

## FOUR NEW SPECIES OF THE GENUS *ALOYSIA* (VERBENACEAE)

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**Abstract:** Four new species of the genus *Aloysia* are described: *A. arequipensis*, *A. coalcomana*, *A. cordata*, and *A. velutina*. A key to the species and a brief discussion of each novelty is included along with a key to the New World genera of the tribe Lantaneae.

**Resumen:** Se describen cuatro especies nuevas del género *Aloysia*: *A. arequipensis*, *A. coalcomana*, *A. cordata*, y *A. velutina*. Se incluyen una clave para las especies y una breve análisis de cada novedad, junto con una clave para los géneros del Nuevo Mundo de la tribu Lantaneae.

**Keywords:** *Aloysia*, *Lippia*, Verbenaceae, Lantaneae.

Taxonomic investigations concerning the genus *Aloysia* Paláu (Siedo, 2006, 2010) have brought to light four remarkable new species. Two of these species, *A. arequipensis* and *A. velutina*, are from Peru, while one, *A. cordata*, is from southern Brazil and one, *A. coalcomana*, is from southern México. Several authors have provided regional treatments or checklists relevant to the species herein described including: Standley (1924),

Moldenke (1940), McBride (1960), Botta (1979), Rzedowski & Rzedowski (2002), Brako & Zarucchi (1993), Ulloa Ulloa et al. (2004), and León (2006). Descriptions of these novelties are provided along with a key to the 30 species currently recognized in the genus. In addition, a key to the New World genera of the tribe Lantaneae is included for greater ease in identifying the related genera.

### ARTIFICIAL KEY TO THE NEW WORLD GENERA OF THE TRIBE LANTANEAE

1. Xerophytic sub-shrub to shrubs; stems branching from base, stiffly erect, multi-angled, essentially smooth; essentially leafless, leaves sometimes reduced
  2. Fruit drupaceous . . . . . **Neosparton** Griseb.
  2. Fruit schizocarpic . . . . . **Diostea** Miers
1. Xerophytic to mesophytic perennial herbs, sub-shrubs to trees; stems prostrate to ascending; leaves present, prominent to somewhat reduced
  3. Fruits rostrate, ellipsoid schizocarps, exceeding calyx tube in length; calyx 5-merous
    4. Fertile stamens 2; staminodes 2; stigmas capitate; flowers partially embedded in excavations in rachis . . . . . **Stachytarpheta** Vahl
    4. Fertile stamens 4; stigmas geniculate, flattened; flowers not embedded in rachis . . . . . **Bouchea** Cham.
  3. Fruits muticous, ellipsoid to spheroid schizocarps or drupes, usually included within an accrescent calyx; calyx 2- or 4-merous
    5. Fruit a fleshy schizocarp; leaves fleshy, succulent; stems peeling, reddish . . . **Lampayo** Phil. ex Murillo
    5. Fruit a dry schizocarp or drupaceous; leaves sclerophyllous to membranous, not fleshy or succulent; stems evenly to variably green to brown to grey
      6. Fruit drupaceous and indehiscent, composed of a single 2-seeded pyrene; mesocarp indurate or fleshy
        7. Inflorescences capitellate, sessile or sub-sessile, axillary; fruit coherent . . . . . **Nashia** Millsp.
        7. Inflorescence capitate to spicate, pedunculate, terminal or axillary; fruit coherent or dehiscent
          8. Inflorescence a capitate spike; peduncle exceeding rachis in length; mesocarp usually fleshy . . . . . **Lantana** L.
          8. Inflorescence a elongated, sub-verticillate, spicate-raceme; rachis exceeding peduncle in length; mesocarp indurate, not fleshy . . . . . **Xeroalloysia** Tronc.
      6. Fruit a readily dehiscent schizocarp, composed of 2, 1-seeded mericarps; mesocarp dry, membranous
        9. Xerophytic sub-shrubs; leaves entire to apically three-lobed, reduced, somewhat fleshy. . . . . **Acantholippia** Griseb.



9. Xerophytic to mesophytic sub-shrubs to small trees; leaves un-lobed, margins entire to variably dentate, serrate, or crenate; membranaceous to sub-coriaceous, not fleshy
  10. Inflorescence a shortened spike at anthesis, often capitulate with an elongate peduncle and a shortened rachis; floral internodes essentially absent, <1 mm long; floral bracts multi-ranked; stigmas lateral . . . . . **Lippia** Houst. ex L.
  10. Inflorescence an interrupted spicate raceme at anthesis, the rachis mostly longer than the peduncle; floral internodes 1.0–9.0 mm long; floral bracts alternate to opposite; stigmas apical to lateral . . . . . **Aloysia** Paláu

**Aloysia** Paláu, Parte Prac. Bot. 1: 767. 1784.

TYPE: *Aloysia citrodora* Paláu

*Verbena* L. sect. *Aloysioides* Walp., Rep. Sp. Nov. 4: 13. 1845.

