
TAXONOMIC REVISION OF *ALOYSIA* (VERBENACEAE, LANTANEAE) IN SOUTH AMERICA¹

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ABSTRACT

Aloysia Paláu is the third largest genus of tribe Lantaneae, after *Lippia* L. and *Lantana* L., in the Verbenaceae. Recent molecular phylogenetic studies have circumscribed genus *Aloysia* as 31 species, with the transfer of most species of *Acantholippia* Griseb. and the inclusion of the monotypic *Xeroaloyisia* Tronc., as well as the exclusion of several North American *Aloysia* species that nest within a *Lippia*–*Lantana* clade. Newly circumscribed *Aloysia* are found mostly in South America, where the genus is represented by 28 species and six varieties. Only four *Aloysia* species are found in North America, *A. coalcomana* Siedo, *A. macrostachya* (Torr.) Moldenke, *A. wrightii* A. Heller, and *A. gratissima* (Gillies & Hook.) Tronc. var. *gratissima*, this last being the only taxon found in both North and South America. A taxonomic revision of the genus *Aloysia* for South America is provided with detailed morphological descriptions, as well as keys for taxonomic identification, illustrations or indication of iconography, and distribution and herbarium specimen lists. The genus *Xeroaloyisia* Tronc. is here considered a synonym of *Aloysia*, and nine new taxonomic synonyms are here established. Lectotypification is designated for *Verbena* L. sect. *Aloysioides* Walp., and neotypification is designated for *V. salvifolia* Hook. & Arn.

Key words: *Acantholippia*, *Aloysia*, South America, Verbenaceae.

Recent molecular phylogenetic studies dealing with generic limits in the Lantaneae (Verbenaceae) have suggested that *Aloysia* Paláu, as traditionally circumscribed, may be a polyphyletic group (Marx et al., 2010; Lu-Irving & Olmstead, 2013). A subsequent study that focused on resolving the position of *Aloysia* and related genera (Lu-Irving et al., 2014), using both chloroplast and nuclear gene sequences, confirmed the non-monophyly of traditional *Aloysia*. These authors proposed the inclusion within *Aloysia* of most taxa in *Acantholippia* Griseb. and the monotypic genus *Xeroaloyisia* Tronc., and the exclusion of several North American taxa nested in the *Lantana* L.–*Lippia* L. clade (Lu-Irving et al., 2014: 649, fig. 4), to be able to recover a well-supported monophyletic *Aloysia*. Consequently, this new circumscription of *Aloysia* comprises 31 species, which occur in four major and consistently inferred clades. One clade groups the majority of *Aloysia* taxa; a second clade groups the type species of *Aloysia*, *A.*

citrodora Paláu, plus another species that shares its inflorescence morphology; a third clade reunites two South American *Aloysia* taxa; and a fourth clade groups the type species of *Acantholippia* together with the rest of the taxa formerly in *Acantholippia*. The *Lantana*–*Lippia* clade is a strongly supported group that includes *Phyla* Lour. and *Nashia* Millsp., as well as three Mexican species of *Aloysia* (*A. barbata* (Brandege) Moldenke, *A. chiapensis* Moldenke, and *A. sonorensis* Moldenke), and *Acantholippia seriphioides* (A. Gray) Moldenke.

Aloysia is the third largest genus of tribe Lantaneae, after *Lippia* and *Lantana*. *Aloysia* is distinguished from *Lantana* by its dry fruit, being fleshy in the last, and from *Lippia* by its long racemose florescences with the rachis longer than the peduncle, and alternate or opposite flowers; in *Lippia*, florescences are capituliform with a brief rachis and longer peduncle, and flowers are spiraled. Sanders (2001: 310) states *Aloysia* is based on two synapo-

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morphies, “inconspicuous, ephemeral floral bracts and involute calyx lobes.” Lu-Irving et al. (2014) noted the 4-lobed calyx as the defining feature for newly circumscribed *Aloysia*, as had been suggested by previous studies (O'Leary et al., 2012).

Aloysia as newly circumscribed is almost exclusively found in South America, with only three species restricted to North America. *Aloysia wrightii* (A. Gray) A. Heller and *A. macrostachya* (Torr.) Moldenke occur in the southwestern United States, extending into Baja California and across northern Mexico; *A. coalcomana* is only known from one locality in Michoacán, Mexico. These three species are not further considered here. Lu-Irving et al. (2014) stated that shifts in geographic range from subtropical South America to North America must have occurred at least twice in *Aloysia*, based on the reconstruction of the geographical distribution of species in the phylogenetic trees (2014: 651, fig. 5). However, based on these results, Lu-Irving et al. (2014) could not ascertain if the three North American *Aloysia* taxa were the result of long-distance dispersal or northward migration via the Andes.

Lu-Irving and Olmstead (2011; 2013) and Lu-Irving et al. (2014) found South American *Aloysia* comprised of several small lineages and one larger lineage containing the majority of *Aloysia* species. This large clade includes the formerly monotypic genus *Xeroaloyisia* as well as the North American *Aloysia* taxa; all exemplars have homothetic pleiobotrya (only axillary florescences). This species assemblage seems to represent a recent radiation, because branch lengths were short throughout the clade (Lu-Irving et al., 2014). *Aloysia* species with heterothetic pleiobotrya (both axillary and terminal florescences) grouped together in another clade, in basal position relative to the larger *Aloysia* clade. Taxa formerly in *Acantholippia* with monobotrya (only terminal florescences) also formed a clade, basal to the rest of *Aloysia*. Consequently, inflorescence morphology seems to have phylogenetic significance in *Aloysia*.

There has been no comprehensive taxonomic revision of *Aloysia*. A Ph.D. dissertation, which unfortunately lacks illustrations (Siedo, 2006), considered 30 species and 14 varieties, seven species from North America and the remaining 23 species from South America. This work included a phylogenetic analysis based on 50 morphological characters, and the results supported the monophyly of *Aloysia*. However, the author mentioned that preliminary molecular phylogenetic analysis conducted by the Olmstead et al. laboratory suggested the contrary, resulting in a polyphyletic *Aloysia*, and that additional studies were needed. This further investigation

was performed by Lu-Irving et al. (2014), with the taxonomic implications being followed in this present work.

Partial treatments have been done for *Aloysia* in Argentina (Troncoso, 1962, 1974; Botta, 1979, 1993; Múlgura et al., 2012), recognizing ca. 10 species. In Bolivia, Wood (2009) recognized seven species, and in Venezuela, López Palacios (1977) mentioned one species. However, no overall revision of the entire genus has ever been published. Four new species of *Aloysia* were recently described by Siedo (2012) for Brazil, Peru, and Mexico.

Revision of *Aloysia* for South America is presented here, following new taxonomic circumscription as suggested by the phylogenetic evidence of Lu-Irving et al. (2014). Illustration or reference to iconography, citation of representative material, synonymy, and any pertinent typification are included for the 28 species and six varieties in South America as considered herein.

MATERIALS AND METHODS

This taxonomic revision is based on collections from the following herbaria: BAF, CONC, F, K, LIL, MO, NY, P, SGO, SI, ULS, US, and WTU. Flower measurements were taken from material rehydrated by boiling. Fruit measurements were taken from dried specimens. The descriptive terminology of the inflorescences used here is in accordance with Múlgura et al. (2002), the morphological terms follow Hickey (1974), and the description of pubescence corresponds to that of Lawrence (1951). Inflorescence morphology follows terminology used by Múlgura et al. (2002), which follows Troll (1964–1969) and Sell (1976, 1980). Distribution and habitat data for taxa were taken from the herbarium specimen labels. A list of accepted species and varieties of *Aloysia* (Appendix 1), an index to collectors (Appendix 2), and a list of taxa newly synonymized here with their accepted range (Appendix 3) are provided.

TAXONOMIC TREATMENT

***Aloysia* Paláu, Parte Práct. Bot. 1: 767. 1784. TYPE:**
Aloysia citrodora Paláu.

Aloysia Ort. ex Juss., Ann. Mus. Hist. Nat. 7: 73. 1806, nom. illeg. *Lippia* L. sect. *Aloysia* (Ort.) Schauer in DC., Prod. [de Candolle] 11: 572. 1847, nom. illeg. *Lippia* subg. *Aloysia* (Ort.) Schauer in Engl. & Prantl, Nat. Pflanzenfam. Teil 4(Abt. 3a): 151. 1897, nom. illeg. TYPE: *Verbena triphylla* L'Hér. [= *A. triphylla* (L'Hér.) Britton; = *A. citrodora* Paláu].
Verbena L. sect. *Aloysioides* Walp., Repert. Bot. Syst. 4: 13. 1845. TYPE: *Verbena gratissima* Gillies & Hook. [= *Aloysia gratissima* (Gillies & Hook.) Tronc.], lectotype, designated here.

Zappania Lam., Tabl. Encycl. 1: 59. 1791, nom. illeg. orth.,
Zappania Scop., 1786.

Xeroaloyisia Tronc., Darwiniana 12: 50. 1960. syn. nov.
TYPE: *Xeroaloyisia ovatifolia* (Moldenke) Troncoso [= *Aloysia ovatifolia* Moldenke, Lilloa 5: 379. 1940].

Plants suffruticose or shrubby, mostly aromatic; stems 4-angled when young, rounded with age, branches sometimes spiny, pubescent or glabrate. Leaves simple, mostly opposite or ternate, 3(4)-whorled, occasionally alternate or clustered into fascicles of 4 to 8 leaves; blades entire or 3- to 5-lobed, exceptionally 3-parted, linear, elliptic, oblong, obovate, ovate, orbicular, rhomboidal, or cordate, sessile, subsessile, or briefly petiolate, basally attenuate, acute, round, truncate, or cordate, apically obtuse, subobtuse, acute, acuminate, or round; blade margins entire, crenate, serrate, dentate, or lobed, sometimes revolute or subrevolute; adaxially glabrous or scabrous, hispidulous, or strigose; abaxially strigose, incanous, hirsute or hispid, often with glandular trichomes, membranaceous, coriaceous, or somewhat thickened texture. Inflorescences in spicate racemes, occasionally paniculate; florescences globose, or filiform in anthesis, elongated or not in fructification, sessile or subsessile, in monobotrya or grouped as pleiobotrya in terminal and axillary (heterothetic) or only axillary (homothetic) positions; flowers often in clusters of 3 to 6; sessile to briefly pedicellate, subtended by floral bracts; bracts inferior to flowers, linear, elliptic, obovate, or ovate; abaxially strigose to setose; apically acute to acuminate. Flower with the calyx 4-toothed, exceptionally bilobed, subactinomorphic to zygomorphic, externally strigose, setose, hirsute, or velutinous, often subsessile glandular, internally glabrous; fully acresent in fruit and persistently enclosing mature schizocarp; corollas subactinomorphic to zygomorphic, infundibuliform, white, lavender, purple, pink, or blue; tube cylindrical to gibbous, glabrous to variously pubescent externally, internally villous along distal half; limb 4-lobed, superior lobe often cleft; styles filiform and usually glabrous, occasionally villous along base; stigmas capitate to subcapitate, bilobed, stigmatic lobes approximately equal or oblique, apically or laterally disposed; stamens 4, epipetalous, subequal to didynamous, the superior pair sometimes weakly exerted, exceptionally with glandular anther connective appendices; thecae longitudinally dehiscent. Fruit a dry schizocarp, exceptionally drupaceous; the dry schizocarp composed of 2 cluses (each cluse is a unit representing half a carpel, derived from a unilocular ovary splitting into 2), ellipsoid to obovoid, often \pm cordate, basally truncate, apically rounded to bilobed, glabrous or setose pubescence, typically elliptic in cross section and commissural

faces not connate, exceptionally orbicular in cross section, commissural faces connate.

Distribution. *Aloysia* is an American genus, occurring from southwestern United States and Mexico to Chile and central Argentina. It is most diverse in South America, with 28 species and six varieties occurring there (Appendix 1). One taxon, *A. gratissima* var. *gratissima* (Gillies & Hook.) Tronc., is found in both North America (Texas, Arizona) and South America, with a disjunction in distribution across the tropics. Only three *Aloysia* species are found exclusively in North America, *A. coalcomana* Siedo, *A. macrostachya* (Torr.) Moldenke, and *A. wrightii* A. Heller, and are not further considered here.

Notes. Walpers (1845) established *Verbena* sect. *Aloysioides*, mentioning the two species *V. salvifolia* Hook. & Arn. and *V. gratissima* Gillies & Hook. The latter name is selected as lectotype (McNeill et al., 2012, Art. 10.2) because it is a species that certainly belongs within *Aloysia* and is representative of the genus.

The fruit in *Aloysia* is a schizocarp that derives from a unilocular ovary that normally (except in *A. ovatifolia* Moldenke, which has an undivided drupaceous fruit) separates into two units along the medial plane of the ovary; each unit represents half a carpel and is called a cluse (O'Leary et al., 2012).

The term florescence is used to define a minimum expression of flower arrangement. In the Verbenaceae, florescences are either racemes or spikes that vary in the arrangement, spacing, number of flowers, and development of its rachis. Florescences are organized into simple inflorescences, as monobotrya, or compound inflorescences, as pleiobotrya. In pleiobotrya, florescences may be either terminal or axillary, as heterothetic pleiobotrya, or grouped only as axillary florescences, as homothetic pleiobotrya (Múlgura et al., 2002; O'Leary et al., 2012). Classical views of inflorescence evolution (Troll, 1964–1969; Sell, 1976; 1980) suggest that heterothetic pleiobotrya gave rise, on the one hand, to homothetic pleiobotrya by loss of the terminal florescence, and, on the other hand, to monobotrya, by loss of axillary florescences (O'Leary et al., 2012). Homothetic pleiobotrya and monobotrya can therefore be considered derived conditions. This analysis also confirms the derivation of monobotrya from heterothetic pleiobotrya by loss of axillary florescences. However, unexpectedly, according to classical assumptions about the evolution of inflorescences, reversions from monobotrya to heterothetic pleiobotrya also occur.

Within *Aloysia*, the most frequent inflorescence morphology in South America is a homothetic

pleiobotrya, found in 19 out of the 28 taxa. There are only five species with heterothetic pleiobotrya: *A. arequipensis* Siedo (cf. Fig. 1), *A. citrodora*, *A. fiebrigii* (Hayek) Moldenke, *A. herrerae* Moldenke (Fig. 7), and *A. velutina* Siedo (Fig. 13). Monobotrya are found in four out of the five *Acantholippia* species recently transferred to *Aloysia* (Lu-Irving et al., 2014): *A. deserticola* (Phil.) Lu-Irving & N. O'Leary, *A. riojana* (Hieron. ex Moldenke) Lu-Irving & N. O'Leary, *A. salsoloides* (Griseb.) Lu-Irving & N. O'Leary, and *A. tarapacana* (Botta) Lu-Irving & N. O'Leary.

The base chromosome number in *Aloysia* seems to be $x = 9$, based on a specimen of *A. gratissima*, although this is the lowest observed count in the genus (Powell et al., 2010). This is in agreement with other Lantaneae, and both *Lippia* and *Phyla* would also appear to have $x = 9$ (Sanders, 1987; Munir, 1993). In contrast, *Lantana* is reported to have a base chromosome number of $x = 11$ or 12 (Sanders, 1987).

TAXONOMIC KEY TO SPECIES OF *ALOYSIA* FROM SOUTH AMERICA

1. Plants with spiny branches and reduced leaf blades, always shorter than 0.5 cm long 2
- 1'. Plants with no spiny branches and developed leaf blades, always longer than 0.5 cm long 5
- 2(1). Leaves alternate, not squamiform, nor imbricate, blades 5-lobed 22. *A. salsoloides* (Griseb.) Lu-Irving & N. O'Leary
- 2'. Leaves opposite, squamiform, densely imbricate, blades entire or 3-lobed 3
- 3(2'). Leaf blades entire and no evident furrows on abaxial surface, dark green colored, endemic to Chile 25. *A. tarapacana* (Botta) Lu-Irving & N. O'Leary
- 3'. Leaf blades 3-lobed, with a conspicuous furrow on each blade lobe, light green or yellow-green colored, Argentina and Chile 4
- 4(3'). Fruits typical of the genus with cluses (each cluse is a unit representing half a carpel, derived from a unicarpellate ovary splitting into two) of elliptic cross section and commissural faces not connate 9. *A. deserticola* (Phil.) Lu-Irving & N. O'Leary
- 4'. Fruits with cluses of orbicular cross section and connate commissural faces ... 21. *A. riojana* (Hieron. ex Moldenke) Lu-Irving & N. O'Leary
- 5(1'). Fruits undivided and drupeaceous 16. *A. ovatifolia* Moldenke
- 5'. Fruits schizocarpic and divided into two dry cluses 6
- 6(5'). Leaves alternate 19. *A. polystachya* (Griseb.) Moldenke
- 6'. Leaves opposite or verticillate (ternate) 7
- 7(6'). Leaves mostly verticillate (ternate), sometimes opposite at some nodes 8
- 7'. Leaves mostly opposite, sometimes verticillate at some nodes 13
- 8(7). Florescences only axillary 9
- 8'. Florescences axillary and terminal 12
- 9(8). Leaves evenly crenate toward apex 8. *A. crenata* Moldenke
- 9'. Leaves with entire margins 10
- 10(9'). Leaves adpressed to the stem, sessile, with ovate, elliptic, or cordate blades 11
- 10'. Leaves not adpressed to the stem, with sessile to subpetiolate, elliptic blades 2. *A. brasiliensis* Moldenke
- 11(10). Leaf blades ovate to elliptic 18. *A. polygalifolia* Cham.
- 11'. Leaf blades cordate 7. *A. cordata* Siedo
- 12(8'). Leaf blades smaller, 1.8–3 × 0.2–0.5 cm, with entire margins 11. *A. fiebrigii* (Hayek) Moldenke
- 12'. Leaf blades larger, 2–8 × 1–2.5 cm, with entire or slightly serrate margins 6. *A. citrodora* Paláu
- 13(7'). Florescences terminal and axillary; plants endemic to Peru and Bolivia 14
- 13'. Florescences only axillary 16
- 14(13). Leaf margins entire, with minute scabrous pubescence on abaxial blade surface, glabrous adaxially 14. *A. herrerae* Moldenke
- 14'. Leaf margins not entire, with velutinous, incanous, strigose, or tomentose pubescence, never glabrous 15
- 15(14'). Margins slightly crenate along entire blade, adaxially velutinous, abaxially incanous ... 27. *A. velutina* Siedo
- 15'. Margins finely serrate along apical 2/3 to 1/2 of blade length, adaxially strigose, abaxially tomentose 1. *A. arequipensis* Siedo
- 16(13'). Flowers with a bilobulated calyx 10. *A. duseñii* Moldenke
- 16'. Flowers with a 4-toothed calyx 17
- 17(16'). Superior pair of stamens with anther connective appendices glandular 26. *A. trifida* (Gay) Lu-Irving & N. O'Leary
- 17'. Superior pair of stamens with anther connective appendices not glandular 18
- 18(17'). Leaf margins completely entire, sometimes slightly serrate toward apex 19
- 18'. Leaf margins not entire, ranging from serrate or crenate to dentate, or basally entire with some serration, crenation, or dentition in some portion of the blade; if margins entire, then only on leaves on some part of the plant, the remaining leaves not entire 22
- 19(18). Leaves smaller, narrowly elliptic, less than 2 × 0.3 cm 12. *A. gratissima* (Gillies & Hook.) Tronc.
- 19'. Leaves larger, elliptic, ovate, cordate, or obovate, more than 2 × 0.3 cm 20
- 20(19'). Leaf adaxial surfaces without a conspicuous midvein, leaves briefly petiolate, with blades elliptic, obovate, or ovate 21
- 20'. Leaf adaxial surfaces with conspicuous midvein, leaves sessile, with blades obovate to oblanceolate 15. *A. oblanceolata* Moldenke
- 21(20). Leaf blades elliptic to obovate, with obtuse apex 20. *A. pulchra* (Briq.) Moldenke
- 21'. Leaf blades elliptic to ovate, with acute to subobtuse apex 12. *A. gratissima* (Gillies & Hook.) Tronc.
- 22(18'). Leaf margins almost entirely dentate, crenate, or serrate 23

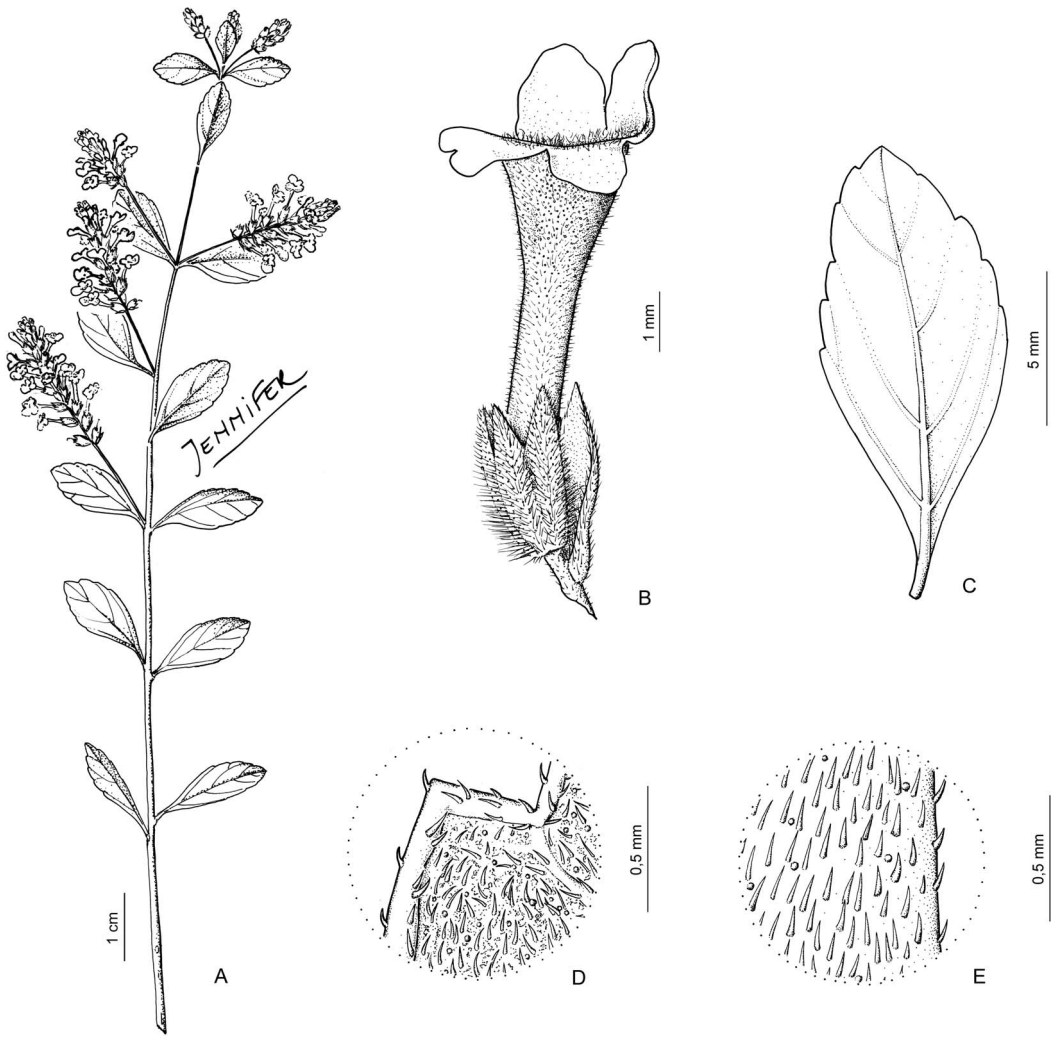


Figure 1. *Aloysia arequipensis* Siedo. —A. Floriferous branch with florescences in both axillary and terminal positions (heterothetic pleiototrya). —B. Lateral view of intact flower with calyx and floral bract. —C. Intact leaf, adaxial surface. —D. Detail of tomentose pubescence on abaxial blade surface. —E. Detail of strigose pubescence on adaxial blade surface. A–E, illustrated from Pennell 13079 (type, US).

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| <p>22'. Leaf margins with some serration or dentition in some portion of the blade, but always entire basally 31</p> <p>23(22). Leaf margins with 3 to 5 deep teeth coarsely dentate or serrate on each side 5. <i>A. chamaedryfolia</i> Cham.</p> <p>23'. Leaf margins evenly dentate, crenate, or serrate 24</p> <p>24(23'). Leaf margins minutely serrate or crenate; corolla less than 4 mm long; calyx with long teeth, equaling or exceeding calyx tube in length 28. <i>A. virgata</i> (Ruiz & Pav.) Pers.</p> <p>24'. Leaf margins notoriously crenate or dentate; corollas more than 4 mm long; calyx teeth never exceeding calyx tube in length 25</p> <p>25(24'). Florescences dense, subrhomboidal in anthesis, cylindrical in fructification, 2–4 cm long,</p> | <p>1 or 2(3) per leaf axil or grouped toward plant apex 4. <i>A. catamarcensis</i> Moldenke</p> <p>25'. Florescences dense or lax, cylindrical, 1–12 cm long, 1 per leaf axil 26</p> <p>26(25'). Leaf blades oblong, 1–4.5 × 0.15–1 cm 3. <i>A. castellanosi</i> Moldenke</p> <p>26'. Leaf blades elliptic, ovate, or orbicular, 1–5(–7) × 1–3(–4) cm 27</p> <p>27(25'). Leaves membranaceous and plane; corolla tube more than 6 mm long 17. <i>A. peruviana</i> (Turcz.) Moldenke</p> <p>27'. Leaves rugose and creased; corolla tube less than 6 mm long; if leaves membranaceous then corolla tube less than 4.5 mm long 24. <i>A. scorodonoides</i> (Kunth) Cham.</p> |
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- 28(22). Floral bracts 4–4.5 mm long, surpassing calyx, endemic to Chile
..... 23. *A. salviifolia* (Hook. & Arn.) Moldenke
28'. Floral bracts 1–2 mm long, not surpassing calyx 29
29(28'). Leaf blades elliptic, with slightly serrate margins in apical half, venation conspicuous, reddish brown, pinnate, impressed on abaxial surface, endemic to Brazil (Paraná) 13. *A. hatschbachii* Moldenke
29'. Leaf blades elliptic or ovate, with entire or serrate margins, midvein impressed only on abaxial surface, or if venation pinnate and conspicuous then not reddish brown
..... 12. *A. gratissima* (Gillies & Hook.) Tronc.

1. *Aloysia arequipensis* Siedo, *Lundellia* 15: 38, fig. 1. 2012. TYPE: Peru. Arequipa: Mpio. Arequipa, Tiabaya, open, rocky slope, 8 Apr. 1925, *F. W. Pennell* 13079 (holotype, NY [barcode] NY01911741 not seen, NY image!; isotypes, F [bc] F0093716F not seen, F image!, GH [bc] GH00359317 not seen, GH image!, US!). Figure 1.

Shrubs 0.5–1.5 m tall; stems glabrous. Leaves opposite, rarely ternate; petioles brief, 1–2 mm; blades elliptic, 1–2 × 0.5–1.2 cm, apex acute to obtuse, base acute, margins finely serrate along apical 2/3 to 1/2 of blade length, adaxially strigose, abaxially tomentose, with an understory of subsessile, glandular trichomes. Florescences terminal and axillary (heterothetic pleiobotrya), cylindrical, loosely spicate, 1–5 cm; peduncles 0.5–2.8 cm; flowers lavender to pink, often with a whitish limb, floral bracts elliptic, 1–3 × 0.5–1 mm, apex acuminate, with strigose pubescence and an understory of subsessile, glandular trichomes. Flower with the calyx 2–4 mm, densely hirsute, with an understory of subsessile, glandular trichomes with 4 brief teeth, unequal, triangular; corolla tube 4–7 mm, externally finely pulverulent, with villous fauce. Cluse 1–1.5 × 1 mm, glabrous.

Distribution and habitat. *Aloysia arequipensis* is endemic to Peru, in arid sites from Arequipa and southern Lima Provinces, at elevations of 2000–3000 m.

Discussion. *Aloysia arequipensis* is one of the five South American taxa distinguished by its heterothetic pleiobotrya, also present in *A. citrodora*, *A. fiebrigii*, *A. herrerae*, and *A. velutina*. However, *A. arequipensis* may be differentiated from *A. citrodora* and *A. fiebrigii* by its opposite leaves, being ternate in these last two species. It is distinguished from *A. herrerae* by its finely serrate leaf blade margins, with blade margins entire in this last taxon. *Aloysia arequipensis*

may be differentiated from *A. velutina* because in this last species leaf blade margins are crenate. *Aloysia arequipensis* is also morphologically similar to *A. scorodonioides* (Kunth) Moldenke var. *hypoleuca* (Briq.) Moldenke from which it is readily distinguished by inflorescence morphology, having only axillary florescences present (homothetic pleiobotrya) in this last taxon.

Selected specimens examined. PERU. **Arequipa:** Arequipa, cerros de Jesús, Vargas 12671 (US). **Lima:** Mpio. Yauyos, Aiza, entre Catahuas y Tupe, Pradera, *E. Cerrate* 1282 (MO).

2. *Aloysia brasiliensis* Moldenke, *Phytologia* 3: 162. 1949. TYPE: Brazil. Paraná, 4 Jan. 1904, *P. K. Dusén* s.n. (holotype, R [barcode] R000046798 not seen, R image!; isotypes, NY [bc] NY00103867 not seen, NY image!, SI [bc] SI003386!). Figure 2.

Shrubs 1–3 m tall, stems glabrous. Leaves ternate, not adpressed to the stem, sclerophyllous, sessile to subpetiolate, petiole 0.2–1.5 mm, blades narrowly elliptic to elliptic, 1–4(–5) × 0.5–1.5 cm, apex acute or sometimes subobtuse, base acute, margins entire, sometimes subrevolute, scabrous to strigose pubescence on both surfaces. Florescences axillary, solitary, lax, 4–10(–16) cm; peduncles 1–5 cm; flowers lilac; pedicels 0.5–1 mm; floral bracts linear, 2–3.5 mm, apex acuminate, with strigose pubescence. Flower with the calyx 2–4 mm, hispid, 4-toothed, the teeth unequal, triangular; corolla tube 4–5.5 mm, externally finely pulverulent, internally, with villous fauce. Cluse 1.5 × 1 mm, glabrous.

