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NEW SERIES, NO. 35

FLORA OF PERU

J. Francis Macbride and Collaborators

Family Asteraceae: Part VI

Ramón Ferreyra

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I. The forest structure, physiognomy, and floristics. *Journal of Ecology*, 51: 567-601.

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Murra, J. 1946. The historic tribes of Ecuador, pp. 785-821. In Steward, J. H., ed., *Handbook of South American Indians*. Vol. 2, *The Andean Civilizations*. Bulletin 143, Bureau of American Ethnology, Smithsonian Institution, Washington, D.C.

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FIELDIANA

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FLORA OF PERU

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Ramón Ferreyra

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FLORA OF PERU

Family Asteraceae: Part VI

Abstract

The tribe Mutisieae (Asteraceae) is treated for Peru and includes 21 genera, 121 species, and 7 varieties. Keys to genera, species, and varieties, descriptions, and illustrations are provided for *Arnaldoa* (3 spp.), *Barnadesia* (13 spp.), *Chaetanthera* (4 spp.), *Chaptalia* (10 spp.), *Chucoa* (1 sp.), *Chuquiraga* (5 spp.), *Dasyphyllum* (8 spp.), *Fulcaldea* (1 sp.), *Gerbera* (1 sp.), *Gochnatia* (4 spp.), *Jungia* (10 spp.), *Leucheria* (1 sp.), *Lycoseris* (2 spp.), *Mutisia* (15 spp.), *Onoseris* (18 spp.), *Perezia* (7 spp.), *Plazia* (2 spp.), *Polyachyrus* (3 spp.), *Proustia* (5 spp.), *Trichocline* (2 spp.), and *Trixis* (6 spp.). The generic limits of *Proustia* are here expanded to include species previously accepted in *Lophopappus* and require the following new combinations: *P. berberidifolia* (Cabr.) Ferreyra, *P. foliosa* (Rusby) Ferreyra, and *P. peruviana* (Cabr.) Ferreyra. Lectotypification is provided for *Dasyphyllum ferox* (Wedd.) Cabr. and *Plazia daphnoides* Wedd.

Tribe MUTISIEAE

Mutisieae Cass., J. Phys. Chem. Hist. Nat. Arts 88: 199. 1819. TYPE: *Mutisia* L. fil.

Annual or perennial **herbs**, **lianas**, **shrubs**, or **small trees**. **Leaves** alternate and cauline, or confined to a basal rosette, rarely opposite. **Capitulum** solitary heads, sessile, pedunculate, or scapose, or several-headed panicles or cymes, occasionally glomerulate in pseudocephalia or synflorescences. **Capitula** homogamous, discoid, or heterogamous, radiate to disciform; involucre globose to cylindrical; receptacles flat or convex, naked (paleate in *Jungia*, *Arnaldoa*), foveolate, or hispid-fimbriate or glandular pubescent; phyllaries (1)–2–12(–14)–seriate, usually unequal, usually imbricate; florets iso-, di-, or trimorphic, the corollas bilabiate, the outer lip ligulate, 3–4-lobed to 3–4-dentate, the interior lip single or of 2 fused or unfused lobes; or actinomorphic, tubular, the limb 5-lobed, the lobes equal to subequal; anthers

with truncate to pointed terminal appendage, the bases usually caudate with long tails (ecaudate in *Barnadesia*), the tails sometimes fringed at the tips; style branches short, truncate or obtuse to rounded or acute, penicillate, papillose, or glabrous. **Achenes** columnar, turbinate, or fusiform, ribbed to costate or smooth, sericeous, glandular, or glabrous; pappus of bristles, usually 1–2-seriate, scabrid, barbellate, or plumose, or occasionally scalelike, flattened, or setaceous, glabrous to hirtellous.

Mutisieae (*sensu lato*) contains 89 genera with over 975 recorded species in tropical and subtropical America, Africa, Asia, Australia, and Hawaii (Cabrera, 1977). It is predominantly a Neotropical tribe with greatest generic representation in South America, where no fewer than 65 of its genera occur. The tribe contains endemic genera in several other areas—for example, North America (5 genera), Asia (5 genera), Australia (1 genus), Africa (10 genera), and several Pacific Islands (1 genus). Western South America is a center of high generic diversity; the Andean Cordillera contains over 30 genera with distributions generally above 2000 m. Peru is particularly rich with 21 genera and over 120 species distributed in various ecosystems of the Coast, Sierra, and Selva. Species diversity and distribution patterns are quite variable; intermontane valleys and the ceja de la montaña are richest in taxa. Fewer than six species are found in the more humid tropics of the Amazon basin of eastern Peru (e.g., *Barnadesia caryophylla*, *Chaptalia nutans*, *Lycoseris* spp., *Trixis divaricata*). *Gerbera* is predominantly an Asian and African genus, with only one species cultivated in Peru. Diversity within genera is also variable; the monotypic genus *Chucoa* is endemic to a single valley in northern Peru, whereas *Onoseris* and *Trixis* each occur in both hemispheres from the United States to the Patagonian region of Argentina and Chile. Some pairs of genera and species exhibit overall morphological convergence. *Fulcaldea* and *Barnadesia*, *Chuquiraga* and *Dasyphyllum*, and even *Chuquiraga spinosa* and *Chuquiraga johnstonii* are quite similar as herbarium specimens but easily distinguishable in the field. The color of the corolla is an important character,

particularly within species with close resemblance—for example, both *Mutisia pulcherrima* and *M. wurdackii* are quite similar lianas, but the former has orange corollas and the latter red.

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Key to Genera of Mutisieae in Peru

The following artificial generic key is adapted from that presented by Cabrera (1977) and will allow determination of representatives treated here but may not function for taxa outside of Peru.

1. Disc florets more or less actinomorphic, deeply 5-lobed or 5-cleft, with equal or unequal segments, occasionally weakly zygomorphic with single lobe opposite a 4-lobed segment, *never* truly bilabiate (i.e., 3 lobes opposite 2 lobes); ray florets, when present, bilabiate or subligulate 2
2. Disc florets with corollas usually villous; pappus of plumose bristles (setaceous to barbellate in *Barnadesia*); axillary or nodal spines frequently present (rarely reduced or absent, e.g., *Chuquiraga* or *Dasyphyllum* spp.) [Barnadesiinae] 3
3. Capitula with 1 disc floret and lacking ray florets *Fulcaldea*
3. Capitula with 2 or more disc florets; if fewer than 2 disc florets then accompanied by 8 or more ray florets (cf. *Barnadesia macbridei*) 4
4. Capitula heterogamous; anthers ecaudate and obtuse to rounded basally *Barnadesia*
4. Capitula heterogamous; anthers caudate to sagittate at base 5
5. Corollas zygomorphic, the limb deeply divided (4 lobes/1 lobe) or subligulate; involucre 25–60 mm high; phyllaries 10–13-seriate; florets 50–150; corollas orange to red *Arnaldoa*
5. Corollas actinomorphic, the limb equally to subequally 5-lobed; involucre 25–35(–50) mm high; phyllaries 5–8(–12)-seriate; florets 10–50; corollas yellow to orange or white to violet 6
6. Leaves 1-nerved; corollas yellow to orange; anthers long-tailed, apical appendages entire, linear-lanceolate, apically acute to obtuse *Chuquiraga*
6. Leaves 3–5-nerved; corollas white to violet; anthers short-tailed, apical appendages usually bifid, occasionally emarginate or truncate *Dasyphyllum*
2. Disc florets with corollas usually glabrous or at most puberulent; pappus of bristles, scabrous to barbellate, never truly plumose; branches lacking axillary or nodal spines [Gochnatiinae] 7
7. Plants dioecious; i.e., capitula functionally unisexual, radiate *Lycoseris*
7. Plants monoecious; i.e., capitula functionally bisexual, discoid or radiate 8
8. Disc florets actinomorphic or slightly zygomorphic, the corollas 5-lobed or 5-dentate, the lobes or teeth *less than* 1/3 the length of the entire corolla 9
9. Shrubs; leaf blades oblanceolate, the margins strongly dentate, the 4–6 pairs of teeth spinulose; capitula homogamous, discoid; florets with yellow corollas; achenes glabrous or papillose *Chucoa*
9. Annual or perennial herbs, subshrubs, shrubs, lianas; leaf blades linear to cordiform, the margins entire to incised or lyrate-lobed, never with 4–6 pairs of spinulose teeth; capitula heterogamous, radiate; disc florets with yellow corollas; ray florets with purple to violet corollas; achenes pubescent, glabrescent, or rarely glabrous *Onoseris*

8. Disc florets actinomorphic, the corollas deeply 5-lobed, the lobes linear and *greater than* $\frac{1}{3}$ the length of the corolla 10
 10. Leaves in dense whorls at branch apices; involucre 18–22 mm high; achenes glabrous or glandular pubescent *Plazia*
 10. Leaves evenly spaced on stems, not densely clustered at apices; involucre 8–12 mm; achenes densely sericeous or glandular *Gochnatia*
1. Disc florets zygomorphic, the corollas clearly bilabiate with the outer lip 3-dentate and the interior lip simple or bifid (for exceptions see *Proustia*), or ligulate with 5-dentate ligule; ray florets bilabiate, ligulate 11
 11. Style branches apically acute to rounded, dorsally glabrous or papillose but lacking conspicuous ring of collecting trichomes [Mutisiinae] 12
 12. Plants perennial herbs; leaves oval to lanceolate or lyrate-pinnatifid in basal rosette; capitulescences scapose; capitula borne singly (rarely 2–3) on elongate peduncles 13
 13. Capitula nutant or rarely erect; florets typically trimorphic; ray florets equalling or rarely exceeding the involucre, staminodia absent *Chaptalia*
 13. Capitula erect; florets dimorphic; ray florets clearly exceeding involucre, staminodia present 14
 14. Peduncles bracteate, tomentose; achenial pubescence of 2 types: biseriate trichomes (Zwillingshaare), the hair shaft typically oblong to spatulate, often appearing inflated, the apices rounded to obtuse, and biseriate, multicellular glandular trichomes *Trichocline*
 14. Peduncles ebracteate, villous; achenial pubescence of only 1 type: biseriate trichomes (Zwillingshaare), the hair shaft typically linear-elongate and tapering, the apices attenuate to acute, lacking biseriate, multicellular glandular trichomes *Gerbera*
 12. Plants subshrubs, lianas, or perennial or annual herbs; leaves not disposed in basal rosettes; capitulescences axillary and terminal, never scapose 15
 15. Small annual or perennial herbs (rarely subshrubs); leaves simple, linear to spatulate, never with tendril at apex *Chaetanthera*
 15. Shrubs or lianas; leaves generally pinnately compound, if simple then usually possessing apical tendril *Mutisia*
 11. Style branches apically truncate (rounded in *Proustia*), usually with a crown of collecting trichomes (penicillate) [Nassauviinae]¹ 16
 16. Leaf blades oblong-lanceolate to orbicular-cordate; receptacles paleate; corollas usually white, yellow, or occasionally pink, lilac, or violaceous *Jungia*
 16. Leaf blades variously linear, lanceolate, oblong, ovate, or lyrate-pinnatifid, *never* truly orbicular-cordate in outline; receptacles fimbriate or naked; corollas yellow or orange, blue, purple or violet, or rarely white to pink 17
 17. Capitulescences glomerulate in pseudocephalia or synflorescences of 9 or more heads *Polyachyrus*
 17. Capitulescences of solitary heads, or cymes to panicles, never glomerulate in synflorescences 18
 18. Shrubs or vines; corollas yellow, whitish yellow, or yellow-orange *Trixis*
 18. Shrubs without yellow florets, or perennial or annual herbs with corollas white, blue, lavender, or violet 19
 19. Shrubs or subshrubs, occasionally with infrapetiolar spines; leaves simple, the margins entire to denticulate; capitulescences solitary or 2–4 heads at apex of branchlets, or panicles or racemes of spikes; capitula with 15 or fewer florets; corollas white to lavender *Proustia* (including *Lophopappus*)

¹ *Proustia* (including *Lophopappus*) is included within the Nassauviinae on the basis of pollen type and is a notable exception in possessing actinomorphic disc florets and rounded, dorsally pubescent style branches (Cabrera, 1977).

19. Perennial herbs, caulescent or scapose; leaves typically in a basal rosette, the margins entire, lobed, or pinnatisect; capitulescences cymose-corymbose or, rarely, solitary; capitula with 15–150 florets; corollas white to blue 20
 20. Corollas white; pappus of plumose bristles *Leucheria*
 20. Corollas violet to blue; pappus of scabrid or barbellate bristles
 *Perezia*

I. ARNALDOA

Arnaldoa Cabr., Bol. Soc. Argent. Bot. 10: 39. 1962.
 TYPE: *Arnaldoa magnifica* Cabr. = *Arnaldoa weberbaueri* (Muschl.) Ferreyra

Shrubs to 5 m tall, much-branched, the branches usually spiny at least below, the nodal spines geminate, divergent, fuscous. **Leaves** alternate, petiolate; blades oblong- to ovate-elliptic, coriaceous, the abaxial surfaces with midrib prominent, penninerved with 2–3 pairs of secondary veins, the margins entire. **Capitulescences** of solitary, terminal heads. **Capitula** homogamous, discoid, sessile; involucre broadly campanulate; receptacles plane, paleate, the pales yellowish; phyllaries 10–13-seriate, acuminate; florets isomorphic, hermaphroditic, the corollas orange or red, bilabiate, the outer lip liguliform, 5-nerved, apically 4-lobed, the inner lip filiform; anthers sagittate; styles cylindrical, 30–32 mm long, the branches small, apically acute. **Achenes** turbinate or cylindrical; pappus of plumose bristles, yellowish.

Key to Species of *Arnaldoa*

1. Branches hirsute or tomentose; leaves pubescent; corollas orange *A. weberbaueri*
 1. Branches glabrous; leaves glabrescent; corollas red 2
 2. Upper branches spiny, spines ca. 38 mm long; apex of leaves spinulose; capitula to 60 mm *A. coccinosantha*
 2. Upper branches usually without spines, rarely with few spines to 22 mm long; apex of leaves obtuse mucronate or emarginate; capitula ca. 30 mm *A. macbrideana*

1. *Arnaldoa coccinosantha* (Muschl.) Ferreyra, Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot. 19: 4. 1965.

Barnadesia coccinosantha Muschl., Bot. Jahrb. Syst. 50, Beibl. 111: 98. 1913. TYPE: Peru, Ancash, Huari, Chavín de Huantar, *A. Weberbauer 3295* (holotype, B, presumably destroyed; isotype, USM; isotype fragment ex W, F; photograph ex B, FM neg. 15908; photograph ex W, FM neg. 52100).
Chuquiraga coccinosantha (Muschl.) Chung, Rev. Barnadesia 7. 1965.

Arnaldoa consists of three species, all confined to central and northern Peru. The genus is most easily recognized by its large, homogamous capitula with zygomorphic corollas. It shares relationships with the other members of the subtribe Barnadesiinae, including *Barnadesia*, *Chuquiraga*, and *Dasyphyllum*.

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Arnaldoa peruviana López & Sagást., Revista Fac. Ci. Biol. Univ. Nac. Trujillo 1(1): 12. 1964. TYPE: Peru, Dept. La Libertad, Patáz, entre Huaylillas y Tayabamba, *A. López M.* & *A. Sagástegui A. 3410* (holotype, HUT).

Shrubs 15–20 dm high, the branches striate, glabrescent, spiny, the spines to 35 mm long. **Leaves** with petioles 2–5 mm long, sericeous; blades oblong to ovate-elliptic, 30–50 mm long, 12–32 mm wide, obtuse, mucronate. **Capitula** with involucre 50–60 mm high, 30–38 mm wide, campanulate;

phyllaries 11–12-seriate, the inner linear, 45–50 mm long, 1.8–3 mm wide, attenuate at apex, sericeous outside, the outer ovate triangular, 8–10 mm long, 3.5–4 mm wide, acute, lanuginous outside; florets ca. 145, the corollas red, 45–50 mm long, the tube 6–8 mm long, the outer lip 35–42 mm long, 3.8–5 mm wide, pubescent outside, the inner lip 35–40 mm long; anthers 9–9.5 mm long. **Achenes** cylindrical, 9–11 mm long, 1.8–2.2 mm wide, pubescent, costate; pappus ca. 30 mm long.

DISTRIBUTION—Native to the intermontane region of northern Peru (2350–2700 m).

Arnaldoa coccinosantha is apparently quite rare and weakly distinguished from *A. weberbaueri* by its more oblong leaves and deep red corollas. It is quite distinct from *A. macbrideana*, with much larger capitula and leaves than that species, but it does share that species' reddish corollas.

LA LIBERTAD, Patáz: Chagual, Huaquil-Tayabamba, López & Sagástegui 8159 (GH, MO); Huancasapata-Mamahuaje, López & Sagástegui 8218 (GH, MO).