*Lippia* L. sect. *Aloysia* Schau. in DC., Prodr. 11: 572. 1847.

*Lippia* L. subgen. *Aloysia* Schau. in Engler and Prantl, Die Natürl. Pflanzenfam. 4(3A): 151. 1897.

*Zapania* Lam., Tabl. Encycl. 1: 59. 1791, *nom. illeg.*

Perennial, phanerophytic SUB-SHRUBS, SHRUBS or TREES, narrowly upright to ascending, 0.5–15.0 m high. STEMS 4-angled in cross section becoming multi-angular to rounded with age; pubescent, glabrate with age, surface smooth, becoming furrowed or longitudinally multi-striated. LEAVES ever-green or dry-season deciduous, simple, exstipulate, mostly opposite or 3(–4)-whorled, occasionally alternate or clustered into fascicles; LAMINAE linear, elliptic, lanceolate, spathulate, obovate, ovate, orbicular to cordate, basally attenuate to cordate, apically retuse to acuminate; margins entire, crenate, crenulate, crenate-serrate, dentate, to serrate; adaxially glabrous or scabrous, hispidulous, to strigulose; abaxially strigulose to incanous, often with sub-sessile, single-celled glandular trichomes. INFLORESCENCES spicate racemes, occasionally paniculate; flowers often in clusters of 3–6 with elongated internodes intervening; rachis rounded to tetragonal, adpressed-villous to incanous, occasionally bearing long-stalked, glandular trichomes; often elongating through anthesis and maturation of fruit. FLOWERS sessile to pedicellate, pedicels 0.5 to 3 mm long, subtended by foliaceous bracts. BRACTS inferior to flowers, linear, lanceolate, elliptic, to ovate; abaxially

strigulose to setose; apically acute to acuminate. CALYCES 2 or 4 lobed, sub-actinomorphic to zygomorphic, externally strigulose, setose, or velutinous, often sub-sessile glandular, internally glabrous; fully accrescent in fruit and persistently enclosing mature schizocarp. COROLLAS sub-actinomorphic to zygomorphic, salverform to 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, glabrous to villulose; externally glabrous to strigulose. STYLES filiform and usually glabrous, occasionally villous along base. STIGMAS capitate to sub-capitate, bilobed; lobes approximately equal or oblique, apically or laterally disposed. STAMENS 4, epipetalous, sub-equal to didynamous, superior pair sometimes weakly exerted; theca longitudinally dehiscent, 0.15–0.50 mm long. FRUITS composed of two schizocarps, ellipsoid to obovoid, often more or less cordate, basally truncate, apically rounded to bilobed, glabrous or setose; mericarps two, readily dehiscent at maturity; intermericarpal cavity present or absent, the surface smooth to papillate. Base chromosome number is 9 (Powell et al. 2010).

ICONOGRAPHY: Paláu (1784, un-numbered illustration by B. Salvador y Carmona [lectotype of *Aloysia citrodora* Paláu]).

*Aloysia* is an amphitropical genus of 30 species native to arid, temperate and subtropical regions of North and South America. It can be found at elevations ranging from near sea level up to approximately 4000 meters in the Andes Mountains of South America. Members of this genus are widely cultivated for culinary, medicinal, and ornamental purposes.

