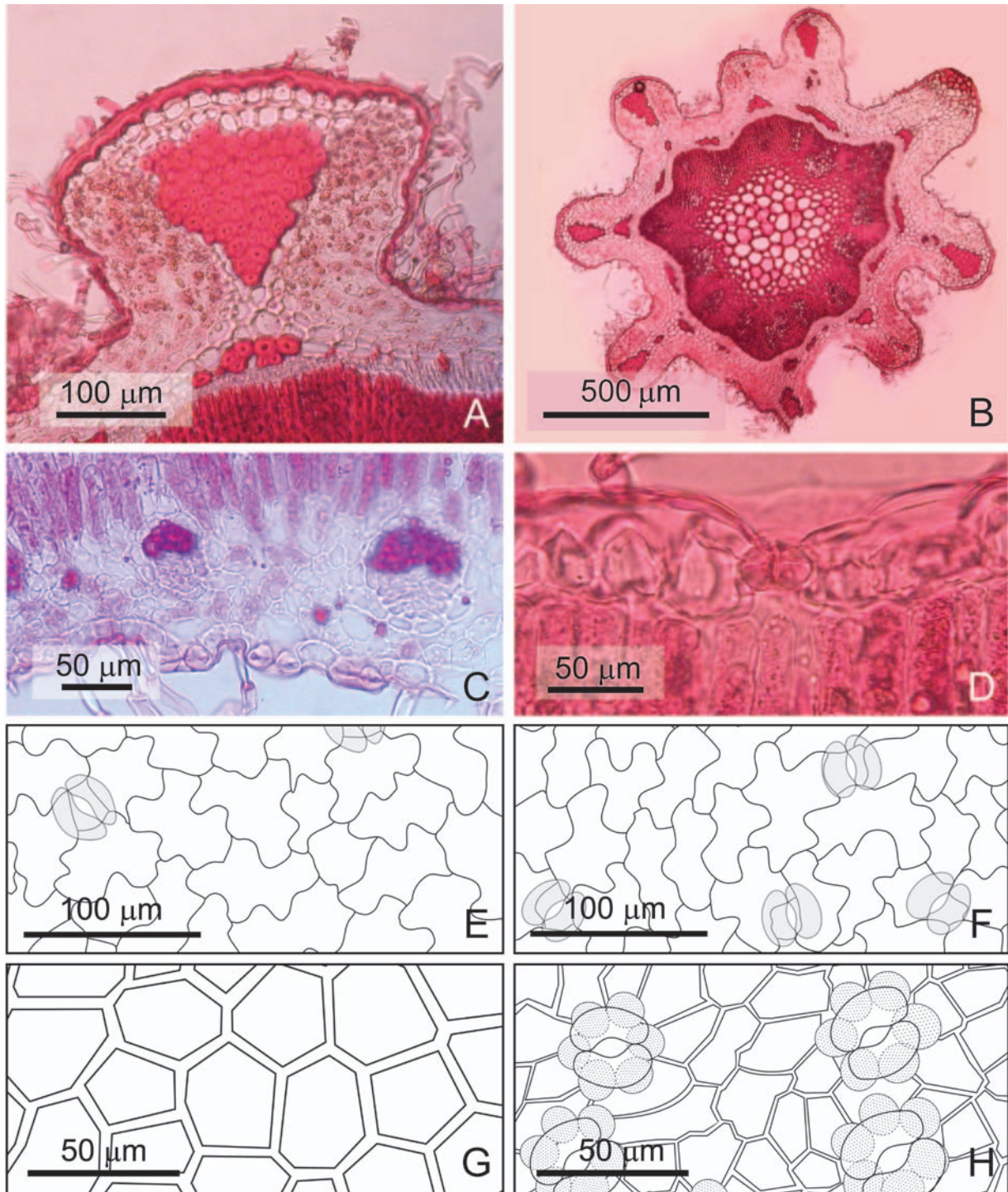


FIGURE 39. Stem and leaf anatomy of the *Chilotrichum* Group sensu stricto representative taxa. A. Close-up of a stem cross section of *Nardophyllum chilotrichioides*, note the abundant schlerenchyma along the ribs. B. Stem cross section of *Nardophyllum chilotrichioides*. C. Leaf cross section showing an elevated stoma on abaxial epidermis, in *Nardophyllum bryoides*. D. Leaf cross section showing a sunken stoma on adaxial epidermis, in *Katinasia cabreranae*. E. Adaxial epidermis of *Haroldia mendocina*. F. Abaxial epidermis of *Haroldia mendocina*. G. Adaxial epidermis of *Chilotrichum diffusum*. H. Abaxial epidermis of *Chilotrichum diffusum* (A, B, Simón & Bonifacino 782, LP; C, D, Bonifacino et al. 563, LP; E, Bonifacino & Donato 699, LP; F, Bonifacino & Romano 825, LP; G, H, Bonifacino & Donato 791, LP).

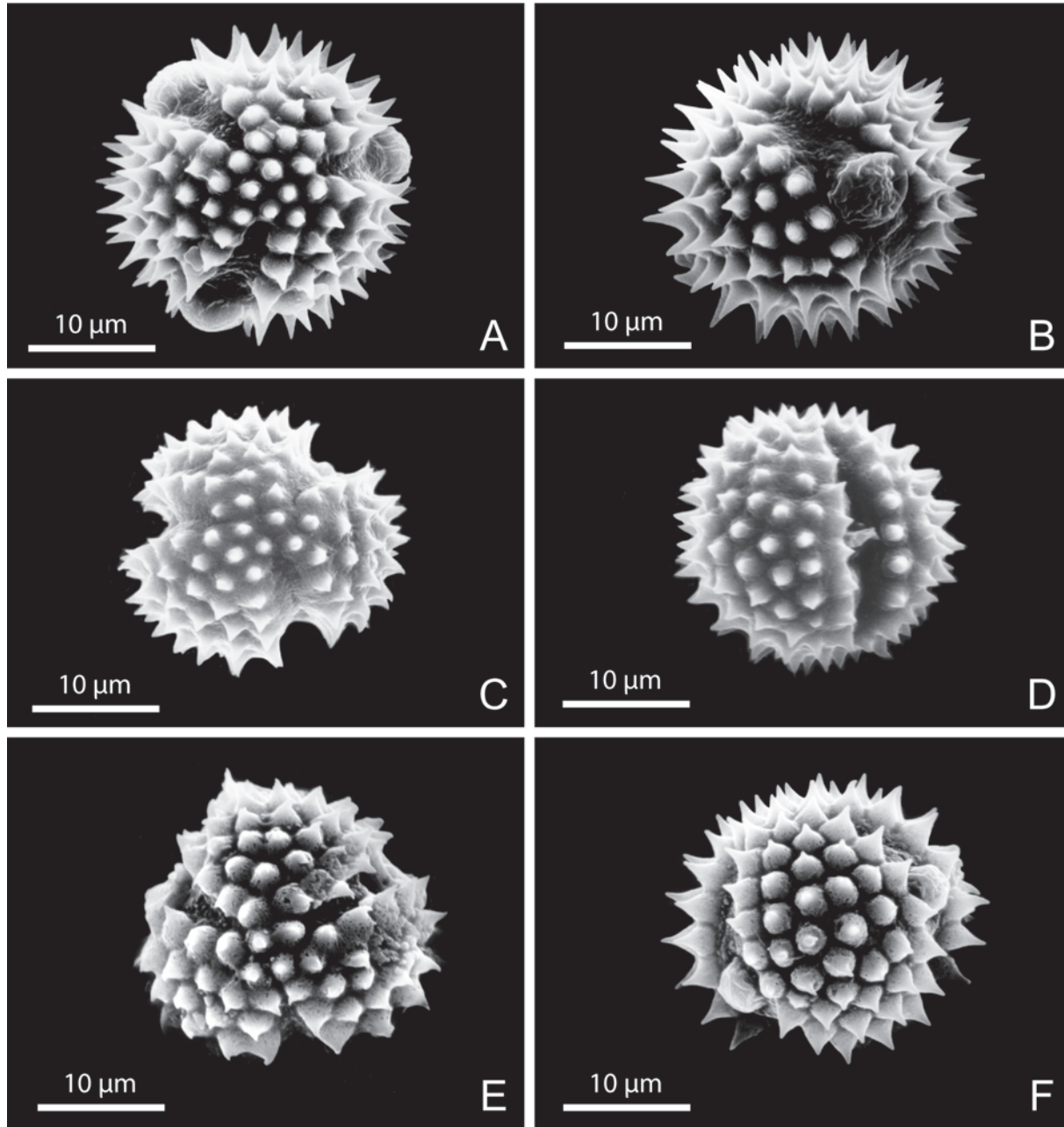


FIGURE 40. Pollen of the *Chilotrichum* Group sensu stricto. A. *Chilotrichum diffusum*, polar view. B. *Chilotrichum diffusum*, equatorial view. C. *Lepidophyllum cupressiforme*, polar view. D. *Lepidophyllum cupressiforme*, equatorial view. E. *Chiliophyllum densifolium*, polar view. F. *Chiliophyllum densifolium*, equatorial view (A, B, Bonifacino et al. 563, LP; C, D, Bonifacino et al. 77, LP; E, F, Gentili 324, LP).



