



## A revision of the genus *Menonvillea* (Cremolobeae, Brassicaceae)

DIEGO L. SALARIATO<sup>1, 3</sup>, FERNANDO O. ZULOAGA<sup>1</sup> & IHSAN A. AL-SHEHBAZ<sup>2</sup>

<sup>1</sup> Instituto de Botánica Darwinion, Labardén 200, Casilla de Correo 22, B1642HYD, San Isidro, Buenos Aires, Argentina

<sup>2</sup> Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166-0299, U.S.A.

<sup>3</sup> Author for correspondence: Diego L. Salarato, [dsalarato@darwin.edu.ar](mailto:dsalarato@darwin.edu.ar)

### Abstract

Following the most recent phylogenetic analyses of *Menonvillea*, an updated taxonomic revision of the genus based on molecular and morphological data is presented here. *Menonvillea* currently includes 24 species distributed in Argentina and Chile. Three new sections, sects. *Cuneata*, *Menonvillea*, and *Scapigera*, are proposed. One subspecies is raised to the specific rank, and the new combination *M. marticorenae* is proposed. Descriptions, keys to all taxa, updated geographical distributions, maps, and illustrations are provided. Lectotypes for *M. filifolia*, *M. minima*, *M. purpurea*, and *M. flexuosa* f. *tomentosa* are designated.

### Resumen

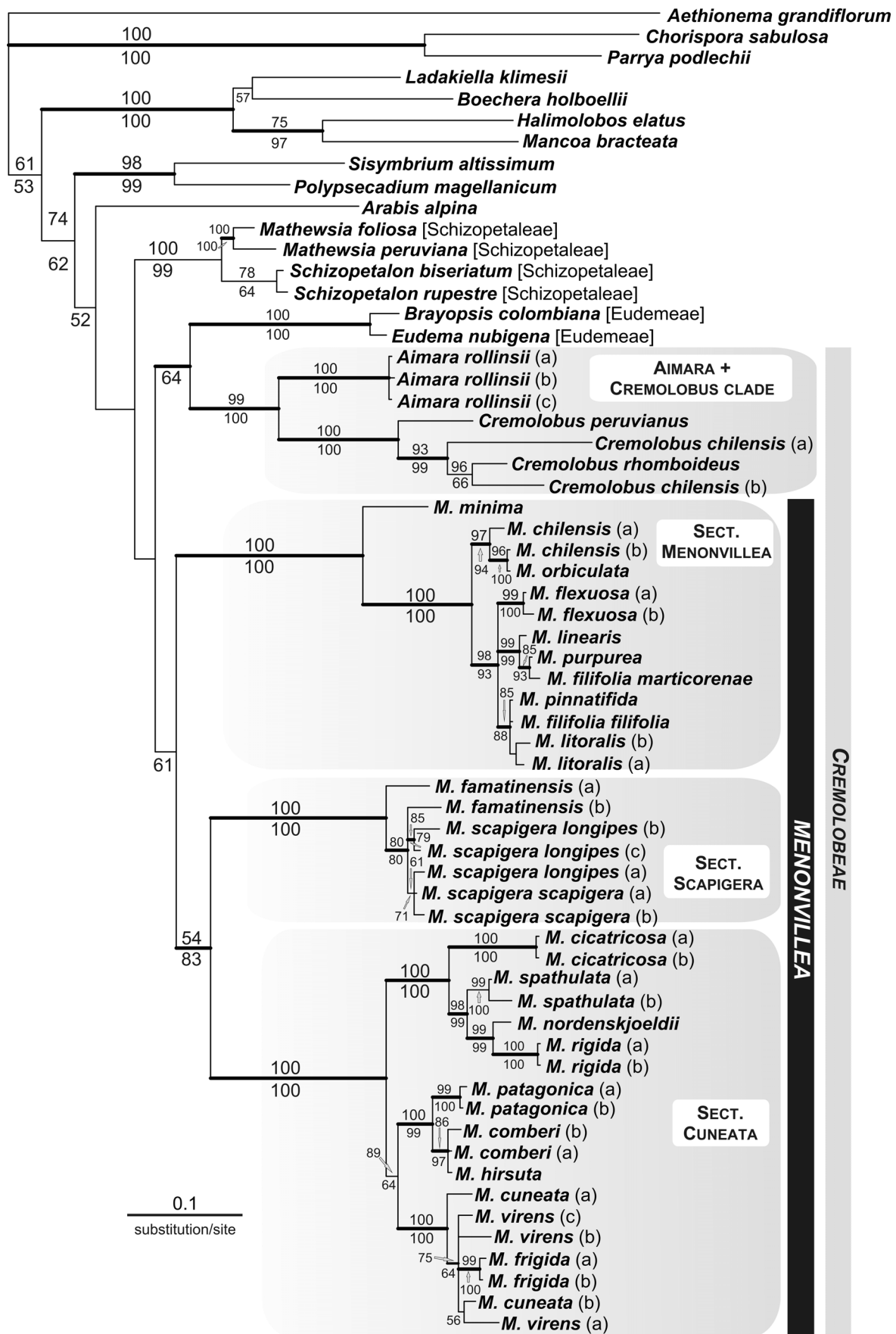
Sobre la base de los últimos estudios filogenéticos de *Menonvillea*, se presenta una revisión taxonómica basada en datos moleculares y morfológicos. Como resultado, *Menonvillea* incluye actualmente 24 especies distribuidas en Argentina y Chile. Tres nuevas secciones dentro del género son propuestas: Sect. *Cuneata*, Sect. *Menonvillea*, y Sect. *Scapigera*. Una subespecie es elevada al rango específico, y la nueva combinación *M. marticorenae* es aquí propuesta. Sinónimos, descripciones y claves para todos los taxones son provistos. La distribución actualizada de los taxones con sus mapas correspondientes son presentados, y varias especies son ilustradas. Adicionalmente lectotipos para *M. filifolia*, *M. minima*, *M. purpurea*, y *M. flexuosa* f. *tomentosa* también son designados.

**Key words:** Andes, Argentina, Chile, Cruciferae, taxonomy

### Introduction

*Menonvillea* de Candolle (1821a: 236) is a genus of Brassicaceae (Cruciferae) distributed mainly along the Andes of Argentina and Chile, with some taxa growing in southern Patagonia (Santa Cruz Province in Argentina southward into Región Magallanes y Antártica in Chile) and others restricted to the Antofagasta desert in northern Chile (Al-Shehbaz, 2008, 2010; Al-Shehbaz & Marticorena, 1990).

Several taxa of *Menonvillea* were originally described in the genera *Hexaptera* Hooker (1830: 350), *Dispeltophorus* Lehmann (1832: 7), *Decaptera* Turczaninow (1846: 497), and *Cymatoptera* Turczaninow (1854: 309). Hooker (1830) included in *Hexaptera* taxa with 3-winged fruit valves (two lateral wings and one dorsal) and assigned to *Menonvillea* species with 2-winged valves (only two lateral wings). By contrast, Turczaninow (1846) included in *Decaptera* taxa with 5-winged fruit valves. Both *Cymatoptera* and *Dispeltophorus* have 2-winged valves and therefore do not differ from *Menonvillea* sensu Hooker (1830). Rollins (1955) monographed *Menonvillea* to include 29 species, placed the above-mentioned four genera in its synonymy, and indicated that the fruit wing number is variable and unreliable to delimit genera. He characterized *Menonvillea* by having schizocarpic silicles that break at maturity into two, 1-seeded, indehiscent, 2-, 3-, or 5-winged (or rarely wingless) mericarps. Al-Shehbaz (2008) accepted 23 species in the genus and later (Al-Shehbaz, 2010) described *M. zuloagaensis* Al-Shehbaz.



**FIGURE 1.** Maximum clade credibility tree from Salariato *et al.* (2013) obtained the combined dataset ITS + *trnL-F*. Values above and below branches correspond to parsimony jackknife/maximum likelihood bootstrap values, respectively. Thick branches indicate > 0.95 Bayesian posterior probability.

Schulz (1936) placed *Menonvillea* and *Cremolobus* de Candolle (1821a: 235) in the South American tribe Cremolobeae. R. Brown (1826: 65) distinguished them from the rest of Brassicaceae by having schizocarpic, angustiseptate, often longitudinally winged fruits that split at maturity into two, indehiscent, 1-seeded mericarps. *Menonvillea* differs from *Cremolobus* (7 spp.; Khanna & Rollins, 1965) by its 2-, 3-, or 5-winged or rarely wingless (vs. 1-winged) mericarps, absence (vs. presence) of fruit septum, and dorsiventrally (vs. laterally) flattened mericarps.

*Menonvillea* is highly diversified morphologically, particularly in duration (annual or perennial herbs), leaves (size, margin, shape, indumentum), flowers (size, color, nectar glands, indumentum of petal and filament bases), and fruits (size, wing number, callosities). Furthermore, the ecological range of the genus is remarkably wide, with species growing from high Andean elevations (to 5300 m), to the dry coastal deserts of Atacama in Chile, or the high rainfall regions of southwestern Argentina and Chile.

Phylogenetics studies in *Menonvillea* had been scarce and partial. In a family-wide ITS phylogeny, Warwick & al. (2010) included one species each of *Menonvillea* and *Cremolobus* and showed that their tribe Cremolobeae was monophyletic, weakly supported, and fell in a clade with the tribes Eudemeae and Schizopetaleae.

Recently, Salariato *et al.* (2013) studied the phylogenetic relationships of *Menonvillea* based on nuclear and chloroplast sequences combined with a wide sampling of the genus (Fig. 1). They showed that *M. rollinsii* Al-Shehbaz & Marticorena (1990: 135) fell outside the genus and formed a strongly supported clade with species of *Cremolobus*. On the basis of molecular and morphological characters, Salariato *et al.* (2013) placed this species in the new genus *Aimara* Salariato & Al-Shehbaz (2013: 1230). They also demonstrated that the remaining species of *Menonvillea* formed a monophyletic group consisting of three strongly-supported main lineages each of which is well-defined morphologically. Those phylogenies demonstrated that the number of fruit wings is variable and unreliable as a diagnostic character at the generic level, thus agreeing with Rollins (1955) in reducing *Hexaptera* and *Decaptera* to synonymy of *Menonvillea*. Finally, Salariato *et al.* (2013) also showed that *Menonvillea* was included in a clade with the remaining members of tribe Cremolobeae (*Aimara* and *Cremolobus*) and genera of Eudemeae and Schizopetaleae.

The objective of this study is to generate an updated revision of *Menonvillea*, discussing the phylogenetic relationships, morphology and geographical distribution of all species.

## Materials and Methods

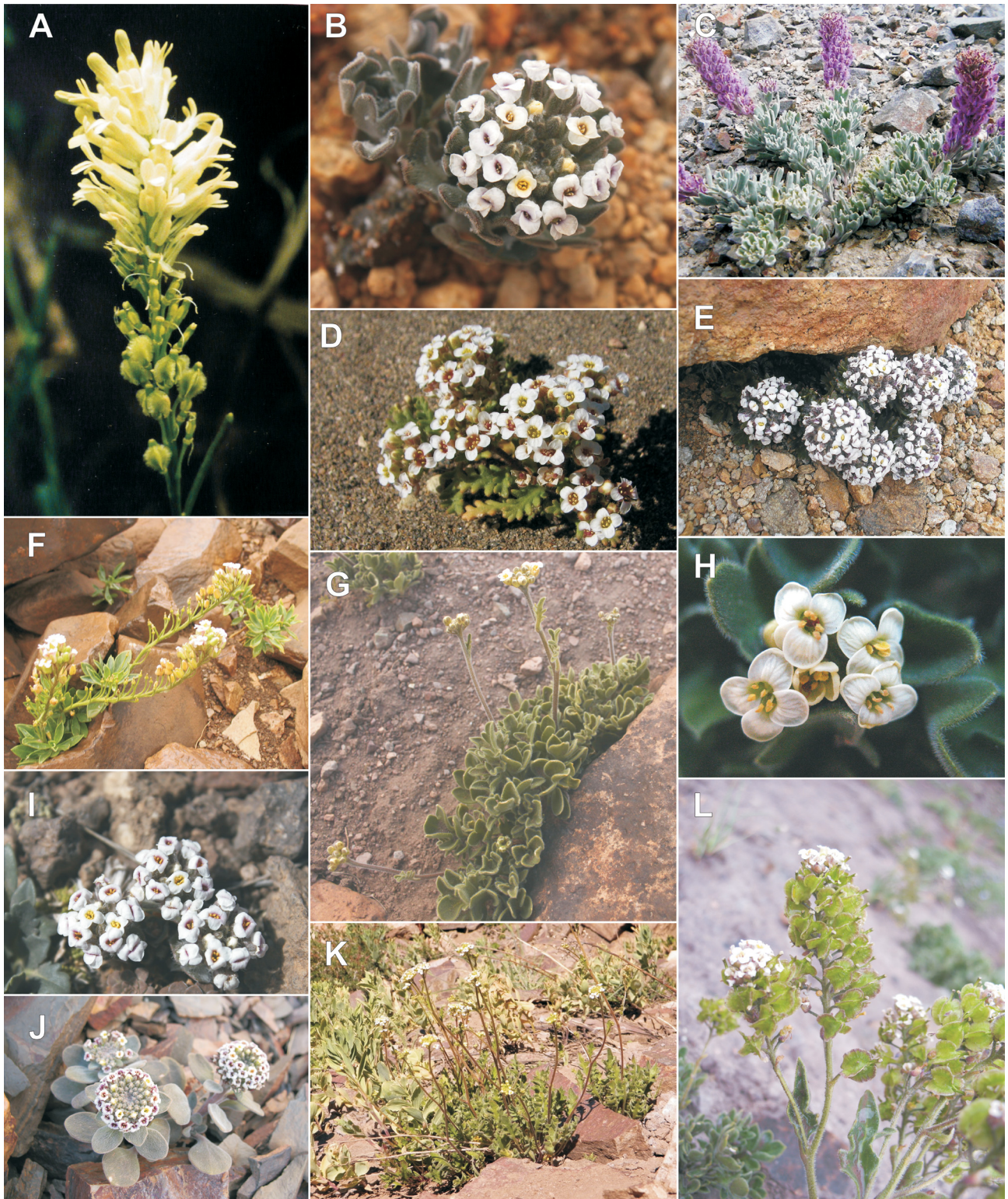
Morphological studies were based on herbarium specimens (see herbarium acronyms in acknowledgments) and on fresh material collected during field trips in Argentina and Chile (vouchers at SI). A total of 850 specimens, representing all species of *Menonvillea*, were studied (Appendix I). They covered the entire geographical range of the genus, and geographical data and elevation on the specimen labels were recorded and used for georeferencing. Leaves, flowers and fruits from herbarium specimens were re-hydrated prior to measurements, and flowers and fruits were measured using an ocular micrometer. Leaf trichomes and fruits were examined in a Philips XL series 30 scanning electron microscope, operating at 10–15 kV. Leaf fragments and fruits were cleaned with xylene and subjected to sonication for 5 min, dried at room temperature for 12 hrs, mounted on aluminum stubs, and coated with gold-palladium 40–60%.

## Results

### *Vegetative Morphology*

*Menonvillea* includes both annual and perennial herbs (Fig. 2). Perennial herbs can have a branched or unbranched thickened caudex either underground near the surface [e.g., *M. constitutionis* (Philippi 1892: 335) Rollins (1955: 36), *M. famatinensis* (Boelcke 1951: 171) Rollins (1955: 35), *M. flexuosa* Philippi (1872: 674), *M. linearis* de Candolle (1821b: 420), *M. purpurea* (Hastings 1905: 622) Rollins (1955: 37), *M. scapigera* (Philippi 1862a: 389) Rollins (1955: 32), and *M. zuloagaensis* Al-Shehbaz (2010: 59)] or a deep, fleshy or woody, much-branched, and rhizome-like stems [e.g., *M. cuneata* (Gillies & Hook. in Hooker 1830: 352) Rollins (1955: 17), *M. macrocarpa* (Johnston 1929b: 166) Rollins (1955: 12), *M. nordenskjoeldii* (Dusén 1900: 172) Rollins (1955: 21), *M. rigida* Rollins (1955: 14), and *M. spathulata* (Gillies & Hook. in Hooker 1830: 351) Rollins (1955: 22)].





**FIGURE 2.** Habit, inflorescence and habitat in *Menonvillea* species. **A**, *M. purpurea*, raceme (Gosewijn s.n.). **B**, *M. cuneata*, raceme (Zuloaga 12775). **C**, *M. cuneata*, mature fruiting plant (Teillier 5558). **D**, *M. patagonica*, mature flowering plant (Villamil 11174). **E**, *M. nordenskjöldii*, mature flowering plant (Iribarren s.n.). **F**, *M. cicatricosa*, mature flowering plant, (Álvarez 2). **G**, *M. scapigera* subsp. *scapigera*, mature flowering plant (Zuloaga 12364). **H**, *M. scapigera* subsp. *scapigera*, raceme (Álvarez 11). **I**, *M. spathulata*, mature flowering plant (Zuloaga 12258). **J**, *M. virens*, mature flowering plants (Donadio 124). **K**, *M. scapigera* subsp. *longipes*, mature flowering plant (Johnson 10-130). **L**, *M. scapigera* subsp. *longipes*, raceme (Zuloaga 12364).



*Menonvillea pinnatifida* Barnéoud in Gay (1846: 182) and *M. orbiculata* Philippi (1860: 9) are perennial species that less frequently grow as annual. On the other hand, annual species [e.g., *M. chilensis* (Turczaninow 1854: 309) Jackson (1894: 207), *M. comberi* Sandwith (1928: 108), *M. filifolia* Fischer & Meyer (1835: 34), *M. minima* Rollins (1955: 52), *M. litoralis* (Barnéoud in Gay 1846: 177) Rollins (1955: 55), and *M. patagonica* Spegazzini (1902: 229)] are usually associated with less rigorous habitats and never become perennials.

Several species (e.g., *M. famatinensis*, *M. scapigera* subsp. *scapigera*, and *M. zuloagaensis*) are scapose herbs without cauline leaves, whereas others (e.g. *M. cicatricosa* (Philippi 1862b: 442) Rollins (1955: 10), *M. cuneata*, *M. flexuosa*, *M. macrocarpa*, *M. nordenskjoeldii*, *M. rigida*, and *M. spathulata*) have only cauline leaves. *Menonvillea chilensis*, *M. comberi*, *M. constitutionis*, *M. filifolia*, *M. linearis*, *M. minima*, *M. orbiculata*, *M. patagonica*, *M. purpurea* and *M. scapigera* subsp. *longipes* (Rollins 1955: 29) Prina (2001: 94) have both basal and cauline leaves.

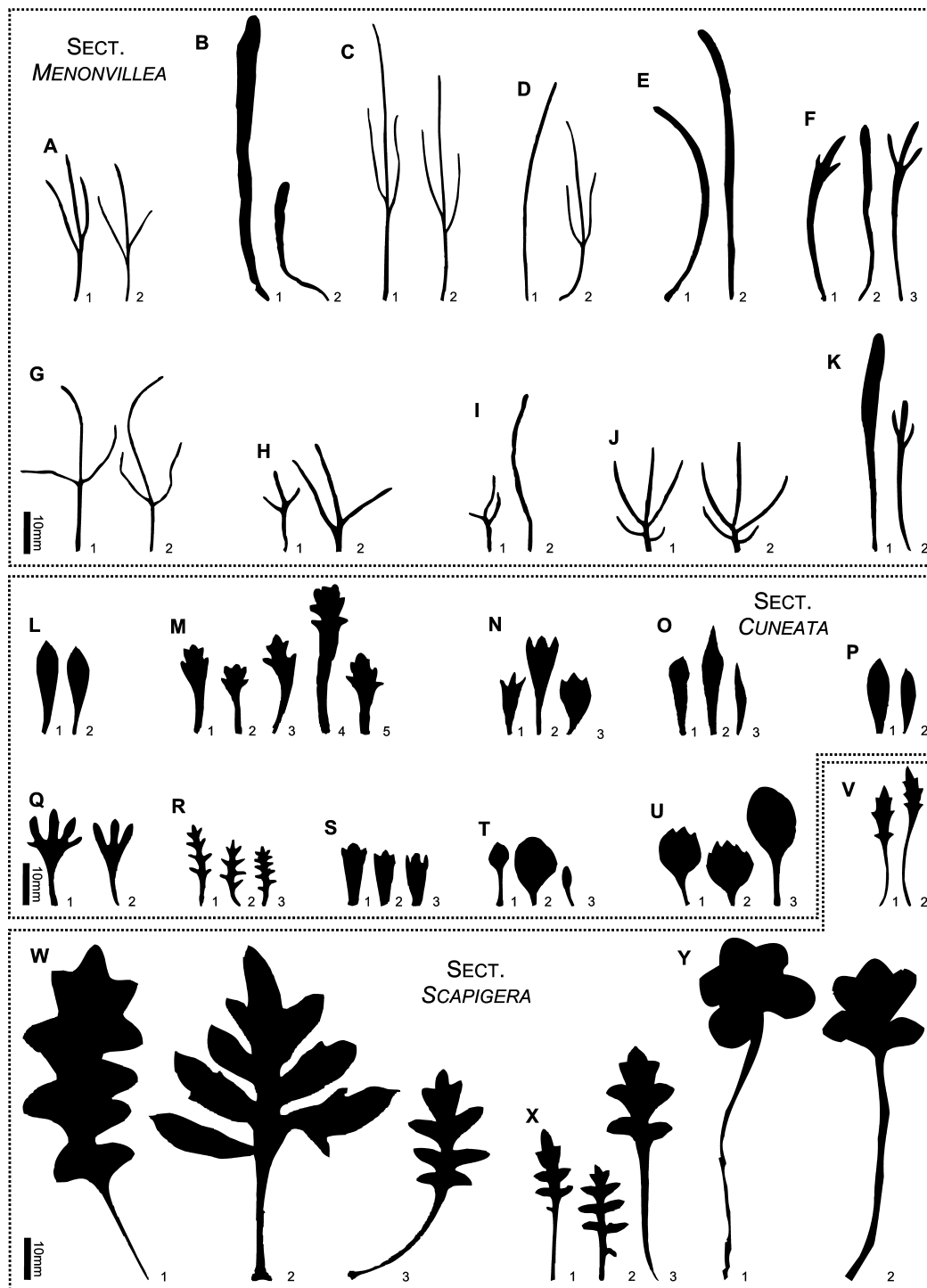
Leaves can vary from sessile to short petiolate with the petiole slightly differentiated from the blade (Figs. 3A–U), or long petiolate in three species (*M. famatinensis*, *M. scapigera*, and *M. zuloagaensis*), with the petiole conspicuously differentiated and longer than the blade (Figs. 3V–Y). Leaf shape, indumentum, and fruit morphology are useful in distinguishing species of *Menonvillea*. Two types of leaf shape can be recognized according to the width/length ratio: filiform to linear or narrowly spatulate leaves (width: length  $\leq 0.1$ ) are found in most of the Chilean endemics (*M. chilensis*, *M. constitutionis*, *M. filifolia*, *M. flexuosa*, *M. linearis*, *M. litoralis*, *M. minima*, *M. orbiculata*, *M. pinnatifida*, and *M. purpurea*). These leaves can be entire (*M. constitutionis*), trifid (*M. chilensis*, *M. filifolia*), or pectinate (*M. pinnatifida*), but leaf division may vary even on the same plant based on their position (Figs. 3A–K). The second group has leaf blades with a width: length ratio  $> 0.2$  and shapes ranging from lanceolate, spatulate, cuneate, obovate, oblanceolate, suborbicular, or reniform (Figs. 3L–Y). Leaf margin can be entire [e.g., *M. cicatricosa*, *M. cuneata*, *M. frigida* (Philippi 1860: 8) Rollins (1955: 23), *M. macrocarpa*, *M. spathulata*, and *M. virens* (Philippi 1891: 6) Rollins (1955: 15)], (Fig. 3L, N–P, T, U), repand (*M. patagonica*, Fig. 3R), dentate (*M. famatinensis*, Fig. 3V), pinnately lobed (*M. scapigera*, Fig. 3W–X), or palmately lobed (*M. zuloagaensis*, Fig. 3Y). Finally, leaf apex can be entire (e.g., *M. cicatricosa*, *M. frigida*, *M. macrocarpa*, and *M. spathulata*) (Fig. 3L, O, P, T) or 3(–5)-dentate/lobed (e.g., *M. cuneata*, *M. nordenskjoeldii*, *M. rigida*, and *M. virens*) (Fig. 3N, Q, S, U).

### Trichomes

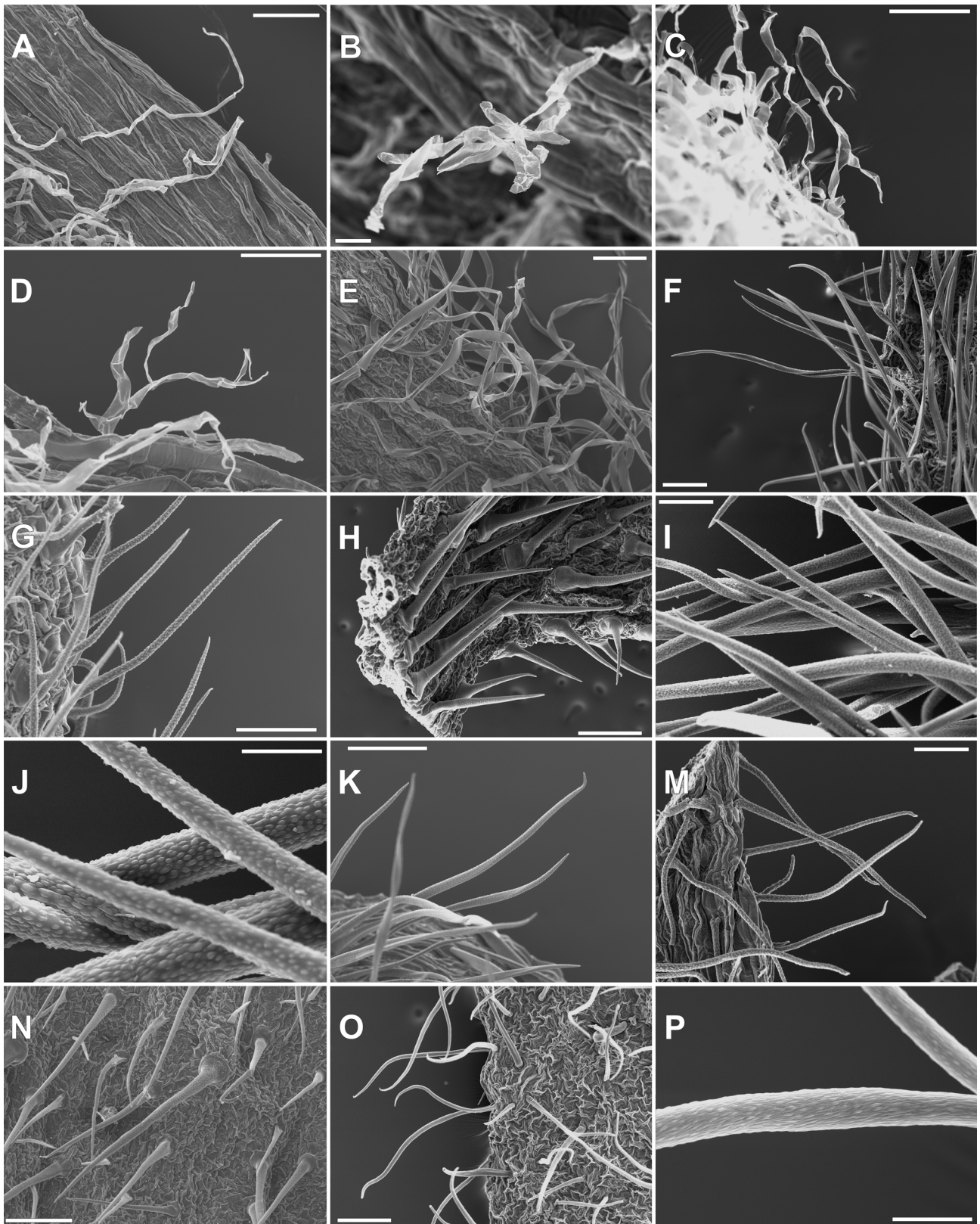
Variation in trichome types is useful to distinguish several species groups. Most Chilean endemics (e.g., *M. chilensis*, *M. constitutionis*, *M. filifolia*, *M. flexuosa*, *M. linearis*, *M. litoralis*, *M. orbiculata*, *M. pinnatifida*, and *M. purpurea*) have flattened, twisted, small trichomes to 0.5(–0.7) mm long and referred to hereafter as “arachnoid trichomes” (Figs. 4A–D). They can be simple, as in *M. chilensis* or *M. filifolia* (Fig. 4B), or branched, as in *M. flexuosa* and *M. pinnatifida* (Figs. 4B–D). *Menonvillea nordenskjoeldii* also has simple, flat and twisted trichomes, but they are longer (1–2(–3) mm long) than those of the Chilean species (Fig. 4E). Simple, straight, and terete, trichomes with minute verrucose papillae are found in species such as *M. comberi*, *M. cuneata*, *M. patagonica*, *M. famatinensis*, *M. macrocarpa*, *M. rigida*, *M. scapigera*, *M. spathulata*, *M. virens*, and *M. zuloagaensis* (Figs. 4F–P). Trichome orientation can vary from antrorse or spreading (e.g., *M. comberi*, *M. famatinensis*, *M. patagonica*, *M. scapigera*, *M. spathulata*, and *M. zuloagaensis*) to retrorse (e.g., *M. cuneata*, *M. macrocarpa*, and *M. virens*).

### Racemes

The racemes in *Menonvillea* can be dense (e.g., *M. cuneata*, *M. nordenskjoeldii*, *M. rigida*, and *M. virens*) or lax (*M. filifolia*), elongated considerably in fruit (e.g., *M. chilensis*, *M. filifolia*, *M. flexuosa*, and *M. pinnatifida*) or hardly elongated (*M. nordenskjoeldii*, *M. rigida*, and *M. virens*), and longer or rarely shorter than the basal leaves (*M. famatinensis*). Although the racemes are usually ebracteate, some species, such as *M. comberi*, *M. cuneata*, *M. frigida*, *M. macrocarpa*, *M. nordenskjoeldii*, *M. patagonica*, *M. rigida*, *M. spathulata* and *M. virens*, are usually bracteate at least proximally. The rachis is commonly straight, but in *M. flexuosa* and *M. pinnatifida* they are conspicuously flexuous. Pedicels can be erect, divaricate, recurved or arcuate, but orientation of the fruiting pedicels have no taxonomic significance.

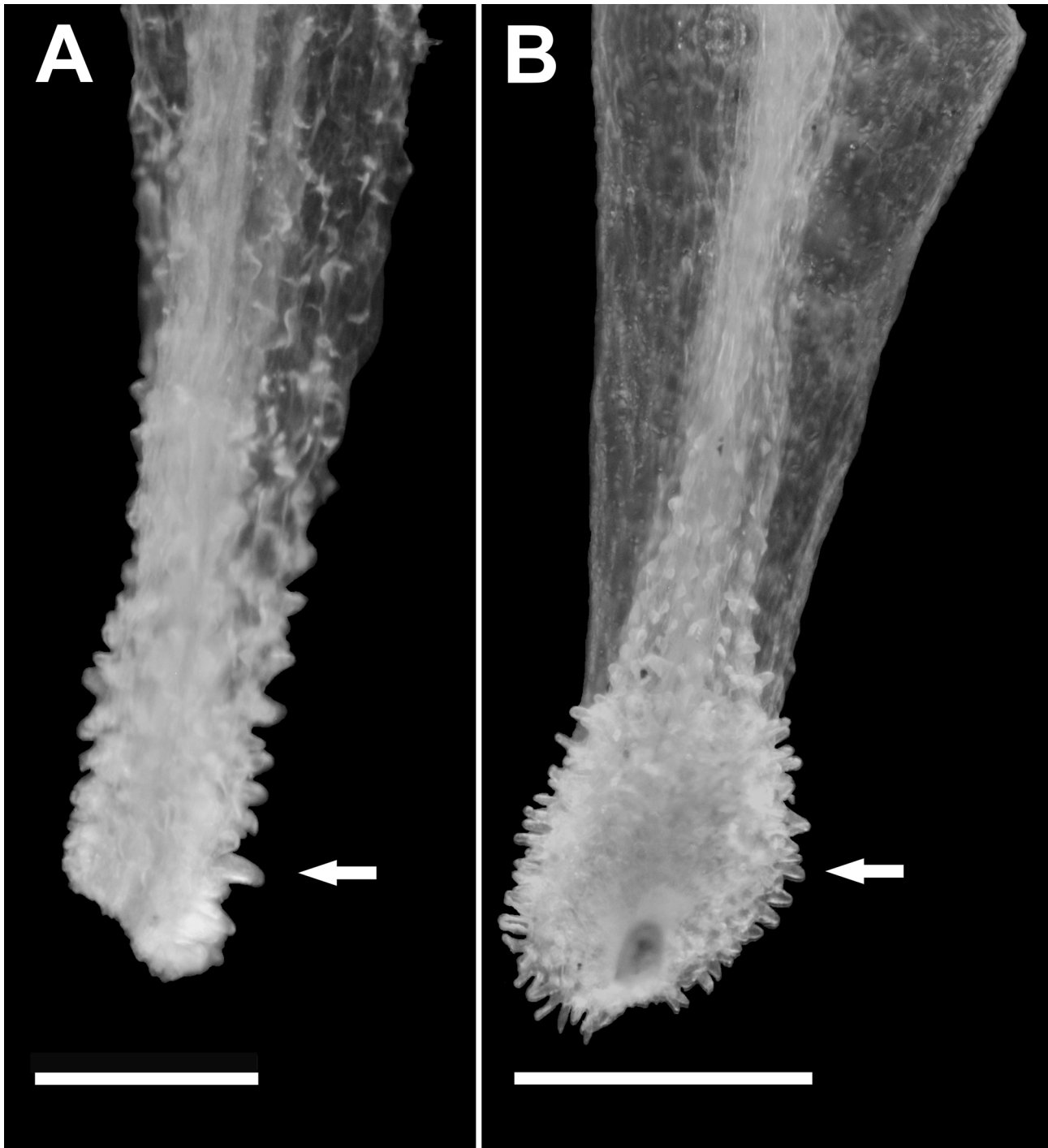


**FIGURE 3.** Representative leaf shapes of *Menonvillea* sections. **A–K, Sect. *Menonvillea*.** **A,** *M. chilensis*, 1: Schlegel 3888 (CONC), 2: Garaventa 7094 (SI). **B,** *M. constitutionis*, 1–2: Boelcke 3821 (SI). **C,** *M. filifolia*, 1: Boelcke 3786 (CONC), 2: Garaventa 7099 (SI). **D,** *M. martcorenae*, 1: Garaventa 8000 (CONC), 2: Martcorena et al. 1408 (CONC). **E,** *M. flexuosa*, 1–2: Werdermann 896 (SI). **F,** *M. linearis*, 1: Sparre 10059 (CONC), 2–3: Pfister s.n. (CONC 8846). **G,** *M. litoralis*, 1: Garaventa 8005 (CONC), 2: Ricardi 2082 (LIL). **H,** *M. minima*, 1: Monypenny 19 (CONC), 2: Behn s.n. (CONC 8986). **I,** *M. orbiculata*, 1: Werdermann 391 (LIL), 2: Martcorena et al. 1784 (CONC). **J,** *Menonvillea pinnatifida*, 1: Pisano & Bravo 895 (CONC), 2: Wagenknecht s.n. (CONC 92012). **K,** *M. purpurea*, 1: LP 028425, 2: Biese 983 (LIL). **L–U, Sect. *Cuneata*.** **L,** *M. cuneata*, 1: Al-Shehbaz 818 (SI), 2: Álvarez 2 (SI). **M,** *M. comberi*, 1–3: Ferreyra 409 (BCRU), 2: Zöllner 12024 (BAA), 3: Ferreyra 624 (BCRU). **N,** *M. cuneata*, 1: Al-Shehbaz, 806 (SI), 2: Álvarez 15 (SI), 3: Ruiz Leal 23411 (MERL). **O,** *M. frigida*, 1–3: Muñoz 3798 (SGO). **P,** *M. macrocarpa*, 1–2: Johnston 6058 (GH). **Q,** *M. nordenskjöldii*, 1: Arroyo s.n., T.B.P.A. 2312 (SI), 2: Arroyo s.n., TBPA 2609 (SI). **R,** *M. patagonica*, 1–2: Vallerini 396 (BAB), 3: Biganzoli & Larsen 1907 (SI). **S,** *M. rigida*, 1: Ezcurra et al. 2979 (BCRU), 2: Neumeyer 596 (SI), 3: Diem 2959 (BAB). **T,** *M. spatulata*, 1: Boelcke 4140 (MERL), 2: Boelcke 15940 (MERL), 3: Ruiz Leal 3180 (MERL). **U,** *M. virens*, 1: Sparre 9742 (BAA), 2: Ayarde 364 (LIL), 3: Kurtz 14047 (CORD). **V–Y, Sect. *Scapigera*.** **V,** *M. famatinensis*, 1–2: Hieronymus & Niederlein 379 (SI). **W,** *M. scapigera* subsp. *longipes*, 1: Roig 6580 (MERL), 2: Morrone 5958 (SI), 3: Kurtz 5697 (CORD). **X,** *M. scapigera* subsp. *scapigera*, 1: Prina 3680 (SRFA), 2: Roig 5196 (MERL), 3: Dalmasso 738 (MERL). **Y,** *M. zuloagaensis*, 1–2: Nicora et al. 8262 (BAA).