ARTIFICIAL KEY TO THE SPECIES OF THE GENUS *ALOYSIA* PALÁU

1. Calyx 2-lobed, lobes rounded to bi-dentate; stigma sub-capitate, laterally disposed
  2. Floral bracts showy, exceeding the corolla in length
    3. Leaves narrowly lanceolate-elliptic (5:1-3:1, L:W)
      4. Shrub 1–4 m tall; pedicels 0.5–1.0 mm long; floral bracts lanceolate-ovate, 8–10 mm long . . . . . *Aloysia nahuire* Gentry & Moldenke
      4. Small tree up to 6 m tall; pedicels 2–3 mm long; floral bracts elliptic, 4–6 mm long . . . . . 2. *Aloysia coalcomana*, sp. nov.
    3. Leaves ovate to elliptic (2:1-6:5, L:W)
      5. Leaves adaxially scabrous; pedicels 0.5–1.0 mm long . . . . . *Aloysia barbata* (Brandeggee) Moldenke
      5. Leaves adaxially velutinous; pedicels 1–2 mm long . . . . . *Aloysia chiapensis* Moldenke
  2. Floral bracts reduced, shorter than the corolla in length
    6. Inflorescence an elongated spicate-raceme, rachis 4–9 cm long, flowers loosely arranged; leaves ternate; native to Southern Brazil . . . . . *Aloysia dusenii* Moldenke
    6. Inflorescence a compact spicate-raceme rachis 0.5–2.5 cm long, flowers congested, tightly arranged; leaves opposite; native to the United States and México . . . . . *Aloysia sonorensis* Moldenke
1. Calyx 4-lobed, lobes triangular to subulate; stigma capitate to sub-capitate, apically to laterally disposed
  7. Native to North America
    8. Laminae elliptic, apically more or less acute; margins entire to irregularly 2–4 toothed along apical 2/3 . . . . . *Aloysia gratissima* (Gill. & Hook.) Tronc.
    8. Laminae ovate to orbicular, apically rounded; margins regularly crenate to dentate
      9. Inflorescence compact, flowers congested, corollas white; leaves orbicular to elliptic . . . . . *Aloysia wrightii* (A. Gray) A. Heller
      9. Inflorescence elongated, loosely flowered, corollas lavender; leaves ovate . . . . . *Aloysia macrostachya* (Torr.) Moldenke
  7. Native to South America
    10. Inflorescence of multiple spicate racemes arranged into a terminal paniculiform synflorescence; flowering branches determinate
      11. Leaves ovate, velutinous, margins crenate . . . . . 4. *Aloysia velutina*, sp. nov.
      11. Leaves lanceolate to elliptic, sparsely strigose to puberulent, margins entire to serrate medially
        12. Leaves mostly opposite, rarely 3-whorled, margins entire . . . . . *Aloysia herrerae* Moldenke
        12. Leaves 3(-4)-whorled, margins entire to serrate medially
          13. Calyx campanulate, 1–2 mm long; corolla tube 2.5–3.5 mm long; leaves entire . . . . . *Aloysia fiebrigii* (Hayek) Moldenke
          13. Calyx tubular, 2.5–3.5 mm long; corolla tube 3.5–5.0 mm long; leaves entire to serrate . . . . . *Aloysia citrodora* Paláu
    10. Inflorescence of 1–4 axillary spicate racemes, distal on the branch but not terminal; flowering branches indeterminate
      14. Leaves mostly ternate, 3(-4)-whorled
        15. Leaves incanous, margins crenate . . . . . *Aloysia crenata* Moldenke
        15. Leaves glabrous to scabrous, generally not pubescent, margins entire, occasionally serrate medially
          16. Leaves petiolate, lax; laminae elliptic to lanceolate, basally rounded to acute, apically rounded to acuminate . . . . . *Aloysia brasiliensis* Moldenke
          16. Leaves sessile, antrorsely adpressed along stem; laminae ovate to cordate, basally truncate to cordate, apically mucronate to acute
            17. Leaves adaxially scabrous; basally truncate to sub-cordate, margins revolute . . . . . *Aloysia polygalifolia* Cham.
            17. Leaves adaxially glabrous, basally cordate, margins weakly revolute and ciliate . . . . . 3. *Aloysia cordata*, sp. nov.
      14. Leaves mostly opposite, sometimes alternate, rarely 3-whorled
        18. Leaves sclerophyllous, firm-textured, margins serrate-dentate to prominently dentate, venation prominently reddish to brownish abaxially
          19. Leaves obovate, margins basally entire, serrate dentate to dentate along distal 2/3 . . . . . *Aloysia hatschbachii* Moldenke
          19. Leaves ovate to orbicular, prominently dentate with spreading teeth . . . . . *Aloysia chamaedryfolia* Cham.
        18. Leaves membranous, margins entire to serrate, crenate or dentate, venation obscure