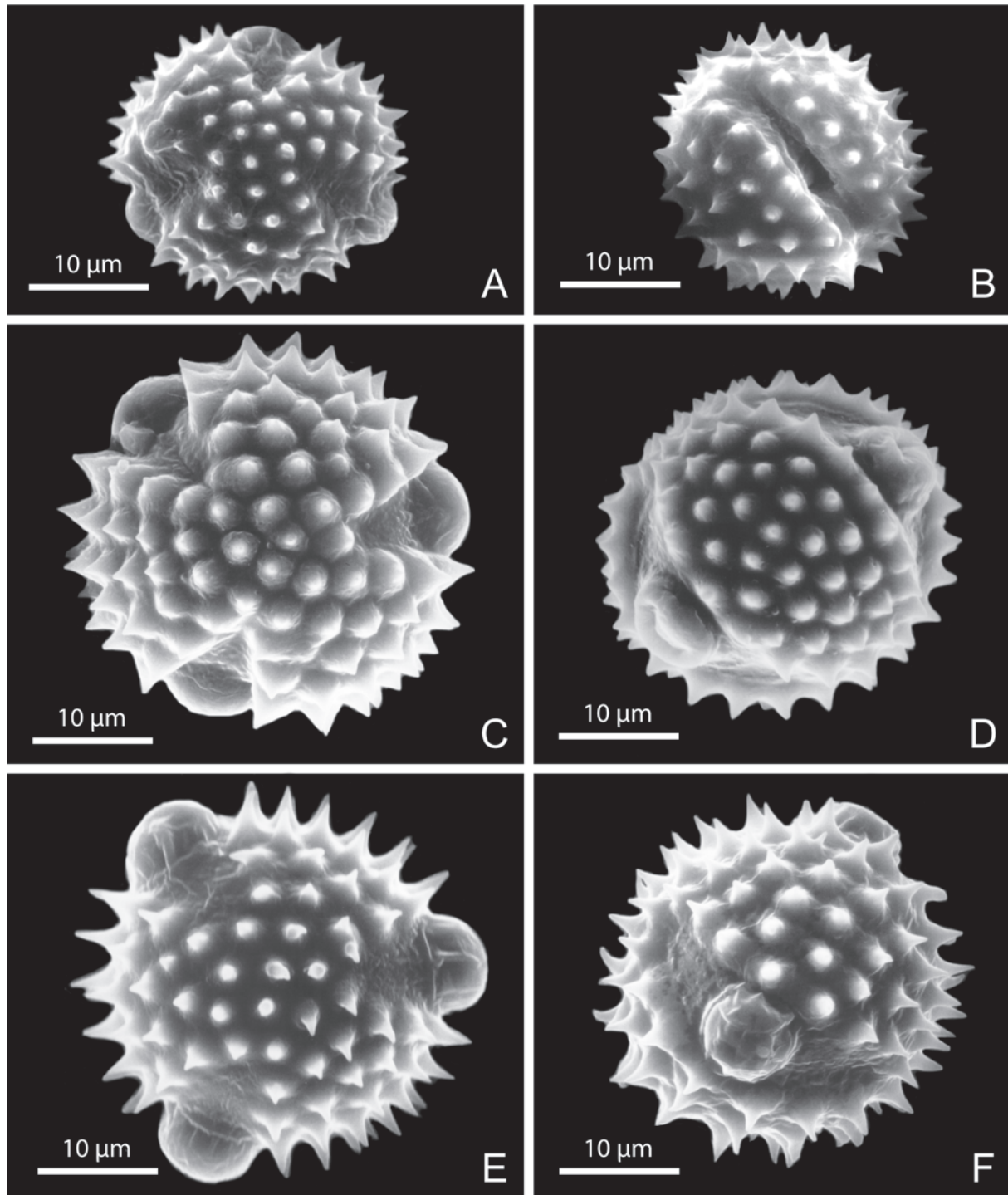


FIGURE 41. Pollen of the *Chilotrichum* Group sensu stricto (cont.). A. *Nardophyllum patagonicum*, polar view. B. *Nardophyllum patagonicum*, equatorial view. C. *Nardophyllum bryoides*, polar view. D. *Nardophyllum bryoides*, equatorial view. E. *Chilotrichiopsis peruviana*, polar view. F. *Chilotrichiopsis peruviana*, equatorial view (A, B, Leon 3846, BAA; C, D, Bonifacino et al. 464, LP; E, F, Flores et al. 2109, LP).

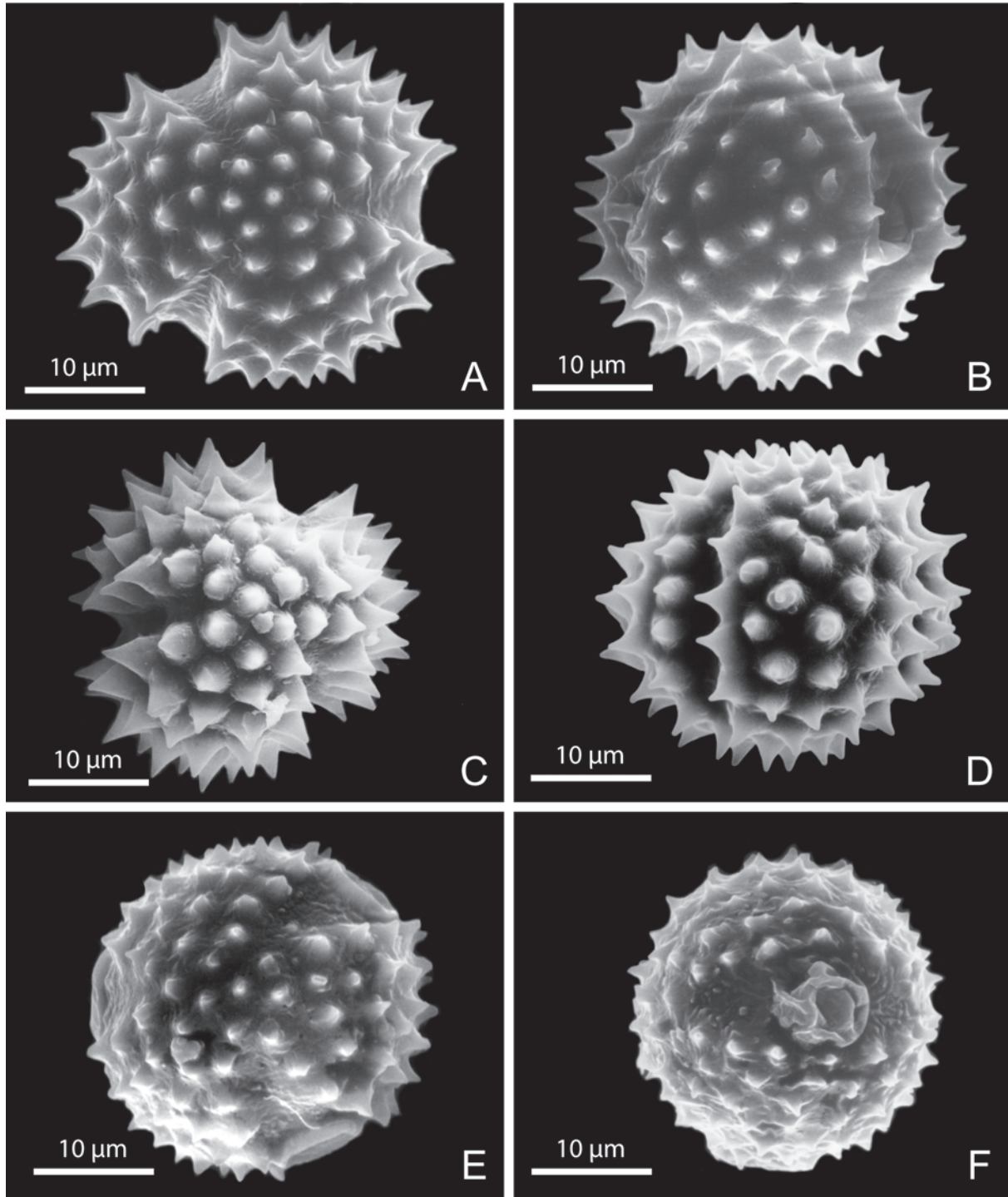


FIGURE 42. Pollen of the *Chilotrichum* Group sensu stricto (cont.). A. *Chilotrichiopsis keidelii*, polar view. B. *Chilotrichiopsis keidelii*, equatorial view. C. *Aylacophora deserticola*, polar view. D. *Aylacophora deserticola*, equatorial view. E. *Cabreraea andina*, polar view. F. *Cabreraea andina*, equatorial view (A, B, Simón & Bonifacino 520, LP; C, D, Bonifacino et al. 335, LP; E, F, Biurrun & Molina 4574, CORD).