2. *Arnaldoa macbrideana* Ferreyra, Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot. 19: 6. 1965. TYPE: Peru, Piura, Huancabamba, near Abra Porculla, R. Ferreyra & J. J. Wurdack 14415 (holotype, USM).

Dasyphyllum barbatum Chung, Phytologia 14: 321. 1967. TYPE: Peru, Dept. Lima, Botanical Garden, cultivated, 7 Aug 1945, R. J. Seibert 2096 (holotype, US 1901491; photograph ex US, FM neg. 52103).

Shrubs 2–5 m high, the branches sericeous, spiny, the spines to 25 mm long. **Leaves** with petioles 2–6 mm long, pubescent; blades oblong-elliptic, 22–55 mm long, 18–42 mm wide, obtuse, mucronate, rarely emarginate, sericeous. **Capitula** with involucre 25–30 mm high, 14–18 mm wide, campanulate; phyllaries 10–11-seriate, the inner linear, 22–25 mm long, 1.2–1.8 mm wide, acute, glabrescent, the margins pubescent, the outer triangular, 6–6.5 mm long, 4.5–4.8 mm wide, acute, mucronate; florets ca. 68, the corollas red-purple, 19–24 mm long, the tube 6–9 mm long, the outer lip 12–14.5 mm long, 3–3.2 mm wide, acuminate, the inner lip 10–15 mm long; anthers 10–10.5 mm long. **Achenes** turbinate, 6.5–7 mm long, pubescent; pappus ca. 16 mm long.

DISTRIBUTION—Endemic to the intermontane region of northern Peru (1000–2200 m).

Arnaldoa macbrideana is distinguished by its smaller capitula with generally fewer florets (usually fewer than 70 per head) and virtually glabrous leaves.

LAMBAYEQUE, Lambayeque: Olmos-Porculla, *Ellenberg* 3723 (US), 3728 (US); W side Abra Porculla Pass km 35 E of Olmos, *Hutchison* 1379 (F, UC, US, USM); between Olmos and Abra Porculla, *Plowman* 5516 (US); road from Olmos to Pucará, km 32 E of Olmos, *Plowman et al.* 14202 (F); Abra de Porculla, km 45 E of Olmos, *Plowman et al.* 14266 (F); *Sagástegui et al.* 7140 (GH). **PIURA, Huancabamba:** near Abra Porculla, *Ferreyra* 13628 (USM), 13731 (USM). **NO EXACT LOCALITY.** Peru, "inter Bagua et Olmos," *Maekawa* 602307 (F 1615406).

3. *Arnaldoa weberbaueri* (Muschl.) Ferreyra, Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot. 19: 2. 1965. **Figure 1.**

Barnadesia weberbaueri Muschl., Bot. Jahrb. Syst. 50, Beibl. 111: 97. 1913. TYPE: Peru, Amazonas, Chachapoyas, prope Balsas, 25 Jun 1904, 2000–2100 m, *A. Weberbauer* 4278 (holotype, v, presumably destroyed; isotype, GH; photograph ex v, FM neg. 15920).

Chuquiraga muschleri Chung, Rev. Barnadesia 8. 1965. NEOTYPE (designated by Chung, 1965): Peru, Amazonas, "Balza" [Balsas], May 1877, *Vidal-Sénèze s.n.* (neotype, P, not seen; isotype fragment ex P, F, photograph ex P, FM neg. 052101), illeg. nom. nov. for *B. weberbaueri* Muschl.

Arnaldoa magnifica Cabr., Bol. Soc. Argent. Bot. 10: 39. 1962. TYPE: Peru, Cajamarca, Celendín, La Lina, Celendín-Marañón, *A. López M. & A. Sagástegui* A. 3372 (holotype, LP; isotype, HUT).

Shrubs 15–20 dm high, the branches striate, hirsute-tomentose, glabrescent, spiny, the spines to 25 mm long. **Leaves** with petioles 3–6 mm long, lanuginous; blades ovate-elliptic, 32–62 mm long, 20–40 mm wide, apex obtuse, mucronate, sericeous or lanuginous. **Capitula** with involucre 45–55 mm high, 24–30 mm wide, campanulate; phyllaries 12–13-seriate, the inner linear, 41–43 mm long, 1.5–2 mm wide, acuminate, recurved, pubescent outside, trinerved, the outer triangular, 8–9 mm long, 3–4 mm wide, acuminate, mucronate or spinulose, densely pubescent outside; florets ca. 91, the corollas orange, 32–33 mm long, the tube 3.5–4 mm long, 1.8–2 mm wide, glabrous, the outer lip of the limb 27–30 mm long, 4–5 mm wide, acute, pubescent outside, the inner lip 27–28 mm long, 1–1.2 mm wide; anthers 14–18 mm long. **Achenes** cylindrical, 8–11 mm long, 2–2.2 mm wide, pubescent; pappus ca. 22 mm long.

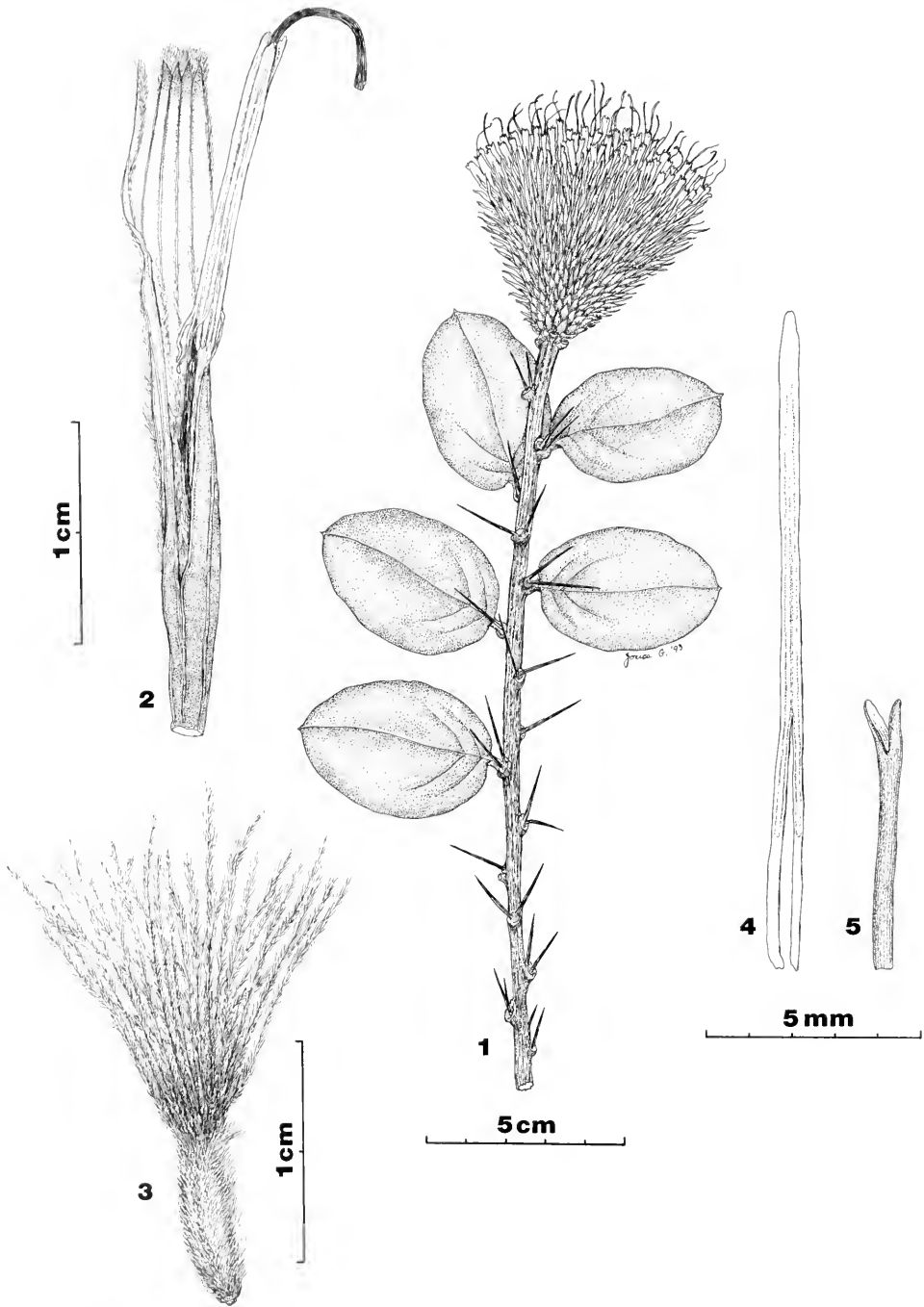


FIG. 1. *Arnaldoa weberbaueri*. 1, habit; 2, floret; 3, achene with pappus; 4, anther; 5, style apex. (Drawn from *D. N. Smith & I. Sánchez V. 4323, F.*)

DISTRIBUTION—Endemic to both sides of the valley of the Upper Río Marañón (1900–2400 m), where it grows on the steep slopes with xerophytic vegetation. *Arnaldoa weberbaueri* is distinguished by its densely sericeous or lanuginous leaves, large capitula, recurved phyllaries, and conspicuously orange corollas.

AMAZONAS. Chachapoyas: Balsas–Leimebamba, *Duncan 2602* (F, MO); western base of the Cerro Calla Calla, 22 km E of Balsas on the road to Leimebamba, *Hutchison 5454* (F, US, USM). **CAJAMARCA.** Celendín: above Hacienda El Limón, *Ferreyra 13322* (USM), *15068* (US, USM); Hacienda Limón, 10 mi W of Balsas, *Osgood & Anderson 62* (F); Hda. El Limón, *Sagástegui 7410* (F, US); Huasho, entre Gelig-Balsas, *Sánchez 339* (CPUN, F).

II. BARNADESIA

Barnadesia Mutis ex L. fil., Suppl. pl. 55, 348. 1782. TYPE: *B. spinosa* L. fil.

Shrubs or small **trees**, the branches usually with geminate or fasciculate nodes. **Leaves** alternate, often fasciculate in groups of 2–8, subsessile to petiolate; blades lanceolate to oblong-elliptic, penninerved, glabrous to sericeous, the margins entire. **Capitulescences** of solitary heads, terminal or axillary, rarely cymose or corymbose, sessile or pedunculate. **Capitula** heterogamous, radiate; involucre campanulate to cylindrical; receptacles plane, epaleate, fimbriate to villous; phyllaries 7–14-seriate, imbricate, linear or lanceolate to ovate, plane to concave, apically acute, acuminate, or long-attenuate; ray florets pistillate, 8–13, 1-seriate, the corollas red to purple, occasionally pink or white, bilabiate with outer lip liguliform, 5-nerved, apically 4-toothed, the inner lip filiform, entire, glabrous to pilose, the tube usually pubescent to villous; stamens 5, filaments free, or connate and forming a fused membranous tube, the anthers ecaudate, basally obtuse or rounded, the apical appendages linear-lanceolate, apically obtuse; styles

claviform, the branches short, rounded, papillate; disc florets hermaphroditic, 1–3, the corollas tubular, the lim 4–5-toothed, the teeth equal to unequal, rarely bilabiate, the outer lip ligulate, 4-toothed, the inner lip simple; stamens 4–5, the anthers ecaudate, basally obtuse or rounded, the apical appendages linear-lanceolate, apically obtuse; styles claviform, the branches short, rounded, papillate. **Achenes** [ray] cylindrical to turbinate, subterete to flattened, villous; pappus of bristles, plumose to barbellate, persistent, yellow to brownish-yellow; [disc] turbinate, densely villous; pappus of setae, yellowish, rigid, coiled to recurved, subulate, glabrous to hirtellous, rarely of barbellate bristles. Chromosome number: $n = 25$.

Barnadesia consists of approximately 20 species confined to the Andean Cordillera from Colombia to northern Argentina and southern Brazil. The genus records its greatest diversity in Peru with 14 species distributed from the Cordillera Occidental to the ceja de la montaña of the Cordillera Oriental (600–4100 m). Only one species, *Barnadesia carvophylla*, has a distribution at lower elevation on the eastern escarpment and into Brazil.

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Key to Peruvian Species of *Barnadesia*

1. Stamen filaments of the ray florets free and distinct, 1–5 mm long 2
2. Ray florets 8; disc floret 1 3
 3. Capitula 40–55 mm high, 10–12 mm wide *B. berberoides*
 3. Capitula 25–30 mm high, 5–8 mm wide 4
 4. Leaf blades linear to lanceolate, 15–25 mm long, 3–5 mm wide *B. horrida*
 4. Leaf blades oblong-elliptic, 15–60 mm long, 11–21 mm wide *B. macbridei*
2. Ray florets 13; disc florets 3 5
 5. Phyllaries 6–8-seriate *B. lehmannii*

- 5. Phyllaries 10–14-seriate 6
- 6. Phyllaries 13–14-seriate; inner phyllaries oblong-lanceolate, ca. 30 mm long, ca. 3 mm wide *B. hutchisoniana*
- 6. Phyllaries 10–13-seriate; inner phyllaries linear, 30–40 mm long, 1.2–2 mm wide 7
- 7. Leaf blades elliptic to obovate-lanceolate, 30–80 mm long, 11–34 mm wide; phyllaries 11–13-seriate *B. caryophylla*
- 7. Leaf blades oblong-elliptic, 12–35 mm long, 5–14 mm wide; phyllaries 10–11-seriate *B. polyacantha*
- 1. Stamen filaments of the ray florets connate and forming a fused membranous tube, 3–13 mm long 8
- 8. Ray florets 8; disc floret 1 9
- 9. Trees; leaves clearly alternate; petioles 5–30 mm long; blades (35–)60–140 mm long; capitulescences corymbose, 10–50-headed *B. corymbosa*
- 9. Shrubs; leaves fasciculate; petioles 5–7 mm long or lacking; blades 7–28 mm long; capitulescences solitary or in 3–5-headed clusters *B. jelskii*
- 8. Ray florets 13; disc florets 3 10
- 10. Plants glabrous 11
- 11. Upper branches densely spiny, the spines ca. 30 mm long; leaves elliptic *B. blakeana*
- 11. Upper branches without spines, or rarely with few spines, 4–10 mm long; leaves oblanceolate *B. wurdackii*
- 10. Plants tomentose or hirsute 12
- 12. Spines 25–50 mm long; leaves with inconspicuous lateral nerves; phyllaries 5–9-seriate, recurved *B. dombeyana*
- 12. Spines 10–18 mm long; leaves with conspicuous lateral nerves; phyllaries 9–12-seriate, erect *B. reticulata*

1. *Barnadesia berberoides* Schultz-Bip. in Lechl., *Berberid. Amer. Austral.* 57. 1857. TYPE: Peru, Puno, Agapata, 1844, *W. Lechler s.n.* (holotype, **B**, presumably destroyed; photograph ex **B**, FM neg. 15907; isotype, **K**, not seen; photograph ex **K**, FM neg. 52068). **Figure 2.**

Barnadesia macrocephala Kuntze, *Revis. gen. pl.* 3(2): 135. 1898. TYPE: Bolivia, "Sierra Colomi," 1–4 Apr 1892, 3000 m, *O. Kuntze s.n.* (holotype, **NY**; photograph ex **NY**, FM neg. 52070).

Barnadesia pycnophylla Muschl., *Bot. Jahrb. Syst.* 50, Beibl. 111: 101. 1903. TYPE: Peru, Apurimac, valley of Pieni, *A. Weberbauer 5558* (holotype, **B**, presumably destroyed; photograph ex **B**, FM neg. 15917).

Shrubs 2–6 m high, branched, the branches fuscous, hirsute, glabrescent, spiny, the spines divaricate or fasciculate, to 28 mm long. **Leaves** fasciculate, 3–5 per node, subsessile; blades lanceolate, 25–42 mm long, 8–14 mm wide, apically acute, mucronate, both surfaces sericeous. **Capitulescences** of solitary heads, terminal or axillary, sessile, occasionally weakly cymose with 2–3 heads. **Capitula** with involucre cylindrical, 40–55 mm high, 10–12 mm wide; phyllaries 9–11-seriate, the outer ovate-triangular, apex strongly spinulose, re-

curved, the inner linear, 26–49 mm long, 1.8–2.2 mm wide, acuminate, the abaxial surfaces sericeous; ray florets 8, the corollas pink-purple, 32–61 mm long, the tube 15–33 mm long, pubescent, the outer lip 15–24 mm long, 3–7 mm wide, the inner lip 10–11.5 mm long, filiform, flexuose; filaments free, the anthers 10–13 mm long; disc floret 1, the corollas 11–17 mm long, the tube 3.5–4.2 mm long, 3.8–4.5 mm wide, pubescent. **Achenes** [ray] turbinate, 3.5–5.5 mm long, 3–5.2 mm wide; pappus ca. 21 mm long; [disc] 3.2–5.5 mm long, 1.4–2.2 mm wide; pappus ca. 25 mm long.