20. Inflorescence compact, flowers congested; leaves alternate or opposite
  21. Leaves alternate, margins entire, laminae narrowly lanceolate-elliptic (2:1-3:2, L:W); calyx obscurely bidentate . . . . . *Aloysia polystachya* (Griseb.) Moldenke
  21. Leaves opposite, margins serrate-dentate, laminae elliptic to ovate (6:1-3:1, L:W); calyx bidentate, teeth long-acuminate . . . . . *Aloysia catamarcensis* Moldenke
20. Inflorescence elongated, flowers lax; leaves opposite, rarely 3-whorled
  22. Leaf margins entire to irregularly 1-5 toothed along apical 2/3
    23. Floral bracts elliptic to lanceolate, conspicuous, at least 2 times the length of the calyx; calyx densely incanous; flowers congested along rachis. . . . . *Aloysia salviifolia* (Hook. & Arn.) Moldenke
    23. Floral bracts lanceolate, reduced, roughly equal to less than 2 times as long as the calyx; calyx villous to setose; flowers loosely arranged.
      24. Leaves spatulate to oblanceolate, clustered into fascicles; calyx sub-actinomorphic, ca. 1/2 to 3/4 the length of the corolla tube . . . . . *Aloysia oblanceolata* Moldenke
      24. Leaves linear to elliptic, obovate, or spatulate, usually solitary; calyx sub-actinomorphic to zygomorphic, ca. 1/4 to 1/2 the length of the corolla tube
        25. Midstem leaves mostly linear to narrowly elliptic (8:1-3:1, L:W), basally acute, apically acute; calyx sub-actinomorphic. . . . . *Aloysia gratissima* (Gill. & Hook.) Tronc.
        25. Midstem leaves mostly spatulate, obovate to elliptic (2:1-3:2, L:W), basally attenuate, apically rounded to sub-acute, if acute then leaf margins serrate; calyx zygomorphic and laterally bilabiate . . . . . *Aloysia lycioides* Cham.
  22. Leaf margins regularly serrate, crenate, or dentate
    26. Calyx lobes linear to acuminate, equaling to exceeding calyx tube in length; leaves lanceolate to ovate, apically acute to acuminate . . . *Aloysia virgata* (Ruiz & Pav.) Moldenke
    26. Calyx lobes acute, <1/2 the calyx tube in length; leaves ovate to elliptic, apically more or less rounded
      27. Leaves bullate, margins prominently dentate, revolute, teeth spreading; bracts prominent, foliaceous, ovate to obovate. . . . . *Aloysia castellanosi* Moldenke
      27. Leaves flat to rugose, margins crenate, dentate, or serrate; bracts reduced, linear, lanceolate or lance-ovate
        28. Leaves rugose, margins crenate to crenate-dentate . . . . . *Aloysia scorodonioides* (Kunth) Moldenke
        28. Leaves essentially flat, if somewhat rugose then basally entire
          29. Calyx tubular; corolla tube <2 times as long as calyx, including the lobes; stems densely strigulose . . . . . *Aloysia minthiosa* Moldenke
          29. Calyx campanulate; corolla tube 2-4 times as long as the calyx, including the lobes; stems sparsely puberulent or setose
            30. Leaves elliptic, margins basally entire, serrate medially to distally . . . . . 1. *Aloysia arequipensis*, sp. nov.
            30. Leaves ovate, margins dentate from base to apex . . . . . *Aloysia peruviana* (Turcz.) Moldenke

**1. *Aloysia arequipensis* Siedo, sp. nov.**  
(Fig. 1).

TYPE: PERÚ. AREQUIPA: Mpio. Arequipa; Tiabaya; open, rocky slope, 8 Apr 1925, *F. W. Pennell 13079* (HOLOTYPE: NY!; ISOTYPES: F!, GH!, S!).

*Aloysia scorodonioides* similis; frutex sub 0.5 m; ramulis gracilibus, quadrangulatis vel rotundatis; petiolis 1.0-2.0 mm longis; laminis anguste elliptis, 1.0-1.5 cm longis, basim cuneatis, marginibus crenato-serratis; inflorescentiis racemis spiciformibus cylindricis congestis,

2.0-4.0 cm longis; pedunculis ca. 1 cm longis; calycibus quadrilobus campanulatis.

Similar to *Aloysia scorodonioides*; shrub under 0.5 m; stems gracile, four-angled to rounded; petioles 1.0-2.0 mm long; laminae narrowly elliptic, 1.0-1.5 cm long, base cuneate, margins crenate-serrate; inflorescence a spicate raceme, cylindrical, congested, 2.0-4.0 cm long; peduncle ca. 1 cm long; calyx four-lobed, campanulate.

SHRUBS 0.5-1.5 m in height. LEAVES opposite, rarely 3-whorled; petioles 1-2 mm long; laminae 1-2 cm long, 0.5-1.2 cm wide,



FIG. 1. Holotype of *Aloysia arequipensis* sp. nov. (NY).

elliptic, margins finely serrate along apical 2/3 to 1/2, basally entire, adaxially strigose, abaxially tomentose, with an understory of sub-sessile, glandular trichomes. INFLORESCENCE more or less loosely spicate, mostly terminal; peduncle 0.5–2.0 cm long, densely strigulose with an understory of sub-sessile, glandular trichomes; rachis 1.5–5.0 cm long, densely strigulose with an understory of sub-sessile, glandular trichomes. BRACTS reduced, lance-elliptic, 1–3 mm long, 0.5–1.0 mm long, apically acute to short-acuminate, strigulose, with an understory of sub-sessile, glandular trichomes. CALYX sub-actinomorphic, campanulate, setulose to setose, with an understory of sub-sessile, glandular trichomes; lobes 4, triangular. COROLLA weakly zygomorphic, lavender to pink, often with a whitish limb; tube 2–3 mm long, pubescent with an understory of sub-sessile, glandular trichomes present distally; limb 3–4 mm wide. STIGMA sub-capitate, apically disposed, lobes obscure. FRUIT obovoid, 1.0–1.5 mm long, 1.0–1.5 mm wide, glabrous, apically bilobed, lobes 0.2–0.5 mm; intermericarpal cavity reduced, surface papillate.