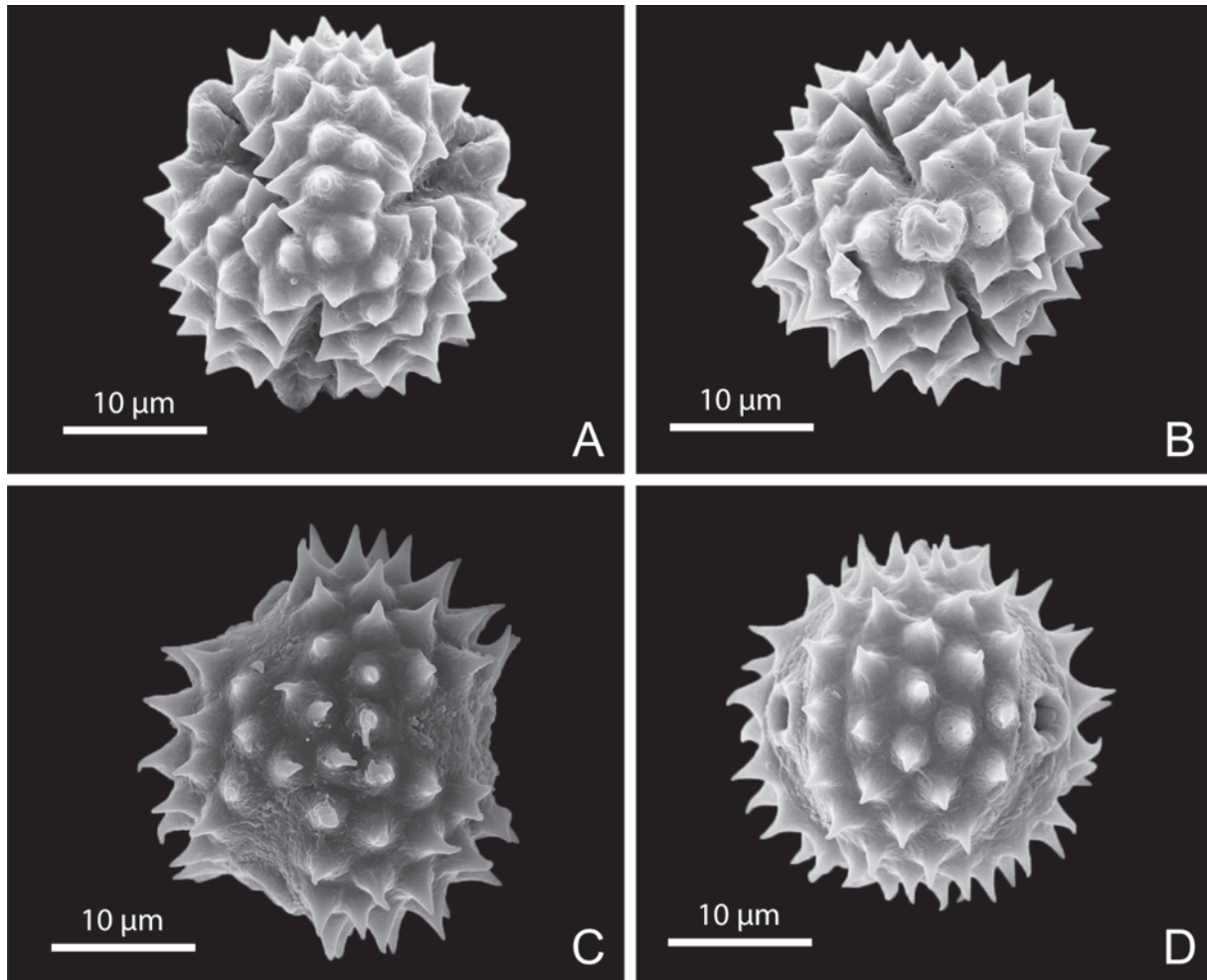


FIGURE 43. Pollen of the *Chilitrichum* Group sensu stricto (cont.). A. *Katinasia cabrerae*, polar view. B. *Katinasia cabrerae*, equatorial view. C. *Haroldia mendocina*, polar view. D. *Haroldia mendocina*, equatorial view (A, B, Simón & Bonifacino 847, US; C, D, Simón & Bonifacino 775, US).