**FIGURE 4.** Trichomes of *Menonvillea* sections. **A–D.** *Menonvillea* Sect. *Menonvillea*. **A.** *M. filifolia* subsp. *filifolia* (Schlegel 3830, CONC). **B.** *M. flexuosa* (Hutchinson 181, BAA). **C, D.** *M. pinnatifida* (Pisano & Bravo 895, CONC). **E–M.** Sect. *Cuneata*. **E.** *M. nordenskjoeldii* (Arroyo s.n., T.B.P.A. 2312, SI). **F.** *M. comberi* (Ferreyra 624, BCRU). **G.** *M. cuneata* (Zuloaga 12775, SI). **H.** *M. patagonica* (Biganzoli 1907, SI). **I–J.** *M. rigida*, (Diem 933, SI). **K.** *M. spathulata* (Prina 2920, SI). **M.** *M. virens* (Krapovickas 6311, BAB). **N–P.** Sect. *Scapigera*. **N.** *M. scapigera* subsp. *longipes* (Morrone 5958, SI). **O–P.** *M. zuloagaensis* (Nicora 8262, BAA). Scale bars: A, C, D, F, G, M, O = 100 µm; B, J, P = 20 µm; E, H, K, N = 200 µm; I = 50 µm.





**FIGURE 5.** Papillae at petal base. **A.** *M. filifolia* (Wagenknecht s.n., CONC 93477). **B.** *M. scapigera* subsp. *longipes* (Al-Shehbaz 812, SI). Arrow shows the papillae. Scale bars: A = 300  $\mu\text{m}$ , B = 500  $\mu\text{m}$ .

#### Flowers

The sepals are deciduous in most common species, but they are persistent after fruit maturity in *M. comberi*, *M. nordenskjoeldii*, *M. spathulata*, *M. minima*, and *M. zuloagaensis*. Bases of the inner (lateral) or both sepal pairs of some Chilean species (e.g., *M. constitutionis*, *M. filifolia*, *M. flexuosa*, *M. linearis*, *M. pinnatifida* and *M. purpurea*) are saccate, but they are not saccate elsewhere in the genus.

Petals vary in shape from linear to narrowly spatulate, oblong or broadly obovate. Petals claws are slightly to strongly differentiated from blade, and their bases are glabrous (e.g., *M. cicatricosa*, *M. chilensis*, *M. cuneata*, *M. frigida*, *M. macrocarpa*, *M. minima*, *M. nordenskjoeldii*, *M. litoralis*, *M. orbiculata*, *M. rigida*, *M. spathulata*, and *M. virens*) or either with minute papillae 20–40  $\mu\text{m}$  long (e.g., *M. constitutionis*, *M. filifolia*, *M. linearis*, *M. orbiculata*, and *M. pinnatifida*) (Fig. 5A), or with coarser papillae 100–200  $\mu\text{m}$  long (e.g., *M. comberi*, *M.*

*famatinensis*, *M. patagonica*, *M. scapigera*, and *M. zuloagaensis*) (Fig. 5B). Petal color is yellow to yellowish green in *M. chilensis*, *M. constitutionis*, *M. filifolia*, *M. flexuosa*, *M. linearis*, *M. macrocarpa*, *M. pinnatifida*, and *M. purpurea*, or white to creamy white in *M. cicatricosa*, *M. comberi*, *M. cuneata*, *M. famatinensis*, *M. frigida*, *M. litoralis*, *M. nordenskjoeldii*, *M. minima*, *M. patagonica*, *M. rigida*, *M. scapigera*, *M. spathulata*, *M. virens*, and *M. zuloagaensis*.

The stamens are subequal or tetradynamous, and the filaments are slender to conspicuously expanded at base, as in *M. spathulata*. The filament bases have the same indumentum as the petal bases and range from glabrous or puberulent with small or conspicuous papillae. Although the filaments of inner stamens are usually free, they are connate from 1/5 to 4/5 of their length in *M. famatinensis* and *M. scapigera*. *Menonvillea zuloagaensis* is the only species of the genus that has stamens persistent after fruiting.

The nectar glands are taxonomically informative and are either confluent gland subtending the bases of all filaments (e.g., *M. cicatricosa*, *M. comberi*, *M. cuneata*, *M. famatinensis*, *M. flexuosa*, *M. frigida*, *M. macrocarpa*, *M. nordenskjoeldii*, *M. patagonica*, *M. rigida*, *M. scapigera*, *M. spathulata*, *M. virens*, and *M. zuloagaensis*) or are four, flat, and petaloid (e.g., *M. chilensis*, *M. constitutionis*, *M. filifolia*, *M. linearis*, *M. litoralis*, *M. minima*, *M. pinnatifida*, and *M. purpurea*). *Menonvillea orbiculata* has confluent and not petaloid glands, although occasionally subpetaloid glands can be found.

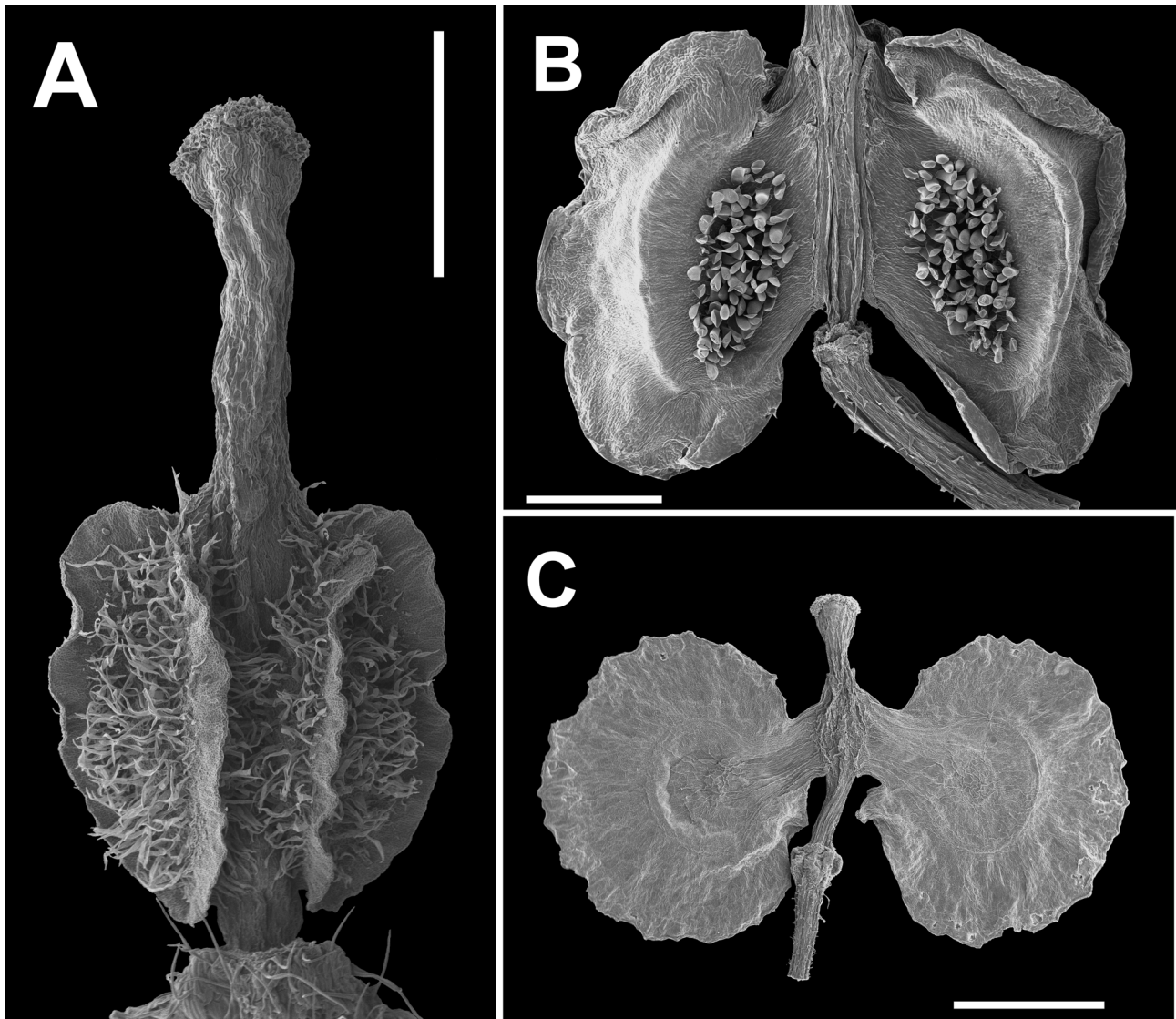
Gynophores are commonly conspicuous in the genus, and the replum has no important taxonomic value. The exception is *M. zuloagaensis* which has an apically expanded replum with a septal perforation. The stigma can be capitate (e.g., *M. cicatricosa*, *M. macrocarpa*, and *M. scapigera*) or somewhat decurrent (e.g., *M. comberi*, *M. cuneata*, *M. frigida*, *M. nordenskjoeldii*, *M. patagonica*, *M. rigida*, *M. spathulata*, and *M. virens*), entire, or 2-lobed (*M. chilensis*, *M. filifolia*, *M. linearis*, *M. litoralis*, *M. minima*, *M. pinnatifida*, and *M. zuloagaensis*).

### Fruits

*Menonvillea* fruits are schizocarpic silicles that break at maturity into two, 1-seeded mericarps (also interchangeably herein as valves) (Figs. 6–10), and they are quite important for distinguishing the species. The valves are dorsally compressed in *Menonvillea*, a character useful to distinguish the genus from the related *Aimara* and *Cremolobus* that have laterally compressed valves (Fig. 6). Fruits of *M. minima* have valves strongly convex dorsally and flat ventrally (Figs. 7O–R), whereas in *M. patagonica* the valves are conspicuously convex adaxially and strongly concave abaxially to form a cupuliform to globose structure in cross section (Figs. 9M–O).

The number of valve wings in *Menonvillea* varies from 0 to 2-, 3-, or 5. Wingless valves characterize fruits of *M. minima* and *M. zuloagaensis* (Figs. 7O, 10M), though the former species sometimes shows rudimentary wings to 0.2 mm wide. Two-winged valves are present in *M. chilensis*, *M. comberi*, *M. filifolia*, *M. linearis*, *M. litoralis*, *M. martcorenae* Al-Shehbaz (2006: 360) *comb. et stat. nov.*, *M. pinnatifida*, *M. patagonica*, *M. flexuosa*, and *M. orbiculata* (Figs. 7A–J, 8A–O, 9A, M–P). Species previously classified under *Hexaptera* (e.g., *M. cicatricosa*, *M. constitutionis*, *M. cuneata*, *M. famatinensis*, *M. frigida*, *M. macrocarpa*, *M. nordenskjoeldii*, *M. purpurea*, *M. rigida*, *M. scapigera*, *M. spathulata*, and *M. virens*) generally have 3-winged valves (Figs. 8P–R, 9D–L, 10A–L). However, both *M. cuneata* and *M. scapigera* sometimes also have 5-winged valves. The wings are usually entire, straight, or undulate, but in *M. filifolia* and *M. martcorenae* they are conspicuously crenate (Fig. 7D–F), while in *M. famatinensis* they are erose (Fig. 10D–F).

Fruit indumentum and ornamentation, particularly on the dorsal (abaxial or outer) valve surface, are extremely important features to differentiate species. In *Menonvillea cicatricosa*, *M. famatinensis*, *M. patagonica*, *M. scapigera*, and *M. zuloagaensis* the valves are glabrous (Figs. 9M–R, 10D–N), whereas in *M. comberi*, *M. cuneata*, *M. frigida*, *M. macrocarpa*, *M. nordenskjoeldii*, *M. rigida*, *M. spathulata*, and *M. virens* they have simple trichomes (Figs. 9A–L, 10A–C). The dorsal valve surface in the Chilean endemic *M. chilensis*, *M. filifolia*, *M. linearis*, *M. litoralis*, *M. martcorenae*, *M. orbiculata*, and *M. pinnatifida* have digitiform/clavate papillae (Figs. 7A–F, J–N, 8A–O), as well as conspicuous callosities, though they may infrequently be found on the ventral surface as well. *Menonvillea filifolia*, *M. martcorenae*, *M. linearis* and *M. litoralis* have a central, conspicuous, tuberculate, oblong to hemispherical callosity surrounded by several to numerous digitiform/clavate papillae 90–200 µm (Figs. 7D, J, M, 8A, D); whereas *M. chilensis*, *M. orbiculata*, and *M. pinnatifida* have two, well-developed, usually wrinkled, lateral callosities dorsally (sometimes also ventrally) separated by few to numerous clavate papillae (Figs. 7A, 8G J, M). One occasionally finds in *M. chilensis* and *M. pinnatifida* a central and two lateral callosities on the same valve (Fig. 8M–O), while *M. linearis* rarely can show a central callus together a reduced dorsal wing on the same



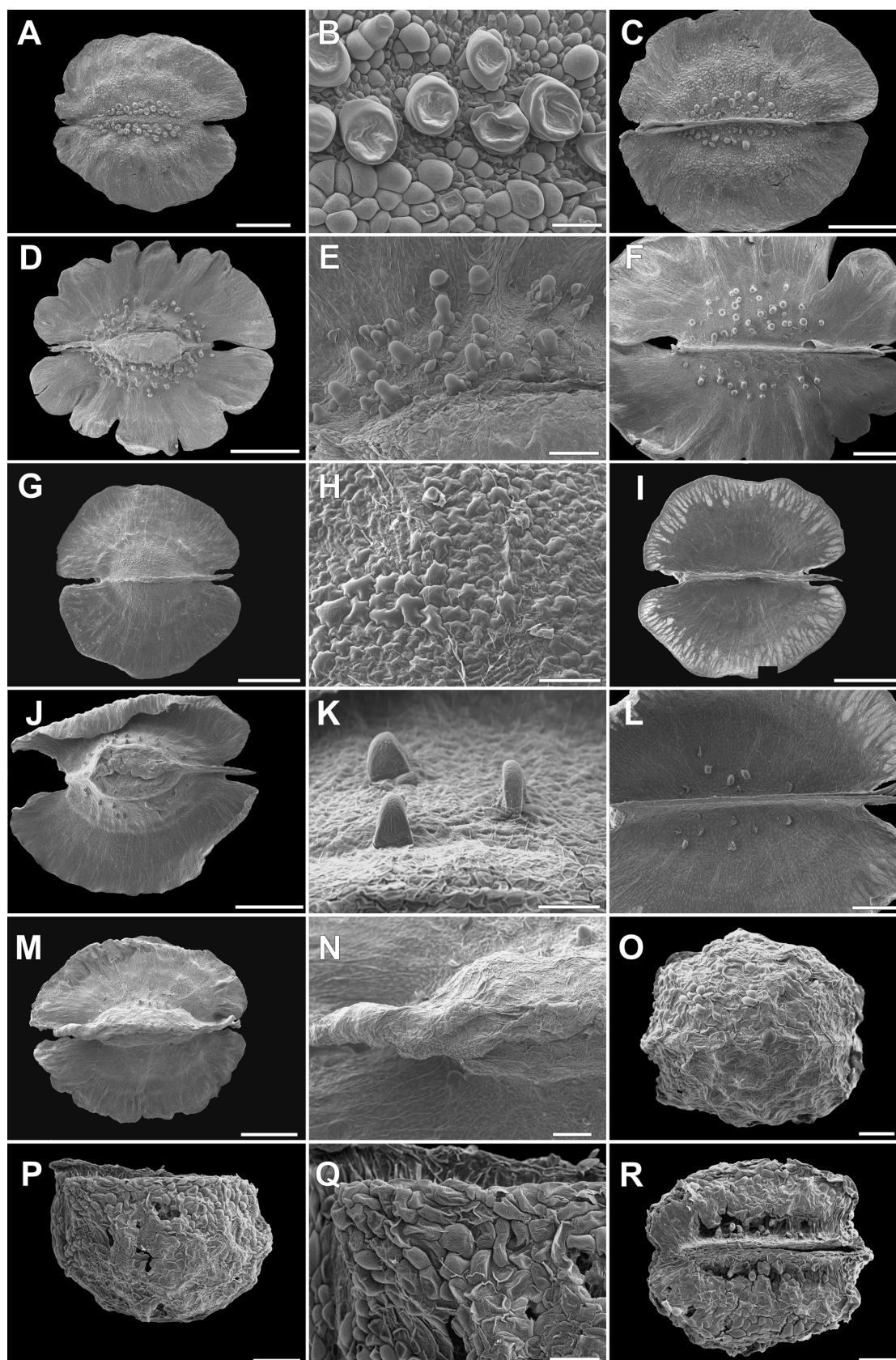
**FIGURE 6.** Mericarp morphology in tribe Cremolobeae. **A.** *Menonvillea cuneata*, lateral view (Zuloaga 12775, SI). **B.** *Aimara rollinsii*, lateral view (Baumann 148, CONC). **C.** *Cremolobus peruvianus*, lateral view (Boeke 947, SI). Scale bars: A, B = 1000  $\mu\text{m}$ ; C = 2000  $\mu\text{m}$ .

fruit valve (Fig. 7M–O). Fruits of *M. constitutionis*, *M. flexuosa*, *M. minima*, and *M. purpurea* lack the digitiform/clavate papillae and callosities but have the surface covered by minute, swelling-like papillae 20–60  $\mu\text{m}$  long (Figs. 7G–I, O–R, 8P–R). *Menonvillea spathulata* is unique in the genus for having the dorsal surface of valves prominently ribbed between wings (Fig. 10A–C).

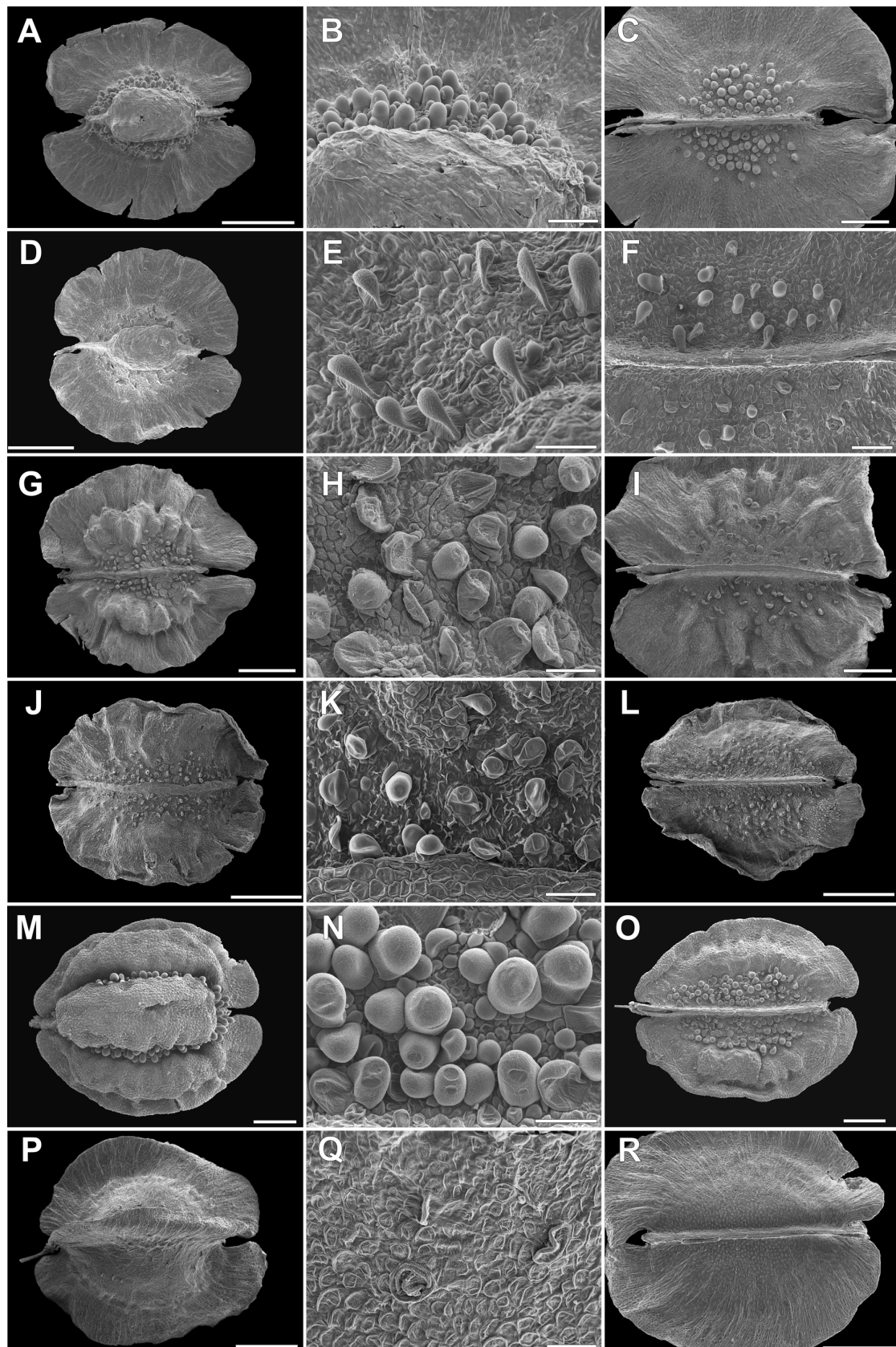
#### *Embryo type*

The cotyledons are accumbent in *Menonvillea cicatricosa*, *M. comberi*, *M. cuneata*, *M. frigida*, *M. macrocarpa*, *M. nordeskoeldii*, *M. patagonica*, *M. rigida*, *M. spathulata*, and *M. virens*, or incumbent in *M. chilensis*, *M. constitutionis*, *M. famatinensis*, *M. filifolia*, *M. flexuosa*, *M. linearis*, *M. litoralis*, *M. marticorenae*, *M. minima*, *M. orbiculata*, *M. purpurea*, *M. scapigera* and *M. zuloagaensis*. In *M. famatinensis*, *M. flexuosa*, *M. pinnatifida*, and *M. scapigera* they vary from accumbent or incumbent to oblique.

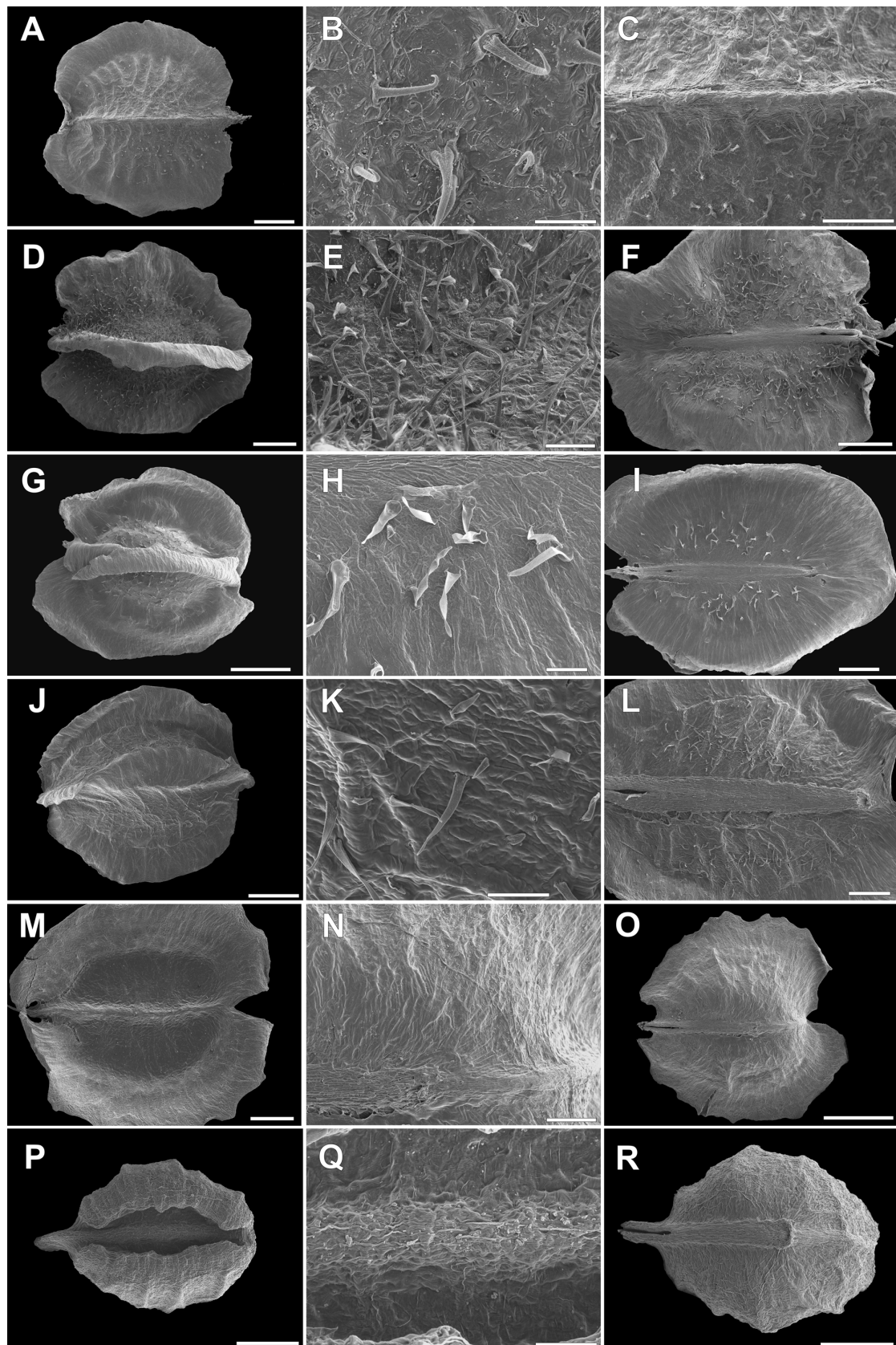




**FIGURE 7.** Mericarp morphology in *Menonvillea* sect. *Menonvillea*. **A–C**, *M. chilensis* (Garaventa 7095, SI). **A**, dorsal view. **B**, detail of papillae on dorsal surface. **C**, ventral view. **D–F**, *M. filifolia* (Garaventa 2746, SI). **D**, dorsal view. **E**, detail of papillae on dorsal surface. **F**, ventral view. **G–I**, *M. flexuosa* (Arancio 93163, ULS). **G**, dorsal view. **H**, detail of papillae on dorsal surface. **I**, ventral view. **J–L**, *M. linearis* (Garaventa 2393, SI). **J**, dorsal view. **K**, detail of papillae on dorsal surface. **L**, ventral view. **M, N**, *M. linearis* (Moreira & Pliscoff 1373, SGO). **M**, dorsal view. **N**, detail of wing and callus. **O–R**, *M. minima* (Marticorena 1837, CONC). **O**, dorsal view. **P**, lateral view. **Q**, detail of papillae. **R**, ventral view. Scale bars: A, C, D, G, I, J, M = 1000 µm; B, H, K, Q = 100 µm; E, N–P, R = 200 µm; L = 500 µm.

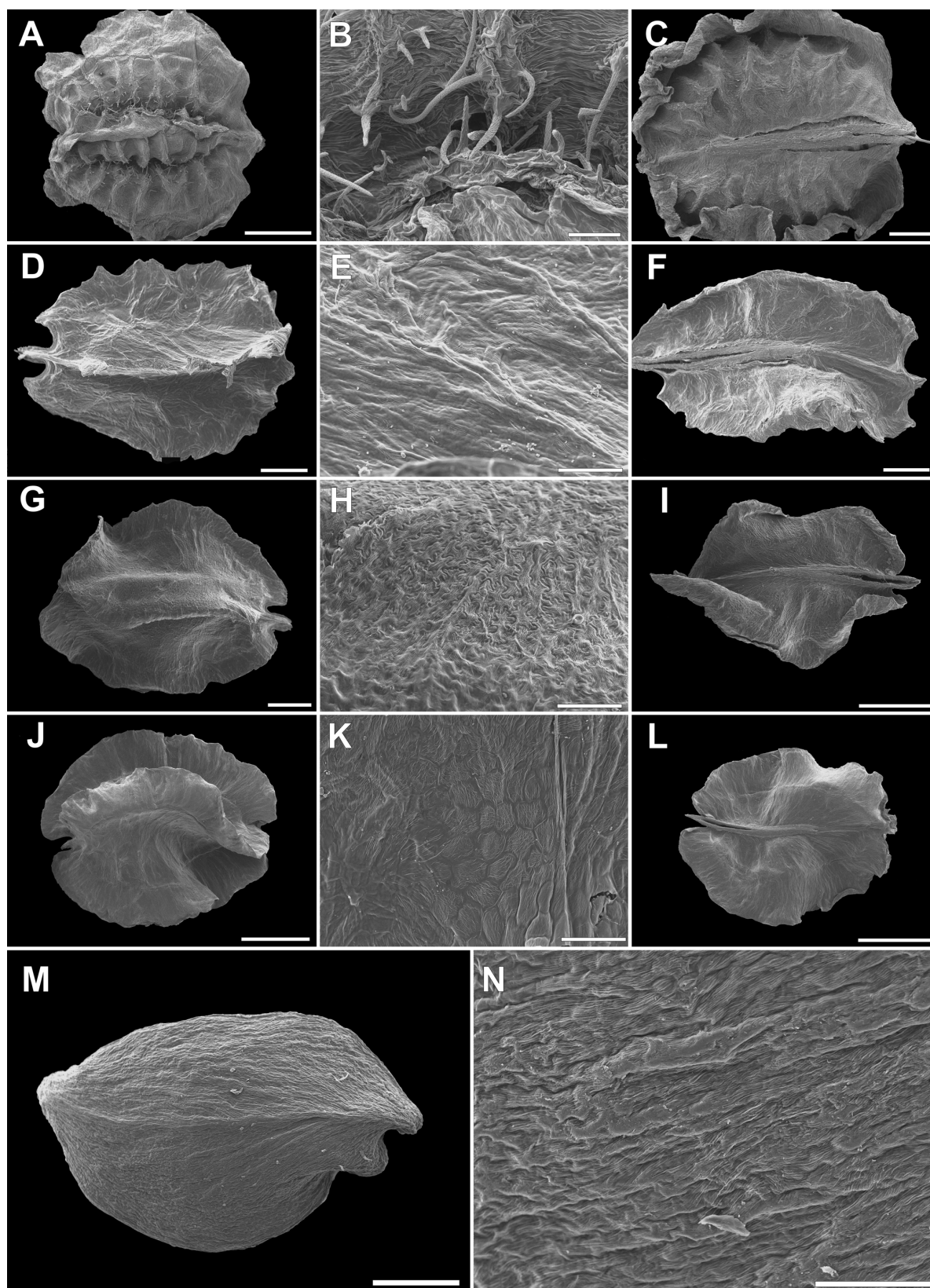


**FIGURE 8.** Mericarp morphology in *Menonvillea* sect. *Menonvillea*. **A–C**, *M. litoralis* (Garaventa 8005, SI). **A**, dorsal view. **B**, detail of papillae and callus on dorsal surface. **C**, ventral view. **D–F**, *M. marticorenae* (Garaventa 8000, CONC). **D**, dorsal view. **E**, detail of papillae on dorsal surface. **F**, ventral view. **G–I**, *M. orbiculata* (Werdermann 391, LIL). **G**, dorsal view. **H**, detail of papillae on dorsal surface. **I**, ventral view. **J–L**, *M. pinnatifida* (Marticorena 83622, CONC). **J**, dorsal view. **K**, detail of papillae on dorsal surface. **L**, ventral view. **M–O** *M. pinnatifida* (Garaventa 8007, CONC). **M**, dorsal view. **N**, detail of papillae on ventral surface. **O**, ventral view. **P–R**, *M. purpurea* (Teillier 5301, CONC). **P**, dorsal view showing lateral and dorsal wings. **Q**, detail of dorsal surface showing small papille. **R**, ventral view. Scale bars: A, D, G, J, L, P, R = 1000 µm; B, F = 200 µm; C, I, M, O = 500 µm; E, H, K, N, Q = 100 µm.

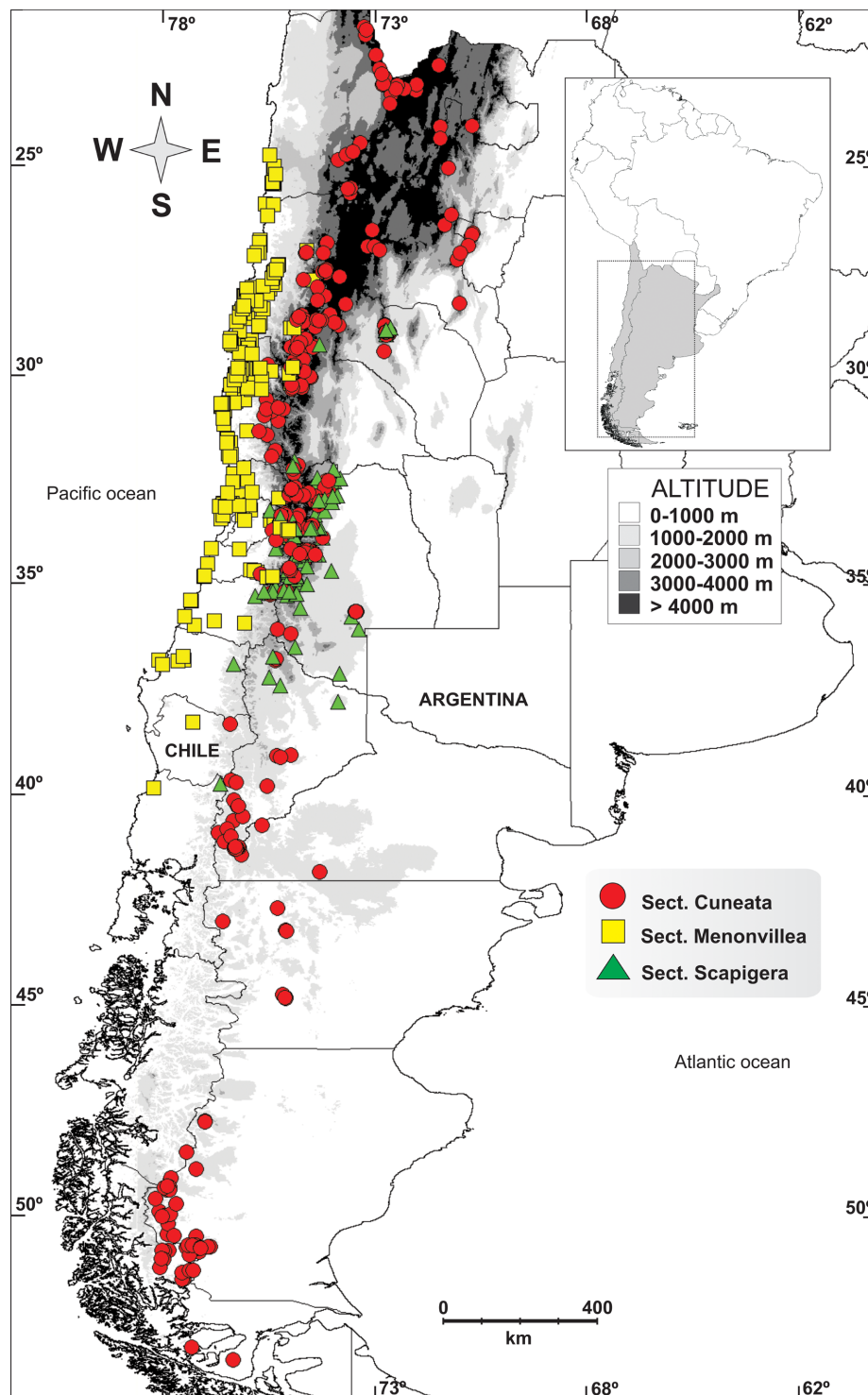


**FIGURE 9.** Mericarp morphology in *Menonvillea* sect. *Cuneata*. **A–C**, *M. comberi* (Zöllner 12024, BAA). **A**, dorsal view. **B**, detail of trichomes on dorsal surface. **C**, ventral view. **D–F**, *M. cuneata* (Zuloaga 12775, SI). **D**, dorsal view. **E**, detail of trichomes on dorsal surface. **F**, ventral view. **G–I**, *M. frigida* (Arroyo 94006, CONC). **G**, dorsal view. **H**, detail of trichomes on dorsal surface. **I**, ventral view. **J–L**, *M. nordenskjöldii* (Guerrido 613, SI). **J**, dorsal view. **K**, detail of trichomes on dorsal surface. **L**, ventral view. **M–O** *M. patagonica* (Biganzoli 1907, SI). **M**, dorsal view. **N**, detail dorsal surface. **O**, ventral view. **P–R**, *M. patagonica* (Ruiz Leal 24473, MERL). **P**, dorsal view showing lateral and dorsal wings. **Q**, detail of dorsal surface. **R**, ventral view. Scale bars: A, D, F, G, J, O = 1000 µm; B, H, K, Q = 100 µm; C, I, L, M, P, R = 500 µm; E, N = 200 µm.