ADDITIONAL SPECIMENS EXAMINED: **PERÚ. AREQUIPA:** Mpio. Arequipa; 12 km S of Arequipa, in rocky gulch, 14 Sep 1938, *W. J. Eyerdam & A. A. Beetle* 22129 (GH, UC); encima de los Baños de Jesús, ladera rocosa, 2600–2700 m, 23 Apr 1961, *R. Ferreyra* 14253 (MO); Tingo, open, rocky slope, 8 Apr 1925, *F. W. Pennell* 13134 (F, NY, S, US); Arequipa, slopes of Pichu Pichu, Feb 1943, 9500 ft [2895.5 m], *C. Sandeman* 3835 (F); Arequipa, lower slope of El Misti in volcanic ash, 22 Mar 1951, *S. Saunders* 102 (TEX); Cerros de Jesús, 10 Apr 1959, *C. Vargas C.* 12671 (US); Quequena, arenoso, 17 Mar 1967, *C. Vargas C.* 19146 (LL). Mpio. Castilla; Quebrada de San Lorenzo, near Arequipa, rocky wall, 11 Mar 1939, *P. A. Munz* 15509 (NY-2). **LIMA:** Mpio. Yauyos; Aiza, entre Catahuas y Tupe, Pradera, 30 Jan 1952, *E. Cerrate* 1282 & *O. Tovar* 696 (MO, SI).

*Aloysia arequipensis* is morphologically similar to *A. scorodonioides* (Kunth) Mol-

denke from which it is readily distinguished by inflorescence, flower and leaf morphology; the former has inflorescences with somewhat congested flowers, corolla tubes that are two to four times the length of the calyx, and elliptic leaves which are basally entire and finely serrate along the distal two-thirds, the latter has inflorescences with somewhat congested to loosely arranged flowers, corolla tubes that are less than two times the length of the calyx, and ovate to orbicular leaves with crenate to crenate-dentate margins. *Aloysia arequipensis* is native to arid climates in the states of Arequipa and Lima, Peru at elevations of 2000–3000 m. It flowers from spring to fall and reportedly has a “thyme-like scent” (*Sandeman* 3835).

**2. *Aloysia coalcomana* Siedo, sp. nov.**  
(Fig. 2).

TYPE: **MÉXICO. MICHOACÁN:** Mpio. Coalcoman de Matamoros; Sierra Naranjillo, Coalcoman, 1550 m, woods, frequent, 11 Mar 1941, *Hinton et al.* 15766 (HOLOTYPE: LL!; ISOTYPES: G!, MICH!, NY!, S!, UC!, W!).

*Aloysia nahuire* similis; frutex sub six metralis; ramulis gracilibus, quadrangulatis vel rotundatis; petiolis 0.6–1.0 cm longis; laminis anguste lanceolatis elliptis 6–10 cm longis, 2–3 cm latis, basim rotundus, marginibus serratis; inflorescentiis racemis spiciformibus congestis, pedunculis 1–5 cm longis, rachidibus 1.5–4.0 cm longis; pedicelis 2–3 mm longis; bracteolis conspicuis anguste elliptis vel elliptis, 4–6 mm longis, 1.5–2.0 mm latis; calycibus bilobis.

Similar to *Aloysia nahuire*; shrub under six meters; stems gracile, four-angled to rounded; petioles 0.6–1.0 cm long; laminae narrowly lanceolate-elliptic, 6–10 cm long, 2–3 cm wide, base rounded, margins serrate; inflorescence a spicate raceme, congested, peduncles 1–5 cm long, rachis 1.5–4.0 cm long; pedicels 2–3 mm long; bracts conspicuous, narrowly elliptic to elliptic, 4–6 mm long, 1.5–2.0 mm wide; calyx bilobed.

SHRUB to SMALL TREE up to 6 m in height. LEAVES opposite; petioles 0.6–1.0 cm long; laminae 6–10 cm long, 2–3 cm wide,



FIG. 2. Holotype of *Aloysia coalcomana* sp. nov. (LL).



narrowly lance-elliptic, margins finely serrate, revolute, adaxially scabrous, abaxially sparsely villous, with an understory of sub-sessile, glandular trichomes. INFLORESCENCE compactly spicate; peduncle 1–5 cm long, antrorsely strigulose mixed with long-stalked, glandular trichomes; rachis 1.5–4.0 cm long, antrorsely strigulose mixed with long-stalked, glandular trichomes; pedicels 2–3 mm long. BRACTS foliaceous, narrowly elliptic to elliptic, 4–6 mm long, 1.5–2.0 mm wide, apically acuminate, tip usually revolute, strigulose. CALYX bilobed, 1.5–2.5 mm long, externally setose, glandular, lobes apically rounded, margins ciliate. COROLLA zygomorphic; tube 2.0–2.5 mm long, strigulose distally; limb 2–3 mm wide, lateral lobes glabrous, superior and inferior lobes strigulose. STIGMA subcapitate, laterally disposed. FRUIT obovoid, 1.5–2.0 mm long, 1.5–2.0 mm wide, glabrous, apically bilobed, lobes 0.1–0.2 mm long; intermericarpal cavity enlarged, the surface papillate.