DISTRIBUTION—Native to intermontane valleys from central Peru to northern Bolivia (3000–3700 m).

Barnadesia berberoides is distinguished by its large heads, strongly spinose and recurved phyllaries, and pink-purple corollas of the ray florets. Chung (1965) reduced *Barnadesia berberoides* to synonymy under *B. pycnophylla*; the former species was validly published, however, and is here accepted.

APURIMAC. **Abancay:** Ampay, *Stork 10615* (F). **Andahuaylas:** between Pajonal and Andahuaylas, *Hjerting & Petersen 1432* (USM). **CUSCO.** **Anta:** Sillapuyu, *Brunel*

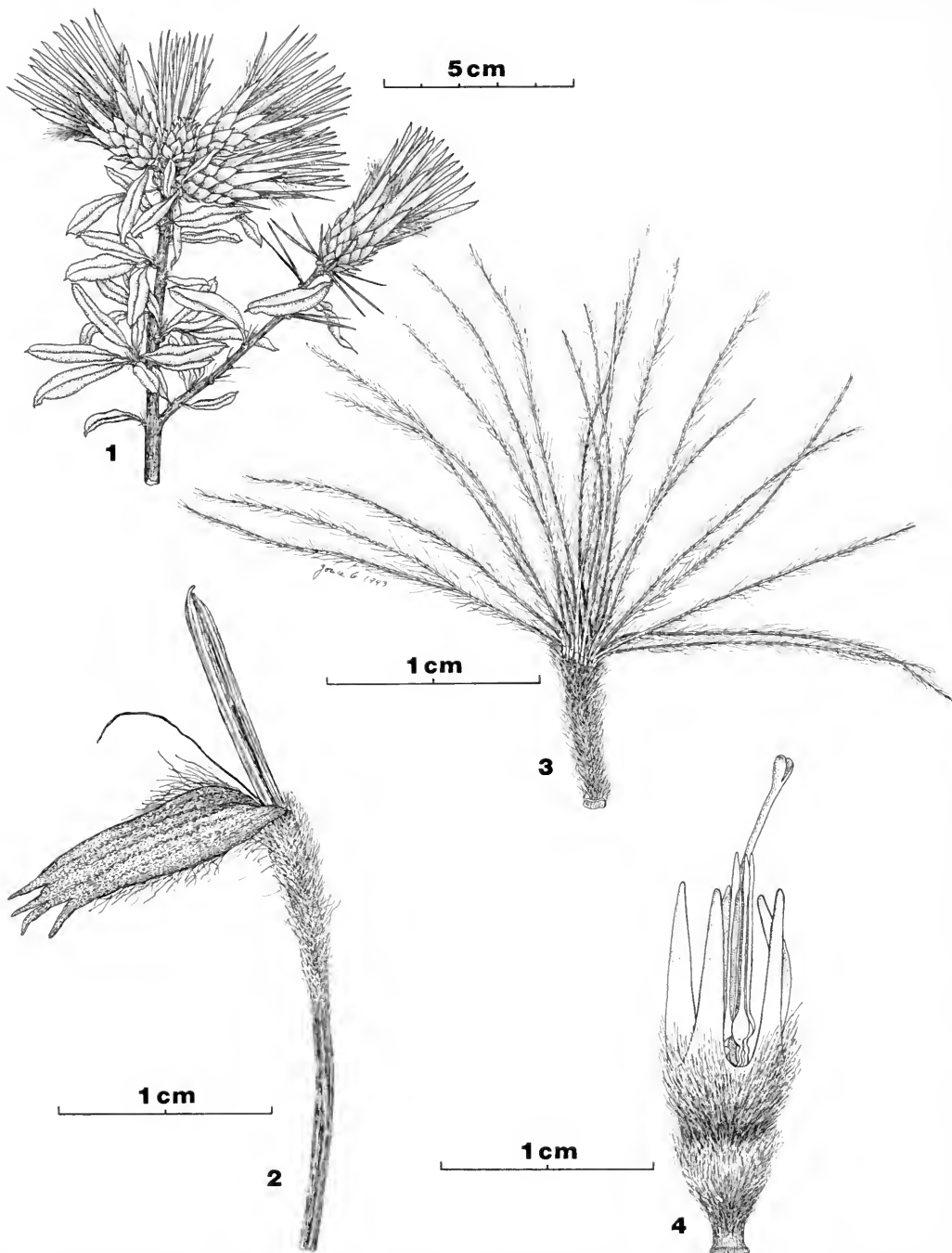


FIG. 2. *Barnadesia berberoides*. 1, habit; 2, ray floret; 3, achene with pappus; 4, disc floret. (Drawn from J.F. Macbride & W. Featherstone 2230, F.)

242 (MO). **Claca:** vicinity of Lares, Vargas 3607 (CUZ, F); Pilco River, Woytkowski 344 (USM). **Paucartambo:** Acjanaco, Parque Nacional de Manu, Cano 3255 (F); 9–12 km NE of Paucartambo, Gentry et al. 23420 (F, MO); Paucartambo-Pilcopata road, 4 km below Tres Cruces,

Gentry et al. 23493 (F); Cachupata, Vargas 2861 (F). **Quispicanchis:** Ocongate to Marcapata, Aronson & Berry 509 (F, MO). **Urubamba:** Urubamba, Peyton 1541, 1563 (MO). **HUANCAVELICA.** **Tayacaja:** Tranca-Pampa, between Huari and Acobamba, Tovar 4544 (USM); above

Ampurco, *Tovar* 3795 (USM); 3 km N of Salcabamba, *Stork & Horton* 10319 (F). **HUANUCO.** Huánuco: 6 mi S of Mito, *Macbride & Featherstone* 1830 (F, US); 15 mi SE of Huánuco, *Macbride & Featherstone* 2230 (F, US). **JUNIN.** Prov. unknown: "Tarhuish," *Soukup* 2883 (F, US). **PUNO.** Sandia: 2–6 km S of Limbani, *Metcalfe* 30446 (F). **NO EXACT LOCALITY.** *Soukup* 1225 (F).

2. *Barnadesia blakeana* Ferreyra, Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot. 18: 14. 1964. TYPE: Peru, Lima, Huarochirí, Monte de Zarate, above San Bartolomé, R. Ferreyra 10427 (holotype, USM 15730; isotype, MO).

Shrubs 15–20 dm high, branched, spiny, the spines ca. 30 mm long, divaricate, fuscous, divergent. **Leaves** fasciculate, 3–4 per node; petioles 1.5–2.5 mm long; blades lanceolate to elliptic, 12–32 mm long, 7–13 mm wide, apically acute, strongly mucronate, glabrous. **Capitulescences** of solitary heads, terminal or axillary, sessile. **Capitula** with involucre 40–45 mm high, 10–12 mm wide, cylindrical to campanulate; phyllaries 11–12-seriate, the outer ovate-lanceolate, 9.5–10 mm long, 5–5.5 mm wide, the inner linear, 38–40 mm long, 1.6–2.2 mm wide, acute, the abaxial surfaces sericeous; ray florets 13, the corollas purple, 52–55 mm long, the tube 32–33 mm long, pubescent, the outer lip 20–21 mm long, 3.8–4.2 mm wide, the abaxial surface pubescent, the inner lip 15–16 mm long; filaments connate, the anthers 10–11 mm long; disc florets 3, the corollas 18–21 mm long, the tube 7.5–8 mm long, 3–3.2 mm wide, pubescent, apically 5-lobed, usually 4 equal, the inner lip filiform; anthers 9–9.5 mm long. **Achenes** [ray] 5.5–6 mm long, 1.2–1.5 mm wide; pappus 21–23 mm long; [disc] 4.5–5 mm long, 3.5–4 mm wide, turbinate; pappus 13–16 mm long.

DISTRIBUTION—Endemic to the type locality of Monte de Zarate, between Lima and Matucana (2900 m) in central Peru.

Barnadesia blakeana most closely resembles *B. dombeyana* but differs from that species with its glabrous habit, leaves with strongly mucronate apices, and longer involucre.

LIMA. Huarochirí: Monte de Zarate, *Diers* 1147 (USM); *Hutchison & Wright* 7091 (USM).

3. *Barnadesia caryophylla* (Vell.) S. F. Blake, Proc. Biol. Soc. Wash. 38: 86. 1925.

Xenophontia caryophylla Vell., Fl. Flum. 347, t. 85. (1825) x1829. NEOTYPE (designated by Chung, 1965): Brazil, Goyaz, 1841, G. Gardner 4268

(neotype, K, not seen; photograph ex K, FM neg. 52085; isoneotypes, F 1013197 ex G, F 974790 ex P).

Shrubs 18–40 dm high, branched, hirsute, glabrescent, spiny, the spines divaricate to 30 mm long, caducous on distal branchlets. **Leaves** fasciculate, 3–4 per node; petioles 3–8 mm long; blades elliptic to obovate-lanceolate, 30–80 mm long, 11–34 mm wide, apically acute, mucronate, the adaxial surfaces glabrous, the abaxial surfaces sericeous. **Capitulescences** of usually solitary heads, terminal or axillary, sessile, or, occasionally weakly cymose with 2–3 heads. **Capitula** with involucre campanulate, 34–42 mm high, 8–10 mm wide; phyllaries 11–13-seriate, the outer ovate-triangular, apically acute, mucronate, 5–5.5 mm long, 2.2–2.5 mm wide, the inner linear, 34–35 mm long, 1.2–2 mm wide, apically acute; ray florets 13, the corolla pink, 46–48 mm long, the tube 33–35 mm long, the outer lip 12–16 mm long, 3–4 mm wide, the inner lip filiform, 11–12 mm long, pubescent; filaments free, the anthers 9.5–10 mm long; disc florets 3, the corollas 18–18.5 mm long, the tube 7–7.5 mm long, pubescent, the limb 5-toothed, the teeth acuminate; anthers 8–8.5 mm long. **Achenes** [ray] 3–5 mm long, 1.4–1.6 mm wide; pappus 18–19 mm long; [disc] 4–4.2 mm long, 3–3.2 mm wide; pappus 18–19 mm long.

DISTRIBUTION—Known from northern Peru to Bolivia and the only member of the genus to reach Brazil; in Peru it grows within the Andean Cordillera and adjacent lowlands from Lambayeque to Cusco (600–1500 m).

Barnadesia caryophylla has the widest distribution at the lowest elevations of any member of the genus. Its attractive rose-colored corollas and absence of spines make it a popular ornamental in subtropical regions.

AMAZONAS. Chachapoyas: Mendoza, *Woytkowski* 8121 (MO). **CAJAMARCA.** Jaén: Colasay, *Woytkowski* 6880 (GH, MO). **CUSCO.** Convención: Alto Urubamba, *Diehl* 2496 (F). **JUNIN.** Tarma: Chanchamayo, La Merced–Quimiri, *Ferreyra* 3696 (MO, USM); Montayaco, W of San Ramón *Gentry & Prance* 16429 (F); La Merced, *Macbride & Featherstone* 5252 (F); Hacienda Genova, *Woytkowski* 7398 (GH, MO); San Luis de Shuaro, *Ridout s.n.* (USM 14564); Satipo, *Soukup* 2818 (USM); Yucapata, *Woytkowski* 6637 (F, MO); Vitoc, *Soukup* 4415 (US); La Merced, *Killip & Smith* 23774 (F); Colonia Perené, *Killip & Smith* 25043 (F, US); along Río Perené, *Killip & Smith* 25142 (F, NY, US); entre San Ramón y Palca, *Hjerting & Petersen* 1214 (USM); Valle Chanchamayo, *Schunke* 334 (F), 1605 (F); La Merced, *Soukup* 3391 (F, GH, US); San Ramón, *Constance & Tovar* 2227 (UC). **LIMA.** Lima:

Jardin Botánico de la Universidad de San Marcos, *Ferreyra 12946* (MO, USM); *Plowman 11037* (F); *Soukup 2918* (F, US, USM). **SAN MARTIN.** Lamas: Roque, *Williams 7241* (F, GH, US). **Moyobamba:** Moyobamba, *Woytkowski 35300* (F), *15482* (MO, USM). **Rioja:** Zepelacio [Jepelacio], *Klug 3318* (F, GH, NY, US). **San Martín:** Tarpoto, *Spruce s.n.* (GH). **NO EXACT LOCALITY:** Peru, *Diehle 2538* (F).

4. *Barnadesia corymbosa* (Ruiz Lopez & Pavón)
D. Don, Trans. Linn. Soc. London 16: 278.
1833.

Bacasia corymbosa Ruiz Lopez & Pavón, Syst. veg. fl. peruv. chil. 189. 1798. TYPE: Peru, Huánuco, Huánuco, *Ruiz Lopez & Pavón s.n.* (holotype, MA; fragment, F 845511; isotype BM, not seen).

Barnadesia venosa Rusby, Mem. Torrey Bot. Club 6(1): 69. 1896. TYPE: Bolivia, "Bolivia Plateau," *M. Bang 1205* (holotype, GH; isotypes, F, MO, UC, US).

Trees to 8 m high; branched, glabrous, usually without spines. **Leaves** alternate; petioles 5–30 mm long; blades ovate-lanceolate, (35–)60–140 mm long, (16–)25–60 mm wide, coriaceous, apically acute-acuminate, the adaxial surfaces glabrous, the abaxial surfaces glabrescent. **Capitulescences** corymbose, 10–50-headed, the axis 50–75 mm long, bracteolate, the bracts lanceolate, 9–28 mm long, 3–12 mm wide, pubescent. **Capitula** with involucre campanulate, 15–24 mm high, 7–9 mm wide; phyllaries 9–10-seriate, the inner linear, 17–20 mm long, 1.8–2.4 mm wide, apically acute to acuminate, mucronate, pubescent; ray florets ca. 8, the corollas 28–38(–43) mm long, 2.8–3 mm wide, the tube 20–27 mm long, the outer lip 15–17 mm long, 3–3.5 mm wide, the inner lip filiform, 11–15 mm long, pilose; filaments connate, the anthers 4.5–5 mm long; disc floret 1, the corolla 15–18 mm long, the tube ca. 16 mm long, pubescent, the limb 5-toothed, the teeth acute, pubescent; anthers 3.5–4 mm long. **Achenes** [ray] 2.5 mm long, 1.2 mm wide; pappus ca. 12 mm long; [disc] turbinate, 2.5 mm long, 2.2 mm wide; pappus ca. 8 mm long.

DISTRIBUTION—Known from the eastern escarpment of the Andean Cordillera of north-central Peru to central Bolivia (1000–2600 m).

Barnadesia corymbosa is distinguished by its arborescent habit, predominately spineless branches, petiolate leaves, and multiheaded corymbose capitulescences. This species superficially resembles *B. parviflora* of Ecuador and Colombia but is easily distinguished by its fused staminal filaments. Cabrera (1960, p. 209) determined that

Barnadesia venosa was conspecific with *B. corymbosa*, and I agree with that placement.

CAJAMARCA. Jaén: Colasay, *Woytkowski 6955* (MO). **CUSCO.** Paucartambo: Santa Isabel, *Vargas 5170* (CUZ, USM); Yanamayo, valle Cosñipata, *Vargas 14710* (CUZ, USM). **HUANUCO.** Huánuco: Muña, *Macbride 3953* (F, GH); Huánuco-Tingo María, N of Carpath Pass, *Plowman & Rury 11166* (F, 2 sheets); Huallaga, Muña, *Weberbauer 6717* (F, USM).

5. *Barnadesia dombeyana* Less., Linnæa 5: 246.
1830. LECTOTYPE (designated by Chung, 1965): Peru, without locality, *J. Dombey 448* (lectotype, P, not seen; photograph ex P, FM neg. 52090; isolectotype ex P, F 974660).

Bacasia spinosa Ruiz Lopez & Pavón, Syst. veg. fl. peruv. chil. 188. 1798. TYPE: Peru, no exact locality, *Ruiz Lopez & Pavón s.n.* (holotype, MA, not seen; photograph ex MA, USM), non *Barnadesia spinosa* L. fil., 1781.

Bacasia lanceolata Ruiz Lopez & Pavón ex DC., Prodr. 7: 3. 1838. TYPE: Peru, no exact locality, *Ruiz Lopez & Pavón s.n.* (not seen).

Barnadesia lanceolata D. Don, Trans. Linn. Soc. London 16: 277. 1830.