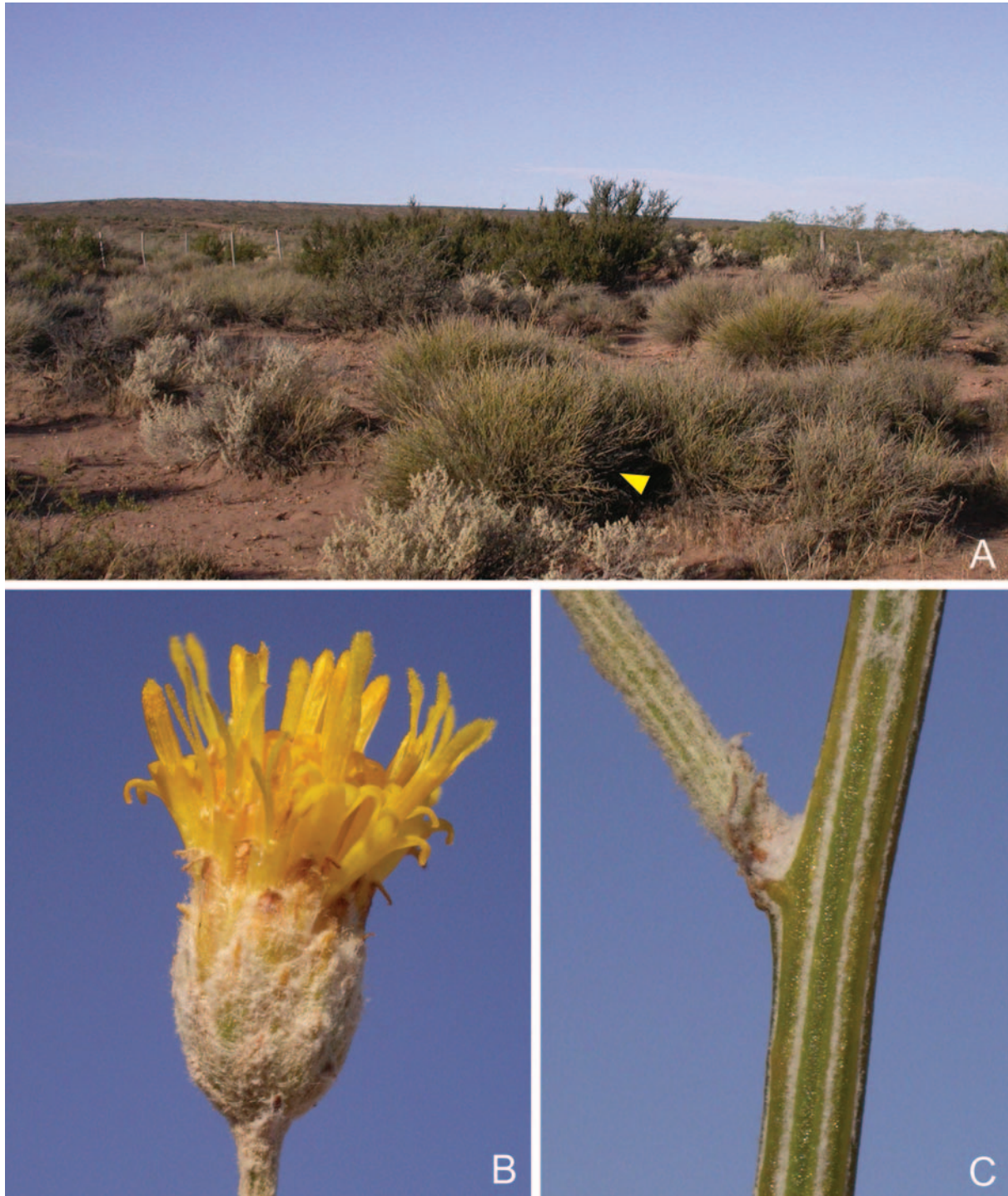
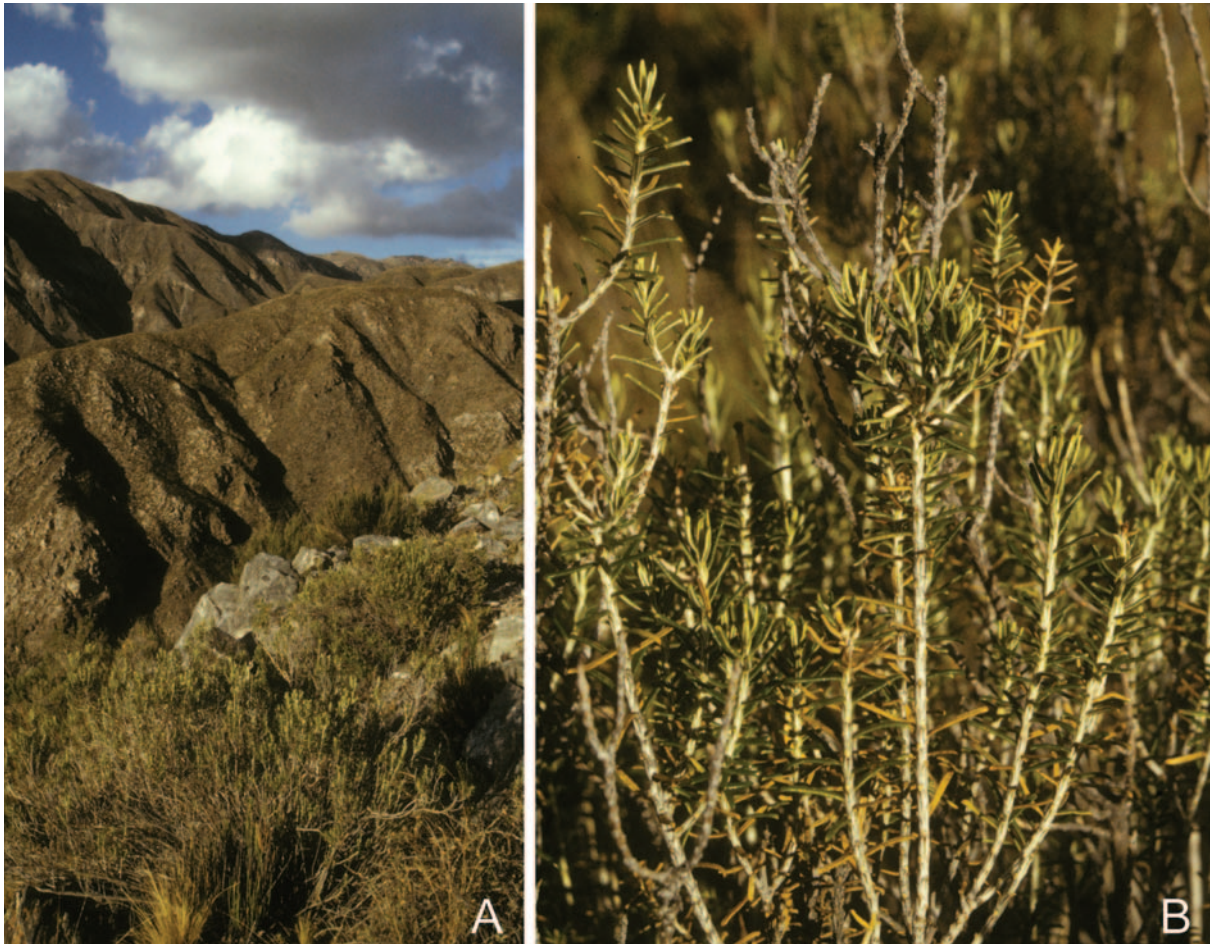


FIGURE 44. *Aylacophora deserticola* Cabrera. A. Habit and habitat, N of Cutral-Co, Neuquén, Argentina; arrow points to one of several individuals of *Aylacophora deserticola*. B. Close-up of capitulum. C. Close-up of stem, notice wide ribs and narrow furrows.



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FIGURE 45. *Cabreraea andina* (Cabrera) Bonif. A. Habit and habitat (Mogote de los Corralitos, San Juan, Argentina). B. Close-up of branches.

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FIGURE 46. *Chiliophyllum densifolium* Phil. A. Branching; notice shiny gland-dotted leaves, and cylindrical shape of involucre. B. Habit and habitat (Portillo de Tunuyán, Mendoza, Argentina). C. Close-up of capitula.



FIGURE 47. *Chilotrichiopsis keidelii* Cabrera. A. Close-up of a capitulum. B. Lateral view of involucre. C. Habitat and habit, S of Say, Jujuy, Argentina). D. Close-up of branches.