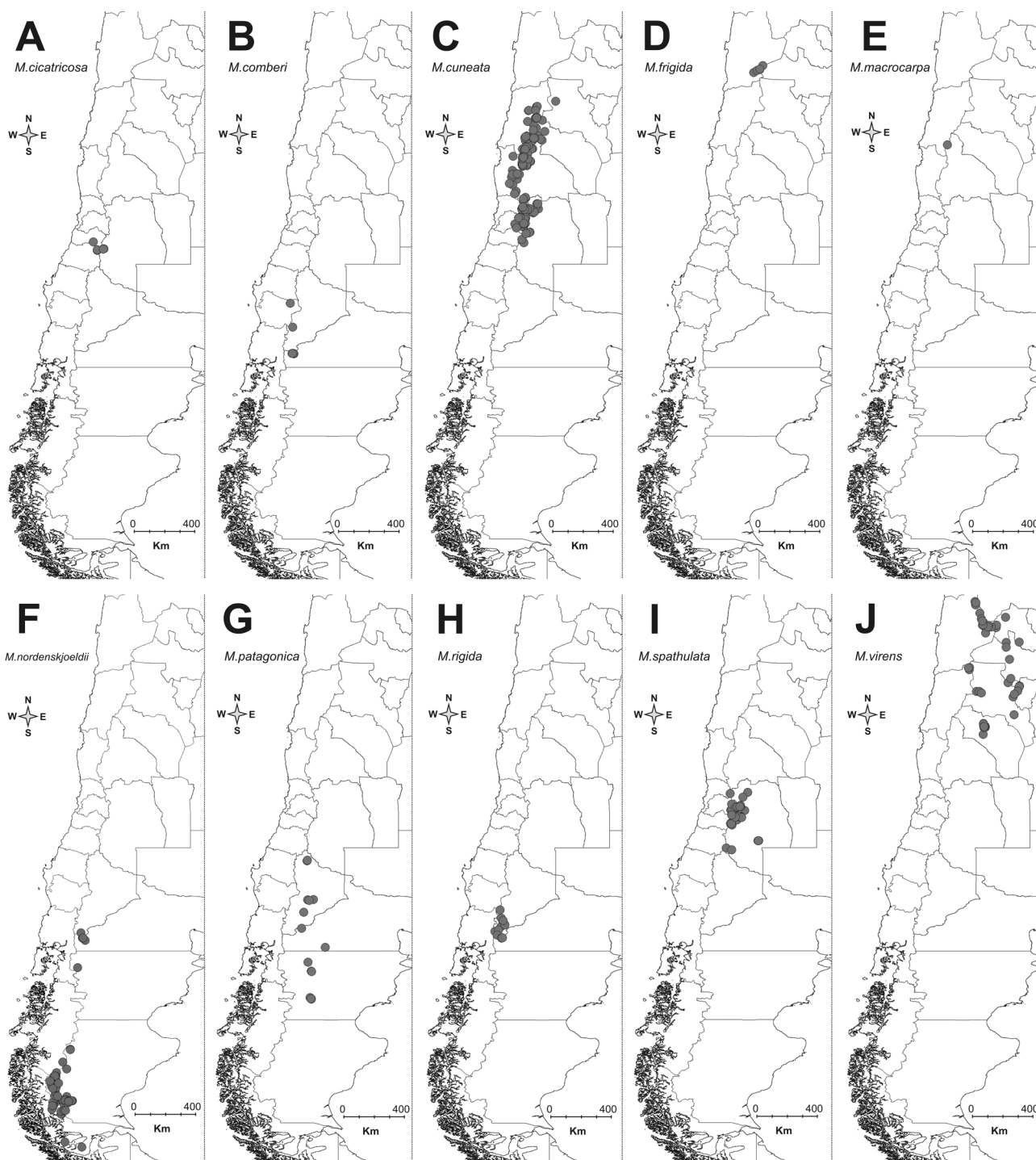
**FIGURE 10.** Mericarp morphology in *Menonvillea* sects. *Cuneata* (A–C) and *Scapigera* (D–N). **A–C**, *M. spathulata* (Teillier 5299, CONC). **A**, dorsal view. **B**, detail of trichomes on dorsal surface. **C**, ventral view. **D–F**, *M. famatinensis* (Hieronymus & Niederlein 379, SI). **D**, dorsal view. **E**, detail of dorsal surface. **F**, ventral view. **G–I**, *M. famatinensis* (Hunziker 1941, SI). **G**, dorsal view. **H**, detail of dorsal surface. **I**, ventral view. **J–L**, *M. scapigera* subsp. *longipes* (Al-Shehbaz 815, SI). **J**, dorsal view. **K**, detail of dorsal surface. **L**, ventral view. **M–N**, *M. zuloagaensis* (Nicora 8262, BAA). **M**, dorsal view. **N**, detail of dorsal view. Scale bars: A, I = 1000 µm; B, E, H, K, N = 100 µm; C, D, F, G, M = 500 µm; J, L = 2000 µm.



**FIGURE 11.** Geographical distribution of *Menonvillea* sections. Circles = Sect. *Cuneata*, Squares = Sect. *Menonvillea*, Triangles = Sect. *Scapigera*.

#### Distribution

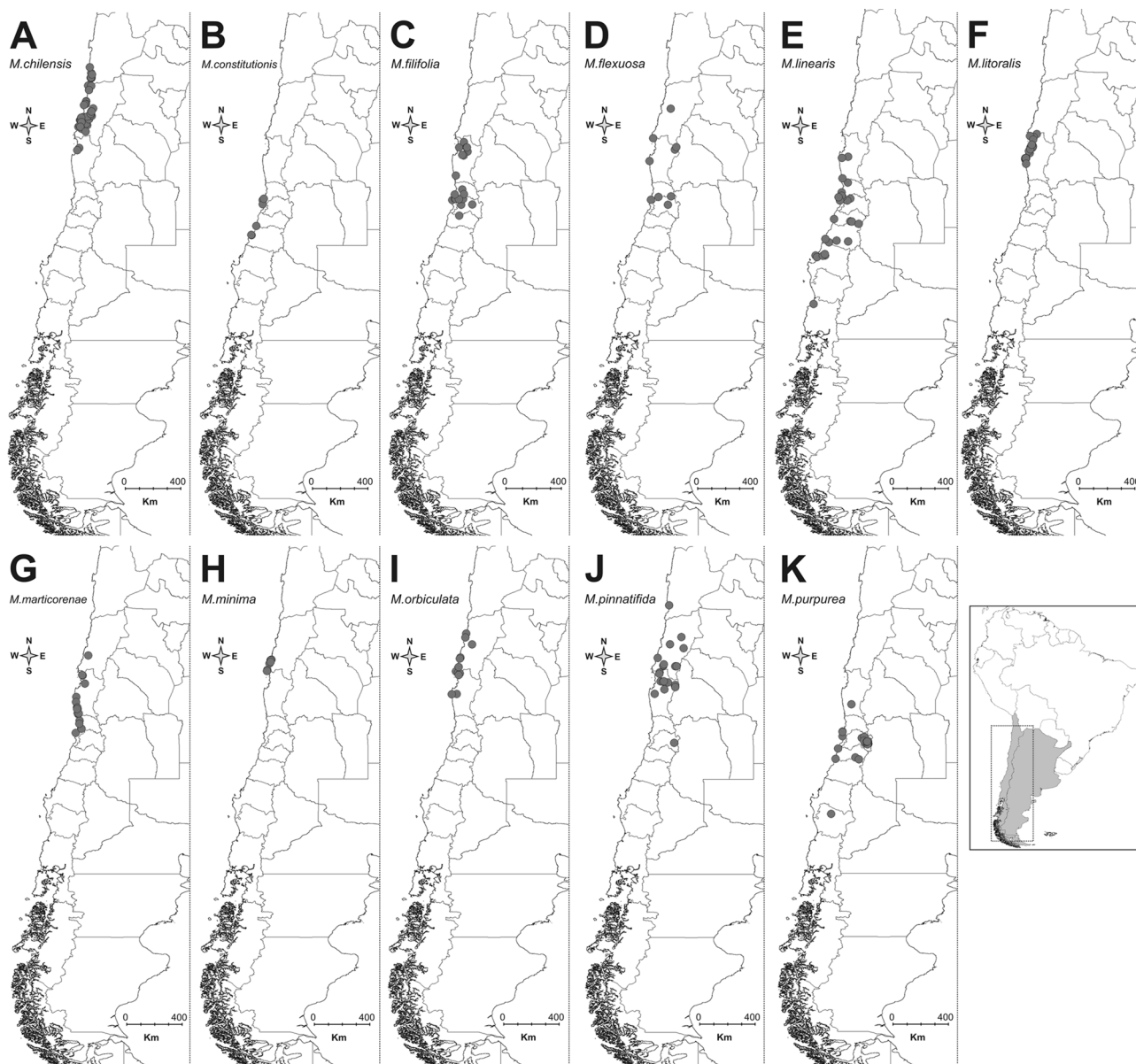
*Menonvillea* is distributed from the northern Antofagasta Region in Chile (21°31'S, 68°17'W) and Argentinean Jujuy Province (22°34'S, 66°31'W) southward into Magallanes Region (53°19'S 71°30'W) and Santa Cruz Province (50°45'S 72°14'W) (Figs. 11–14). Thirteen species are endemic to Chile (*M. chilensis*, *M. constitutionis*, *M. filifolia*, *M. flexuosa*, *M. frigida*, *M. linearis*, *M. litoralis*, *M. macrocarpa*, *M. minima*, *M. marticorenae*, *M. orbiculata*, *M. pinnatifida*, and *M. purpurea*), four to Argentina (*M. famatinensis*, *M. patagonica*, *M. rigida*, and *M. zuloagaensis*), and seven grow in both countries (*M. cicatricosa*, *M. comberi*, *M. cuneata*, *M. nordenskjoldii*, *M. scapigera*, *M. spathulata*, and *M. virens*).



**FIGURE 12.** Distribution of species of *Menonvillea* sect. *Cuneata*. **A.** *M. cicatricosa*. **B.** *M. comberi*. **C.** *M. cuneata*. **D.** *M. frigida*. **E.** *M. macrocarpa*. **F.** *M. nordenskjöldii*. **G.** *M. patagonica*. **H.** *M. rigida*. **I.** *M. spathulata*. **J.** *M. virens*.

Two main geographical distribution patterns are observed in the genus. A group of species are distributed along the Chilean-Argentinean Andes and their foothills; they reach high altitudes in the northern portions, and low altitudes southwards as the latitudes increase. *Menonvillea frigida*, *M. macrocarpa*, and *M. virens* are distributed in northern Altoandina and Puna regions of Argentina and Chile (sensu Cabrera & Willink 1973; Morrone, 2001) reaching to 5300 m. (Fig. 12J). *Menonvillea cuneata* is also present in northern Andes of Chile and Argentina, but its range extends southwards into VI Region (Libertador O'Higgins) of Chile and Mendoza Province in Argentina. *Menonvillea scapigera*, *M. famatinensis*, *M. zuloagaensis*, *M. spathulata*, *M. comberi*, *M. rigida*, and *M. nordenskjöldii* occur mainly along the central-southern Andes of Argentina and Chile or only Argentina (*M.*

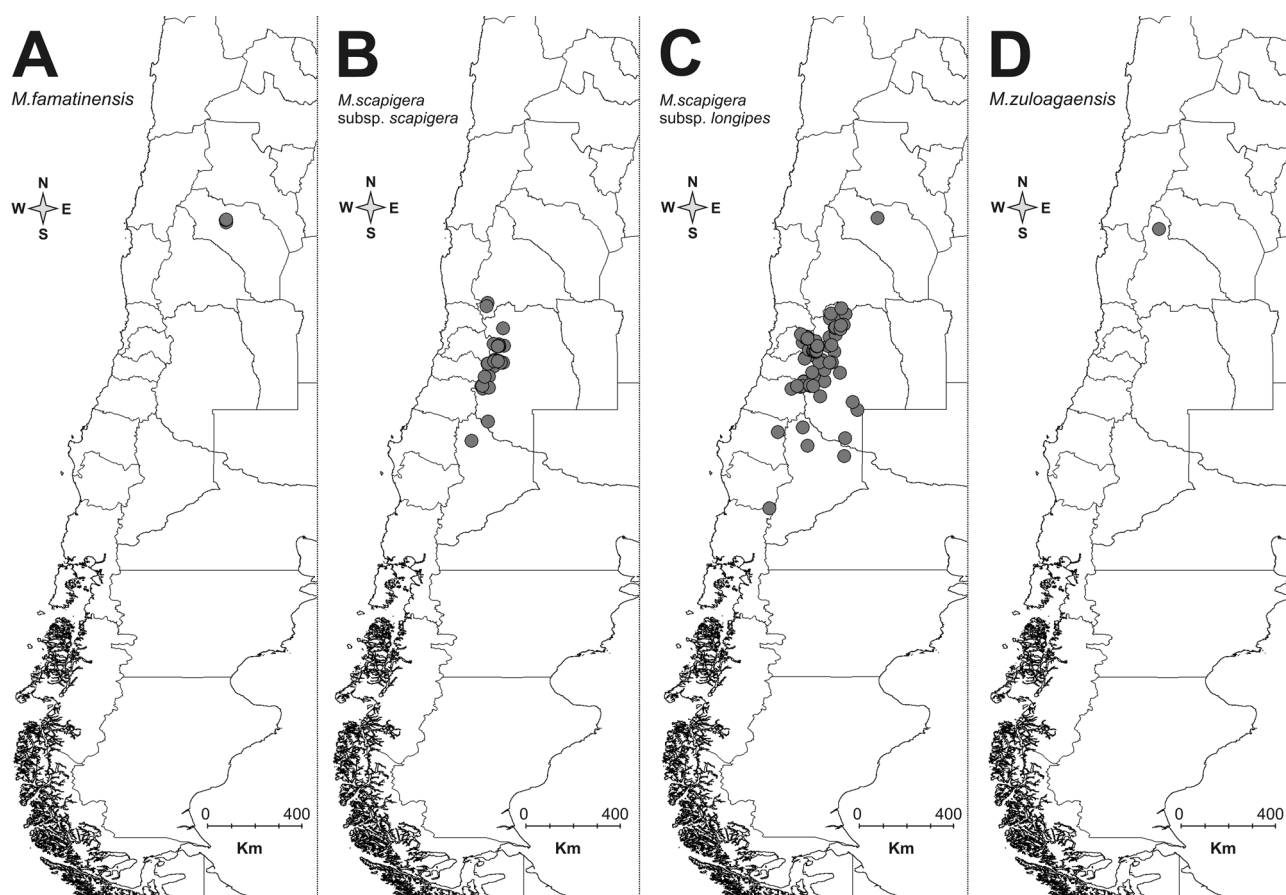




**FIGURE 13.** Distribution of species of *Menonvillea* sect. *Menonvillea*. **A.** *M. chilensis*. **B.** *M. constitutionis*. **C.** *M. filifolia*. **D.** *M. flexuosa*. **E.** *M. linearis*. **F.** *M. litoralis*. **G.** *M. martcorenae*. **H.** *M. minima*. **I.** *M. orbiculata*. **J.** *M. pinnatifida*. **K.** *M. purpurea*.

*famatinensis*, *M. zuloagaensis* and *M. rigida*), principally in the Altoandina biogeographical province (Figs. 12, 14). By contrast, *M. nordenskjöldii* is restricted to the southernmost distribution in the genus (Fig. 12F), whereas *M. patagonica* grows at low to moderate elevations (500–2,500 m) of west-central Patagonia in the Argentinean provinces of Neuquén, Río Negro, and Chubut (Fig. 12G).

The remaining of species are endemic to Chile mainly along the central depression (between the Andes and the Chilean coast range) and extending to that coast (Fig. 13). They are principally distributed from the Antofagasta region in the north into the central regions of Santiago, Libertador O'Higgins, and Maule but mainly in the biogeographical provinces of Atacama (southwest), Coquimbo, and Santiago (sensu Cabrera & Willink, 1973; Morrone, 2001). However, *M. purpurea* and *M. linearis* reach the southern regions of Araucanía and Los Ríos, respectively (Figs. 13E, K). Species such as *M. chilensis*, *M. constitutionis*, *M. filifolia*, *M. orbiculata*, *M. litoralis*, *M. minima*, and *M. martcorenae* inhabit lowlands near sea level along the Chilean coast. Other species (e.g., *M. flexuosa*, *M. linearis*, *M. pinnatifida*, and *M. purpurea*) show a similar distribution pattern but they also grow in Andean highlands (Figs. 13D, E, J, K).



**FIGURE 14.** Distribution of species of *Menonvillea* sect. *Scapigera*. **A.** *M. famatinensis*. **B.** *M. scapigera* subsp. *scapigera*. **C.** *M. scapigera* subsp. *longipes*. **D.** *M. zuloagaensis*.

## Discussion

As shown by Salariato *et al.* (2013), *Menonvillea* includes three main lineages (cuneata, chilensis, scapigera) strongly supported by molecular data (Fig. 1) and several morphological characters such as leaf outline, trichome type, nectar glands type, union of median staminal filament pairs, ornamentation of the fruits, and cotyledonary type. The chilensis lineage includes herbs with linear leaves covered with simple or branched arachnoid trichomes, white or yellow petals, petaloid nectar glands (except in *M. flexuosa*), glabrous or papillate fruit valves with or without callosities, and incumbent cotyledons (*M. pinnatifida* has obliquely accumbent cotyledons). The cuneata lineage includes herbs with lanceolate to broadly obovate or cuneate leaves covered with simple terete or flat and twisted trichomes, white petals (except *M. macrocarpa* with yellow petals), confluent and non-petaloid nectar glands, glabrous fruit valves or pubescent with simple trichomes and without callosities or papillae, and accumbent cotyledons. Finally, the scapigera lineage consists of perennial herbs with long-petiolate, oblanceolate or suborbicular to reniform leaves lobed or dentate at margin, simple and terete trichomes, white petals coarsely papillate at base, basally papillate filaments the median pairs of which are connate (except in *M. zuloagaensis*), confluent and non-petaloid nectar glands, glabrous fruit valves, and incumbent to obliquely incumbent cotyledons. The *Menonvillea* lineages also have different geographical distributions (Fig. 11). Species of the chilensis lineage are Chilean endemics that mainly grow at moderate to low altitudes between the Chilean coast and central depression, though *M. flexuosa*, *M. linearis*, *M. pinnatifida* and *M. purpurea* can reach the Andean highlands. Species of the scapigera and cuneata lineages are distributed along the Andes of Argentina and Chile. The scapigera lineage occupies the central portion of the Andes in Argentina and Chile, in the Altoandina, Prepuna and Puna biogeographical provinces (sensu Cabrera & Willink, 1973) and northern Patagonia. Members of the scapigera lineage usually grow at high altitudes reaching ca. 4500 m, where low temperatures are common throughout the year. They are perennials with deep underground caudices. Species of the cuneata lineage are

widely distributed and occupy the most variable ecological ranges in the genus; they grow from the northern Altoandina and Puna regions of Jujuy and Antofagasta to southern Patagonia in Santa Cruz Province and the Magallanes Region. For example, *M. virens* and *M. cuneata* grow in the north-central Andes of Argentina and Chile at elevations of 2000–5300 m, whereas *M. nordenskjöldii* grows in the southernmost end of the Andes at 500–2100 m. Species of this group are perennials except for *M. comberi* and *M. patagonica*, which are distributed in central-western Patagonia (Chubut, Neuquén and Río Negro Argentinean provinces) between 500–2500 m.

As concluded in Salariato *et al.* (2013) and herein, *Menonvillea* is a monophyletic genus consisting of three main lineages well-differentiated molecularly and morphologically and recognized hereafter as sections *Cuneata*, *Menonvillea*, and *Scapigera*.

## Taxonomic Treatment

Key to the genera of tribe Cremolobeae

1. Fruit valves dorsally compressed, 2-, 3-, or 5-winged, rarely wingless; herbs..... *Menonvillea*
- Fruits valves laterally compressed, 1- or 2- winged, rarely wingless; herbs, lianas, subshrubs, or shrubs ..... 2
2. Fruit valves wingless or 1-winged; cotyledons accumbent; annual herbs or scandent perennials; leaves neither fleshy nor subulate, dentate to pinnatifid ..... *Cremolobus*
- Fruit valves 2-winged; cotyledons incumbent; shrubs or subshrubs; leaves fleshy, subulate, entire ..... *Aimara*

*Menonvillea* de Candolle (1821a: 236). Type species: *Menonvillea linearis* DC.

*Cymatoptera* Turczaninow (1854: 309). Type: *Cymatoptera chilensis* Turczaninow (1854: 309) [= *Menonvillea chilensis* (Turcz.) B.D. Jacks.]

*Decaptera* Turczaninow (1846: 497). Type: *Decaptera trifida* Turczaninow (1846: 498) [= *Menonvillea cuneata* (Gillies & Hook.) Rollins].

*Dispeltophorus* Lehmann (1832: 7). Type: *Dispeltophorus crassifolius* Lehmann (1832: 7) [= *Menonvillea linearis* DC.].

*Hexaptera* Hooker (1830: 350). Type: *Hexaptera pinnatifida* Gillies & Hook. in Hooker (1830: 350) [= *M. scapigera* subsp. *longipes* (Rollins) Prina].

**Herbs**, annual or more commonly perennial, with simple or branched caudex. **Stems** 1 to many, simple or branched basally and/or above, erect to decumbent, herbaceous or rarely woody at base. **Trichomes** simple or less frequently branched. **Multicellular glands** absent. **Basal leaves** absent or present subsessile to long petiolate, rosulate or not, simple, entire or dentate to pinnatifid, pinnately or palmately lobed, or pectinate; cauline leaves absent or present, petiolate or sessile, not auriculate at base, entire, trifid, pinnatifid, or pectinate. **Racemes** terminal and less frequently axillary, dense or lax, corymbose, ebracteate or bracteate proximally, elongated considerably or not elongated in fruit, longer or rarely shorter than basal leaves; rachis straight or flexuous; fruiting pedicels erect, divaricate, recurved or arcuate, persistent. **Sepals** ovate to broadly oblong, free, deciduous or rarely persistent, erect or rarely spreading, equal or unequal, base of inner or both pairs saccate or not. **Petals** yellow, yellowish green, white, or creamy white, longer than sepals; blade linear to narrowly spatulate or broadly obovate; claw undifferentiated or strongly differentiated from blade, longer to shorter than sepals, glabrous or papillate at base, unappendaged, entire. **Stamens** 6, erect, subequal or tetradynamous; filaments wingless, unappendaged, slender or dilated and glabrous or papillate at base, free or inner pairs connate; anthers ovate or oblong, not apiculate. **Nectar glands** 1 and confluent, or 4 and lateral, petaloid or inconspicuous; median nectaries present or absent. **Ovules** 2 per ovary; placentation subapical. **Fruit** schizocarpic silicles, breaking at maturity into 2, 1-seeded mericarps, oblong, ovoid, orbicular or globose, dorsally compressed, didymous, strongly angustiseptate, not inflated, unsegmented; valves closed, thickened, woody, keeled or not, glabrous, pilose or papillate, 2-, 3-, 5(or 7)-winged, rarely wingless, unappendaged, with or without a central and/or 2 lateral callosities dorsally, with keeled attachment scar and sometimes 2 lateral callosities ventrally; gynophore commonly distinct; replum persistent, thickened, rounded, with nearly connate sides, rarely expanded apically and with a septal perforation; septum generally absent; style distinct, cylindric or conical, persistent; stigma capitate or somewhat decurrent, entire or 2-lobed, unappendaged. **Seeds** 1 per mericarp, wingless, plump or flattened; seed coat smooth or minutely reticulate, not mucilaginous when wetted; cotyledons incumbent, oblique, or accumbent.

A genus of 24 species distributed in western Argentina and Chile.

## Key to the sections of *Menonvillea*

1. Leaves filiform to linear in outline (width: length  $\leq$  0.1); trichomes of stems and leaves when present arachnoid, simple and/or branched; sepal base saccate or not; petals yellow, rarely white; nectar glands commonly 4 and petaloid, rarely 1 and confluent or inconspicuous; fruits glabrous or papillate, never pilose, with or without a central or 2 lateral callosities dorsally; cotyledons incumbent, rarely obliquely accumbent ..... Sect. *Menonvillea*
- Leaves of different shapes but not filiform to linear (width: length  $>$  0.1); trichomes of stems and leaves when present simple, terete or flattened but never arachnoid; sepals base not saccate; petals white, rarely yellow; nectar glands 1 and confluent; fruits glabrous or pilose, never papillate, without callosities; cotyledons incumbent or accumbent ..... 2
2. Annuals or non-scapose perennials; basal leaves subsessile to short petiolate; racemes basally bracteate or rarely ebracteate; staminal filaments free; cotyledons accumbent. .... Sect. *Cuneata*
- Usually scapose perennials; basal leaves long petiolate; racemes ebracteate; median staminal filaments usually connate; cotyledons incumbent to obliquely incumbent ..... Sect. *Scapigera*

Sect. *Cuneata* Salariato & Al-Shehbaz, *sect. nov.* Type species: *Menonvillea cuneata* (Gillies & Hook.) Rollins

Annual or more commonly perennial herbs, with simple or branched caudex. **Stems** 1 to many, simple or branched basally and/or above, erect to decumbent, herbaceous or rarely woody. **Trichomes** when present simple and terete or rarely flattened and twisted. **Leaves** subsessile to short petiolate; blade lanceolate, spatulate, cuneate, obovate, oblanceolate or suborbicular, entire or pinnatifid. **Racemes** ebracteate or proximally bracteate. **Sepals** non-saccate at base. **Petals** white, rarely yellow; claw undifferentiated to strongly differentiated from blade, glabrous or papillate at base. **Stamens** subequal or tetradynamous; filaments slender or dilated, glabrous or papillate at base, free. **Nectar glands** 1, confluent. **Fruits** glabrous or pilose, never papillate, 2-, 3-, or 5-winged, without callosities; stigma capitate or decurrent, entire or slightly 2-lobed. **Cotyledons** accumbent.

Ten species.

## Key to the species of *Menonvillea* sect. *Cuneata*

1. Annuals, rarely biennials, with a conspicuous taproot; petals and stamens papillate at base; fruit valves 2-winged ..... 2
- Perennials, with fleshy or woody caudex; petals and stamens glabrous at base; fruit valves 3- or 5-winged ..... 3
2. Petals 1.5–3(–3.5) mm long; fruit valves glabrous, conspicuously convex adaxially, strongly concave abaxially, cupuliform to globose in cross section ..... *M. patagonica*
- Petals 3.5–6(–7.5) mm long; fruit valves hirsute, straight to slightly concave abaxially, flattened in cross section ..... *M. comberi*
3. Leaf blade spatulate to broadly obovate (oblong to narrowly elliptic or lanceolate in *M. macrocarpa*), apex entire, rounded to acute ..... 4
- Leaf blade cuneate or orbicular to broadly spatulate, apex 3–5(–7)-dentate or -lobed, if entire and rounded, then leaves distinctly petiolate and with retrorse trichomes ..... 7
4. Leaves hirsute with spreading or retrorse trichomes ..... *M. macrocarpa*
- Leaves glabrous or pilose with antrorse trichomes ..... 5
5. Stems 2.5–8(–13) cm; leaves subrosulate, suborbicular to broadly obovate or rarely oblong; fruit valves prominently ribbed between wings ..... *M. spathulata*
- Stems 5–35 cm; leaves cauline, not subrosulate, lanceolate to oblanceolate or spatulate to obovate; fruit valves not prominently ribbed between wings ..... 6
6. Plants suffruticose; stems 7–35 cm, with persistent petiolar bases; fruit valves similar or one reduced, developed valve 12–16 mm long ..... *M. cicatricosa*
- Plants not suffruticose; stems 5–15 cm, with caduceous petiolar bases; fruit valves all alike, 4–6 mm long ..... *M. frigida*
7. Plants pubescent with flat, crisped or twisted trichomes 1–2(–3) mm long, rarely glabrous or glabrescent; leaf blade deeply 3–5(–7)-lobed at the apex; sepals usually persistent in fruits ..... *M. nordenskjöldii*
- Plants pubescent or canescent with terete, straight, commonly retrorse trichomes to 1(–1.2) mm long; leaf blade 3(–5)-dentate to slightly lobed or entire and rounded; sepals caducous ..... 8
8. Stems thick, conspicuously woody, less frequently fleshy, with numerous leaf scars; fruit valves 9–13(–14) mm long ..... *M. rigida*
- Stems usually thin, fleshy or slightly woody, without leaf scars; fruit valves (4–)5–8(–11) mm long ..... 9
9. Leaves petiolate, blade orbicular to broadly spatulate or obovate, apex rounded or 3–5-toothed ..... *M. virens*
- Leaves subsessile or petiole undifferentiated, blade oblanceolate to cuneate, rarely obovate, apex 3-dentate or sometimes 3-lobed, occasionally entire and acute to rounded ..... *M. cuneata*



1. *Menonvillea cicatricosa* (Phil.) Rollins (1955: 10). *Hexaptera cicatricosa* Philippi (1862b: 442). Type:—CHILE. [Región del Maule]. Prov. del Maule, San José, 1861–1862, *G. Volkmann s.n.* (holotype SGO 63959!; isotype GH!).

**Suffrutescent** perennials, chamaephytes, with woody, profusely branched caudex base. **Stems** 7–35 cm, erect to ascending, stramineous, glabrous or sparsely pilose with simple, terete, antrorse trichomes to 0.7 mm long, covered with persistent petiolar bases. **Leaves** petiolate, not rosulate; petiole persistent, becoming stramineous; blade entire, spatulate to obovate, fleshy, 10–18 × 4–8(–10) mm, glabrous or sparsely to densely pilose, base cuneate to attenuate, margin entire, apex acute, commonly abruptly sharp pointed. **Racemes** terminal, ebracteate, corymbose, elongated in fruit, 3–8 cm long; rachis pilose or glabrescent, straight; fruiting pedicels divaricate-ascending, straight, (0.9–)1.3–1.4(–2) cm long, usually pilose. **Sepals** oblong, 2.5–3.5(–4) × 1–2.5 mm, sparsely pilose, somewhat spreading, not saccate, caducous, margin scarious; petals creamy white, spatulate to broadly so, 4–6 × 1–2.5 mm, with a distinct claw glabrous at base; stamens slightly tetradynamous; filaments free, dilated at base, glabrous, 2–3.3 mm long; anthers narrowly oblong, 1.5–1.6 mm long; nectar glands confluent, surrounding bases of all filaments. **Fruits** subglobose, glabrous; valves 3-winged, conspicuously veined, frequently with 1 valve reduced; developed valve 12–16 × 10–14 mm; wings 2.5–3.5 mm wide, straight or slightly undulate; gynophore 2–4 mm long; style 2.5–4(–6) mm long; stigma capitate, entire. **Seeds** 4–4.5 × 2.5–3 mm, wingless; cotyledons accumbent.

**Distribution and habitat:**—*Menonvillea cicatricosa* grows in Chile (VI Libertador O'Higgins and VII Maule) and Argentina, just across the border in Mendoza. The species is found in rock crevices and roadside rocky banks of mountains at 1800–2800 m (Fig. 12A).

**Phenology:**—Flowers mainly from November to March.

**Taxonomic notes:**—*Menonvillea cicatricosa* is easily distinguished by its suffrutescent habit, persistent petiolar bases, entire and non-rosulate leaves, and glabrous, 3-winged fruit valves. It is morphologically related to *M. macrocarpa*, from which it is distinguished by the suffrutescent (vs. herbaceous) habit, persistent (vs. caduceous) petiolar bases, and pubescent (vs. glabrous) fruits.

**Representative Specimens:**—ARGENTINA. Mendoza: Depto. Malargüe, Mirador de Valle Hermoso, 28 January 2004, *Prina et al.* 2395 (SI). CHILE. VI Libertador O'Higgins: Prov. Colchagua, Com. San Fernando, Cordillera Tinguiririca, January 1930, *Piri6n 138* (CONC). VII Maule: Prov. Curic6, Com. Romeral, a orillas de la Laguna de Teno, 10 March 1967, *Martcorena & Matthei 906* (CONC).

2. *Menonvillea comberi* Sandwith (1928: 108). Type:—ARGENTINA. [Provincia de Neuqu6n]. Sierra Mamuil, 40°S, 1650 m, 29 December 1926, *H. F. Comber 914* (holotype K!; isotype E!).

*Menonvillea hirsuta* Rollins (1955: 28). *Menonvillea scapigera* (Phil.) Rollins subsp. *hirsuta* (Rollins) Prina (2001: 94). Type:—Argentina. [Provincia de R6o Negro]. Cerro Ventana, 20 January 1946, *J. Neumeyer 664* (holotype, LIL 153769!; isotype, GH!, fragm. ex LIL 153769).

**Annual** herbs, rarely biennials, with a conspicuous taproot. **Stems** (3–)5–11 cm, several to numerous from base, simple or branched above, erect to decumbent, sparsely to densely hirsute with white, antrorse to spreading, simple, terete trichomes 0.5–1.2 mm long. **Basal leaves** rosulate to subrosulate, petiolate; blade spatulate to broadly oblanceolate or cuneate, 0.7–3 × 0.4–1 cm, densely hirsute, subapically 5–7-lobed; cauline leaves similar to basal, smaller. **Racemes** terminal, bracteate proximally, corymbose, congested in fruit, 3–7 cm long; rachis hirsute, straight; fruiting pedicels ascending to divaricate or subhorizontal, straight, 0.4–1 cm long, densely hirsute. **Sepals** ovate to broadly oblong, 2.5–4.5 × ca. 2 mm, densely hirsute, erect, not saccate, persistent, margin membranous; petals white, spatulate to broadly so, 3.5–6(–7.5) × 1.5–3 mm, clawed, papillate at base; stamens tetradynamous; filaments free, erect, dilated and papillate at base, 1.5–4 mm long; anthers oblong, 0.7–1.2 mm long; nectar glands confluent, not petaloid. **Fruits** subglobose, basally notched; valves 2-winged, 4–5.5 × 3.5–5 mm, hirsute with short, spreading trichomes 0.2–0.5 mm long, with a conspicuous midvein dorsally; wings 0.5–0.1 mm wide, entire, flat; gynophore 0.5–1 mm long; style 1–2 mm long; stigma decurrent, slightly 2-lobed. **Seeds** broadly ovate, 2–3 × 1.8–2.6 mm, wingless, compressed; cotyledons accumbent.

**Distribution and habitat:**—*Menonvillea comberi* grows in southern Argentina (R6o Negro and Neuqu6n) and Chile (IX, Araucan6a) on loose sandy and rocky soils of hills at elevations of 1000–1700 m (Fig. 12B).

**Phenology:**—Flowers between January and March.

**Taxonomic notes:**—*Menonvillea comberi* is easily distinguished by its annual habit, rosulate basal leaves subapically 5–7-lobed, papillate petals and stamen bases, and hirsute, 2-winged fruits with a conspicuously marked dorsal midvein. It shares with *M. patagonica* the annual habit, several stems from base, and a conspicuous taproot; the latter differs by having glabrous fruits conspicuously concave abaxially.

Rollins (1955) characterized *Menonvillea hirsuta* by including perennial plants with a conspicuous taproot, numerous suberect to decumbent stems, rosulate and 5–7-lobed basal leaves, and hirsute, 2-winged fruits with a conspicuous midvein. Prina (2001) reduced it to a subspecies of *M. scapigera*, but *M. hirsuta* clearly differs by the hirsute (vs. glabrous) fruits, 2-winged (vs. 3- or 5-winged) valves, shorter fruit pedicels (4–8 vs. 6–14 mm long), and free (vs. connate) median filaments. On the other hand, a critical study of types and additional specimens of *M. comberi* and *M. hirsuta* revealed that they are indistinguishable in vegetative, floral, and fruit characters. The alleged difference in habit (annual *M. comberi* vs. perennial *M. hirsuta*) is unfounded because the types of both species have the same habit. Furthermore, molecular data (Fig. 1) showed them to be closely related. Therefore, we follow Salariato & Al-Shehbaz (2012) in reducing *M. hirsuta* to synonymy of *M. comberi*.

**Representative Specimens:**—ARGENTINA. Río Negro: Depto. Bariloche, Parque Nac. Nahuel Huapi, Cerro Estratos, ladera Este, 25 February 1995, *Ferreya 409* (BCRU). CHILE. IX Araucanía: Prov. Malleco, Com. Caracautin, Paso Lolco, al pié del volcán Lonquimay, 2 February 1972, *Zöllner 12024* (BAA).

3. *Menonvillea cuneata* (Gillies & Hook.) Rollins (1955: 17). *Hexaptera cuneata* Gillies & Hook. in Hooker (1830: 352). Type:—ARGENTINA. [Provincia de Mendoza]. Between Cortaderas and Río de las Vacas, *A. Cruickshanks 95* (holotype K!).

*Hexaptera jussiaei* Barnéoud in Gay (1846: 179). Type:—CHILE. [Región de Coquimbo]. Coquimbo, without locality, *C. Gay 336* (holotype P!; isotypes F!, G!, GH!, K!, LE!, NY!, PI!).

*Hexaptera violacea* Philippi (1872: 673). *Hexaptera cuneata* Gillies & Hook. var. *violacea* (Phil.) Reiche (1895: 88). Type:—CHILE. [Región de Coquimbo]. Quebrada Escondida, 1860–1861, *G. Volkman s.n.* [lectotype designated by Al-Shehbaz *et al.* (2011: 284), SGO 63963!; isolectotype SGO 68265!].

*Hexaptera tridens* Philippi (1891: 6). *Hexaptera jussiaei* Barnéoud var. *tridens* (Phil.) Reiche (1895: 88). Type:—CHILE. [Región de Atacama]. Cuesta Maricunga, January 1885, *F. Philippi s.n.* [lectotype designated by Al-Shehbaz *et al.* (2011: 284), SGO 63957!; isolectotypes B!, K!, SGO 68269!].

*Hexaptera kurtzii* Hosseus (1921: 97). Type:—ARGENTINA. [Provincia de San Juan]. Los Patillos, Cordillera del Espinazito, 10 February 1897, *F. Kurtz 9661* (holotype CORD!).

*Decaptera trifida* Turczaninow (1846: 498). Type:—CHILE. [Región de Valparaíso]. Prov. Aconcagua, without locality, *T. Bridges s.n.* (holotype KW!; isotypes, GH!, LE!).