Distribution and habitat. *Aloysia brasiliensis* is endemic to southern Brazil, from the states of Rio Grande do Sul, Paraná, and Santa Catarina. The species has been collected from disturbed habitats, at elevations from 700 to 900 m.

Discussion. *Aloysia brasiliensis*, *A. cordata*, and *A. polygalifolia* all have glabrous stems but puberulent rachises, and sclerophyllous leaves with entire margins, and all three are endemic to Brazil. *Aloysia brasiliensis* differs because leaves are not adpressed to the stem, with elliptic blades, versus leaves adpressed to the stem, with ovate, elliptic, or cordate blades in the other two species. In addition, *A. brasiliensis* has larger leaves (1–4[–5] × 0.5–1.5 cm) with an acute base, versus smaller and a different basal shape in the other two species. Leaf blades in *A. polygalifolia* (0.5–2 × 0.3–1 cm) have a truncate base; blades in *A. cordata* (0.3–1 × 0.3–0.9 cm) have a cordate base.

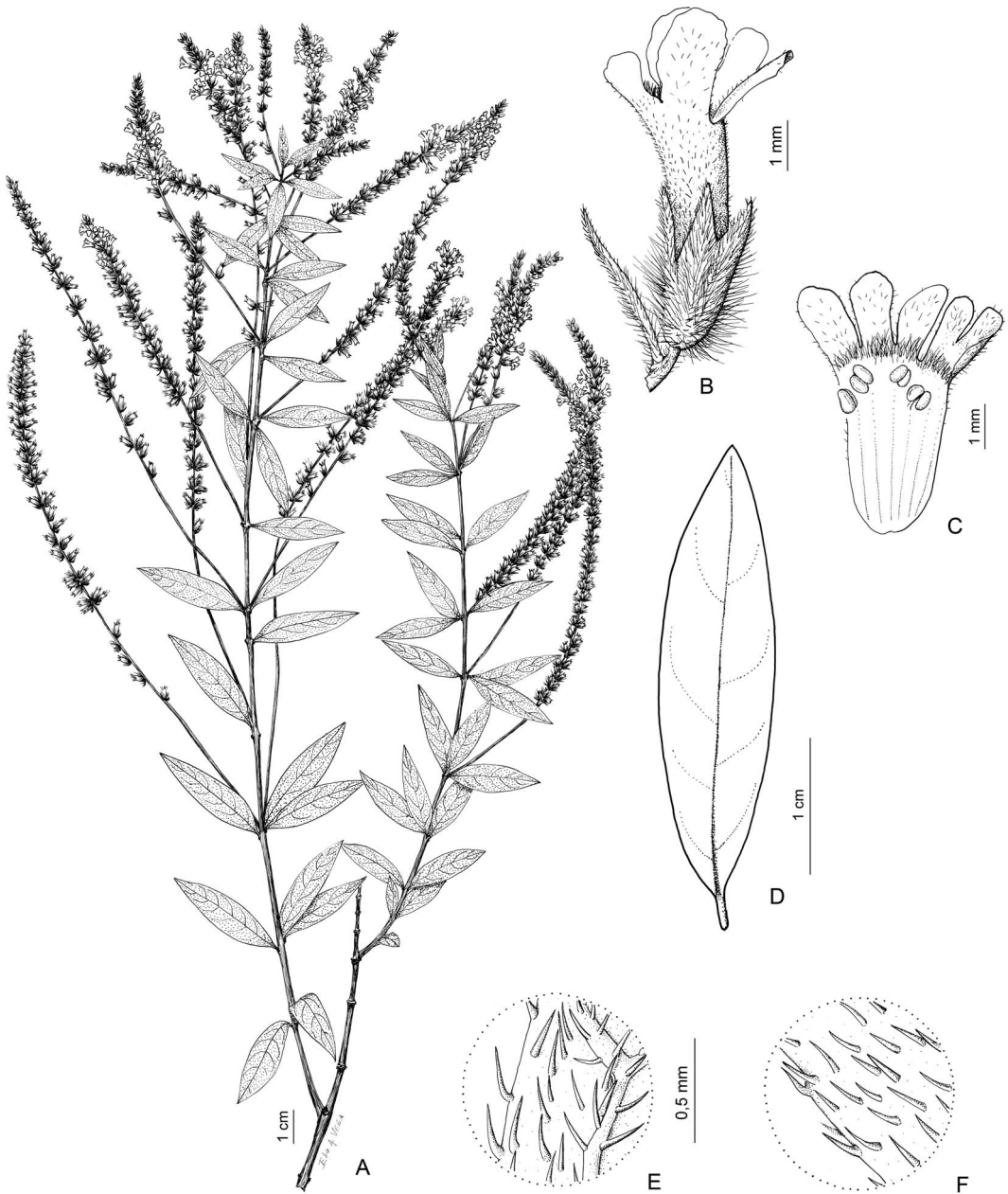


Figure 2. *Aloysia brasiliensis* Moldenke. —A. Floriferous branch, showing the axillary florescences (homothetic pleiobotrya). —B. Intact flower in lateral view, with floral bract subtending the hispid calyx. —C. Corolla dissected open to reveal the androecium. —D. Intact leaf, adaxial surface. —E. Detail of strigose pubescence on blade adaxial surface. —F. Detail of strigose pubescence on abaxial blade surface. A, taken from *Klein 3489* (SI); B–F, from *Hatschbach 14905* (SI).

Selected specimens examined. BRAZIL. **Paraná:** Uniao da Vitoria, Sao Domingos, *Silva 7037* (SI); Uniao da Vitoria, *Hatschbach 14905* (SI). **Rio Grande do Sul:** Nonoai, ad fl. Uruguay, *Rambo 28141* (NY). **Santa Catarina:** Irani, *Smith & Klein 13029* (NY); Caçador, faz. dos Carneiros, *Klein 3489* (SI), *Smith & Reitz 9012* (SI).

3. *Aloysia castellanosii* Moldenke, *Lilloa* 5: 372. 1940. TYPE: Argentina. San Juan: Quebrada del Zonda, 28 Feb. 1926, *A. Castellanos s.n.* (holotype, BA-26/602!; isotypes, CORD [barcode] CORD00003815 not seen, CORD image!;

NY [bc] NY00103870 not seen, NY image!, SI [bc] SI003376!).

Aloysia castellanosii var. *magna* Moldenke, Known Geogr. Distrib. Verb. Avicenn., 76. 1942. TYPE: Argentina. Tucumán: Valle de Amaicha, Zurita, 4 Feb. 1917, *L. Castillón 85* (holotype, NY [barcode] NY00103871 not seen, NY image!; isotypes, LIL [bc] LIL001434 not seen, LIL image!, LP [bc] LP006684 not seen, LP image!, SI [bc] SI003387!).

Aloysia decorticans Ravenna, Onira 11(2): 3(–4). 2007. TYPE: Argentina. Salta: Quebrada de Guachipas, 23 Jan. 1943, *Castellanos s.n.* (holotype, BA-46961!).

Plants suffruticose, 1 m tall; stems cylindrical, pilose to subglabrous, internodes 1–4.5 cm, smooth, red, with fallen bark. Leaves opposite; petioles brief, 0.8–4 mm; blades oblong, 1–4.5 × 0.15–1 cm, apex obtuse, base truncate, margins prominently and evenly crenate, blade margins subrevolute, adaxially scabrous, creased, abaxially densely hispid. Florescences axillary, solitary, dense, cylindrical, 1–6 cm in fructification; peduncles 0.5–2.8 cm; flowers white, pink, or violet; floral bracts ovate, obovate, or elliptic, 2.5–10.5 × 1.5–6 mm, sticky glandular on both bract surfaces. Flower with the calyx 2.5–5 mm, densely hirsute, with 4 brief teeth, unequal, triangular; corolla tube 4–7 mm, externally glabrous, with villous fauce. Cluse 2 × 0.5 mm, glabrous.

Iconography. Botta (1979: 73, fig. 1).

Distribution and habitat. *Aloysia castellanosii* is endemic to Argentina, known only from the provinces of Catamarca, La Rioja, Salta, San Juan, and Tucumán. The species is found in the phytogeographic provinces of monte and chaqueña (Cabrera & Willink, 1973), growing at elevations of 2500–2800 m.

Discussion. *Aloysia castellanosii* is distinguished by its leaf morphology, with oblong blades and margins prominently and evenly crenate, and creased texture. This feature makes it hard to confuse with any other species of the genus.

Selected specimens examined. ARGENTINA. **Catamarca:** Andalgalá: 16 km SE from Andalgalá, *Cantino 693* (SI). **La Rioja:** General Lavalle, Parque Nac. Talampaya, *Botta 695* (SI). **Salta:** San Carlos, ruta 40 de Cafayate a Cachi, sierra de Quilmes, *Cialdella 218* (SI). **San Juan:** Caucete, Marayes, *Haene 93* (SI). **Tucumán:** Tafi, Amaicha del Valle, *Burkart 22066* (SI).

4. *Aloysia catamarcensis* Moldenke, Known Geogr. Distrib. Verb. Avicenn. 76. 1942. TYPE: Argentina. Catamarca: Quebrada del Tala, 15 Mar. 1909, *L. Castillón 956* (holotype, NY [barcode] NY00103872 not seen, NY image!;

isotypes, CORD [bc] CORD00003817 not seen, CORD image!, GH [bc] GH00299000 not seen, GH image!, LIL [bc] LIL001435 not seen, LIL image!, LIL [bc] LIL001436 not seen, LIL image!, SI [bc] SI003377!).

Plants suffruticose, 1–1.5 m tall, stems cylindrical, pilose to glabrous, with fallen bark, internodes 3–7 cm. Leaves opposite, sometimes ternate; petioles 0.3–1.5 mm; blades elliptic, 1.5–5 × 1–3 cm, apex acute to subobtuse, base acute, margins prominently and evenly crenate to dentate, scabrous, adaxially rugose, abaxially hispid. Florescences axillary, 1 or 2(3) per leaf axil, grouped toward stem apex, dense, subrhomboidal at anthesis, cylindrical in fructification, 2–4 cm, pedunculate; flowers white, pink, or violet; floral bracts elliptic to obovate, apex attenuate, acuminate, 2.5–3.5 × 1–1.5 mm, surpassing calyx, puberulous. Flower with the calyx short, 1–2 mm, hispid, with 4 brief teeth, unequal, triangular; corolla tube 4–7.5 mm, with glabrous fauce. Cluse 1 × 0.5 mm, glabrous.

Iconography. Botta (1979: 79, fig. 3).

Distribution and habitat. *Aloysia catamarcensis* is endemic to northwestern Argentina, being found in the provinces of Santiago del Estero, La Rioja, Catamarca, and Salta. The species has been observed to grow on slopes of small hills or rises.

Discussion. *Aloysia catamarcensis* is distinguished by its elliptic leaf blades with margins prominently and evenly crenate to dentate. It can be confused with *A. scorodonioides* var. *scorodonioides* or *A. peruviana*. However, these two last taxa have florescences cylindrical in anthesis, 4.5–10 cm long, one per leaf axil, in contrast to the shorter florescences of *A. catamarcensis*, subrhomboidal in anthesis, cylindrical in fructification, 2–4 cm long, one or two (three) per leaf axil or grouped toward the apex of the plant in *A. catamarcensis*.

Selected specimens examined. ARGENTINA. **Catamarca:** Belén, cerrito de la Cruz, *Ulibarri 332* (SI); Capital, Quebrada de los Nacimientos, *Ulibarri 950* (SI). **La Rioja:** Chilecito, Miranda, rt. 40 a 16 km de Chilecito, *Olmstead 2007-82* (SI). **Salta:** La Viña, Km. 77, camino de Cafayate a Salta, *Correa 4318* (SI). **Santiago del Estero:** Alberdi, entre Donaden y Campo Gallo, *s. coll. 43* (SI).

5. *Aloysia chamaedryfolia* Cham., Linnaea 7: 234. 1832. *Lippia chamaedryfolia* (Cham.) Steud., Nomencl. Bot. [Steudel], ed. 2 1: 62. 1841. TYPE: “Brasilia,” s.d., *F. Sellow s.n.* (lectotype, designated by Siedo [2010: 200], W-0032437; isolectotypes, BM-643743 not seen, BM image!;

G [barcode] G00208776 not seen, G image!, W-Rchb. 1889-0290180 not seen, W image!).

Shrubs erect, 0.5–2 m tall; stems tetragonous, densely pubescent with retrorse hairs. Leaves opposite, sometimes ternate, subsessile; blades ovate to suborbicular 0.3–3 × 0.7–2 cm, apex subobtuse, base subtruncate, margin slightly revolute, deeply toothed, with 3 to 5 deep teeth coarsely dentate or serrate on each side, adaxially scabrous, abaxially densely strigose, venation conspicuous. Florescences axillary, solitary, lax, 5–15 cm; peduncles 2–4 cm; flowers lilac or purple; floral bracts ovate, apex subulate, 1.5 mm, hispid. Flower with the calyx 2.5 mm, hispid in inferior half, slightly hispid toward apex, calyx with 4 brief teeth, unequal, triangular; corolla tube 3–4 mm, with villous fauce. Cluse 1 × 0.5 mm, pubescent at apex.

Iconography. Botta (1979: 91, fig. 7).

Distribution and habitat. *Aloysia chamaedryfolia* grows in southern Brazil, Uruguay, and northeastern Argentina where it is found in rocky soils.

Discussion. *Aloysia chamaedryfolia* is distinguished by its leaf blades ovate to suborbicular with margins with three to five deep teeth on each side, which makes this species not easily mistaken for any other member of the genus.

Selected specimens examined. ARGENTINA. **Misiones:** San Javier, Balneario 4 Bocas, 11 km SE de San Javier, *Krapovickas 28868* (CTES, SI). BRAZIL. **Rio Grande do Sul:** Arroio dos Ratos, *Hagelund 10590* (SI). URUGUAY. **Artigas:** Arroyo Sepulturas, *Bonifacino et al. 1953* (SI). **Rivera:** *Herter 158* (NY). **Tacuarembó:** Valle Edén, *Rosengurt 4967* (SI).

6. *Aloysia citrodora* Paláu, *Parte Prácte Bot.* 1: 768. 1784, as “citriodora.” *Verbena citriodora* (Paláu) Cav., *Descr. Pl.* (Cavanilles) 68. 1802. *Aloysia citriodora* Ort. ex Pers., *Syn. Pl.* 2(1): 139. 1806, nom. superfl. illeg. [cf. Art. 52.1; cites *Verbena triphylla* L’Hér.]. TYPE: unnumbered illustration in Paláu, *Part. Prácte. Bot.* 1: 768. 1784 (lectotype, designated by Armada & Barra [1992: 89], icon s.n. in Paláu [1784: 768]).

Verbena triphylla L’Hér., *Stirp.* Nov. 1: 21. 1785. *Zapania citrodora* Lam., *Tab. Encycl.* 1: 59. 1791, nom. illeg. [Art. 52.1, cites *Verbena triphylla* L’Hér., the epithet that ought to have been used]. *Lippia citrodora* Kunth, *Nov. Gen. Sp.* 2: 269. 1818, as “citriodora,” nom. illeg. [cf. Art. 52.1, comb. based on “*Zapania citrodora*” Lam.]. *Lippia triphylla* (L’Hér.) Kuntze, *Revis. Gen. Pl.* 3(3): 253. 1898. *Aloysia triphylla* (L’Hér.) Britton, *Sci. Surv. Porto Rico & Virgin*

Islands 6: 140. 1925, nom. superfl. illeg., non *Aloysia triphylla* Royle, *Ill. Bot. Himal. Mts.*, 299. 1833. TYPE: France. Ile de France, cultivated plant in Jardin de Plantes, Paris, s.d., *C. L. L’Héritier s.n.* (lectotype, designated by Moldenke & Moldenke [1983: 232], P not seen, P image!).

Aloysia sleumeri Moldenke, *Phytologia* 10: 170. 1964. TYPE: Argentina. Catamarca: Belén, Pozo de Piedra, 25–31 ene. 1952, *H. Sleumer & F. Vervoost 2370* (holotype, US [barcode] US00118880 not seen, US image!; isotypes, TEX-LL [barcode] LL00374941 not seen, TEX-LL image!, SI [bc] SI003401!).

Aloysia triphylla (L’Hér.) Britton f. *serrulata* Moldenke, *Phytologia* 50: 308–309. 1982. TYPE: [cultivated] U.S.A. Indiana: Floyd Co., New Albany, 3 Oct. 1893, *L. H. Bailey 160* (holotype, BH not seen).

Shrubs 1–3 m tall, aromatic, stems glabrous at maturity, subpendulous. Leaves ternate, briefly petiolate, petioles 1–5 mm; blades elliptic, 2–8 × 1–2.5 cm, apex acute, base acute, margins entire or slightly serrate, blade adaxially scabrous, abaxially glabrate with subsessile glandular trichomes, midvein and pinnate venation conspicuous. Florescences terminal and axillary (heterothetic pleiobotrya), lax, 1–5 cm, the terminal ones grouped as paniculiform inflorescences; flowers white, small; floral bracts reduced, ovate, 1–1.5 mm, scabrous. Flower with the calyx 2.5–3 mm, puberulous, with 4 brief teeth, unequal, triangular; corolla tube 5–6 mm, externally puberulous, with villous fauce. Cluse 2 × 1 mm, glabrous or pubescent at apex.

Iconography. Botta (1979: 104, fig. 12).

Distribution and habitat. *Aloysia citrodora* is native to the dry areas of northwestern Argentina, including the provinces of Catamarca, Jujuy, La Rioja, Salta, San Juan, and Tucumán, to southern Bolivia and Paraguay. The species is cultivated all around the world.

Discussion. *Aloysia citrodora* has strongly lemon-scented leaves, which easily distinguishes it from other species, and is often cultivated for the preparation of aromatic teas with medicinal properties. For this reason the taxon is widely cultivated in Chile, Uruguay, southern Brazil, and Paraguay (Arambarri et al., 2009: 18). It can be confused with *A. friebriigii*, which also has ternate leaves. However, in this last species, blades are smaller, 1.8–3 × 0.2–0.5 cm, and the blade margin is always entire, in contrast to the blades 2–8 × 1–2.5 cm in *A. citrodora*, which are also entire but sometimes with a slightly serrate margin.

Moldenke (1982: 309) noted that the type for *Aloysia triphylla* f. *serrulata* was collected “from the garden of Cornell Experiment Station. . .from material

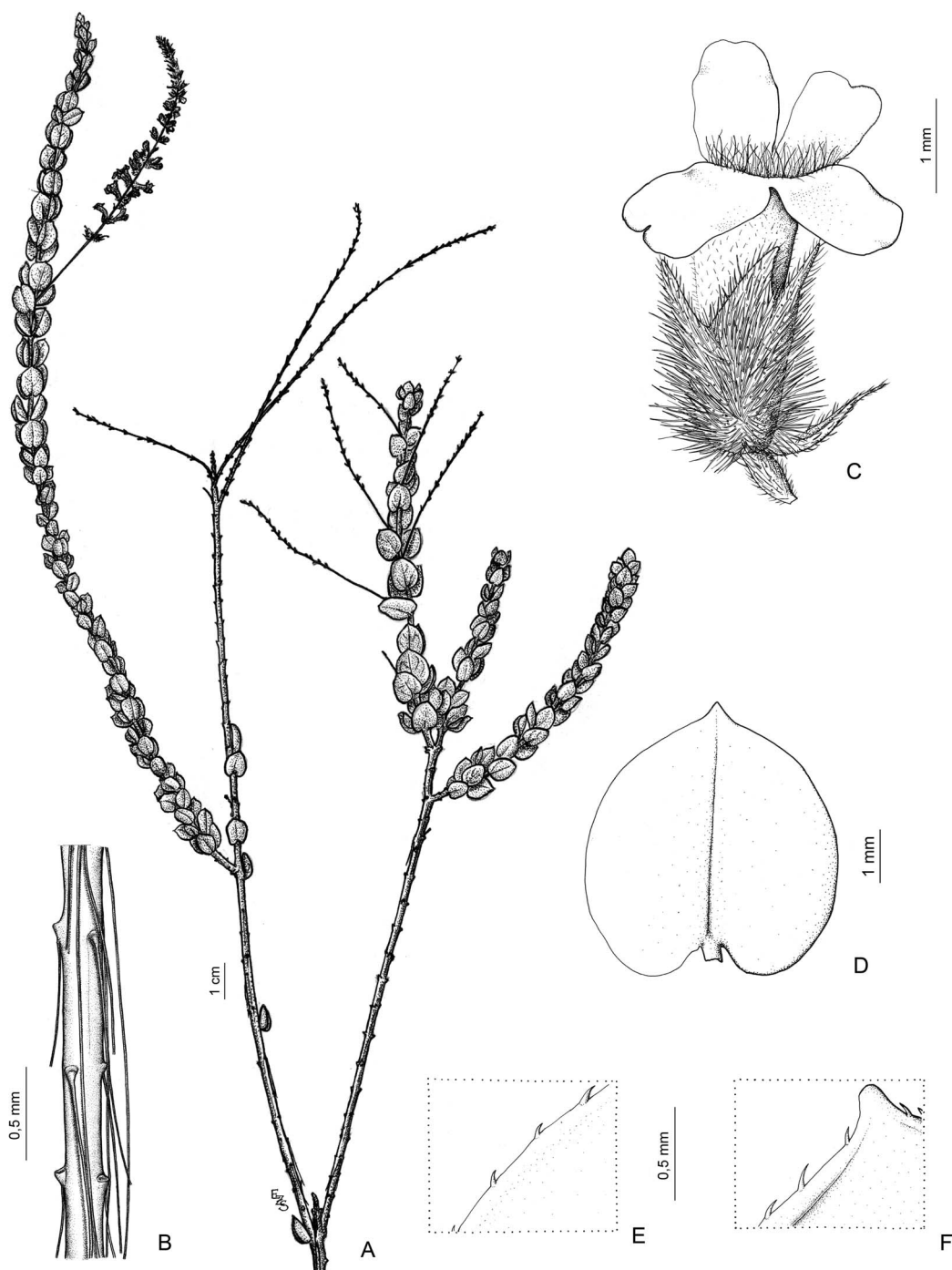


Figure 3. *Aloysia cordata* Siedo. —A. Floriferous branches, showing the axillary florescences (homothetic pleiobotrya). —B. Detail of stem with leaf scars and antrorse pubescence. —C. Lateral view of intact flower, with hispid floral bract. —D. Cordate shape of leaf adaxial surface. —E. Detail of leaf adaxial surface, glabrous with minutely scabrous margins. —F. Detail of leaf abaxial surface, glabrous with minutely scabrous margins. A–F, taken from *Hatschbach 20792* (isotype, SI).

secured from Ernest Walker of New Albany, Indiana." Even though described from North America, this was a cultivated form of *A. citrodora* native to Argentina.

Cavanilles spelled the epithet *citrodora* with a second "i." This spelling is correctable (McNeill et al., 2012, Art. 60.8) by omitting the second "i" for *citrodora*.

Selected specimens examined. ARGENTINA. **Catamarca:** Belén, Pozo de Piedra, *Troncoso 1897* (NY, SI). **Jujuy:** Tumbaya, Chicayo, finca del Sr. Gronda subiendo cerro, *Zuloaga 10188* (SI); Volcán Chicayo, *Cabrera 16877* (SI). **La Rioja:** Famatina, La Aguadita, *Cabrera 24637* (SI). **Salta:** Rosario de Lerma, rt. 51 de Salta a San Antonio de los Cobres, *Olmstead 2007-13* (SI). **San Juan:** Valle Fértil, de Sa. De Elizondo a Sa. De Chavez, *Kiesling 6620* (SI). **Tucumán:** Juan Bautista Alberdi, El Chorro, cumbres Calchaquies, *D. Rodríguez 1214* (NY, SI). BOLIVIA. **Cochabamba:** Carrasco, *E. Martínez 479* (NY). **La Paz:** Murillo, Calacoto, *Solomon 15755* (SI). **Tarija:** Mendez, río Pilaya, Camaron, *Gerold 161* (SI). PARAGUAY. **Cordillera:** *Schinini 6767* (NY). **Dpto. Central:** Itá, *Arenas 1918* (BACP).

7. *Aloysia cordata* Siedo, *Lundellia* 15: 42, fig. 3. 2012. TYPE: Brazil. Paraná: Mpio. São José dos Pinhães; Río Pequeno, do brejo, 17 Jan. 1969, *G. Hatschbach 20792* (holotype, NY [barcode] NY01911743 not seen, NY image!; isotypes, K!, MICH!, MO!, SI [bc] SI041007!, SI [bc] SI041008!, UC!). Figure 3.

Shrubs 1–2 m tall, slender, few-branched. Leaves ternate, antrorsely adpressed to the stem, internodes highly regular in length, sessile; blades cordate, sclerophyllous, 0.3–1 × 0.3–0.9 cm, apex mucronulate, base cordate, margins entire, minutely scaberrulous, adaxially glabrous, smooth, lustrous, abaxially glabrous, smooth, satin-lustrous. Florescences axillary, solitary, lax, 4–12 cm; peduncles 1–3 cm, strigulose; flowers lilac; pedicels 0.5–1 mm; floral bracts linear, 1–1.5 mm, apex acuminate, with strigose pubescence. Flower with the calyx 1.5–2 mm, setose, glandular, 4-toothed, the teeth unequal, triangular; corolla tube 2.5–3.5 mm, externally finely pulverulent, internally, with villous fauce. Cluse 1.5 × 1 mm, glabrous.

Distribution and habitat. *Aloysia cordata* is endemic to Brazil, from the state of Paraná, where it is found on wet soils.

Discussion. *Aloysia cordata* is similar to *A. polygalifolia* in having leaves adpressed to the stem and sessile, but it is distinguished by its cordate leaf blades (vs. ovate to elliptic in *A. polygalifolia*) and its glabrate leaf surfaces (vs. scabrous to strigose). Both

species occur in Brazil, while *A. cordata* is restricted to eastern Paraná. *Aloysia polygalifolia* is more broadly distributed, from the states of Paraná, Rio Grande do Sul, and Santa Catarina. *Aloysia brasiliensis* also occurs in Paraná, in sympatry with these two species; however, it is easily distinguished by its leaves not adpressed to the stem, with elliptic blades (see discussion under *A. brasiliensis*).

Selected specimens examined. BRAZIL. **Paraná:** San José dos Pinhães, rio Pequeño, *Hatschbach 20792* (SI); Piraquara, Medianeira, *Costa & Barbosa 6* (SI).

8. *Aloysia crenata* Moldenke, *Phytologia* 9: 182. 1963. TYPE: Paraguay. Alto Paraná: in regione fluminis, 1909–1910, *K. Fiebrig 6137* (holotype, US [barcode] US00118876 not seen, US image!; isotypes, BM [bc] BM000098774 not seen, BM image!, GH [bc] GH00282999 not seen, GH image!, LIL [bc] LIL001364 not seen, LIL image!, TEX-LL [bc] LL00374936 not seen, TEX-LL image!, SI [bc] SI003382!, SI [bc] SI003381!, W not seen).

Aloysia krapovickasii Moldenke, *Phytologia* 47: 330. 1981. TYPE: Argentina. Corrientes: Ituzaingó, 24 Sep. 1974, *C. L. Cristobal, J. M. Gonzalez, A. Schinini, C. Quarin, M. M. Arbo & A. Krapovickas 26439* (holotype, TEX-LL [barcode] LL00374493 not seen, TEX-LL image!; isotypes, CTES [bc] CTES0013814 not seen, CTES image!, SI [bc] SI003402!).

Shrubs 1–2 m tall; stems cylindrical, densely strigose. Leaves ternate, rarely 2 or 4 per node, subsessile, blades elliptic to obovate, 3.5–7 × 1–2.5 cm, apex acute to subobtusate, base acute, margin entire toward base, evenly crenate toward apex, conspicuously reticulate venation, adaxially scabrous, abaxially dense strigose with subsessile glandular trichomes underneath. Florescences axillary, solitary, lax, 10–15 cm; peduncles 2–4 cm; flowers white, floral bracts linear, with subulate apex, 2.5–4 mm, hispid. Flower with the calyx 4 mm, hispid in the inferior half, slightly hispid toward apex, with 4 brief teeth, unequal, triangular; corolla tube 7 mm, with villous fauce. Cluse 2 × 0.5 mm, pubescent in apex.

Iconography. Botta (1979: 100, fig. 10).

Distribution and habitat. *Aloysia crenata* is found from eastern Paraguay to northeastern Argentina (Corrientes) and in Brazil (Paraná).

Discussion. *Aloysia crenata* is distinguished by its ternate leaves with evenly crenate blade margins toward the apex and the presence of only axillary florescences. Other species that have ternate leaves

and only axillary florescences (*A. brasiliensis*, *A. cordata*, and *A. polygalifolia*) can be differentiated by their entire leaf blade margins.

The type specimens of both species *Aloysia crenata* and *A. krapovickasii* are from areas in close proximity to one another, and both specimens are nearly identical morphologically. Thus, *A. krapovickasii* is conspecific and considered a synonym of *A. crenata*, as previously established in Múlgura et al. (2012).

Selected specimens examined. ARGENTINA. **Corrientes:** Ituzaingó, rte. 39 a 10 km de rte. 14, *Cabrera 29106* (SI). BRAZIL. **Paraná:** *Hatschbach 26325* (SI). PARAGUAY. **Caazapá:** San Juan Neponuseno, *Rojas 5903* (SI).