Shrubs 12–30 dm high, branched, branches hirsute to sericeous, spiny, spines divaricate, fuscous, 25–48 mm long. **Leaves** in fascicles of 3–8; petioles 1–3 mm long; blades ovate-oblong, 13–60 mm long, 4–17 mm wide, acute, mucronate, sericeous. **Capitulescences** of solitary heads, terminal or axillary, sessile. **Capitula** with involucre campanulate, 26–28 mm high, 7–9 mm wide; phyllaries (5–)8–9-seriate, the outer ovate 4.2–9 mm long, 1.8–3.6 mm wide, acuminate, long-apiculate, the inner linear, 21–30 mm long, 1–1.8 mm wide, acute, the abaxial surfaces sericeous; ray florets 13, the corollas pink of red-purple, 27–40 mm long, the tube 12–21 mm long, 1.2–1.8 mm wide, pilose to villous, the outer lip 15–21 mm long, 3.2–5 mm wide, pubescent, the teeth acuminate, the inner lip 12–17 mm long, filiform; filaments connate, the anthers 7.5–9 mm long; disc florets 3, the corollas 12.5–19 mm long, the tube 4–7 mm long, 1.4–2.6 mm wide, pubescent, the limb 4–5-toothed, the teeth acuminate, the inner lip 7–12.5 mm long, filiform; anthers 6.8–7 mm long. **Achenes** [ray] 3–4 mm long, 0.8–2 mm wide, pubescent; pappus ca. 18 mm long; [disc] turbinate, 3–4.2 mm long, 1.8–3 mm wide; pappus 7–11 mm long.

DISTRIBUTION—Known from the Andean Cordillera of northern to central Peru (2300–4100 m). *Barnadesia dombeyana* is easily distinguished

with its densely pubescent habit, long spines, and long-apiculate outer phyllaries.

Cabrera (1960, p. 210) examined the holotype of *Bacasia spinosa* Ruiz Lopez & Pavón at MA and determined it to be identical to *Barnadesia dombeyana*. While type material of D. Don's *Barnadesia lanceolata* has not been consulted, his description agrees with the concept of *B. dombeyana* adopted here.

ANCASH. Bolognesi: Ocos, *Weberbauer 2755* (USM); near Laguna Conococha, *Ferreyra 14453* (USM); Chiquián, *Cerrate 523* (MO, USM), *419, 1318, 1407* (USM), *Ferreyra 6216* (USM), *7325* (MO, USM); Matarragra, *Ferreyra & Cerrate 5595* (MO, USM); Chiquián, *Ferreyra 12136* (MO, USM); Huacar, *Cerrate 276* (MO, USM), *17* (MO, USM). **Pasmas:** El Tambo, *Mostacero 532* (F). **Recuay:** Pampa de Lampa, *Edwin & Schunke 3846* (F); Río Santa, *Gentry et al. 37463* (F, MO); Catac, near Conococha, *Ferreyra 4292* (MO, USM), *Ames 29* (USM), between Chavín and Recuay, *Ferreyra 14550* (USM). **Santa:** El Tambo, *Boeke 32* (MO). **CAJAMARCA. Cajamarca:** Sunchubamba, *Ellenberg 1701* (USM); 3 km E of Encañada, *Hutchison & Wright 5120* (F, UC, US, USM); Michiquillo, *Pennell & Reichlin 15041* (USM); Hacienda Polloquito, *Sánchez 312* (USM); Cajamarca-Pacasmayo, cerca El Gavilán, *Sánchez 3340* (F). **Celendín:** between Balsas and Celendín, *Hutchison & Wright 5312* (F, GH, UC, US, USM). **Chota:** Párama, *Sandeman 4087* (F). **Contumazá:** Jalca El Chuño (Pozo Chuño), *Sagástegui 9385* (F, HUT, MO); Cascabamba, *Sagástegui et al. 9013* (F, MO), *10001* (MO). **HUANUCO. Ambo:** Chasqui, *Macbride & Featherstone 1759* (F, GH, US). **Huamalii:** Llata, *Macbride & Featherstone 2250* (F, GH, US). **LA LIBERTAD. Bolívar:** Nevado Camarquilla, *Ferreyra 1335* (USM); Quishuar, *López & Sagástegui 3280* (HUT); Huamachuco, *López 1019* (USM). **Pucallpa:** Agallpampa, *López 1059* (HUT, USM). **Santiago de Chuco:** near Shorey, *Hutchison et al. 6289* (USM); Cerro la Botica, *López 1010* (USM); Chulite, *Sagástegui et al. 11814* (F). **LIMA. Canta:** Huaros, *Pennell 14720* (USM); Buenaventura, *Nee s.n.* (F); Pachacama, *Meza 86* (USM); Pucachaca, near Buenaventura, *Diaz s.n.* (USM); Obrajillo, near Canta, *Pennell 14397* (F, GH); *Capt. Wilkes Exped. s.n.* (US); Churcac, near Canta, *Acleto 603* (USM); Aguallin, near Canta, *Sánchez 15* (USM). **PASCO. Daniel Carrión:** Yanahuanca, *Macbride & Featherstone 1222* (F, US). **Pasco:** between Salcachupan and Cerro de Pasco, *Ferreyra 6630* (USM), *8062* (USM); La Quinoa-Salcachupan, *Ochoa 350* (GH, USM).

Barnadesia horrida Muschl., Bot. Jahrb. Syst. 50, Beibl. 111: 100. 1913. TYPE: Peru, Cusco, Sacsahuaman, *A. Weberbauer 4859* (holotype, v, presumably destroyed; photograph ex v, FM neg. 15911, USM).

Chuquiraga seleriana Muschl., Bot. Jahrb. Syst. 50, Beibl. 111: 100. 1913. TYPE: Peru, Cusco, Sacsahuaman, *E. G. Selser 161* (holotype, v, presumably destroyed; isotype, GH; photograph ex GH, FM neg. 52107).

Shrubs 1–3 m high, erect, branched, spiny, the spines divaricate, ca. 22 mm long. **Leaves** fasciculate, 3–4 per node, subsessile; blades linear to lanceolate, 15–25 mm long, 3–5 mm wide, apically acuminate-spinulose, glabrescent. **Capitulescences** of solitary heads, terminal or axillary, sessile. **Capitula** with involucre narrowly campanulate, 28–30 mm high, 5–6 mm wide; phyllaries 7–8-seriate, the inner linear, 26–27 mm long, 1.4–1.6 mm wide, apically acuminate, mucronate, the abaxial surfaces sericeous; ray florets 8, the corollas purple, 36–38 mm long, the tube 18–19 mm long, the outer lip 17–18 mm long, 3.4–3.8 mm wide, pubescent, the inner lip 10–13 mm long, filiform; filaments free, the anthers 8.8–9 mm long; disc floret 1, the corollas 17–18 mm long, the tube 5–6 mm long, pubescent, the limb 5-lobed, the teeth acuminate; anthers 8.5–9 mm long. **Achenes** [ray] cylindrical, 4.5–5 mm long, 1–1.2 mm wide; pappus 14–16 mm long; [disc] pyriform, 3–4 mm long, 2.8–3.8 mm wide; pappus 14–17 mm long.

DISTRIBUTION—Endemic to intermontane valleys in the Andean Cordillera of southern Peru (3000–3800 m).

Barnadesia horrida closely resembles *B. jelskii* of northern Peru and southern Ecuador. The former species differs in having linear-lanceolate leaves, more narrow involucre, and, generally, 7–8-seriate phyllaries.

Chung (1965) established a neotype (*Herrera 1544*, us) for *Barnadesia horrida*; until an exhaustive search for additional *Weberbauer 4859* is conducted, however, the neotype will not be recognized.

AYACUCHO. Andahuaylas: Chincheros, *Hutchison 1718* (F, us). **CUSCO. Anta:** between Cusco and Limatambo, *Hjerting & Petersen 1513* (USM). **Chumbivilcas:** Bosque de Miraflores, *Núñez & Delgado 7914* (F); Velille, *Vargas 6520* (CUZ). **Cusco:** Cerro Picchu, *Ferreyra 9843* (USM); Cusco, *Cardenas 4182* (us); *Ferreyra 20847* (USM); Tankarpata, *Gentry 43223* (F); Saxaihuamán, *Herrera 1544* (F, us), *Herrera s.n.* (USM); *López 615* (HUT); Sacsahuaman, *Pennell 13556* (F, GH); Tambomachay, *Ugent 4372* (us), *Vargas 1896* (CUZ, GH, NY), *Rose 19036* (NY, us), *Gay s.n.* (GH); Socorro, *Vargas 3627* (CUZ). **Paucartambo:** Paucartambo, *Balls 6683* (us), *Vuilleumier 247* (GH), *Herrera 2956* (us); Quebrada Llulluchayoc, *Vargas 4360* (CUZ). **Quispicanchis:** Hacienda Ccapanco, *Herrera 1055* (us); Hacienda Chiraura, *Herrera 2611* (us); Marcapata, *Vargas 14559* (CUZ, USM). **Urubamba:** Chupani, *Vargas 11119* (us, USM). **HUANCAVELICA. Tayacaja:** Hacienda Tocas, between Colcabamba and Paucartambo, *Tovar 1931* (USM).

7. *Barnadesia hutchisoniana* Ferreyra, Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot. 18: 30. 1964. TYPE: Peru, Amazonas, Bongará, frente al pueblo de Pomacochas, 17 Aug 1963, R. Ferreyra & C. Acleto 15201 (holotype, USM 15732; isotype, us).

Shrubs 4–6 m high, branched, hirsute, spiny, the spines divaricate, fuscous, ca. 25 mm long. **Leaves** fasciculate, 2–5 per node, subsessile; blades oblong-elliptic, 10–56 mm long, 6–20 mm wide, apically obtuse, mucronate, both surfaces sericeous. **Capitulescences** of solitary heads, terminal or axillary, the peduncles 5–7 mm long. **Capitula** with involucre campanulate, 30–33 mm high, 10–12 mm wide; phyllaries 13–14-seriate, the outer ovate, 6–6.5 mm long, 4–5 mm wide, the inner oblong-lanceolate ca. 30 mm long, ca. 3 mm wide, acute, mucronate, sericeous; ray florets 13, the corollas pink, 40–42 mm long, the tube 27–28 mm long, 1.2–1.5 mm wide, pubescent, the outer lip 15–16 mm long, 4–4.2 mm wide, pubescent, the teeth acute, the inner lip 10–11 mm long, filiform; filaments free, the anthers 9–9.5 mm long; disc florets 3, the corollas 14–15 mm long, the tube 5–6 mm long, 2.8–3 mm wide, pubescent, the limb 4–5-lobed, the inner lip filiform. **Achenes** [ray] 4–4.5 mm long, 1.8–2 mm wide; pappus ca. 18 mm long; [disc] conical, 5–5.5 mm long, 2.5–3 mm wide; pappus 10–15 mm long.

DISTRIBUTION—Endemic to the intermontane valleys in the Andean Cordillera of northern Peru (1300–3100 m).

Barnadesia hutchisoniana most closely resembles *B. lehmannii* and is distinguished by its smaller, sericeous leaves and shorter involucre with 13–14-seriate phyllaries.

AMAZONAS. Rodríguez de Mendoza: no exact locality, *Soukup 5032* (USM). **CAJAMARCA.** Cajamarca: San Pablo, *Muñoz 1015* (USM). Chota: Llama–Chongoyape, *Ferreyra 862* (USM); near Llama, *Ferreyra 8394* (USM). **Contumazá:** arriba de Trinidad, *Sagástegui et al. 8945* (F); Rupe–Contumazá, *Sagástegui et al. 9819* (F). **Hualgayoc:** Hacienda Lives, *Díaz s.n.* (USM). **LAMBAYEQUE.** Lambayeque: W side Abra Porculla Pass km 35 E of Almos, *Hutchison 1378* (F, GH, UC). **PIURA.** Huancabamba: arriba de Palambla, *López & Sagástegui 8802* (F, MO).

8. *Barnadesia jelskii* Hieron., Bot. Jahrb. Syst. 36: 511. 1905. TYPE: Peru, Cajamarca, Chota, entre Chota y Cutervo, Jun 1879, *Jelski 748* (holotype, B, presumably destroyed; photo-

graph ex B, FM neg. 15912, USM). NEOTYPE (designated by Chung, 1965): Peru, Amazonas, Chachapoyas, *Mathews s.n.* (K, not seen; photograph ex K, FM neg. 52088).

Shrubs 2–6 m high, erect, branched, the branches tomentose, spiny, the spines divaricate, fuscous, ca. 38 mm long. **Leaves** alternate, fasciculate; petioles 1–2 mm long, sericeous; blades oblong-elliptic, rarely spatulate, 7–28 mm long, 5–10 mm wide, apically obtuse, mucronate to spinulose, the adaxial surfaces glabrous, the abaxial surfaces sericeous. **Capitulescences** of solitary heads, terminal and axillary. **Capitula** with involucre campanulate, 19–25 mm high, 7–9 mm wide; phyllaries 10–12-seriate, the inner linear 18–24 mm long, 1.4–1.8 mm wide, acute, pubescent, fuscous; ray florets 8, the corolla pink-purple, 26–33 mm long, the tube 13–17 mm long, pubescent, the outer lip ca. 16 mm long, ca. 4 mm wide, the teeth acute, the inner lip 9–11 mm long, filiform, pubescent; filaments connate, the anthers 6.4–7.5 mm long; disc floret 1, the corollas 11–15 mm long, the tube 3.6–4.2 mm long, 2–2.4 mm wide, pubescent, the limb 5-lobed, the teeth acute; anthers 4.5–5.5 mm long. **Achenes** [ray] 2.2–3.2 mm long, 1–1.4 mm wide; pappus ca. 11.5 mm long; [disc] conical, 2.5–3.2 mm long, pubescent; pappus ca. 6.8 mm long.

DISTRIBUTION—Known from the Andean Cordillera from northern Ecuador to northwestern Peru (2500–3700 m).

Barnadesia jelskii appears to be confined to small relict forest patches in interandean valleys in northern Peru and is known locally as *cara-cashua*.

AMAZONAS. Bongará: Pomacocha, *López et al. 4406* (HUT). **CAJAMARCA.** Cajabamba: entre Wacaruco y Succubamba, *Díaz 2154* (F); near Cajabamba, *Ferreyra 3039* (USM). **Cajamarca:** Cumbre El Gavilán, *Ferreyra 3331* (USM); below Cumbe Mayo, *Muller & Gutte s.n.* (USM); San Miguel, El Tingo, *Sagástegui et al. 8798* (MO); Cumbre El Gavilán, *Sánchez 582* (MO); Cajamarca–Bambamarca, *Smith & Vasquez 3445* (F). **Celendín:** Celendín, *Dillon & Turner 1637* (F, MO); near Celendín, *Ferreyra 15032* (USM); Cruz Conga, between Cumullica and Celendín, *Ferreyra 13821* (USM); Sendamal, *Sagástegui et al. 12235* (F). **Chota:** 12 km SE of Chota, *Gentry et al. 61608* (F); above Chota, *Ferreyra 8493* (USM). **Cutervo:** between Cutervo and Cochabamba, *Ferreyra 838* (USM). **Hualgayoc:** above San Miguel, *Weberbauer 3948* (USM); Tahona, between Bambamarca and Hualgayoc, *Ferreyra 8533* (USM). **HUANUCO.** Huánuco: Quichqui, *Apac 4115* (USM). **LA LIBERTAD.** Bolívar: near Nevado Cajamarquilla, *Infantes s.n.* (USM). **Huamachuco:** Motil,

Ferreyra 3003 (USM), *3008* (USM); Yanazara-Huaquil, López & Sagástegui 2755 (F). **Otusco:** Agallpampa, López 311 (USM). **PIURA. Huancabamba:** above Huancabamba, Hutchison 1611 (USM); Mitopampa, Sagástegui 8239 (F, MO).

9. *Barnadesia lehmannii* Hieron., Bot. Jahrb. Syst. 29: 77. 1901. LECTOTYPE (designated by Harling, 1991): Ecuador, Chimborazo, Panza-Cajabamba, F. C. Lehmann 5238 (lectotype, K, not seen; isolectotype, NY).

Barnadesia lehmannii Hieron. var. *angustifolia* Chung, Rev. Barnadesia 50. 1965. TYPE: Peru, Lima, Canta, Sandeman 216 (holotype, BM, not seen; photograph ex BM, FM neg. 52084; isotype, K, not seen).