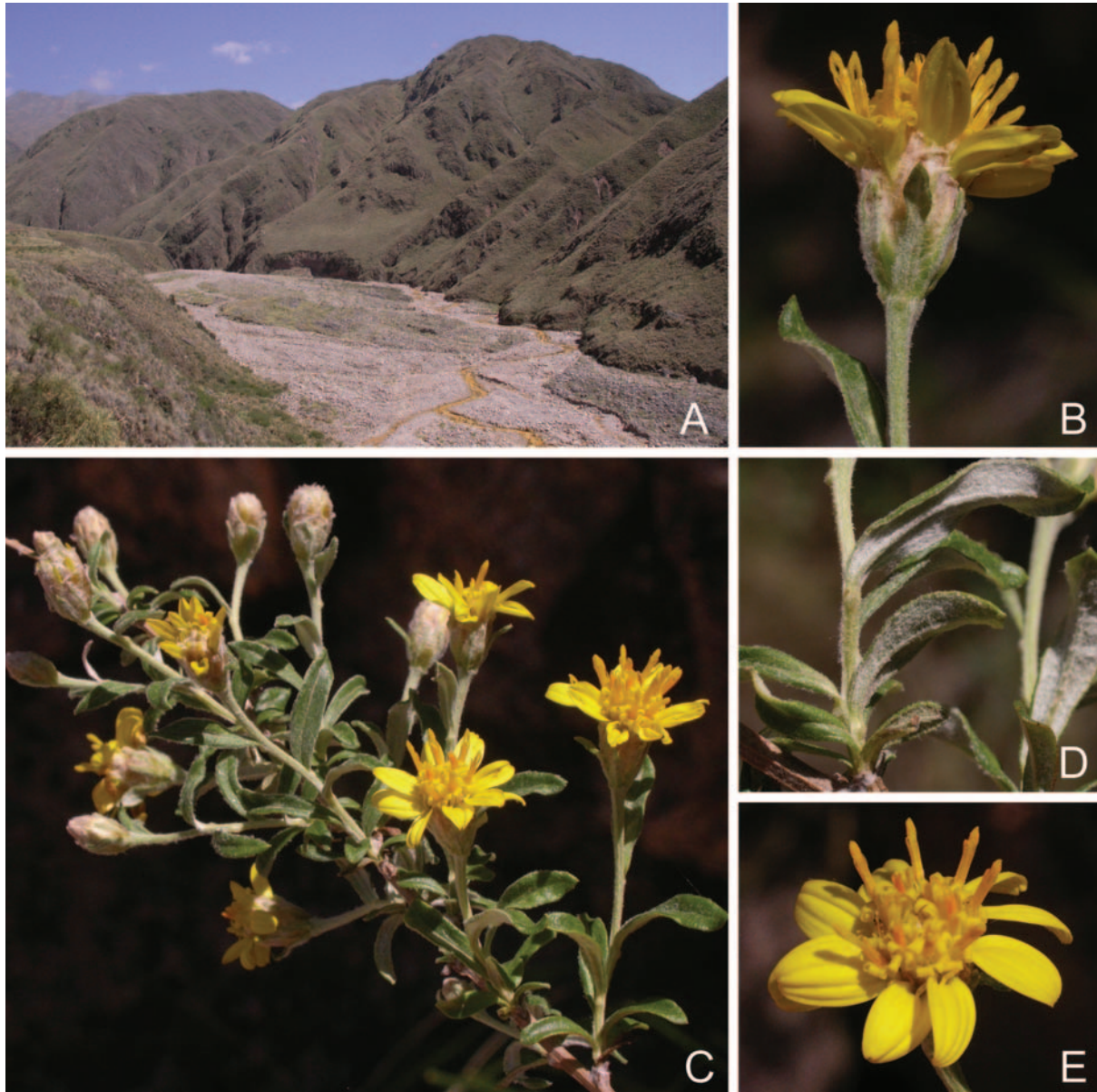


FIGURE 48. *Chilotrichiopsis ledifolia* (Griseb.) Cabrera. A. Habitat (road to Mina El Oro, near Chilecito, La Rioja, Argentina). B. Lateral view of involucre. C. Close-up of branches. D. Close-up of leaves. E. Detail of the capitulum.





FIGURE 49. *Chilotrichiopsis peruwiana* G. L. Nesom, H. Rob. and A. Granda. Image of Holotype at US.



FIGURE 50. *Chilotrichum diffusum* (G. Forst.) Kuntze. A. Habit. B. Close-up of involucre. C. Close-up of capitulum. D. Close-up of leaves.

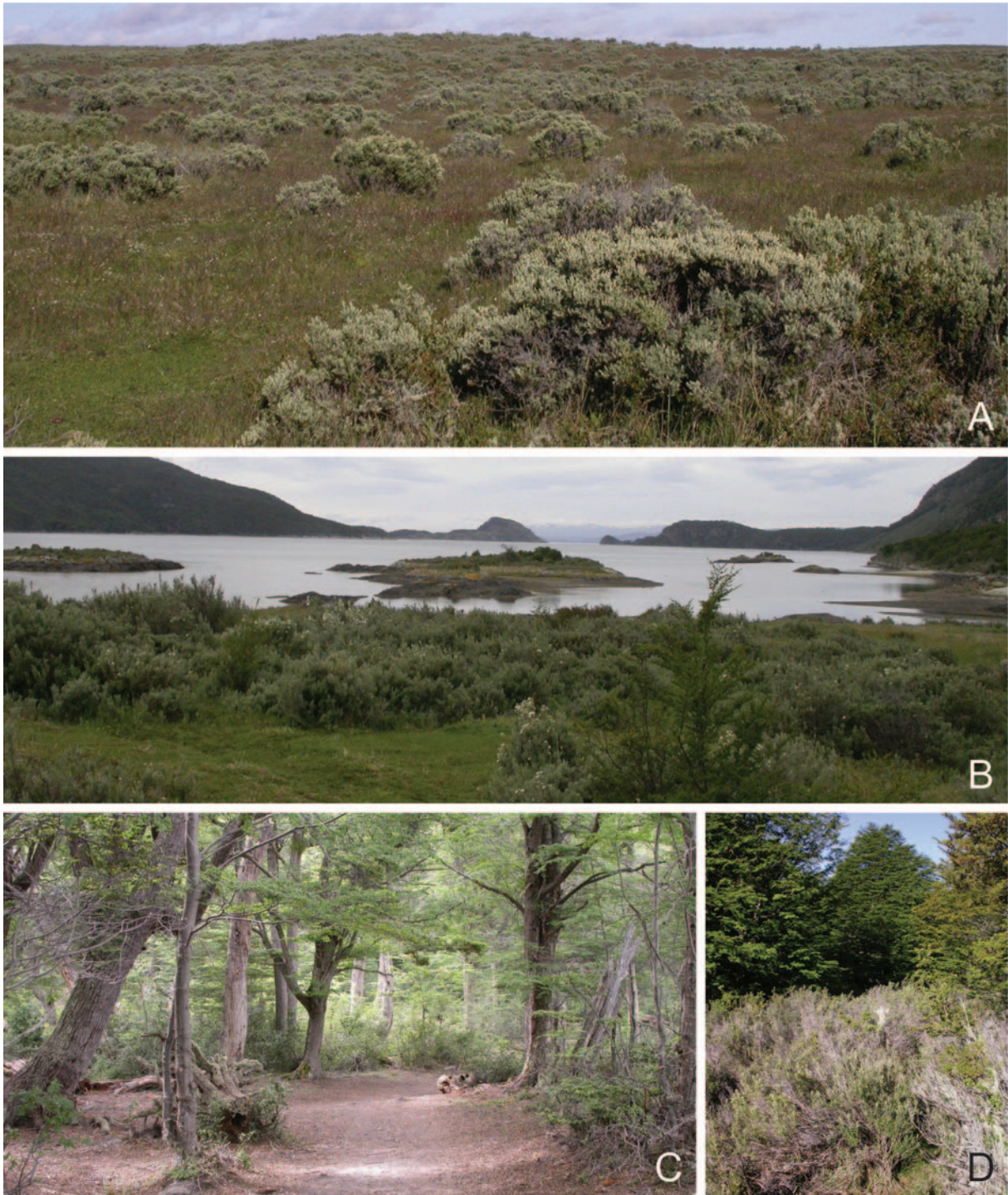


FIGURE 51. *Chilotrichum diffusum* (G. Forst.) Kuntze (cont.). A. Habitat in N Fuegia, close to Bahía San Sebastián, Argentina; notice dense consociation and almost exclusive presence on the shrub stratum. B. Habitat in S Fuegia amid *Nothofagus* forest clearings. C. *Chilotrichum diffusum* can also be found as part of the understory of *Nothofagus* forest such as the one shown here. D. Dense consociations of *Chilotrichum diffusum* in forest clearings in SW Chubut, Argentina.



FIGURE 52. *Chilotrichum fuegianum* (O. Hoffm.) Bonif. A. Close-up of capitula. B. Detail of leaves. C. Habit and Habitat (Bahía San Sebastián, Tierra del Fuego, Argentina). D. Close-up of branches.