**Cespitose** perennials with deep, woody, much-branched caudex. **Stems** (5–)10–20(–32) cm, herbaceous to woody, slender, several to numerous from base, erect to subdecumbent, branched or not above, pubescent to canescent with simple, terete, straight, retrorse or rarely spreading trichomes 0.4–1(–1.2) mm long. **Leaves** cauline, not rosulate, subsessile or less frequently shortly petiolate; blade oblanceolate to cuneate, rarely obovate, (6–)1020(–35) × 4–10 mm, canescent, base cuneate to attenuate, margin entire, apex 3-dentate or sometimes 3-lobed, occasionally entire and then acute to rounded. **Racemes** terminal, ebracteate or most commonly bracteate proximally, corymbose, densely flowered, elongated in fruit, 2–7(–10) cm long; rachis densely pubescent, straight; fruiting pedicels ascending, divaricate to reflexed, straight to recurved, (5–)7–12(–15) mm long, hirsute. **Sepals** oblong, (2.5–)4–5.5(–6.5) × (1.2–)1.5–2(–2.3) mm, pubescent, erect, not saccate, caducous, margin scarious; petals white to creamy white, often drying purplish, spatulate, (4–)6–10(–12) × (1.5–)2–2.5 mm, clawed, not papillate at base; stamens tetradynamous; filaments free, erect, white, slightly dilated and glabrous at base, (2–)4–5(–7) mm long; anthers narrowly oblong, (0.8–)1.1–1.6(–2) mm long, sagittate at base; nectar glands confluent, subtending bases of all filaments. **Fruits** subglobose to ellipsoid, glabrous or hirsute; valves 3- or 5(or 7)-winged, obscurely to conspicuously veined, (4–)5–8(–11) × (3–)5–8(–10) mm, emarginate apically; lateral and dorsal wings well developed, (0.5–)1.1–2.5(–3.5) mm wide; gynophore 0.5–1.8 mm long; style (1–)1.5–3.5(–4.5) mm long; stigma subdecurrent. **Seeds** oblong to ovate, (2–)2.5–4 × (1.2–)1.8–3 mm, wingless, flattened; cotyledons accumbent.

**Distribution and habitat:**—*Menonvillea cuneata* is widely distributed in north-central Argentina (Catamarca, La Rioja, San Juan, and Mendoza) and Chile (Atacama, Coquimbo, Valparaíso, Región Metropolitana de Santiago

and Libertador O'Higgins). It grows on gravel, partially serpentinized rock, stony ground, and among loose rocks at 1700–4600 m (Fig. 12C).

**Phenology:**—Flowers mainly from December to March.

**Taxonomic notes:**—*Menonvillea cuneata* is highly variable in leaf shape (oblanceolate to cuneate or rarely obovate), leaf apex (3-dentate, sometimes 3-lobed, or rarely entire and then acute to rounded), indumentum (pubescent to canescent with retrorse or rarely spreading trichomes), fruit size [(4–)5–8(–11) mm long], wings number [3 or 5(or 7)], and flower size [petals (4–)6–10(–12) mm long]. Although several variants were segregated as separate species, they fall within the morphological range of *M. cuneata*. *Menonvillea nordenskjöldii*, *M. rigida*, and *M. virens* are morphologically related to *M. cuneata*, with *M. virens* being closely related in the molecular phylogenies. However, they are morphologically distinct to merit independent recognition (see comments under these species).

**Representative Specimens:**—ARGENTINA. Catamarca: Depto. Tinogasta, Tres Quebradas, 31 March 1951, *Vervoorst 3245* (BAA, LIL). La Rioja: Depto. Lamadrid, entre río Las Cuevas y Portillo del Alto, 25 January 1949, *Krapovickas & Hunziker 5595* (BAB); Depto. Vinchina, Laguna Mulas Muertas, 5 February 1947, *Hunziker 2186* (BAA, SI). Mendoza: Depto. Las Heras, Puente del Inca, faldeo S Cerro Banderita N, 12 January 1963, *Boelcke et al. 9804* (BAA); Depto. Luján de Cuyo, La Jaula, Río Mendoza sup., 25 January 1886, *Kurtz 3471* (BAA, CORD, LP, SI); Depto. Malargüe, Alto valle del Atuel, 2° del arroyo Nield, 9 January 1954, *Guimon Poci s.n.* (MERL 15728); Depto. San Carlos, Cerro Laguna, en inmediaciones de la Estación de Altura Perón, 15 January 1952, *Ruiz Leal 14596* (MERL); Depto. San Rafael, Agua amarilla, Volcán Overo, El Sosneado, 21 January 1973, *Lagiglia & D'Antoni 1331* (LP); Depto. Tunuyán, inmediaciones del Paso del Portillo mendocino, entre las Crucecitas y El Pozo, 25 January 1900, *Ruiz Leal 1901* (LIL, MERL). San Juan: Depto. Calingasta, Oeste de Barreal: El Pachón: de casilla naranja a casilla amarilla, 9 February 1977, *Kiesling & Sáenz 1398* (SI); Depto. Iglesia, Quebrada Agua Negra, 11 km antes del límite con Chile, ruta internacional 150, 28 January 2008, *Al-Shehbaz 806* (MO, SI). CHILE. III Atacama: Prov. Chañaral, Com. Diego de Almagro, Camino de Potrerillos al Salar de Maricunga, 53 km al interior del Tranque La Ola, 14 February 1966, *Ricardi et al. 1638* (BAB, CONC, LP); Prov. Copiapó, Com. Tierra Amarilla, Laguna del Negro Francisco, 2 February 1944, *Muñoz 3977* (SGO); Prov. Huasco, Com. Alto del Carmen, Quebrada Cantarito entre Quebrada Marancel y Portezuelo Cantarito, 12 February 1981, *Arroyo 81630* (CONC). IV Coquimbo: Prov. Choapa, Com. Salamanca, al E de Cuncumén, ladera S, 9 January 1984, *Zöllner 11879* (BAA), Prov. Elqui, Com. Vicuña, rodados Cerro Colorado y rodados Lagunitas en el Río Seco, 16 February 1940, *Wagenknecht 5424* (CONC, SI); Prov. Limarí, Com. Monte Patria, Cordillera de Ovalle, Quebrada Larga, 17 February 1958, *Jiles 3423* (CONC). V Valparaíso: Prov. Los Andes, Com. San Estebán, Ascensión al Monte Aconcagua, 1 February 1983, *Gálvez s.n.* (SGO 109237). Región Metropolitana de Santiago: Prov. Cordillera, Com. San José del Maipo, Camino entre Laguna del Yeso y Baños del Plomo, 1 December 1992, *von Bohlen 1450* (SGO); Prov. Santiago, Com. Lo Barnechea, Valle Nevado, última pista, trayecto desde Alto tres Puntas hasta piedra numerada, camino a cerro El Plomo, January 1993, *Solervicens s.n.* (SGO 130779). VI Libertador O'Higgins: Prov. Cachapoal, Com. Mostazal, Cordillera del Peuco, no date, *Philippi* (SGO 78136).

4. *Menonvillea frigida* (Phil.) Rollins (1955: 23). *Hexaptera frigida* Philippi (1860: 8). Type:—CHILE. [Región de Antofagasta]. Río Frío, (desierto) Atacama, ca. 10800 ft (3292 m), *R. A. Philippi s.n.* (holotype SGO 63964!).

**Perennials** with woody, branched caudex. **Stems** 5–9(–15) cm, herbaceous to woody, slender, several from base, erect to subdecumbent, not branched above, glabrous throughout. **Leaves** cauline, sessile to subsessile; blade entire, lowermost leaves oblanceolate, 1–2.5 × 0.3–1.5 cm, glabrous, attenuate to a petiole-like base; uppermost leaves narrowly oblanceolate to lanceolate, 1–2 cm × 1.5–3 mm, glabrous or sparsely pubescent near apex with simple trichomes, margin entire, apex acute. **Racemes** terminal, ebracteate or proximally bracteate, densely corymbose, slightly elongated in fruit, 3–5 cm long; rachis glabrous, straight; fruiting pedicels ascending at base, divaricate and strongly recurved distally, 6–12 mm long, slender, distinctly enlarged near receptacle, glabrous. **Sepals** green, oblong, 3–3.5 × 1.2–1.5 mm, pubescent, erect, lateral pair slightly saccate at base, caducous, margin scarious; petals white, spatulate, 5–6 × 1.5–2 mm; clawed, not papillate at base; stamens slightly tetradynamous; filaments free, somewhat dilated and not papillate at base, 2.5–4 mm long; anthers oblong, ca. 1 mm long; nectar glands confluent, not petaloid, subtending bases of all filaments. **Fruits** broadly ellipsoid, glabrous or pilose;

valves 3-winged, smooth, 4–6 × 3–4.5 mm, notched at apex; wings ca. 1 mm wide, straight or slightly undulate; gynophore 1–3 mm long; style 1.3–1.5(–2.5) mm long; stigma slightly decurrent. **Seeds** ovate, 2–2.5 × 1.5–1.8 mm, wingless, flattened; cotyledons accumbent to obliquely so.

**Distribution and habitat:**—*Menonvillea frigida* grows in northwestern Chile (II Antofagasta), at elevations of 3200–4700 m (Fig. 12D).

**Phenology:**—Flowers between December and March.

**Taxonomic notes:**—*Menonvillea frigida*, along with *M. macrocarpa* and *M. cicatricosa*, have entire, lanceolate to oblanceolate leaves. It differs from both species by having smaller fruits (4–5 vs. 9–13 or 12–16 mm long in *M. macrocarpa* and *M. cicatricosa*, respectively); see other differences under *M. macrocarpa*.

**Representative Specimens:**—CHILE. II Antofagasta: Prov. Antofagasta, Com. Antofagasta, Volcán Llullaillaco, 13 January 1994, *Arroyo et al.* 94006 (CONC).

**5. *Menonvillea macrocarpa*** (I.M. Johnst.) Rollins (1955: 12). *Hexaptera macrocarpa* Johnston (1929b: 166). Type:—CHILE. [Región de Atacama]. Prov. Atacama, Depto. Vallenar, alluvial gravels at lower end of lake, Laguna Valeriano, 29°3'S, 69°52'W, 3,900 m, 8–10 January 1926, *I. M. Johnston* 6058 (holotype GH!; isotypes BAA!, fragm. ex GH, K!, US 1497694!).

**Perennials** with underground, woody, branched caudex annually producing aerial branches. **Stems** 8–22 cm, herbaceous, hirsute with spreading trichomes. **Leaves** cauline, subsessile; blade entire, oblong to narrowly elliptic or oblanceolate, 6–17 × 3–5 mm, hirsute with spreading or retrorse simple trichomes, base cuneate, margin entire, apex acute. **Racemes** terminal, ebracteate or proximally bracteate, corymbose, elongated in fruit, 3.5–10 cm long; rachis hirsute, straight; fruiting pedicels erect to ascending, straight, 1–1.5 cm long, hirsute. **Sepals** oblong, 3–4 × 1.2–1.5 mm, pubescent, erect, not saccate, caducous, margin scarious; petals pale yellow, spatulate, 5–6 × 1.5–2 mm, slightly differentiated into blade and claw, not papillate at base; stamens tetradynamous; filaments free, dilated at base, not papillate, 3.5–4.5 mm long; anthers oblong, ca. 1 mm long; nectar glands confluent, subtending bases of all filaments, not petaloid. **Fruits** subglobose to broadly ellipsoid, pubescent; valves 3-winged, transversely veined, 9–13 × 8–11 mm, notched apically; wings 2–3.5 mm wide, membranous, undulate; gynophore 1–2 mm long, slender; style 3–5 mm long; stigma capitate, entire. **Seeds** 3.5–4 × ca. 2.5 mm, wingless, flattened; cotyledons accumbent.

**Distribution and habitat:**—*Menonvillea macrocarpa* is endemic to Depto. Vallenar in III (Atacama) Region of Chile and is known only from the type collection (Fig. 12E).

**Phenology:**—This species flowers in January.

**Taxonomic notes:**—*Menonvillea macrocarpa* and *M. cicatricosa* have entire leaves and 3-winged fruit valves. However, the former differs by the herbaceous (vs. suffrutescent) habit, caducous (vs. persistent) petiolar bases, and pubescent (vs. glabrous) fruits. Also, *M. cicatricosa* grows in regions VI–VII of Chile and Mendoza in Argentina. Rollins (1955) suggested a possible relationship between *M. macrocarpa* and *M. cuneata*. Both species have deep and woody caudices with annual aerial branches, spreading or retrorse simple trichomes, and pubescent, 3-winged fruit valves. However, *M. macrocarpa* has acute (vs. 3-dentate or 3-lobed) leaves and pale yellow (vs. white) petals. Although it was not possible to sequence this species in the molecular phylogenetic studies, morphological characters suggest its inclusion in Sect. *Cuneata*.

**6. *Menonvillea nordenskjöldii*** (Dusén) Rollins (1955: 21). *Hexaptera nordenskjöldii* Dusén (1900: 172). *Hexaptera cuneata* Gillies & Hook. var. *nordenskjöldii* (Dusén) Gilg & Muschler (1909: 443). TYPE:—CHILE. [Región del Aysén]. Cerro Contreras, ca. 900 m, *O. Nordenskjöld* s.n. (holotype UPS 2267-32!).

**Perennials** with thick, deep, fleshy, branched caudex and often underground, prostrate, rhizome-like stems. **Stems** (3.5–)5–15(–30) cm, fleshy, erect to subdecumbent, usually unbranched above, with numerous foliar scars, sparsely to densely pubescent with simple, flat, crisped or more commonly twisted, spreading trichomes 1–2(–3) mm long, rarely glabrous or glabrescent. **Leaves** cauline, subsessile; blade cuneate, deeply 3–5(–7)-lobed at apex, (6–)8–18(–25) × (3–)5–10(–13) mm, densely pubescent to glabrescent or rarely glabrous, base cuneate,



differentiated or not into petiole and blade, margin entire, lobes acute at apex. **Racemes** terminal, ebracteate or less frequently bracteate proximally, corymbose, densely flowered, not elongated in fruit, borne only slightly above adjacent leaves, (1.5–) 2–4 cm long; rachis straight, usually pubescent or glabrescent; fruiting pedicels ascending to divaricate, usually straight, (8–)10–15(–20) mm long, glabrous or pubescent. **Sepals** oblong, (3–)4–5 × 1.5–2(–2.5) mm, pubescent or glabrous, erect, not saccate, usually persistent, margin scarious; petals white, sometimes purplish at base, spatulate to broadly so, (5–)6–8(–9) × (1.5–)2.5–3.5(–4.5) mm, clawed, not papillate at base, apex rounded; stamens tetradynamous; filaments free, erect, dilated and not papillate at base, 3–4(–4.5) mm long; anthers narrowly oblong, 1–1.5 mm long; nectar glands confluent, ringlike, subtending bases of all filaments. **Fruits** subglobose, glabrous or rarely pubescent; valves 3-winged, conspicuously veined, 5–8 mm in diam.; wings (1–)1.5–2(–2.3) mm wide; gynophore (0.5–)1–2(–3) mm long; style 1–2(–2.8) mm long; stigma slightly decurrent. **Seeds** ovate, 2.8–3.2 × 1.8–2 mm, wingless, flattened; cotyledons accumbent.

**Distribution and habitat:**—*Menonvillea nordenskjöldii* is the southernmost species of the genus and restricted to Patagonian Argentina (Chubut, Río Negro and Santa Cruz) and southern Chile (IX Aysén and XII Magallanes). It grows on rocky soils at the limits of vegetation between 500–2100 m (Fig. 12F).

**Phenology:**—Flowers mainly from December to March, although *Dollenz 1226* (HIP) was collected on April.

**Taxonomic notes:**—*Menonvillea nordenskjöldii* is morphologically related to *M. cuneata* and *M. rigida*, from both of which it is easily distinguished by having leaves deeply 3–5(–7)-lobed (vs. 3-dentate/lobed), spreading, flat, crisped or twisted trichomes to 3 mm long (vs. straight, retrorse or spreading trichomes to 1(–1.2) mm long), and persistent (vs. caducous) sepals. Molecular phylogenies based on nuclear and chloroplast data indicate that *M. nordenskjöldii* is most closely related to *M. rigida*.

**Representative Specimens:**—ARGENTINA. Chubut: Depto. Futaleufú, Parque Nac. Los Alerces, cordón Situación, February 1944, *Pérez Moreau s.n.* (BA 49542, BAA). Río Negro: Depto. San Carlos de Bariloche, Cerro Colorado, 16 February 1942, *Neumeyer 597* (SI). Santa Cruz: Depto. Güer Aike, Cerro Pinaculo, January 1977, *Boelcke 626* (SI); Depto. Lago Argentino, El Calafate, Estancia Anita, Cerro Huiliche, 2° laberinto, 14 December 2001, *Guerrido & Fernández 434* (LP, SI); Depto. Río Chico, Cerro Corona. Ea. "El Rincón", Lago Belgrano, 23 December 1940, *Spegazzini 178* (BAB). CHILE. XI Aysén: Prov. Capitán Prat, Com. O'Higgins, Villa O'Higgins, Cuenca del Río Mosco, 24 March 2003, *García 131* (CONC). XII Magallanes: Prov. Magallanes, Com. Punta Arenas, Isla Riesco, Fiordo Fanny, 2 April 1982, *Dollenz 1226* (HIP); Prov. Última Esperanza, Com. Torres del Paine, Sierra de Los Baguales, Estancia la Cumbre, Cerro sin nombre, 7 January 1987, *Landero 732* (CONC).

**7. *Menonvillea patagonica*** Spegazzini (1902: 229). Type:—ARGENTINA. [Provincia de Chubut]. Arid areas between Teka-choique and Carrenleufú, 1899, *N. Illin s.n.* (holotype LP 10408!).

*Menonvillea alyssoides* Rollins (1955: 25). Type:—ARGENTINA. [Provincia de Neuquén]. Zapala, 12 October 1925, *H. F. Comber 66* (holotype K!; isotype E!).

**Annuals** with conspicuous taproot. **Stems** 1.5–14 cm, 1 to several from base, erect to subdecumbent, branched above, sparsely hirsute with straight, simple, terete trichomes 0.4–0.6 mm long. **Leaves** basal and cauline, petiolate, basal not rosulate to subrosulate; blade broadly spatulate to oblong in outline, shallowly pinnately lobed to repand, 0.3–3 cm long, sparsely hirsute with antrorse, terete trichomes; cauline leaves reduced in size upward. **Racemes** terminal, rarely axillary, bracteate at least proximally, corymbose, elongated in fruit, 2–8 cm long; rachis straight, pilose to sparsely hirsute; fruiting pedicels divaricate, straight, 3–6 mm long, sparsely hirsute. **Sepals** oblong, 1.5–2 × ca. 1 mm, caducous, sparsely hirsute, erect, not saccate at base, margin membranous; petals white, spatulate, 1.5–3(–3.5) × 0.6–1(–1.5) mm, claw papillate; stamens slightly tetradynamous; filaments free, erect, dilated and papillate at base, 1–1.5(–1.8) mm long; anthers ovate, 0.3–0.6 mm long; nectar glands confluent, not petaloid. **Fruits** subglobose, glabrous; valves conspicuously convex adaxially, strongly concave abaxially, cupuliform to globose in cross section, 2-winged, (2.5–)3–5 × (2–)3–4 mm, emarginate above and below; wings extending away from the replum or reflexed to form a nearly complete cavity, 0.4–1 mm wide, slightly undulate to straight; gynophore obsolete, to 0.25 mm long; style (0.8–)1–1.5 mm long; stigma slightly decurrent. **Seeds** ovate, 1.5–1.7 × 1–1.3 mm, slightly compressed; cotyledons accumbent, often persistent.

**Distribution and habitat:**—*Menonvillea patagonica* is endemic to Argentina in Chubut, Neuquén and Río Negro provinces. It grows on sandy-rocky soils frequently close to streams at 500–2500 m (Fig. 12G).

**Phenology:**—Flowers from October to February.

**Taxonomic notes:**—*Menonvillea patagonica* is easily distinguished by its glabrous fruit valves, strongly concave abaxially and with wings extending away from the replum or curved to form a nearly complete cavity. Rollins (1955) differentiated *M. alyssoides* from *M. patagonica* mainly by having taller plants prominently branched at base, petals 2.5–3.5 (vs. ca. 1.5) mm long, and reflexed fruit wings often forming a cavity (vs. poorly developed wings not forming a cavity). However, specimens such as *Boelcke 11235* (BAA, BAB, SI) have closed valves and petals less than 2.5 mm long, and *Vallerini 396* (BAA, BAB) have open valves and petals more than 3 mm long. Additionally, the degree of wing curvature can vary from open to reflexed or closed on the same plant (e.g., *Vallerini 396* at BAA). These observations, along with the unreliable stem branching, show that there are no clear morphological differences that justify the recognition of *M. alyssoides* as distinct from *M. patagonica*.

**Representative Specimens:**—ARGENTINA. Chubut: Depto. Languiñeo, Ruta 12 entre Gualjaina y Paso del Sapo, pasando el río Gualjaina, 31 October 2008, *Biganzoli & Larsen 1907* (SI), Depto. Río Senguer, Ruta Nacional 40, Parador Estancia Laurita, 19 November 2012, *Zuloaga et al. 13942* (SI). Neuquén: Depto. Catán Lil, Catán Lil, 14 December 1972, *Vallerini s.n.* (BAA, CRP 3521); Depto. Chos Malal, Chos Malal, cajón inferior del Arroyo turbio (localmente llamado arroyo Domuyo), 28 January 1964, *Boelcke 11306* (BAA), cajón del Arroyo del Cruce, en la ladera seca próxima al arroyo, 27 January 1964, *Boelcke 11235* (BAA, BAB, SI); Depto. Zapala, 15 km al sur de Zapala, 19 November 1969, *Ancibor et al. s.n.* (BAB 90253, SI). Río Negro: Depto. 25 de Mayo, aprox. 60 km al Sur de Jacobacci, arroyo Quetrequile, 9 November 1966, *Abadie & Vallerini s.n.* (BAA, CRP 1048); Depto. Pilcaniyeu, RN 40, a aprox. 10 km al sur de Paso Flores, 29 November 1963, *Vallerini 396* (BAA, BAB).

8. *Menonvillea rigida* Rollins (1955: 14). Type:—ARGENTINA. [Provincia de Neuquén]. Arroyo Manzana, Andes Expedition 38–41°S, 1925–1927, *H. F. Comber 1130* (holotype K!; isotype GH! fragm. ex K).

**Perennials** with thick, deep, fleshy to woody, branched caudex. **Stems** (6–)9–25(–30) cm, fleshy or more frequently woody, thick, erect, generally unbranched above, with numerous leaf scars, pubescent to canescent with simple, terete, straight, retrorse or less frequently spreading to antrorse trichomes 0.5–1.2 mm long. **Leaves** cauline, subsessile, cuneate, 7–18(–25) × (3–)5–8 mm, canescent, generally with retrorse trichomes or sometimes antrorse to spreading adaxially, base cuneate to attenuate, margin entire, apex 3-lobed or 3-dentate. **Racemes** terminal, ebracteate or frequently bracteate proximally, corymbose, densely flowered, slightly elongated in fruit, 3–6 cm long; rachis straight, canescent; fruiting pedicels ascending to divaricate or reflexed, straight to recurved, (6–)8–14 mm long, densely pubescent with spreading trichomes. **Sepals** oblong, 4–6 × 2–2.5 mm, pubescent, erect, not saccate, caducous, margin scarious; petals white, spatulate to broadly so, 6.5–9 × 1.5–3.5 mm, clawed, not papillate at base; stamens tetradynamous; filaments free, erect, dilated and not papillate at base, 3–5.5 mm long; anthers narrowly oblong, 1.2–2 mm long; nectar glands confluent, ringlike, subtending bases of all filaments. **Fruits** subglobose, pubescent with spreading trichomes; valves 3-winged, conspicuously veined, 9–13(14) × 7–12 mm, emarginate apically, wings 1.5–2(–2.7) mm wide; gynophore 1.5–2(–3) mm long; style 2–3 mm long; stigma slightly decurrent. **Seeds** ovate, ca. 4 × 3 mm, wingless, flattened; cotyledons accumbent.

**Distribution and habitat:**—*Menonvillea rigida* is endemic to Argentina where it grows in north-central Patagonia (Neuquén and Río Negro) on rocky slopes at elevations of 1500–1900 m (Fig. 12H).

**Phenology:**—Flowers from December to March.

**Taxonomic notes:**—Although Rollins (1955) considered *Menonvillea rigida* to be morphologically related to *M. nordenskjoeldii*, the species also seems to be related to *M. cuneata*, as both have simple, terete, straight and usually retrorse trichomes 0.5–1(–1.2) mm long, compared to trichomes 1–2(3) mm long in *M. nordenskjoeldii*. Furthermore, their leaves are 3-dentate to slightly 3-lobed, whereas those of *M. nordenskjoeldii* are deeply 3–5(–7)-lobed at apex. Based on these similarities, Al-Shehbaz (2008) included *M. rigida* in the synonymy of *M. cuneata*. However, the former has thick and conspicuously woody stems with numerous leaf scars and fruit valves 9–13(–14) mm long. By contrast, *M. cuneata* has generally thin, fleshy or slightly woody stems without leaf scars, and the fruit valves are (4–)5–8(–11) mm long. Also, leaves of *M. rigida* have trichomes antrorse adaxially and retrorse to spreading abaxially [as in *Diem 933* (LIL, SI), *Diem 2959* (BAB), *Neumeyer 596* (SI)], whereas those of *M. cuneata* have retrorse to spreading trichomes on both surfaces. Molecular phylogenies agree with Rollins (1955) in recognizing *M. rigida* as most closely related to *M. nordenskjoeldii*.

**Representative Specimens:**—ARGENTINA. Neuquén: Depto. Huiliches, Parque Nac. Lanín, ladera N, subiendo al refugio por sendero de mulas, 1 February 2000, *Ezcurra* 2979 (BCRU); Depto. Lácar, Cerro Chapelco, 11 December 1963, *Schajovskoy* 7712 (BAB); Depto. Los Lagos, Filo Machete al Cerro Rothkugel, 11 March 1945, *Diem* 933 (LIL, SI); Villa Puerto Manzano, 11 February 1962, *Diem* 2959 (BAB). Río Negro: Depto. Bariloche, cerro Capilla, faldeo Sur, March 1942, *Neumeyer* 596 (SI).

9. *Menonvillea spathulata* (Gillies & Hook.) Rollins (1955: 22). *Hexaptera spathulata* Gillies & Hook. in Hooker (1830: 351). Type:—ARGENTINA or CHILE. Andes between Chile and Mendoza, *J. Gillies s.n.* (holotype K!; isotype E!).

*Hexaptera pusilla* Philippi (1872: 674). *Hexaptera spathulata* Gillies & Hook. var. *pusilla* (Phil.) Reiche (1895: 89). *Hexaptera spathulata* subsp. *pusilla* (Phil.) Gilg & Muschler (1909: 443). Type:—ARGENTINA [Provincia de Mendoza], Paso de las Avestruces, Cruz de Piedras, 1871, *F. Leybold s.n.* [lectotype designated by Al-Shehbaz *et al.* (2011: 284), SGO 63965!; isolectotype SGO 68270!].

*Hexaptera cuneata* (Gillies & Hook.) Rollins var. *edentata* Kuntze (1898: 6). Type:—ARGENTINA. [Provincia de Mendoza]. Cordillera, Paso Cruz, *O. Kuntze* 51 (holotype NY!; isotype CORD!).

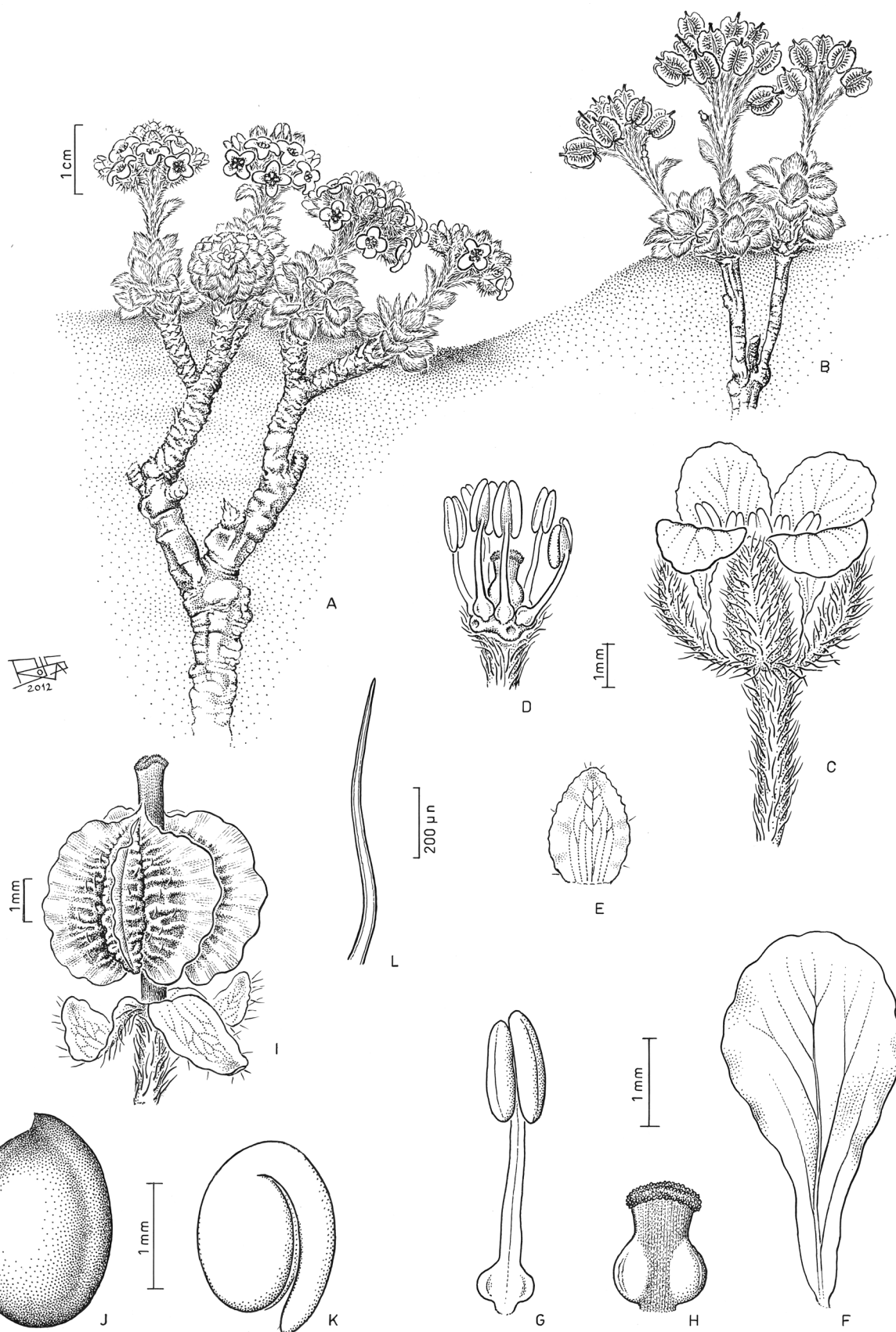
**Perennials**, caespitose, with deep, branched caudex. **Stems** 2.5–8(–13) cm, woody to slightly fleshy, 1 to several from base, usually canescent with straight, simple, terete, antrorse trichomes 0.5–1.5 mm long. **Leaves** petiolate, subrosulate; blade entire, suborbicular to broadly obovate, rarely oblong, 5–15(–20) × (3–)4–6(–8) mm, pubescent with appressed, antrorse trichomes, base cuneate, margin entire, apex rounded or rarely acute; upper leaves smaller and narrower. **Racemes** terminal, ebracteate or less frequently bracteate proximally, corymbose, slightly elongated in fruit, 1.3–4(–5.5) cm long; rachis pilose, straight; fruiting pedicels ascending at base, straight or often recurved distally, (5–)7–11 mm long, appressed hirsute. **Sepals** broadly oblong, (2–)2.53.5(–4.5) × (1.2–)1.5–2 mm, hirsute, erect, not saccate, persistent, margin membranous; petals white, sometimes slightly purplish at base, spatulate to broadly so, 4–6(–6.5) × 1.5–2(–3) mm, clawed, not papillate at base; stamens tetradynamous; filaments free, conspicuously dilated at base, not papillate, white, 2–3 mm long; anthers oblong to narrowly so, 11.4 mm long; nectar glands confluent, subtending or surrounding bases of all filaments. **Fruits** globose to broadly ovoid, sparsely hirsute or glabrous; valves 3-winged, prominently ribbed between wings, (3.5–)4–6(–8.5) × (3.5–)5–7(–8.5) mm; lateral wings (0.3–)1–2(–2.5) mm wide, purplish red at maturity, slightly undulate; dorsal wing smaller, occasionally reduced to a crest, 0.1–1.4(–2) mm wide; gynophore 0.5–1.3 mm long; style 1–2(–3) mm long; stigma slightly decurrent. **Seeds** broadly ovate, 2.2–3.2(–4) × 1.6–2.2(–3) mm, wingless, flattened to somewhat plump; cotyledons accumbent. Fig. 15.

**Distribution and habitat:**—*Menonvillea spathulata* grows in Argentina (Mendoza) and Chile (Región Metropolitana de Santiago and V Valparaíso) at elevations of 2100–4200 m (Fig. 12H).

**Phenology:**—Flowers from November to March.

**Taxonomic notes:**—A very distinct species easily distinguished by its dwarf size, appressed, terete and antrorse leaf trichomes, persistent sepals, strongly dilated filament bases, and fruit valves conspicuously ribbed abaxially between the wings. Width of the fruit wings is highly variable, and some specimens have almost wingless fruits and others with fully developed wings to 2.5 mm wide.

**Representative Specimens:**—ARGENTINA. Mendoza: Depto. Las Heras, Cerro Pelado, 2 February 1913, *Sanzin* 116 (SI); Depto. Luján de Cuyo, Cerro platita, 21 January 1983, *Roig* 11058 (MERL); Depto. Malargüe, Mallin del Valle, December 1912, *Hicken* 94 (SI), Depto. San Carlos, reserva provincial Laguna del Diamante, 2 February 2010, *Prina* 3624 (SI, SRFA); Depto. San Rafael, subida desde Ruta Provincial 180 a Cerro El Nevado, 20 November 2010, *Zuloaga et al.* 12258 (SI); Depto. Tunuyán, cerca de las llaretas, entre Real de Curuona y las Lagunitas, camino al Paso del Portillo Argentino, 24 December 1933, *Ruiz Leal* 1903 (MERL). CHILE. Región Metropolitana de Santiago: Prov. Cordillera, Com. San José de Maipo, Cajón del Yeso Termas El Plomo, sendero hacia Paso Piuquenes, 18 January 1995, *Muñoz et al.* 3513 (SGO). V Valparaíso: Prov. Los Andes, Com. San Estebán, Portillo, lado de Chile, no date, *Diaz s.n.* (SGO 63966).



**FIGURE 15.** *Menonvillea spathulata* (Gillies & Hook.) Rollins. **A**, plant with flowers. **B**, plant with fruits. **C**, flower. **D**, nectar glands, stamens and ovary. **E**, sepal. **F**, petal. **G**, stamen. **H**, ovary. **I**, fruit, dorsal view. **J**, seed. **K**, embryo. **L**, leaf trichome. From Boelcke et al. 10008 (SI). Scale bars: A–B = 1 cm; D–K = 1 mm; L = 200  $\mu$ m.



10. *Menonvillea virens* (Phil.) Rollins (1955: 15). *Hexaptera virens* Philippi (1891: 6). Type:—Chile. [Región de Antofagasta]. Prov. Tarapacá, entre Machuca a Copacoya, 3200–3500 m, 18 February 1885, *F. Philippi 1838* [lectotype designated by Al-Shehbaz et al. (2011: 284), SGO 63960!; isolectotype SGO 68264!].

**Perennials** with deep, woody to subfleshy, much branched, rhizome-like caudex. **Stems** 4–15 cm, subfleshy, erect to subdecumbent, generally unbranched above, glabrous or sparsely to densely pubescent with short, spreading or retrorse, terete trichomes to 0.7 mm long. **Leaves** cauline, not rosulate, distinctly petiolate; blade orbicular to broadly spatulate or obovate, 1–3 × (0.6–)1–1.5(–2.2) cm, pubescent or rarely glabrescent, abruptly narrowed below, margin entire, apex rounded or 3–5-toothed. **Racemes** terminal, ebracteate or proximally bracteate, corymbose, not or just slightly elongated in fruit, slightly exerted to subincluded among leaves, (1.5–)2–5 mm long; rachis straight, pubescent or glabrous; fruiting pedicels divaricate, usually curved, 6–10(–13) mm long, glabrous or pubescent. **Sepals** oblong, (2.5–)3–5 × 1.8–2.2 mm, pubescent, erect, not saccate, caducous, margin membranous; petals white, spatulate to obovate, (4–)5–7(–9) × (1.5–)2–2.5(–3) mm, clawed, not papillate at base; stamens tetradynamous; filaments free, erect, white, not papillate and only slightly dilated or not at base, 2–4.5 mm long; anthers narrowly oblong, 1–1.4 mm long; nectar glands confluent, surrounding bases of all filaments, not petaloid. **Fruits** subglobose, glabrous or sparsely pubescent; valves 3-winged, 5–6(–8.5) × 4–7 mm; wings 0.5–1.6(–2) mm wide; gynophore 0.8–2(–3) mm long; style 1–2.5(–3) mm long, stout; stigma slightly decurrent. **Seeds** ovate to suboblong, 2.5–3 × 1.5–1.8 mm, wingless, flattened; cotyledons accumbent.