Shrubs 1–4 m high, branched, upper branches hirsute, spiny, spines divaricate, fuscous, pilose, ca. 42 mm long. **Leaves** alternate, fasciculate, 2–4 per node; petioles 3–7 mm long; blades ovate-elliptic, 26–70 mm long, 15–36 mm wide, apically acute or rarely obtuse, mucronate, the adaxial surfaces hirtellous, glabrescent, the abaxial surfaces sericeous. **Capitulescences** of solitary heads, sessile, terminal and axillary, or weakly cymose with 2–3 heads. **Capitula** with involucre cylindrical, 30–46 mm high, 9–11 mm wide; phyllaries 6–8-seriate, the outer ovate, acute, 5–7 mm long, 4.2–5 mm wide, the inner oblong-lanceolate, 26–42 mm long, 2–4 mm wide, acute, sericeous; ray florets 13, the corollas 32–54 mm long, the tube 17–25 mm long, 1.5–1.8 mm wide, the outer lip 15–26 mm long, 4.5–5 mm wide, pubescent, the teeth acuminate, the inner lip 11–12 mm long, filiform, glabrous; filaments free, the anthers 9–10 mm long; disc florets 3, the corollas 17–24 mm long, the tube 6–7 mm long, 2.2–3 mm wide, pubescent, the limb 4-toothed, the teeth acuminate, the inner lip 11–12 mm long, filiform, glabrous; anthers 8–8.5 mm long. **Achenes** [ray] 4–4.2 mm long, 1.2–1.4 mm wide; pappus ca. 18 mm long; [disc] turbinate, 4–4.2 mm long, 2.5–3.2 mm wide; pappus ca. 18 mm long.

DISTRIBUTION—Known from the Andean Cordillera from central Ecuador to northern Peru (1500–2200 m).

Barnadesia lehmannii closely resembles *B. spinosa* of Colombia but differs in its larger leaves, larger involucre, and 6–8-seriate phyllaries. Chung's (1965) variety *angustifolia* is not considered sufficiently distinct to allow recognition in this treatment.

PIURA. Ayavaca: above Tandopa, Hutchison & Wright 6684 (UC, US, USM). **Morropón:** entre Chalaco y San Miguel, Díaz & Vásquez 3031 (F). **TUMBES. Zarumilla:** near Caucho, Maekawa s.n. (USM).

10. *Barnadesia macbridei* Ferreyra, Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot. 18: 23. 1964. TYPE: Peru, Huánuco, Huánuco, Huacachi, estación near Muña, J. F. Macbride 3878 (holotype, F 534941).

Barnadesia glomerata Kuntze var. *distincta* Chung, Rev. Barnadesia 36. 1965. TYPE: Peru, Junín, Jauja, Comas, C. Ochoa 553 (holotype, us 1952591; isotype, F 1626953).

Shrubs 12–25 dm high, branched, the upper branches hirsute, spiny, the spines divaricate, yellowish-fuscous, ca. 21 mm long. **Leaves** alternate, fasciculate, 3 per node; petioles 1.5–2 mm long; blades oblong-elliptic, 15–60 mm long, 11–21 mm wide, apically obtuse, mucronate, both surfaces pubescent. **Capitulescences** of solitary heads, terminal or axillary, rarely weakly cymose with 2–3 heads. **Capitula** with involucre cylindrical, 25–28 mm high, 6–8 mm wide; phyllaries 9–11-seriate, the outer ovate-lanceolate, 5–7 mm long, 1.5–2 mm wide, the inner linear, 22–26 mm long, 1.6–1.8 mm wide, acuminate; ray florets 8, the corollas pink or purple, 22–30 mm long, the tube 15–22 mm long, 0.6–1 mm wide, pubescent, the outer lip 8–10 mm long, 3.5–4 mm wide, pubescent, the inner lip 6.5–9 mm long, linear, glabrous; filaments free, the anthers 6.5–7 mm long; disc floret 1, the corollas 9.5–11 mm long, the tube 3.5–4.5 mm long, 1.5–2.8 mm wide, pubescent, the limb 5-toothed; anthers 6–6.5 mm long. **Achenes** [ray] 2.5–3 mm long, 1–1.3 mm wide; pappus ca. 12 mm long; [disc] conical, 2.8–3.8 mm long, 2.2–3 mm wide; pappus 8–9 mm long.

DISTRIBUTION—Endemic to the intermontane region in the Andean Cordillera of central Peru (2200–3350 m).

Barnadesia macbridei closely resembles *B. reticulata*, but, unlike that species, it has conspicuously hirsute branches and capitula with 8 ray florets and only 1 disc floret.

HUANUCO. Huánuco: near Acomayo, Woytkowski 34335 (F, USM). **JUNIN. Jauja:** Comas, Ochoa 553 (F, US, USM). **LIMA. Lima:** Jardín Botánico, Ferreyra 12946A (MO, USM).

11. *Barnadesia polyacantha* Wedd., Chlor. And. 1: 13, t. 1. A. 1855. LECTOTYPE (designated

by Chung, 1965): Bolivia, Larecaja, "Envir. de Sorata," 1848, *H. A. Weddell 4468* (lectotype, P, not seen; photograph ex P, FM neg. 52077; isolectotype, F 974857).

Shrubs 25–40 dm high, branched, the branches hirsute, spiny, the spines divaricate, fuscous, ca. 25 mm long. **Leaves** alternate, fasciculate, 3–5 per node; petioles 1.5–4 mm long; blades oblong-elliptic, 12–35 mm long, 5–14 mm wide, apically acute, spinulose, both surfaces sericeous. **Capitulescences** of solitary heads, terminal or axillary, sessile. **Capitula** with involucre campanulate, 25–30 mm high, 8–10 mm wide; phyllaries 10–11-seriate, the outer ovate, 6–7 mm long, 2.8–4 mm wide, acute, mucronate, the inner linear, 23–38 mm long, 1–2 mm wide, acuminate, sericeous; ray florets 13, the corollas 38–46 mm long, the tube 25–29 mm long, 0.8–1 mm wide, pubescent, the outer lip 12–16 mm long, 3.8–4.8 mm wide, pubescent, the teeth acute, the inner lip 8–10 mm long, filiform, flexuose, glabrous; filaments free, the anthers 6–7 mm long; disc florets 3, the corollas 12–17 mm long, the tube 4.5–6.5 mm long, 2–2.2 mm wide, pubescent, the limb 5-lobed. **Achenes** [ray] cylindrical, 2.8–3.2 mm long, 1.2–1.4 mm wide; pappus 12–16 mm long; [disc] turbinate, 2.5–3.5 mm long, 2.6–3.2 mm wide; pappus ca. 10 mm long.

DISTRIBUTION—Native to the Andean Cordillera from central Peru to Bolivia (2300–3500 m).

Barnadesia polyacantha is distinguished by its hirsute branches, oblong-elliptic leaves with spinulose-mucronate apices, and fuscous phyllaries. Chung (1965) described several varieties under this species that have not been recognized in this treatment, including *B. polyacantha* var. *attenuata* Chung, which Harling (1991) placed under the Ecuadorian *B. kingii* H. Robinson.

CUSCO. Anta: Cuesta Limatambo, *Varbas 2960* (CUZ). Calca: Vilcabamba, *Vargas 3966* (CUZ, USM). Paruro: Araypallpa, *Vargas 440* (CUZ, F, USM). **URUBAMBA:** Peñas, *Vargas 8120* (US, USM); Ollataytambo, *Cook & Gilbert 657* (US); Janccac, *Marín 1614* (US); km 88–95, Ferro-carril Santa Ana, *Vargas 3395* (CUZ, USM). **JUNIN.** Tarma: Tiambra, km 14 desde Huasahuasi, *Díaz 2919* (F); Carpapata, above Huacapistana, *Killip & Smith 24391* (F); near Tarma, *Palmer 64* (USM). **PUNO.** Sandia: entre Sandia y Cuyo-Cuyo, *Weberbauer 838* (USM); *Ferreyra 16742* (MO, USM).

12. *Barnadesia reticulata* D. Don, Trans. Linn. Soc. London 16: 277. 1830. TYPE: Peru, Junín, "Tarmae Peruvianorum" [Tarma], *Ruiz*

Lopez & Pavón s.n. (holotype, MA, not seen; isotype fragment, BM).

Shrubs 2–3 m high, branched, upper branches sericeous, spiny, spines divaricate, fuscous, 10–18 mm long. **Leaves** alternate, fasciculate, 3–6 per node; petioles 1.5–3 mm long; blades oblong-elliptic, 20–48 mm long, 9–20 mm wide, obtuse, mucronate, the adaxial surfaces glabrous, the abaxial surfaces sericeous. **Capitulescences** of solitary heads, terminal or axillary, subsessile. **Capitula** with involucre campanulate, 43–45 mm high, 10–11 mm wide; phyllaries 9–10(–12)-seriate, the outer ovate-lanceolate 7–7.5 mm long, 4.6–4.8 mm wide, brown, the inner linear, 38–40 mm long, 2.3–2.5 mm wide, membranaceous, acute, mucronate, sericeous; ray florets 13, the corollas pink, 50–51 mm long, the tube 31–32 mm long, 1–1.2 mm wide, pubescent, the outer lip 20–21 mm long, 3.8–4 mm wide, pubescent, the teeth acuminate, the inner lip 9–10 mm long, filiform; filaments connate, the anthers 11–12 mm long; disc florets 3, the corollas 18.5–19 mm long, the tube 6–7 mm long, 2.8–3 mm wide, pubescent, the limb 4-toothed, the inner lip 8–9 mm long, filiform, glabrous; anthers 10–11 mm long. **Achenes** [ray] 4.5–4.8 mm long, 1.2–1.4 mm wide; pappus ca. 22 mm long; [disc] turbinate, 4.5–4.8 mm long, 3.8–4 mm wide; pappus ca. 13 mm long.

DISTRIBUTION—Endemic to the Andean Cordillera of central Peru (2800–3000 m).

ICA. Pisco: above Pisco, *Rauh 386* (USM). **LIMA.** Canta: vicinity of Canta, *Ferreyra 6914* (USM); Pachacama, near Canta, *Meza 86A* (USM).

13. *Barnadesia wurdackii* Ferreyra, Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot. 18: 16. 1864. TYPE: Peru, Amazonas, Chachapoyas, upper slopes of Puma-urcu ESE of Chachapoyas, 1 Jun 1962, 2700–3000 m, *J. J. Wurdack 681* (holotype, USM 15731; isotypes, F 1635434, MO, US).

Barnadesia chachapoyasensis Chung, Rev. Barnadesia 64. 1965. TYPE: Peru, Amazonas, Chachapoyas, Cerro Chunchula, 2500 m, *C. Ochoa 1665* (holotype, US 2059145; photograph ex US, FM neg. 52096; isotype, USM).

Shrubs 2–6 m high, spiny, the spines ca. 8 mm long, divaricate, caducous on distal portions. **Leaves** alternate, fasciculate, 3–6 per node; petioles 1–2.5 mm long; blades oblanceolate, 20–50

mm long, 9–16 mm wide, apically acute, mucro-ate, both surfaces glabrous. **Capitulescences** of solitary heads, terminal or axillary, weakly cymose with 1–4 heads, the peduncles 30–80 mm long or sessile, subtended by reduced leaf. **Capitula** with involucre campanulate, 23–30 mm high, 10–12 mm wide; phyllaries 10–12-seriate, the outer ovate, 9 mm long, 4–5 mm wide, the inner linear, 23–2 mm long, 1.2–2 mm wide, acute, recurved, sericeous, the margins pilose; ray florets 13, the corollas pink, 32–48 mm long, the tube 15–23 mm long, 1–1.2 mm wide, pubescent, the outer lip ca. 2 mm long, ca. 4 mm wide, the teeth acuminate, the inner lip 13–14 mm long, filiform, flexuose; filaments connate, the anthers 8.5–9 mm long; disc florets 3, the corollas 14–18 mm long, the tube 6–6.5 mm long, 2–4.5 mm wide, pubescent, the limb 4-toothed, the teeth acuminate, the inner lip 10–11 mm long, filiform; anthers 7–8 mm long. **Achenes** [ray] 4–5.2 mm long, 1.2–1.8 mm wide; pappus 15–17 mm long; [disc] 3–5 mm long, 2.8–3 mm wide; pappus 8–9.5 mm long.

DISTRIBUTION—Endemic to the interandean region of northern Peru (2300–3500 m).

Barnadesia wurdackii resembles *B. lehmannii* but differs in its smaller, glabrous, oblanceolate leaves and shorter, recurved phyllaries. Robinson (1975) suggested that *B. wurdackii* was synonymous with Chung's (1965) *B. chachapoyasensis*, and I agree with this placement, even though Harling (1991, p. 17) questioned the placement of the latter species.

AMAZONAS. Bongará: WNW of Pomacocha, *Wurdack 930* (F, US, USM). **Chachapoyas:** Cerro Calla-Calla, *Swain & Schunke 3651* (F, US, USM); above Leimebamba, *Ferreya 12325* (USM); 15–21 km SW of Leimebamba, *Swain et al. 23188* (F, MO); Cerros Calla Calla, E side, 9 km above Leimebamba, *Hutchison & Wright 5596* (F, UC, USM); 25 km above Leimebamba on road to Balsas, *Hutchison & Wright 6972* (F, UC, USM); SE of Chachapoyas, *King & Bishop 9295* (US); Chachacomo-Leimebamba, *Ochoa 2669* (USM); Pumaucro, *Pennell 15553* (F, USM); Cerro Puma Urco, *Soukup 4047* (F).

I. CHAETANTHERA

Chaetanthera Ruiz Lopez & Pavón, Fl. peruv. prodr. 106. 1794. TYPE: *Chaetanthera ciliata* Ruiz Lopez & Pavón.

Key to Peruvian Species of *Chaetanthera*

Plants procumbent, the stems 3–4 cm long; leaves oblong-spathulate, lanate-tomentose, the margins entire, apically obtuse; capitula sessile; involucre hemispheric; ray florets ca. 25; disc florets ca. 27

Erect to prostrate, annual or perennial **herbs**, rarely **subshrubs**, glabrous, pilose, or lanate; monoecious (extra-Peruvian species occasionally dioecious). **Leaves** alternate or opposite; blades linear-apiculate to lanceolate, oblanceolate, oblong, spatulate, or flabellate, the margins entire to dentate, denticulate, or spinulose. **Capitulescences** of solitary, terminal heads, sessile. **Capitula** heterogamous, radiate; involucre campanulate to cylindrical; receptacles plane, epaleate, pubescent to naked; phyllaries 3–4-seriate; ray florets 1-seriate, functionally pistillate or neuter, the corollas bilabiate, yellow, orange, white, rarely reddish, the outer lip ligulate, 3-toothed, the inner lip filiform or absent; anthers sterile; styles slender, cylindrical, bifid; disc florets perfect or functionally staminate, the corollas tubular, bilabiate, the outer lip tridentate, the inner lip bifid; anthers basally caudate, the tails plumose, the terminal appendages lanceolate; styles deeply bifid, the branches apically obtuse, papillose distally. **Achenes** [ray] turbinate or lanceolate, glabrous or densely papillose; pappus of ciliolate bristles, 1–2-seriate; [disc] cylindrical or turbinate, glabrous or densely papillose; pappus of ciliolate bristles, 1–2-seriate, white.

Chaetanthera consists of nearly 40 species, all confined to southern South America from central Peru to 42°S latitude in Chile and Argentina. Only four species are recorded from Peru; all tend to occur at high elevations (2700–4900 m) within the Andean Cordillera.

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- *C. cochlearifolia*
1. Plants erect, the stems (6–)9–32 cm long; leaves lanceolate to spatulate, villous to glabrous or glandular-pubescent, apically 3–7-dentate or entire; capitula pedunculate or subtended by upper leaves; involucre campanulate; ray florets 5–16; disc florets 5–20 2
 2. Stems to 6 cm long; leaves opposite, decussate, the blades oblong-lanceolate, the bases connate, the margins strictly entire, strongly involute and leaves appearing cylindrical *C. stuebelii*
 2. Stems 9–32 cm long; leaves alternate to subopposite, *never* decussate, the blades linear-lanceolate to spatulate, the bases *never* connate, the margins dentate 3
 3. Stems to 9 cm long, or rarely to 20 cm; leaves lanceolate 5–10(–14) mm long, villous to glabrescent, apically 3–5-dentate; capitula containing ca. 6 ray florets, 5–7 disc florets *C. peruviana*
 3. Stems to 32 cm long; leaves spatulate, 10–22 mm long, glandular-pubescent, apically 7-dentate; capitula containing ca. 16 ray florets, ca. 20 disc florets *C. chiquianensis*

1. *Chaetanthera chiquianensis* Ferreyra, Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot., 6: 5. 1953. TYPE: Peru, Ancash, Bolognesi, Chiquián, *E. Cerrate 1323* (holotype, USM 15710; isotype, MO).

son, Proc. Amer. Acad. Arts 49: 514. 1913. **Figure 3.**

Oreastrum cochlearifolium A. Gray, Proc. Amer. Acad. Arts 5: 144. 1861. TYPE: Peru, Junín, Yauli, Al-pamarca, *Capt. Wilkes Exped. s.n.* (holotype, GH).