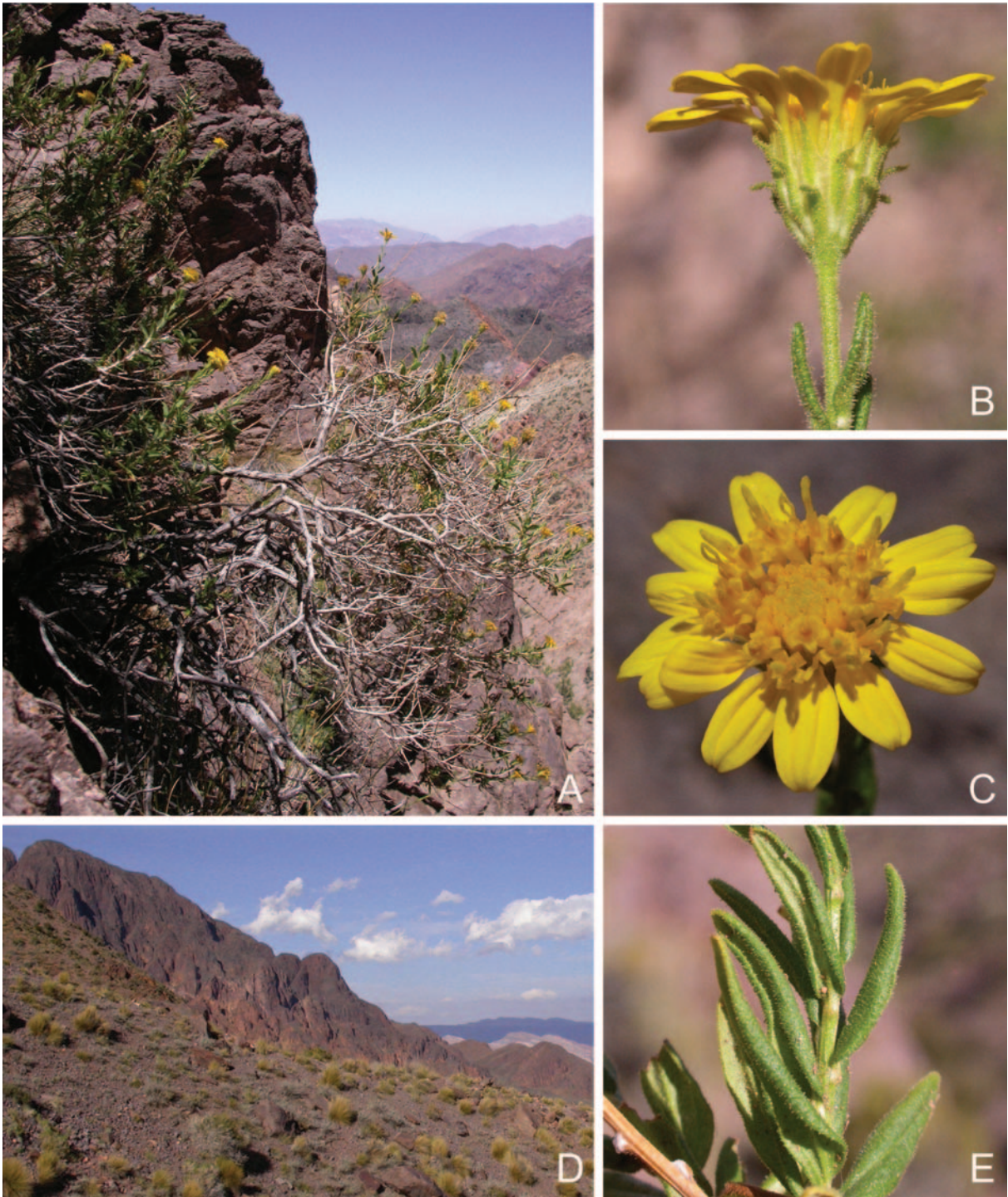
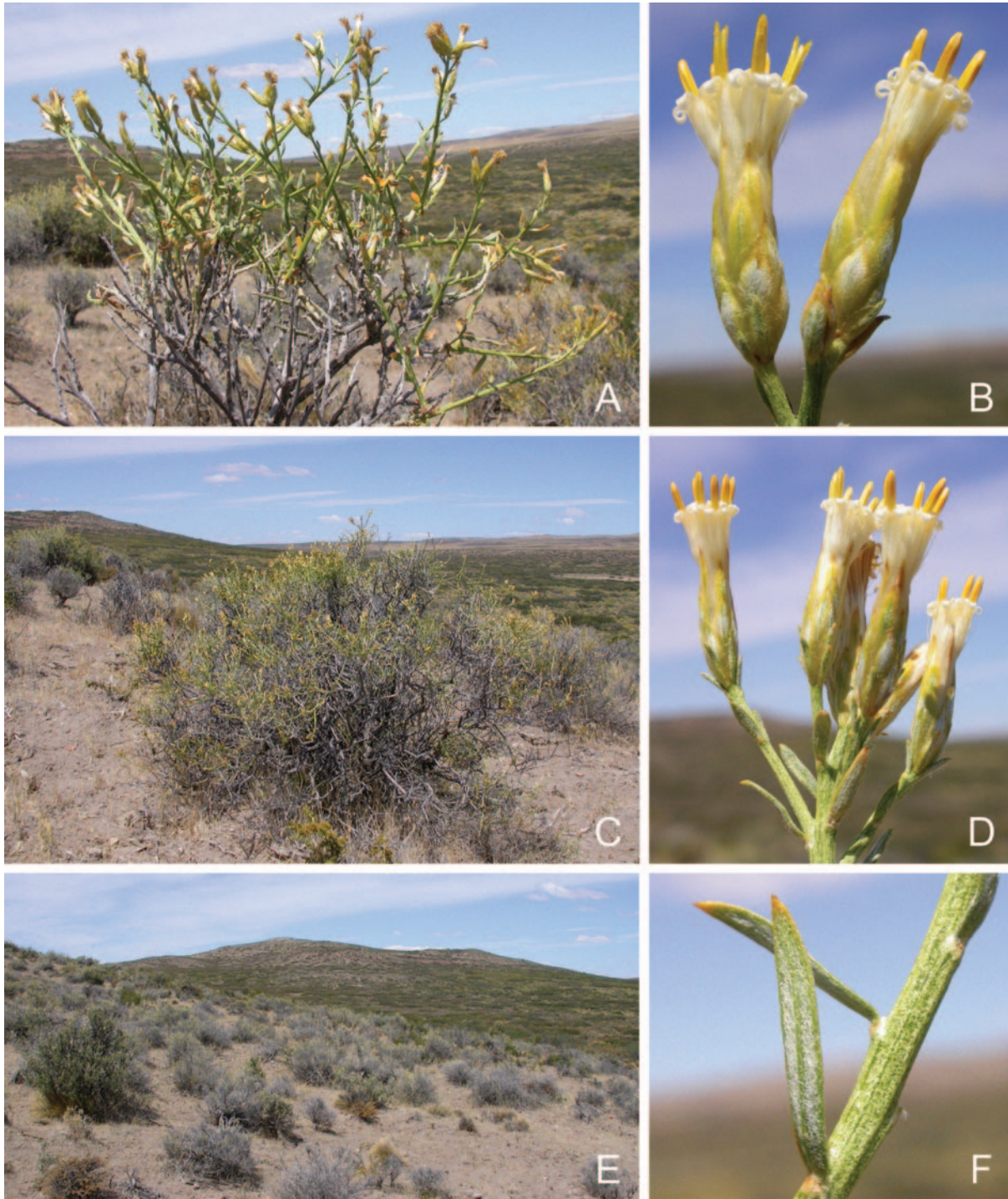


FIGURE 53. *Haroldia mendocina* (Cabrera) Bonif. A. Habit. B. Lateral view of capitulum. C. Upper view of capitulum. D. Habitat (Cordillera del Tigre, Mendoza, Argentina). E. Close-up of the leaves.



**FIGURE 54.** *Katinasia cabreriae* (Bonif.) Bonif. **A.** Close-up of branches. **B.** Lateral view of capitula; notice distinctive cylindrical shape of involucre and white corollas. **C.** Habit; notice intricate branching pattern. **D.** Cluster of capitula. **E.** Habitat at type locality (Arroyo China Muerta, Neuquén, Argentina), here *Katinasia* is among the dominant species in the shrub stratum. **F.** Close-up of the leaves; notice entire (non-revolute) margin of leaves and the slightly noticeable ribs along the stem.