**Distribution and habitat:**—*Menonvillea virens* is distributed in northern Argentina (Jujuy, Salta, Catamarca, Tucumán, and La Rioja provinces) and northern Chile (II Antofagasta, III Atacama), where it grows at elevations between 2000 and 5300 m. It is common on rocky soils of metamorphic rocks as shales and slates (Fig. 12J).

**Phenology:**—Flowers between November and April.

**Taxonomic notes:**—*Menonvillea virens* is morphologically related to *M. cuneata*, and more distantly to *M. nordenskjöldii* and *M. rigida*, and molecular phylogenies indicate a closer relationship with *M. cuneata*. It is easily distinguished from these species by having distinctly petiolate, orbicular to broadly spatulate leaves abruptly narrowed at base and rounded or 3–5-toothed at apex. The trichomes in *M. virens* differ from those of *M. nordenskjöldii* by being short, terete, spreading or retrorse (vs. long, flat, crisped or twisted, spreading) and, although similar in form and orientation, they are shorter than those of *M. cuneata* and *M. rigida*.

**Representative Specimens:**—ARGENTINA. Catamarca: Depto. Ambato, Sierra de Ambato, falda E, subiendo desde El Rodeo, cerca de la cumbre del Cerro Manchado, 21 February 1971, *Hunziker 20873* (BAA); Depto. Santa María, El Cajón, Cumbres del Negro Ara, La Bolsa, 17 January 1914, *Castillón 3361* (GH, LIL); Depto. Tinogasta, San Francisco, El Hoyito, camino a Chile, 2 November 1930, *Schreiter 6109* (LIL). Jujuy: Depto. Dr. Manuel Belgrano, de Refugio Militar al Chañi, 28 January 2012, *Zannoti & Suescún 286* (SI); Depto. Rinconada, Mina Pirquitas, Cerro Granada, ladera sur, 1 March 1970, *Fabris & Zuloaga 7740* (LP); Depto. Susques, Cerro Tuzgle, 2 February 1944, *Cabrera 8365* (LP). La Rioja: Depto. Famatina: Sierra de Famatina, camino a la mina La Mexicana, Cueva. De Noroña, 20 January 1986, *Kiesling et al. 6384B* (BAA); Depto. Felipe Varela, Las Trancas, Cerro Coloradito, 10 March 1907, *Kurtz 14583* (CORD). Salta: Depto. Cachi, Cerro de Cachi, January 1897, *Spegazzini 21243* (LP); Depto. Los Andes, a ca. 40 km al SW de San Antonio de los Cobres, en camino a Pastos Grandes, 17 December 1946, *Krapovickas 3206* (LIL); Depto. San Carlos, Nevado del Cajón, 25 February 1914, *Rodríguez 1399* (LIL, LP, SI). Tucumán: Depto. Chicligasta, Aconquija, Nevado Overo, Falda SE, 9 March 1941, *Rohmeder s.n.* (LIL 300670); Depto. Tafí del Valle, Cumbres Calchaquies, 9 March 1952, *Sparre 9742* (BAA). CHILE. II Antofagasta: Prov. El Loa, Com. San Pedro de Atacama, Cordón Cerro de la Pacana, cuesta entre Salar de Aguas Calientes y Quebrada Quepiaco, 11 April 1997, *Arroyo et al. 97500* (CONC). III Atacama: Prov. Chañaral, Com. Diego de Almagro, Chañaral, Cuesta entre Salar de Gorbea y Salar de la Isla, 22 January 1994, *Arroyo et al. 94156* (CONC).

## Sect. *Menonvillea*

**Annual** or perennial herbs, with simple or branched caudex. **Stems** 1 to many, simple or branched basally and/or above, erect to decumbent, herbaceous. **Trichomes** when present simple or branched and arachnoid. **Leaves** sessile, filiform to linear, entire, trifid, or pectinate. **Racemes** ebracteate. **Sepals** base of inner pair saccate or

not. **Petals** yellow to creamy white, claw undifferentiated or strongly differentiated from blade, glabrous or minutely papillate at base. **Stamens** subequal or tetradynamous; filaments slender, glabrous or minutely papillate, free. **Nectar glands** commonly 4 and petaloid, rarely 1 and confluent or inconspicuous. **Fruits** glabrous or papillate, never pilose, 2- or 3-winged, rarely wingless (*M. minima*), with or without central or 2 lateral callosities dorsally, sometimes with 2 lateral callosities ventrally. **Stigma** decurrent, 2-lobed. **Cotyledons** incumbent, rarely obliquely accumbent.

Eleven species.

#### Key to the species of *Menonvillea* sect. *Menonvillea*

1. Fruit valves hemispherical, strongly convex dorsally, flat ventrally, wingless or with rudimentary wings ..... *M. minima*
- Fruit valves not hemispherical, 2- or 3-winged, wings distinct ..... 2
2. Fruit valves without conspicuous callosities dorsally ..... 3
- Fruit valves with conspicuous callosities dorsally ..... 5
3. Valve wings 2 (both lateral); stems glabrescent to floccose with arachnoid simple and branched trichomes ..... *M. flexuosa*
- Valve wings 3 (2 lateral and 1 dorsal); stems glabrous or only with arachnoid simple trichomes ..... 4
4. Leaves subapically 3-lobed; pedicels ascending to recurved, 1.5–3.5(–4) mm long; seeds oblong, plump ..... *M. purpurea*
- Leaves undivided; pedicels ascending to arcuate, 3.5–6 mm long; seeds ovate, compressed ..... *M. constitutionis*
5. Fruit valves dorsally with a conspicuous central callus over midvein, with or without clavate papillae between the callosities and midvein ..... 6
- Fruit valves dorsally with two lateral callosities adjacent to wings, surrounded or not by clavate papillae ..... 9
6. Perennials with woody caudex ..... *M. linearis*
- Annuals without caudex ..... 7
7. Sepals strongly saccate at base, 4–5(–6.5) mm long; petals linear, (6.5–)7–11 (–12) mm long; fruiting pedicels 1.5–3(–4.5) mm long ..... *M. filifolia*
- Sepals slightly saccate or not saccate at base, 1.2–2.5(–3) mm long; petals narrowly-spatulate to broadly obovate, 2–4.5(–5) mm long; fruiting pedicels (1.5–)4–8(–9) mm long ..... 8
8. Petals yellow, narrowly spatulate; fruit valves with crenate to entire wings ..... *M. marticorenae*
- Petals white, broadly obovate; fruit valves with entire or rarely undulate wings ..... *M. litoralis*
9. Stems with simple or more frequently branched arachnoid trichomes; rachis of raceme conspicuously flexuous in fruit; sepals narrowly oblong, all or at least inner pair saccate at base; cotyledons obliquely accumbent ..... *M. pinnatifida*
- Stems with only simple arachnoid trichomes; rachis of raceme straight in fruit; sepals oblong to broadly so, not saccate at base; cotyledons incumbent ..... 10
10. Annuals with sparsely floccose to glabrescent stems; sepals 1.5–2(–2.5) mm long; petals 2.5–4.4 mm long, not papillate at base; fruit valves broadly oblong, 2.5–3.2(–4.2) mm long; wings undulate, 0.2–0.4(–0.7) mm wide ..... *M. chilensis*
- Perennials with densely floccose stems (rarely glabrescent or sparsely pubescent annuals or biennials); sepals 2.5–4(–4.4) mm long; petals (3.5–)7(–8) mm long, sparsely papillate at base or rarely glabrous; fruit valves suborbicular, (2.5–)3.5–5.5(–6) mm long; wings flat, (0.5–)0.8–1.2 mm wide ..... *M. orbiculata*

11. *Menonvillea chilensis* (Turcz.) Jackson (1894: 207). *Cymatoptera chilensis* Turczaninow (1854: 309). *Menonvillea media* Turczaninow (1863: 551) *nom. illeg. superfl.* [= *Menonvillea chilensis* (Turcz.) B.D. Jacks.]. Type:—CHILE. [Región de Atacama]. Prov. Coquimbo, hills between Copiapo and Huasco, Mar 1842, *T. Bridges* 1279 (holotype KW!; isotypes BM!, E!, G!, K!, LE!, P!).

*Menonvillea aptera* Philippi (1860: 9). *Menonvillea parviflora* (Phil.) var. *aptera* Johnston (1929a: 44). *Menonvillea chilensis* var. *aptera* (Phil.) Rollins (1955: 50). Type:—CHILE. [Región de Antofagasta]. Aguada del Clérigo, cerca de Hueso Parado, 366 m, *R. A. Philippi s.n.* (holotype SGO 63971!).

*Menonvillea parviflora* Philippi (1860: 8). *Menonvillea orbiculata* Phil. var. *parviflora* (Phil.) Reiche (1895: 85). Type:—CHILE. [Región de Atacama] Cachinal de la Costa, 518 m, *R. A. Philippi s.n.* [lectotype designated by Al-Shehbaz *et al.* (2011: 285), SGO 49154!; isoelectotype SGO 68273!].

*Menonvillea parvula* Philippi (1892: 336). *Menonvillea pinnatifida* Barnéoud var. *parvula* (Phil.) Gilg & Muschler (1909: 441). Type:—CHILE. [Región de Atacama]. Prov. Atacama, cerca de Huasco, October 1866, *F. Philippi s.n.* [lectotype designated by Al-Shehbaz *et al.* (2011: 286), SGO 63976!; isoelectotype 63208!].

*Menonvillea orbiculata* Phil. fo. *glabra* Gilg & Muschler (1909: 442). Type:—CHILE. [Región de Coquimbo]. Prov. de Coquimbo, *F. Philippi s.n.* [holotype B; isotype F!].

**Annuals.** **Stems** (4–)6–24(–34) cm, erect to ascending, highly branched at base, glabrescent to sparsely floccose, usually densely floccose at leaf axils, with simple floccose or arachnoid trichomes to 0.5 mm long. **Leaves** basal and cauline, sessile to subsessile; blade pectinate or trifid, rarely undivided, with linear segments, usually flat, (1–)1.5–5.5(–7) cm × 0.5–1.5(–2.5) mm, glabrous to sparsely pubescent. **Racemes** terminal or axillary, ebracteate,

corymbose, elongated considerably in fruit, (2.5–)4–8.5 cm long; rachis glabrous to glabrescent, straight in fruit; fruiting pedicels divaricate, ascending to recurved or arcuate, (1–)1.5–3(–4) mm long, glabrous or sparsely pubescent, somewhat flattened at base. **Sepals** broadly oblong, 1.5–2(–2.5) × 0.9–1.2(–1.5) mm, glabrous or sparsely pubescent, erect, not saccate at base, caducous, margin membranous; petals yellow to yellowish green, linear, 2.5–4.4 × 0.6–1(–1.2) mm, clawed, not papillate at base; stamens slightly tetradynamous; filaments free, erect, not dilated or papillate at base, (1.5–)1.8–(–2.5) mm long; anthers oblong, 0.5–0.9 mm long; nectar glands confluent, petaloid. **Fruits** broadly oblong; valves narrowly 2-winged, 2.5–3.2(–4.2) × (1.5–)2–2.5(–3.5) mm, usually notched at apex and base, dorsal and ventral surfaces each with 2, well-developed, usually wrinkled lateral callosities separated by numerous to few, conspicuous, clavate papillae; midrib prominent or rarely slightly marked; wings 0.2–0.4(–0.7) mm wide, undulate; gynophore 0.4–1 mm long; style 1–1.5 mm long; stigma 2-lobed, subdecurent. **Seeds** ovate, 1.3–1.6 × 0.9–1.2 mm, plump, slightly compressed; cotyledons incumbent. Fig. 16.

**Distribution and habitat:**—*Menonvillea chilensis* is endemic to northern Chile, where it is distributed in regions II (Antofagasta), III (Atacama), and IV (Coquimbo), at elevations between 0–800 m. It grows on rocky hillsides, steep granite slopes, rock crevices, rocky beds, and ravines with scattered shrubs (Fig. 13A).

**Phenology:**—Flowers between September and November.

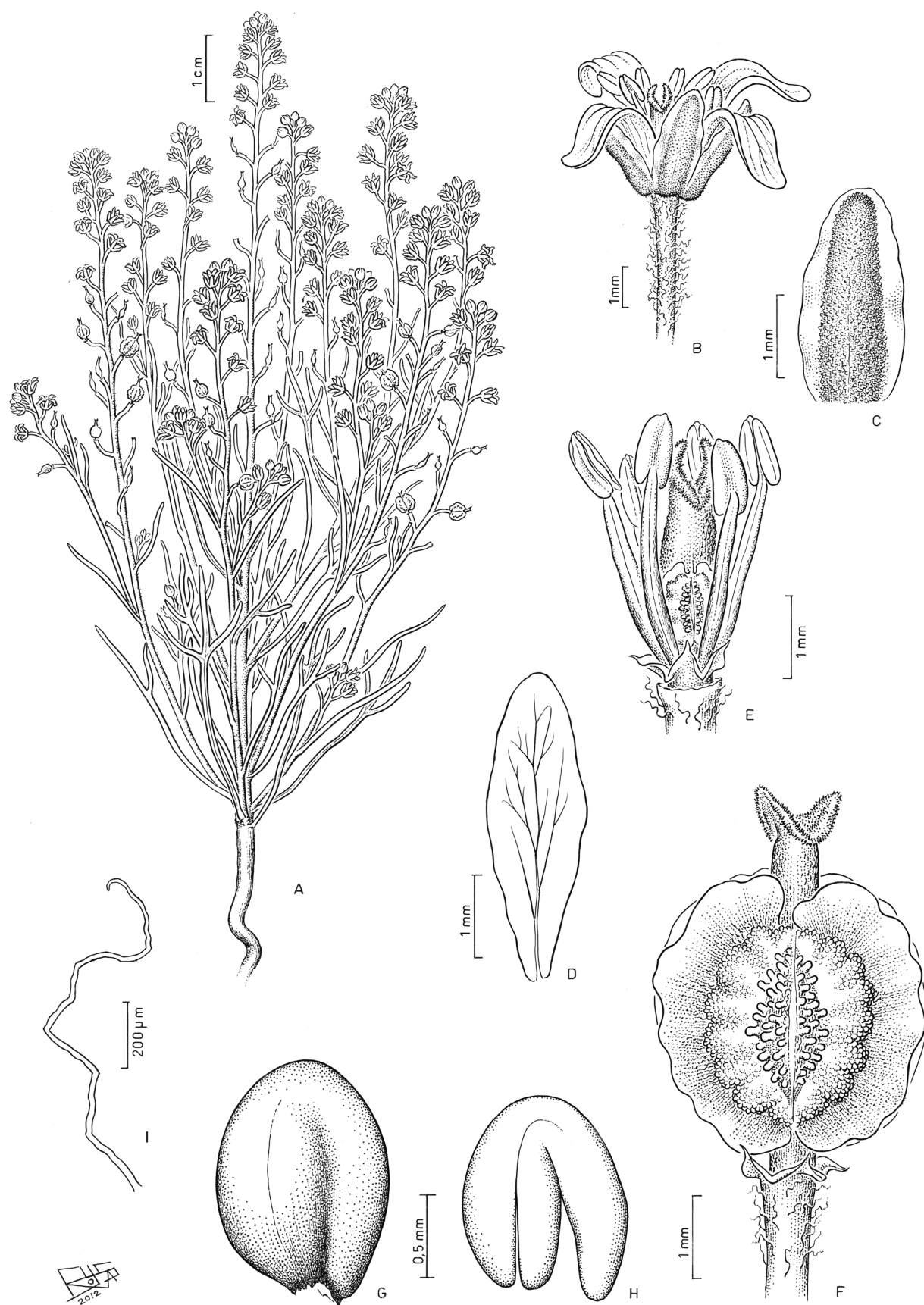
**Taxonomic notes:**—*Menonvillea chilensis* is highly variable in fruit morphology, and some of its variants were previously recognized at the specific or varietal ranks. The most noticeable variation is in the degree of development of the fruit wing. Forms with reduced wings have been treated as var. *aptera* (Rollins, 1955), but plants with reduced or fully developed wings are found in the same population. In one collection, *Ricardi et al. 1504* (CONC), both maximum and minimum measurements of the fruit wing are observed. Other characters cited by Rollins (1955) to differentiate this variety were the pedicel orientation or the prominence of midrib. These characters too are highly variable, as in *Garaventa 7094* (SI), with ascending, recurved and arcuate pedicels, or in *King s.n.* (CONC 61882) with obscurely developed midrib. Therefore, var. *aptera* is here included within the morphological range of *M. chilensis*.

*Menonvillea chilensis* and *M. orbiculata* are morphologically related and sometimes difficult to separate. The former includes sparsely floccose to glabrescent annuals with broadly oblong fruits 2.5–3.2(–4.2) long, undulate wings 0.2–0.4(–0.7) wide, well-developed wrinkled lateral callosities, sepals 1.5–2(–2.5) mm long, and petals 2.5–4.4 mm long not papillate at base. By contrast, *M. orbiculata* includes usually densely floccose perennials (occasionally glabrescent or sparsely pubescent annuals or biennials) with suborbicular fruits (2.5–)3.5–5.5(–6) mm long, flat wings (0.5–)0.8–1.2 mm wide, poorly developed or not wrinkled lateral callosities, sepals 2.5–4 mm long, and petals (3.5–)7(–8) mm long and with a sparsely papillate base or rarely glabrous.

The label of *Cymatoptera chilensis* isotype at E reads “Hills between Copiapo and Huasco, Province of Coquimbo”. However, Copiapó and Huasco are located in Región III (Atacama).

In the protologue of *Menonvillea parvula*, Philippi (1892) cited the specimens Huasco, Oct. 1866, *F. Philippi*. Rollins (1955) corroborated this material type and noted “the type of *M. parvula* consist of two plants labeled “*Thionophila parvula* Ph., Huasco. Octobri 1866”. Al-Shehbaz *et al.* (2011) correctly listed SGO 63976 and SGO 63208 as the lectotype and isotype, respectively. However, they erroneously included SGO 68272 as an isotype with a label “Huasco, Sep 1885, *F. Philippi*”. The last specimen is excluded herein from the type collection of *M. parvula* and included as probable isotype of *M. minima* Rollins (see below).

**Representative Specimens:**—CHILE. II Antofagasta: Prov. Antofagasta, Com. Taltal, Quebrada San Ramón, 5 km al norte de Taltal, 15 November 1987, *Hoffmann & Rodríguez 180* (CONC). III Atacama: Prov. Chañaral, Com. Chañaral, Parque Nacional Pan de Azúcar, Quebrada cerro Castillo, 13 October 1992, *Muñoz 3075* (SGO); Prov. Copiapó, Com. Copiapó, “La Travesía”, entre Vallenar y Copiapó, 27 October 1961, *Garaventa 7094* (BAA, SI), *Garaventa 7095* (BAA, CONC, SI), Carrizal bajo, no date, *King s.n.* (CONC 61882); Prov. Huasco, Com. Huasco, 10 Km al E. de Huasco, 8 October 1987, *Teillier 922* (CONC). IV Coquimbo: Prov. Elqui, Com. Coquimbo, Coquimbo, 1885, *Philippi s.n.* (SGO 77943).



**FIGURE 16.** *Menonvillea chilensis* (Turcz.) B.D. Jacks. **A**, plant. **B**, flower. **C**, sepal. **D**, petal. **E**, nectar glands, stamens and ovary. **F**, fruit, dorsal view. **G**, seed. **H**, embryo. **I**, leaf trichome. From Ricardi *et al.* 1285 (CONC). Scale bars: A = 1 cm; B–F = 1 mm; G–H = 500 µm; H = 200 µm.



12. *Menonvillea constitutionis* (F. Phil.) Rollins (1955: 36). *Hexaptera constitutionis* Philippi (1892: 335). Type:—CHILE. [Región del Maule]. Desembocadura del Río Maule, cerca de Constitución, *R. Azocart s.n.* (holotype SGO 63962!).

**Perennials** with woody, branched caudex. **Stems** 10–35 cm, erect, several from base, simple or branched, glabrous throughout or sparsely pubescent with simple slender and arachnoid trichomes to 0.4 mm long. **Basal leaves** and lowermost cauline subsessile; blade narrowly spatulate to narrowly oblanceolate, subfleshy, 2–5(–6) cm × 2–3(–5) mm, glabrous to glabrescent, base attenuate and petiole-like, margin entire, apex obtuse, undivided; upper cauline leaves smaller, narrower. **Racemes** terminal, less frequently axillary, ebracteate, corymbose, many flowered, elongated in fruit, 4–13 cm long; rachis glabrous or sparsely pubescent, straight in fruit; fruiting pedicels ascending at base, somewhat arcuate, 3.5–6 mm long, glabrous or sparsely pubescent with arachnoid trichomes. **Sepals** narrowly oblong, 5–6.5 × 1–1.5 mm, glabrous, erect, strongly saccate at base, caducous, margin membranous; petals yellowish, linear to narrowly oblanceolate, 8–12 × 1–1.8 mm, attenuate to a papillate slender claw, apex obtuse; stamens tetradynamous; filaments free, erect, not dilated and minutely papillate at base, 4–6 mm long; anthers narrowly oblong, 1.2–1.7 mm long, base sagittate; nectar glands confluent, flat, somewhat petaloid. **Fruits** subglobose, glabrous; valves 3-winged, keeled, 4–6 × 4–5 mm, deeply notched at apex and base; wings 0.7–1 mm wide; gynophore 0.7–1.3 mm long; style 1–1.5 mm long; stigma slightly decurrent. **Seeds** ovate, 2–2.5 mm long, wingless, compressed; cotyledons obliquely incumbent.

**Distribution and habitat:**—*Menonvillea constitutionis* grows in Chile in regions V (Valparaíso) and VII (Maule) in sandy areas at elevations to 150 m (Fig. 13B).

**Phenology:**—Flowers mainly from September to December, and less frequently until February.

**Taxonomic notes:**—*Menonvillea constitutionis* is morphologically related to *M. purpurea*, from which it differs by having spatulate to narrowly oblanceolate undivided leaves, longer fruiting pedicels, and compact fruiting racemes. It also grows at elevations much lower than those occupied by *M. purpurea*. Although this species was not included in the molecular phylogeny, the morphology suggests its inclusion in sect. *Menonvillea* (Salariato *et al.*, 2013).

**Representative Specimens:**—CHILE. V Valparaíso: Prov. San Antonio, Com. El Quisco, Balneario El Quisco, 19 February 1965, *Mahu 2450* (CONC); Prov. Valparaíso, Com. Viña del Mar, Las Docas, 26 December 1949, *Boelcke 3821* (BAA, SI). VII Maule: Prov. Curicó, Com. Vichuquén, Vichuquén, a la orilla del mar, 27 September 1967, *Zöllner s.n.* (CONC 91676); Prov. Talca, Com. Constitución, Constitución, November 1893, *Reiche s.n.* (SGO 61493).

13. *Menonvillea filifolia* Fischer & Meyer (1835: 34). *Menonvillea linearis* DC. var. *filifolia* (Fisch. & C.A. Mey.) Rollins (1955: 43). Type:—CHILE. *Ex horto bot. Petropolitano* (lectotype designated by V. Dorofeyev 2011 and herein, LE!; isoelectotypes K 471802!, LE!).

*Menonvillea angustifolia* Presl (1944: 439) Type:—CHILE. 1832, *Cuming s.n.* (holotype PR; isotype GH!).

**Annuals.** **Stems** (7–)15–36(–46) cm, erect, usually simple at base, glabrous throughout or rarely sparsely pubescent, with simple, flat, slender trichomes to 0.5 mm long. **Leaves** sessile to subsessile; blade of basal and lowermost cauline leaves filiform, undivided or trifid into filiform segments, (2.5–)4–8(–10) cm × 0.5–1 mm, glabrous or sparsely pubescent, base attenuate, margin entire; upper cauline leaves smaller than basal ones, filiform, undivided. **Racemes** terminal or axillary, ebracteate, corymbose, elongated considerably in fruit, (2.5–)4–10(–15) cm long; rachis glabrous or sparsely pubescent, straight in fruit; fruiting pedicels ascending, straight or slightly arcuate, 1.5–3(–4.5) mm long, sparsely pubescent with simple and slender trichomes. **Sepals** narrowly oblong, 4–5(–6.5) × 1–1.2(–1.5) mm, glabrous, erect, strongly saccate at base, caducous, margin membranous; petals yellowish, linear, (6.5–)7–11(–12) × 0.7–1(–1.4) mm, clawed, base conspicuously papillate; stamens tetradynamous; filaments free, erect, minutely papillate and not dilated and at base, 2–4–5(–6.6) mm long; anthers narrowly oblong, (0.9–)1–1.2(–1.5) mm long, sagittate at base; nectar glands 4, confluent, flat, petaloid. **Fruits** broadly ovoid to subglobose; valves 2-winged, (3.5–)4–5 × 3–4.4(–5) mm, deeply notched basally, slightly to deeply emarginate apically, with well-developed, somewhat tuberculate, oblong callus at center of dorsal side,

often with abundant clavate papillae between callus and wing, sparsely papillate ventrally; wings (0.5–)1–1.2 mm wide, conspicuously crenate to rarely entire, undulate; gynophore 0.5–1.5 mm long; style 0.8–2 mm long; stigma 2-lobed, slightly decurrent. **Seeds** ovate, 1.5–2(–2.2) × 0.9–1.1(–1.3) mm, wingless, slightly compressed; cotyledons incumbent.

**Distribution and habitat:**—*Menonvillea filifolia* is endemic to Chilean regions IV (Coquimbo), V (Valparaíso), Metropolitana de Santiago, and VI (Libertador General O'Higgins). It is found mainly at elevations between 20 and 1200 m (Fig. 13C).

**Phenology:**—Flowers from September to November.

**Taxonomic notes:**—Rollins (1955) considered *Menonvillea filifolia* a variety of *M. linearis*. However, it differs by being an annual (vs. perennial) with crenate or rarely entire, undulate (vs. entire) fruit wings and fruits valves usually densely covered with clavate papillae between the wings and on the tuberculate callus (vs. glabrous or only sparsely papillate between the wings and glabrous callus). It is closely related morphologically to *M. marticorenae* (see discussion under the latter).

**Representative Specimens:**—CHILE. IV Coquimbo: Prov. Choapa, Com. Canela, Valle Choapa, 8 October 1961, *Schlegel 3830* (CONC); Prov. Elqui, Com. Vicuña, Cuesta de Churqui, km 7 al 10 del camino de Vicuña a Hurtado, 31 October 1940, *Wagenknecht s.n.* (CONC 93512); Prov. Limarí, Com. Ovalle, Corral Quemado, 5 October 1958, *Jiles 3507* (CONC). V Valparaíso: Prov. Marga Marga, Com. Limache, Cerro Cruz, 27 September 1930, *Garaventa 1676* (BAA, CONC, SI); Prov. Petorca, Com. Cabildo, propiedad del Sr. Claudio Vicuña Subercaceux, cerca de Cabildo, 2 October 1955, *Garaventa 8011* (SI); Prov. San Felipe de Aconcagua, Com. Catemu, Catemu, September 1860, *Herbarium Salesianum "Camilo Ortuzar Montt" 1698* (CONC), Prov. Valparaíso, Com. Viña del Mar, El Salto, Quebrada de Matthei, 4 October 1935, *Behn s.n.* (CONC 21328). Región Metropolitana de Santiago: Prov. Melipilla, Com. Curacaví, Curacaví, 1 October 1967, *Zöllner 2031* (CONC); Prov. Santiago, Com. Lo Barnechea, Cerro Provincia, November 1932, *Grandjot s.n.* (CONC 21330). VI Libertador O'Higgins: Prov. Cachapoal, Com. Las Cabras, Cocalán, October 1931, *Grandjot s.n.* (CONC 929); Prov. Colchagua, without locality, no date, without collector (SGO 78105).

14. *Menonvillea flexuosa* Philippi (1872: 674). Type:—CHILE. [Región Metropolitana]. Prov. Santiago, Valle del Yeso, January 1866, *R. A. Philippi s.n.* (holotype SGO 63980!; isotypes CONC 61870!, SGO 63980, fragm. in GH!, B!, K!, LE!).

*Menonvillea crassa* Rollins (1955: 45). Type:—CHILE. [Región de Coquimbo]. Ovalle, Limari, Fray Jorge, November 1925, *E. Werdermann 896* (holotype GH!; isotypes CAS 142894!, E!, F 59103!, G!, K!, LIL 53554!, SI 47248!, 47249!, U!, UC 289283!).

*Menonvillea falcata* Reiche (1895: 85). Type:—CHILE. Salto de Agua, 7 December 1879, *R. A. Philippi s.n.* (holotype SGO 63978!).

*Menonvillea flexuosa* Phil. f. *tomentosa* Gilg & Muschler (1909: 441). Type:—CHILE. [Región Metropolitana]. Santiago, *R. A. Philippi s.n.* (holotype in B destroyed; lectotype here designated CORD!)

**Perennials** with thick, woody caudex. **Stems** 20–40(–60) cm, erect to decumbent, several from base, simple or branched, slightly to strongly flexuous above, densely floccose to glabrescent, with slender, simple or more frequently branched trichomes to 0.4 mm long. **Leaves** not rosulate, sessile; blade narrowly linear, fleshy, 3–5(–10) cm × 0.8–2 mm, subterete, trifid or undivided, entire, glabrous or densely pubescent. **Racemes** terminal or axillary, ebracteate, corymbose, elongated considerably in fruit, 4–12 cm long; rachis glabrous to glabrescent, often flexuous; fruiting pedicels divaricate-ascending, straight, 2–4(–6) mm long, glabrous or sparsely pubescent with slender, arachnoid trichomes. **Sepals** narrowly oblong, (3–)4–6 × 1–1.5(–2) mm, glabrous, erect, subsaccate at base, caducous, margin membranous; petals yellowish, narrowly spatulate to nearly linear, (5–)6–8(–11) × 0.8–1.2(–2) mm, minutely papillate at base; stamens tetradynamous; filaments free, erect, papillate and not dilated at base, 3–5(–6) mm long; anthers oblong, 0.8–1.4 mm long; nectar glands confluent, low, not petaloid. **Fruits** globose, glabrous; valves 2-winged, 4–5(–7) × 4–5(–6) mm, with a prominent midvein, callus absent, glabrous or with few papillae on dorsal surface; wings (0.7–)1–1.5 mm wide; gynophore 0.5–1.8 mm long; style 1–2(–3) mm long; stigma slightly decurrent. **Seeds** ovate, 2–3 × 1.3–2.5 mm, wingless, compressed; cotyledons obliquely incumbent.

**Distribution and habitat:**—*Menonvillea flexuosa* is endemic to Chilean regions III (Atacama), VI (Coquimbo), V (Valparaíso), and Metropolitana de Santiago, where it grows on steep rocky slopes from coastal areas to the Andes at high elevations to 3700 m (Fig. 13D).

**Phenology:**—Flowers from September till January.

**Taxonomic notes:**—Rollins (1955) recognized *Menonvillea crassa* and *M. flexuosa* as different species based mainly having in the former of straight (vs. flexuous) stems and rachis and stout, slightly recurved (vs. slender, ascending) fruiting pedicels. However, these characters are unreliable because the type collection of *M. crassa* has flexuous stems and rachis and slender, recurved pedicels. The presence of several leaves at each node in *M. crassa* results from abnormal growth induced by fungal or insect infestations, and these observations were noted by Rollins (1955). Although the type collection of *M. crassa* has longer leaves and slightly larger flowers and fruits, it is indistinguishable from *M. flexuosa* in all other aspects. Therefore, *M. crassa* is reduced herein to synonymy of *M. flexuosa*.

Rollins (1955) reduced *Menonvillea falcata* Reiche to synonymy of *M. linearis* DC. However, a critical examination of its type shows that it is a synonym of *M. flexuosa* Phil.

**Representative Specimens:**—CHILE. III Atacama: Prov. Copiapó, Com. Copiapó, Copiapó, 20 September 1885, *Mison-Gaste s.n.* (SGO 63973). IV Coquimbo: Prov. Elqui, Com. Vicuña, Baños del Toro, 23 December 1971, *Beckett et al.* 4667 (SGO). V Valparaíso: Prov. Los Andes, Com. Los Andes, 3 km E del Río Blanco, en el lado opuesto Piscicultura, en pendientes paradas al lado Sur del Río Blanco, 13 December 1951, *Hutchinson 181* (CONC); Prov. Quillota, Com. Quillota, Cerro La Campana, ladera oeste, 30 November 1947, *Bultmann s.n.* (CONC 21331); Prov. Valparaíso, Com. Valparaíso, Santo del Agua, no date, *Philippi s.n.* (SGO 63978). Región Metropolitana de Santiago: Prov. Santiago, Com. San Ramón, Salto de San Ramón, December 1879, *Philippi 109-6* (SGO 68227).

15. *Menonvillea linearis* de Candolle (1821b: 420). Type:—CHILE. Without locality, *J. Dombey s.n.* (holotype P!; isotype F 894736!).

*Dispeltophorus crassifolius* Lehmann (1832 : 7). Type:—CHILE. Type specimen not found.

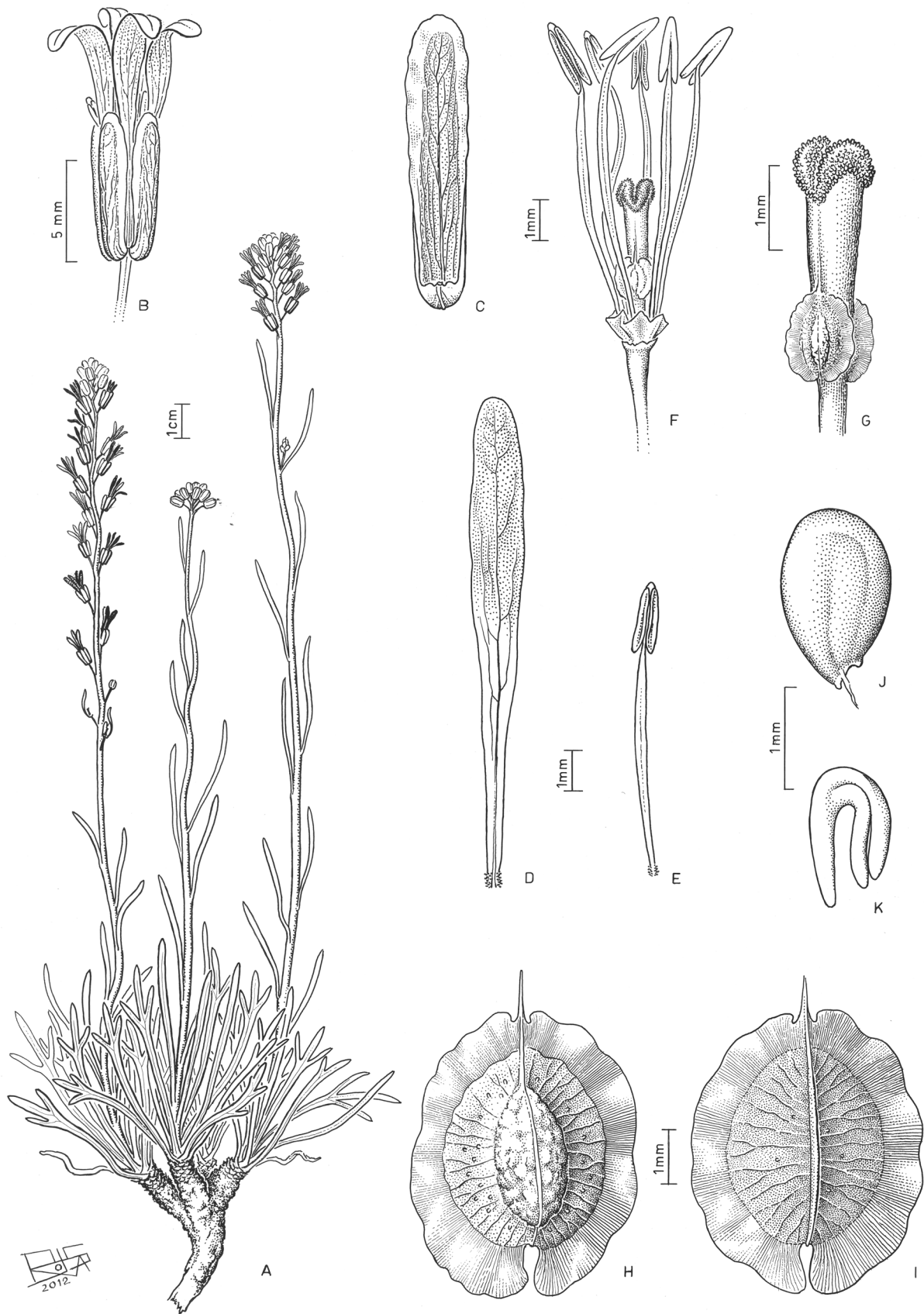
*Menonvillea robustula* Steudel (1856: 411). Type:—CHILE. [Región de Valparaíso]. Prov. Valparaíso, August 1830, *C. Bertero 1145* (holotype P!; isotypes G!, GH!, K!, LE!, NY, P!, S!).

*Menonvillea trifida* Steudel (1841: 125). Type:—CHILE. [Región del Libertador General O'Higgin]. Cachapul, in monte la Leona Rancagua, October 1828, *C. Bertero 426* (holotype P!).

*Menonvillea trifida* Philippi (1856a: 610), non Steudel (1841: 125). *Menonvillea linearis* DC. var. *trifida* Reiche (1895: 83). Type:—CHILE. [Región Metropolitana]. Prov. Santiago, Cordillera de la Compañía, November 1853, *F. Germain s.n.* (holotype SGO 63979!).

*Menonvillea virgata* Philippi (1856b: 671). *Menonvillea linearis* DC. var. *virgata* (Phil.) Reiche (1895: 83). Type:—CHILE. [Región de Valparaíso], Algarrobo, October 1856, *F. Germain s.n.* (holotype SGO 63974!). [Mixed labels: Luis Landbeck, Cord. de Colchagua, 1860; R. A. Philippi, San Vicente pr. Concepción, Dic. 1894; see Al-Shehbaz *et al.* (2011)].