Annual **herbs**, the stems 14–32 cm high, erect, pubescent. **Leaves** alternate, rarely opposite, sessile; blades spatulate, 10–22 mm long, 3–8 mm wide, attenuate at base, glandular-pubescent, apically ca. 7-dentate, the teeth acute, mucronate, the margins plane. **Capitulescences** of solitary heads, axillary or terminal, pedunculate, subtended by apical leaves, spatulate, 5-dentate, 5–8 mm long, 2–2.8 mm wide, pubescent. **Capitula** with involucre 7–10 mm high, 5–7 mm wide, campanulate; phyllaries 3-seriate, the outer lanceolate, 6.6–7.5 mm long, 1.8–2 mm wide, the inner lanceolate, 7–8 mm long, 1.8–2 mm wide, membranaceous, obtuse, mucronate, glabrous; ray florets ca. 16, the corollas 5.8–6.2 mm long, the tube 4–4.2 mm long, glabrous, the outer lip ligulate, 1.8–2 mm long, 0.8–1 mm wide, tridentate, the inner lip bifid, the lobes acute, 0.4–0.5 mm long; disc florets ca. 20, the corollas 4.5–5 mm long, the tube 3.8–4.2 mm long, glabrous. **Achenes** [ray] turbinate, 2–2.2 mm long, papillose; pappus ca. 4.5 mm long; [disc] turbinate, 1.6–2 mm long, 1–1.2 mm wide, papillose; pappus 4–4.5 mm long.

Annual **herbs**, or short-lived perennials, 3–4 cm high, glabrescent. **Leaves** alternate, sessile; blades oblong-spathulate, ca. 10 mm long, ca. 3 mm wide, basally attenuate, apically obtuse, both surfaces dense lanuginous, the margins entire, revolute. **Capitulescences** of solitary, terminal heads, sessile. **Capitula** with involucre hemispheric, 10–12(–16) mm high, ca. 15 mm wide; phyllaries 3–4-seriate, the outer elliptic, 11–12 mm long, 4.5–5 mm wide, acute, foliaceous, lanose basally, slightly coriaceous at the apex, the inner lanceolate, 14–16 mm long, 2.2–2.8 mm wide, membranaceous, acuminate, glabrescent, 1–3-nerved, transparent at the base; ray florets ca. 25, the corollas 7–7.5 mm long, bilabiate, the tube 3–3.2 mm long, glabrous, the outer lip 4–4.5 mm long, 0.7–0.8 mm wide, glabrous; disc florets ca. 27, the corollas 5.8–7 mm long, the tube 4.2–5.2 mm long, glabrous. **Achenes** [ray] cylindrical, 2.2–2.6 mm long, 0.2–0.6 mm wide, glabrous; pappus ca. 8.5 mm long; [disc] cylindrical, 2.4–2.8 mm long, 0.4–0.5 mm wide, glabrous; pappus 7.5–8 mm long.

DISTRIBUTION—Endemic to the Andean Cordillera of central Peru (2700–3500 m).

Chaetanthera chiquianensis most closely resembles *C. peruviana* but it differs in having 7-nerved leaves and larger heads with more florets.

DISTRIBUTION—Endemic to the Andean Cordillera of central Peru (4800–5000 m).

Chaetanthera cochlearifolia most closely resembles *C. pulvinata* (Phil.) Hauman from the Andean Cordillera of Chile and Argentina [27°–34°S latitude]; however, it differs in its larger leaves, phyllaries, and ray florets.

ANCASH. Recuay: Marca, Gómez 345 (USM).

2. *Chaetanthera cochlearifolia* (A. Gray) Robin-

JUNIN. Yauli: near Anticona Pass, *Dillon & Turner 1315* (F), *1477* (F); Ticlio, *Tovar 7192* (USM); above Ha-

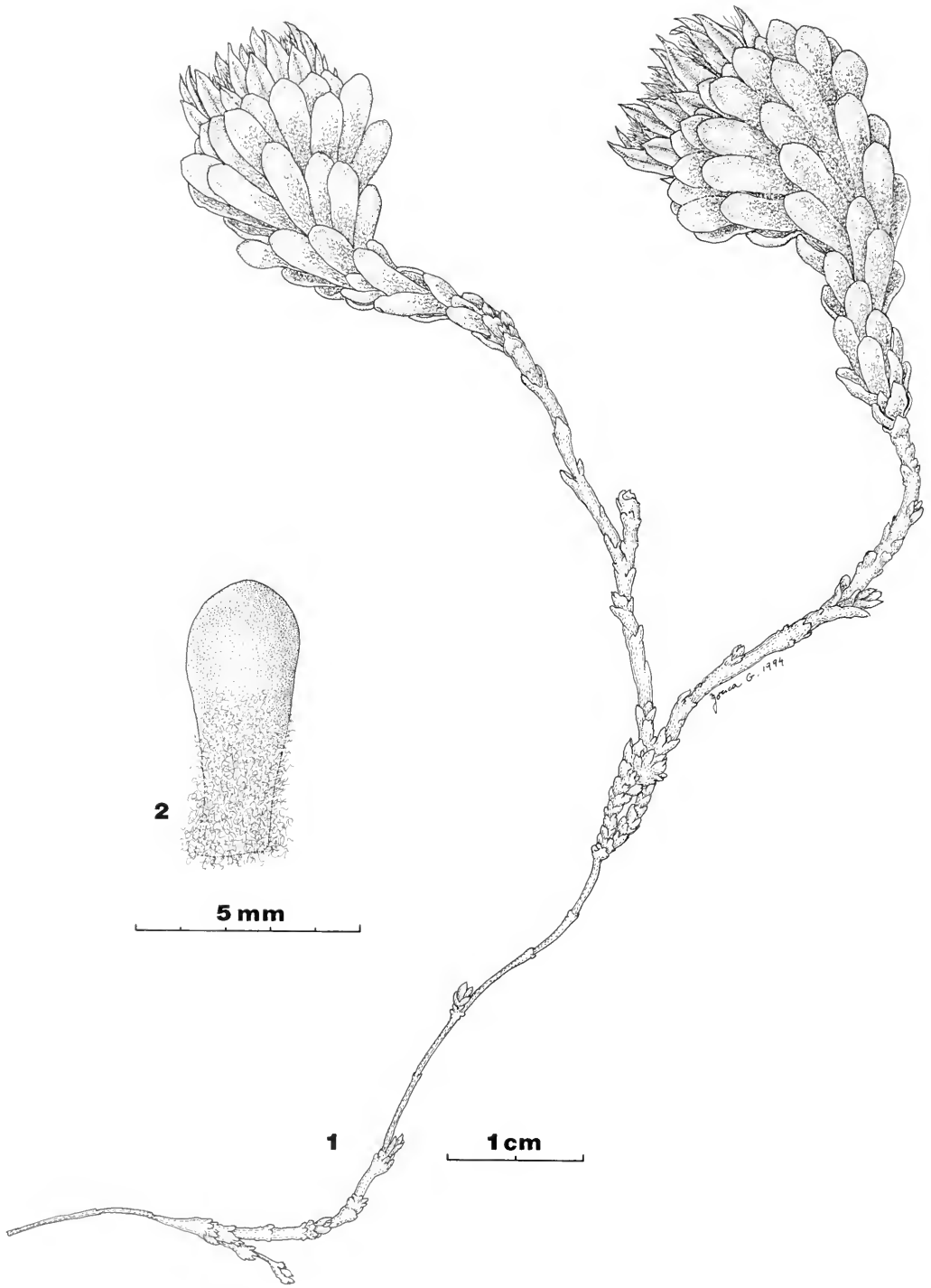


FIG. 3. *Chaetanthera cochlearifolia*. 1, habit; 2, leaf. (Drawn from J.F. Macbride & W. Featherstone 845, F.)

cienda Acopalca, *Weberbauer 6524* (USM). LIMA. **Canta:** La Viuda, *Meza 225* (USM). **Huaro-chiri:** Casapalca, *Macbride & Featherstone 845* (F).

3. *Chaetanthera peruviana* A. Gray, Proc. Amer. Acad. Arts 5: 144. 1861. TYPE: Peru, Lima, Canta, Baños, *Capt. Wilkes Exped. s.n.* (holotype, GH).

Annual **herbs**, 4.5–9 cm high, erect, slightly pubescent. **Leaves** alternate, sessile; blades lanceolate to spathulate, 6–14 mm long, 2–4 mm wide, the adaxial surfaces glabrous, the abaxial surfaces villos to glabrescent, basally attenuate, apically 3-dentate (rarely 5-dentate), the teeth acute, mucronate. **Capitulescences** of solitary, terminal heads, peduncles with lanceolate-linear bracts, tridentate, 5–6 mm long, 1–1.6 mm wide. **Capitula** with involucre campanulate, 5–8 mm high, 3–5 mm wide; phyllaries 3–4-seriate, the outer ovate, 4.5–5.8 mm long, 1.6–1.8 mm wide, foliaceous, mucronate, glabrous, the inner elliptic, 4.2–6.2 mm long, 1.5–1.8 mm wide, membranaceous, obtuse, glabrous; ray florets 6, the corollas 4.8–6 mm long, the tube 2.5–3 mm long, glabrous, the outer lip 2.3–3 mm long, 0.8–1 mm wide, pubescent; disc florets 5–7(–13), hermaphroditic, the corollas 2.5–3 mm long, the tube 2–2.5 mm long, glabrous. **Achenes** [ray] turbinate, papillose; pappus ca. 4 mm long; [disc] turbinate, 1–1.2 mm long, 0.5–0.6 mm wide, papillose, costate; pappus ca. 4 mm long.

DISTRIBUTION—Native to the Andean Cordillera from central and southern Peru (3000–4000 m).

Chaetanthera peruviana most closely resembles *C. tenella* Less. from the Andean Cordillera of northern to central Chile; however, it differs in its shorter, branched habit and smaller leaves, involucre, and florets.

AREQUIPA. La Union: above Alca, Cotahuasi, *Weberbauer 6876* (F, GH, USM). **LIMA.** Huaro-chiri: Matucana, *Macbride & Featherstone 197* (F, USM). **NO EXACT LOCALITY.** Peru, 1904–1914, *Weberbauer 5419* (F).

4. *Chaetanthera stuebelii* Hieron., Bot. Jahrb. Syst. 21: 368. 1896. TYPE: Bolivia, La Paz, “crescit prope Sisasica inter Tomarapé et La Paz,” 3800 m, *A. Stübel 15a* (holotype, v, presumably destroyed).

Annual **herbs**, ca. 6 cm high. **Leaves** opposite, decussate; blades oblong-lanceolate, 3.5–9 mm

long, ca. 1.5 mm wide, the adaxial surfaces densely tomentose, the abaxial surfaces glabrous, apically obtuse to acute, mucronulate, the bases connate, the margins strictly entire, strongly involute and appearing cylindrical. **Capitulescences** of solitary, terminal, sessile heads. **Capitula** with involucre narrowly campanulate, 5–6 mm high, 4–5 mm wide; phyllaries 3–4-seriate, the outer oblanceolate, ca. 5 mm long, ca. 1.5 mm wide, glabrous, the margins broadly hyaline, obtuse, brownish, the inner elliptic, ca. 6.5 mm long, ca. 1.8 mm wide, broadly hyaline, obtuse, brownish; ray florets ca. 11, the corolla ca. 6 mm long, the tube ca. 3 mm long, glabrous, the outer lip ca. 3 mm long, 0.5 mm wide, the inner lip ca. 1 mm long; disc florets ca. 13, the corollas ca. 5 mm long, the tube ca. 4.5 mm long, glabrous. **Achenes** columnar, ca. 1 mm long, isomorphic, glabrous; pappus ca. 5 mm long.

PUNO. Puno: San Antonio de Esquilache, *Stafford 873* (F).

IV. CHAPTALIA

Chaptalia Venten., Descr. pl. nouv. 61. 1802. TYPE: *Chaptalia tomentosa* Venten.

Perennial **herbs**, scapose, acaulescent, rhizomatous. **Leaves** in basal rosettes, the blades oblanceolate, lyrate, or lanceolate-ovate, rarely cordiform or elliptic-ovate, lanuginous or tomentose, the margins entire, runcinate, crenate, denticulate, lobed. **Capitulescences** of solitary, terminal, nutant heads; peduncles 2–60 cm long, lanate or arachnoid. **Capitula** disciform, heterogamous; involucre campanulate or turbinate; receptacles plane, epaleate, foveolate; phyllaries 3–7-seriate, graduated, glabrous or lanuginous; florets 20–300, trimorphic, occasionally dimorphic, the outermost 1–several rows of pistillate florets, the corollas ligulate, tridentate, the tube shorter than the style, staminodia absent; inner pistillate florets 1–several-seriate, the corollas filiform, tubular, styles slender, exceeding the tube; central disc florets hermaphroditic or more rarely pseudohermaphroditic with sterile ovaries, the corollas bilabiate (the outer lip 3-parted, the inner lip 2-parted) or regularly 5-lobed; anthers sagittate; styles thickened, the branches short, papillose. **Achenes** columnar to fusiform, (4–)5(–11)-costate, glabrous or pubescent; pappus of scabrous bristles, white or pink.

Chaptalia consists of about 50 species distrib-

uted from the United States to southern South America, with 10 here treated for Peru. There has been considerable taxonomic disagreement as to the generic limits among *Chaptalia*, *Gerbera*, and *Trichocline* (Burkart, 1944; Zardini, 1974; Hansen, 1990). The three are separated with some difficulty and various species have been moved among these genera. *Chaptalia* is characterized by trimorphic florets (rarely strictly dimorphic), ray florets with corollas merely equalling or slightly surpassing the phyllaries, staminodia absent, and rostrate achenes with inflated trichomes or, more commonly, glabrous. *Gerbera* possesses staminodia in the ray florets and achenes with slender, acute trichomes; *Trichocline* also possesses ray florets with staminodia and achenes with slightly inflated, myxogenic trichomes mixed with capitate-glandular types. Burkart (1944) provided a dis-

cussion of the characters separating *Chaptalia* from its close relatives and provided a key to putative sections of the genus. The treatment presented here should be considered provisional; the Andean species of the genus are in need of monographic treatment.

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 ZARDINI, E. M. 1975. Revisión del género *Trichocline* (Compositae). *Darwiniana*, **19**: 618–733.

Key to Peruvian Species of *Chaptalia*

1. Heads sessile in leaf bases or borne on peduncles 1–2 cm long *C. exscapa* var. *microcephala*
1. Heads borne on peduncles 5–60 cm long 2
2. Leaves sessile or with winged petioles to 20 mm long; blades oblanceolate to spatulate with entire margins, or lyrate-pinnatifid 3
3. Leaf blades oblanceolate to spatulate, the margins entire *C. integerrima*
3. Leaf blades lyrate-pinnatifid 4
4. Leaf blades 20–110 mm long, 7–30 mm wide; achenes ca. 5 mm long *C. similis*
4. Leaf blades 90–350 mm long, 40–100 mm wide; achenes 10–15 mm long *C. nutans*
2. Leaves with unwinged petioles, 20–320 mm long; blades generally ovate, oval, or oblong, the margins entire to remotely crenate-denticulate 5
5. Leaf blades with the abaxial and adaxial surfaces densely tomentose 6
6. Adaxial and abaxial leaf surfaces densely cinereo-tomentose; peduncles stout, ebracteate, densely pubescent flavo-tomentose, to 20 cm long; involucre densely flavo-tomentose; ray florets 15–22, the corollas white, the outer lip 13–14 mm long, ca. 1.5 mm wide *C. malcabalensis*
6. Abaxial leaf surfaces densely flavo-tomentose, the adaxial surfaces arachnoid-tomentose; ray florets ca. 25–27, the corollas yellow to orange, the outer lip 6–7 mm long, ca. 1 mm wide *C. isernina*
5. Leaf blades with abaxial surfaces densely tomentose, the adaxial surfaces glabrous or rarely simply glabrescent 7
7. Leaf blades ovate to oval, (20–)30–50 mm long, (15–)20–35 mm wide, basally cordate to truncate 8
8. Involucre 10–12 mm high *C. cordata*
8. Involucre 18–20 mm high *C. rotundifolia*
7. Leaf blades oblong-elliptic, 60–110 mm long, 10–25(–40) mm wide, basally cuneate to attenuate 9
9. Outer phyllaries densely ferrugineo-tomentose *C. oblonga*
9. Outer phyllaries lanuginous *C. callacallensis*

1. *Chaptalia callacallensis* Cuatr., Fontqueria 9: 5. 1985. TYPE: Peru, Amazonas, Chachapoyas, Cerros Calla-Calla, 3100 m, 18 km

above Leimebamba on road to Balsas, 7 Jun 1964, P. C. Hutchison & J. K. Wright 5589 (holotype, us).