*Aloysia coalcomana* is known from a single collection in the mountains known as the Sierra Naranjillo in the Municipio of Coalcoman de Matamoros, Michoacán, México. It is morphologically similar to *A. nahui* Moldenke from which it is readily distinguished by its habitat, habit, pedicels, and floral bracts; the latter is a shrub of low elevation, coastal thorn forests 1–4 m tall with pedicels 0.5 to 1.0 mm long and ovate bracts 8–10 mm long. *Aloysia coalcomana* is a shrub or small tree of high elevation, montane woodlands up to 6 m tall with pedicels 2–3 mm long and elliptic bracts 4–6 mm long. The novelty appears to flower in the spring and was reportedly common in the area at the time of collection (Hinton *et al.* 1976). The area of the type locality was visited on March 16, 1999. Unfortunately, much of the area in the mountains had been cleared and little undisturbed vegetation remained. The area along the highway between Coalcoman de Matamoros and Villa Victoria was surveyed for several hours, but

neither the woodland described on the original collection label nor any specimens of *Aloysia* were encountered.

### 3. *Aloysia cordata* Siedo, sp. nov. (Fig. 3).

TYPE: **BRAZIL. PARANÁ:** Mpio. São José dos Pinhães; Río Pequeno, do brejo, 17 Jan 1969, G. Hatschbach 20792 (HOLOTYPE: NY!; ISOTYPES: K!, MICH!, MO!, UC!).

*Aloysia brasiliensis* similis; frutex 1–2 m; ramulis glabris, gracilibus; foliis ternatis et sessilibus; laminis cordatis, glabris; marginibus minutae-scabrosis, basim cordatis, apicem subapiculatis; inflorescentiis racemis spiciformibus laxis; corollis lilacinus.

Similar to *Aloysia brasiliensis*; shrub 1–2 m; stems glabrous, gracile; leaves ternate and sessile; laminae cordate, glabrous; margins minutely scabrous, base cordate, apex subapiculate; inflorescence a spicate raceme, lax; corolla lilac.

SHRUB 1–2 m in height, slender, few-branched. LEAVES 3-whorled, antrorsely adpressed, internodes highly regular in length, sessile; laminae cordate, sclerophyllous, 0.3–1.0 cm long, 0.3–0.9 cm wide, margins entire, minutely scabrous, basally cordate, apically mucronulate, adaxially glabrous, smooth, lustrous, abaxially glabrous, smooth, satin-lustrous. INFLORESCENCE loosely spicate; peduncle 1–3 cm long, strigulose; rachis 4–12 cm long, strigulose; pedicels 0.5–1.0 mm long. BRACTS reduced, linear to lanceolate, 1.0–1.5 mm long, ca. 0.5 mm wide, acuminate, strigulose. CALYX zygomorphic, tubular; 1.5–2.0 mm long, setose, glandular, lobes 4, trullate, acute. COROLLA sub-actinomorphic, lilac; tube 2.5–3.5 mm long, sparsely villous apically; limb 2–3 mm wide. STIGMA capitate, apically disposed, lobes oblique. FRUIT obovoid, 1.0–1.5 mm long, 1.0–1.5 mm wide, glabrous, apically weakly bilobed, lobes less than 0.1 mm; intermericarpal cavity reduced, surface smooth.

ADDITIONAL SPECIMENS EXAMINED: **BRAZIL. PARANÁ:** Mpio. Piraquara; Novo Tirol, local

FIG. 3. Holotype of *Aloysia cordata* sp. nov. (NY).

brejoso, raro, 27 Nov 1964, *G. Hatschbach* 11896 (F, MBM); S. Maria, 11 Oct 1969, *G. Hatschbach* 22418 (UC). Mpio. Quatro Barras; Quatro Barras, 22 Apr 1961, *G. Hatschbach* 8437 (LL). Mpio. São José dos Pinhais; Rio Pequeno, brejo, 4 Mar 1980, *G. Hatschbach* 42775 (MBM); Rio Pequeno, 27 Apr 1988, *G. Hatschbach* 51984 w/J. Cordeiro (BM, S); Rio Pequeno, brejo, solo turfoso, 23 Nov 1989, V. Nicolack 87 w/J. Cordeiro (W). Mpio. Teixeira Soares; Florestal 29 km para leste de Curitiba, estrada C[uritiba]-Paranaguá, campo limpo, em lugares aguados num corrego pantanoso, isolado e raro, 12 Dec 1947, *G. Tessmann* 2741 (NY).