9. *Aloysia deserticola* (Phil.) Lu-Irving & N. O'Leary, *Syst. Bot.* 39(2): 653. 2014. Basionym: *Lippia deserticola* Phil., *Anales Univ. Chile* 59: 262. 1881, replacement name. Replaced synonym: *Lippia microphylla* Phil., *Anal. Univ. Chile* 27: 350. 1865, non *Lippia microphylla* Cham., *Linnaea* 7: 226. 1832. *Acantholippia deserticola* (Phil.) Moldenke, *Lilloa* 5: 370. 1940. *Acantholippia punensis* (Phil.) Botta, *Hickenia* 1(35): 195. 1979, nom. illeg. superfl. TYPE: Chile. "Frequens in parte boreali deserti Atacama," s.d., *R. A. Philippi s.n.* (lectotype, designated by Múlgura et al. [2012: 5] SGO-4230 not seen, SGO-4230 image!).

Shrubs 0.4–1.5 m tall, with spiny branches; stems hispid, but glabrous at maturity. Leaves small, opposite, adpressed to the stem, sessile, squamiform, imbricate; blades rhomboidal, 1.5 × 1.5–2 mm, 3-lobed with a large apical and 1 lateral small lobe on each side, somewhat thicker texture, apex subobtuse, base rounded, margin entire, revolute, adaxially scabrous, abaxially with a conspicuous hirsute furrow on each blade lobe, light green or yellow-green in color. Florescences terminal, solitary, dense, 12–15 mm; flowers lilac; floral bracts ovate or obovate, 3–3.5 mm long, apex acute or obtuse, slightly strigose. Flower with the calyx 3.5–4.5 mm long, hispid, with 4 brief teeth, unequal, triangular; corolla tube 4–6 mm, with villous fauce. Cluse 2–3 × 0.5 mm, elliptical in cross section, commissural faces not connate.

Iconography. Botta (1980: 518, fig. 1); Caro (1982: 17, fig. 3).

Distribution and habitat. *Aloysia deserticola* grows in northwestern Argentina, southern Bolivia, and Chile, Region II. This species is found at elevations of 2300–3500 m and is noted to occur frequently on rocky to sandy soils.

Discussion. The four species *Aloysia deserticola*, *A. tarapacana* (Botta) Lu-Irving & N. O'Leary, *A. riojana* (Hieron. ex Moldenke) Lu-Irving & N. O'Leary, and *A. salsoloides* (Griseb.) Lu-Irving & N. O'Leary were formerly recognized in *Acantholippia* and have short floriferous branches that develop over the previous year's stems, as stated by Múlgura et al. (2002). In addition, each of these species has erect, imbricate leaves with inverse dorsiventral mesophyll (Carmona & Ancibor, 1995).

Moldenke (1961) mentioned *Verbena deserticola*, described by Philippi (1860), as a synonym of *Acantholippia deserticola*. However, *V. deserticola* is actually a synonym referred to *Junellia origenes* (Phil.) N. O'Leary & P. Peralta (O'Leary et al., 2011).

Selected specimens examined. ARGENTINA. **Catamarca:** Antofagasta de la Sierra, *Ulibarri et al. 679* (SI). **Jujuy:** Susques, ca. de Olacapato, esquina Azul, *Cabrera et al. 31792* (SI). **Salta:** Los Andes, camino de Pocitos a Canchari, *Ruthsatz 213* (SI). **San Juan:** Dpto. Iglesia, Parque Nac. San Guillermo, *E. Haene et al. 2121* (SI). BOLIVIA. **Oruro:** Atahualpa, al S de Sabaya, salar de Coipasa, *Beck 21555* (SI). **Potosí:** Nor Lipez, *E. García 1209* (SI). CHILE. **Region II:** Antofagasta, El Loa, 60 km E ruta 5, on rte. to Solar de Aguas Calientes, *Dillon et al. 6018* (SI).

10. *Aloysia dusenii* Moldenke, *Phytologia* 1: 440. 1940. TYPE: Brazil. Paraná: shrubby campo at Tamandré, 4 Oct. 1914, *P. Dusén 1050a* (lectotype, designated by Siedo [2010: 200], S11-10477 not seen, S image!; isolectotype, NY [barcode] NY00103874 not seen, NY image!). Figure 4.

Aloysia ternifolia Moldenke, *Phytologia* 2: 309. 1947. TYPE: Brazil. Paraná: Itaiacoca, Ponta Grossa, 17 Mar. 1904, *P. K. Dusén 4228* (holotype, S11-10485 not seen, S image!; isotypes, NY [barcode] NY00103891 not seen, NY image!, NY [bc] NY00103892 not seen, NY image!, US [bc] US00118881 not seen, US image!).

Aloysia ternifolia Moldenke f. *oppositifolia* Moldenke, *Phytologia* 28: 192. 1974. TYPE: Brazil. Paraná: Pitanga, rio Bonito, 25 Feb. 1971, *G. Hatschbach 26516* (holotype, TEX-LL [barcode] LL00374942 not seen, TEX-LL image!; isotypes, SI [bc] SI041146!, UC [bc] UC1426950 not seen, UC image!, US [bc] US00118882 not seen, US image!).

Shrubs 1–2 m tall; stems glabrous. Leaves mostly opposite, sometimes 3-whorled, sessile to subpetiolate, petiole 2–4 mm; blades narrowly elliptic to elliptic, 3–4(–5) × 1–1.5 cm, apex acute to subobtuse, base acute, margins entire toward base, minutely serrate toward apex, abaxially strigose on midvein, adaxially with adpressed strigose pubescence over entire surface. Florescences axillary, solitary or sometimes 2 per leaf axil, lax, 3–8 cm;

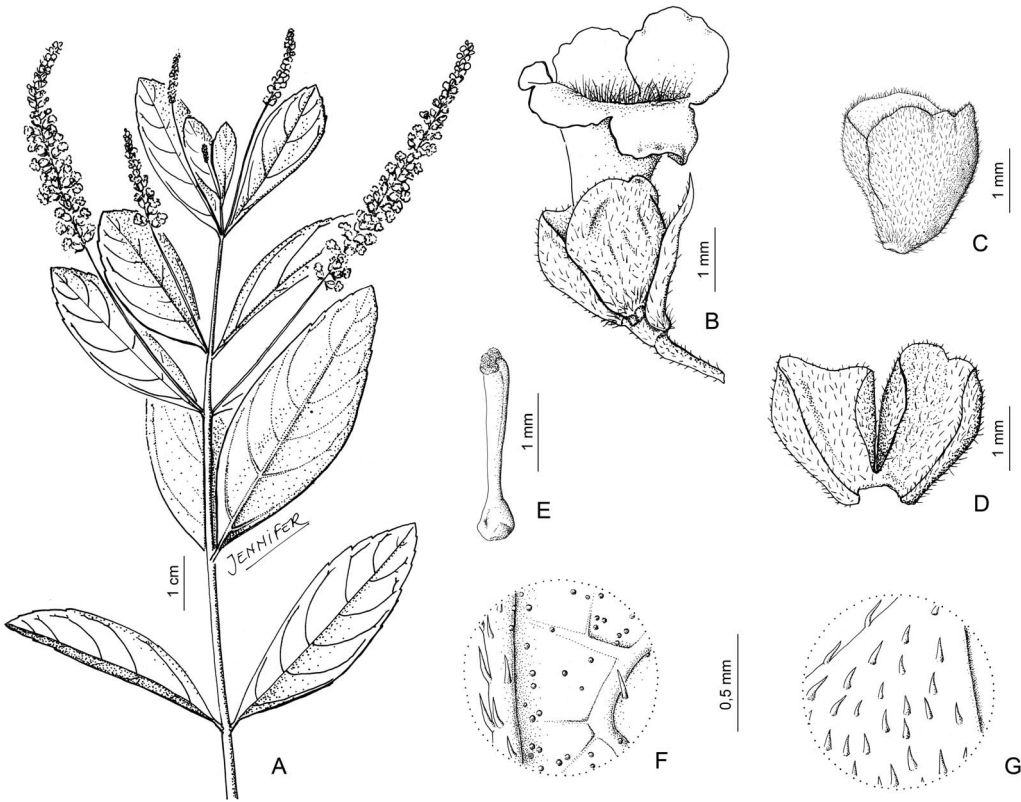


Figure 4. *Aloysia dusenii* Moldenke. —A. Floriferous branch, showing the axillary florescences (homothetic pleiobotrya). —B. Intact flower in lateral view, with floral bract subtending the lightly strigose calyx. —C. Detail of bilobulated calyx. —D. Detail of dissected bilobulated calyx, internal view. —E. Gynoecium. —F. Detail of leaf abaxial surface, strigose on midvein. —G. Detail of leaf abaxial surface, with adpressed strigose pubescence. A–G, taken from *Hatschbach 22546* (SI).

peduncles 1–3.5 cm; flowers white; pedicels 0.2–0.5 mm; floral bracts narrowly elliptic, 2–2.5 mm, apex acute, strigose. Flower with the calyx bilobulated, 2–2.5 mm, lightly strigose; corolla tube 3–4 mm, externally glabrous, with villous fauce. Cluse 1.5×1 mm, glabrous.

Distribution and habitat. *Aloysia dusenii* is endemic to Brazil (Paraná, Rio Grande do Sul, Santa Catarina) and has been observed to grow on riverbanks or on marginal moist forests.

Discussion. *Aloysia dusenii* is remarkable in relation to its bilobulated calyx, which is 4-toothed in the rest of the South American *Aloysia* taxa. Bilobulated calyces are seen among North American *Aloysia* such as *A. coalcomana* Siedo and are frequent within *Lippia*.

Selected specimens examined. BRAZIL. **Paraná:** Guarapuava, Rio Jordao, *Hatschbach 22546* (SI); General Carneiro, faz. dos Souza, *Hatschbach 28366* (SI). **Rio**

Grande do Sul: Bom Jesus, Pelotas, de S. Joaquim a Ronchinha, *Krapovickas 38344* (SI). **Santa Catarina:** Rio Pelotas, crossing rd. from Silveira to Sao Joaquim, *Olmstead 2010-217* (SI); Mun. Sao Joaquim, Lajes, *Lourteig 2189* (SI).

11. *Aloysia fiebrigii* (Hayek) Moldenke, *Revista Sudamer. Bot.* 4: 15. 1937. Basionym: *Lippia fiebrigii* Hayek, *Bot. Jahrb. Syst.* 42: 165. 1909. TYPE: Bolivia. Tarija, 4 Feb. 1904, K. *Fiebrig 3036* (lectotype, designated by Wood [2009: 515], K [barcode] K000470999 not seen, K image!; isolectotypes, A [bc] A00069310 not seen, A image!, BM [bc] BM000643747 not seen, BM image!, E [bc] E00373278 not seen, E image!, F [bc] F0092410F not seen, F image!, F [bc] F0093491F not seen, F image!, G [bc] G00386442 not seen, G image!, GH [bc] GH00069311 not seen, GH image!, GOET [bc] GOET011516 not seen, GOET image!, M [bc] M0111834 not seen, M image!, NY [bc] NY00137758 not seen, NY image!, P [bc] P00713756 not seen, P image!, P

[bc] P00713757 not seen, P image!, S11-10531 not seen, S image!, S11-10526 not seen, S image!, SI [bc] SI003507!, SI [bc] SI003383!, SI [bc] SI003508!, US [bc] US00118823 not seen, US image!, W 1911-0001742 not seen, W image!).

Aloysia arcuifolia G. L. Nesom, *Phytologia* 70: 145. 1991. TYPE: Bolivia. Potosi: Valle de Palqui, 7 Feb. 1987, R. Ehlich 339 (holotype, TEX [barcode] TEX00374932 not seen, TEX image!; isotype, LPB [bc] LPB0000837 not seen, LPB image!).

Shrubs 1–2 m tall. Leaves verticillate, in whorls of 3, sometimes 4, rarely opposite, subsessile; blades linear to elliptic, 1.8–3 × 0.2–0.5 cm, apex acute, base acute, attenuate, margin entire, adaxially scabrous, abaxially glabrate, with underlayer of glandular trichomes, midvein abaxially conspicuous. Florescences terminal and axillary (heterothetic pleiobotrya), dense, brief, 1–2 cm; peduncles 0.5–1 cm; flowers white; floral bracts ovate, apex acuminate, 2–2.5 mm, lightly strigose, margin ciliate. Flower with the calyx 1.5 mm, strigose, with 4 brief teeth, unequal, triangular; corolla tube 5.5 mm, with glabrous fauce. Cluse 1 × 0.5 mm, glabrous.

Iconography. Botta (1979: 102, fig. 11).

Distribution and habitat. *Aloysia fiebrigii* has been observed to grow in southern Bolivia and northwestern Argentina (Jujuy, Salta).

Discussion. Siedo (2010) lectotypified this taxon superfluously, because Wood had previously designated the lectotype for *Aloysia fiebrigii* (Wood, 2009).

Aloysia fiebrigii shares with *A. arequipensis*, *A. citrodora*, *A. herrerae*, and *A. velutina* the presence of axillary and terminal florescences, a group of five species in *Aloysia* with heterothetic pleiobotrya. It is distinguished from these species, except from *A. citrodora*, by its ternate leaves, with the leaves being opposite in the rest. *Aloysia citrodora* and *A. fiebrigii* may be differentiated by their leaves, being smaller (blades 1.8–3 × 0.2–0.5 cm) and with entire margins in the latter, and larger (blades 2–8 × 1–2.5 cm) and with entire or slightly serrate margins in the former.

Selected specimens examined. ARGENTINA. **Jujuy:** Santa Catalina, Cienequillas, Arenas 927 (SI). **Salta:** Hunziker 8055 (CORD). BOLIVIA. **Chuquisaca:** entre Muyuyquiri y Camargo, Cocucci 3366 (SI). **Tarija:** Yunchará, Rupaska, Beck 26988 (SI); s. loc., s.d., Fiebrig 3040 (SI).

12. *Aloysia gratissima* (Gillies & Hook. ex Hook.) Tronc., *Darwiniana* 12: 527. 1962. Basionym: *Verbena gratissima* Gillies & Hook. ex Hook.,

Bot. Misc. 1: 160. 1829. TYPE: Argentina. Mendoza, 1829, *G. Gillies s.n.* (holotype, K [barcode] K000470994 not seen, K image!; isotypes, BM [bc] BM000643772 not seen, BM image!, BM [bc] BM000643773 not seen, BM image!, E [bc] E00320620 not seen, E image!, E [bc] E00320623 not seen, E image!, E [bc] E00320622 not seen, E image!, GH [bc] GH00069316 not seen, GH image!, GH [bc] GH00299005 not seen, GH image!, OXF not seen, SI [bc] SI003701!). Figure 5.

Shrubs 1–3 m tall; stems glabrous, sometimes puberulous when young. Leaves opposite, subsessile, or briefly petiolate to 3 mm, sometimes fasciculate, membranaceous or coriaceous; blades elliptic to ovate, 0.15–7 × 0.05–3 cm, apex acute or sometimes subobtuse, base acute, margins entire, dentate, or serrate, or basally entire and serrate toward apex, adaxially scabrous, abaxially glabrate to lightly strigose, midvein only impressed on abaxial surface or the venation pinnate, conspicuous. Florescences axillary, solitary, lax, or dense, 3–13 cm; peduncles 0.5–3 cm; flowers white; floral bracts ovate, apex acute, 1–2 mm, lightly strigose, margin ciliate. Flower with the calyx 2–4 mm, hispid in inferior half, lightly hispid toward apex, calyx with 4 teeth, unequal, triangular; corolla tube 3–5 mm, externally puberulous toward apex, with villous fauce. Cluse 1–2 × 0.5 mm, glabrous.

Distribution and habitat. *Aloysia gratissima* is an amply distributed species, growing throughout the Americas. *Aloysia gratissima* var. *gratissima* has the most far-reaching distribution, being the only taxon in the genus that occurs in both South and North America. Its geographic distribution extends from the southwestern United States and northern Mexico, into southern South America. Three other varieties of *A. gratissima* are here recognized (*A. gratissima* var. *schulziana* (Moldenke) Botta, *A. gratissima* var. *angustifolia* (Tronc.) Botta, and *A. gratissima* var. *chacoensis* (Moldenke) Botta) and have distributions restricted to southern South America. Consequently, in South America four varieties of *A. gratissima* are recognized.

Discussion. Ragonese (1955) stated that *Aloysia gratissima* is an aromatic shrub known to be toxic for cattle.

Aloysia gratissima is a problematic taxon, and throughout the years botanists (Troncoso, 1964; Botta, 1979; Siedo, 2006) have differed in the significance of singular characters to delimit this complex, which has been reflected in the variable number of species and

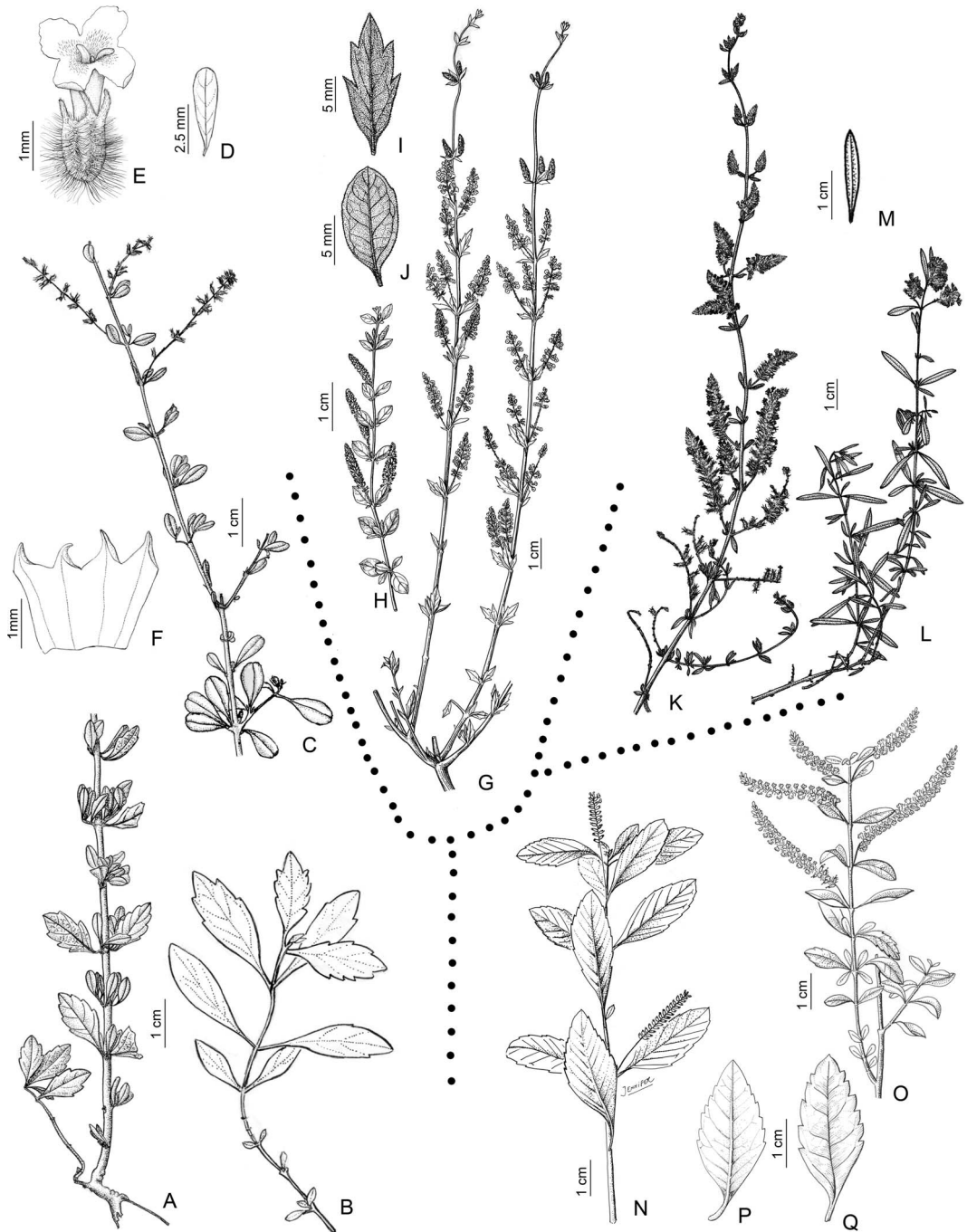


Figure 5. *Aloysia gratissima* (Gillies & Hook.) Tronc. A–F. *Aloysia gratissima* var. *gratissima*. —A. Basal branch. —B. Apical branch. —C. Fructiferous branch. —D. Leaf. —E. Intact flower with calyx hispid in lower half, with three teeth (of four) visible. —F. Dissected calyx, internal view. G–J. *Aloysia gratissima* var. *chacoensis* (Moldenke) Botta. —G. Floriferous branch with dentate leaves. —H. Apical branch with entire leaves. —I. Basal leaf with dentate margin in upper half. —J. Apical leaf with entire margins. K–M. *Aloysia gratissima* var. *angustifolia* (Tronc.) Botta. —K. Fructiferous branch with apical leaves. —L. Floriferous branch with basal leaves. —M. Mature leaf. N–Q. *Aloysia gratissima* var. *schulziana* (Moldenke) Botta. —N. Floriferous branch. —O. Fructiferous branch. —P. Leaf, abaxial surface with conspicuous pinnate venation. —Q. Leaf, adaxial surface. A–F from Schinini 10366 (SI); G–J from Schulz 1494 (holotype, *A. gratissima* var. *chocoensis*, CTES); K from Burkart 23805 (SI); L–M from Burkart 6695 (holotype, *A. gratissima* var. *angustifolia*, SI); N from Krapovickas 30899 (SI); O–Q from Cabrera 14633 (SI).

varieties recognized over time. Lu-Irving et al. (2014) hypothesized that this group may represent a recent radiation, given that branch lengths are short throughout the *A. gratissima* clade. Therefore, a population-level approach to sampling may be required to elucidate the identities and evolutionary histories of taxa belonging to this clade. Recently, Moroni et al. (2016) applied a statistical approach to try to resolve relationships within *A. gratissima*.

Cytology. A mitotic chromosome count of $2n = 54$ has been reported for the species *Aloysia gratissima* (Powell et al., 2010).

TAXONOMIC KEY TO THE VARIETIES OF *ALOYSIA GRATISSIMA*

1. Apical leaf blades small, less than 2 cm long, or small throughout the entire stem axis; florescences dense, 3–7 cm long 2
- 1'. Apical leaf blades larger than lower ones, more than 2 cm long; florescences lax, 5–13 cm long ... 3
 2. Leaf blades with entire margins, less than 2 cm long throughout the entire plant
..... 12a. *A. gratissima* (Gillies & Hook. ex Hook.) Tronc. var. *angustifolia* (Tronc.) Botta
 - 2'. Leaf blades on upper plant stems with entire margins or sometimes 1- to 3-dentate, blades less than 1 cm long, leaf blades on lower plant stems with 1 to 4 teeth, blades more than 2.5 cm long
..... 12b. *A. gratissima* (Gillies & Hook. ex Hook.) Tronc. var. *chacoensis* Moldenke
3. Leaves with an acute apex and serrate margins; abaxial blades with conspicuous pinnate venation
... 12d. *A. gratissima* (Gillies & Hook. ex Hook.) var. *schulziana* (Moldenke) Botta
- 3'. Leaves with an acute or subobtuse apex and entire margins, sometimes serrate; abaxial blades with only the midvein impressed
... 12c. *A. gratissima* (Gillies & Hook. ex Hook.) Tronc. var. *gratissima*

12a. *Aloysia gratissima* (Gillies & Hook. ex Hook.) Tronc. var. ***angustifolia*** (Tronc.) Botta, Darwiniana 22: 89. 1979. Basionym: *Aloysia chacoensis* var. *angustifolia* Tronc., Darwiniana 13: 630. 1964. TYPE: Argentina. Buenos Aires: Campana, 28 Oct. 1934, *A. Burkart 6695* (holotype, SI [barcode] SI003379!; isotype, SI [bc] SI003378!). Figure 5K–M.

Aloysia decipiens Ravenna, Onira 11(4): 14–15. 2007. TYPE: Argentina. Santiago del Estero: Dpto. Robles, colonia Jaime, 19 Nov. 1948, *B. Luna Ruiz s.n.* (holotype, BA [barcode] BA53388!).

Xerophytic shrubs; leaves small, narrow elliptic, up to 2×0.3 cm, with an acute apex and base, entire

margins, and a conspicuous midvein abaxially. Florescences dense, 3–7 cm long.

Distribution and habitat. *Aloysia gratissima* var. *angustifolia* grows in central Argentina (Buenos Aires, Chaco, Córdoba, Entre Ríos, La Pampa, La Rioja, Santa Fé, and Santiago del Estero) and also in western Paraguay.

Discussion. Ravenna (2007) stated that *Aloysia decipiens* was closely related to *A. beckii* Moldenke; however, this name is treated as a synonym of *A. gratissima* var. *gratissima* herein. Study of the type material of *A. decipiens* evinces that it shares a similar leaf morphology with *A. gratissima* var. *angustifolia*, and therefore Múlgura et al. (2012) considered the species name a synonym of this variety.

Selected specimens examined. ARGENTINA. **Buenos Aires:** Campana, barranca Paraná, *Krapovickas 2597* (NY). **Chaco:** Resistencia, *Malvarez 1367* (NY). **Córdoba:** Punilla, Villa del Lago, *Cabrera et al. 29664* (SI). **Diamante:** Barranca, *Burkart 28067* (SI). **Entre Ríos:** Paraná, Paracao, *Burkart et al. 23805* (SI). **La Pampa:** Guatraché, Estancia Remecó, *Rúgolo 1275* (SI). **La Rioja:** Chilecito, *Meyer 4087* (NY). **Santa Fé:** General Obligado, Villa Ana, Villa Ocampo, *Ragonese 3120* (SI). **Santiago del Estero:** San Martín, ruta 34, Km. 571, *Aliscioni et al. 692* (SI). **Tucumán:** s.d., *D. Cozzo s.n.* (NY). PARAGUAY. **Boquerón:** Colonia Menno, *Arenas 1085* (SI). **Chaco:** Loma Porá, *Rojas 2542* (SI).

12b. *Aloysia gratissima* (Gillies & Hook. ex Hook.) Tronc. var. ***chacoensis*** (Moldenke) Botta, Darwiniana 22: 89. 1979. Basionym: *Aloysia chacoensis* Moldenke, Lilloa 5: 373. 1940. TYPE: Argentina. Chaco: Tirol, on side of mtn., Feb. 1934, *A. G. Schulz 1494* (holotype, NY [barcode] NY00103873 not seen, NY image!; isotype, CTES [bc] CTES0013810 not seen, CTES image!). Figure 5G–J.

Aloysia casadensis Hassl. ex Moldenke, Phytologia 3: 106–107. 1949. TYPE: Paraguay. Puerto Casado, Feb. 1917, *T. Rojas 2529* (holotype, MVM not seen; isotypes, NY [barcode] NY00103869 not seen, NY image!, NY [bc] NY00103868 not seen, NY image!, SI [bc] SI003388!).

Leaves small, elliptic, with lengths of less than 1 cm toward apical portion of plant stems, but lengths to 4 cm with 1 to 4 teeth, toward basal portions. Florescences dense, 3–7 cm long.

Distribution and habitat. Most specimens of *Aloysia gratissima* var. *chacoensis* grow in the Argentinean provinces of Chaco and Formosa. This variety is less commonly found in Santa Fé, Santiago del Estero, and Córdoba, and also occurs in western Paraguay.

Selected specimens examined. ARGENTINA. **Chaco:** Enrique Urién, *Schulz 772* (NY); Pampa del Infierno, *Meyer 5066* (NY). **Córdoba:** Ischilín, Dean Funes a San Vicente, *de la Sota 198* (NY). **Formosa:** Camino de Fortín Nuevo, Pilcomayo a La Esmeralda, *Cordini 60* (SI). **Santa Fé:** San Bernardo, *Alonso 548* (SI). **Santiago del Estero:** Espada, *Argañarás 61* (SI). PARAGUAY. **Alto Paraguay:** Puerto Casado, *Rojas 7701* (SI). **Boquerón:** Colonia Fernheim, Filadelfia, *Arenas 1879* (SI). **Presidente Hayes:** Ea. Loma Pyta, *Arenas 664* (SI).

12c. *Aloysia gratissima* (Gillies & Hook. ex Hook.)
Tronc. var. ***gratissima***. Figure 5A–F.

Aloysia lycioides Cham., *Linnaea* 7: 237. 1832. *Lippia lycioides* (Cham.) Steud., *Nomencl. Bot.* [Ed. 2] 2: 62. 1841. TYPE: Brazil meridian, s.d., *F. Sellow s.n.* (lectotype, designated by Múlgura et al. [2012: 17], K [barcode] K000487005 not seen, K image!, K; isolectotypes, BM [bc] BM001118329 not seen, BM image!, BR [bc] BR0000005720156 not seen, BR image!, HAL [bc] HAL0107063 not seen, HAL image!, HAL [bc] HAL0107062 not seen, HAL image!, K [bc] K000487006 not seen, K image!, G [bc] G00386444 not seen, G image!, M [bc] M0111831 not seen, M image!, NY not seen, NY photo at SI!, US [bc] US01049793 not seen, US image!, SI [bc] SI003390!, SI [bc] SI003391!).

Aloysia floribunda M. Martens & Galeotti, *Bull. Acad. Roy. Sci. Bruxelles*, 11(2): 320. 1844, syn. nov. TYPE: Mexico. Veracruz: June–Oct. 1840, *H. Galeotti 774* (holotype, BR [barcode] BR005187300 not seen, BR image!).

Lippia ligustrina (Lag.) Britton var. *lasiodonta* Briq., *Annuaire Conserv. Jard. Bot. Genève* 7–8: 305. 1904. TYPE: Paraguay. Paraguairí, 15 Mar. 1881, *B. Balansa 3117* (holotype, G [barcode] G00166265 not seen, G image!; isotypes, BM [bc] BM000643660 not seen, BM image!, GH [bc] GH00299001 not seen, GH image!, F [bc] F0092411F not seen, F image!, K [bc] K000487007 not seen, K image!, SI!).