**Perennials** with deep roots and woody, branched caudices. **Stems** (13–)20–45(–60) cm, erect, 1 to several from base, generally branched, glabrous throughout or rarely sparsely pubescent with simple, flat, slender trichomes to 0.5 mm long. **Basal leaves** subsessile, with a slender petiole; blade filiform, linear, to narrowly spatulate, undivided or trifid at apex, subfleshy, (1.5–)3.5–9(–10) cm × (0.3–)0.5–2(–6) mm, glabrous or sparsely pubescent, base attenuate, margin entire; cauline leaves narrower, 2–5 cm long. **Racemes** terminal or axillary, ebracteate, corymbose, elongated considerably in fruit, 4.5–15 mm long; rachis glabrous or sparsely pubescent, straight in fruit; fruiting pedicels ascending, straight or rarely arcuate, 1.5–4(–6) mm long, sparsely pubescent with crisped simple trichomes. **Sepals** narrowly oblong, (3.5–)4.5–7.5 × 1–1.5 mm, glabrous, erect, strongly saccate at base, caducous, margin membranous; petals yellow, linear to narrowly spatulate, 8–11(–13) × 1–1.5 mm, base attenuate, papillate on claw; stamens tetradynamous; filaments free, erect, minutely papillate and not dilated at base, 4–6(–7) mm long; anthers oblong, 1–1.5 mm long, sagittate at base; nectar glands confluent, flat, petaloid. **Fruits** ovoid, somewhat appressed to rachis; valves 2-winged, (3.5–)4–5(–6) × 3.5–4(–4.5) mm, deeply notched basally, slightly emarginate apically, with well-developed callus at center of dorsal side, with or without clavate papillae between callus and wing, sometimes papillate ventrally; wings 0.5–1(–1.2) mm wide, undulate; gynophore 0.8–1.5(–2) mm long; style 1–2(–2.8) mm long; stigma 2-lobed, slightly decurrent. **Seeds** ovate, 1.5–2 × 1.3–1.6 mm, wingless, plump; cotyledons incumbent. Fig. 17.



**FIGURE 17.** *Menonvillea linearis* DC. **A**, plant. **B**, flower. **C**, sepal. **D**, petal. **E**, stamen. **F**, nectar glands, stamens and ovary. **G**, immature fruit, dorsal view. **H**, fruit mericarp, dorsal view. **I**, fruit mericarp, ventral view. From Sparre 10059 (CONC). Scale bars: A = 1 cm; B = 5 mm; C–I = 1 mm.

**Distribution and habitat:**—*Menonvillea linearis* is endemic to Chilean regions IV (Coquimbo), V (Valparaíso), Metropolitana de Santiago, VI (Libertador O'Higgins), VII (Maule), VIII (Biobío), and XIV (Los Ríos). It grows at elevations between sea level and 800 m to as high as 2300 m (Fig. 13E).

**Phenology:**—Flowers mainly from September to November, sometimes from December to February.

**Taxonomic notes:**—*Menonvillea linearis* is most variable in basal leaf morphology and shows two predominant types: entire and filiform to linear or broadly trifid to 3-lobed. Rollins (1955) argued that these leaf types do not represent natural populations, a position with which we agree because the variation does not correlate with geography or other characters. Therefore, the species cannot be divided into infraspecific taxa.

The presence of a small dorsal wing, as in *Moreira & Pliscoff 1373* (SGO), is rather rare in this species.

When J.G.C. Lehmann (1832) described *Dispeltophorus crassifolius*, the only reference given to type material was “Hab. in Chili”. His original herbarium is preserved in the Swedish Museum of Natural History in Stockholm (S) and the Royal Botanic Gardens in Melbourne (MEL) but no type is there. According to Nordenstam (1980), the Cruciferae from Lehmann's herbarium was sold to private collectors (unspecified) and therefore type of the above name has not yet been found.

**Representative Specimens:**—CHILE. IV Coquimbo: Prov. Choapa, Com. Los Vilos, Los Vilos, 1 February 1894, *without collector* (SGO 72704); Prov. Limarí, Com. Ovalle, La Calera, 1 October 1936, *Schlegel 53* (CONC). V Valparaíso: Prov. Marga Marga, Com. Quilpué, Cerro del Roble, Punta Imán, 11 January 1932, *Garaventa 2392* (BAA, CONC); Prov. Petorca, Com. La Ligua, Fundo Las Palmas, 13 October 1963, *Zöllner 249* (CONC); Prov. San Antonio, Com. Algarrobo, Playa Mirasol, 19 September 1958, *Kausel 4422* (SGO); Prov. Valparaíso, Com. Valparaíso, Quebrada “El Cricket”, 4 November 1931, *Garaventa 2393* (BAA, CONC, SI), 19 September 1965 *Garaventa 8014* (BAA, CONC, SI); Punta Caraumilla, 7 January 2011, *Moreira & Pliscoff 1373* (SGO). Región Metropolitana de Santiago: Prov. Melipilla, Com. Curacaví, Los Perales, February 1882, *Herbarium Salesianum “Camilo Ortúzar Montt” 1705* (CONC). VI Libertador O'Higgins: Prov. Cardenal Caro, Com. Pichilemu, Cahuil, November 1878, *Philippi s.n.* (SGO 49150); Prov. Colchagua, Com. San Fernando, Cerro Centinela, October 1936, *Montero 770* (CONC). VII Maule, Prov. Cauquenes, Com. Cauquenes, Subestación experimental Cauquenes, INIA, November 1979, *Avendaño 72* (SGO), Prov. Linares, Com. Retiro, Villaseca, Cerro alto de Caliboro, 12 October 1955, *Aravena N13* (SI). VIII Biobío: Prov. Concepción, Com. San Pedro de la Paz, San Pedro, sobre las lomas al sur de la Laguna Chica, 10 December 1946, *Pfister s.n.* (CONC 7110); Prov. Ñuble, Com. Ránquil, Fundo El Milagro, 17 November 1953, *Sparre 10059* (CONC). XIV Los Ríos: Prov. Valdivia, Com. Valdivia, Valdivia, en las colinas, October 1958, *Bailey s.n.* (SGO 132748).

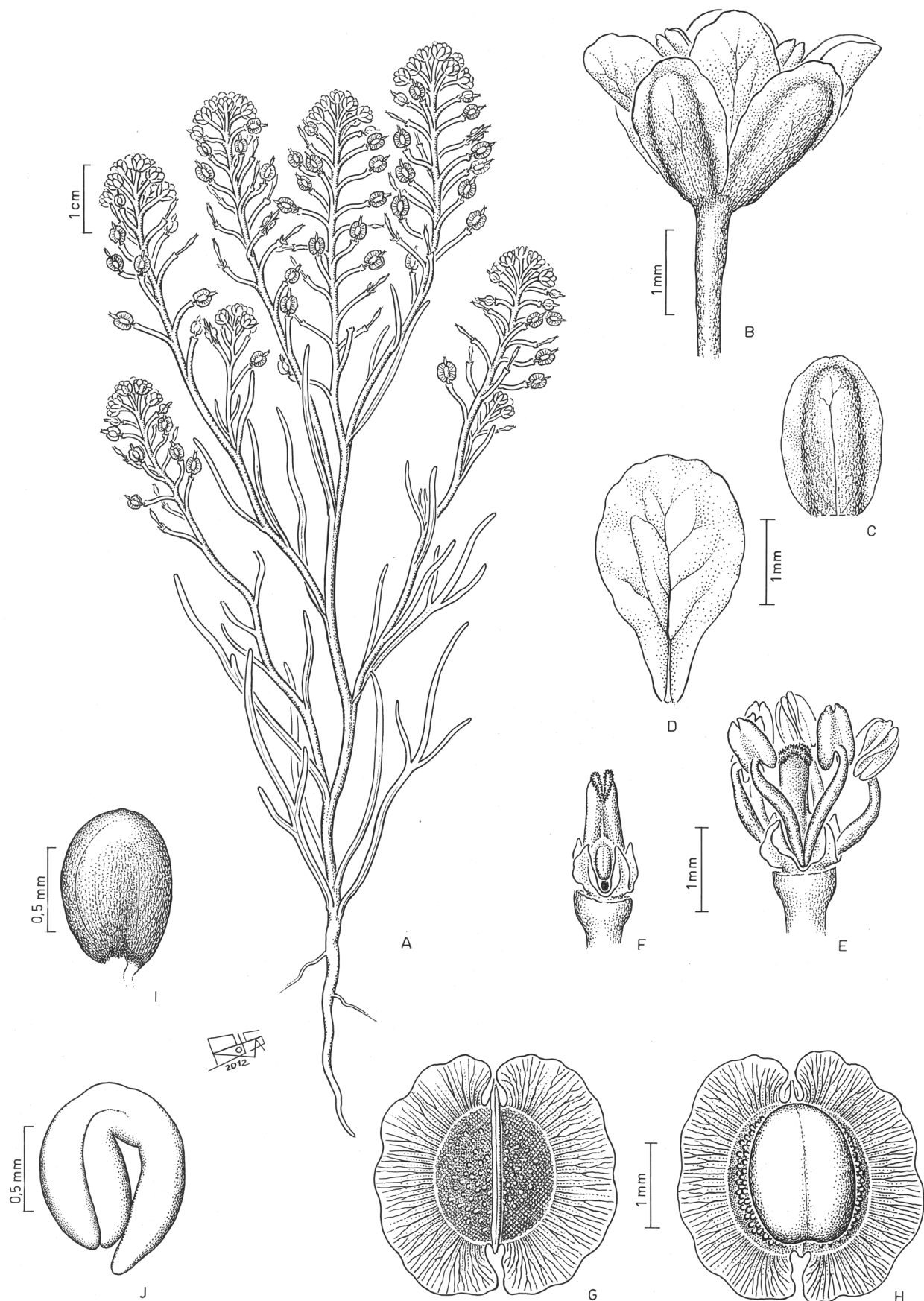
16. *Menonvillea litoralis* (Barnéoud) Rollins (1955: 55). *Hexaptera litoralis* Barnéoud in Gay (1846: 177). Type:—CHILE. [Región de Coquimbo]. Coquimbo, 1839, *C. Gay 63* (holotype P!).

*Menonvillea gayi* Philippi (1856a: 610). Type:—CHILE. [Región de Coquimbo]. Prov. Coquimbo, Arqueros, 1836, *C. Gay 1036* [lectotype designated by Al-Shehbaz *et al.* (2011: 285), SGO 71223!; isolectotype SGO 63977!]. Rollins (1955) designated SGO 77937 as the type, but the sheet neither carries Philippi's hand writing nor “Las Ánimas” cited in the protologue [Al-Shehbaz, 2008].

*Menonvillea arachnoidea* Schulz (1928: 466). Type:—CHILE. [Región de Coquimbo]. Fray Jorge, November 1922, *E. Werdermann 1525* (holotype B!; isotype B, photo in F!).

**Annuals. Stems** (3.5–)6–19(–35) cm, erect, branched or sometimes simple at base, glabrous or sparsely pubescent with arachnoid, slender, simple trichomes 0.25–0.45 mm long. **Leaves** not rosulate, sessile; blades of basal and lowermost cauline leaves filiform to linear, (1–)2–6 cm × 0.5–1 mm, trifid or entire, glabrous or sparsely pubescent; upper cauline leaves entire, smaller than basal ones. **Racemes** terminal and axillary, ebracteate, corymbose, elongated in fruit, 3–6(–11) cm long; rachis glabrous or sparsely pubescent, straight; fruiting pedicels divaricate, straight or rarely slightly arcuate, (2–)4–8(–11) mm long, glabrous or sparsely pubescent. **Sepals** broadly oblong, 1.2–1.8(–2) × 1–1.2 mm, glabrous, erect, not saccate at base, caducous, margin membranous; petals white, broadly obovate, 2–3(–3.5) × 1.3–2(–2.4) mm, apex rounded, base abruptly narrowed into a short claw not papillate at base; stamens tetradynamous; filaments free, erect, not dilated or papillate at base, 1–2 mm long; anthers ovoid, 0.4–0.8 mm long; nectar glands 4, petaloid, apex blunt to acuminate. **Fruits** globose; valves 2-winged, 2–3.5(–4) mm in diam., with a well-developed dorsal callus varying from hemispherical with a conspicuous constriction all around, or oblong and not constricted at margin, clavate papillae between callus and





**FIGURE 18.** *Menonvillea litoralis* (Barnéoud) Rollins. **A**, plant. **B**, flower. **C**, sepal. **D**, petal. **E**, stamens and ovary. **F**, nectar glands and ovary. **G**, fruit mericarp, ventral view. **H**, fruit mericarp, dorsal view. **I**, seed. **J**, embryo. From *Montero 1838* (CONC). Scale bars: A = 1 cm; B–H = 1 mm; I–J = 500 µm.

wings sparse or rarely absent, midrib above and below the callus prominent or obscure; wings 0.5–1(–1.2) mm wide, entire or rarely undulate; gynophore 0.4–1.2 mm long; style 0.8–1.7 mm long; stigma slightly 2-lobed. **Seeds** ovate, 1.1–1.5 × 0.8–1.1 mm, compressed; cotyledons incumbent. Fig. 18.

**Distribution and habitat:**—*Menonvillea litoralis* is endemic to Chile and grows in regions III (Atacama) and IV (Coquimbo) mainly in coastal areas between sea level and 500(–1100) m (Fig. 13F).

**Phenology:**—Flowers from August to November.

**Taxonomic notes:**—Rollins (1955) distinguished *Menonvillea gayi* from *M. litoralis* by having acuminate (vs. blunt) nectar glands, dorsal callus of valves with (vs. without) a marked constriction below, and crinkled (vs. smooth) valve wings. However, these characters do not correlate with each other or with geography. Plants with strongly developed, constricted, hemispherical callus, as well as others with slightly elevated and non-constricted oblong callus, can be found within the same population. Also, the shape and apex of nectar glands and the undulation of the fruit wing are unreliable characters because they can vary even on the same plant. Furthermore, *M. gayi* occupies the exact geographical range of *M. litoralis*. For these reasons, the former is reduced to synonymy of the latter.

*Menonvillea litoralis* is closely related morphologically to *M. filifolia* and *M. marticorenae*, from both of which it is easily distinguished by having white and broadly obovate (vs. yellow and narrowly spatulate) petals and fruit valves with entire or rarely undulate (vs. crenate to entire) wings.

**Representative Specimens:**—CHILE. III Atacama: Prov. Huasco, Com. Vallenar, Cuesta Pajonales, al N de La Serena, 12 October 1965, *Garaventa 8005* (BAA, CONC, SI). IV Coquimbo: Prov. Elqui, Com. Coquimbo, entre Tongoy y Guanaqueros, 15 September 1965, *Gleisner 10* (CONC); Prov. Limarí, Com. Ovalle, Parque Nacional Bosque de Fray Jorge, desembocadura del Río Limarí, 26 August 1976, *Zöllner 9930* (CONC).

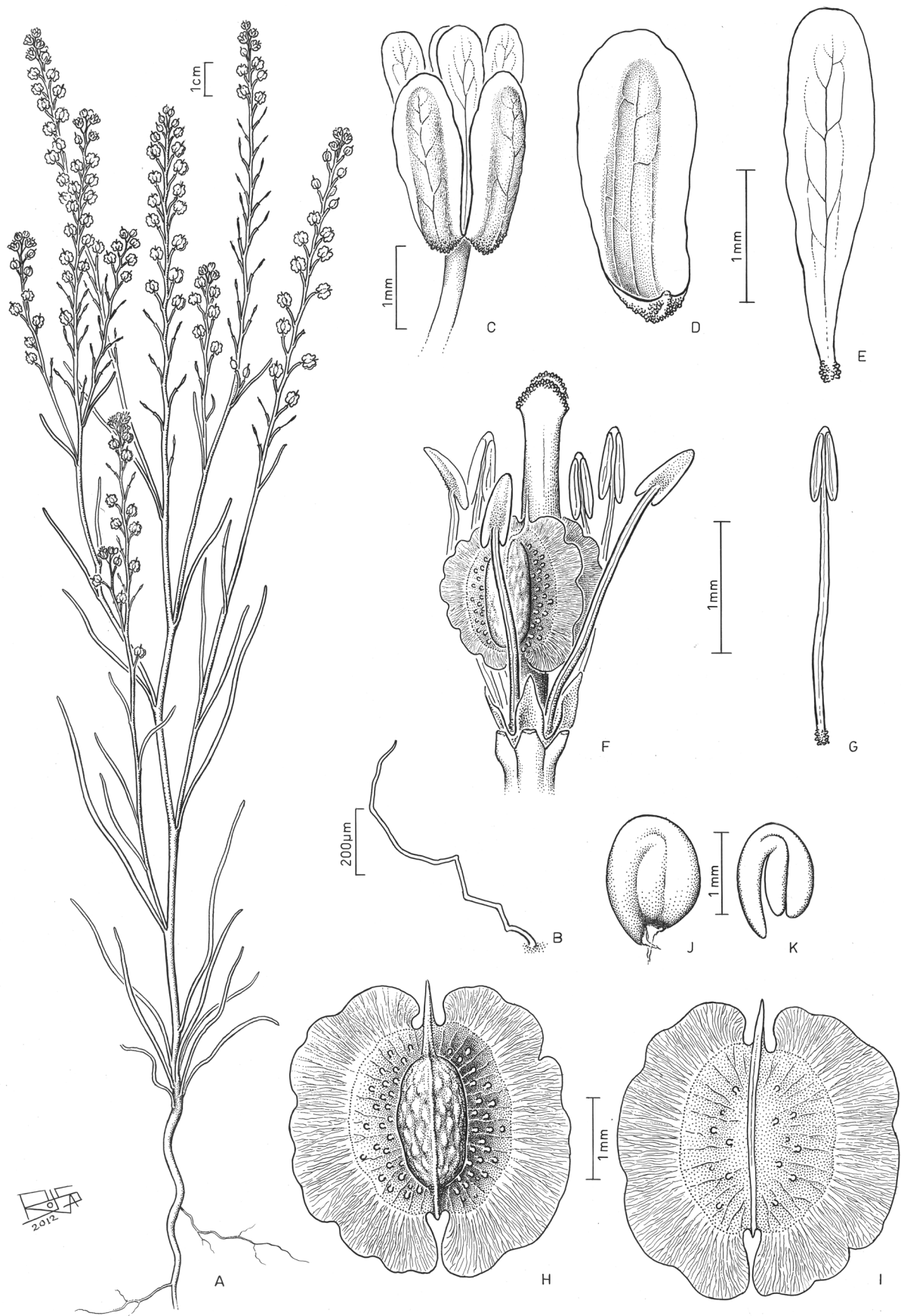
17. *Menonvillea marticorenae* (Al-Shehbaz) Salariato & Al-Shehbaz, *comb. et stat. nov.* *Menonvillea filifolia* Fisch. & C.A. Mey. subsp. *marticorenae* Al-Shehbaz (2006: 360). Type:—CHILE. [Región de Coquimbo]. Carretera Panamericana, 89 km al norte de los Vilos, [250 m, 31°11'S, 71°36'W], 13 October 1963, *C. Marticorena & O. Matthei 122* (holotype CONC 70351!).

**Annuals. Stems** (8–)15–28(–30) cm, erect, simple or branched at base, glabrous throughout or rarely sparsely pubescent with simple, flat, slender trichomes to 0.5 mm long. **Leaves** sessile to subsessile; blade of basal and lowermost cauline leaves filiform, undivided or trifid into filiform segments, (2.2–)2.5–6(–10) cm × 0.4–1 mm, glabrous or sparsely pubescent, base attenuate, margin entire; upper cauline leaves smaller, filiform, undivided. **Racemes** terminal or axillary, ebracteate, corymbose, elongated considerably in fruit, (1.8–)3.5–7(–10) cm long; rachis glabrous or sparsely pubescent, straight in fruit; fruiting pedicels ascending, straight or slightly arcuate, (1.5–)2–7(–9) mm long, sparsely pubescent with simple, slender trichomes. **Sepals** oblong, 1.5–2.5(–3) × 1–1.2(–1.4) mm, glabrous, erect, slightly saccate at base or not, caducous, margin membranous; petals yellow, narrowly spatulate, 2.5–4.5(–5) × 0.6–1.2(–1.5) mm, clawed, base obscurely papillate; stamens tetradynamous; filaments free, erect, minutely papillate and not dilated at base, 1.6–2.5(–3) mm long; anthers narrowly ovoid, (0.4–)0.5–0.8 mm long, sagittate at base; nectar glands 4, confluent, flat, petaloid. **Fruits** broadly ovate to suborbicular; valves 2-winged, 2.5–4(–4.5) × (2.5–)3–3.5(–4) mm, deeply notched basally, slightly to deeply emarginate apically, with well-developed, somewhat tuberculate oblong callus at center of dorsal side, often with abundant clavate papillae between callus and wing, sparsely papillate ventrally; wings 0.5–0.8(–1.2) mm wide, crenate to entire, undulate; gynophore 0.5–1.4 mm long; style 1.2–1.5 mm long; stigma 2-lobed, slightly decurrent. **Seeds** ovate, 1.5–2 × 0.9–1.1 mm, wingless, slightly compressed; cotyledons incumbent. Fig. 19.

**Distribution and habitat:**—This endemic species of Chile grows from Región III (Atacama) to IV (Coquimbo) and V (Valparaíso) from sea level to 900 m (Fig. 13G).

**Phenology:**—Flowering between September and October.

**Taxonomic notes:**—Al-Shehbaz (2006) divided *Menonvillea filifolia* into subspecies *filifolia* and *marticorenae* based primarily on smaller flower size. However, they can be easily separated by other characters, including the presence in subsp. *marticorenae* of non-saccate or slightly saccate (vs. strongly saccate) sepal bases, obscurely papillate (vs. conspicuously papillate) petal bases, and ovoid (vs. narrowly oblong) anthers. For these reasons, subsp. *marticorenae* is elevated herein to the species rank.



**FIGURE 19. *Menonvillea marticorenae*** (Al-Shehbaz) Salariato & Al-Shehbaz. **A**, plant. **B**, leaf trichome. **C**, flower. **D**, sepal. **E**, petal. **F**, nectar glands, stamens and ovary. **G**, stamen. **H**, fruit mericarp, dorsal view. **I**, fruit mericarp, ventral view. **J**, seed. **K**, embryo. From *Garaventa 8001* (CONC). Scale bars: A = 1 cm; B = 200 µm; C–K = 500 µm.

**Representative Specimens:**—CHILE. III Atacama: Prov. Huasco, Com. Freirina, Tololopampa (Pampa de Tololo), 18 September 1957, *Cabrera 12678* (BAA). IV Coquimbo: Prov. Choapa, Com. Los Vilos, Carretera Panamericana 8 km al N of Los Vilos, 12 October 1963, *Martcorena & Matthei 93* (CONC); Prov. Elqui, Com. La Higuera, Rte 5, N of La Serena, ca. 1 km N of the entrance to the El Tofo mine, at a bridge over a dry creek, 30 October 1991, *Taylor et al. 10669* (CONC); Prov. Limarí, Com. Ovalle, Quebrada Grande, entre Amolanas and Quebrada Teniente, 10 September 1942, *Wagenknecht 46* (CONC). V Valparaíso: Prov. Petorca, Com. La Ligua, al Norte de Longotoma, 18 October 1963, *Garaventa 8001* (BAA, CONC, SI); Prov. Quillota, Com. Quillota, Cerro La Cruz, 1 October 1957, *Garaventa 8000* (CONC); Prov. Valparaíso, Com. Valparaíso, Laguna Verde, October 1960, *Garaventa 7098* (SI).

18. *Menonvillea minima* Rollins (1955: 52). Type:—CHILE. [Región de Atacama]. Prov. Huasco, Huasco, September 1885, *F. Philippi 1948* (lectotype here designated SGO 77941!; isoelectotypes G!, SGO 77940!, probable isoelectotype SGO 68272!).

**Annuals.** **Stems** (1.5–)38(–10) cm, highly branched at base, usually irregularly winged, glabrous throughout. **Leaves** basal and cauline, sessile to subsessile; blade linear, trifid to deeply 3-lobed or entire, rarely subpinnately lobed or dentate, 1–3 cm × 1–3(–6) mm, attenuate to a petiole-like base, glabrous or with few, simple crisped trichomes to 0.3 mm long. **Racemes** terminal and axillary, densely flowered, ebracteate, corymbose, elongated in fruit, 2–4.5 cm long; rachis glabrous, straight, winged; fruiting pedicels divaricate, 5–8(–10) mm long, usually arcuate, glabrous, winged abaxially. **Sepals** oblong, 1.5–2.5 × 1.5–1.7 mm, glabrous, erect, not saccate at base, persistent at fruit maturity, margin membranous; petals creamy white, broadly obovate, 3–4 × (1.5–)2–2.5 mm, base clawlike, glabrous, not papillate; stamens subequal in length; filaments free, neither dilated nor papillate at base, 1.7–2.5 mm long; anthers ovoid, 0.4–0.5(–0.6) mm long; nectar glands confluent, somewhat petaloid. **Fruits** globose, glabrous; valves hemispherical to slightly longer than broad, strongly convex dorsally, flat ventrally, 1.2–1.5(–1.8) × 1–1.2(–1.4) mm, corky, verrucose to rugose or rarely smooth, with a conspicuous midvein dorsally, wingless or with rudimentary wings to 0.2 mm wide; gynophore to 0.5 mm long; style 1–1.5 mm long; stigma slightly 2-lobed. **Seeds** ovate, 0.8–1 × 0.6–0.7 mm, plump; cotyledons incumbent. Fig. 20.

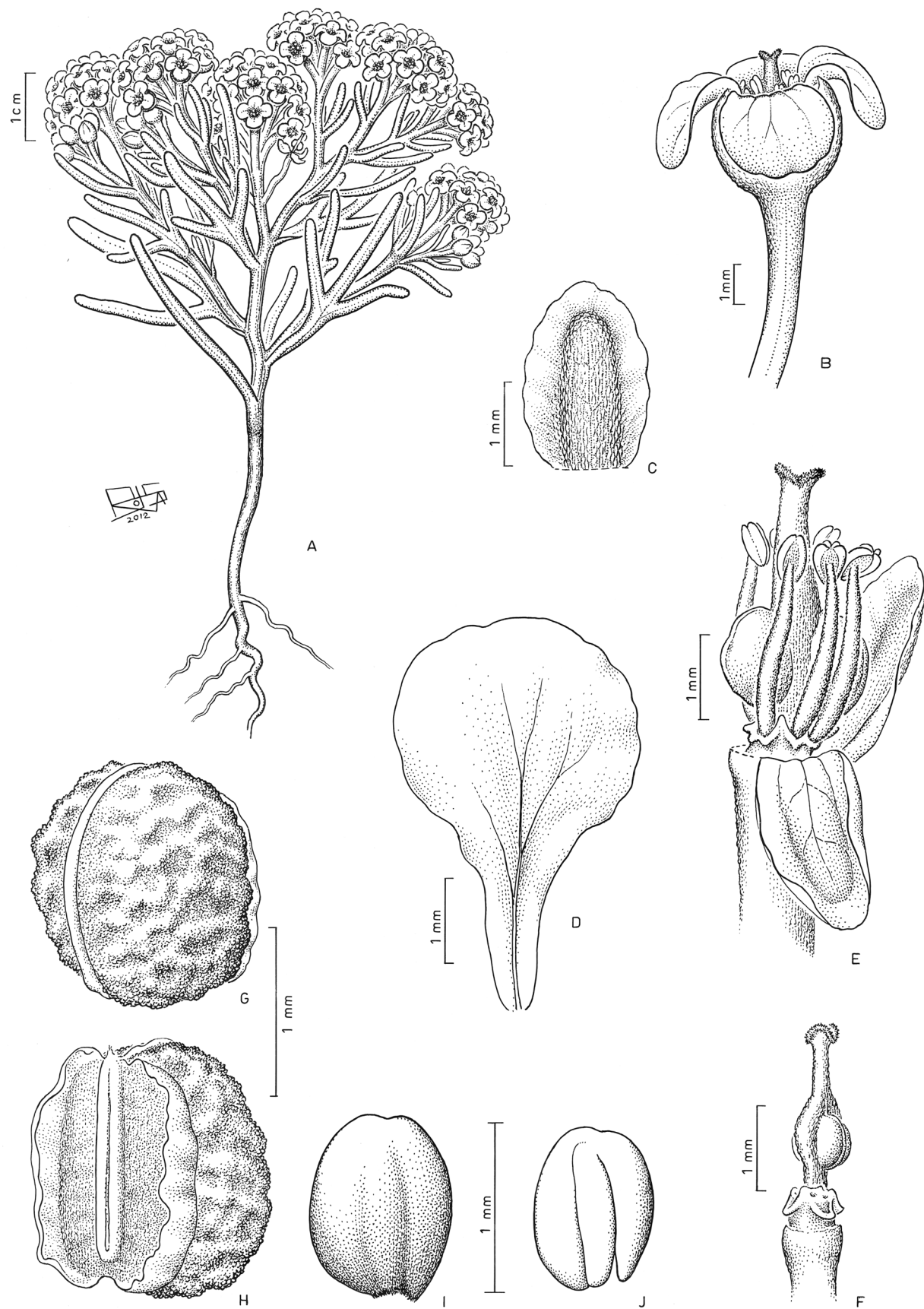
**Distribution and habitat:**—*Menonvillea minima* is endemic to Region III (Atacama) of Chile along the coastal areas of Huasco and Freirina provinces. It grows on sandy soils at elevations to 100 m (Fig. 13H).

**Phenology:**—Flowers between September and October.

**Taxonomic notes:**—*Menonvillea minima* is easily distinguished from other annual species of the genus by being small plants with conspicuously winged pedicels and hemispherical and wingless fruit valves. *Menonvillea zuloagaensis*, another species with wingless fruits, differs by its perennial habit, long-petiolate and palmately lobed (vs. sessile to subsessile and, deeply 3-lobed, entire or rarely subpinnately lobed) leaves and persistent (vs. caducous) sepals, petals and stamens.

Rollins (1955) cited type of *M. minima* as “Huasco, Sept 1885, *F. Philippi 1948* (SGO)” and an isotype from G. However, SGO has two sheets with the same locality data (SGO 77941 and SGO 77940). Therefore, the sheet SGO 77941, which was annotated by Rollins in 1952 at the type, is designated herein as the lectotype. Al-Shehbaz *et al.* (2011) designated SGO 63208 as an isoelectotype of *M. parvula* Phil., but its label reads “Huasco, Sep 1885, *F. Philippi*” and suggests that the specimen belongs to the type collection of *M. minima*. The type of *M. parvula* is labeled as “Huasco, Oct 1866, *F. Philippi*” (Philippi, 1892; see *M. parvula* under synonymy of *M. chilensis*).

**Representative Specimens:**—CHILE. III Atacama: Prov. Huasco, Com. Freirina, Playa de Carrizalillo, a 6 km del pueblo de Carrizalillo, 23 September 1941, *Muñoz & Johnson 1990* (SGO); Com. Huasco, Huasco, 19 September 1966, *Montero 7619* (CONC).



**FIGURE 20.** *Menonvillea minima* Rollins. **A**, plant. **B**, flower. **C**, sepal. **D**, petal. **E**, stamens and ovary. **F**, nectar glands and ovary. **G**, fruit mericarp, dorsal view. **H**, fruit mericarp, ventral view. **I**, seed. **J**, embryo. From *Behn s.n.* (CONC 8986). Scale bars: A = 1 cm; B–J = 1 mm.



19. *Menonvillea orbiculata* Philippi (1860: 9). Type:—CHILE. [Región de Atacama]. Caldera, *R. A. Philippi s.n.* [lectotype designated by Al-Shehbaz *et al.* (2011: 285), SGO 49155!; isolectotype SGO 68274!].

*Menonvillea orbiculata* var. *perplexa* Rollins (1955: 47). Type:—CHILE. [Región de Antofagasta]. Prov. Antofagasta, Com. Taltal, Cerro Yumbes, vicinity of Papos, 25°0'S, 8 December 1925, *I. M. Johnston 5552* (holotype GH!; isotypes K!, S!).  
*Menonvillea alata* Rollins (1955: 51). Type:—Chile. [Región de Atacama]. Prov. Copiapó, Copiapó, Quebrada de Chancoquin, September 1885, *E. E. Gigoux s.n.* (holotype GH!).

**Perennials**, rarely annuals or biennials, usually suffrutescent. **Stems** (6–)8–37(–60) cm, usually several from base, gyrose or not, densely floccose to glabrescent, usually floccose at leaf axils with simple or arachnoid trichomes to 0.5 mm long. **Leaves** basal and cauline, sessile; blade terete, pectinate or undivided, linear or with linear segments, fleshy, 1–5 cm × 0.7–2.5 mm, glabrous or sparsely pubescent. **Racemes** terminal or less frequently axillary, ebracteate, corymbose, elongated considerably in fruit, 5–20 cm long; rachis glabrous to glabrescent, straight in fruit; fruiting pedicels divaricate, arcuate or rarely straight, stout, 2–4(–5) mm long, pubescent. **Sepals** oblong, 2.5–4(–4.4) × 1.5–2.3 mm, floccose to glabrescent, erect, not saccate at base, caducous, margin broadly membranous; petals yellow to yellowish green, linear-oblongate, 3.5–7(–8) × 0.7–1.2(–1.5) mm, clawed, base sparsely papillate or rarely glabrous; stamens tetradynamous; filaments free, erect, base not dilated, sparsely papillate or glabrous, (3–)3.5–4.5(–5) mm long; anthers oblong, 0.9–1(–1.5) mm long; nectar glands confluent, not or rarely petaloid. **Fruits** subglobose to slightly longer than broad; valves 2-winged, (2.5–)3.5–5.5(–6) in diam., emarginate at apex and base, dorsal and ventral surfaces each with 2, poorly developed or conspicuous lateral callosities with clavate papillae at center; wings (0.5–)0.8–1.2 mm wide, flat; gynophore 0.5–1(–1.5) mm long; style 1–1.5(–2) mm long. **Seeds** ovate, 1.5–2.4 × 1.1–1.6 mm; cotyledons incumbent.

**Distribution and habitat:**—*Menonvillea orbiculata* is endemic to northern Chile in regions II (Antofagasta), III (Atacama) and IV (Coquimbo) at elevations between sea level and 800 m. It grows among rocks, gravel, and on sand in shelter of large rocks (Fig. 13I).

**Phenology:**—Flowers between September and November and rarely, *Ricardi 5468* (CONC), in February.

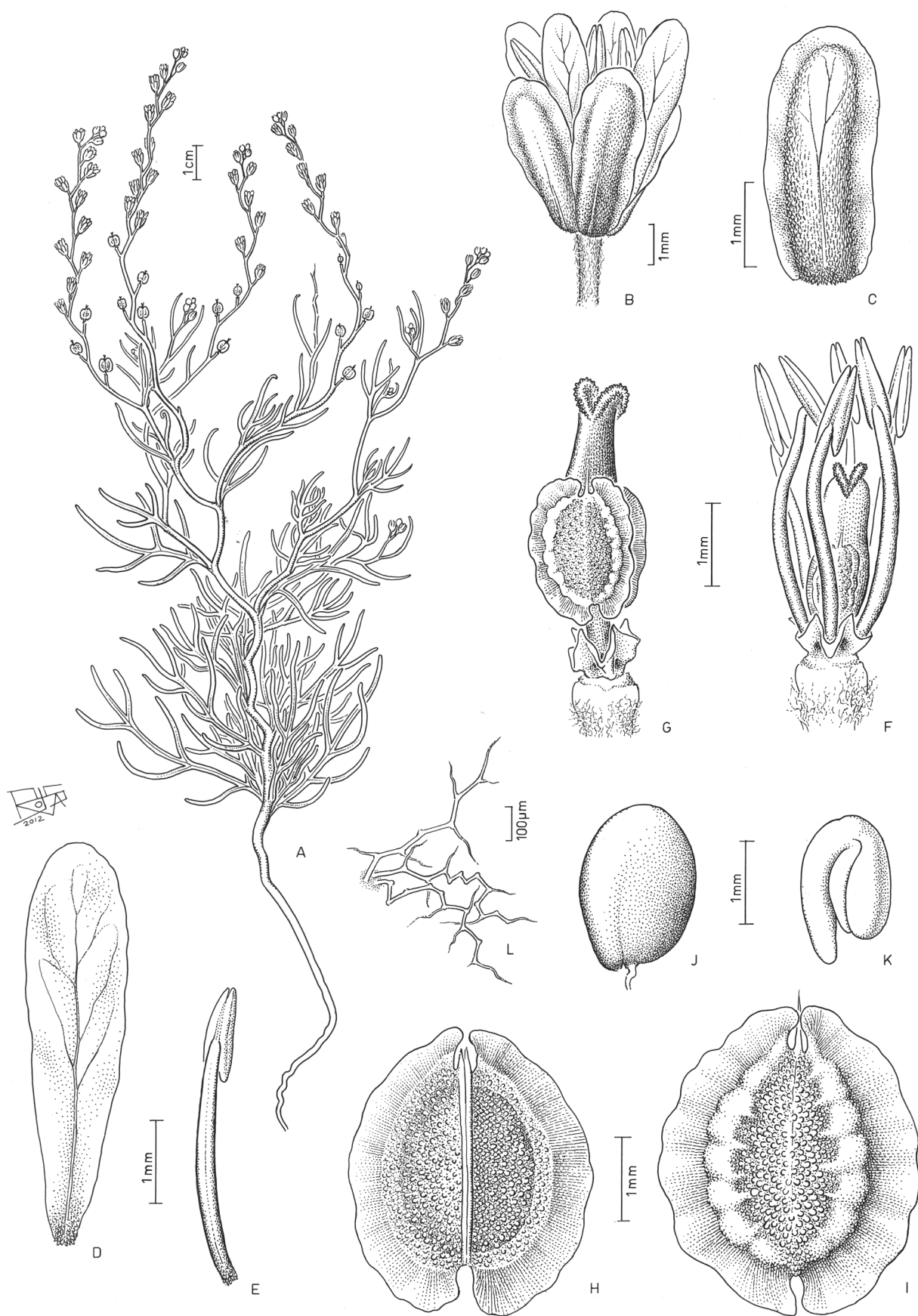
**Taxonomic notes:**—Rollins (1955) distinguished *Menonvillea orbiculata* var. *perplexa* from var. *orbiculata* by having ovoid to oblong (vs. subglobose) fruits and non-petaloid (vs. petaloid) nectar glands. Fruit shape and size are so variable in the species that all of the above variants can be found on the same plant. Furthermore, the nectar glands in the species are not petaloid, and only occasionally one finds plants with subpetaloid glands. Therefore, var. *perplexa* does not merit recognition.