Perennial rosulate **herbs** to 30 cm tall, rhizomatous. **Leaves** in basal rosette, petiolate; petioles 23–32 cm long; blades oblong-elliptic, 80–110 mm long, 20–23 mm wide, apically attenuate, obtuse or subobtuse, basally cuneate, the adaxial surfaces glabrescent, pale green, the abaxial surfaces densely albo-lanate, the margins remotely sinuate-denticulate, revolute. **Capitulescences** of solitary, scape heads, 5–6 per rosette, the scapes 30–40 cm long, bracteolate. **Capitula** cernuous or nutant; involucre narrowly cylindrical-campanulate, 15–16 mm high, ca. 8 mm wide; phyllaries ca. 6-seriate, the outer lanceolate, 4–4.5 mm long, 1–1.2 mm wide, lanuginous, the inner linear to linear-lanceolate, 14–15 mm long, 1.5–2 mm wide, scarious; florets ca. 55 per head; ray florets ca. 28, the corollas ligulate, pinkish, 11–13 mm long, the tube 3–4 mm long, the ligules 8–9 mm long, 1–1.2 mm wide, the ovary fertile; disc florets ca. 27, the corollas tubular, bilabiate, yellowish, ca. 8.3 mm long, the tube 3.2–3.5 mm long, the abaxial lip ca. 4 mm long; anthers ca. 4.5 mm long; ovary 3–3.5 mm long, sterile. **Achenes** [ray] oblong-elliptic, ca. 5 mm long, pilose; pappus 5.5–6.7 mm long.

DISTRIBUTION—Only known from the type locality.

2. *Chaptalia cordata* Hieron., Bot. Jahrb. Syst. 21: 370. 1896. **LECTOTYPE** (designated by Harling, 1991): Ecuador, Carchi, Páramo del Angel, near El Voladero, 3500 m, 23 Feb 1974, G. Harling & L. Andersson 12104 (lectotype, GH, not seen).

Perennial **herbs**, rhizomatous. **Leaves** in basal rosette; petioles 2–12 cm long; blades cordiform, 20–40 mm long, 18–38 mm wide, basally cordate, apically obtuse, the adaxial surfaces arachnoid-lanate, glabrescent, the abaxial surfaces white-tomentose, the margins revolute, entire to denticulate. **Capitulescences** with scapes 9–24 cm long, lanate, bracteate, the bracts subulate. **Capitula** usually nutant; involucre campanulate, 10–12 mm high, 5–6 mm wide; phyllaries 4–5-seriate, imbricate, acute, glabrous, the margins rose to pink, the outer linear, 5–6 mm long, ca. 0.7 mm wide, the inner linear-lanceolate, 10–12 mm long, 1.2–1.5 mm wide; ray florets reddish to whitish; disc florets white or yellow. **Achenes** fusiform, 5-costate, glabrous, 4.5–5.5 mm long, 1–1.2 mm wide; pappus 5–6 mm long, yellowish.

DISTRIBUTION—Known from the Andean Cor-

dillera from Colombia to northern Peru (2900–3700 m).

Chaptalia cordata is very similar to *C. rotundifolia*, from which it differs in having cordate leaves and smaller, campanulate involucre. These two species are easily confused, and detailed populational studies might suggest that they are conspecific. The collections cited here are considered as one end of a great deal of morphological variability in leaf shape and involucre size.

AMAZONAS. Bongará: Yambarabamba–Pomacocha trail between Yanayacu and Pomacocha, *Wurdack 1062* (us). **Chachapoyas:** between Balsas to Chachapoyas, *Dillon & Turner 1735* (F, USM); middle eastern Calla-Calla slopes, near km 416–419 of Leimebamba–Balsas road, *Wurdack 1276* (us, USM); 22 km along road from Leimebamba SW toward Celendin, *King & Bishop 9249* (MO, US); Cerros Calla-Calla, *Hutchison & Wright 5566* (UC, us, USM). **CAJAMARCA.** Cajamarca: Cumbe Mayo (Frailones), *Becker & Terrones 817* (PPEA, US); Negritos, *Becker & Terrones 1715* (PPEA, US). **PIURA:** **Huanca-bamba:** La Cruz, *Acleto 399* (USM).

3. *Chaptalia exscapa* (Pers.) Baker, Mart. Fl. Br. 6(3): 379. 1884.

Tussilago (*Chaptalia*) *exscapa* Pers., Syn. pl. 2: 456. 1807. **TYPE:** P-JU, not seen.

Chaptalia exscapa is a highly variable species of austral South America, and Burkart (1944) recognized three varieties based largely on corolla size and achenial pubescence. The following variety was described from Peru and accepted by Burkart (1944; p. 539) with some doubts.

- 3a. *Chaptalia exscapa* (Pers.) Baker var. *microcephala* Domke, Notizbl. Bot. Gart. Berlin-Dahlem 13: 246. 1936. **TYPE:** Peru, Puno, Santa Rosa, Nov 1933, D. Stafford 243 (holotype, K).

Acaulescent, perennial **herbs**, 10–25 mm tall. **Leaves** in basal rosette; sessile or petioles to 8 mm long; blades oval to oblanceolate, 10–20 mm long, 5–8(–14) mm wide, the abaxial surfaces densely albo-tomentose, the adaxial surfaces glabrescent, the margins retrorse-dentate to crenate. **Capitulescences** of solitary capitula, sessile or on peduncles to 20 mm long. **Capitula** erect; involucre cylindrical, 6–10 mm high, ca. 6 mm wide; phyllaries 2–3-seriate, the outer subulate, ca. 4 mm long, the inner lanceolate, 7–8 mm long, apically attenuate, all glabrous; ray florets ca. 21, the corollas bilabiate, the tube ca. 3 mm long, the outer lip ca. 4.2 mm

long, ca. 0.8 mm wide, the adaxial surfaces white, the abaxial surfaces pink, 3-toothed; disc florets hermaphroditic, the corollas white, tubular, actinomorphic, the limb 5-lobed, the lobes equal or unequal. **Achenes** fusiform, 4–7 mm long, 7–8-costate, glabrous; pappus 3.2–3.5 mm long.

Chaptalia exscapa var. *microcephala* is apparently a rare variety, known only from a few collections. It is easily distinguished by its essentially sessile heads on nonelongating peduncles concealed in the leaf bases; it varies from the typical variety in possessing smaller heads and glabrous achenes. The collection cited here from Cajamarca (Becker & Terrones 2479, us) varies from the type collection of *C. exscapa* var. *microcephala* in possessing long-attenuate inner phyllaries. Further collections must be examined before the extent of variation of this and other characters can be evaluated.

CAJAMARCA. Cajamarca: Llano Cruz, Becker & Terrones 2479 (us).

5. *Chaptalia integerrima* (Vell.) Burkart, Darwiniana 6: 576. 1944.

Tussilago integerrima Vell., Fl. flumin. Icon. 8, t. 140. (1827) 1831. TYPE: not seen.

Perennial **herbs** to 60 cm. **Leaves** in basal rosette; sessile; blades oblanceolate to spatulate, 80–150 mm long, 15–35 mm wide, basally attenuate, apically acute to obtuse, the abaxial surfaces densely albo-tomentose, the adaxial surfaces arachnoid-tomentose, glabrescent, the margins entire. **Capitulescences** of solitary heads, the scapes 14–60 cm long, lanuginous. **Capitula** erect; involucre campanulate, 15–18 mm high, 12–15 mm wide; phyllaries 3–4-seriate, albo-tomentose, the outer linear, 4–5 mm long, apiculate, the inner lanceolate, 4–15 mm long, apiculate; ray florets white or reddish, the corollas ligulate, the outer lip linear, not exceeding involucre; disc florets white. **Achenes** fusiform, ca. 8 mm long, 5-costate, papillose with biseriate trichomes; pappus 10–12 mm long, reddish.

DISTRIBUTION—Known from the Andean Cordillera from Venezuela to Bolivia. In Peru, it is apparently a rare species known only from two localities in northern Peru (1800–2500 m).

Chaptalia integerrima is distinguished by its entire, oblanceolate to spatulate leaves with long-

attenuate bases and scapes with erect, densely white-tomentose heads.

AMAZONAS. Chachapoyas: mountains behind Tingo, King & Bishop 9282 (us). **JUNIN.** Tarma: Chanchamayo valley, Schunke 1392 (f). **SAN MARTIN.** San Martín: Tarapoto, Spruce 4181 (GH).

5. *Chaptalia isernina* Cuatr., Anales Univ. Madrid 4(2): 212. 1935. TYPE: Peru, Junín, Chanchamayo, “in sylvis,” 12 Oct 1863, J. Isern 42 (holotype, f).

Perennial rosulate **herbs**, 10–45 cm tall. **Leaves** in basal rosette, petiolate; petioles 15–25 mm long; blades oblong-elliptic, 50–90 mm long, 17–30 mm wide, subcoriaceous, apically obtuse to rounded, basally attenuate, the adaxial surfaces arachnoid-tomentose, glabrescent, the abaxial surfaces densely stramineous-tomentose, the margins remotely sinuate-denticulate. **Capitulescences** of solitary, scapose heads, usually 1 per rosette, the scapes 10–45 cm long, bracteolate, densely stramineous-tomentose. **Capitula** erect; involucre cylindrical, ca. 15 mm high, 3.5–4 mm wide; phyllaries 3–5-seriate, the outer lanceolate, ca. 5 mm long, 0.5–1 mm wide, apically attenuate, the inner lanceolate, 11–13 mm long, 1–1.5 mm wide, apically attenuate, the margins scarious; florets heteromorphic; pistillate florets 2-seriate, the corollas ligulate, yellowish-orange, 13–14 mm long, the tube ca. 5 mm long, the ligules 3–5 mm long, the ovary fertile; disc florets hermaphroditic, the corollas tubular, bilabiate, yellowish, ca. 10 mm long. **Achenes** [ray] fusiform, 2.5–3 mm long, glabrous; pappus ca. 7 mm long.

Chaptalia isernina is readily recognized by its short petiolate leaves with densely yellowish-tomentose abaxial surfaces.

HUANUCO. Huánuco: Pillao, 2700 m, 19 Feb 1946, Woytkowski 34110 (f).

6. *Chaptalia malcabalensis* Cuatr., Ciencia (Mexico) 24: 123. 1965. TYPE: Peru, Amazonas, Chachapoyas, summit of Cerro Malcabal (Cerro Tumbé) 3–6 km SW of Molinopampa, 2850–2900 m, J. J. Wurdack 1414 (holotype, us 2373662; isotype, USM 32682). **Figure 4.**

Perennial **herbs**, 20–30 cm high. **Leaves** in basal rosette; petioles ca. 20–40 mm long, ca. 3 mm wide, densely tomentose; blades ovate-elliptic, 35–40(–55) mm long, 15–26 mm wide, basally cuneate

to rounded, apically obtuse, both adaxial and abaxial surfaces densely cinereo-tomentose, the margins entire or slightly crenate-undulate. **Capitulences** with scapes to 30 cm long, densely flavo-tomentose, ebracteate. **Capitula** nutant; involucre campanulate, ca. 20 mm high, ca. 25 mm wide; phyllaries 3–4-seriate, all densely ochraceous-tomentose, the outer linear, 5–8 mm long, ca. 0.8 mm wide, the inner linear-lanceolate, 12–15 mm long, 1.5–1.8 mm wide, all apically acute; ray florets ca. 13, white; disc florets ca. 20, cream-colored. **Achenes** cylindric, 2.6–2.8 mm long, 5-costate, glabrous; pappus 12–14 mm long, white.

DISTRIBUTION—Known only from the type locality.

Chaptalia malcabalensis is distinguished by its ovate-elliptic, short petiolate leaves and densely lanate scapes without bracts.

7. *Chaptalia nutans* (L.) Polak., *Linnaea* 41: 582. 1878.

Tussilago nutans L., *Syst. Nat.* 10(2): 1214. 1795.
TYPE: America, collector unknown, Herb. Linn. 995.5 (holotype, LINN, not seen).

Perennial herbs, 40–90 cm high. **Leaves** in basal rosette; blades lyrate-pinnatifid, 90–350 mm long, 40–100 mm wide, the adaxial surfaces glabrous or slightly pubescent, the abaxial surfaces densely lanuginous. **Capitulences** of 1–several scapes. **Capitula** nutant; involucre campanulate to turbinate, 11–15 mm high, 8–10 mm wide; phyllaries 3–4-seriate, linear-lanceolate, acute; florets trimorphic, white; outer series pistillate, the corollas ligulate, the ligules narrow, ca. 12 mm long; second series pistillate, the corolla tubular, shorter than the style; innermost disc florets hermaphroditic, the corolla bilabiate. **Achenes** fusiform or linear, 10–15 mm long, reddish-brown to green, 5–8-costate, papillose with minute, biseriolate trichomes; pappus 12–15 mm long, yellowish to pink. Chromosome number: $2n = 48$.

DISTRIBUTION—Known from North and Central America to southern South America (600–1200 m). In Peru, it is usually found in the ceja de la montaña or the eastern escarpment of the Cordillera Oriental.

Chaptalia nutans is easily recognized by its large spatulate to lyrate basal leaves and nutant heads.

AMAZONAS. Chachapoyas: Mendoza, *Woytkowski* 8144 (MO). **CUSCO.** La Convención: Rosario Mayo, *Vargas* 21180 (US); Maranura, Chaullay, *Núñez* 8143 (F).



FIG. 4. Flowering individual of *Chaptalia malcabalensis*. (Drawn from J.J. Wurdack 1414, us.)

Urubamba: between Molino and Maras, *Vargas* 12474 (US). **HUANUCO.** Huánuco: Puente Durand, *Stork & Horton* 9584 (F, GH, MO, UC). **Leoncio Prado:** near Tingo María, *Allard* 21654 (F, UC, us); Tingo María, *Ferreya* 12769 (MO, USM); Cayumba, *Ferreya* 6743 (USM). **JUNIN.** Jauja: Satipo, *Ridoutt* s.n. (USM); Satipo, *Woytkowski* 5887 (US). **Tarma:** Chanchamayo, *Esposito* s.n. (USM); near San Ramón, *Ferreya* 379 (USM); Tulumayo, *Ferreya* 1618 (GH, MO, USM); San Luis de Shuaro, *Ferreya* 18619 (USM); San Ramón, *Hermann* 11327 (US); La Merced, *Killip & Smith* 23427 (US); Perené, *Kunkel* 826 (US); Chanchamayo valley, *Schunke* 388 (F), 390 (F); La Merced, *Soukup* 3394 (F). **MADRE DE DIOS.** Tambopata: 0–4 km from Puerto Maldonado, *Gentry & Reville* 16343 (F). **PASCO.** Oxypampa: Pozuzo, *Macbride* 4704 (F). **SAN MARTIN.** San Martín: Tarapoto, *Fer-*

Ferreyra 5066 (MO, USM); Pucaloma, *Ferreyra* 7795 (us, USM); Alto Puca Yacu, *Montes* 55 (F); Tarapoto, *Williams* 5500 (F). **Lamas:** Cumbaza River, *Belshaw* 3526 (UC); near Lamas, *Ferreyra* 4661 (USM); Zepelacio [Jepelacio], near Moyobamba, *Klug* 3476 (F, GH, MO). **Mariscal Cáceres:** Tocache Nuevo, *Schunke* 4945 (F, US), 3204 (F), 12518 (F, US). **UCAYALI. Coronel Portillo:** Cordillera Azul, *Young & Sullivan* 710 (F).

8. *Chaptalia oblonga* D. Don, Trans. Linn. Soc. London 16: 240. 1830.

Perdicium oblongum Ruiz Lopez & Pavón ex D. Don, Trans. Linn. Soc. London 16: 240. 1830. TYPE: Peru, "in Peruviae Andibus prope Panao," *Ruiz Lopez & Pavón s.n.* (holotype, MA, not seen).

Trichocline oblonga (D. Don) Burkart, *Darwiniana* 6: 592. 1944.

Trichocline oblonga Hieron., Bot. Jahrb. Syst. 21: 370. 1896. TYPE: Peru, "crescit prope Fraileyacu inter Pacasmayo et Moyobamba, alt. 3300 m," *A. Stübel* 24 (holotype, B, presumably destroyed). Non *T. oblonga* (D. Don) Burkart, 1944.

Rosulate, perennial herbs. Leaves petiolate; petioles 20–50 mm long, tomentose; blades oblong to elliptic, 30–55 mm long, 10–30 mm wide, apically obtuse to rounded, basally rounded to obtuse, the adaxial surfaces densely arachnoid-tomentose, the abaxial surfaces densely tomentose, ochraceous to ferruginous, the margins remotely denticulate. Capitulescences of solitary heads, the scapes bracteolate, tomentose. Capitula nutant; involucre campanulate, ca. 15 mm high, ca. 15 mm wide; phyllaries 3–4-seriate, narrowly lanceolate, apically acute, densely ferrugineo-tomentose, the outer ca. 9 mm long, the inner ca. 16 mm long; outer florets bilabiate, the corolla 12–15 mm long, the tube 3–4 mm long, the outer lip ligulate, 7–11 mm long, apically 3-toothed, the inner lip 1–5 mm long, bifid; disc florets 8–9 mm long, the corollas bilabiate, the outer lip 3-dentate, the inner lip bifid. Achenes fusiform, 2.5–6 mm long, distally constricted, 5–6-costate, glabrous; pappus 7–9 mm long.