Lippia ligustrina (Lag.) Britton var. *paraguariensis* Briq., *Annuaire Conserv. Jard. Bot. Genève* 7–8: 305. 1904. *Aloysia ligustrina* var. *paraguariensis* (Briq.) Moldenke, *Phytologia* 1: 167. 1935. *Aloysia lycioides* var. *paraguariensis* (Briq.) Moldenke, *Phytologia* 2: 464. 1948. *Aloysia gratissima* (Gillies & Hook.) Tronc. var. *paraguariensis* (Briq.) Moldenke, *Phytologia* 9: 500. 1964. TYPE: Paraguay. Paraguairí, Jan. 1875, *B. Balansa 1015* (holotype, G [barcode] G00166413 not seen, G image!; isotypes, BR not seen, BR photo at SI!, G [bc] G00166414 not seen, G photo at SI!, G image!, SI-67609!).

Aloysia beckii Moldenke, *Phytologia* 52(1): 18. 1982. TYPE: Bolivia. Cochabamba: Carrasco, Cochabamba hacia Santa Cruz, 27 Sep. 1981, *S. Beck 7036* (holotype, TEX-LL [barcode] LL00374934 not seen, TEX-LL image!; isotypes, LPB [bc] LPB0000839 not seen, LPB image!, M [bc] M0112713 not seen, M image!, SI [bc] SI003374!).

Aloysia famatinensis Ravenna, *Onira* 11(4): 15–16. 2007. TYPE: Argentina. La Rioja: Sierra de Famatina, Guanchín Viejo, 25 Jan. 1928, *A. Castellanos s.n.* (holotype, BA-28328!).

Leaves elliptic to ovate, generally glabrate, with an acute to subobtusate apex and blade margins entire, sometimes slightly serrate; abaxial blade surface with only the midvein impressed. Florescences lax, 5–13 cm long.

Distribution and habitat. *Aloysia gratissima* var. *gratissima* is amply distributed across northern, northeastern, and northwestern Argentina, extending south to La Pampa. The autonymic variety also occurs in Chile, Bolivia, Paraguay, Uruguay, and southern Brazil. It is found across northern Mexico and in the southwestern United States. This is the only taxon of *Aloysia* known to occur in both South and North America, with an interesting distributional disjunction between northern populations (southwestern United States and adjacent Mexico) and southern ones (Brazil and south). *Aloysia gratissima* var. *gratissima* has been collected and noted as frequent along riverbanks or in xeromorphic scrublands.

Discussion. In northeastern Corrientes Province, Argentina, as well as Paraguay, a phenotype exists (*Morel 1257* [NY]; *Jorgensen 2473* [NY]) that has slightly obovate or rounded leaves, with an entire margin and obtuse apex, with a prominent midvein abaxially and multiple fasciculate leaves at stem nodes. This resembles what Moldenke (1935) referred to as *Aloysia ligustrina* var. *paraguariensis*, which is herein considered a synonym of *A. gratissima* var. *gratissima*.

Study of the type material of *Aloysia floribunda* indicates that this species is the same taxon as *A. gratissima* var. *gratissima*. This was first proposed by Múlgura et al. (2012), given that the type specimen has lax florescences longer than 5 cm, with leaves with a subobtusate apex and entire margin. Wood (2009) mentioned that the holotype of *A. lycioides* was housed at LE, but none of the authors have seen it. A lectotype was selected by Múlgura et al. (2012) from a specimen housed at K.

Selected specimens examined. ARGENTINA. **Buenos Aires:** Campana, *Burkart 3083* (SI). **Catamarca:** Tinogasta, cuesta de Zapata, *Cabrera 24648* (SI). **Chaco:** Colonia Benítez, *Schulz 8317* (SI). **Córdoba:** Punilla, Los Gigantes, *Sayago 940* (SI). **Corrientes:** Santo Tomé, Arroyo Chimiray, Río Uruguay, *Schinini 10366* (CTES; SI). **Curuzú Cuatiá:** Est. María Azucena, *Schinini 13902* (SI). **Entre Ríos:** Concordia, Salto Grande, *Cabrera 19245* (SI). **Formosa:** s. loc., *Jörgensen 2473* (NY). **Jujuy:** Tumbaya, Volcán, Laguna, *Burkart 30608* (SI). **La Pampa:** Sierra de Lihuel Calel, 30 Nov. 1959, *Troncoso s.n.* (SI 20589). **La Rioja:** Chilecito, Quanchín, *Okada 2747* (SI). **Mendoza:** Tunuyán, *Ruiz Leal 1102* (SI). **Misiones:** Cainguaús, rte. 7, camino de Aristóbulo del Valle a Jardín América, *Morrone 635* (SI). **Patiño:** Las Lomitas, 3–5 km SO por rte. 81, *Schinini 24130* (SI). **Pilcomayo:** Clorinda, *Morel 1257* (NY). **Salta:**

Anta, finca Pozo Largo, *Saravia Toledo* 716 (SI). **San Juan:** Valle Fértil, Sa. De Valle Fértil, *Kiesling* 4954 (SI). **San Luis:** La Capital, San Martín del Alto Negro, *L. Anderson* 1521 (SI). **Santa Fe:** Garay, entre Santa Rosa y Cayastá, *Ragones* 2829 (SI). **Santiago del Estero:** Ojo de Agua, *Fabris* 2729 (SI). **Tucumán:** Taff del Valle, *Schulz* 11465 (SI). **BOLIVIA. Chuquisaca:** Luis Calvo, clausura El Huare, *Saravia Toledo* 11830 (SI). **Cochabamba:** Mizque, canton Molinero, *Sigle* 137 (SI). **Santa Cruz:** Samaipata, *Steinbach* 8248 (NY). **Tarija:** de Tarija a Narvaez, *Kiesling* 3708 (SI). **BRAZIL. Rio Grande do Sul:** Alegrete a Uruguayana, *Nicora* 4726 (SI). **CHILE. Region V:** Limache, *Garaventa* 7092 (SI). **ECUADOR. Pichincha:** Quito, Parque Italia, Barrio Las Casas, *Cerón* 12387 (SI). **MEXICO. Chihuahua:** Bachimba canyon, 23 Mar. 1885, *Pringle s.n.* (SI). **Guanajuato:** 60 mi. S San Luis Potosí, *Dunn* 20552 (MO). **Nuevo Leon:** valley near Monterey, 31 Aug. 1903, *Pringle s.n.* (SI). **PARAGUAY. Boquerón:** Colonia Menno, Lolita, *Vanni* 1830 (SI). **Chaco:** Santa Elisa, *Hassler* 2635 (SI). **Cordillera:** San Bernardino, *Hassler* 53 (SI). **Guaira:** Cordillera de Ybytyruzú, Cerro. Polilla, *Zardini* 8599 (SI). **Itapúa:** Villa Encarnación, *Rojas* 7902 (SI). **Paraguarí:** de Paraguarí a Escobar, *Mulgura* 3743 (SI). **San Pedro:** Alto Paraguay, Primavera, *Woolston* 794 (NY). **U.S.A. Texas:** Jim Hogg Co., NE Hebronville, *Lundell* 11958 (SI). **URUGUAY. Artigas:** Tomás Gomensoro, *Marchesi* 10078 (SI). **Minas:** Arroyo Aguas Blancas, *Crespo* 26457 (SI). **Paysandú:** Arroyo Negro, *Rosengurt* 2245 (SI). **Rivera:** rte. 29, pasando Minas de Corrales, *Denham* 333 (SI). **Tacuarembó:** *Cabrera* 32345 (SI).

12d. *Aloysia gratissima* (Gillies & Hook. ex Hook.) Tronc. var. *schulziana* (Moldenke) Botta, *Darwiniana* 22: 87. 1979. Basionym: *Aloysia schulziana* Moldenke, *Lilloa* 5: 381. 1940. TYPE: Argentina. Salta: Colonia San Bernardo, Feb. 1936, *A. G. Schulz* 1447 (holotype, NY [barcode] NY00103887 not seen, NY image!; isotypes, CTES [bc] CTES0013830 not seen, CTES image!, SI [bc] SI003394!) Figure 5N–Q.

Aloysia meyeri Moldenke, *Lilloa* 5: 378. 1940. TYPE: Argentina. Tucumán: Trancas, San Pedro de Colalao, 4 ene. 1940, *T. Meyer* 3092 (holotype, NY [barcode] NY00103881 not seen, NY image!; isotypes, LIL [bc] LIL001365 not seen, LIL image!, SI [bc] SI003389!).

Aloysia looseri Moldenke, *Lilloa* 5: 377. 1940. *Lippia looseri* (Moldenke) Looser, *Revista Univ.* (Santiago) 26(2): 141. 1941. TYPE: Chile. Santiago, 15 Dec. 1925, [cult.] *G. Looser* 4008 (holotype, NY [barcode] NY00103879 not seen, NY image; isotypes, SI!, SGO not seen).

Aloysia lomaplatae Ravenna, *Onira* 10(19): 60. 2006. TYPE: Paraguay. “In scopulosis ad Loma Plata, civit. Boquerón,” 13 Sep. 2001, *P. Ravenna* 5030 (holotype, FCQ not seen).

Leaves elliptic, with an acute apex and serrate margin; blades with pinnate venation conspicuous on abaxial surface. Florescences lax, longer than 5 cm.

Distribution and habitat. The greatest number of specimens attributed to *Aloysia gratissima* var. *schulziana* were collected from northwestern Argenti-

na (Jujuy, Salta). This variety is also known, but less frequently, from the Argentinean provinces of Catamarca, Chaco, Formosa, La Rioja, Misiones, San Juan, and Tucumán. *Aloysia gratissima* var. *schulziana* is also present in southern Bolivia and Paraguay.

Discussion. *Aloysia gratissima* var. *schulziana* is distinguished by its leaves with serrate margins and conspicuous pinnate venation on the abaxial blade surface, with the margins entire or slightly serrate toward apex. Only the midvein is impressed in the other three varieties.

Moldenke (1940) mentioned that type material of *Aloysia looseri* was a specimen cultivated in Chile. The species name is herein considered a synonym of *A. gratissima* var. *schulziana*. Chile is not considered as part of the natural distributional range for *A. gratissima* var. *schulziana*. Elsewhere, this variety is sometimes cultivated for ornamental purposes, as in the suburbs of Buenos Aires.

Ravenna (2006: 60) stated in the protologue of *Aloysia lomaplatae* Ravenna that the species can be distinguished by its “relatively large, somewhat scabrous, conspicuously lobulate-dentate blades.” These are characters that define the variety, and consequently the species name is here considered a synonym of *A. gratissima* var. *schulziana*.

Selected specimens examined. **ARGENTINA. Catamarca:** Ancastí, entre Ancastí e Icaño, *Troncoso* 1824 (SI). **Chaco:** 1° de Mayo, Colonia Benítez, *Schulz* 8699 (SI). **Córdoba:** Quilino, *Cordo* 77-d-45 (SI). **Corrientes:** Ituzain-gó, camino a San Carlos, *Krapovickas* 17970 (SI). **Formosa:** Matacos, Ingeniero Juárez, 3 km al S del pueblo, sobre la rte. que va al Bermejo, a Belgrano, *Arenas* 2330 (SI); Patiño, Las Lomitas, *Maranta* 1104 (BA). **Jujuy:** Santa Bárbara, *Cabrera* 31018 (S); entre San Pedro y Santa Clara, *Cabrera* 14633 (SI). **La Rioja:** Independencia, rte. 79, *Pensiero* 7426 (SI). **Misiones:** Posadas, *Bertoni* 761 (NY). **Salta:** Anta. San Javier (8 km al Sud de I.V. González), 1988, *Saravia Toledo* 1750 (SI). **San Juan:** Valle Fértil, Ruta prov. 42, entre San Agustín de Valle Fértil y Las Tumanas, a 23 km del primero, *Biurrun* 4002 (SI). **San Martín:** Río Seco, *Krapovickas* 30899 (SI). **Santiago del Estero:** Choya, *Sayago* 2649 (SI). **Tarija:** Villa Montes, Abra de Tapequa, *Krapovickas* 19210 (SI). **Tucumán:** Leales, La Florida, *Krapovickas* 17337 (SI). **BOLIVIA. Potosí:** Nor Chichas, Aripalca, 10 Mar. 1993, *Torrico* 107 (SI). **Tarija:** Villa Montes, Abra de Tapequa, 25 May 1971, *Krapovickas* 19210 (SI). **PARAGUAY. Boquerón:** s. loc., *Vanni* 2410 (SI).

13. *Aloysia hatschbachii* Moldenke, *Phytologia* 18(6): 341. 1967. TYPE: Brazil. Paraná: Pien, 8 Mar. 1967, *G. Hatschbach* 16101 (holotype, NY [barcode] NY00103876 not seen, NY image!; isotypes, MO-2217903 not seen, MO image!, TEX-LL [bc] LL00374938 not seen, TEX-LL image!, TEX-LL [bc] LL00374939 not

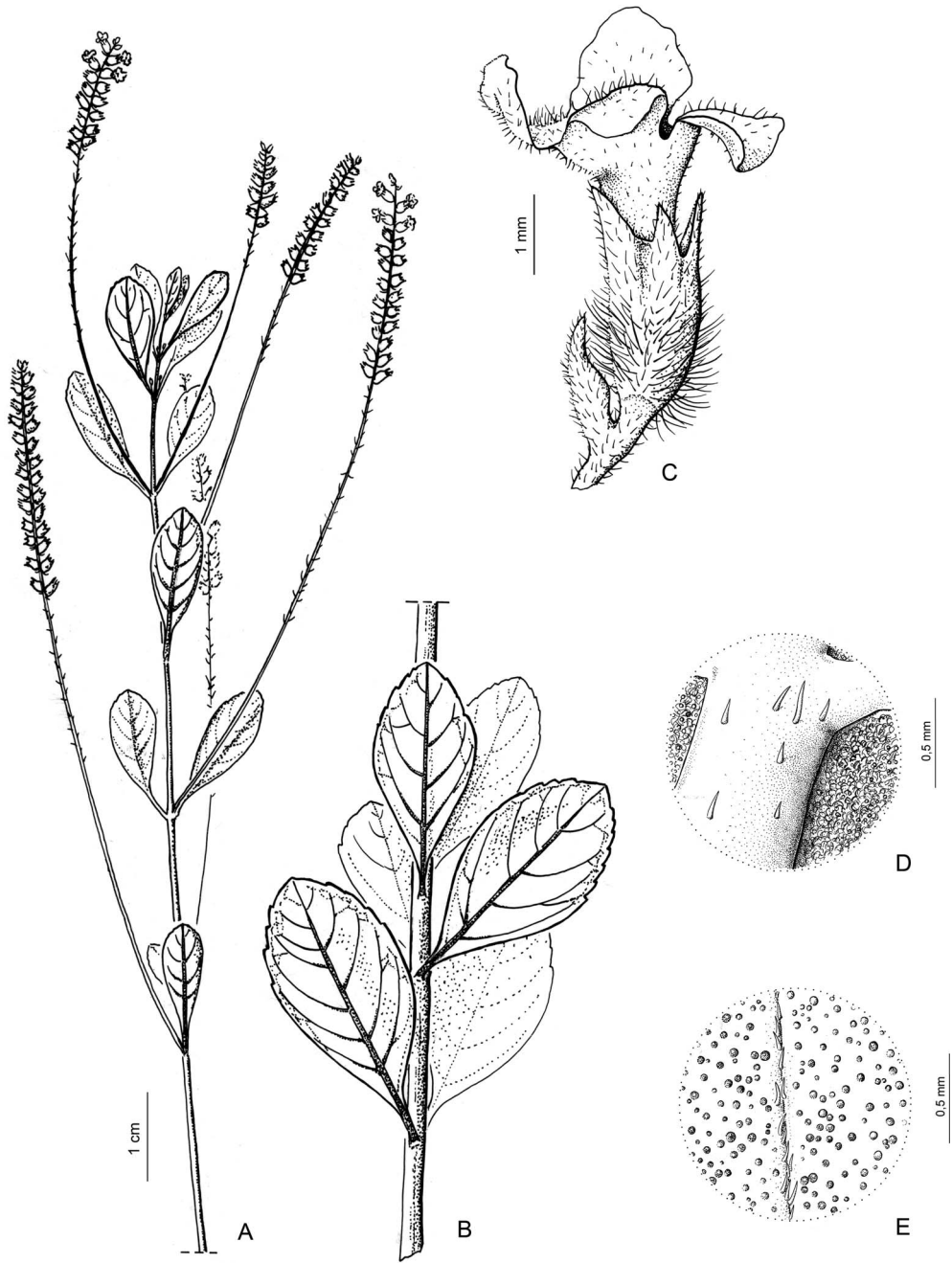


Figure 6. *Aloysia hatschbachii* Moldenke. —A. Floriferous branch, general aspect, with axillary florescences (homothetic pleiobotrya). —B. Detail of branch, showing elliptic leaves with serrulate margins in upper half. —C. Intact flower with hispid calyx subtended by strigose floral bract (at left). —D. Close-up of abaxial leaf surface, glabrous with lightly strigose midvein. —E. Close-up of adaxial leaf surface, glabrous with glandular papillae. A, illustrated from *Hatschbach 16101* (isotype, SI); B–E from *Hatschbach 51897* (SI).

seen, TEX-LL image!, UC [bc] UC1414074 not seen, UC image!, US [bc] US01049795 not seen, US image!, SI [bc] SI041045!, SI [bc] SI003385!, SI [bc] SI003384!, WIS [bc] WIS0255184 not seen, WIS image!). Figure 6.

Shrubs 1–2 m tall; stems glabrous. Leaves opposite, subcoriaceous, briefly petiolate, petiole 2–4 mm; blades elliptic, 2–3 × 1–1.5 cm, apex subobtuse to obtuse, base acute, decurrent, margins entire toward base, serrulate in upper half, adaxially glabrous, with glandular papillae, abaxially glabrous, scarcely strigose over abaxial midvein, with venation conspicuous, reddish brown, impressed on abaxial surface. Florescences axillary, solitary, lax, 3–8 cm; peduncles 1–4 cm; flowers white to lilac; pedicels 1 mm; floral bracts reduced, narrowly elliptic, 1–1.2 mm, strigose, apex acute. Flower with the calyx 2–3 mm, hispid, with 4 brief teeth, unequal, triangular; corolla tube 3–4 mm, externally glabrate, with villous fauce. Cluse 1.5 × 1 mm, glabrous.

Distribution and habitat. *Aloysia hatschbachii* is endemic to Brazil (Paraná), where it has been noted to grow in rocky soils.

Discussion. *Aloysia hatschbachii* shares with *A. salviifolia* and varieties of *A. gratissima* the presence of leaf margins with some degree of serration or dentition, but they are always basally entire. *Aloysia hatschbachii* is readily recognized by its conspicuous, reddish brown, impressed pinnate venation on the abaxial surface of the leaf blades.

Selected specimen examined. BRAZIL. **Paraná:** Pien, *Hatschbach 51897* (SI, US).

14. *Aloysia herrerae* Moldenke, *Phytologia* 2: 10. 1941. TYPE: Peru. Urubamba valley, July 1927, *F. L. Herrera 1534* (holotype, F [barcode] F0043367F not seen, F image!; isotype, NY [bc] NY00103877 not seen, NY image!, SI!). Figure 7.

Aloysia ayacuchensis Moldenke, *Phytologia* 6(6): 256, 323. 1958, syn. nov. TYPE: Peru. Ayacucho, *J. J. Soukup 4187* (holotype, NY [barcode] NY00103866 not seen, NY image!).

Shrubs 1–2.3 m tall; stems glabrous. Leaves opposite, sometimes ternate, sessile or briefly petiolate, petioles 1–5 mm; blades subcoriaceous, narrowly elliptic, 2(–5.5) × 0.4(–1.5) cm, apex subobtuse, base obtuse, margins entire, adaxially glabrous or with scattered scabrid hairs, especially along midvein, abaxially scabrid with glandular trichomes and prominent midvein. Florescences terminal and axillary (heterothetic pleiobotrya),

dense, 1–3 cm; peduncles 1 cm; flowers white, cream with pink to violet tube; pedicels 0.5 mm; floral bracts reduced, widely ovate, 2–2.5 mm, apex acuminate, with scarce scabrous pubescence. Flower with the calyx 2–3 mm, with underlayer of sessile glandular trichomes, and scarce scabrous pubescence, calyx with 4 brief acuminate teeth; corolla tube 3–5 mm, strigose on both surfaces. Cluses 1.5 × 1 mm, glabrous.

Distribution and habitat. *Aloysia herrerae* grows in Peru and Bolivia and has been collected from hillsides, rocky slopes, or open sunny areas. It has been found at elevations up to 2800 m.

Discussion. *Aloysia herrerae* is an aromatic plant, the leaves of which are used to treat headaches. The species is distinguished by its terminal florescences, which are also present in *A. citrodora* and *A. fiebrigii*, with these three taxa sharing heterothetic pleiobotrya. However, *A. herrerae* is differentiated by its opposite leaves, in contrast to the verticillate leaves seen in *A. citrodora* and *A. fiebrigii*. Terminal florescences are also present in *A. velutina* and *A. arequipensis*, but these two species lack entire leaf margins, while the leaf margin is consistently entire in *A. herrerae*. Leaves are serrulate in the upper portion of the blade in *A. arequipensis* but crenate in *A. velutina*.

The type specimen of *Aloysia ayacuchensis* was observed to have both terminal and axillary florescences and opposite leaves. These are both characters that define *A. herrerae*, so the species name is here considered a synonym of the latter.

Selected specimens examined. BOLIVIA. **Chuquisaca:** Zudañez, 5 km from Candelaria toward Icla, *Wood 14658* (K). PERU. **Ancash:** Huaraz, baños de Chancos, *Sanderman 4612* (F, US). **Ayacucho:** Ayacucho, *Ochoa 710* (NY, SI); s. loc., *Soukup 5467* (US). **Cajamarca:** San Miguel, Niepos, *Llata Quiroz 1513* (SI). **Cuzco:** Calca, *C. Vargas 248* (NY, SI); Urubamba, Chincheros, *Davis 1757* (F, K, NY); Urubamba, Huallabamba, *Olmstead 2009-30* (SI, WTU); Huayocorari to Yabncocha, *Núñez 7018* (F). **Huancavelica:** Tayacaja, betw. Izcuchaca & Acostambo, *Hutchison 4199* (NY, SI, US).

15. *Aloysia oblanceolata* Moldenke, *Phytologia* 3: 108. 1949. TYPE: Paraguay. San Bernardino, 1915, *T. Rojas 53a* (holotype, NY [barcode] NY00103883 not seen, NY image!; isotypes, MVM not seen, SI [bc] SI003407!). Figure 8.

Aloysia gratissima (Gillies & Hook. ex Hook.) Tronc. var. *oblanceolata* Moldenke, *Phytologia* 15: 462. 1968, syn. nov. TYPE: Brazil. Rio Grande do Sul: Gloria, SE of Porto Alegre, 2 Oct. 1948, *A. L. Moldenke 19684* (holotype, NY [barcode] NY00103875 not seen, NY image!).

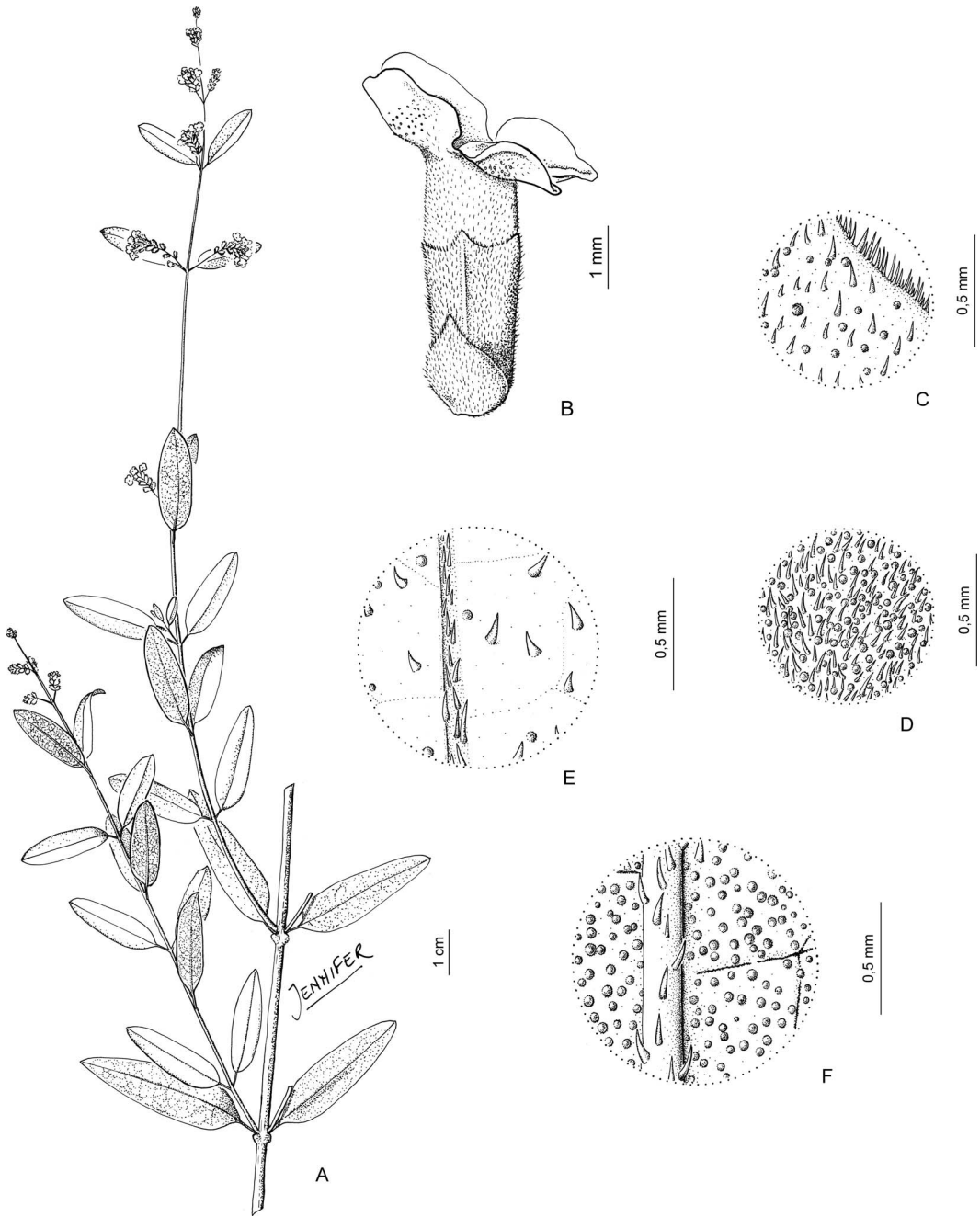


Figure 7. *Aloysia herrerae* Moldenke. —A. Fertile branch, with florescences in both axillary and terminal positions (heterothetic pleiobotrya). —B. Intact flower subtended by widely ovate floral bract. —C. Close-up of floral bract surface, with scattered scabrid hairs and ciliate margins and underlayer of sessile glandular trichomes. —D. Close-up of external calyx surface, scabrid, with underlayer of glandular trichomes. —E. Close-up of adaxial leaf surface, with scattered scabrid hairs, especially along midvein. —F. Close-up of abaxial leaf surface, scabrid with glandular trichomes and prominent midvein. A–F, illustrated from *Olmstead 2009-30* (SI).

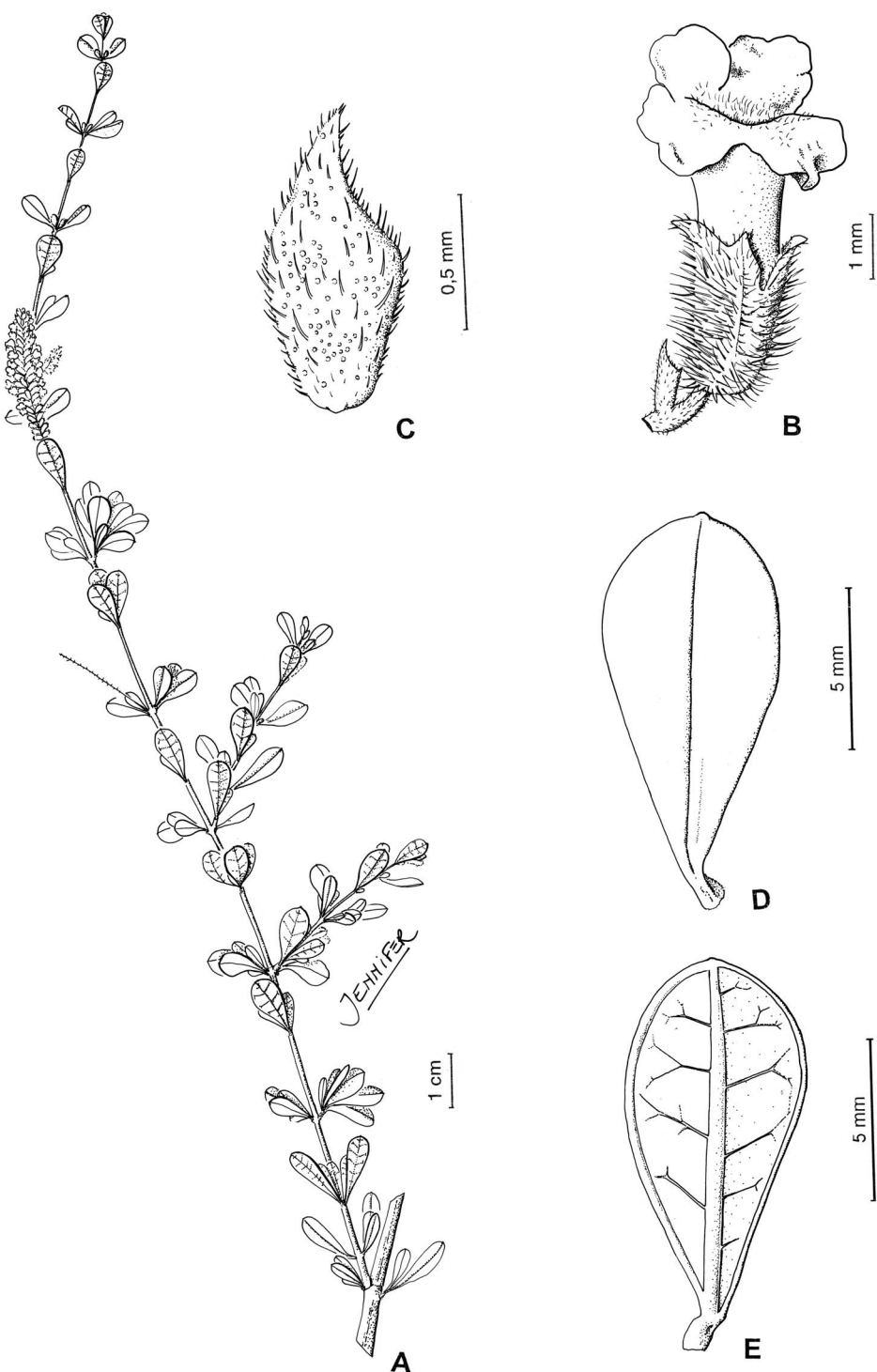


Figure 8. *Aloysia oblanceolata* Moldenke. —A. Fertile branch, general aspect. —B. Flower with hispid calyx and subtending strigose bract (left). —C. Floral bract with ovate, acute apex. —D. Adaxial glabrous leaf surface. —E. Abaxial leaf surface, with prominent midvein and revolute margins. A–E, illustrated from *Arenas 148* (SI).