*Aloysia cordata* is readily distinguished from all other members of the genus by its ternately arranged, sessile, sclerophyllous, cordate, and glabrous leaves with minutely scabrous margins. It is morphologically similar to *A. polygalifolia* Cham. and *A. brasiliensis* Moldenke since all have ternately arranged, somewhat sclerophyllous leaves with strongly to weakly revolute margins. However, the former taxon has sessile, truncate to subcordate, and adaxially scabrous leaves while the latter has petiolate, rounded to acute, and adaxially scabrous leaves. *Aloysia cordata* is endemic to the eastern part of the state of Paraná, Brazil in the area between the cities of Curitiba and Paranaguá in low elevation marshy or swampy habitats, usually in riverine settings. It flowers in the early part of the summer from October to January and is reportedly rare when encountered (*Hatschbach* 20792, 11896, and *Tessmann* 2741).

#### 4. *Aloysia velutina* Siedo, sp. nov. (Fig. 4).

TYPE: PERU. CAJAMARCA: Mpio. Cajamarca; sobre el km 156 de la carretera Pacasmayo-Cajamarca, bosque espinoso, 2000 m, 5 Apr 1982, *I. Sanchez Vega* 2763 (HOLOTYPE: F!; ISOTYPES: MO!, SI!).

*Aloysia scorodonioides* similis; ramulis velutinis, gracilibus; foliis oppositis; laminis ovatis vel ellipticis, 3.5–6.0 cm longis, 1.7–5.0 cm latis, supra velutinis, infra incanis; inflorescentiis paniculiformibus terminalibus, rachidibus incanis; schizocarpis bilobis, apicem setulosis.

Similar to *Aloysia scorodonioides*; stems velutinous, gracile; leaves opposite; laminae ovate to elliptic, 3.5–6.0 cm long, 1.7–5.0 cm

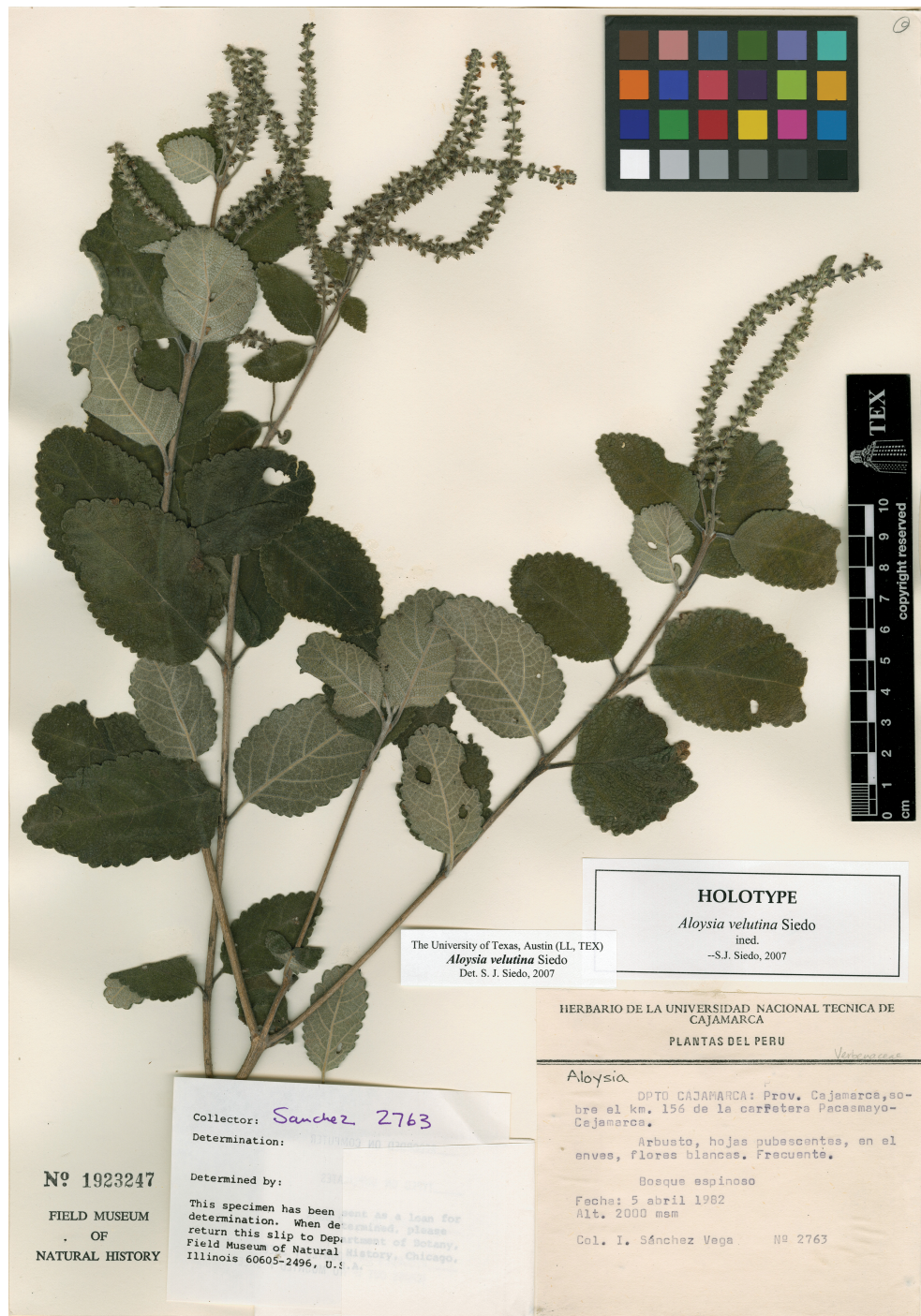
wide, adaxially velutinous, abaxially incanous; inflorescence paniculate, terminal, rachis incanous; schizocarp bilobed, apex setose.