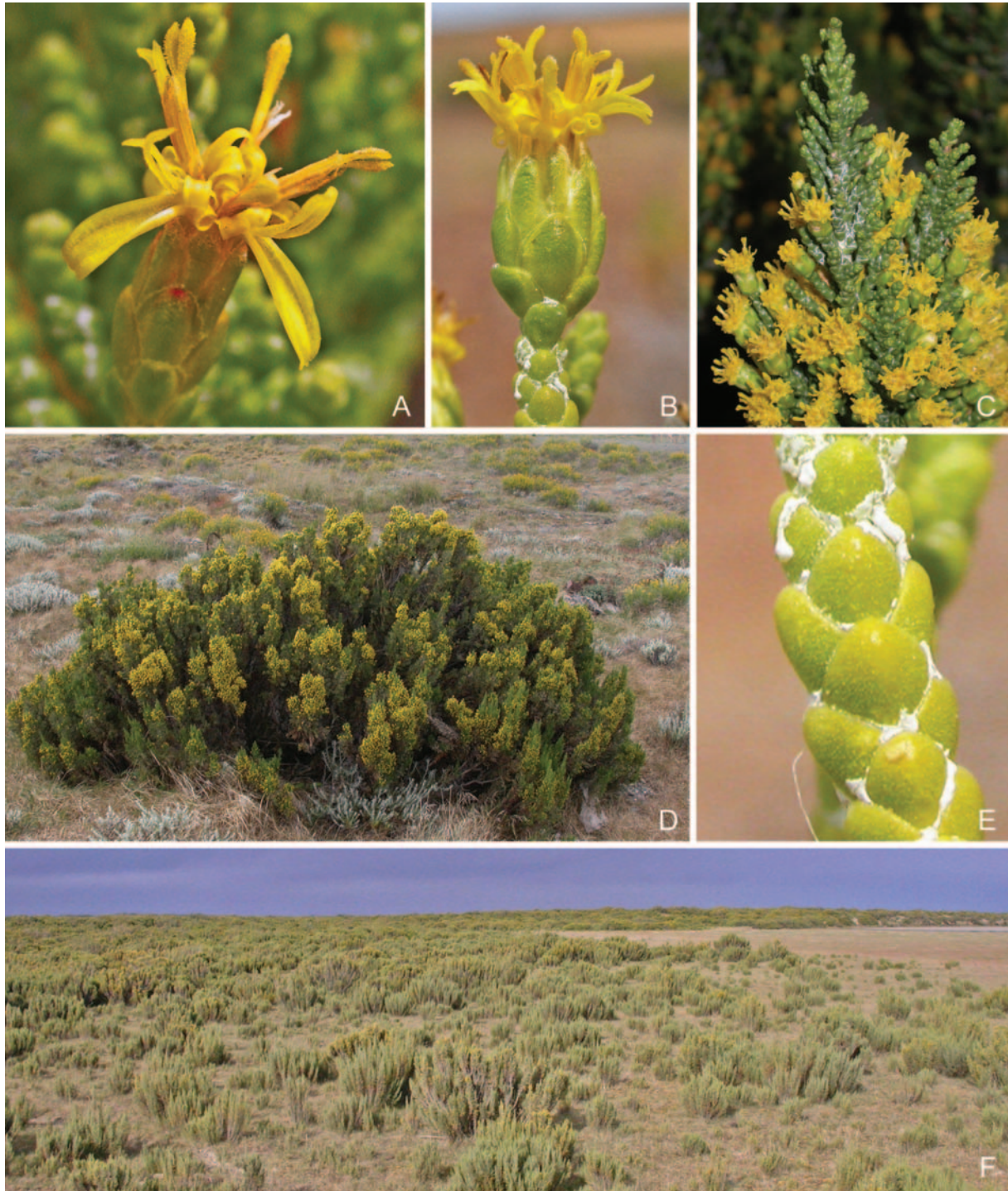


FIGURE 55. *Lepidophyllum cupressiforme* (Lam.) Cass. A. Close-up of the capitulum. B. Lateral view of capitulum. C. Close-up of branches; notice dense branching pattern. D. Habit. E. Close-up of a branch; notice opposite phyllotaxy. F. Habitat in N Fuegia (W of Bahía Inútil, Chile); notice absolute dominance of *Lepidophyllum cupressiforme* in the shrub stratum, a common situation in saline flat and low areas of N Fuegia.



FIGURE 56. *Nardophyllum bryoides* (Lam.) Cabrera. A. Close-up of capitula in lateral view. B. Close-up of branching pattern. C. Close-up of leaves. D. Close-up of leaves; notice white tomentose pubescence causing a more whitish appearance on leaves. E. Habit of dwarf individual appressed to the ground. F. Close-up of dwarf individual showing very dense branching pattern (SE Santa Cruz, close to Río Gallegos, Argentina).



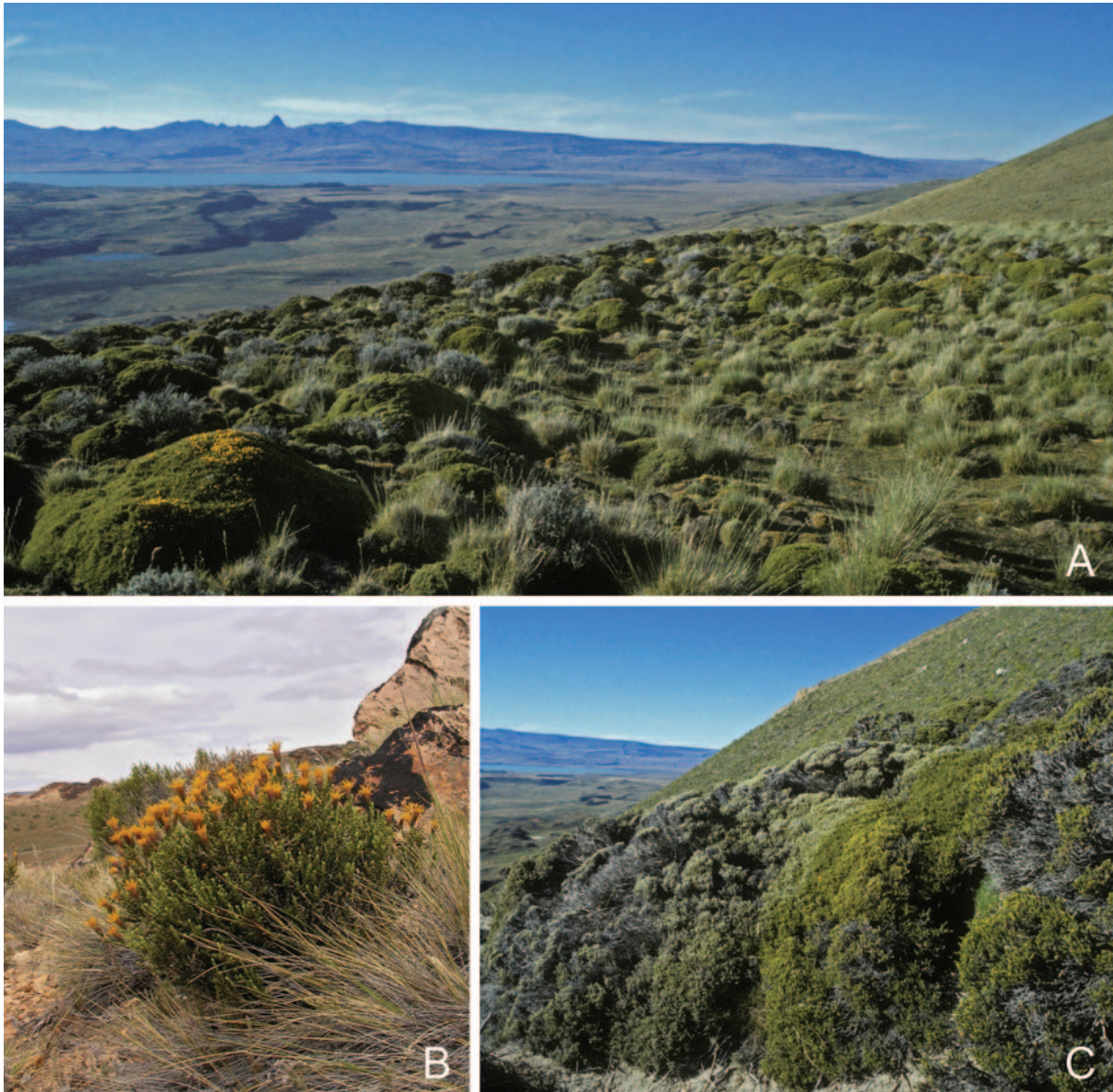


FIGURE 57. *Nardophyllum bryoides* (Lam.) Cabrera (cont.). A. Habit in W Santa Cruz, close to Lake San Martín (Argentina); notice compact shape of the shrubs and dominance in the vegetation. B. Towards the north end of the distribution, individual plants tend to show a more lax branching pattern, as shown here in central Chubut (Argentina). C. Some individual plants can attain a notable size, amassing an important amount of soil between their branches; also notice the different pubescence shown on the leaves of these two contiguous individuals.



FIGURE 58. *Nardophyllum chilotrichioides* (J. Rémy) A. Gray. A. Close-up of the capitulum, from a population in Chubut, 300 m elevation (Argentina). B. Close-up of the capitulum from a population in Mendoza, 2,800 m elevation (Argentina). C. Close-up of the capitulum from a population near Santiago, 2,400 m elevation (Chile). D. Close-up of branches in an individual from central Chubut (Argentina). E. Close-up of stem and leaf; notice revolute margin on leaf and ribs along the stem.