Shrubs 1–2 m tall; stems glabrous. Leaves opposite, generally clustered into fascicles of 4 to 8 leaves, blades sessile, obovate to oblanceolate, 2(–3) × 0.4–0.6 cm, apex obtuse to round, base acute, attenuate, margins entire, revolute to subrevolute, coriaceous, adaxial surface glabrous, with conspicuous midvein both adaxially and abaxially. Florescences axillary, solitary, dense, 2–5 cm; peduncles 1–2 cm long; flowers white; pedicels 0.5 mm; floral bracts widely ovate, 1–1.5 mm, apex acute, strigose. Flower with the calyx 2–3 mm, hispid, with 4 teeth, unequal, triangular; corolla tube 3–4 mm, glabrate externally, glabrous inside. Cluses 1.5 × 1 mm, glabrous.

Distribution and habitat. *Aloysia oblanceolata* grows in Paraguay, Bolivia, and Brazil, and is collected from shrubby forests or rocky soils.

Discussion. *Aloysia oblanceolata* is similar to varieties of *A. gratissima*, sharing a leaf morphology with blades that can be elliptic with a subobtusate apex, acute base, and entire margin. *Aloysia oblanceolata* may be distinguished by its fasciculate leaves (vs. not fasciculate in *A. gratissima*) and its revolute to subrevolute blade margins (vs. blade margins not revolute in *A. gratissima*).

Upon examination, the type material of *Aloysia gratissima* var. *oblanceolata*, later described by Moldenke in 1968, is undistinguishable from *A. oblanceolata*, also described by Moldenke in 1949. Thus, this varietal name is here considered a synonym of *A. oblanceolata*.

Selected specimens examined. BOLIVIA. **Cochabamba:** Quillacollo, 22 km hacia Oruro, *Beck 874* (SI). **Santa Cruz:** Florida, 13 km W Samaipata, *Ferrucci et al. 2659* (SI). BRAZIL. **Paraná:** Guarapuava, río Cavernoso, *Hatschbach 9339* (SI). **Rio Grande do Sul:** Rambo 49976 (SI). PARAGUAY. **Central:** Yparacay, *Hassler 11497* (NY). **Cordillera:** Caacupé, *Soria 2098* (NY); Itaugua, cantera, *Arenas 148* (SI).

16. *Aloysia ovatifolia* Moldenke, Lilloa 5: 379. 1940. *Xeroaloyisia ovatifolia* (Moldenke) Tronc., Darwiniana 12: 51. 1960. TYPE: Argentina. Córdoba: San Javier, La Barranca, 6 Feb. 1939, *A. Castellanos s.n.* (holotype, NY [barcode] NY00103884 not seen, NY image!; isotypes, BA!, CORD [bc] CORD00003824 not seen, CORD image!).

Shrubs small, 0.5–0.75(–1.2) m tall; stems densely puberulent when young, glabrescent in age. Leaves opposite, sometimes clustered into fascicles, petioles 0.2–1 cm; blades ovate to deltate, 1.5–5 × 1–3 cm, apex subobtusate, base truncate, margins coarsely crenate, adaxially hispid, abaxially strigose, pinnate

and reticulate venation prominent on abaxial surface. Florescences axillary, solitary, dense, 2.5–10 cm, elongating to 20 cm in fructification; peduncles 1–2 cm; flowers in whorls of ca. 5, white to pinkish white; pedicels 0.5 mm, floral bracts ovate, 2.5–4 mm, apex acute, strigose. Flowers with the calyx 3 mm, hispid, with long hairs on nerves, with 4 teeth, unequal, triangular; corolla tube 3–4 mm, externally glabrous, with villous fauce. Fruit undivided, drupaceous, obovoid, covered by the accrescent calyx, 2–2.5 × 1.5–2 mm, with two 1-seeded locules.

Iconography. Troncoso (1960: 52, fig. 1, 53, fig. 2, 55, fig. 3).

Distribution and habitat. *Aloysia ovatifolia* is endemic to northwestern Argentina where it is found on rocky slopes, in sunny, sandy, dry soils.

Discussion. *Aloysia ovatifolia* is unique in *Aloysia* in having fruits undivided and drupaceous, being schizocarpic in the rest of the taxa. It also can be differentiated by its blades ovate to deltate, with subobtusate apex, truncate base, and margins coarsely crenate.

Selected specimens examined. ARGENTINA. **Catamarca:** Tinogasta, rte. 45, 14 km N Tinogasta, *J. Hunziker 11998* (SI). **Córdoba:** Sobremonte, San Francisco del Chañar, *Burkart 29641* (SI). **La Rioja:** General Belgrano, entre Nepe y Los Baldes, *Riedel 226* (SI). **Mendoza:** San Carlos, rte. 1001, 6 km S jct. rte. 40, *Olmstead 2001-184* (SI). **San Juan:** Valle Fértil, cerros rodean Embalse, *Roig 8424* (SI). **San Luis:** Belgrano, Estancia El Médano, 65 km NO de San Luis, *L. Anderson 3077* (SI). **Santiago del Estero:** Guasayán, de Guampacha a Guasayán, *Rotman 228* (SI). **Tucumán:** Trancas, ruta 9 al S de Choromoro, *Burkart 30574* (SI).

17. *Aloysia peruviana* (Turcz.) Moldenke, Revista Sudamer. Bot. 4: 15. 1937. Basionym: *Lippia peruviana* Turcz., Bull. Soc. Imp. Naturalistes Moscou 36(2): 200. 1863. TYPE: Peru. Puno-chuca, s.d., *W. Matthews 585* (holotype, KW [barcode] KW001001633 not seen, KW image!; isotypes, BM [bc] BM000643629 not seen, BM image!, BR-562372 not seen, BR [bc] BR0000005623723 not seen, BR image!, K [bc] K000470998 not seen, K image!). Figure 9.

Aloysia aloysioides Loes. ex Moldenke, Phytologia 2: 9–10. 1941. *Lippia aloysioides* Loes. ex Moldenke, nom. inval. [cheironym]. Phytologia 2: 10. 1941. TYPE: Peru. Lima, below Surco, Feb. 1909, *A. Weberbauer 5206* (holotype, F [barcode] F0043368 not seen, F image!; isotypes, NY [bc] NY00103865 not seen, NY image!, S11-10554 not seen, S image!, SI [bc] SI014007!, US [bc] US00118806 not seen, US image!).

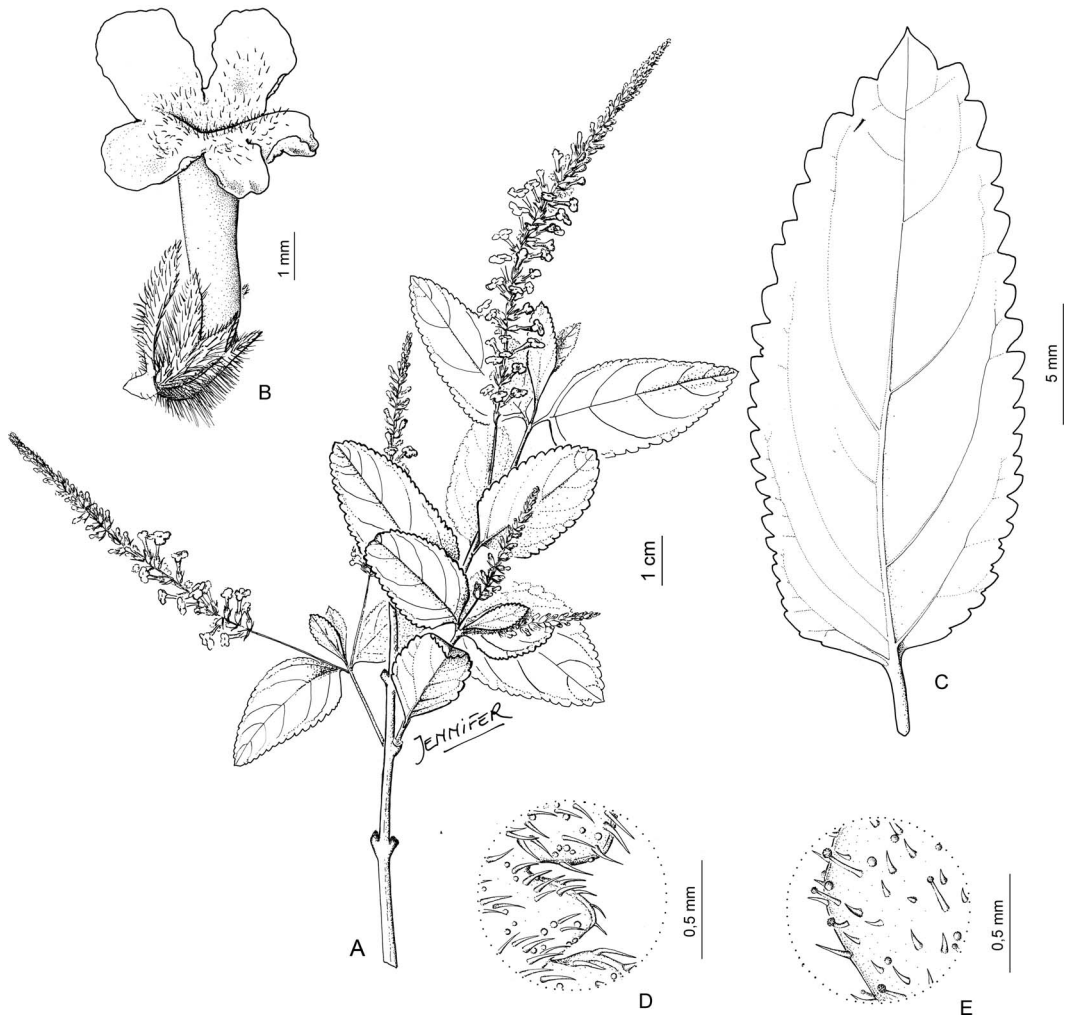


Figure 9. *Aloysia peruviana* (Turcz.) Moldenke. —A. Floriferous branch, with axillary florescences (homothetic pleiototrya). —B. Intact flower in lateral view, with hispid calyx and subtending strigose floral bract (at left). —C. Intact leaf, abaxial surface, evenly crenate margin and prominent venation. —D. Close-up of abaxial leaf surface, with hispid indument. —E. Close-up of adaxial leaf surface with scattered strigose and hispid hairs. B, illustrated from *Soukup 4872* (US); A, C–E, taken from *Donovan P978* (US).

Aloysia minthiosa Moldenke, *Phytologia* 2: 12. 1941, syn. nov. TYPE: Peru. Ancash, Yaután, 9 Oct. 1922, *J. F. Macbride 2564* (holotype, F [barcode] F0042838F not seen, F image!; isotypes, GH [bc] GH00299002 not seen, GH image!, NY [bc] NY00103882 not seen, NY image!, SI!).

Shrubs 1–2.5 m tall; stems lightly puberulent to strigose. Leaves generally opposite; petioles 0.2–0.5 cm long; blades ovate to elliptic, 2–4 × 1–2 cm, apex subobtusely, base rounded, margins evenly crenate, adaxially scabrous, abaxially hispid or strigose, venation pinnate and reticulate, conspicuous on abaxial surface, membranaceous and plane texture. Florescences axillary, solitary, dense, 8–10 cm;

peduncles 1–2 cm; flowers white or pale violet; pedicels 0.5 mm; floral bracts narrowly elliptic, 2–3 mm, apex acute, strigose. Flower with the calyx 2–2.5 mm, hispid, hairs longer proximally, grading to shorter distally, with 4 teeth, unequal, triangular; corolla tube 6–7(–8) mm, externally glabrous, with villous fauce. Cluses 2 × 1 mm, smooth and glabrous.

Distribution and habitat. *Aloysia peruviana* is endemic to Peru, growing at elevations from 1200 to 2000 m, on rocky slopes.

Discussion. *Lippia aloysioides* Loes. is an invalid name, only mentioned in the protologue of *Aloysia*

aloysioides where Moldenke (1941: 10) stated “The cheironym, *Lippia aloysioides* Loes., appears on the label.” A cheironym is an unpublished name and invalid.

Aloysia peruviana has perfumed, sweet-smelling flowers, with showy blooms and long corolla tubes 6–7(8) mm. There are also other species in *Aloysia* with long corollas. *Aloysia castellanosi* would be distinguished by its oblong leaf blades, these being ovate to elliptic in *A. peruviana*. *Aloysia crenata* and *A. citrodora* differ in their ternate leaves, these being opposite in *A. peruviana*. *Aloysia salsoloides*, *A. deserticola*, and *A. tarapacana* also may have long corollas, with lengths of 5–7 mm, 4–6 mm, and 5–6 mm, respectively. However, all three are plants with spiny branches and reduced leaf blades. Two varieties of *A. scorodonioides* also have long corollas, 5–6 cm in both *A. scorodonioides* var. *mathewsi* and *A. scorodonioides* var. *scorodonioides*. However, both varieties may be distinguished by rugose leaf textures, in contrast to a membranaceous texture in *A. peruviana*.

The type material of *Aloysia minthiosa*, described by Moldenke in 1941 from Peru, indicates its similarity to *A. peruviana*, with both sharing leaf and florescence morphology and also long corolla tubes. The name *A. minthiosa* is synonymized herein, to *A. peruviana*.

Siedo (2010) designated a superfluous lectotype for *Lippia peruviana* from BM, stating that all original material had been destroyed. This has proved inaccurate and the holotype has been confirmed to exist at KW in Kiev, where material studied by Turczaninow is housed (Natalia Shiyan, curator at KW, 2013, pers. comm.).

Selected specimens examined. PERU. **Ancash:** Km. 265 on rd. from Conococha to coast, *Donovan P978* (US). **Lima:** Km. 70 valle del Rimac, *Velarde Nuñez 301* (SI); Camino a Huarachiri, *Soukup 4872* (US); Surco, *Soukup 3741* (F); Santa Eulalia, 27 km from Chosica, *Gentry 44821* (MO); Santa Eulalia rd., N of Chosica, *Gentry 36089* (F); above Chosica, betw. Lima & Matucana, *Ferreya 755* (NY, SI); Huarochiri, 7.5 km above Santa Eulalia rd., *Olmstead 2009-45* (SI, WTU); Canta, *Ferreya 12952* (SI); Huarochiri, N Chosica, *Ferreya 759* (F).

18. *Aloysia polygalifolia* Cham., *Linnaea* 7: 236. 1832, as “polygalaefolia.” *Lippia polygalaefolia* (Cham.) Steud., *Nomencl. Bot.* [Steudel] 2(2): 54. 1841. TYPE: Brazil. s. loc., s.d., *F. Sellow s.n.* (lectotype, designated by Siedo [2010: 201], G [barcode] G00386462 not seen; isolectotype, E [bc] E00373271 not seen, E image!). Figure 10.

Shrubs 1–3.5 m tall. Leaves ternate, adpressed to stem; blades sessile, ovate to elliptic, 0.5–2 × 0.3–1

cm, apex acute, base truncate, margins entire, sometimes subrevolute, sclerophyllous, scabrous to strigose on both surfaces, sometimes glabrate, venation plane. Florescences axillary, solitary, dense, 4–13 cm; peduncles 1–3 cm. Flowers lilac; floral bracts sublinear, 2–3.5 mm, apex acuminate, strigose. Flower with the calyx 2–4 mm, hispid, 4-toothed, the teeth unequal, triangular; corolla tube 4–5 mm, externally finely pulverulent, internally with villous fauce. Cluses 1.5 × 1 mm, glabrous.

Distribution and habitat. *Aloysia polygalifolia* is endemic to Brazil from Paraná, Rio Grande do Sul, and Santa Catarina, and is found in disturbed and dry areas.

Discussion. *Aloysia polygalifolia* is similar to *A. cordata* because both have ternate leaves adpressed to the stem. Both have been collected from the state of Paraná, although *A. cordata* has been noted from more mesic conditions. However, *A. cordata* has cordate leaf blades that are glabrate and only minutely scaberulous, whereas leaf blades range from scabrous to strigose, with a truncate base, in *A. polygalifolia*. Exceptionally, leaves can be glabrate (*Thode et al.* 398, ICN) as in *A. cordata*, but the blades are never cordate in *A. polygalifolia*. *Aloysia polygalifolia* is also similar to *A. brasiliensis* (see discussion under *A. brasiliensis*).

Selected specimens examined. BRAZIL. **Paraná:** Palmas, Morro da Baliza, *Hatschbach 30734* (NY); Palmas, 10 km NO Palmas, *Hatschbach 28171* (NY). **Rio Grande do Sul:** Guaíba, faz. Sao Maximiano, BR-116, *Thode 398* (ICN, SI). **Santa Catarina:** Ponte Serrada, Fachinal dos Guedes, *Smith & Reitz 12478* (SI); Agua Doce, 5 km S of turn to rd. E to Palmas, *Smith 15683* (SI); Iraní, *Smith & Klein 13029* (SI); Agua Doce, campos de Palmas, *Smith & Klein 13577* (SI).

19. *Aloysia polystachya* (Griseb.) Moldenke, *Lilloa* 5: 380. 1940. Basionym: *Lippia polystachya* Griseb., *Abh. Königl. Ges. Wiss. Göttingen* 19: 242. 1874. TYPE: Argentina. Córdoba: Las Mollas, Las Peñas, Jan. 1871, *P. G. Lorentz 130* (holotype, GOET [barcode] GOET008519 not seen, GOET image!; isotypes, [B†, B as F neg. 17535!], CORD [bc] CORD00006124 not seen, CORD image!, GOET [bc] GOET008520 not seen, GOET image!, K [bc] K000470937 not seen, K image!, US [bc] US01049797 not seen, US image!, SI [bc] SI004434!, SI [bc] SI003577!, VT [bc] UVMVT026110 not seen, VT image!).

Shrubs 0.5–1.5 m tall; stems glabrous at maturity, with short internodes. Leaves alternate, rarely

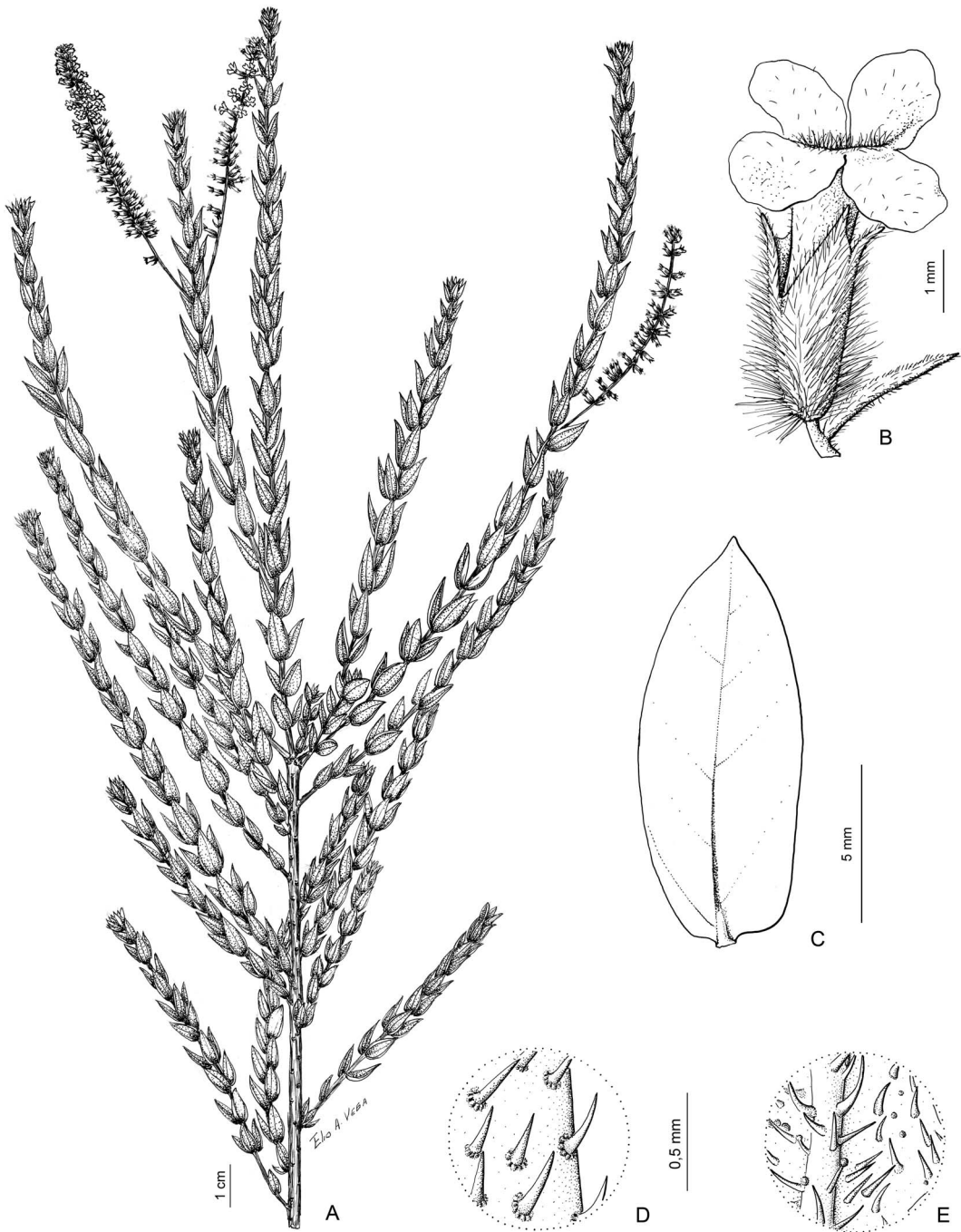


Figure 10. *Aloysia polygalifolia* Cham. —A. Floriferous branches, general aspect, with axillary florescences (homothetic pleiobotrya). —B. Intact flower with strigose floral bract subtending (at right) the hispid calyx. —C. Intact leaf, adaxial surface, venation plane. —D. Close-up of adaxial leaf surface, with strigose and scabrid indument. —E. Close-up of abaxial leaf surface, with strigose and scabrid indument. A, illustrated from *Smith & Klein 13577* (SI); B–E from *Smith & Klein 13029* (SI).

opposite, petioles 0.1–0.3 cm; blades elliptic, 1–5 × 0.3–1 cm, apex acute to subobtusate, base acute, attenuate, margin entire, adaxially scabrous, abaxially densely strigose. Florescences axillary, solitary or sometimes fasciculate, dense, short, 0.5–3 cm; peduncles 0.5–1 cm; flowers white, small; floral bracts reduced, obovate, 1–1.5 mm, hispid. Flowers with the calyx 1–1.5 mm, puberulous, with 4 teeth, brief, unequal, triangular; corolla tube 1.5–2 mm, externally puberulous, with villous fauce. Cluses 1 × 0.5 mm, glabrous.

Iconography. Botta (1979: 106, fig. 13).

Distribution and habitat. *Aloysia polystachya* has been observed to grow in central and northwestern Argentina, and Paraguay, on sandy soils.

Discussion. *Aloysia polystachya* is an aromatic plant, cultivated for medicinal properties (Arambarri et al., 2009). Siedo (2010) lectotypified this taxon, but this was superfluous, because the holotype has been confirmed to exist and is housed at GOET.

Aloysia polystachya is easily distinguished from other congeners since it has developed alternate leaves to 5 cm long. Only one other species, *A. salsoloides*, also has alternate leaves, but the leaf blades are reduced, always shorter than 0.5 cm.

Selected specimens examined. ARGENTINA. **Catamarca:** Belén, cult., *Arenas 257* (SI). **Córdoba:** Punilla, Sierra Chica, Falda O, San Salvador, al N del Cerro Uritorco, Quebrada de Ochoa, *A. Hunziker 8951* (SI). **Formosa:** Patiño, Las Lomitas, Barrio La Bomba, *Arenas 3465* (SI). **La Rioja:** General San Martín, Ulapes, *Stuckert 17046* (SI). **Salta:** Anta, *Luna 147* (NY). **San Juan:** Valle Fertil, San Agustín, *Pedersen 11796* (NY, SI). BOLIVIA. **Chuquisaca:** Azero, Estación Exp. zootecnica “El Salvador,” *Krapovickas 31277* (SI). PARAGUAY. **Central:** Itá, *Arenas 1916* (BACP). **Pte. Hayes:** Misión San Leonardo de Escalante, June 1981, *Sturzenegger s.n.* (BACP 2453).

20. *Aloysia pulchra* (Briq.) Moldenke, *Phytologia* 1: 95. 1934. Basionym: *Lippia pulchra* Briq., *Ark. Bot.* 2(10): 18. 1904. TYPE: Brazil. Rio Grande do Sul: Porto Alegre, 1892, *A. F. Regnell 579* (holotype, G [barcode] G00386457 not seen, G image!; isotypes, F [bc] F0092929F not seen, F image!, G [bc] G00386456 not seen, G image!, NY [bc] NY00137807 not seen, NY image!, RB not seen, SI, S11-10470 not seen, S image!, SI [bc] SI003403!, US [bc] US01049794 not seen, US image!).

Lippia sellowii Briq., *Annuaire Conserv. Jard. Bot. Genève* 4: 21. 1900, replacement name for *Lippia affinis* Briq., *Bull. Herb. Boissier* 4: 339. 1896, nom. illeg. superfl., non *Lippia affinis* Schauer ex DC., *Prod. [de Candolle]* 11: 576. *Aloysia uruguayensis* Moldenke, *Phytologia*

1(4): 167. 1935, nom. illeg. superfl. *Aloysia sellowii* (Briq.) Moldenke, *Revista Sudamer. Bot.* 4: 15. 1937. *Aloysia gratissima* var. *sellowii* (Briq.) Botta, *Darwiniana* 22: 85. 1979. TYPE: Uruguay. Montevideo, *F. Sellow 1744* (holotype, G [barcode] G00386443 not seen, G image!; isotypes, [B†, B as F neg. 24670!], W not seen, W fragm. at SI 66318!).

Aloysia lycioides var. *revoluta* Moldenke, *Phytologia* 3: 108. 1949. *Aloysia gratissima* var. *revoluta* (Moldenke) Moldenke, *Phytologia* 9: 500. 1964. TYPE: Uruguay. s. loc., s. coll. [no label, probably collected by *J. Arachavaleta s.n.*] (holotype, MVM not seen; isotype, NY [barcode] NY00103880 not seen, NY image!).

Shrubs 1–3 m tall; stems glabrous. Leaves opposite, with brief petioles 2–8 mm; blades elliptic to obovate, 2–5 × 1–2 cm, apex obtuse, base acute, attenuate, margin entire, sometimes slightly serrate toward apex, coriaceous, adaxially scabrous, abaxially glabrate to slightly puberulous, venation pinnate, with lateral veins that converge in marginal vein. Florescences axillary, solitary, lax, 5–8 cm; peduncles 1–3 cm; flowers white; floral bracts ovate, apex acute, 1–1.5 mm, lightly strigose, margin ciliate. Flower with the calyx 2–3.5 mm, hispid in inferior half, lightly hispid toward apex, with 4 teeth, brief, unequal, triangular; corolla tube 4–5.5 mm, externally puberulous toward apex, with villous fauce. Cluses 1 × 0.5 mm, glabrous.

Iconography. Botta (1979: 80, fig. 4).

Distribution and habitat. *Aloysia pulchra* grows in the northeastern provinces of Argentina (Corrientes, Misiones), southern Brazil (Paraná, Rio Grande do Sul), Paraguay, and Uruguay.

Discussion. *Aloysia pulchra* differs from *A. gratissima* in its habitat preference, with the latter found in more xeric areas, and is a more xerophytic plant in appearance. Morphologically, *A. pulchra* has elliptic to obovate leaf blades, with entire margins and an obtuse apex. While leaves range from elliptic to ovate in *A. gratissima*, blade margins vary from entire to dentate or serrate, with acute or subobtusate apices. Both species are rather similar in general morphology, and subsequent studies are being performed in order to check the validity of these two taxa.

When published, the name *Lippia affinis* Briq. (Briquet, 1896) was superfluous and illegitimate because of the priority of *L. affinis* Schauer (1847), which affines with *Lippia* and not *Aloysia*. Briquet (1900) later realized this homonymy and created *L. sellowii* as a replacement name for the blocked *L. affinis* Briq. However, Moldenke (1935) did not realize Briquet had offered a replacement name and created another replacement name, also superfluous, as *A. uruguayensis* Moldenke.

Aloysia gratissima var. *sellowii* (Briq.) Botta is here considered a synonym of *A. pulchra* (Briq.) Moldenke, following Botta's (1979) observation about the close relationship between these two taxa.