The type specimen of *Menonvillea alata* differs from typical plants of *M. orbiculata* in being a non-floccose annual, but both taxa are indistinguishable in others characters. Although plants of *M. orbiculata* are perennial, they usually flower in the first year and sometimes they are glabrescent except in leaf axils, just as in the type of *M. alata*, which lacks the fully mature fruits.

**Representative Specimens:**—CHILE. III Atacama: Prov. Copiapó, Com. Caldera, 5 Km al sur de Obispito, camino Caldera-Chañaral, 10 February 1968, *Ricardi 5468* (BAB, CONC, SI); Prov. Huasco, Com. Freirina, Quebrada El Morado 1 km SO de la junta del camino Carrizalillo-El Morado, 23 October 1971, *Martcorena et al. 1784* (CONC). IV Coquimbo: Prov. Elqui, Com. La Higuera, Los Choros, fondo de quebrada seco, 17 November 1961, *Jiles 3950* (CONC); Prov. Limarí, Com. Ovalle, Fray Jorge, 15 September 1947, *Ibañez & Kuschel s.n.* (SGO 130633).

20. *Menonvillea pinnatifida* Barnéoud in Gay (1846: 182). Type:—CHILE. [Región de Coquimbo]. Coquimbo, *C. Gay 332* (holotype P!; isotype F 13845!).

**Perennials** or rarely annuals. **Stems** (15–)20–45(–55) cm, erect, 1 to several from base, gyrose or not, much branched, densely tomentose to sparsely pubescent with simple or more frequently branched, arachnoid, slender trichomes 0.25–0.7 mm long. **Leaves** not rosulate, sessile to subsessile; blades of basal and lowermost cauline leaves pectinate, 2–7 cm × 5–11 mm, with (3–)5–11, narrowly linear to filiform lobes (0.5–)0.7–1.5(–2) mm wide, densely pubescent and canescent or rarely glabrescent; middle and uppermost cauline leaves trifid or undivided, smaller than lower leaves. **Racemes** terminal or axillary, ebracteate, corymbose, elongated considerably in fruit, 6–12 cm long; rachis sparsely pubescent to glabrescent or glabrous, conspicuously flexuous in fruit; fruiting pedicels



**FIGURE 21.** *Menonvillea pinnatifida* Barnéoud. **A**, plant. **B**, flower. **C**, sepal. **D**, petal. **E**, stamens. **F**, nectar glands stamens and ovary. **G**, immature fruit. **H**, fruit mericarp, ventral view. **I**, fruit mericarp, dorsal view. **J**, seed. **K**, embryo. **L**, leaf trichome. From Wagenknecht s.n. (CONC 93480). Scale bars: A = 1 cm; B–K = 1 mm; L = 100 µm.

divaricate-ascending, straight, 1.5–4(–5) mm long, glabrescent or pubescent. **Sepals** narrowly oblong, (2.8–)3–4.5(–5.5) × 1.3–1.8 mm, glabrous or pubescent, erect, both pairs or at least inner pair saccate at base, caducous, margin membranous; petals yellow to yellowish green, linear to narrowly spatulate, 5–8(–10) × 0.8–1.2 mm, clawed, base papillate; stamens tetradynamous; filaments free, erect, papillate and not dilated at base, 3–4(–4.7) mm long; anthers narrowly oblong, 0.9–1.2(–1.4) mm long, sagittate at base; nectar glands confluent, petaloid. **Fruits** broadly oblong to subovoid; valves 2-winged, 3–4(–5) × 2.5–4 mm, emarginate at apex and base, with 2 dorsal and 2 ventral wrinkled calluses adjacent to wings, sometimes midvein of dorsal side conspicuously thick and as wide as or wider than lateral callosities, papillate or glabrous between callosities; wings (0.1–)0.2–0.6(–0.8) mm wide, narrower near apex or base; gynophore 0.4–0.9 mm long; style 1–1.5(–2.1) mm long; stigma 2-lobed, slightly decurrent. **Seeds** ovoid to broadly oblong, 1.4–2 × 1–1.5 mm, wingless, plump; cotyledons obliquely accumbent. Fig. 21.

**Distribution and habitat:**—This species is restricted to Chile in regions II (Antofagasta), III (Atacama), IV (Coquimbo), and Metropolitana de Santiago. It grows frequently in arid scrub and rocky slopes and outcrops at elevations of (10–)800–3000 m (Fig. 13J).

**Phenology:**—Flowering from September to February

**Taxonomic notes:**—*Menonvillea pinnatifida* is easily distinguished from all species of the genus by its pectinate lowermost leaves, branched and arachnoid trichomes, flexuous rachis of fruiting raceme, and two or three bands of callus on dorsal side of each valve. The fruit wing is somewhat variable in length, although it is always less than 1 mm long. A variation that requires critical field study is the development of dorsal midvein area of fruit valves into a central callus. For example, in *Wagenknecht s.n.* (CONC 92012) the central callus is about the same size as the two lateral ones, but in *Garaventa 8007* (CONC), *Ricardi et al. 1255* (CONC), and *Ricardi & Marticorena 4363/748* (CONC, OS) the central callus is much larger than the lateral ones.

**Representative Specimens:**—CHILE. II Antofagasta: Prov. Antofagasta, Com. Taltal, Paposo, 10 November 1987, *Hoffmann & Rodríguez 98-b* (CONC). III Atacama: Prov. Copiapó, Com. Tierra Amarilla, Valle del río Turbio subafuente del Río Copiapó, en la cordillera de Copiapó, 30 November 1941, *Pisano & Bravo 895* (CONC, SGO); Prov. Huasco, Com. Vallenar, cerca del Mineral de Santa Fe (entre La Serena y Vallenar), 9 October 1965, *Garaventa 8007* (CONC) Carretera Panamericana, 30 km al Sur de Vallenar, 13 October 1965, *Ricardi et al. 1255* (CONC 70349). IV Coquimbo: Prov. Elqui, Com. La Higuera, Incahuasi, 19 September 1957, *Ricardi & Marticorena 4363/748* (CONC, OS); Com. Vicuña, Camino al embalse de La Laguna, a 15 km de La Junta, 5 February 1963, *Ricardi et al. 707* (CONC); Rodados del Río Seco, a 4 km más arriba de Nueva Elqui en camino a mina El Carmen, 16 December 1940, *Wagenknecht s.n.* (CONC 92012, GH, MO); Prov. Limarí, Com. Río Hurtado, Séron, 24 December 1957, *Jiles 3300* (CONC). Región Metropolitana de Santiago: Prov. Cordillera, Com. San José de Maipo, Río Yeso, 17 km de Romeral, 28 December 1977, *Biese 742* (LIL).

21. *Menonvillea purpurea* (Hastings) Rollins (1955: 37). *Hexaptera purpurea* Hastings (1905: 622) Type:—CHILE. [Región Metropolitana] Prov. Santiago, rocks near Laguna Negra, 10,000 ft [3,048 m], 6 February 1902, *G. T. Hastings 480* (lectotype here designated US 530369!; isoelectotypes BH!, NY!, UC 67055!).

*Hexaptera linearis* Barnéoud in Gay (1846: 176), non *Menonvillea linearis* de Candolle (1821b: 420). Type:—CHILE. [Región del Libertador General O'Higgins]. Prov. Colchagua, Talcahué, February 1831, *C. Gay s.n.* (holotype P!).

**Perennials** with woody, simple or branched caudex. **Stems** (10–)25–40 cm, erect, simple or sometimes branched, usually glabrous or rarely sparsely pubescent with simple, slender, arachnoid trichomes to 0.35 mm long. Basal and lowermost cauline leaves subsessile; blade linear to narrowly spatulate, subfleshy, (1–)2.5–5(–8.5) cm × 1–2(–4) mm, glabrous, base attenuate, margin entire, divided near apex into 3, oblong to linear lobes or less frequently undivided; uppermost cauline leaves undivided upwards, smaller than basal ones. **Racemes** terminal, rarely axillary, ebracteate, elongated considerably in fruit, 4–9 cm long; rachis glabrous or sparsely pubescent, straight in fruit; fruiting pedicels ascending at base, somewhat recurved, 1.5–3.5(–4) mm long, glabrous or sparsely pubescent with crisped trichomes. **Sepals** often tinged purple, narrowly oblong, (3–)4–6(–7) mm long, glabrous, erect, saccate at base, caducous, margin membranous; petals yellowish, linear to narrowly oblanceolate, (6–)7–9(–12.5) × 0.8–1(–1.7) mm, minutely papillate at base or glabrous; stamens tetradynamous; filaments free, erect, sparsely papillate and not dilated at base, 3.5–5(–7) mm long; anthers oblong, 0.9–1.5 mm long; nectar glands confluent,

flat, somewhat petaloid. **Fruits** broadly oblong, glabrous or sparsely papillate; valves 3-winged, (3–)4–5.5 × 2.5–4.5(–5.5) mm, notched at apex and base, rarely with small callus at base of dorsal wing; wings 0.8–1 mm wide, flat; gynophore 0.8–1.7 mm long; style 1–2 mm long; stigma slightly decurrent. **Seeds** oblong, 2–2.5 × 1–2 mm, wingless, plump; cotyledons incumbent.

**Distribution and habitat:**—*Menonvillea purpurea* is endemic to Chile and grows in central and southern regions IV (Coquimbo), V (Valparaíso), Metropolitana de Santiago, VI (Libertador O'Higgins), VII (Maule) and IX (Araucanía) on rocky areas and cliffs at elevations of 50–2800 m (Fig. 13K).

**Phenology:**—Flowers mainly from October to January.

**Taxonomic notes:**—*Menonvillea purpurea* differs from *M. constitutionis* by its 3-lobed (vs. undivided) leaves, lax (vs. densely corymbose) fruiting racemes, ascending to recurved pedicels 1.5–3.5(–4) mm long (vs. ascending to arcuate pedicels 3.5–6 mm long), and oblong and plump (vs. ovoid to slightly compressed) seeds. It resembles *M. linearis* in the perennial habit, woody and branched caudex, and sessile and linear to narrowly spatulate leaves with entire or 3-lobed apex but differs by having 3-winged, usually non-callose (vs. valves 2-winged and strongly callose) fruit valves. However, one rarely finds specimens of *M. purpurea* with a small callus at base of the dorsal wing, as is *Lammers 7743* (CONC) or *Biese 910* (LIL).

**Representative Specimens:**—CHILE. IV Coquimbo: Prov. Limarí, Com. Combarbalá, Cuesta Espino between Illapel and Combarbalá, 1 November 1974, *Zöllner 7913* (CONC). V Valparaíso: Prov. San Antonio, Com. Algarrobo Algarrobo Norte, Playa Mirasol, 4 March 1952, *Boelcke 9056* (BAA); Prov. Valparaíso, Com. Valparaíso, 21 km S Punta de Angeles on the costal road from Valparaíso to Laguna Verde, November 1990, *Lammers et al. 7743* (CONC, NY). Región Metropolitana de Santiago: Prov. Cordillera, Com. San José de Maipo, Cajón de Morales, entre Baños Morales y las Panimávidas, 26 January 2002, *Teillier & Márquez 5301* (CONC), Río Yeso, Laguna de los Piuquenes, 13 January 1945, *Biese 910* (LIL, SGO); Prov. Santiago, Com. Lo Barnechea, camino a Valle Nevado, 19 December 2006, *Teillier 5536* (CONC). VI Libertador O'Higgins: Prov. Cardenal Caro, Com. Litueche, Hacienda Topocalma, 11 November 1982, *Muñoz 1781* (SGO); Prov. Colchagua, Com. Chimbarongo, Cerro Centinela, 12 October 1923, *Montero 2792* (CONC). VII Maule: Prov. Curicó, Com. Vichuquén, Llico, 29 October 1995, *Gosewijn s.n.* (SGO 138175). IX Araucanía: Prov. Malleco, Com. Victoria, Victoria, November 1887, *Philippi s.n.* (SGO 78096).

Sect. **Scapigera** Salariato & Al-Shehbaz, *sect. nov.* Type species: *Menonvillea scapigera* (Phil.) Rollins.

**Herbs** perennial, with a branched caudex. **Stems** 1 to many, simple or branched above, commonly scapose. **Trichomes** simple, terete. **Basal leaves** long petiolate, rosulate; blade oblanceolate or suborbicular to reniform, simple, dentate to pinnately or palmately lobed; cauline leaves commonly absent or rarely few. **Racemes** ebracteate. **Sepals** not saccate. **Petals** white; claw differentiated from blade, papillate at base. **Stamens** tetradynamous; filaments dilated and papillate at base, inner pairs connate or rarely free. **Nectar glands** 1, confluent. **Fruit** glabrous, 2-, 3-, or 5-winged, rarely wingless, without callosities. Stigma capitate, entire or rarely somewhat 2-lobed. **Cotyledons** incumbent to obliquely so.

Three species.

Key to the species of *Menonvillea* sect. *Scapigera*

1. Leaf blade usually palmately lobed; petals and stamens persistent after fruit dehiscence; replum expanded apically, with a septal perforation; fruit valves wingless..... *M. zuloagaensis*
- Leaf blade dentate to pinnately lobed; petals and stamens caducous shortly after anthesis; replum not expanded apically, without septal perforation; fruit valves 2-, 3- or 5-winged ..... 2
2. Basal leaves dentate; racemes shorter than basal leaves; filaments of median pairs of stamens united to 1/5–1/4 of their length..... *M. famatinensis*
- Basal leaves pinnately lobed; racemes longer than basal leaves; filaments of median pairs of stamens united to 1/3–4/5 of their length..... *M. scapigera*

22. *Menonvillea famatinensis* (Boelcke) Rollins (1955: 35). *Hexaptera famatinensis* Boelcke (1951: 171). *Hexaptera pinnatifida* Gillies & Hook. var. *nana* Hieronymus in Hosseus (1921: 98), *nom. nud.* Type:—

ARGENTINA. [Provincia de la Rioja]. Sierra Famatina, Cueva de Pérez, 26–28 January 1879, *G. Hieronymus & G. Niederlein* 379 (holotype CORD!; isotypes G!, GH!, K!, SI 28562!).

*Hexaptera famatinensis* Boelcke var. *sphaerocarpa* (1951: 175). *Menonvillea famatinensis* Boelcke var. *sphaerocarpa* (Boelcke) Rollins (1955: 36). Type:—ARGENTINA. [Provincia de La Rioja]. Sierra de Famatina, Cueva de Pérez, 4,200 m, 15 January 1947, *J. H. Hunziker* 1941 (holotype BAB!; isotypes BAA!, LP 76595!, MO!, K!, SI 28624!).

**Perennials**, scapose, with branched woody caudex. **Stems** 3–6 cm, several to numerous from base, erect, slender, shorter than basal leaves, unbranched above, hirsute with antrorse to spreading, terete, simple trichomes to 0.5 mm long. **Basal leaves** numerous, rosulate, conspicuously tufted, long petiolate; petiole 2–10 cm long; blade oblanceolate, (1.5–)2.5–5(–8) × 0.4–1.2 cm, densely pubescent with appressed, antrorse simple trichomes, base attenuate, margin dentate, lobes and apex acute; cauline leaves absent. **Racemes** terminal, ebracteate, corymbose, compact, slightly elongated in fruit, shorter than basal leaves, 2–5 cm long; rachis densely hirsute, straight; fruiting pedicels divaricate to ascending, 0.6–1.5 cm long, straight, densely pubescent, slender. **Sepals** oblong, 2–2.3(–2.6) × 0.7–1.1(–1.3) mm, sparsely pilose, erect, not saccate, caducous, margin membranous; petals white to creamy white, spatulate to narrowly so, 2.2–3(–3.5) × 0.8–1.2 mm, clawed, densely papillate at base; stamens tetradynamous; filaments of median pairs united from base to 1/5–1/4 of their length, erect, slightly dilated and papillate at base, 2–3 mm long; anthers oblong, 0.5–0.8 mm long; nectar glands confluent, not petaloid, subtending base of all filaments. **Fruits** ovoid to broadly oblong or ellipsoid, glabrous; valves 3-winged, conspicuously veined, 3.5–4.5 × 2.5–3.2 mm; lateral and dorsal wings similar, irregularly undulate, erose or entire at margin, 0.4–0.7 mm wide; gynophore 0.5–1 mm long; style 1–1.5(–2) mm long; stigma capitate. **Seeds** oblong, ca. 1.5 × 1 mm, wingless, plump; cotyledons obliquely incumbent.

**Distribution and habitat:**—*Menonvillea famatinensis* is an Argentinean endemic of Sierra Famatina in La Rioja Province. It grows at elevations of 3700–4500 m (Fig. 14A).

**Phenology:**—Flowers between December and January.

**Taxonomic notes:**—*Menonvillea famatinensis* is distinguished from *M. scapigera* by having tufted, strongly dentate (vs. pinnatifid to pinnately lobed) basal leaves and racemes shorter (vs. conspicuously longer) than basal leaves. Boelcke (1951) distinguished var. *famatinensis* from var. *sphaerocarpa* mainly by having in the former ovoid fruits with irregularly erose wings (vs. broadly ellipsoid to oblong fruits with entire and undulate wings). Given that these characters are variable, we decided not to recognize infraspecific taxa in *M. famatinensis*.

**Representative Specimen:**—ARGENTINA. La Rioja: Depto. Famatina, Pampa de Tambería, 20 December 2011, *Barboza et al.* 3360 (CORD).

23. *Menonvillea scapigera* (Phil.) Rollins (1955: 32). *Hexaptera scapigera* Philippi (1862a: 389). Type:—ARGENTINA. [Provincia de Mendoza]. Portezuelo del Portillo (de los Piuquenes), lado de Mendoza, 1861–1862, *W. Díaz s.n.* (holotype SGO 63958!).

**Perennials**, scapose or not, with simple or branched woody caudex. **Stems** (3.1–)6–40(–52) cm, erect, 1 to several from base, simple or branched, sparsely to densely hirsute with antrorse to spreading, terete, simple trichomes 0.4–0.9 mm long. **Basal leaves** rosulate; petioles (1–)2–10(–12) cm long; blade oblanceolate in outline, pinnatifid to pinnately lobed, (0.7–)2–10(–15) × (0.3–)0.6–3.5(–5) cm, hirsute; lobes oblong to ovate, obtuse to rounded; cauline leaves when present petiolate to sessile, smaller than basal ones. **Racemes** terminal and less frequently axillary, ebracteate, densely flowered, corymbose, elongated in fruit, 3–15 cm long; rachis hirsute, straight; fruiting pedicels divaricate to ascending, 5–15 mm long, straight, hirsute, slender, strongly expanded at apex. **Sepals** ovate to oblong, (1.7–)2–5 × (1–)1.5–3 mm, hirsute, erect, not saccate, caducous, margin membranous; petals white to creamy white, linear or narrowly to broadly spatulate or obovate, (2.4–)3.4–9(–10.5) × 1.4–2.5 mm, slightly to strongly clawed, densely papillate at base; stamens tetradynamous; filaments erect, dilated and densely papillate at base, white, (1.4–)2.2–7.4 mm long, median pairs united to 1/3–4/5 of their length; anthers oblong, 0.8–1.4 mm long; nectar glands confluent, subtending bases of all filaments. **Fruits** subglobose, glabrous; valves 3(or 5)-winged, obscurely veined, (3.5–)4–10 × 3.2–8(–9) mm; lateral and dorsal wings well developed, entire, flat or slightly undulate, 0.5–2 mm wide; gynophore 0.5–3 mm long; style 1–3 mm long; stigma capitate. **Seeds** oblong, 2.5–3.5 × 1.52 mm, wingless, plump to somewhat compressed; cotyledons obliquely incumbent.

**Phenology:**—Flowers mainly from November to March.



Key to the subspecies of *Menonvillea scapigera*

1. Stems (3.1–)4.2–17.7(–21.4) cm, generally unbranched above; blade of basal leaves (0.7–)1–3.8(–5.7) × (0.3–)0.6–2.3(–4.2) cm; cauline leaves when present few, sessile to subsessile, to 2(–2.7) cm long; sepals (3–)3.3–4.5(–5) mm long; petals (5.4–)6.2–9.1(–10.5) mm long; filaments (3.3–)4.8–6.9(–7.4) mm long.....subsp. *scapigera*
- Stems (7.1–)13–40(–52) cm, generally branched above; blade of basal leaves (0.8–)2.2–10(–15) × (0.7–)1.2–3.5(–5) cm; cauline leaves 1.3–3.8(–4.8) cm long; sepals (1.7–)2.2–3.4(–3.9) mm long, petals (2.4–)3.4–5.2(–5.8) mm long; filaments (1.4–)2.2–3.8(–4.4) mm long ..... subsp. *longipes*

23.1 *Menonvillea scapigera* (Phil.) Rollins subsp. *scapigera*

**Stems** (3.1–)4.2–17.7(–21.4) cm, simple and scapose or rarely branched, with cauline leaves. **Blade** of basal leaves (0.7–)1–3.8(–5.7) × (0.3–)0.6–2.3(–4.2) cm; cauline leaves when present few, sessile to subsessile, to 2(–2.7) cm long. **Racemes** terminal. **Sepals** (3–)3.3–4.5(–5) × 2.5–3 mm; petals, linear to narrowly spatulate, (5.4–)6.2–9.1(–10.5) mm long, strongly clawed; filaments (3.3–)4.8–6.9(–7.4) mm long.

**Distribution and habitat:**—This subspecies is endemic to the Argentinean provinces of Mendoza, Neuquén, and San Juan. It grows on loose rocks and basaltic soils at elevations between 2200 and 4300 m (Fig. 14B).

**Taxonomic notes:**—*Menonvillea scapigera* subsp. *scapigera* differs from the related *M. famatinensis* by having pinnately lobed basal leaves shorter than the racemes and filaments of median pairs of stamens united to 1/3–4/5 of their length. By contrast, *M. famatinensis* has dentate basal leaves longer than the racemes and filaments united to 1/5–1/4 of their length.

**Representative Specimens:**—ARGENTINA. Mendoza: Depto. Luján de Cuyo, Los Vallecitos, 8 January 1950, *Semper s.n.* (MERL 13063); Depto. Malargüe, Ruta Provincial 322, entre Las Leñas y Valle Hermoso, 22 November 2010, *Zuloaga et al.* 12353 (SI); Depto. San Carlos, Ruta 98, ca. 13 km al W de Casa de Piedra, 25 January 1985, *Hunziker et al.* 11317 (SI); Depto. San Rafael, Hotel Termas del Sosneado, sobre ladera rocosa, 22 November 2010, *Zuloaga et al.* 12380 (SI); Depto. Tunuyán, Ruta provincial 94, entre Los Manantiales y Real de Piedras Coloradas, 12 January 2003, *Cocucci* 2252 (SI). Neuquén: Depto. Minas, Cordillera del Viento, cruzada de Tricao Malal al Cajón de Butaló, no date, *Boelcke et al.* 11604 (BAA). San Juan: Depto. Calingasta, Cordillera de Ansilla, paso del Espinacito, 11 January 1953, *Castellanos s.n.* (LIL 15514).

23.2 *Menonvillea scapigera* (Phil.) Rollins subsp. *longipes* (Rollins) Prina (2001: 94). *Menonvillea longipes* Rollins (1955: 29). Type:—ARGENTINA [Provincia de la Rioja]. En las cercanías de la quebrada, 2 a 4 leguas mas Arriba del Vallecito, Sierra Famatina, 21 January 1879, *G. Hieronymus & G. Niederlein* 609 (holotype GH!; isotype G!).

*Menonvillea hookeri* Rollins (1955: 30). *Hexaptera pinnatifida* Gillies & Hook. in Hooker (1830: 350), non *Menonvillea pinnatifida* Barnéoud in Gay (1846: 181). Type:—CHILE. Quebrada de Rios, in valle Andinum Chilensium, *J. Gillies s.n.* (holotype K!; isotype E!).

*Menonvillea perstylosa* Rollins (1955: 34). Type:—CHILE. [Región de Los Ríos]. Province of Valdivia, *E. Reid s.n.* (holotype K!; isotype GH!, fragm. ex K).

**Stems** (7.1–)13–40(–52) cm, branched above or rarely simple. **Blade** of basal leaves (0.8–)2.2–10(–15) × (0.7–)1.2–3.5(–5) cm; cauline leaves generally present, smaller than basal ones, less divided, petiolate to subsessile, 1.3–3.8(–4.8) cm long. **Racemes** terminal and axillary. **Sepals** (1.7–)2.2–3.4(–3.9) × (1–)1.5–2 mm; petals obovate to broadly spatulate, (2.4–)3.4–5.2(–5.8) × 1.5–2.5 mm, slightly clawed; filaments (1.4–)2.2–3.8(–4.4) mm long.

**Distribution and habitat:**—This subspecies is distributed in Argentina (La Rioja, Mendoza, and Neuquén provinces) and Chile (regions Metropolitana de Santiago, VI Libertador O'Higgins, VII Maule, VIII Bio Bío and XIV Los Ríos). It grows on rocky soils and slopes at 1100–2500(–3300 m) (Fig. 14C).

**Taxonomic notes:**—Rollins (1955) separated *Menonvillea hookeri*, *M. longipes*, and *M. pertylosa* from *M. scapigera* mainly by characters such as plant height, stem branching, presence vs. absence of cauline leaves, and length of flowers and silicles. As pointed out by Prina (2001), however, the entire complex seems to represent a continuous range of morphological variation, possibly associated with altitudinal ranges. Plants of higher

elevations have larger flowers and reduced stems (to scapose habit), while those of lower altitudes have smaller flowers and longer stems with well-developed cauline leaves. Based on analyses using morphological and molecular characters, Salariato *et al.* (2012) concluded that *M. scapigera* subsp. *longipes* (including *M. hookeri* and *M. perstylosa*) cannot be differentiated from *M. scapigera* subsp. *scapigera* by an unambiguous character combination and that the two entities are extremes of a continuous, altitudinal morphological variation that does not necessarily represent a genealogical ancestry. Therefore, the subspecific rank seems to be more appropriate than the recognition of independent species.

**Representative Specimens:**—ARGENTINA. Mendoza: Depto. Las Heras, entre Villavicencio y Cruz del Paramillo, 26 December 1947, *Ruiz Leal 11078* (MERL); Depto. Luján de Cuyo, Cerro del Medio, Estancia El Salto, 4 December 1938, *Ruiz Leal 5482* (LIL, MERL); Depto. Malargüe, Cerros del Portezuelo de Borbarán, 20 km NW de Agua Escondida, ruta provincial 180, 2 February 2008, *Al-Shehbaz 824* (MO, SI); Depto. San Carlos, Refugio Militar Gral. Alvarado, entrada a la Reserva Laguna del Diamante, 30 January 2008, *Al-Shehbaz 812* (MO, SI); Depto. San Rafael, valle del Río Atuel, planta Mina de Azufre, 80 km W de El Sosneado, 24 January 1963, *Boelcke et al. 10222* (BAA); Depto. Tunuyán, en cerros aridísimos cerca de puesto El Manzano, 15 December 1933, *Ruiz Leal 1739* (MERL); Depto. Tupungato, camino de San José a Potrerillos, 14 November 1975, *Roig 8832* (MERL). Neuquén: Depto. Añelo, Sierra Auca Mahuida, November 1953, *Fabris 906* (LP); Depto. Chos Malal, Chos Malal, Cerro de la Virgen, 16 November 1969, *Ancibor et al. s.n.* (BAB 90166). CHILE. Región Metropolitana de Santiago: Prov. Chacabuco, Com. Colina, Cordillera de Santiago, mina las Arañas, January 1853, *without collector* (SGO 49214); Prov. Cordillera, Com. San José de Maipo, Parq. Nac. El Morado, Cajón del Morales, 13 January 1991, *Teillier et al. 2518* (CONC); Prov. Santiago, Com. Lo Barnechea, Santuario de la Naturaleza Yerba Loca, ladera NO del estero de la Yerba Loca, Sector Quebrada Agua Blanca, 29 February 2000, *Arroyo et al. 202088* (CONC, SGO). VI Libertador O'Higgins: Cachapoal, Machalí, Cordillera del Teniente Sewell, Río Coya, 22 February 1942, *Jiles 19* (CONC, SI); Prov. Colchagua, Com. San Fernando, Termas de Flaco, 3 January 1959, *Montero 6055* (CONC). VII Maule: Prov. Curicó, Com. Romeral, orillas de la Laguna de Teno, 9 March 1967, *Martcorena & Matthei 842* (CONC). VIII Bío-bío: Prov. Ñuble, Com. Coihueco, Cordillera de Chillán, no date, *without collector* (SGO 49212).

24. *Menonvillea zuloagaensis* Al-Shehbaz (2010: 59). Type:—ARGENTINA. [Prov. San Juan]. Depto. Iglesia, Reserva de San Guillermo, Los Caserones, vega con paredes rocosas, 3,410 m, 22 February 1981, *E. G. Nicora, E. R. Guaglianone, & A. M. Ragonesi 8262* (holotype BAA!).

**Perennials**, scapose, with compactly branched woody caudex. **Stems** 6–18 cm, erect to ascending, few from caudex, unbranched, moderately to densely pilose throughout with spreading, straight, simple trichomes 0.1–0.4(–0.6) mm long. **Leaves** all basal, long petiolate; petiole 3–12 cm long; blade suborbicular to reniform in outline, palmately or less frequently pinnately 5-lobed, sometimes with additional pair of smaller lobes, 1–3 × 1–2.5 cm, cordate to subtruncate at base; lobes broadly ovate, entire, obtuse to subacute at apex; cauline leaves absent or 1, petiolate, much smaller than basal leaves. **Racemes** terminal, 30–50-flowered, ebracteate, corymbose, elongated considerably in fruit, slightly longer than leaves, 7–12 cm long; rachis pilose, straight; fruiting pedicels divaricate to descending, 6–12 mm long, curved, slender, pilose. **Sepals** ovate, 2–2.5 × 1.4–1.8 mm, pilose, spreading, not saccate, persistent after fruit maturity, margins membranous; petals white, obovate, 3–3.5 × 1–1.8 mm, persistent, clawed, dilated and papillate at base; stamens slightly tetradynamous, persistent; filaments free, erect, dilated and papillate at base, 1.5–2 mm long; anthers oblong, 0.5–0.6 mm long; nectar glands confluent, not petaloid. **Fruits** didymous, widely ellipsoid to orbicular, glabrous; valves wingless, 2.5–3 × 1.5–2 mm; gynophore 0.2–0.5 mm long; replum expanded apically, with a septal perforation; style 0.4–0.6 mm long; stigma capitate, somewhat 2-lobed. **Seeds** oblong ca. 1.5 × 0.8 mm, wingless; cotyledons incumbent.

**Phenology:**—Flowers in February.

**Distribution and habitat:**—Known only from the type collection from the National Park “San Guillermo” in the Argentinean Province of San Juan, where it grows in rock crevices at elevations ca. 3410 m (Fig. 14D).

**Taxonomic notes:**—*Menonvillea zuloagaensis*, together with the Chilean species *M. minima*, are the only members in *Menonvillea* with wingless fruits. They belong to different sections (see key above) and differ also by characters listed under the latter species. Other morphological characters, such as the scapose habit, long-petiolate

basal leaves, and coarsely papillate petals and stamens bases support the relationship of *M. zuloagensis* to *M. scapigera* and *M. famatinensis*. Although this species was not sequenced for the molecular analysis of Salariato *et al.* (2013), morphological characters analyzed herein support its placement in Sect. *Scapigera*.

## Acknowledgments

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## References

- Al-Shehbaz, I.A. (2006) New or Noteworthy taxa of Argentinean and Chilean Brassicaceae (Cruciferae). *Darwiniana* 44(2): 359–362.
- Al-Shehbaz, I.A. (2008) Brassicaceae. In: Zuloaga, F.O., Morrone, O., Belgrano, M.J., (eds.) Catalogue of the vascular plants of the southern cone (Argentina, southern Brazil, Chile, Paraguay and Uruguay), vol 2: Dicotyledoneae: Acanthaceae–Fabaceae (Abarema–Schizolobium). *Monographs in Systematic Botany from the Missouri Botanical Garden* 107: 1663–1709.
- Al-Shehbaz, I.A. (2010) *Menonvillea zuloagaensis* and *Mostacillastrum hunzikeri* (Brassicaceae), two new species from Argentina. *Darwiniana* 48(1): 59–63.
- Al-Shehbaz, I.A. & Marticorena, C. (1990) *Menonvillea rollinsii* (Brassicaceae), a new shrubby species from Chile. *Journal of the Arnold Arboretum* 71: 135–138.
- Al-Shehbaz, I.A., Muñoz-Schick, M. & Morales, V. (2011) The present status of Brassicaceae taxa described by Rodolfo and Federico Philippi. *Harvard Papers in Botany* 16: 279–291.  
<http://dx.doi.org/10.3100/0.25.016.0204>
- Boelcke, O. (1951) Una nueva especie de “Hexaptera” de la Rioja. *Revista Argentina de Agronomía* 18(3): 171–175.
- Brown, R. (1826) Botanical appendix. In: Denham, D. & Clapperton, H (eds.) *Narrative of travels and discoveries in Northern and Central Africa, in the years 1822, 1823, and 1824, by Major Denham, Captain Clapperton, and the late Dr. Oudney*. Cummings, Hilliard & Co., Boston, pp. 61–92.
- Cabrera, A.L. & Willink, A. (1973) *Biogeografía de América Latina, Serie Biológica, Monografía 13*. Organización de los Estados Americanos, Washington, D.C., 117 pp.
- Candolle, A.P. de (1821a) Mémoire sur la famille des Crucifères. *Mémoires du Muséum d'Histoire Naturelle* 7: 169–252.
- Candolle, A.P. de (1821b) *Regni vegetabilis systema naturale, sive ordines, genera et species plantarum secundum methodi naturalis normas digestarum et descriptarum, vol. II*. Sumptibus sociorum Treuttel et Würtz, Paris, 745 pp.  
<http://dx.doi.org/10.5962/bhl.title.59874>
- Dusén, P. (1900) *Die Gefäßpflanzen der Magellansländer; nebst einem Beitrage zur Flora der Ostküste von Patagonien*. Svenska expeditionen till Magellansländerna 3(5): 77–266.  
<http://dx.doi.org/10.5962/bhl.title.9040>
- Fischer, F.E.L. & Meyer C.A. (1835) *Index seminum, quae Hortus Botanicus Imperialis Petropolitanus pro mutua commutatione offert: accedunt Animadversiones botanicae nonnullae*. Petropoli, St. Petersburg, 42 pp.
- Gay, C. (1846) *Flora Chilena, tomo I*. Fain & Thunot, Paris, 493 pp.
- Gilg, E. & Muschler R. (1909) Aufzählung aller zur Zeit bekannten südamerikanischen Cruciferen. *Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie* 42: 437–487.
- Hastings, R.I. (1905) Observations on the flora of central Chile. *Bulletin of the Torrey Botanical Club* 32: 613–623.
- Hooker, W.J. (1830) On a New Genus of Plants of the Nat. Ord. Cruciferae, from the Andes of Chili and Mendoza. *Botanical Miscellany* 1: 349–352.
- Hosseus, C.C. (1921) Flora Argentina. Estudios comparativos sobre la vegetación de las provincias de La Rioja y San Juan. *Boletín de la Academia Nacional de Ciencias de Córdoba* 26: 5–160.
- Jackson, B.D. (1894) *Index Kewensis plantarum phanerogamarum nomina et synonyma omnium generum et specierum a*

- Linnaeo usque ad annum MDCCCLXXXV complectens nomine recepto auctore patria unicuique plantae subjectis, vol II.* Oxford, Clarendon Press, 1299 pp.  
<http://dx.doi.org/10.5962/bhl.title.66720>
- Johnston, I.M. (1929a) Papers on the Flora of Northern Chile: The coastal flora of the departments of Chañaral and Taltal. *Contributions from the Gray Herbarium of Harvard University* 85: 1–137.
- Johnston, I.M. (1929b) Papers on the Flora of Northern Chile: Undescribed species from the cordillera of Atacama. *Contributions from the Gray Herbarium of Harvard University* 85: 164–172.
- Khanna, K.R. & Rollins, R.C. (1965) A taxonomic revision of *Cremolobus* (Cruciferae). *Contributions from the Gray Herbarium of Harvard University* 195: 135–157.
- Kuntze, O. (1898) *Revisio generum plantarum: vascularium omnium atque cellularium multarum secundum leges nomenclaturae internationales cum enumeratione plantarum exoticarum in itinere mundi collectarum, vol. 3b.* A. Felix, Leipzig, 576 pp.  
<http://dx.doi.org/10.5962/bhl.title.327>
- Lehmann, J.G.C. (1832) *Delectus Seminum quae in horto Hamburgensium botanico e collectione anni 1832 mutuae commutationi offeruntur.* Typis Ioannis Augusti Meissneri, Hamburg, 7 pp.
- Morrone, J.J. (2001) *Biogeografía de América latina y el Caribe.* M&T-Manuales & Tesis SEA, Zaragoza, 148 pp.
- Nordenstam, B. (1980) The Herbaria of Lehmann and Sonder in Stockholm, with Special Reference to the Ecklon and Zeyher Collection. *Taxon* 29: 279–288.  
<http://dx.doi.org/10.2307/1220289>
- Philippi, R.A. (1856a) Plantarum novarum Chilensium, Centuria prima. *Linnaea: Ein Journal für die Botanik in ihrem ganzen Umfange* 28: 609–660.
- Philippi, R.A. (1856b) Plantarum novarum Chilensium, Centuria secunda. Auctore eoden. *Linnaea: Ein Journal für die Botanik in ihrem ganzen Umfange* 28: 661–704.
- Philippi, R.A. (1860) *Florula Atacamensis seu Enumeratio Plantarum in itinere per desertum Atacamense observatarum.* Eduard Anton, Halle, 62 pp.
- Philippi, R.A. (1862a) Botánica. Sertum mendocinum. Catálogo de las plantas recojidas en Mendoza i en el camino entre ésta provincia i Chile por el portezuelo del Portillo, por don Wenceslao Díaz en los años 1860 i 1861. *Anales de la Universidad de Chile* 21: 389–407.  
<http://dx.doi.org/10.5354/0365-7779.1862.2575>
- Philippi, R.A. (1862b) Botánica. Descripcion de unas plantas nuevas, recojidas en el verano pasado en la provincia del Maule i en Chillan por don Jerman Volckmann. *Anales de la Universidad de Chile* 21: 442–450.  
<http://dx.doi.org/10.5354/0365-7779.1862.2576>
- Philippi, R.A. (1872) Botánica: descripcion de las plantas nuevas incorporadas últimamente en el herbario chileno. *Anales de la Universidad de Chile* 41: 663–746.  
<http://dx.doi.org/10.5354/0365-7779.1872.23716>
- Philippi, R.A. (1891) Catalogus Praevius Plantarum in Itinere ad Tarapaca a Friderico Philippi Lectarum. *Anales del Museo Nacional de Chile, Santiago de Chile* 8: 1–94.
- Philippi, R.A. (1892) Plantas nuevas chilenas de las familias Crucíferas, Bixáceas, Violáceas, Poligaléas (continuación). *Anales de la Universidad de Chile* 81: 329–347.  
<http://dx.doi.org/10.5962/bhl.title.8592>
- Presl, K.B. (1844) *Botanische Bemerkungen.* G. Hasse, Prague, 154 pp.  
<http://dx.doi.org/10.5962/bhl.title.280>
- Prina, A.O. (2001) Nuevas combinaciones en *Menonvillea* (Brassicaceae). *Hickenia* 3(26): 93–94.
- Reiche, C. (1895) Estudios críticos sobre la flora de Chile (continuación): familia Crucíferas. *Anales de la Universidad de Chile* 90: 77–157.
- Rollins, R.C. (1955) A revisionary study of the genus *Menonvillea* (Cruciferae). *Contributions from the Gray Herbarium of Harvard University* 177: 3–57.
- Salariato, D.L. & Al-Shehbaz I.A. (2012) *Menonvillea*. In: Anton A.M. & Zuloaga F.O. (eds.) *Flora Argentina: Brassicaceae, vol. 8.* Estudio Sigma, Buenos Aires, pp. 101–105.
- Salariato, D.L., Zuloaga, F.O. & Al-Shehbaz, I.A. (2012) Morphometric studies and taxonomic delimitation in *Menonvillea scapigera* and related species (Cremolobeae: Brassicaceae). *Plant Systematics and Evolution* 298: 1961–1976.  
<http://dx.doi.org/10.1007/s00606-012-0694-5>
- Salariato, D.L., Zuloaga, F.O. & Al-Shehbaz, I.A. (2013) Molecular phylogeny of *Menonvillea* and recognition of the new genus *Aimara* (Brassicaceae: Cremolobeae). *Taxon* 62: 1220–1234.  
<http://dx.doi.org/10.12705/626.6>
- Sandwith, N.Y. (1928) New Species from the Andes of Argentina: II. *Bulletin of Miscellaneous Information Kew* 1928: 107–109.  
<http://dx.doi.org/10.2307/4107700>
- Schulz, O.E. (1928) Die von O. Berninger, A. Hollermayer und besonders von E. Werdermann in Chile gesammelten Cruciferen. In: Werderman, E. (ed.) *Beiträge zur Kenntnis der Flora von Chile. Notizblatt des Botanischen Gartens und Museums zu Berlin-Dahlem* 10(95): 460–472.