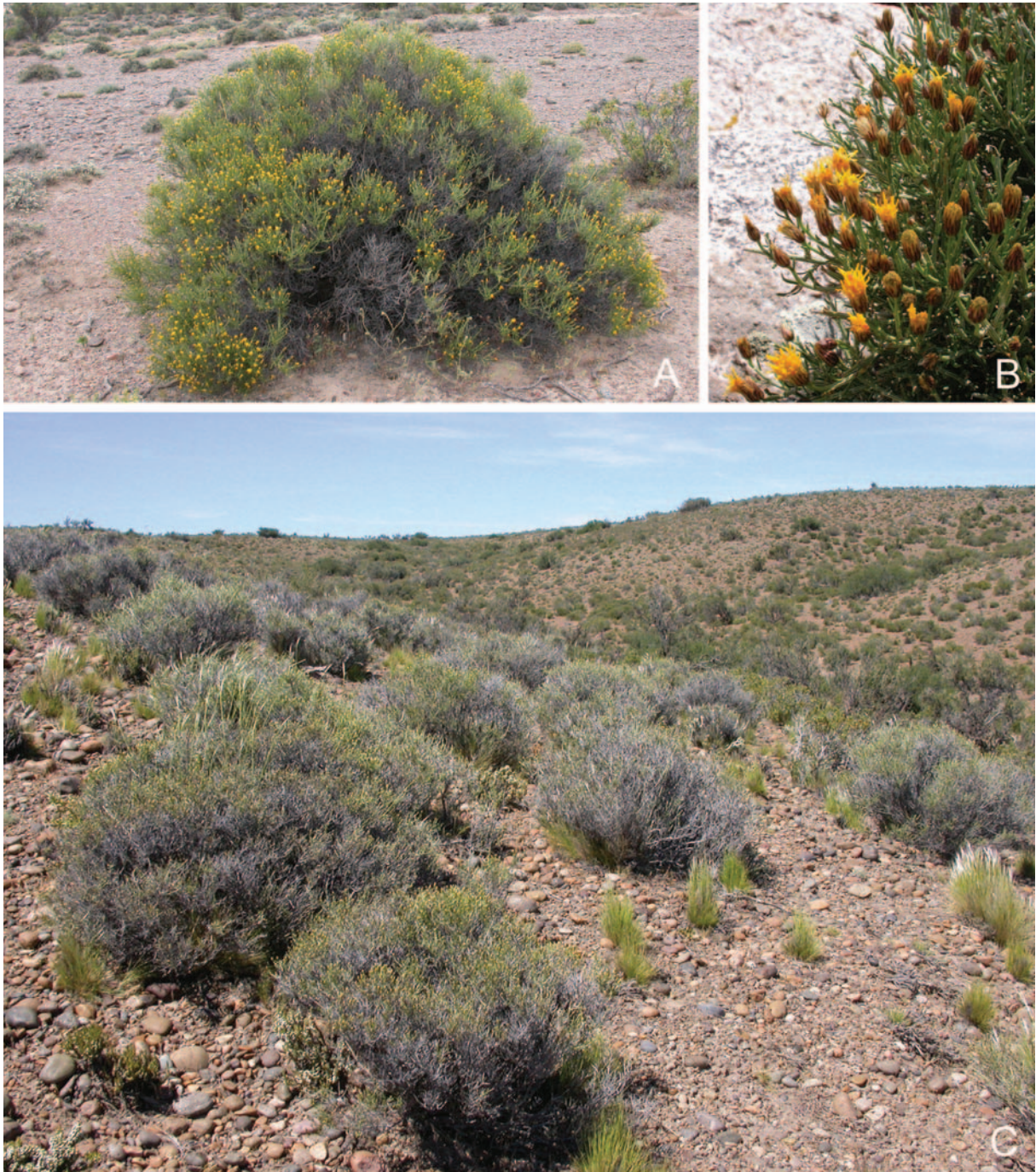


FIGURE 59. *Nardophyllum chilotrichioides* (J. Rémy) A. Gray (cont.). A. Habit in central Chubut (Argentina). B. Habit in Mendoza (Argentina), notice the more dense branching and compact shape. C. Habitat in central Chubut (Argentina).



FIGURE 60. *Nardophyllum genistoides* (Phil.) A. Gray. A. Image of holotype at SGO. B. Detail of holotype label. C. Image of Isotype at BM.

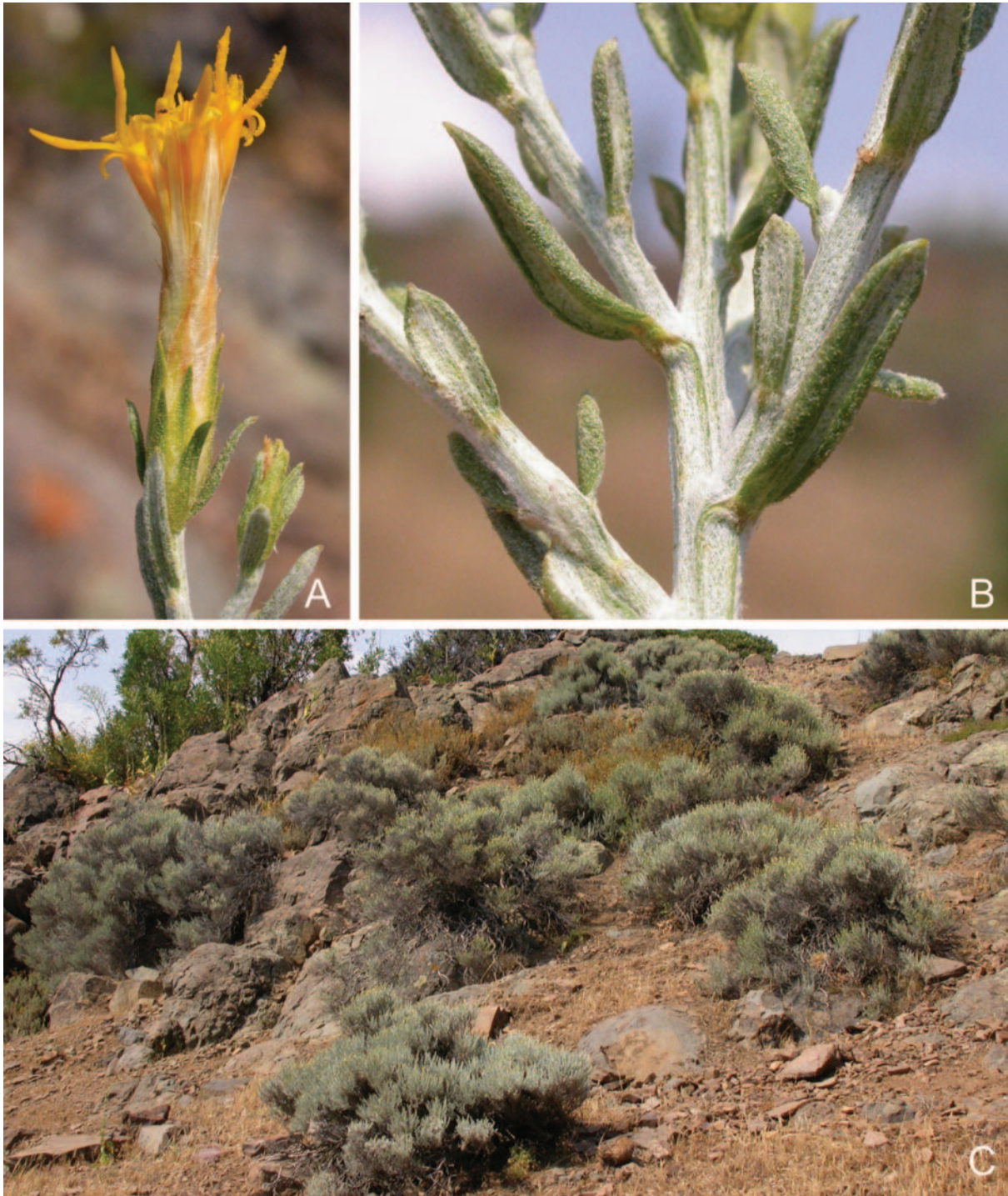


FIGURE 61. *Nardophyllum lanatum* (Meyen) Cabrera. A. Close-up of a capitulum; notice the distinctive cylindrical shape of the involucre. B. Close-up of a branch and leaves; notice dense whitish tomentose pubescence all over the stem and leaves, and the notably revolute margin, also notice the rather minute ribs, notably contrasting with the ribs exhibited by *Nardophyllum chilotrichioides*, also growing on the same area of the central Andes in Chile. C. Habit and habitat (Farellones, Región Metropolitana, Chile), notice the compact shape and dense branching pattern.



FIGURE 62. *Nardophyllum patagonicum* (Cabrera) G. L. Nesom. A. Habit; notice dwarf habit and intricate branching pattern. B. Close-up of branches; notice dense tomentose pubescence covering the stems and also the leaves arranged in brachyblasts. C. Close-up of a capitulum. D. Habitat in central Chubut, near Laguna Palacios (Argentina).

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