Selected specimens examined. ARGENTINA. **Corrientes:** Capital, Riachuelo, *Martínez Crovetto 10801* (SI). **Misiones:** Leandro Alem, Cerro Azul, *Cabrera 28634* (SI); San Javier, Arroyo Lorenzo, *G. J. Schwarz 3803* (NY). BRAZIL. **Paraná:** Palmeira, Papagaio, *Smith 14930* (SI). **Rio Grande do Sul:** entre Chapada y Lajeado Grande, *Brescia & Marchesi 4269* (SI). **Santa Catarina:** Isla do Francés, *Stienstra s.n.* (SI). PARAGUAY. **Alto Paraná:** in regione fluminis, *Fiebrig 5904* (SI). **Paraguari:** Cerro Mbatoví, *Zardini 10036* (SI). URUGUAY. **Rivera:** bajada de Pena, *Del Puerto 6053* (SI). **Tacuarembó:** Valle Edén, *Dematteis 1531* (SI).

21. *Aloysia riojana* (Hieron. ex Moldenke) Lu-Irving & N. O'Leary, *Syst. Bot.* 39(2): 653. 2014. Basionym: *Acantholippia riojana* Hieron. ex Moldenke, *Phytologia* 3(3): 106. 1949. TYPE: Argentina. La Rioja, Vinchina, 5 Mar. 1879, *G. Hieronymus & G. Niederlein 292* (lectotype, designated by Múlgura et al. [2012: 6], CORD [barcode] CORD00003809 not seen, CORD image!; isolectotypes, CORD [bc] CORD00003810 not seen, CORD image!, G [bc] G00366265 not seen, G image!).

Shrubs 1–1.7 m tall; branches spiny, stems hispid to glabrate at maturity. Leaves small, opposite, adpressed to the stem, sessile, squamiform, imbricate; blades rhomboidal in outline, 1.5 × 1.5–2 mm, light green or yellow-green, 3-lobed with a large apical lobe and 1 lateral smaller lobe on either side, ± thickened texture, apex subobtuse, base rounded, margin entire, revolute, adaxially scabrous, abaxially with a conspicuous hirsute furrow on each blade lobe. Florescences terminal, solitary, dense, 12–15 mm; flowers lilac; floral bracts ovate or obovate, apex acute or obtuse, 3–3.5 mm, slightly strigose. Flowers with the calyx 3.5 mm, hispid, with 4 teeth, brief, unequal, triangular; corolla tube 4–6 mm, with villous fauce. Cluse 2–3 × 0.5 mm, orbicular in cross section, commissural faces connate.

Iconography. Botta (1980: 520, fig. 2).

Distribution and habitat. *Aloysia riojana* is endemic to Argentina (La Rioja, San Juan) where it is frequent on sandy soils along riversides. Collections have been made at elevations up to 1800 m.s.m.

Discussion. *Aloysia riojana* is similar to *A. deserticola*, both shrubs with spiny branches and small, sessile leaves that are squamiform, adpressed to stems with blades 3-lobed, with a conspicuous

furrow on each blade lobe. However, *A. riojana* differs from *A. deserticola* by its fruit with connate commissural cluses. Plants are taller and more graceful, to 1.7 m in *A. riojana* (vs. 1.5 m or less in *A. deserticola*) with more slender, less spiny, and longer branches.

Moldenke (1949: 106) mentioned a Berlin specimen identified in sched. as *Acantholippia riojana* by Hieronymus, who was one of the two collectors of the type. The Berlin sheet no longer exists and is the reason why Múlgura (2012: 6) lectotypified this name on a CORD specimen. Moldenke indicated in the protologue that Hieronymus never published the name, as in sched. and invalid, although Moldenke acknowledged Hieronymus as the source for the later validly published epithet, ascribing it as “Hieron. & Moldenke.” The two could not have collaborated on the epithet, given the difference in lifetimes (Hieronymus, 1846–1921; Moldenke, 1909–1996). The epithet is better attributed as Hieron. ex Moldenke (McNeill et al., 2012: Art. 46.5).

Selected specimens examined. ARGENTINA. **La Rioja:** Coronel Felipe Varela, cauce río Bermejo, c. Villa Unión, *Biurrun 7705* (SI); Vinchina, en médano, *Hunziker 2037* (SI). **San Juan:** Valle Fértil, ruta 510, cauce La Guardia, 2 km E de Baldecito, *Biurrun 7696* (SI).

22. *Aloysia salsoloides* (Griseb.) Lu-Irving & N. O'Leary, *Syst. Bot.* 39(2): 653. 2014. Basionym: *Acantholippia salsoloides* Griseb., *Abh. Königl. Ges. Wiss. Göttingen* 19: 244. 1874. *Lippia salsoloides* (Griseb.) Briq., *Nat. Pflanzenfam.* [Engler & Prantl] 4(3a): 152. 1897. TYPE: Argentina. Catamarca: “ubi fruticeta praecipue constituit in planitie Laguna blanca, alt. 10000,” *P. G. Lorentz 457* (holotype, GOET [barcode] GOET007269 not seen, GOET image!; isotypes, [B†, B as F neg. 17540!]; CORD [bc] CORD00006133 not seen, CORD image!, SI [bc] SI003359!).

Acantholippia hastulata Griseb., *Symb. Fl. Argent.*, 279. 1879. *Lippia hastulata* (Griseb.) Hieron., *Bol. Acad. Nac. Ci.* 4: 407. 1882. TYPE: Argentina, *P. G. Lorentz & G. H. Hieronymus 713* (holotype, CORD [barcode] CORD00006139 not seen, CORD image!; isotypes, [B†, B as F neg. 17511!]; GOET [bc] GOET008868 not seen, GOET image!, GOET [bc] GOET008867 not seen, GOET image!, SI [bc] SI003357!).

Shrubs 0.35–1.5 m tall; branches spiny; stems hispid, glabrate at maturity. Leaves alternate, adpressed to stem, sessile; blades reduced, ovate, 1.5–4.5 × 2 mm, 5-lobed with 1 large apical and 2 lateral small lobes on either side, ± thickened texture, apex subobtuse base rounded, margin entire, revolute, adaxially scabrous, abaxially hirsute, venation prom-

inent, reticulate. Florescences terminal, solitary, dense, 10–15 mm; flowers white; floral bracts ovate or obovate, apex acute or obtuse, 3–4 mm, slightly strigose. Flower with the calyx 3.5–4 mm, hispid, with 4 brief teeth, unequal, triangular; corolla tube 5–7 mm, with villous fauce. Cluse 2–3 × 0.5 mm, glabrous.

Iconography. Troncoso (1974: 347, fig. 12, k–n); Botta (1980: 524, fig. 4); Caro (1982: 9, fig. 1 and 13, fig. 2, sub *Aloysia hastulata*).

Distribution and habitat. *Aloysia salsoloides* grows in northwestern Argentina and southern Bolivia, noted as found in salty soils and at elevations to 3200 m.

Discussion. *Aloysia salsoloides* shares with *A. deserticola*, *A. riojana*, and *A. tarapacana* a shrubby habit with spiny branches and reduced leaf blades, with the leaves sessile and adpressed to stems. However, *A. salsoloides* is distinguished from these three by the alternate arrangement of its leaves that are 5-lobed and not squamiform nor imbricate. Leaves are opposite, squamiform, and densely imbricate, with blades either entire or 3-lobed in *A. deserticola*, *A. riojana*, and *A. tarapacana*.

Selected specimens examined. ARGENTINA. **Catamarca:** Belén, Laguna Blanca, *Cabrera 32474* (SI). **Jujuy:** Humahuaca, *Zuloaga 9170* (SI). **Salta:** Rosario de Lerma, 57 km pasando Pte. Integración Argentina-Chilena, *Cialdella 407* (SI). BOLIVIA. **Potosí:** Uyuni, *Hicken 17* (SI).

23. *Aloysia salviifolia* (Hook. & Arn.) Moldenke, *Lilloa* 5: 381. 1940. Basionym: *Verbena salviifolia* Hook. & Arn., *Bot. Beechey Voy.* 1: 42. 1830, as “*salviaefolia*.” *Lippia chilensis* Schauer, *Prodr.* [de Candolle] 11: 573. 1847, replacement name, non *Lippia salviifolia* Cham., *Linnaea* 7: 227. 1832. *Aloysia chilensis* (Schauer) Moldenke, *Revista Sudamer. Bot.* 4: 15. 1937. TYPE: Chile. “Hab. Coquimbo,” s.d., s. coll. (neotype, designated here, K [barcode] K000470996 not seen, K image!). Figure 11.

Shrubs 1–2 m tall; stems glabrous. Leaves opposite, rarely alternate, sessile, elliptic, 1–2(–4) × 1(–1.5) cm, apex acute to subobtuse, base obtuse to subtruncate, margin basally entire, irregularly serrate toward apex or from mid-blade distally, abaxial and adaxial surfaces strigose, venation pinnate, reticulate, abaxially prominent. Florescences axillary, solitary, dense, 5–10 cm; peduncles 1–2 cm; flowers white; pedicels 0.5 mm; floral bracts widely ovate, large, 4–4.5 mm, apex acute, acuminate,

hispid. Flower with the calyx 2–3.5 mm, hispid, with underlayer of subsessile glandular trichomes, with 4 teeth, unequal, triangular; corolla tube 3–3.5 mm, externally and internally glabrous. Cluses 1.5 × 1 mm, glabrous.

Distribution and habitat. *Aloysia salviifolia* is found in Chile (Regions III, IV), and one collection exists from Argentina.

Discussion. *Aloysia salviifolia* is distinguished by its leaf blade base obtuse to subtruncate, and margin basally entire and irregularly serrate toward apex or from mid-blade distally, and venation pinnate, reticulate, and abaxially prominent. It is also differentiated by its large floral bracts, to 4–4.5 mm, surpassing the calyx, a feature not frequent in the rest of *Aloysia*.

Schauer (1847) considered that *Verbena salviifolia* Hook. & Arn. should be under *Lippia*, but the epithet’s use in *Lippia* was blocked by the prior name *L. salviifolia* Cham., so that Schauer proposed *L. chilensis* as the replacement name. When Moldenke (1940) later transferred *V. salviifolia* to *Aloysia*, the original epithet was not blocked by priority and was available for use within *Aloysia*.

Noltie (2010: 181) stated that no original material has been found from *Verbena salviifolia* at the E and K herbaria. Noltie mentioned that “Arnott’s MS description has been mistakenly attached to a sheet annotated ‘*Lippia chilensis* Schauer,’ bearing mixed specimens of *Lobb 453* (K [barcode] K000470996) and a *Gillies s.n.* collection from Mendoza (K [barcode] K000470995), neither of which are not original material.” Consequently, a neotype is here selected, with the more representative *Lobb 453* material from Chile here chosen.

Selected specimens examined. ARGENTINA. **Mendoza:** s. loc., *Gillies s.n.* (K). CHILE. s. loc., *Bridges 1346* (SI). **Region III:** Atacama, San Felix, *Ricardi 23967* (SI). **Region IV:** Coquimbo, Quebrada de Rivadavia, *Werdermann 103* (SI); Paihuano, *Pfister 8318* (SI).

24. *Aloysia scorodonioides* (Kunth) Cham., *Linnaea* 7: 234. 1832. Basionym: *Lippia scorodonioides* Kunth, *Nov. Gen. Sp.* [quarto ed.] 2: 269. 1818. TYPE: Ecuador. “in regno Quitensis,” s.d., *A. Bonpland 2192* (holotype, P [barcode] P00307136 not seen, P image; isotype, SI [bc] SI003396!). Figure 12.

Shrubs 0.5–3(–4) m tall; stems canescent when young, puberulous to strigose on mature stems. Leaves opposite, petioles 0.5–1 cm, sometimes sessile; blades elliptic, ovate, or orbicular, 1–5(–7) × 1–3(–4) cm, apex obtuse to subobtuse, base

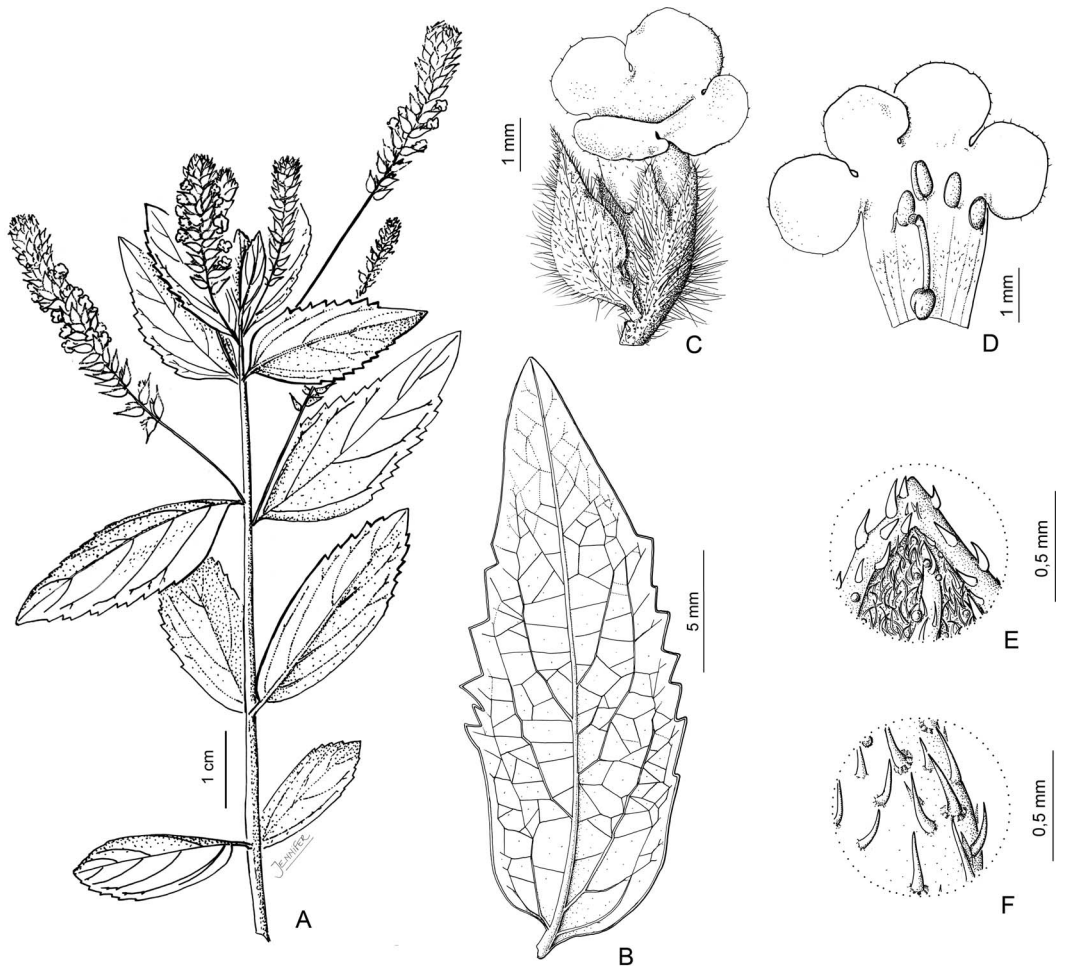


Figure 11. *Aloysia salviifolia* (Hook. & Arn.) Moldenke. —A. Floriferous branch with axillary florescences (homothetic pleiobotrya). —B. Entire leaf, abaxial surface, margin basally entire, irregularly serrate toward apex, prominent pinnate, reticulate venation. —C. Intact flower with hispid floral bract subtending, calyx hispid, with underlayer of subsessile glandular trichomes. —D. Corolla dissected open to reveal the androecium and gynoecium. —E. Close-up of abaxial leaf surface, with strigose and scabrid indument. —F. Close-up of adaxial leaf surface, with strigose indument. From *Bridges 1346* (SI).

acute, cordate, or rounded, margin evenly crenate, rugose and creased texture, sometimes membranaceous, adaxially scabrous, with conspicuous reticulate venation, abaxially hispid or tomentose. Florescences axillary, solitary, lax or dense, 1–9(–12) cm; peduncles 1–4 cm; flowers white, purple, or pink, small; floral bracts linear to narrowly ovate, subulate, 1–3 mm, strigose or scabrous. Flower with the calyx 2–3 mm, densely hispid, sometimes with long hairs in lower half, grading to shorter hairs toward apex, with 4 unequal teeth; corolla tube 4.5–6 mm, externally puberulous, with villous fauce;

ovary glabrous, sometimes slightly pilose. Cluses 2 × 1 mm, glabrate.

TAXONOMIC KEY TO THE VARIETIES OF *ALOYSIA SCORODONIOIDES*

1. Shrubs 0.5–2 m tall; leaves 1–2.5(–4) × 1–1.5(–2) cm, blades elliptic to ovate; florescences dense, 1–3(–4) cm long, straight; peduncles 1–3 cm long; corollas 4.5–5.5 mm long 24a. *A. scorodonioides* (Kunth) Cham. var. *hypoleuca* (Briq.) Moldenke
- 1'. Shrubs 2–3(–4) m tall; leaves 2–5(–7) × 2–3(–4) cm, blades ovate to orbicular; florescences lax or dense, 4.5–12 cm long, curved, peduncles 2–4 cm long; corollas 5–6 mm long 2

2. Florescences lax, 8–12 cm long, peduncles 2–4 cm long 24b. *A. scorodonioides* (Kunth) Cham. var. *mathewsii* (Briq.) Moldenke
2'. Florescences dense, 4.5–8 cm long, peduncles 2 cm long 24c. *A. scorodonioides* var. *scorodonioides*

24a. *Aloysia scorodonioides* var. *hypoleuca* (Briq.) Moldenke, *Phytologia* 36(5): 437. 1977. Basionym: *Lippia scorodonioides* var. *hypoleuca* Briq., *Bull. Herb. Boissier* 4: 338. 1896. TYPE: Peru. s. loc., s.d., *J. Dombey* 259 (lectotype, designated by Siedo [2010: 203], G [barcode] 0386453 not seen, G image!, G as F neg. 24668!). Figure 12J–L.

Aloysia scorodonioides var. *parvifolia* Moldenke, *Phytologia* 36(5): 437. 1977. TYPE: Bolivia. Near La Paz, Oct. 1885, *H. H. Rusby* 920 (holotype, NY [barcode] NY00103890 not seen, NY image!, isotypes, BM [bc] BM000643654 not seen, BM image!, MO-116725 not seen, MO image!, NY [2, bc] 103888, 103889, not seen, NY images!, US [2, bc] 01013795, 1323004 not seen, US images!, WIS [bc] WIS0256108 not seen, WIS image!).

Aloysia depressa Ravenna, *Onira* 11(4): 15. 2007, syn. nov. TYPE: Bolivia. La Paz, Feb.–Mar. 1933, *M. Doello-Jurado* s.n. (holotype, BA-9827!).

Aloysia axillaris J. R. I. Wood, *Kew Bull.* 64: 521. 2009, syn. nov. TYPE: Bolivia. Potosí, Torotoro, Cañon del Vergel, 2591 m, 3 Jan. 2000, *J. R. I. Wood, M. Mercado & T. Ortuño* 21305 (holotype, K [2, barcode] K000738254 not seen, K image!, K [barcode] K000738253 not seen, K image!, isotypes, BOLV not seen, LPB [bc] LPB0000838 not seen, LPB image!).

Shrubs 0.5–2 m tall; stems puberulous. Leaves 1–2.5(–4) × 1–1.5(–2) cm; blades elliptic or ovate. Florescences dense, 1–3(–4) cm, straight; peduncles 1–3 cm. Flowers pink to purple, corolla tubes 4.5–5.5 mm.

Distribution and habitat. *Aloysia scorodonioides* var. *hypoleuca* has a narrow distribution being found only in Peru and Bolivia growing on open, dry hillsides in loose gravel and shallow soils, at elevations to 3070 m.

Discussion. In Cuzco, Peru, near Calca, there are some specimens with lax florescences with flowers spaced apart 3 mm, e.g., *Olmstead* 2009-40 (WTU), *Vargas* 160 (SI), and *Cook* 247 (US).

In his 2009 protologue, Wood stated that *Aloysia axillaris* was distinguished by two different inflorescence forms, one with solitary axillary flowers without floral bracts and the second with axillary spikes typical for the genus. These plants were observed to be restricted to two areas in Bolivia, from Potosí and Cochabamba. The author

noted the possibility of a hybrid origin for *A. axillaris*. The analysis of the type material and the description of the plant indicate that this corresponds to *A. scorodonioides* var. *hypoleuca*, with both sharing small leaf blades, shorter than 4 cm, with elliptic to ovate shapes. *Aloysia axillaris* differs principally in the presence of solitary flowers that lack floral bracts; this may be a localized somatic mutation in two known populations in Bolivia, which is here interpreted as of teratological or hybrid origin.

The study of the type material of *Aloysia depressa* Ravenna indicates that this is the same as *A. scorodonioides* var. *hypoleuca*. Both have the distinctive leaves of this variety (small elliptic to ovate blades) and dense florescences shorter than 4 cm.

Selected specimens examined. BOLIVIA. **Cochabamba:** Quillacolo, La Cabaña, *Wood* 20173 (BOLV, K, LPB). **La Paz:** Murillo, Mecapaca, *Beck* 3530 (SI). PERU. **Cajamarca:** Obrajillo, 1838–1842, *Wilkes* s.n. (US). **Cuzco:** Calca, 2 km from Pisac, *Olmstead* 2009-40 (WTU). **Huancavelica:** Tayacaja, entre Izuchaca y Acostambo, *Hutchison* 4201 (US). **Lima:** Huarochirí, c. Matucana, *Ferreya* 7021 (SI); Matucana, *Macbride* 133 (US); Km. 86, Lima–Oraya, *Ferreya* 7013 (NY, SI).

24b. *Aloysia scorodonioides* var. *mathewsii* (Briq.) Moldenke, *Phytologia* 1: 95. 1934. Basionym: *Lippia scorodonioides* var. *mathewsii* Briq., *Bull. Herb. Boissier* 4: 339. 1896. TYPE: Peru. s. loc., *W. Mathews* 3160 (holotype, G [barcode] G00386446 not seen, G image! as F neg. 24669!; isotypes, G [bc] G0386464 not seen, G image!, K [bc] K000545990 not seen, K image!). Figure 12M.

Aloysia scorodonioides var. *lopez-palacii* Moldenke, *Phytologia* 36(5): 437. 1977. TYPE: Ecuador. Pichincha: Quito, 4 Feb. 1977, *S. López-Palacios* 4249 (holotype, TEX-LL [barcode] LL00374940 not seen, TEX-LL image!).

Shrubs 2–3(–4) m tall, stems canescent when young, strigose at maturity. Leaves 2–5(–7) × 2–3(–4) cm, blades ovate to orbicular, with rugose texture. Florescences lax, long, flowers not densely disposed, 8–12 cm, curved; peduncles 2–4 cm. Flowers white or pink, with corolla tubes 5–6 cm.

Distribution and habitat. *Aloysia scorodonioides* var. *mathewsii* grows in Ecuador, Peru, Bolivia, and northern Argentina. This variety has been collected from elevations of 900–2600 m.

Discussion. *Aloysia scorodonioides* var. *mathewsii* is distinguished by its long florescences, 8–12 cm, with flowers laxly disposed. This contrasts with the dense florescences 4.5–8 cm long in the autonymic variety,

and the shorter florescences less than 4 cm in *A. scorodonioides* var. *hypoleuca*.

Selected specimens examined. ARGENTINA. **Chaco:** Quitilipi, borde bosque, *Schulz 2985* (SI). **Jujuy:** Santa Barbara, ruta Prov. 6, de Santa Clara a Abra de los Morteros, 12 km de Santa Clara, *Zuloaga 11490* (SI). **Salta:** Anta, San Javier, *Saravia Toledo 1764* (SI). BOLIVIA. **Chuquisaca:** Luis Calvo, Boyuibe, *Beck 9428* (SI). ECUADOR. **Pichincha:** Tumbaco, *Asplund 6533* (US). PERU. **Ápurímac:** Abarcay, *Vargas 594* (SI). **Cajamarca:** Jaén, Km. 127, rd. Bagua to Pucara, *Lu-Irving 9-62* (SI, WTU); Pucará, 127 km E Olmos, *Huchison 3520* (US). **Cuzco:** Calca, *Cook 247* (US).

24c. *Aloysia scorodonioides* (Kunth) Cham. var. *scorodonioides*. Figure 12A–I.

Lippia scorodonioides var. *detonsa* Briq., Bull. Herb. Boissier 4: 339. 1896. *Aloysia scorodonioides* var. *detonsa* (Briq.) Moldenke, Phytologia 1: 95. 1934. TYPE: Colombia. “In montibus Columbiae,” s.d., *K. T. Hartweg 1349* (holotype, BR [barcode] BR000000550590 not seen, BR image!; isotype, OXF not seen).

Aloysia leptophylla Loes ex Moldenke, Phytologia 2: 11. 1941, syn. nov. TYPE: Peru. s. loc., 1909–1914, *A. Weberbauer 5374* (holotype, F [barcode] V0042839F! not seen, F image!; isotypes, NY [bc] NY00103878 not seen, NY image!, SI).

Aloysia scorodonioides var. *orbicularis* Moldenke, Phytologia 3: 406. 1951. TYPE: Colombia. Yuaco, near Pasto, Nariño, s.d., *G. K. Wilhelm Hermann Karsten s.n.* (holotype, W [barcode] W0032435 not seen, W image!).

Aloysia boliviensis Moldenke, Phytologia 53(7): 460. 1983. TYPE: Bolivia. La Paz, Murillo, Mecapaca, 28 Mar. 1982, *J. C. Solomon 7410* (holotype, TEX-LL [barcode] LL00374935 not seen, TEX-LL image!; isotypes, LPB [bc] LPB0000841 not seen, LPB image!, MO-3006114 not seen, MO image!, SI [bc] SI003375!, U [bc] U0006999 not seen, U image!).

Shrubs 2–3(–4) m tall, stems canescent when young, strigose at maturity. Leaves 2–5(–7) × 2–3(–4) cm, blades ovate to orbicular, rugose texture. Florescences dense, 4.5–8 cm, curved; peduncles 2 cm long. Flowers white or pink, corolla tubes 5–6 cm.

Distribution and habitat. *Aloysia scorodonioides* var. *scorodonioides* is found in Colombia, Ecuador, Peru, Bolivia, Paraguay, and northern Argentina. It has been collected from dry, brushy slopes, from open xeric, calcareous soils, and at elevations of 800–2800 m. Flowers are said to be very fragrant.

Discussion. The study of the type material of *Aloysia leptophylla* shows that this species corresponds to *A. scorodonioides* var. *scorodonioides*, sharing dense florescences 4.5–8 cm long.

There has been confusion about the attribution of the author of *Aloysia leptophylla*, since the holotype

sheet from F has a label, by Moldenke, that reads: “*Aloysia leptophylla* Loes.” In the protologue, Moldenke (1941: 11) attributed the name as “Loes. & Moldenke.” Given the differences in life spans (Loesener, 1865–1941; Moldenke, 1909–1996), it is unlikely Moldenke collaborated with Loesener, but rather credited Loesener for the unpublished name (nom. ined.). There is no further mention of Loesener by Moldenke and the ascription of the plant name should be Loes. ex Moldenke (McNeill et al., 2012: Art. 46.5).

Selected specimens examined. ARGENTINA. **Jujuy:** El Carmen, Pampa Blanca, *Cabrera 29961* (SI). **Salta:** Anta, sector II, *Saravia Toledo 1591* (SI). **Tucumán:** Burruyacu, Cañada Alegre, *Stuckert 21287* (SI); s. loc., *Venturi 849* (SI). BOLIVIA. **La Paz:** Loayasa, *Beck 6039* (SI); Illimani, Nov. 1911, *Buchtien 3240* (NY, SI). **Santa Cruz:** Cordillera, Charagua, *Cabrera 33665* (SI). ECUADOR. **Esmeraldas:** Lita–San Lorenzo rd., *Gentry 70190* (MO). **Loja:** near Saraguro, *Hart 1481* (US). **Pichincha:** Guailabamba valley at Quito, *Haught 3155* (US). **Tungurahua:** Ambato, *Pachano 120* (US). PARAGUAY. s. loc., 1896, *Drake s.n.* (SI). PERU. **Cajamarca:** Celendin, valley rio Marañon, *Lu-Irving 9-32* (SI, WTU). **Cuzco:** Anta, *Vargas 3692* (SI). **Lima:** along rio Chillón, *Pennell 14438* (US).

25. *Aloysia tarapacana* (Botta) Lu-Irving & N. O'Leary. Syst. Bot. 39(2): 653. 2014. Basionym: *Acantholippia tarapacana* Botta, Hickenia 1(35): 197. 1979. TYPE: Chile. Tarapacá, Arica, Puquios, 3750 m.s.m., 16 Sep. 1955, *M. Ricardi 3363* (holotype, SI [barcode] SI003356!; isotypes, CONC not seen, LP [bc] LP006687 not seen, LP image!).

Shrubs 0.5–1 m tall, stems cylindrical, with spiny branches, hispid when young, glabrate at maturity. Leaves opposite, adpressed to the stem, sessile, squamiform, imbricate; blades reduced, rhomboidal, 2 × 1 mm, dark green, texture ± thickened, apex subobtuse, base rounded, margin entire, revolute, adaxially scabrous, abaxially hirsute. Florescences terminal, solitary, dense, 6–12 mm; flowers blue; floral bracts ovate or elliptic, apex acute or obtuse, 4.5 mm, slightly strigose. Flower with the calyx 4 mm, hispid, with 4 brief teeth, unequal, triangular; corolla tube 5–6 mm, with villous fauce. Cluse 2 × 0.5 mm.

Iconography. Botta (1980: 522, fig. 3).

Distribution and habitat. *Aloysia tarapacana* is endemic to Chile (Region I), collected at elevations from 3000 to 3390 m.