- Schulz, O.E. (1936) Cruciferae. In: Engler, A. & Harms, H. (eds) *Die Natürlichen Pflanzenfamilien*, vol 17B, 2nd ed. Verlag von Wilhelm Engelmann, Leipzig, pp 227–658.
- Spegazzini C.L. (1902) Nova Addenda ad Floram Patagonicam. *Anales del Museo Nacional de Buenos Aires* 7(2): 135–308.
- Steudel, E.G. (1841) *Nomenclator botanicus, seu, Synonymia plantarum universalis: enumerans ordine alphabetico nomina atque synonyma, tum generica tum specifica, et a Linnaeo et a recentioribus de re botanica scriptoribus plantis phanerogamis imposita, Vol II.* typis et sumptibus J.G. Cotta, Stuttgart & Tübingen, 810 pp.  
<http://dx.doi.org/10.5962/bhl.title.655>
- Steudel, E.G. (1856) Einige Beiträge zuder Chilesischen und Peruanischen Flora, hauptsächlich nach den Sammlungen von Bertero und Lechler. *Flora oder Botanische Zeitung: welche Recensionen, Abhandlungen, Aufsätze, Neuigkeiten und Nachrichten, die Botanik betreffend, enthält herausgegeben von der Königl. Botanischen Gesellschaft in Regensburg* 39(26): 401–412.
- Turczaninow, N.S. (1846) Generum Adhuc non Descriptorum, Adjectis Descriptionibus Nonnullarum Specierum Byttneriacearum. *Bulletin de la Société impériale des naturalistes de Moscou* 19(3): 497–510.
- Turczaninow, N.S. (1854) Animadversiones ad Primam Partem Herbarii Turczaninowiani, Nunc Universitatis Caesareae Charkowiensis. *Bulletin de la Société impériale des naturalistes de Moscou* 27(4): 271–372.
- Turczaninow, N.S. (1863) Animadversiones ad Catalogum Primum et Secundum Herbarii Universitatis Charkoviensis. *Bulletin de la Société impériale des naturalistes de Moscou* 36(2): 545–615.
- Warwick, S.I., Mummenhoff, K., Sauder, C.A., Koch, M.A. & Al-Shehbaz, I.A. (2010) Closing the gaps: Phylogenetic relationships in the Brassicaceae based on DNA sequence data of nuclear ribosomal ITS. *Plant Systematics and Evolution* 285: 209–232.  
<http://dx.doi.org/10.1007/s00606-010-0271-8>

## Appendix I. Numerical List of Taxa and Specimens Examined

### Numerical List of Taxa

#### ***Menonvillea* Sect. *Cuneata***

1. *Menonvillea cicatricosa* (Phil.) Rollins
2. *Menonvillea comberi* Sandwith
3. *Menonvillea cuneata* (Gillies & Hook.) Rollins
4. *Menonvillea frigida* (Phil.) Rollins
5. *Menonvillea macrocarpa* (I.M. Johnst.) Rollins
6. *Menonvillea nordenskjoeldii* (Dusén) Rollins
7. *Menonvillea patagonica* Speg.
8. *Menonvillea rigida* Rollins
9. *Menonvillea spathulata* (Gillies & Hook.) Rollins
10. *Menonvillea virens* (Phil.) Rollins

#### ***Menonvillea* Sect. *Menonvillea***

11. *Menonvillea chilensis* (Turcz.) B.D. Jacks.
12. *Menonvillea constitutionis* (Phil.) Rollins
13. *Menonvillea filifolia* Fisch. & C.A. Mey.
14. *Menonvillea flexuosa* Phil.
15. *Menonvillea linearis* DC.
16. *Menonvillea litoralis* (Barnéoud) Rollins
17. *Menonvillea marticorenae* (Al-Shehbaz) Salariato & Al-Shehbaz
18. *Menonvillea minima* Rollins
19. *Menonvillea orbiculata* Phil.
20. *Menonvillea pinnatifida* Barnéoud
21. *Menonvillea purpurea* (Hastings) Rollins

#### ***Menonvillea* Sect. *Scapigera***

22. *Menonvillea famatinensis* (Boelcke) Rollins
- 23.1. *Menonvillea scapigera* (Phil.) Rollins subsp. *longipes* (Rollins) Prina
- 23.2. *Menonvillea scapigera* (Phil.) Rollins subsp. *scapigera*
24. *Menonvillea zuloagaensis* Al-Shehbaz

**Specimens Examined.** Specimens are arranged by collector (with first initial, when known) in alphabetical order, followed by collector's number in increasing order (s.n. = without number), followed by species number in parentheses.

**Abadie, C.** s.n., CRP 1048 (7)  
**Ackermann, M.** 71 (10)  
**Al-Shehbaz, I.** 806 (3); 807 (3); 812 (23.1); 814 (23.2); 815 (23.1); 816 (1); 818 (1); 824 (23.1)  
**Álvarez, N.** 2 (1); 3 (23.2); 8 (9); 9 (9); 10 (9); 11 (23.2); 15 (3)  
**Ambrosetti, J.** s.n., MERL 29193 (23.1); s.n., MERL 33825 (23.1); s.n., MERL 34551 (23.1)  
**Ancibor, E.** s.n., BAB 90166 (23.1); s.n., BAB 90253 (7)  
**Andrews, M.** s.n., HIP 3118 (6)  
**Arancio, G.** 11239 (11); 12540 (16); 15322 (11); 88301 (19); 89991 (11); 91439 (18); 91855 (14); 92125a (3); 92151 (3); 92181 (3); 92181 (3); 92365 (10); 92365 (10); 93163 (14); 94249 (3)  
**Aravena, P.** N13 (15)  
**Arroyo, M.** 81021 (3); 81153 (20); 81618 (3); 81630 (3); 85350 (10); 85571 (10); 92418 (6); 94006 (4); 94131 (10); 94156 (10); 97011 (10); 97264 (10); 97390 (10); 97422 (10); 97500 (10); 201398 (23.1); 202088 (23.1); 841030 (6); 860022 (6); 870014 (6); 870106 (6); 870211 (6); 995105 (23.1)  
**Arroyo, S.** s.n., T.B.P.A. 2312 (6); s.n., T.B.P.A. 2609 (6); s.n., T.B.P.A. 2715 (6); s.n., T.B.P.A. 2727 (6)  
**Avendaño, J.** 72 (15)  
**Ayarde, H.** 364 (10)  
**Azocart, R.** s.n., SGO 63962 (12)  
**Baeza, M.** 557 (10)  
**Bailey, E.** s.n., CONC 145049 (16); s.n., SGO 132748 (15)  
**Balegno, B.** 4330 (9)  
**Barboza, G.** 210 (3); 3343 (22); 3360 (22)  
**Barros, E.** 2767 (11); s.n. CONC 62049 (9)  
**Bassano, M.** s.n., SGO 138635 (3)  
**Beckett, K.** 4469 (21); 4648 (3); 4667 (14)  
**Behn, F.** 8992 (20); s.n. CONC 21328 (13); s.n. CONC 21327 (15); s.n., CONC 21329 (13); s.n., CONC 21351 (3); s.n., CONC 26749 (3); s.n., CONC 32315 (1); s.n., CONC 7782 (15); s.n., CONC 8986 (18); s.n., CONC 8998 (19); s.n., CONC 93504 (11)  
**Belgrano, M.** 45 (6)  
**Biese, W.** 742 (20); 816 (21); 849 (23.1); 910 (21); 910 (21); 983 (21); 984 (21); 985 (23.1); 2940 (13)  
**Biganzoli, F.** 1907 (7)  
**Biurrun, F.** 4546 (3)  
**Böcher, T.** 1040 (23.1); 1068 (23.1); 1304 (23.1); 1527 (9); 1995 (3); 2053 (23.1); 2205 (3)  
**Boelcke, O.** 453 (6); 582 (6); 626 (6); 751 (6); 3786 (13); 3821 (12); 4089 (9); 4116 (23.2); 4140 (9); 4168 (9); 7154 (8); 9056 (21); 9658 (15); 9743 (3); 9747 (3); 9804 (3); 10008 (9); 10020 (23.2); 10059 (9); 10222 (23.1); 10624 (3); 11235 (7); 11306 (7); 11604 (23.2); 11727 (7); 15940 (9); 16749 (6); 16862 (16)  
**Bultmann, F.** s.n., CONC 21331 (14); s.n., CONC 23529 (15)  
**Burkart, A.** 14052 (23.1); 14057 (23.2)  
**Burmeister, C.** s.n., LPS 21241 (3)  
**Cabrera, A.** 3567 (3); 8365 (10); 9100 (10); 11432 (17); 11478 (13); 12562 (17); 12678 (17); 19160 (8); 23007 (8); 24387 (3); 24391 (3)  
**Cadillo, M.** s.n., BCRU (8)  
**Carette, B.** 4 (23.2); 21 (23.1); 25 (9); 41 (23.1); 66 (9); 196 (23.1); 197 (23.1); 198 (23.1); 199 (23.1); 200 (9); 201 (9); 202 (9); s.n., MERL 3458 (9)  
**Castellanos, A.** s.n., BA 30/481 (10); s.n., LIL 15514 (23.2); s.n., LIL 16228 (3); s.n., LIL 406275 (3)  
**Castillón, L.** 3361 (10); s.n., BA 3632 (10)  
**Cocucci, A.** 2252 (23.2)  
**Collantes, B.** s.n., CONC 61874 (16)  
**Comber, H.** 914 (2)  
**Covas, G.** 1067 (9); 1084 (9); 2297 (23.1)  
**Cruzat, E.** s.n., SGO 130750 (23.1)  
**Dalmaso, A.** 738 (23.2); 760 (3)  
**Del Vitto, L.** s.n., MERL 27614 (23.1); s.n., MERL 27626 (23.1)  
**Díaz, W.** s.n., SGO 63966 (9)  
**Diem, J.** 473 (8); 933 (8); 2959 (8)  
**Dollenz, O.** 1226 (6)  
**Donadio, S.** 6 (3); 14 (3); 124 (10)  
**Donat, A.** 433 (6)  
**Dusén, P.** 5951 (6)  
**Eggli, U.** 1810 (20)  
**Ezcurra, C.** 2768 (23.1); 2979 (8)  
**Fabris, H.** 906 (23.1); 7740 (10)  
**Ferreira, M.** 111 (8); 334 (6); 409 (2); 449 (2); 623 (2); 624 (2)



**Fiedler, R.** 89 (9)  
**Flores, L.** s.n., SGO 155581 (13)  
**Flossdorf, A.** 22 (10)  
**Flury, A.** s.n., CORD 1046 (3)  
**Gálvez, I.** s.n., SGO 109237 (3)  
**Garaventa, A.** 219 (23.1); 440 (13); 488 (23.1); 1675 (13); 1676 (13); 2392 (15); 2393 (15); 2725 (13); 2742 (13); 2746 (13); 3310 (23.1); 3311 (23.1); 3508 (9); 4101 (23.1); 4102 (23.1); 4103 (23.1); 4104 (23.1); 4114 (13); 4341 (16); 4345 (17); 7094 (11); 7095 (11); 7097 (23.1); 7098 (17); 7099 (13); 8000 (17); 8001 (17); 8002 (11); 8004 (15); 8005 (16); 8006 (11); 8007 (20); 8008 (11); 8009 (16); 8011 (13); 8014 (15); 8252 (9); 8254 (23.1); s.n., SGO 133660 (13)  
**García, N.** 131 (6)  
**Garfia, C.** s.n., CONC 173204 (0)  
**Geisse, W.** 1923 (11), s.n., CONC 61864 (11); s.n., SGO 72464 (11)  
**Germain.** s.n., SGO 49151 (15); s.n., SGO 63961 (3)  
**Gerth, A.** 136 (23.1)  
**Gleisner, G.** 10 (16); 127 (13)  
**Gosewijn, W.** s.n., SGO 138175 (21)  
**Grandjot, C.** 356 (16); 883a (23.1); 1028 (21); 1160 (9); 1166 (3); 2623 (9); 2726 (9); 3908 (23.1); 4537 (11); 4537 (11); s.n., CONC 1029 (3); s.n., CONC 21330 (13); s.n., CONC 21349 (23.1); s.n., CONC 929 (13); s.n., Garaventa 8040 (11)  
**Guerrido, C.** 434 (6); 613 (6)  
**Guimon-Poci.** s.n., MERL 15728 (3)  
**Gunckel, H.** 23101 (20)  
**H.A.L.** 6648 (9); 6649 (23.1)  
**Haloy, S.** 443 (3); 643 (10)  
**Hauman, L.** 127 (3); 17449 (3)  
**Herbarium Salesianum "Camilo Ortuzar Montt"** 1698 (13); 1705 (15)  
**Herrera, S.** 872 (3); 995 (3)  
**Hicken, C.** 94 (9)  
**Hieronymus, G.** 377 (10); 379 (22); 609 (23.1)  
**Hoffmann, A.** 98b (20); 180 (11)  
**Hosseus, C.** s.n., CORD (3)  
**Hueck, J.** 18180 (9) s.n., SI 18155 (3); s.n., SI 18179 (9); s.n., SI 18187 (9)  
**Hunziker, A.** 20873 (10)  
**Hunziker, J.** 1941 (22); 2186 (3); 3077 (3); 11190 (3); 11201 (3); 11306 (9); 11317 (23.2)  
**Hutchinson, P.** 181 (14)  
**Ibañez, A.** s.n., SGO 130633 (19)  
**Iter Patagonicum.** 357 (6)  
**Jaffuel, F.** 646 (23.1)  
**James, P.** 306 (6)  
**Jiles, C.** 19 (23.1); 1368 (17); 2168 (11); 2477 (3); 2806 (17); 2951 (3); 2973 (3); 3300 (20); 3423 (3); 3507 (13); 3617 (3); 3948 (19); 3950 (19); 4174 (3); 4447 (3); 4841 (3); 5066 (3); 6116 (3); 6483 (3)  
**Johnson, L.** 10-130 (23.1)  
**Johnston, I.** 5980 (3); 6058 (5); 6087 (3); 6175 (3); 6176 (3); 6211 (3);  
**Kausel, E.** 4422 (15)  
**Kiesling, R.** 1398 (3); 3191 (3); 6262 (3); 6384b (10) 6751 (1)  
**King, T.** s.n., CONC 61882 (11)  
**Kohler, A.** 535 (11)  
**Krapovickas, A.** 3206 (10); 5377 (10); 5595 (3); 5621 (3); 5807 (3); 6311 (10); 6313 (10); 6317 (10); 6321 (10); 6334 (10)  
**Kunkel, G.** 4881 (23.1)  
**Kuntze, O.** 50 (23.2)  
**Kurtz, F.** 162 (23.2); 3451 (23.1); 3471a (3); 3471b (3); 5617 (9); 5697 (23.1); 5866 (23.1); 7143 (23.1); 7156 (23.2); 7413 (23.1); 7542 (23.2); 9562 (3); 9630 (3); 9657 (3); 9681 (3); 9955 (23.1); 10977 (23.1); 11012 (23.2); 11067 (9); 11111 (9); 13929 (10); 14000 (10); 14047 (10); 14583 (10); 15777 (10); 15862 (10)  
**Lagiglia, H.** 1331 (3)  
**Lammers, T.** 7743 (21)  
**Landero, A.** 695 (6); 732 (6)  
**Landi, A.** s.n., MERL 5751 (3)  
**Latorre, C.** 204 (10)  
**Latour, M.** s.n., T.B.P.A 1748 (6)  
**Letelier, L.** 462 (18); 997 (3)  
**Loos, A.** s.n., BAB 15034 (3)  
**Looser, G.** 1161 (13); 2734 (12); 4516 (23.1)

**Luti, R.** 3517 (3)  
**Mahu, M.** 2450 (12)  
**Martcorena, C.** 39 (1); 93 (17); 122 (17); 194 (17); 326 (20); 431 (16); 842 (23.1); 848 (1); 906 (1); 1408 (17); 1464 (16); 1657 (19); 1675 (16); 1784 (19); 1837 (18); 1880 (11); 9863 (3); 83358 (20); 83453 (3); 83560 (3); 83622 (20)  
**Martin, H.** 559 (10)  
**Martínez-Carretero, E.** 80 (23.1); 1254 (3)  
**Mc Sweeney, G.** 35 (6)  
**Medan, D.** 822 (9); 826 (23.2)  
**Meiling, O.** 2088 (8)  
**Méndez, E.** 9976 (23.2); 10023 (23.2); 10025 (23.2); 10101 (23.2); s.n., MERL 37039 (9)  
**Meserve, L.** 42 (16); 43 (16)  
**Mieres, G.** s.n., CONC 166159 (9)  
**Mihoc, M.** 346 (13)  
**Milner, R.** s.n., CONC 21350 (3)  
**Mison-Gaste, E.** s.n. (SGO 63973) (14)  
**Montero, G.** 523 (21); 770 (15); 1838 (16); 2792 (21); 3225 (17); 6055 (23.1); 6625 (23.1); 7073 (23.1); 7393 (23.1); 7574 (11); 7593 (11); 7619 (18); 9640 (23.1); 11027 (11)  
**Monypenny, R.** 19 (18)  
**Morales, J.** s.n., CONC 61879 (3)  
**Moreira, A.** 1373 (15)  
**Morrison, J.** 16974 (3)  
**Morrone, O.** 5958 (23.1)  
**Muñoz, C.** 1897 (11); 1937 (11); 1990 (18); 3376 (16); 3798 (4)  
**Muñoz, M.** 1019 (11); 1037 (11); 1318 (23.1); 1781 (21); 2006 (18); 2669 (16); 2894 (11)  
 3040 (19); 3075 (11); 3421 (16); 3499 (23.1); 3513 (9); 3521 (9); 3522 (9); 3530 (9); 3582 (23.1); 3819 (18); 3961 (3); 3976 (3); 3977 (3); 4080 (18); 4195 (20); 4210 (13); 4212 (13); 4222 (13); s.n., CONC 62048 (3); s.n., CONC 61876 (3); s.n., CONC 62047 (3)  
**Neumeyer, J.** 596 (8); 597 (6); 664 (2)  
**Nicora, E.** 4368 (3); 8262 (24); 8413 (3); 8493 (3); 8503 (3)  
**Niemeyer, H.** s.n., CONC 61881 (3)  
**Novoa, J.** 95 (17)  
**Osorio, R.** s.n., SGO 134988 (3)  
**Pardo, V.** 15 (4)  
**Paschke, S.** s.n., CONC 12239 (6)  
**Patiño, R.** s.n., MERL 7913 (23.2)  
**Pensa, M.** s.n., CORD (10)  
**Peña, L.** s.n., CONC 61845 (10)  
**Peralta, D.** s.n., SGO 78134 (3)  
**Pereyra, J.** s.n., CRP 710 (7)  
**Pérez-Moreau, R.** s.n., BA 23112 (23.1); s.n., BA 30/78 (3); s.n., BA 30/81 (3); s.n. BA 44816 (6); s.n., BA 49542 (6); s.n., BA 30/80 (3); s.n. (BA) (6)  
**Petersen, E.** 863 (10)  
**Pfister, A.** s.n., CONC 12176 (6); s.n., CONC 7110 (15); s.n., CONC 8846 (15)  
**Philippi, F.** 106a, SGO 45154 (3); 106-6, SGO 45156 (3); 109-6, SGO 68227 (14); 110c, SGO 45122 (15); 111 (15); 186d, SGO 45155 (3); 1619 (16); 1785a, SGO 78113 (11); 1785b, SGO 78112 (11); 1882 (11); 1946 (11); 1948 (18); 2281 (3)  
**Philippi, R.** s.n., BAA (3); s.n., CORD (11); s.n., CORD (3); s.n., SGO 49150 (15); s.n. SGO 63964 (4); s.n., SGO 63975 (19); s.n., SGO 63978 (14); s.n., SGO 68266 (4); s.n., SGO 77943 (11); s.n., SGO 78096 (21); s.n., SGO 78102 (16); s.n., SGO 78103 (16); s.n., SGO 78109 (11); s.n., SGO 78136 (3)  
**Pirión, P.** 138 (1)  
**Pisano, E.** 465 (11); 895 (20); 1869 (10); 1994 (10); 4351 (6); 4366 (6); 6012 (11)  
**Prina, A.** 2395 (1), 2920 (9), 3531 (23.1), 3624 (9), 3680 (23.2), 1240b (23.1)  
**Pugatte, J.** 240 (3)  
**Quirós, R.** s.n., CONC 61865 (15)  
**Reiche, K.** s.n., SGO 49215 (23.1); s.n., SGO 61493 (12); s.n., SGO 63962 (12)  
**Reid, E.** s.n. (23.1)  
**Ricardi, M.** 392 (6); 547 (20); 598 (3); 707 (20); 1255 (20); 1285 (11); 1504 (11); 1638 (3); 1677 (3); 1732 (3); 1771 (3); 1784 (3); 2082 (16); 2229 (11); 3944 (11); 5468 (19); 4363/748 (20); 4453/838 (20); 4532/917 (20); s.n., CONC 25868 (15)  
**Risopatrón, L.** s.n., SGO 78132 (9)  
**Rodríguez, D.** 1399 (10)  
**Rodríguez, R.** 2687 (19)  
**Rogero, J.** 8384 (7)

**Rohmeder, W.** B-1 (10); s.n., LIL 300670 (10); s.n., LIL 29355 (10); s.n., LIL 29392 (10)  
**Roig, F.** 45 (23.2); 84 (3); 275 (9); 5152 (9); 5196 (23.2); 6580 (23.1); 7449 (23.1); 8832 (23.1); 11058 (9); 11423 (3); 11860 (9); s.n., MERL 43713 (23.1)  
**Ruiz Leal, R.** 76 (3); 160 (3); 191 (3); 1599 (3); 1739 (23.1); 1870 (23.2); 1897 (23.2); 1898 (9); 1901 (3); 1903 (9); 1912 (23.2); 1913 (23.2); 1972 (9); 2056 (9); 2394 (23.1); 3142 (23.2); 3172 (23.2); 3180 (9); 4076 (23.1); 4267 (3); 4931 (3); 5452 (23.1); 5482 (23.1); 5624 (3); 6604 (3); 6863 (23.1); 7158 (23.2); 7215 (9); 7230 (23.2); 11078 (23.1); 11460 (3); 11684 (9); 11701 (23.2); 11741 (9); 11942 (3); 14554 (9); 14566 (23.2); 14596 (3); 14622 (3); 14879 (3); 15768 (23.2); 16781 (23.1); 16831 (9); 21597 (3); 23411 (3); 23517 (23.2); 23521 (9); 23553 (9); 23565 (9); 24473 (7); s.n., LP 191 (3); s.n., LP 76 (3)  
**Saa, J.** s.n., CONC 61885 (11)  
**Saavedra, F.** 150 (3); 152 (23.1); 153 (21); 155 (9)  
**Sanzin, R.** 116 (9); 142 (3); 328 (3)  
**Schajovskoy, S.** 7712 (8)  
**Schiller, W.** s.n., LP 108 (3)  
**Schlegel, F.** 348 (12); 2518 (23.1); 3830 (13); 3888 (11); 4430 (23.1); 53 (15)  
**Schreiter, R.** 6092 (10); 6109 (10)  
**Schwebe, H.** 196a (23.1)  
**Semper, J.** 4117 (23.1); 4918 (3); s.n., LIL 213928 (3); s.n., MERL 13063 (23.2);  
**Serey, I.** s.n., SGO 138116 (13)  
**Serra, L.** 9 (23.2); 15 (9); 38 (23.2); 43 (9); 52 (23.2)  
**Without collector.** BAA 8962 (8); LP 028425 (21); SGO 49156 (11); SGO 49212 (23.1); SGO 49214 (23.1); SGO 72704 (15); SGO 78105 (13); SI 17458 (15); ULS 2448 (11)  
**Sleumer, H.** 530 (23.2); 1156 (6); 1345 (6); 1403 (6); 1421 (6)  
**Soehrens, J.** s.n., SGO 45121 (13)  
**Solervicens, J.** s.n., SGO 130779 (3)  
**Soriano, A.** 2120 (7); 3857 (7); 4090 (9)  
**Sparre, B.** 1583 (3); 2548 (16); 9742 (10); 10059 (15)  
**Spegazzini, C.** 21242 (6); 21243 (10); 21244 (3); 21246 (3); 21249 (3); 21250 (3); 21251 (3); 21500 (3); 21521 (3); 21524 (7); 24409 (3)  
**Spegazzini, R.** 178 (6); 257 (6)  
**Squeo, F.** 87081 (16); 88019 (3); 88038 (3); 88058 (3); 88071 (3); 88150 (3)  
**Stebbins, G.** 8570 (21); 8950 (23.1)  
**Stuessy, T.** 10380 (3)  
**Taylor, C.** 10669 (17); 10683 (20); 10816 (19)  
**Teillier, S.** 922 (11); 2514 (3); 2515 (9); 2516 (23.1); 2518 (23.1); 2518 (23.1); 2520 (21); 2957 (11); 4184 (3); 4494 (3); 4532 (3); 4581 (9); 4582 (9); 4904 (17); 4977 (3); 5008 (3); 5049 (3); 5298 (21); 5299 (9); 5300 (23.1); 5301 (21); 5302 (23.1); 5303 (23.1); 5512 (3); 5513 (3); 5536 (21); 5543 (21); 6126 (11); 6175 (3); 6473 (3); 6483 (23.1)  
**Torres, J.** 391 (3); s.n., SGO 140222 (10)  
**Vallerini, J.** 396 (7); s.n., CRP 3521 (7)  
**Vargas, A.** 96 (23.1)  
**Vervoorst, F.** 3245 (3); 4411 (6); 4472 (6); 4685 (6)  
**Villagrán, C.** 441 (23.1); 1813 (3); 4584 (3); 4628 (3); 8456 (9); 8466 (3); 8480 (23.1)  
**von Bohlen, C.** 687 (23.1); 1166 (11); 1342 (20); 1343 (19); 1450 (3)  
**Wagenknecht, R.** 46 (17); 263 (3); 310 (16); 332 (20); 3317 (16); 5424 (3); s.n., CONC 92011 (3); s.n., CONC 92012 (20); s.n., CONC 93477 (13); s.n., CONC 93480 (20); s.n., CONC 93512 (13); s.n., Garaventa 3318 (13).  
**Weldt, E.** 678 (23.1)  
**Werdermann, E.** 28 (15); 219 (3); 391 (19); 835 (11); 896 (14); 949 (3); 137/835 (11)  
**Wingenroth, M.** 22 (3); 96 (3); 122 (3); 125 (3); 340 (3); 380 (3)  
**Witte, L.** 21 (6); 53 (6)  
**Worth, C.** 16393 (20)  
**Zannoti, C.** 286 (10)  
**Zöllner, O.** 249 (15); 1907 (11); 2031 (13); 4108 (3); 5733 (23.1); 6437 (20); 7512 (6); 7913 (21); 9842 (11); 9930 (16); 11876 (3); 11879 (3); 12024 (2); 14118 (23.1); s.n., CONC 91676 (12); s.n., CONC 93496 (21); s.n., CONC 93499 (16); s.n., CONC 93501 (11); s.n., SI (3)  
**Zuloaga, F.** 12258 (9); 12353 (23.2); 12364 (23.1); 12365 (1); 12380 (23.2); 12775 (3); 12784 (3); 13932 (7); 13942 (7)

## Appendix II. Index of Names

Accepted taxa are bold face.

*Cymatoptera chilensis* Turcz.

*Cymatoptera* Turcz.

*Decaptera trifida* Turcz.  
*Decaptera* Turcz.  
*Dispeltophorus crassifolius* Lehm.  
*Dispeltophorus* Lehm.  
*Hexaptera cuneata* Gillies & Hook.  
*Hexaptera cuneata* (Gillies & Hook.) Rollins var. *edentata* Kuntze  
*Hexaptera cuneata* Gillies & Hook. var. *nordenskjoeldii* (Dusén) Gilg & Muschl.  
*Hexaptera cuneata* Gillies & Hook. var. *violacea* (Phil.) Reiche  
*Hexaptera cicatricosa* Phil.  
*Hexaptera constitutionis* Phil.  
*Hexaptera famatinensis* Boelcke var. *sphaerocarpa* Boelcke  
*Hexaptera famatinensis* Boelcke  
*Hexaptera frigida* Phil.  
*Hexaptera* Hook.  
*Hexaptera jussiaei* Barnéoud  
*Hexaptera jussiaei* Barnéoud var. *tridens* (Phil.) Reiche  
*Hexaptera kurtzii* Hosseus  
*Hexaptera linearis* Barnéoud  
*Hexaptera litoralis* Barnéoud  
*Hexaptera macrocarpa* I.M. Johnst.  
*Hexaptera nordenskjoeldii* Dusén  
*Hexaptera pinnatifida* Gillies & Hook.  
*Hexaptera pinnatifida* Gillies & Hook. var. *nana* Hieron.  
*Hexaptera purpurea* Hastings  
*Hexaptera pusilla* Phil.  
*Hexaptera scapigera* Phil.  
*Hexaptera spathulata* Gillies & Hook.  
*Hexaptera spathulata* subsp. *pusilla* (Phil.) Gilg & Muschl.  
*Hexaptera spathulata* Gillies & Hook. var. *pusilla* (Phil.) Reiche  
*Hexaptera tridens* Phil.  
*Hexaptera violacea* Phil.  
*Hexaptera virens* Phil.  
*Menonvillea alata* Rollins  
*Menonvillea alyssoides* Rollins  
*Menonvillea angustifolia* C. Presl  
*Menonvillea aptera* Phil.  
*Menonvillea arachnoidea* O. E. Schulz  
***Menonvillea chilensis*** (Turcz.) B.D. Jacks.  
*Menonvillea chilensis* var. *aptera* (Phil.) Rollins  
***Menonvillea cicatricosa*** (Phil.) Rollins  
***Menonvillea comberi*** Sandwith  
***Menonvillea constitutionis*** (Phil.) Rollins  
*Menonvillea crassa* Rollins  
***Menonvillea cuneata*** (Gillies & Hook.) Rollins  
***Menonvillea*** DC.  
*Menonvillea falcata* Reiche  
***Menonvillea famatinensis*** (Boelcke) Rollins  
*Menonvillea famatinensis* Boelcke var. *sphaerocarpa* (Boelcke) Rollins  
***Menonvillea filifolia*** Fisch. & C.A. Mey.  
*Menonvillea filifolia* Fisch. & C.A. Mey. subsp. *marticorenae* Al-Shehbaz  
***Menonvillea flexuosa*** Phil.  
*Menonvillea flexuosa* Phil. f. *tomentosa* Gilg & Muschl.  
***Menonvillea frigida*** (Phil.) Rollins  
*Menonvillea gayi* Phil.  
*Menonvillea hirsuta* Rollins  
*Menonvillea hookeri* Rollins  
***Menonvillea linearis*** DC.  
*Menonvillea linearis* DC. var. *filifolia* (Fisch. & C.A. Mey.) Rollins  
*Menonvillea linearis* DC. var. *trifida* Reiche  
*Menonvillea linearis* DC. var. *virgata* (Phil.) Reiche  
***Menonvillea litoralis*** (Barnéoud) Rollins

*Menonvillea longipes* Rollins  
***Menonvillea macrocarpa*** (I.M. Johnst.) Rollins  
***Menonvillea marticorenae*** (Al-Shehbaz) Salariaio & Al-Shehbaz  
*Menonvillea media* Turcz.  
***Menonvillea minima*** Rollins  
***Menonvillea nordenskjoeldii*** (Dusén) Rollins  
***Menonvillea orbiculata*** Phil.  
*Menonvillea orbiculata* Phil. var. *parviflora* (Phil.) Reiche  
*Menonvillea orbiculata* Phil. var. *perplexa* Rollins  
*Menonvillea orbiculata* Phil. f. *glabra* Gilg & Muschl.  
*Menonvillea parviflora* (Phil.) var. *aptera* I.M. Johnst.  
*Menonvillea parviflora* Phil.  
*Menonvillea parvula* Phil.  
***Menonvillea patagonica*** Speg.  
*Menonvillea perstylosa* Rollins  
***Menonvillea pinnatifida*** Barnéoud  
*Menonvillea pinnatifida* Barnéoud var. *parvula* (Phil.) Gilg & Muschl.  
***Menonvillea purpurea*** (Hastings) Rollins  
***Menonvillea rigida*** Rollins  
*Menonvillea robustula* Steud.  
***Menonvillea scapigera*** (Phil.) Rollins  
***Menonvillea scapigera*** (Phil.) Rollins subsp. *scapigera*  
*Menonvillea scapigera* (Phil.) Rollins subsp. *hirsuta* (Rollins) Prina  
***Menonvillea scapigera*** (Phil.) Rollins subsp. *longipes* (Rollins) Prina  
***Menonvillea spathulata*** (Gillies & Hook.) Rollins  
*Menonvillea trifida* Phil.  
*Menonvillea trifida* Steud.  
***Menonvillea virens*** (Phil.) Rollins  
*Menonvillea virgata* Phil.  
***Menonvillea zuloagaensis*** Al-Shehbaz