SHRUB 1.0–1.5 m in height. LEAVES opposite; petioles 0.3–1.0 cm long; laminae ovate to elliptic, 3.5–6.0 cm long, 1.7–5.0 cm wide, margins crenate, basally truncate to rounded, apically rounded, obtuse, to subacute, adaxially velutinous, abaxially incanous. INFLORESCENCE loosely paniculate, composed of spicate racemes, terminal, determinate; peduncle 1–3 cm long, incanous; rachis 8–15(–25) cm long, incanous; pedicels 0.2–0.5 mm long. BRACTS reduced, lanceolate, midrib present, 2.0–2.5 mm long, 0.3–0.5 mm wide, acuminate, strigulose, margins prominently ciliate. CALYX weakly zygomorphic, tubular, 2.0–2.5 mm long, densely setose with an understory of subsessile, glandular trichomes; lobes 4, trullate, acute to short acuminate. COROLLA subactinomorphic, white; tube 2.5–3.0 mm long, pubescent with understory of subsessile, glandular trichomes, at least distally; limb 2.5–3.5 mm wide, basally pubescent with an understory of sub-sessile, glandular trichomes. STIGMA sub-capitate, laterally disposed. FRUIT obovoid, 1.5–2.0 mm long, 1.0–1.5 mm wide, apically setulose, bilobed, lobes 0.1–0.3 mm long; intermericarpal cavity reduced, the surface papillate.

ADDITIONAL SPECIMENS EXAMINED: PERU. CAJAMARCA: Mpio. Cajamarca; km 131 on Highway from near Pacasmayo to Cajamarca, low dense forest on steep limestone slopes, 1000–1500 m, 4 Jan 1983, *W. D. Stevens* 22046 (K, MO). Mpio. Contumazá; ca. 2 km from Contumazá on route to Cascas, 2620 m, 15 Apr 1986, *M. O. Dillon et al.* 4544 (F); alrededores de Contumazá, ladera, 2600 m, 25 May 1981, *A. Sagástegui A. et al.* 9843 (GH, MBM, MO, SI); alrededores de Contumazá, ladera, 2650 m, 15 Apr 1994, *A. Sagástegui A. et al.* 15634 (F); alrededores de Contumazá, salida a Chilete, ladera, 2700 m, 5 Apr 1996, *A. Sagástegui A. et al.* 15867 (F); sobre la ruta Contumazá-Chilete, cerca a la Fila de las Pencas, ladera de arbustos, 2700–2750 m, 3 Jul 1983, *I. Sánchez Vega* 3170 (F).

*Aloysia velutina* is distinctive in having an inflorescence composed of indeterminate



FIG. 4. Holotype of *Aloysia velutina* sp. nov. (F).

spicate racemes arranged into a terminal paniculate synflorescence; a similar structure is seen in only three other species: *A. citrodora*, *A. fiebrigii*, and *A. herrerae*. The latter taxa have little else in common with the novelty and are readily distinguished by the characters used in the key. The species most similar morphologically to *A. velutina* is *A. scorodonioides*, which it is distinguished by inflorescence structure, fruit morphology and overall pubescence. The former taxon has a terminal paniculate synflorescence, apically pubescent mericarps and densely velutinous to incanous vestiture, the latter has solitary inflorescences of spicate racemes arranged along the distal portion of an indeterminate branch, glabrous mericarps and strigulose to scabrous pubescence. The novelty is endemic to the dense woodlands in the area from Contumazá north to Chilete, Cajamarca, Peru at elevations of 2000–2800 m. It flowers in the fall from April to July and at least one collector reports it is locally common (*Sanchez Vega* 2763 and 3170).

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