Discussion. *Aloysia tarapacana* is similar to *A. deserticola* and *A. riojana*, with a shrubby habit and

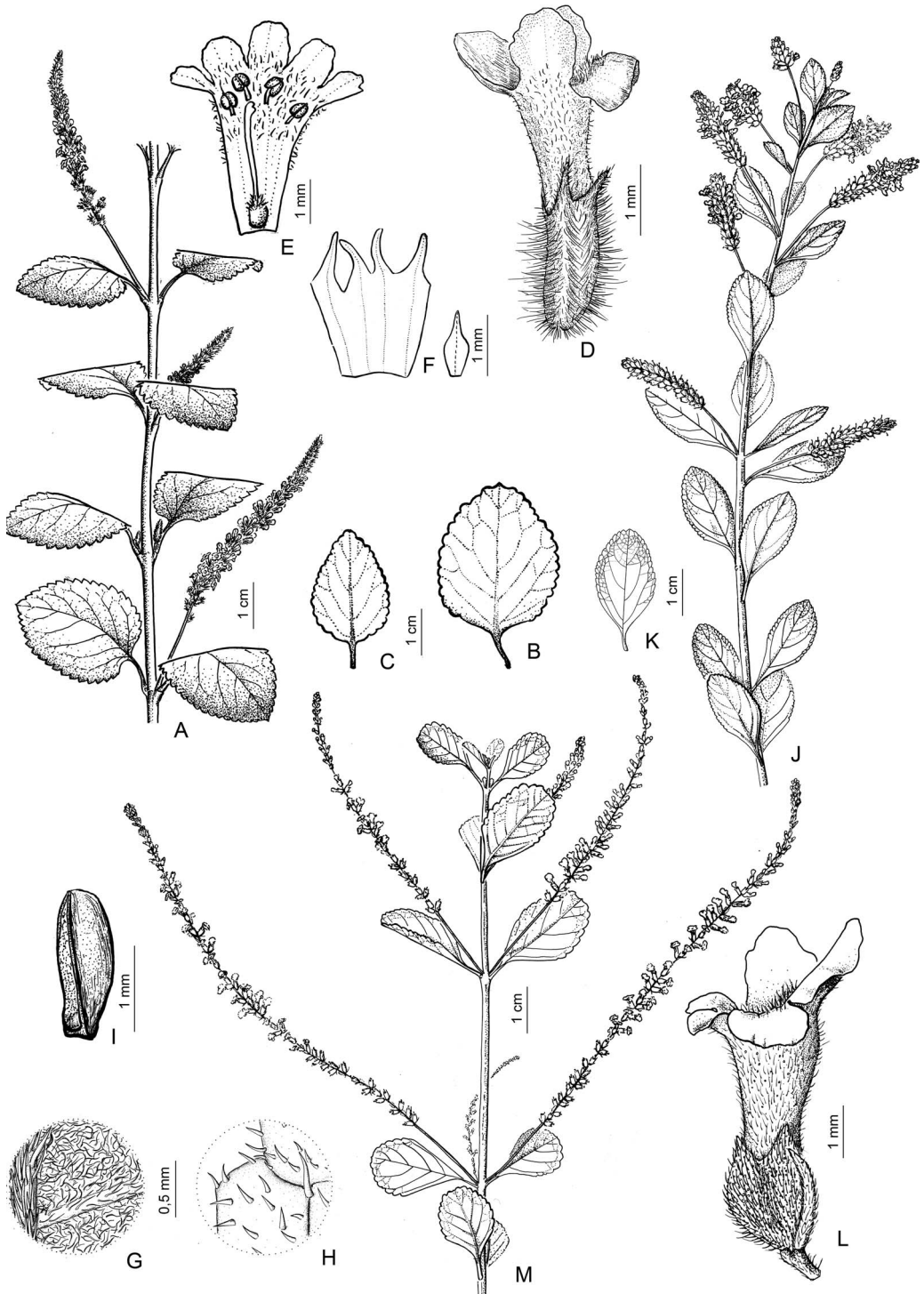


Figure 12. *Aloysia scorodonioides* (Kunth) Cham. A–I. *Aloysia scorodonioides* var. *scorodonioides*. —A. Floriferous branch with axillary inflorescences (homothetic pleiobotrya). —B. Basal leaf, orbicular blade. —C. Apical leaf, ovate blade. —D. Intact flower with hispid calyx. —E. Corolla dissected open to reveal the androecium and gynoecium. —F. Dissected calyx and floral bract, scheme. —G. Close-up of abaxial leaf surface, with hispid indument. —H. Close-up of adaxial leaf surface, with scabrid indument. —I. Cluse, lateral view. J–L. *Aloysia scorodonioides* var. *hypoleuca* (Briq.) Moldenke. —J. Floriferous branch with

spiny branches. In all three species, the leaf blades are in opposite position, reduced and squamiform, and densely imbricate along the stems. *Aloysia tarapacana* may be distinguished by its leaf blades with entire margins and dark green in color. Leaves are 3-lobed, with a conspicuous furrow on each blade lobe, and light green or yellow in color in both *A. deserticola* and *A. riojana*.

Selected specimens examined. CHILE. **Region I:** Arica, Antes de Zapahuina, *H. Escobar* 233 (SI); Parinacota entre Zapahuira y Putre, *Cocucci et al.* 3277 (SI).

26. *Aloysia trifida* (Gay) Lu-Irving & N. O'Leary. Syst. Bot. 39(2): 653. 2014. Basionym: *Lippia trifida* Gay, Fl. Chil. 5: 29. 1849. *Acantholippia trifida* (Gay) Moldenke, Lilloa 5(2): 371. 1940. TYPE: Chile. Copiapó, Feb. 1843, *C. Gay s.n.* (holotype, G [barcode] G00366065 not seen, G image!).

Lippia fonckii Phil., Anales Univ. Chile 90: 620. 1895, syn. nov. *Aloysia fonckii* (Phil.) Moldenke, Phytologia 2: 50. 1941. TYPE: Chile. Coquimbo, "prope La Higuera in litoral prov. Coquimbo," s.d., *F. S. Fonck s.n.* (holotype, SGO not seen, SGO image!; isotypes, SGO not seen, image!, SI [barcode] SI003514!).

Aloysia reichei Moldenke, Lilloa 5: 380. 1940, as "reichii," syn. nov. TYPE: Chile. Huanta, cordillera de Coquimbo, Jan. 1904, *K. F. Reiche* 19 (holotype, SGO-4203 not seen, SGO-4203 image!; isotype, SI [barcode] SI003393!).

Aloysia reichei var. *trilobata* Moldenke, Phytologia 2: 309. 1947. TYPE: Chile. Coquimbo, Elqui, Rio Turbio, 19 Oct. 1940, *R. Wagenknecht* 4238 (holotype, NY [barcode] NY103886 not seen, NY image!; isotypes, SGO-4204 not seen, SGO-image!, SI [bc] SI003408!).

Shrubs 1–2 m tall; stems cylindrical, hispid when young, glabrate at maturity. Leaves opposite, sessile, blade entire, ovate to elliptic, or 3-parted, 3.5–4.5 × 2–3.5 mm, somewhat thickened texture, apex acute to obtuse, base attenuate, margin entire, scabrous on both surfaces. Florescences axillary, solitary, dense, 1.5–3 cm; flowers white; floral bracts ovate, apex acute or obtuse, 3–3.5 mm, slightly strigose. Flowers with the calyx 2–2.5 mm, hispid, with 4 teeth, brief, unequal, triangular; corolla tube 4–5 mm, with villous fauce; superior pair of stamens with glandular appendices to anther connectives. Cluse 2–3 × 0.5 mm.

Iconography. Botta (1980: 518, fig. 6); Caro (1982: 27, fig. 5).

Distribution and habitat. *Aloysia trifida* is known from Chile (Regions III and IV) and also grows in Argentina (La Rioja, San Juan). Carmona and Ancíbor (1995) established that leaf anatomical characters indicated that this species was probably a facultative halophyte. This species has been collected from elevations up to 2500 m.

Discussion. *Aloysia trifida* is the only taxon in *Aloysia* known to have glandular appendices on the anther connectives of the superior pair of stamens. This species is also distinguished by its leaf blades entire, ovate to elliptic, but sometimes 3-parted.

The type material examined for *Aloysia reichei* has 3-parted leaves, as well as the distinctive glandular appendices on the anther connectives of the upper stamen pair. These are both characters exclusively observed in *A. trifida* and why *A. reichei* is synonymized to the species. The type specimen of *Lippia fonckii* also shares these characters, and this species name is also synonymized to *A. trifida*.

Selected specimens examined. ARGENTINA. **La Rioja:** Coronel Felipe Varela, ruta 40, entre Villa Unión y Sañogasta, 5 km E Puerto Alegre, *Biurrún et al.* 7706 (SI). **San Juan:** Calingasta, camp. Castaño, *Kiesling et al.* 9130 (SI). CHILE. **Region III:** Atacama, Copiapó, ruta a San Francisco, 61 km E intersección ruta Paipote y Inca de Oro, *Taylor & Pool* 11607 (MO, SI). **Region IV:** Coquimbo, La Laguna, *Jiles* 5079 (SI).

27. *Aloysia velutina* Siedo, Lundellia 15: 44, fig. 4. 2012. TYPE. Peru. Cajamarca: Mpio. Cajamarca, sobre el km 156 de la carr. Pacasmayo–Cajamarca, bosque espinoso, 2000 m, 5 Apr. 1982, *I. Sanchez Vega* 2763 (holotype, F [barcode] F0093715F not seen, F image!; isotypes, MO not seen, SI [bc] SI080019!). Figure 13.

Shrubs 1–1.5 m tall; stems glabrous. Leaves opposite, with an occasional third leaf per node and ternate, petioles 0.3–1 cm long; blades ovate to elliptic, 3–6 × 1–5 cm, apex acute to subobtuse, base rounded to truncate, margin slightly crenate along entire blade, adaxially velutinous, abaxially incanous. Florescences terminal and axillary, dense, 8–15(–25) cm; peduncles 1–3 cm; flowers violet or cream-white, sometimes with lavender tubes and white lobes; pedicels 0.5 mm; floral bracts ovate,

axillary florescences (homothetic pleiobotrya). —K. Leaf, elliptic blade. —L. Intact flower with strigose floral bract subtending. M. *Aloysia scorodonioides* var. *matthewsii* (Briq.) Moldenke. —M. Floriferous branch with axillary florescences (homothetic pleiobotrya). A–F, I are illustrated from *Venturi* 849 (SI); G, H, from *Haught* 3155 (US); J–L, from *Macbride* 133 (US); M, from *Saravia Toledo* 1764 (SI).

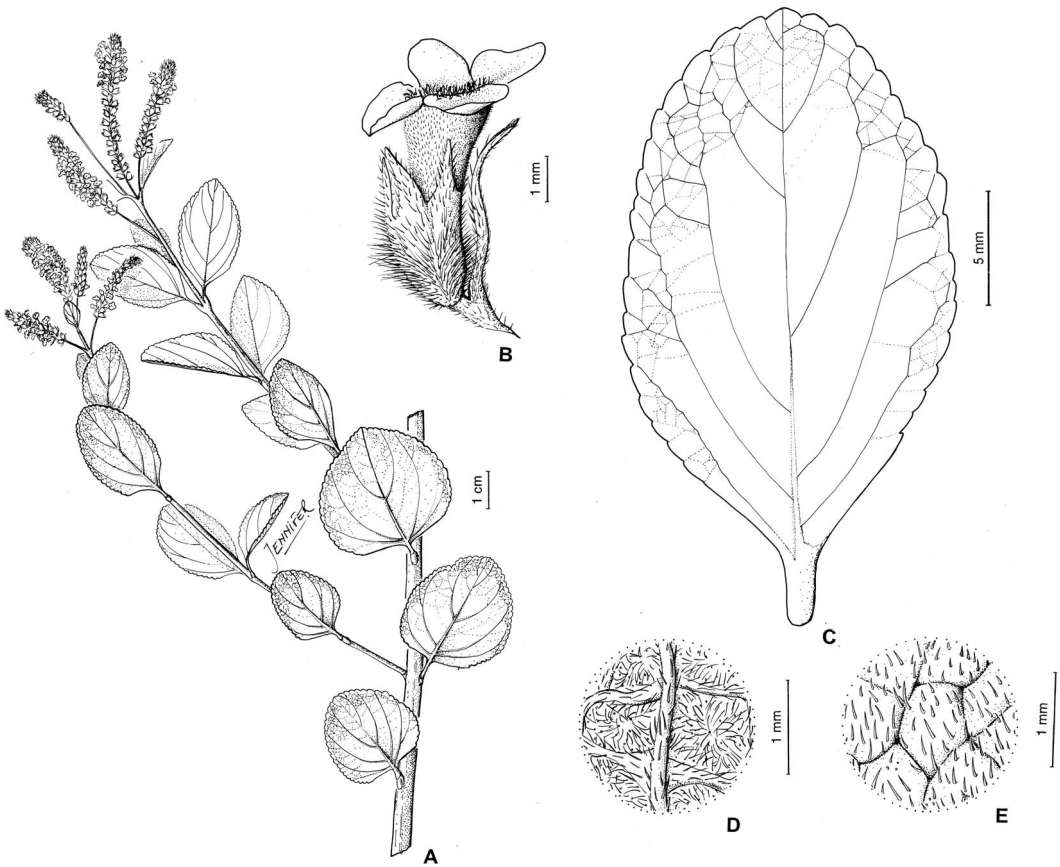


Figure 13. *Aloysia velutina* Siedo. —A. Floriferous branch, with both axillary and terminal florescences (heteroethetic pleiobotrya). —B. Flower with hispid calyx and floral bract. —C. Leaf adaxial surface. —D. Close-up of abaxial leaf surface, with incanous indument. —E. Close-up of adaxial leaf surface, with scabrid indument. A, B from *Sagástegui 14147* (SI); C–E from *Llatas Quiroz 1953* (SI).

small, 2–2.5 mm, apex acute, acuminate, strigose, or hispid. Flower with the calyx 2–2.5 mm, hispid, with 4 teeth, unequal, triangular; corolla tube 3–3.5 mm, externally puberulous, with villous fauce. Cluses 1.5 × 1 mm, glabrous.

Distribution and habitat. *Aloysia velutina* is endemic and known only from woodland habitats in Cajamarca, Peru.

Discussion. *Aloysia velutina* has violet or cream-white flowers, sometimes with lavender tubes and white lobes, and sometimes three leaves per node (e.g., *Olmstead 2009-8*, WTU). The species is quite similar in leaf and florescence appearance to *A. scorodonioides* var. *scorodonioides*. However, *A. velutina* has both axillary and terminal florescences, whereas florescences appear only axillary in *A. scorodonioides*, even if this trait is not always easy to observe. The inflorescence morphology in *A.*

velutina (presence of both terminal and axillary florescences) groups *A. velutina* with *A. arequipensis*, *A. citrodora*, *A. fiebrigii*, and *A. herrerae*. However, *A. velutina* is easily distinguished by its opposite leaves that are ovate to elliptic, which contrasts with the ternate leaves of *A. citrodora* and the verticillate leaves, in whorls of three, with narrower blades (linear to elliptic) for *A. fiebrigii*. The shallowly crenate margins of the leaves of *A. velutina* easily distinguish this species from *A. herrerae* and *A. arequipensis*. Leaves seem longer in *A. velutina* too (3–6 × 1–5 cm) versus 1–2 × 0.5–1.2 cm in *A. arequipensis* and 2(–5.5) × 0.4(–1.5) cm in *A. herrerae*. Leaf margins are entire in the former, and margins are finely serrate in the apical two thirds to one half of the blade in the latter.

Selected specimens examined. PERU. **Cajamarca:** Contumazá, ca. 2 km from Contumazá, *Dillon 4544* (SI). **Cuzco:** Anta, Canyon rio Apurimac, 0.5 km from Pte. Cunyac,

Olmstead 2009-8 (WTU). **La Libertad:** Otuzco, alrededor San Ignacio, *Sagástegui 14147* (SI). **Lambayeque:** Ferrefafe, Incahuasi, *Llatas Quiroz 1953* (SI).

28. *Aloysia virgata* (Ruiz & Pav.) Pers., Syn. Pl. 2(1): 139. 1806. Basionym: *Verbena virgata* Ruiz & Pav., Fl. Peruv. 1: 20. 1798. *Aloysia virgata* (Ruiz & Pav.) Juss., Ann. Mus. Natl. Hist. Nat. 7: 73. 1806, nom. inval. *Zappania virgata* (Ruiz & Pav.) Poir., Encycl. [J. Lamarck et al.] 8: 845. 1808, as "*Zapania virgata*." *Priva virgata* (Ruiz & Pav.) Spreng., Syst. Veg. [Sprengel] 2: 753. 1825. TYPE: [Peru. Pasco:] "Pozuzo," 1827, *J. A. Pavón s.n.* [Herb. Pavón 36] (holotype, P [barcode] P000713759 not seen, P image; isotypes, G [bc] G00236936 not seen, G image!, G [bc] G00236923 not seen, G image, G [bc] G00386451 not seen, G image!, G [bc] G00386450 not seen, G image!, MPU [bc] MPU011501 not seen, MPU image!, P [bc] P000713760 not seen, P image!, SI [P fragm., photo!]).

Shrubs 2–7 m tall, stems hirsute, glabrate at maturity. Leaves opposite; petioles 3–10 mm; blades elliptic to ovate, 4–9(–15) × 1.5–4 cm, apex acute to subobtusate, base acute, subobtusate, or truncate, margin evenly minutely serrate or crenate, sometimes almost entire in appearance, membranaceous to coriaceous, adaxially strigose, abaxially hirsute, with prominent venation. Florescences axillary, solitary or 2 to 5, sometimes 7, per leaf axil, lax, subpendulous, 10–20 cm; peduncles 1–3 cm, sometimes branched; flowers white or cream, small; floral bracts linear to narrowly elliptic, 2–3 mm, hirsute. Flower with the calyx 2.5–3.5 mm, densely hispid, with long hairs and subsessile glandular trichomes, with 4 teeth, unequal, acute, subulate, the teeth equaling or exceeding the calyx tube in length; corolla tube 2.3–3.5 mm, externally puberulous toward apex, with villous fauce. Cluses 1 × 0.5 mm, glabrate.

Iconography. Botta (1979: 97, fig. 9).

Discussion. Leaves of *Aloysia virgata* are said to be used for therapeutical matters, such as antifungal treatments (Arambarri et al., 2008, 2009).

Aloysia virgata (Ruiz & Pav.) Juss. is an invalid combination (McNeill et al., 2012: Art. 33.1); Jussieu assigned *Verbena virgata* Ruiz & Pav. to *Aloysia*, but did not make the formal combination.

TAXONOMIC KEY TO THE VARIETIES OF *ALOYSIA VIRGATA*

1. Leaf apex acute, blades with acute to subobtusate base, high blade length/width ratios; ovary glabrous 28b. *A. virgata* (Ruiz & Pav.) Juss. var. *virgata*

1'. Leaf apex subobtusate, blades with obtuse to truncate base, low blade length/width ratios; ovary pilose 28a. *A. virgata* (Ruiz & Pav.) Juss. var. *platyphylla* (Briq.) Moldenke

28a. *Aloysia virgata* (Ruiz & Pav.) Pers. var. **platyphylla** (Briq.) Moldenke, Phytologia 2: 408. 1948. Basionym: *Lippia virgata* var. *platyphylla* Briq., Annuaire Conserv. Jard. Bot. Genève 7–8: 304. 1904. TYPE: Paraguay. Paraguairí, Mar. 1881–1884, *B. Balansa 3116* (lectotype, designated by Siedo [2010: 203], F-876782!; isolectotypes, BM [barcode] BM000098764 not seen, BM image!, G [bc] G00166263 not seen, G image!, GH [bc] GH00312629 not seen GH image!, K [bc] K000471000 not seen, K image!, K [bc] K000487001 not seen, K image!, P [bc] P02851828 not seen, P image!, SI [bc] SI003609!).

Lippia virgata var. *elliptica* Briq., Annuaire Conserv. Jard. Bot. Genève 7–8: 304. 1904. *Aloysia virgata* var. *elliptica* (Briq.) Moldenke, Phytologia 1: 441. 1940. TYPE: Paraguay. L'Assomption, 15 abr. 1874, *B. Balansa 1016* p.p. (holotype, G [barcode] G00166264 not seen, G image!; isotypes, G [bc] G00381090 not seen, G image!, G [bc] G00381089 not seen, G image!, BR [bc] BR0000005505258 not seen, BR image!, P [bc] P02851832 not seen, P image!, SI!, SI1-10533 not seen, S image!).

Aloysia naviculata Ravenna, Onira 11(4): 16–17. 2007. TYPE: Paraguay. Dpto. Cordillera: Colonia Ojopó E de Piribebuy, 3 June 1985, *P. Arenas 2912* (holotype, BA-90077!).

Shrubs with ovate leaf blades, almost the same length as width, with subobtusate apex, and obtuse to truncate base. Pilose ovary.

Distribution and habitat. *Aloysia virgata* var. *platyphylla* grows in Bolivia, Paraguay, and Argentina. In this last country, this variety exhibits a wider distribution than the type variety. *Aloysia virgata* var. *platyphylla* has been collected from woods and thickets on dry or wet ground, in forest patches or xerophytic areas.

Discussion. In the new combination *Aloysia virgata* var. *elliptica* (Briq.) Moldenke, Moldenke repeated the same taxonomic action, not once but four times (Moldenke, 1940: 441; 1942: 310; 1947: 363; 1948: 408), with the last three names constituting later isonyms, which are disregarded by the Code (McNeill et al., 2012: Art. 6, Note 2). To add confusion to this, Moldenke (1942: 310) committed a typographic error between varieties *platyphylla* and *elliptica*, which he later corrected (1947: 363). There are three sheets at G collected by Balansa, number 1016, with a collection date of 1874, from Paraguay, that correspond to *A. virgata* var. *elliptica*. There is no

indication of pro parte on these three sheets, although the pro parte designation could be traced to three additional sheets at G for the collection *Balansa 1016*, each noted as “Isotypus, *Malabaila carvifolia* Boiss. & Balansa,” with “validated determination” to *Peucedanum palimbioides* Boiss., Apiaceae, from Turkey [G SIB #s 271723/1, 2, 3]. Thus the pro parte designation for the type of *Lippia virgata* var. *elliptica* Briq. referred to Balansa’s collection number 1016 mixed with another taxon in a different family, rather than any confusion on Balansa’s part for varieties in *L. virgata*. Consequently, a mixed collection for *Balansa 1016* exists at G that consists of at least six sheets for *Balansa 1016*, three for *L. virgata* var. *elliptica* and three for *Malabaila carvifolia* (Apiaceae), with all six sheets indicated as type material.

Selected specimens examined. ARGENTINA. **Chaco:** 1° de Mayo, Colonia Benítez, *Venturi 7897* (SI). **Corrientes:** Ituzaingó, Rapidos del Apipé, *Cabrera 28959* (SI); s. loc., *Burkart 6923* (SI). **Entre Ríos:** Diamante, Puerto, *Bacigalupo 1659* (SI). **Formosa:** Pirané, ferrocarril, *Krapovickas 1136* (SI). **Jujuy:** El Carmen, Pampa Blanca, *Kiesling 1654* (SI). **Misiones:** Capital, Posadas, *F. M. Rodríguez 97* (SI). **Salta:** Metán, El Tunel, *Saravia Toledo 1929* (SI). **Santiago del Estero:** Carlos Pellegrini, co. Del Remate, *Venturi 5360* (SI). **Tucumán:** Burruyacú, Alto de Medina, *Venturi 2692* (SI). BOLIVIA. **Chuquisaca:** El Salvador, El Huare, *Saravia Toledo 10339* (SI). **Santa Cruz:** Cordillera, Camiri, *Ferrucci 2706* (SI). **Tarija:** Villa Monettes, Qda. de Tampinta, *Krapovickas 19383* (SI). PARAGUAY. **Alto Paraná:** Fiebrig 6151 (SI). **Boquerón:** Colonia Menno, rio Verde, *Vanni 1858* (SI). **Caaguazú:** rte. 2, Km. 122, *Zardini 10633* (SI). **Central:** Yaguarón, *Krapovickas 12255* (SI). **Chaco:** Carnachini, *Rojas 7216* (SI). **Cordillera:** San Bernardino, *Hassler 263* (SI). **Guairá:** Colonia Independencia, serranía Ybytumesú, *Schinini 14* (SI). **Misiones:** San Ignacio, *Burkart 18241* (SI). **Nueva Asunción:** 60 km W Est. La Patria, *Nicora 9758* (SI). **Paraguarí:** Cerro Mbatoví, *Zardini 4451* (SI). **San Pedro:** Villa Primavera, *Woolston 793* (SI).

28b. *Aloysia virgata* (Ruiz & Pav.) Pers. var. *virgata*.

Aloysia urticoides Cham., Linnaea 7: 238. 1832. *Lippia urticoides* (Cham.) Steud., Nomencl. Bot. 2: 54. 1841. TYPE: Brazil. s. loc., s.d., *F. Sellow s.n.* (lectotype, designated by Siedo [2010: 201], G [barcode] G00208721 not seen, G image!; isolecotypes, G [bc] G00386463 not seen, G image! GH!, HAL [bc] HAL0098258 not seen, HAL image!, K [bc] K000487003 not seen, K image!, NY [bc] NY0136532 not seen, NY image!, P [bc] P00713758 not seen, P image!, US not seen, US image!).

Lippia urticoides (Cham.) Steud. var. *laxa* Chodat, Bull. Herb. Boissier, ser. 2, 2: 819. 1902. *Lippia virgata* var. *laxa* (Chodat) Briq., Annuaire Conserv. Jard. Bot. Genève 7–8: 304. 1904. *Aloysia virgata* var. *laxa* (Chodat) Moldenke, Phytologia 1: 95. 1934. TYPE: Paraguay. Sierra de Mbaracayu, Oct. 1898–1899, *E. Hassler 5206* (holotype, G [barcode] G00306073 not seen, G image!; isotypes, G [bc] G00400306 not seen,

G image!, K [bc] K000545989 not seen, K image!; P [bc] P00753761 not seen, P image!, P [bc] P00753760 not seen, P image!, P [bc] P02851825 not seen, P image!, MPU [bc] MPU012512 not seen, MPU image!, UC [bc] UC935077 not seen, UC image!).

Aloysia virgata var. *argutedentata* Moldenke, Phytologia 55(4): 232. 1984. TYPE: Argentina. Santiago del Estero, C. Pellegrini, cerro del Remote, 14 Jan. 1928, *S. Venturi 5764* (holotype, US [barcode] US00118883 not seen, US image!; isotypes, A [bc] A00354571 not seen, A image!, F [bc] F0092407F not seen, F image!, GH [bc] GH00354572 not seen, GH image!, NY [bc] NY01365328 not seen, NY image!, S11-10466 not seen, S image!, SI [bc] SI3404!).

Shrubs with elliptic leaf blades, longer than wide, with acute apex, and acute to subobtuse base. Glabrous ovary.

Distribution and habitat. *Aloysia virgata* var. *virgata* grows in Bolivia, Paraguay, Peru, southern Brazil, and northern Argentina. It has been observed in open fields and sometimes in sandy soils.

Discussion. *Aloysia virgata* is distinguished by its lax, subpendulous florescences, solitary or two to five, sometimes seven, per leaf axil. It is similar to *A. peruviana* and *A. scorodonioides*. However, it is contrasted by its leaf margins minutely serrate or crenate and shorter corollas, less than 4 mm, contrasted with leaf margins notoriously crenate or dentate, and corollas more than 4 mm long in these two last taxa.

There is a certain phenotype of *Aloysia virgata* var. *virgata* found in southern Brazil (Mato Grosso do Sul, Paraná, Santa Catarina) and northeastern Argentina (Misiones), with large leaves to 15 cm long, with narrowly elliptic blades and an acute apex, and long florescences to 15–20 cm in fructification. Generally, there are five to 12 florescences per node, many times reiterated in successive nodes, which makes the plant look like a feather duster. Siedo (2006) referred to this form as *A. virgata* var. *urticoides* (Cham.) Siedo, based upon *A. urticoides* Cham.; however, Siedo’s variety was never validly published and is an ined. name. In the present treatment we consider this to fall within the range of morphological variation of *A. virgata* s. str.

Selected specimens examined. ARGENTINA. **Catamarca:** Ruta Prov. 2, entre Icaño y Ancasti, *Biurrun 8133* (SI). **Chaco:** Ruta 11, 54 millas N de Resistencia, *Cordo 77-A-96* (SI). **Corrientes:** San Miguel, 12 km. N de San Miguel, Ruta 17, *Ahumada 2375* (SI). **Formosa:** Ing. Juárez, *Burkart 20287* (SI). **Jujuy:** San Pedro, Sierra de Zapla, *Burkart 11993* (SI). **Misiones:** El Dorado, ruta 17, a 15 km de El Dorado, *Cabrera 28951* (SI). **Salta:** La Viña, Dique Cabra Corral, *Cabrera 29734* (SI). **Tucumán:** Tafí Viejo, Tapia, *Rodríguez 545* (SI). BOLIVIA. **Beni:** San Borja, *Beck 12734* (SI). **Chuquisaca:** Siles, *Beck 9364* (SI). **La Paz:** Nor/Sud

Yungas, Puente Villa, *Beck 4791* (SI). **Santa Cruz:** Cordillera, Alto Parapetí, *Michel 115* (SI). BRAZIL. s. loc., *Saint Hilaire s.n.* (MVM). **Bahia:** s. loc., *Blanchet 1330* (SI). **Mato Grosso do Sul:** Bela Vista, *Schinini 1993* (SI). **Minas Gerais:** s. loc., *Claussen 6087* (SI). **Paraná:** Perola D'Oeste, *Hatschbach 22629* (SI). **Rio de Janeiro:** entre Macuco & Santa María Magdalena, *Santos 2043* (SI). **Santa Catarina:** Cambará, aguas de Chapecó, *Klein 5604* (SI). **São Paulo:** Porto Feliz, *Morello 49* (SI). PARAGUAY. **Alto Paraná:** Pto. Bestosi, *Rojas 7987* (SI). **Caaguazu:** ruta 2, *Zardini 10579* (SI). **Cordillera:** Tobatí, "Ybytu Silla," *Zardini 27301* (SI). **Guaíra:** Ybytyruzú, Cerro Polilla, *Zardini 13918* (SI). **Paraguari:** Chololó, *Eskuche 6247* (SI). PERU. **Cuzco:** Santa Ana, *Cook 1484* (US). **Junín:** Pte. Herrería, *Schunke Vigo 6202* (US). **San Martín:** Puente Colombia, entre Tarapoto y Juanjui, *Ferreira 17541* (US).

DOUBTFUL TAXON

Aloysia dodsoniorum Moldenke, *Phytologia* 50: 308. 1982. TYPE: Ecuador. Guayanas: Capeira, Gauyaquil to Daule, 15 Sep. 1981, *C. H. Dodson & P. M. Dodson 11224* (holotype, TEX-LL [barcode] LL00374937 not seen, TEX-LL image!).

No further material, apart from the type specimen, could be found for this taxon. The type material resembles a *Lippia*.

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- Appendix 1. Accepted species and varieties of *Aloysia*.
1. *Aloysia arequipensis* Siedo
 2. *Aloysia brasiliensis* Moldenke
 3. *Aloysia castellanosii* Moldenke
 4. *Aloysia catamarcensis* Moldenke
 5. *Aloysia chamaedryfolia* Cham.
 6. *Aloysia citrodora* Paláu
 7. *Aloysia cordata* Siedo
 8. *Aloysia crenata* Moldenke
 9. *Aloysia deserticola* (Phil.) Lu-Irving & N. O'Leary
 10. *Aloysia dusenii* Moldenke
 11. *Aloysia fiebrigii* (Hayek) Moldenke
 - 12a. *Aloysia gratissima* (Gillies & Hook. ex Hook.) Tronc. var. *angustifolia* (Tronc.) Botta
 - 12b. *Aloysia gratissima* var. *chacoensis* (Moldenke) Botta
 - 12c. *Aloysia gratissima* (Gillies & Hook. ex Hook.) Tronc. var. *gratissima*
 - 12d. *Aloysia gratissima* var. *schulziana* (Moldenke) Botta
 13. *Aloysia hatschbachii* Moldenke
 14. *Aloysia herrerae* Moldenke
 15. *Aloysia oblanceolata* Moldenke
 16. *Aloysia ovatifolia* Moldenke
 17. *Aloysia peruwiana* (Turcz.) Moldenke
 18. *Aloysia polygalifolia* Cham.
 19. *Aloysia polystachya* (Griseb.) Moldenke
 20. *Aloysia pulchra* (Briq.) Moldenke
 21. *Aloysia riojana* (Hieron. ex Moldenke) Lu-Irving & N. O'Leary
 22. *Aloysia salsoloides* (Griseb.) Lu-Irving & N. O'Leary
 23. *Aloysia salviifolia* (Hook. & Arn.) Moldenke
 - 24a. *Aloysia scorodonioides* (Kunth) Cham. var. *hypoleuca* (Briq.) Moldenke
 - 24b. *Aloysia scorodonioides* var. *mathewii* (Briq.) Moldenke
 - 24c. *Aloysia scorodonioides* var. *scorodonioides*
 25. *Aloysia tarapacana* (Botta) Lu-Irving & N. O'Leary
 26. *Aloysia trifida* (Gay) Lu-Irving & N. O'Leary
 27. *Aloysia velutina* Siedo
 - 28a. *Aloysia virgata* (Ruiz & Pav.) Pers. var. *platyphylla* (Briq.) Moldenke
 - 28b. *Aloysia virgata* var. *virgata*
- Appendix 2. Index to collectors.
- Collections are listed alphabetically by collector's last name. The number in parentheses, after the collector's number, corresponds to the species number in the species list (Appendix 1).
- Ahumada, O.** 8 (12c), 986 (28a), 2375 (28b), 4458 (28b), 4665 (12c), 9002 (12c). **Alberti, F. R.** 619 (12c), 1232 (12c). **Aliscioni, S. S.** 692 (12a). **Alonso, E.** 548 (12b). **Arenas, P.** 148 (15), 257 (19), 276 (6), 351 (6), 370 (15), 428 (22), 444 (6), 664 (12b), 927 (11), 1023 (6), 1085 (12a), 1879 (12b), 1916 (19), 1918 (6), 2330 (12d), 3266 (19), 3465 (19), 20262 (19). **Argañarás, J. L.** 61 (12b). **Asplund, E.** 6533 (24b). **Bacigalupo, N.** 1659 (28a). **Baer, G. A.** 2 (12c), 31794 (16). **Báez, J. R.** 3 (12c), s.n. (12b). **Balegno, B.** 971 (12a), 1068 (12a), 1410 (12a), 1584 (12c). **Barkley, F. A.** 214 (12c), s.n. (12c). **Barrionuevo, A.** s.n. (12a). **Bartlett, H. H.** 19200 (12c), 19543 (12c), 19687 (12d), 19942 (12c), 20004 (12c), 20076 (12c), 20513 (3), 20548 (9), 20573 (3), 20602 (12c). **Beck, S.** 463 (12c), 874 (15), 3530 (24a), 4791 (28b), 6039 (24c), 9364 (28b), 9428 (24b), 12734 (28b), 14132 (22), 21555 (9), 26988 (11). **Bertoni, M.** 761 (12d), 3617 (20), 98421 (20). **Biganzoli, F.** 1414 (20). **Biloni, A.** 16624 (28b). **Biloni, J. S.** 6255 (16), 6671 (22). **Biurrun, F.** 650 (12c), 718

- (16), 974 (4), 1214 (12c), 1250 (16), 1302 (16), 2569 (12d), 2774 (6), 4002 (12d), 4080 (19), 4250 (19), 4272 (16), 4688 (6), 4700 (4), 4701 (16), 4740 (26), 4963 (9), 4996 (16), 5042 (3), 5639 (9), 5819 (3), 5980 (21), 5998 (4), 6370 (22), 6392 (12d), 7693 (21), 7696 (21), 7705 (21), 7706 (26), 7710 (21), 8133 (28b). **Blanchet, J.** 1330 (28b). **Bocco, M. E.** 821 (12c). **Boelcke, O.** 1249 (12c). **Boffa, P.** s.n. (12b). **Bonifacino, M.** 1953 (5). **Botta, S. M.** 116 (12c), 273 (12c), 364 (22), 685 (4), 695 (3). **Brescia, R.** 4269 (20). **Bridges, E.** 1346 (23). **Brizuela, A.** 90 (19), 181 (16), 386 (12c), 389 (19), 437 (12c), 550 (12c), 882 (12c), 1082 (19), 1180 (12c). **Brown, A.** 1610 (12d). **Bruch, C. s.n.** (12c). **Buchtien, O.** 3240 (24c). **Buratovich, F.** 219 (12d), 941 (12c). **Burkart, A.** 3083 (12c), 4140 (12c), 6923 (28a), 6928 (12c), 8486 (12c), 11966 (22), 11993 (28b), 12536 (21), 12540 (21), 12542 (6), 12543 (16), 12545 (16), 12549 (4), 13195 (12d), 13856 (12c), 13858 (12c), 13968 (16), 14201 (20), 14209 (20), 15281 (20), 15834 (12c), 18002 (12c), 18241 (28a), 20226 (19), 20287 (28b), 21361 (12a), 22066 (3), 23796 (12c), 23800 (12a), 23805 (12a), 26347 (12c), 26348 (12c), 26594 (12c), 27051 (12c), 27876 (12c), 28067 (12a), 28074 (12c), 29450 (12c), 29465 (12c), 29641 (16), 30574 (16), 30593 (24c), 30595 (12d), 30596 (28b), 30606 (12d), 30608 (12c).
- Cabezas, V.** 23192 (12c). **Cabrera, A. L.** 3046 (12c), 4368 (12c), 7209 (12c), 7716 (22), 8192 (12c), 9016 (22), 12183 (12c), 13252 (12c), 14241 (24c), 14633 (12d), 15711 (24b), 16695 (6), 16783 (4), 16877 (6), 18475 (12c), 19245 (12c), 20325 (12c), 20988 (24b), 21092 (12d) 22438 (22), 23330 (28a), 24637 (6), 24648 (12c), 27399 (22), 27962 (24b), 28063 (16), 28331 (20), 28485 (20), 28634 (20), 28743 (20), 28870 (28b), 28951 (28b), 28959 (28a), 28973 (12c), 28989 (20), 29017 (12c), 29029 (12c), 29062 (20), 29104 (28a), 29106 (8), 29117 (20), 29187 (28b), 29529 (12c), 29554 (12c), 29588 (16), 29603 (12c), 29616 (12c), 29632 (12c), 29664 (12a), 29670 (12c), 29727 (24b), 29729 (24c), 29731 (12c), 29734 (28b), 29736 (12d), 29745 (24c), 29746 (12c), 29828 (12c), 29961 (24c), 30346 (12d), 31018 (12d), 31725 (22), 31735 (22), 31792 (9), 32301 (28a), 32345 (12c), 32474 (22), 32746 (28a), 33665 (24c), 34018 (28a), 34101 (24c). **Calderón, C. E.** 991 (12a), 1243 (12c), 1386 (12c). **Cano, E.** 724 (12c), 1971 (12c). **Cantino, P.** 327 (12c), 557 (12c), 559 (12c), 693 (3), 734 (16). **Carette, E.** 3046 (12c), 3877 (12c). **Castellanos, A.** 585 (12a), 623 (12a), 11669 (19), 19062 (12c), 19615 (12a), 28/327 (6), 28/331 (16), 33887 (19), 33892 (12a), 33894 (16). **Castillon, L.** 943 (6). **Cerón** 12387 (12c). **Cerrate, E.** 1282 (1). **Cialdella, A.** 218 (3), 407 (22). **Clausen, P.** 6087 (28b). **Cocucci, A.** 3277 (25), 3366 (11). **Cook** 247 (24b), 1484 (28b). **Cordini, R. I.** 60 (12b). **Cordo, H.** 77-A-33 (12c), 77-A-49 (12c), 77-A-50 (12a), 77-A-93 (12a), 77-A-94 (12c), 77-A-96 (28b), 77-A-101 (12b), 77-A-102 (28b), 77-A-160 (12c), 77-B-11 (12c), 77-B-66 (28b), 77-B-70 (12c), 77-B-82 (12c), 77-B-83 (19), 77-B-88 (12c), 77-C-21 (12c), 77-C-33 (12c), 77-D-45 (12d), 77-D-46 (12c), 77-D-47 (12c), 78-A-39 (28a), 78-A-41 (12a), 78-A-42 (12b), 78-A-43 (12d), 78-A-44 (12c), 78-A-45 (12d), 78-A-46 (12d), 78-A-48 (24c), 82-A-24 (22), 89-A-93 (12c). **Correa, A.** 209 (12c), 238 (12c), 4318 (4), 18073 (12c). **Correa, J. B.** 26 (12c). **Corzo, R.** 777 (19). **Costa, M.** 6 (7). **Cozzo, D.** s.n. (12a). **Crespo, S.** 26457 (12c). **Cristóbal, C. L.** 1649 (12c). **Cuezzo, A. R.** 971 (19), 1656 (3), 9362 (12c), 9498 (12c).
- Davis, E.** 1757 (14). **Dawson, G.** 3340 (6), 3432 (16). **De la Sota, A. V.** 198 (12b), 261 (12c), 447 (12c), 458 (12c), 580 (12c), 4236 (12c). **De la Vega, R.** 26 (6), 44 (6). **Deginani, N.** 1375 (20). **Del Castillo, A.** 451 (12c). **Del Puerto** 6053 (20). **Dematteis, M.** 1531 (20). **Denham, S.** 333 (12c). **Descole, H. R.** 3330 (28b). **Devoto, F.** 1142 (24c), 1566 (12c), 2208 (12c), 2257 (12c), 3427 (24c). **Dier, L.** 148 (22). **Dillon, M.** 4544 (27), 6018 (9). **Donadio, S.** 177 (19). **Donovan** P978 (17). **Drake, J.** s.n. (24c). **Dunn, D.** 20552 (12c).
- Ekman, E. L.** 1999 (20), 2000 (20), 2004 (5). **Escobar, H.** 233 (25). **Eskuche, U.** 6247 (28b). **Eukontes, J.** 534 (20). **Eyerdam, W.** 22363 (12c), 23408 (12c).
- Fabris, H. A.** 2729 (12c), 2994 (12b), 3081 (12c), 3546 (12c), 6036 (22), 6336 (22), 7954 (12c), 7989 (28b), 8121 (6). **Ferreira, R.** 755 (17), 759 (17), 7013 (24a), 7021 (24a), 12952 (17), 17541 (28b). **Ferrucci, M.** 2659 (15), 2706 (28a). **Fiebrig, K.** 3040 (11), 5904 (20), 6151 (28a). **Fortunato, R.** 1269 (12c), 2339 (12c), 5040 (12c), 5091 (16), 5950 (12c), 6628 (12c). **Forzza, R. C.** 1977 (12c), 1978 (6). **Frenguell, J.** 19 (12c). **Fries, R.** 746 (22).
- Garaventa** 7092 (12c). **García, E.** 1209 (9). **García, P.** 814 (12a). **Gentry, H.** 36089 (17), 44821 (17), 70190 (24c). **Gerold, H.** 161 (6). **Giardelli, M. L.** 25 (12a), 418 (12a), 19542 (12c). **Giberti, G.** 825 (22). **Golbach, R.** 9 (12c). **Gomez** 28/770 (19). **Guaglianone, R.** 220 (20), 599 (12c), 956 (20) 2071 (12c), 2787 (12c).
- Haene, E.** 93 (3), 2121 (9). **Hagelund, K.** 132 (12d), 10590 (5). **Hart, C.** 1481 (24c). **Hassler** 53 (12c), 263 (28a), 2635 (12c), 11497 (15). **Hatschbach, G.** 9339 (15), 14905 (2), 20792 (7), 22546 (10), 22629 (28b), 26325 (8), 28171 (18), 28366 (10), 30734 (18), 51897 (13). **Haught, O.** 3155 (24c). **Hayward, K.** 2067 (4). **Herrera, E.** 194 (19). **Herter, G.** 158 (5). **Hicken, C.** 17 (22), 113 (12c), 3519 (22), 3528 (12b), 3531 (12c), 3537 (12c). **Hieronymus, G.** 82 (19), 547 (21), 755 (6). **Huajardo, E. D.** 2559 (12c), s.n. (3). **Hunziker, A.** 2037 (21), 4729 (4), 4771 (19), 5069 (4), 7912 (16), 8055 (11), 8945 (12c), 8951 (19), 13507 (19), 15321 (6), 17046 (6), 18369 (12c), 21887 (4), 22803 (6), 24629 (16). **Hunziker, J.** 1042 (12c), 1276 (12c), 2037 (21), 11998 (16), 12605 (6), 12908 (12c), 13117 (4). **Hurrell, J.** 6907 (12c). **Hutchison, P.** 3520 (24b), 4199 (14), 4201 (24a).
- Irigoyen, J.** 142 (12c), 222 (12c). **Isern, J.** 8014 (12a), 8336 (12a).
- Jiles, G.** 5079 (26). **Job, M. M.** 573 (12a), 835 (12a), 1072 (12b). **Jørgensen, P.** 1020 (12c), 1023 (6), 1736 (22), 2473 (12c), 2474 (28a). **Juárez, F.** 1314 (12c).
- Kiesling, R.** 1654 (28a), 3069 (12c), 3458 (12c), 3535 (22), 3578 (6), 3708 (12c), 3992 (22), 4346 (3), 4821 (3), 4837 (3), 4912 (12c), 4954 (12c), 5243 (22), 5269 (22), 5370 (12c), 5533 (12d), 5941 (3), 6313 (3), 6620 (6), 8847 (9), 9130 (26). **Klein, E.** 3489 (2), 5604 (28b). **Krapovickas, A.** 1136 (28a), 1523 (22), 1645 (28a) 2597 (12a), 3239 (12c), 6492 (12a), 11741 (28a), 12255 (28a), 13743 (28b), 13748 (12d), 17337 (12d), 17970 (12d), 18530 (12c), 18544 (12c), 19210 (12d), 19383 (28a), 20788 (20), 22064 (6), 25485 (20), 25760 (20) 26801 (12c), 26802 (28b), 26989 (12c), 27356 (12c), 27453 (20), 27999 (28b), 28868 (5), 30307 (12c), 30899 (12d), 31277 (19), 38344 (10). **Kristensen, K.** 1359 (9). **Kuntze, O.** s.n. (12c).
- Lanfranchi** 1076 (12c), 1097 (16). **Lee Anderson** 748 (12c), 1412 (16), 1521 (12c), 3077 (16). **Legname, P. R.** 6887 (12c), 9108 (12c). **Leuenberger, B.** 3981 (28a), 4773 (12c). **Lillo, M.** 3278 (12c), 6073 (16), 7183 (12c), 32305 (12a). **Llatas Queiroz, S.** 1513 (14), 1953 (27). **López, E.** 34 (12c). **Lorentz, P. G.** s.n. (12c). **Lourteig, A.** 1037 (12c), 2189 (10). **Lu-Irving, P.** 9-32 (24c), 9-62 (24b). **Luna, P. E.** 147 (19). **Lundell, C.** 11958 (12c).
- Macbride, J.** 133 (24a). **Maldonado, R.** 206 (12a), 860 (12d), 970 (12c). **Malvarez, R.** 286 (12c), 1367 (12a), 1431 (12c). **Maranta, B.** 1104 (12d). **Marchesi, E.** 10078 (12c). **Marquez** 63 (6). **Martínez, A.** s.n. (12c). **Martínez, E.** 479 (6). **Martínez, G.** 94 (12c), 910 (12c). **Martínez Crovetto, R.** 4231 (12c), 8956 (20), 9474 (20), 9597 (20), 9935 (20), 10638 (12c), 10801 (20), 10824 (28b), 11363 (12c). **Maturro,**

- H. 160 (28a). **Medina, B. R.** 240 (20). **Melillo, A. C.** 2339 (12b). **Meyer, T.** 2671 (12b), 3367 (12c), 3370 (3), 4248 (6), 4289 (12c), 4868 (12c), 5066 (12b), 8590 (12b), 9994 (12c), 10639 (12c), 10954 (12c), 11090 (12c), 11742 (20), 11965 (20), 12156 (12c), 16436 (12d), 22633 (22), 23456 (12c), 34400 (11). **Michel, A.** 115 (28b). **Moldenke, H.** 19729 (3). **Monetti, L.** 1035 (12c). **Montes, J. E.** 12 (20), 534 (12c), 1031 (28b), 1410 (20) 1864 (20), 2125 (28b), 2299 (20), 2314 (28b), 3434 (28b), 14841 (20), 14911 (20), 15011 (28b), 15161 (20), 15455 (28b), 27627 (20), 27697 (20). **Morel, J.** 146 (12b) 913 (12b) 1257 (12c), 2049 (12c), 4518 (12c). **Morello, J.** 49 (28b), 1966 (12c), 4013 (12a). **Moretti, A.** 1925 (6). **Morrone, O.** 635 (12c), 1749 (20), 3052 (12c), 3113 (12d), 4119 (12c), 4366 (12c), 4367 (6), 4634 (24c). **Múlgura, M.** 481 (20), 767 (12c), 925 (28a), 1105 (12c), 1158 (12c), 2204 (28b), 3183 (28a), 3743 (12c), 3847 (28b), 4142 (6), 4223 (22).
- Naranjo, C.** 923 (12c). **Nicora, E.** 966 (12c), 1310 (12c), 1711 (12b), 2321 (12c), 2494 (19), 3276 (12c), 3288 (12c), 4640 (12c) 4726 (12c), 8260 (9), 8472 (9), 8483 (9), 8565 (9), 8612 (9) 9758 (28a) 17824 (16) 19558 (12a). **Niederlein, G.** 23907 (20). **Novara, L.** 505 (12d), 855 (12c), 1301 (12c), 1829 (12c), 1954 (12c), 2331 (19), 5703 (9), 6305 (12c), 7260 (12c), 7550 (6), 9311 (28a), 10106 (24c). **Núñez, O.** 7018 (14).
- Ochoa, C.** 710 (14). **O'Donell, C. A.** 3159 (12c), 4366 (12c), 5377 (12c). **Okada, K.** 2747 (12c). **Olea, D.** 78 (6), 99 (12d). **Olmstead, R.** 2001-184 (16), 2004-109 (12c), 2004-125 (28b), 2004-129 (20), 2004-133 (28b), 2007-13 (6), 2007-13 (6), 2007-52 (22), 2007-68 (28a), 2007-82 (4), 2007-82 (4), 2009-30 (14), 2009-40 (24a), 2009-45 (17), 2009-8 (27), 2010-217 (10).
- Pachano, A.** 120 (24c). **Parodi, L. R.** 14244 (12c). **Pastore, F.** 2031 (12c). **Paula-Souza, J.** 6989 (12c), 7623 (22), 7697 (22), 7796 (12d), 8122 (28a). **Pedersen, T. M.** 614 (12c), 874 (12c), 5564 (12c), 6428 (12c), 8261 (12c), 11796 (19), 15295 (4). **Pennell, M.** 14438 (24c). **Pensiero, J.** 1722 (12c), 4249 (12c), 5640 (12c), 5707 (12c), 7426 (12d), 7450 (12c). **Perez Moreau, R.** 13577 (12a). **Pfsister** 8318 (23). **Pierotti, S.** 16 (12a). **Pittier, H.** 970 (6). **Pozner, R.** 144 (4). **Prado, D. E.** 107 (12c). **Prina, A.** 2696 (12c). **Pringle, C. s.n.** (12c). **Pujalte, J. C.** 133 (9).
- Quarín, C.** 2117 (20). **Queiroz, L. P.** 13358 (12d), 13465 (22).
- Ragonese, A.** 2604 (12a), 2623 (20), 2829 (12c), 3031 (12a), 3120 (12a), 7162 (28a), 9426 (12a), 9635 (12c), 9676 (12c), 23993 (12d). **Rambo, B.** 28141 (2), 49976 (15). **Reca, A.** 22 (22), 33 (22). **Rentzell, I.** 18837 (12c), 19133 (12c), 19236 (12c). **Renvoize, S. A.** 2898 (12c), 3002 (20), 3156 (20), 3389 (12c), 3537 (28a). **Ricardi, M.** 23967 (23). **Riedel, L.** 226 (16). **Risso, J. L.** 872 (6). **Rivero, R.** 44 (9). **Rodrigo, A. P.** 2535 (12b). **Rodriguez** 6 (12c), 66 (20), 216 (12c), 545 (28b), 661 (12c), 891 (12c), 1196 (16), 1214 (6), 23848 (20), 30/2059 (20). **Rodriguez, D.** 1175 (12c), 1214 (6). **Rodriguez, F. M.** (9), 97 (28a), 123 (20), SI 28218 (9). **Roig, F. A.** 8166 (16), 8424 (16). **Rojas, T.** 2542 (12a), 5903 (8), 7216 (28a), 7701 (12b), 7902 (12c), 7987 (28b). **Romanczuk, C.** 20 (12c), 420 (28a), 741 (20). **Rosengurt, B.** 2245 (12c), 4967 (5). **Rotman, A.** 189 (12c), 228 (16), 241 (12c), 304 (16), 518 (12c), 673 (12c). **Rúgolo, Z.** 1275 (12a). **Ruiz Huidobro** s.n. (12c), 1102 (12c), 3134 (12a), 4565 (20), 4886 (20), 5284 (20), 5395 (20), 5457 (20), 5551 (20). **Ruiz Leal, A.** 1102 (12c), 1220 (12c), 1505 (12c), 3877 (12c), 4476 (12c), 8795 (16), 9167 (16) 9848 (12c), 10439 (12c), 22090 (9), 22101 (3). **Ruthsatz, B.** 109 (22), 118 (22), 132 (22), 168 (22), 213 (9), 242 (22), 328 (22).
- Sagástegui, A.** 14147 (27). **Saint Hilaire, G.** s.n. (28b). **Sanderman, S.** 4612 (14). **Santos, A.** 2043 (28b). **Santos Biloni, J.** 6618 (22). **Sanzin, R.** 42 (12c). **Saravia Toledo, C.** 716 (12c), 743 (12c), 902 (12c) 1247-a (19), 1440 (12c), 1591 (24c), 1750 (12d), 1764 (24b), 1766 (12c), 1929 (28a), 1931 (12c), 1968 (12d), 10339 (28a), 11830 (12c), 12085 (12c). **Sayago, M.** s.n. (6), 407 (16), 557 (6), 940 (12c), 1942 (6), 2397 (16), 2407 (16), 2553 (16), 2608 (16), 2649 (12d). **Scarpa, G.** 701 (19). **Schinini, A.** 14 (28a), 1993 (28b), 6767 (6), 7525 (12c), 9688 (12c), 10366 (12c), 12770 (12c), 12822 (12c), 13902 (12c), 14019 (20), 14121 (20), 17016 (12c), 24130 (12c), 26306 (28a), 26811 (12c), 27599 (20), 34455 (28b). **Schreiter, R.** 7133 (6), 9475 (6), 11126 (22), 37997 (6), 37998 (6). **Schulz, A. G.** 2893 (24c), 2985 (24b), 8740 (28a), 10361 (28a). **Schulz, C. L.** 333 (12b), 556 (12d), 772 (12b), 1493 (12b), 6467 (12b), 6875 (20), 8317 (12c) 8699 (12d), 9099 (12c), 11465 (12c). **Schunke Vigo** 6202 (28b). **Schwarz, G. J.** 763 (20), 1687 (20), 1924 (20), 1952 (20), 2312 (20), 3233 (20), 3334 (20), 3742 (20), 3803 (20), 4444 (20), 4561 (20), 4610 (20), 5439 (20), 5536 (20), 6398 (20). **Schwindt, E.** 110 (20). **Semper, J.** s.n. (16), 116 (12c), 339 (12c). **Sesmero** 304 (20). **Siclo** 3278 (12c), 9790 (28b). **Sigle** 137 (12c). **Silva** 7037 (2). **Slanis, A. C.** 23 (12d), 40 (12c). **Sleumer, H.** 3291 (22). **Smith** 9012 (2), 12478 (18), 13029 (18), 13577 (18), 14930 (20), 15683 (18). **Solis Neffa, V.** 875 (6). **Solomon, J.** 15755 (6). **Soria** 2098 (15). **Soriano, A.** 940 (12c), 944 (4), 1102 (12a). **Soukup, J.** 3741 (17), 4872 (17), 5467 (14). **Soza, V.** 1831 (22), 1834 (16). **Steibel, P.** 2334 (12c), 3178 (12c). **Steinbach, J.** 8248 (12c). **Stienstra** s.n. (20). **Stuckert, T.** 1354 (19), 7004 (3), 12584 (24c), 17046 (19), 21287 (24c). **Sturzenegger** s.n. (19). **Suero, A.** s.n. (12c).
- Taylor, A.** 11607 (26). **Terribile, M.** 376 (12b), 418 (6). **Thode, V. 157 (13)**, 398 (18). **Torrico** 107 (12d). **Troiani, H.** 558 (12c). **Troncoso, N.** s.n. (12c), 299 (12c), 1062 (12c), 1253 (12c), 1277 (12c), 1824 (12d), 1826 (12c), 1856 (12c), 1857 (12c), 1859 (12c), 1860 (12c), 1861 (6), 1893 (6), 1895 (6), 1896 (6), 1897 (6), 1898 (6), 1910 (12b), 1929 (6), 1930 (12c), 1931 (6), 1989 (12c), 2496 (12a), 20589 (12c).
- Ulibarri, E.** 332 (4), 333 (12c), 679 (9), 906 (16), 950 (4), 1481 (9).
- Vanni, R.** 1830 (12c), 1858 (28a), 2410 (12d). **Varela** 675 (12c). **Vargas, C.** 248 (14), 594 (24b), 3692 (24c), 12671 (1). **Vattuone, I. C.** 71 (12c). **Velarde Nuñez, O.** 301 (17). **Venturi, S.** 834 (12c), 849 (24c), 2692 (28a), 3756 (19), 3963 (16), 4262 (6), 4885 (22), 5860 (28a), 7458 (28a), 7897 (28a), 8144 (22), 8300 (22), 10579 (24b). **Vervoost, F.** 498 (12c), 688 (22), 4318 (4), 4476 (22), 8642 (12c). **Vignati, M.** 977 (12c). **Villafañe, M.** 342 (12c), 464 (12c), 558 (12c), 693 (12a), 751 (12a), 776 (12c).
- Wall, E.** s.n. (12c). **Werdermann** 103 (23). **Werner, D.** 789 (22). **Wilkes** s.n. (24a). **Wood, J.** 14658 (14). **Woolston, A.** 793 (28a), 794 (12c). **Wulff, A.** 103 (12c).
- Xifreda, C.** 519 (20).
- Zabala, S.** 526 (19). **Zardini, E.** 4451 (28a), 8599 (12c), 10036 (20), 10579 (28b), 10633 (28a), 13918 (28b), 27301 (28b). **Zuloaga, F. O.** 2687 (12c), 3670 (12d), 3738 (12c), 3855 (12c), 5036 (28b), 5405 (28b), 6384 (4), 6703 (28b), 7891 (12c), 8632 (6), 9170 (22), 9257 (6), 9296 (22), 9362 (12c), 10188 (6), 10596 (12c), 11490 (24b), 12706 (3), 12845 (16), 12857 (6), 12912 (12c), 12972 (6).

Appendix 3. List of taxa newly synonymized in the present work.

Aloysia ayacuchensis Moldenke [= *A. herrerae* Moldenke]

Aloysia axillaris J. R. I. Wood [= *A. scorodonioides* var. *hypoleuca* (Briq.) Moldenke]

Aloysia depressa Ravenna [= *A. scorodonioides* var. *hypoleuca* (Briq.) Moldenke]

Aloysia floribunda M. Martens & Galeotti [= *A. gratissima* (Gillies & Hook) Tronc. var. *gratissima*]

Aloysia gratissima var. *oblanceolata* Moldenke [= *A. oblanceolata* Moldenke]

Aloysia leptophylla Moldenke [= *A. scorodonioides* (Kunth.) Cham. var. *scorodonioides*]

Aloysia minthiosa Moldenke [= *A. peruviana* (Turcz.) Moldenke]

Aloysia reichei Moldenke [= *A. trifida* (Gay) Lu-Irving & N. O'Leary]

Lippia fonckii Phil. [= *A. trifida* (Gay) Lu-Irving & N. O'Leary]