DISTRIBUTION—Known from high-elevation habitats within the Andean Cordillera from southern Ecuador to north-central Peru (3000–3500 m).

Chaptalia oblonga is distinguished by its long-petiolate, oblong leaves and the densely ferrugineo-tomentose phyllaries. Hieronymus (1896) was apparently unsure of D. Don's species and described what he took as a new species under *Trichocline* and cited a northern Peruvian specimen (*A. Stübel* 24, B) under the description. Zardini (1975) argued that it was best accommodated

in *Chaptalia* since it lacks staminodia and achenial pubescence. A complete specimen of *C. callacalensis* has not been examined; however, the description and fragments (ex US) suggest close similarity to *C. oblonga*.

AMAZONAS. Bagua: Cordillera Colán, E of La Peca, *Barbour* 3157 (F), 3243 (F). **HUANUCO. Huánuco:** Mito, *Macbride & Featherstone* 1793 (F).

9. *Chaptalia rotundifolia* D. Don, Trans. Linn. Soc. London 16: 242. 1830. TYPE: Peru, Huánuco, Pillao, *Ruiz Lopez & Pavón s.n.* (holotype, MA, not seen).

Chaptalia cordata var. *ferrugineo-tomentosa* Hieron., Bot. Jahrb. Syst. 36: 512. 1905. TYPE: Peru, Cajamarca, *Jelski* 726 (holotype, B, presumably destroyed; photograph ex B, FM neg. 16000).

Perdicium ovale Ruiz Lopez & Pavón ex D. Don, Trans. Linn. Soc. London 16: 241. 1830. TYPE: Peru, Junín, Tarma, "in Peruvia ad Huassahuassi et Churapallanam" (holotype, MA, not seen).

Chaptalia ovalis D. Don, Trans. Linn. Soc. London 16: 240. 1830.

Trichocline ovalis (D. Don) Hieron., Bot. Jahrb. Syst. 21: 370. 1896.

Perennial herbs; rhizomatous. Leaves in basal rosette; petioles 25–60 mm long, conspicuously lanose; blades oval to round, 25–45 mm long, 15–35 mm wide, lanuginous, base amplexicaul, apically obtuse to acute, the adaxial surfaces arachnoid, the abaxial surfaces white-tomentose, the margins denticulate. Capitulescences with scapes 12–27 cm long, lanose, bracteate, bracts subulate, glabrous. Capitula nutant; involucre turbinate, 18–20 mm high, 10–12 mm wide; phyllaries 5–6-seriate, the outer linear, 5–10 mm long, 0.5–1 mm wide, acuminate, the inner lanceolate, 10–18 mm long, 1.8–2 mm wide, more or less reddish at apex, acuminate; ray florets ligulate, the ligule linear, reddish, female; disc florets linear, white, bilabiate. Achenes fusiform, costate, glabrous, 7–9 mm long, 4–5 mm wide; pappus 9–10 mm, yellowish.

DISTRIBUTION—Known from the Andean Cordillera in northern to southern Peru (3300–4200 m).

Chaptalia rotundifolia most closely resembles *C. cordata* and is rather arbitrarily distinguished from that species by its rotund to ovate, noncordate leaf blades and larger involucre. Detailed populational studies are needed, especially in northern Peru, where the two species are apparently sympatric.

Hieronymus (1905) described *C. cordata* var. *ferrugineo-tomentosa*, calling attention to its densely ferrugineo-tomentose phyllaries. The type material from northern Peru is no longer available for study; however, a photograph of the type (FM neg. 16000 ex B) shows that Burkart examined the holotype collection in 1930 and annotated it as equaling *C. rotundifolia*. The photograph of *C. ovalis* (FM neg. 38071 ex P) and D. Don's description both conform to material here placed under *C. rotundifolia*.

ANCASH. Carhuaz: Huascarán National Park, Quebrada Ishinca, *Smith & Buddensiek 11272* (F). Huaras: Quebrada Churup, *Smith et al. 9622* (F); Laguna Querochocha, *Tovar & Rivas 9549* (USM). **Huaylas:** Quebrada Alpamayo, *Smith et al. 9847* (US). **Yungay:** Quebrada Ranincuray, *Smith et al. 10373* (F). **CAJAMARCA.** Cajamarca: Cumbe Mayo, *Sánchez 3443* (F, MO). **CUSCO.** Paucartambo: Acanjaco, Parque Nacional del Manu, *Cano 3142* (F, USM), *3204* (F, USM); Piñasniocj, Pantiacalla Pass, *Cook & Gilbert 1881* (US); Aconaco, *Woytkowski 056* (USM). **HUANUCO.** Dos de Mayo: Huallanca Valley, *Tovar & Rivas 9895* (USM). **Huánuco:** 15 mi NE of Huánuco, *Macbride & Featherstone 2189* (F, US). **JUNIN.** Huancayo: Huancayo, *Soukup 2735* (F). **LIMA.** **Huaroquiri:** Viso, *Macbride & Featherstone 585* (F); Río Blanco, *Macbride 3014* (F, US). **SAN MARTIN.** Mariscal Cáceres: Chochos, *Young & León 4829* (F).

10. *Chaptalia similis* R. E. Fries, Nova. Acta Regiae Soc. Sci. Upsal., ser. 4, 1: 95. 1905. CO-TYPES: Argentina, Jujuy, Puna, Sta. Catalina *Kurtz 14460* (BAF, not seen); Bolivia, La Paz, Potopoto, *Mandon 13* (K, not seen).

Perennial herbs to 22 cm tall; rhizomatous. Leaves in basal rosette; petioles 15–20 mm long; blades lyrate-pinnatifid, 20–110 mm long, 7–30 mm wide, basally attenuate, apically acute to obtuse, mucronate, the adaxial surfaces lanuginous-tomentose, the abaxial surfaces densely albo-tomentose, the margins sinuate-crenate. Capitulescences with scapes 3–20 cm high, tomentose, bracteate, the bracts subulate. Capitula nutant; involucre campanulate, 10–15 mm high, 7–8 mm wide; phyllaries 3–4-seriate, the outer linear, 4–5 mm long, apiculate, the inner linear, ca. 18 mm long, acute, tomentose to glabrous; florets 25–40, trimorphic; outer ray florets ligulate, the corollas white, the outer lip ligulate, inconspicuous, not surpassing involucre, the inner lip bifid; inner ray florets hermaphroditic, ca. 10, the corollas tubular, the limb bilabiate; disc florets hermaphroditic, 7–11, the corollas tubular, the limb bilabiate. Achenes fusiform, ca. 5 mm long, papillose with biseriate trichomes; pappus 8–10 mm long, white.

DISTRIBUTION—Known from extreme southern Peru, through Bolivia, and into northern Argentina (1500–4500 m).

Chaptalia similis is distinguished by its lyrate-pinnatifid leaf blades with sinuate-crenate margins and lower surfaces lanate tomentose. Burkart (1944) cited this taxon from Lago Titicaca to west-central Argentina and the Peruvian collection cited here (*Vargas 12474*, us) is the northernmost recorded occurrence of the species.

CUSCO. Urubamba: entre Molino Waycko y Maras, *Vargas 12474* (US).

V. CHUCOA

Chucoa Cabr., Bol. Soc. Argent. Bot. 6: 40. 1955.

TYPE: *C. ilicifolia* Cabr.

Shrubs much-branched. **Leaves** alternate, sessile; blades lanceolate to oblanceolate, the margins unequally dentate with 4–6 pairs of spinulose teeth. **Capitulescences** of solitary, terminal heads, pedunculate. **Capitula** homogamous, discoid; involucre turbinate; receptacles plane, alveolate, epaleate, densely pilose-fimbriate; phyllaries 4–5-seriate; florets isomorphic, or occasionally, dimorphic with abortion of anthers in marginal florets, hermaphroditic, the corollas yellow, the limb 5-lobed, the lobes linear; stamens 5, the anther appendages linear-lanceolate, the bases caudate, glabrous; styles bilobed, the branches apically obtuse, the abaxial surfaces papillose. **Achenes** cylindrical, glabrous or papillose; pappus of scabrid bristles, 2–3-seriate, isomorphic.

Chucoa is a monotypic genus with only the following northern Peruvian species recorded.

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- FERREYRA, R. 1980. Notas sobre especies Peruanas de los géneros *Arnaldoa*, *Chucoa* (Compositae) y *Monnina* (Polygalaceae). *Bol. Soc. Peruana Bot.*, 8: 106–109.
1. *Chucoa ilicifolia* Cabr., *Bol. Soc. Argent. Bot.* 6: 42. 1955. TYPE: Peru, La Libertad, Santiago de Chuco, Angasmarca-Tulpo, 2930 m, 19 Jun 1954 *A. López M. 1090* (holotype, LP).

Figure 5.

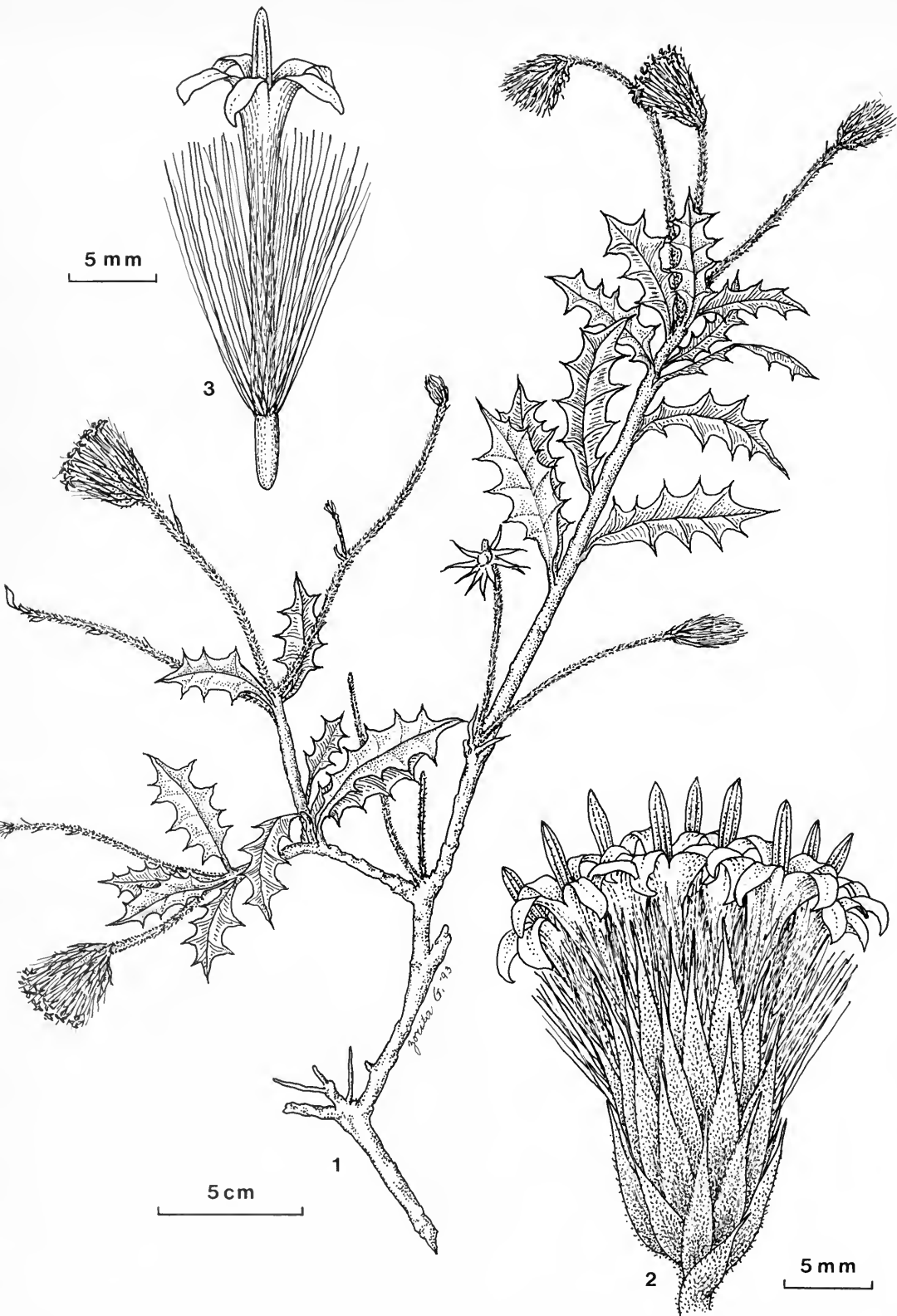


FIG. 5. *Chucoa ilicifolia*. 1, habit; 2, capitulum; 3, floret with achene. (Drawn from A. Weberbauer 7017, F.)

Weberbaueriella johnstoniana Ferreyra, Bol. Soc. Peruana Bot. 5: 2. 1955. TYPE: Peru, La Libertad, Santiago de Chuco, below Mollepata, A. *Weberbauer* 7017 (holotype, GH; isotype, F, USM).

Suffrutescent **shrubs**, 40–50 cm high. **Leaves** with petioles 2–6 mm long, tomentose; blades oblanceolate or lanceolate, 22–70 mm long, 10–28 mm wide, the adaxial surfaces glabrous, the abaxial surfaces white-tomentose, apex acute, spinulose, the margins unequally dentate, the teeth 1–3 mm long, the spines 2–3 mm long. **Capitulescences** of solitary, terminal or axillary heads or weakly cymose, 1–3-headed; peduncles 32–130 mm long, lanuginous-glandulose, bracts 3–8 mm long, subulate. **Capitula** with involucre 14–17 mm high, 8–15 mm wide; phyllaries 4–5-seriate, the outer subulate, ca. 5 mm long, ca. 1 mm wide, the inner lanceolate, 8–16 mm long, 1–2 mm wide, attenuate; florets 15–20, the corollas 14–18 mm long, the tube 11–15 mm long, 5-lobed, the lobes linear, 2–3 mm long, coiled; anthers 8–10 mm long, the apical appendage ca. 3 mm long, the tails ca. 2.5 mm long. **Achenes** cylindric, ca. 3 mm long; pappus 12–15 mm long, yellowish-white.

DISTRIBUTION—Endemic to the intermontane region of northern Peru (2200–3000 m).

Chucoa ilicifolia is apparently a rare species known only from the type and one other collection.

VI. CHUQUIRAGA

Chuquiraga Juss., Gen. pl. 178. 1789. TYPE: *Chuquiraga jussieu* J. F. Gmelin

Intricately branched **shrubs**, frequently with axillary spines, erect or rounded to flattened cushions. **Leaves** opposite or alternate; sessile or shortly petiolate; blades coriaceous, uninerved, often apically spinulose, the margins entire, plane, in-cassate, or revolute. **Capitulescences** of solitary heads or loose aggregates, terminal and/or axillary,

sessile. **Capitula** homogamous, discoid; involucre cylindric, campanulate, or turbinate; receptacle veolate, epaleate, pilose; phyllaries 5–10(–12)-seriate, scarious to coriaceous, imbricate, pubescent, the outer ovate-lanceolate, sericeous, the inner linear-lanceolate, mucronate; florets hermaphroditic, the corollas yellow to orange, densely villous, tubular, the limb 5-lobed; stamens 5, the anthers basally caudate, the terminal appendages acute to obtuse; styles filiform, bifid, the branches rounded, papillose-glandular distally. **Achenes** conical, densely sericeo-villous; pappus of plumose bristles, 1-seriate, yellowish to purple, united at base.

Chuquiraga consists of approximately 20 species largely confined to the Andean Cordillera from Colombia to Argentina and Chile. In Peru the genus is represented by five species distributed in the jalca and puna formations at elevations above 3000 m. *Chuquiraga* is most similar to *Arnaldoa* and distinguished from that genus by possessing actinomorphic corollas with five lobes and staminal filaments inserted at the base of the corollas rather than above the base as in *Arnaldoa*. *Chuquiraga* is readily separated from *Dasyphyllum* with the former possessing coriaceous leaves with only one central nerve, yellow to orange corollas, and anthers with linear-lanceolate, apical appendages. Various species of *Chuquiraga* are used in folk medicine and are commonly found in herb markets.

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Key to Peruvian Species of *Chuquiraga*

1. Plants with spines 2
2. Leaf blades rounded, sessile; involucre turbinate, 34–40 mm high; florets 10–16 *C. rotundifolia*
2. Leaf blades ovate-elliptic or oblanceolate, subsessile; involucre campanulate, 25–30 mm high; florets 15–20 3

- 3. Leaves ovate-lanceolate, pubescent, then glabrescent; phyllaries 8–10-seriate, orange; corollas 19–22 mm long *C. spinosa*
- 3. Leaves oblanceolate, tomentose; phyllaries 7–9-seriate, greenish to brunneous; corollas 16–17 mm long *C. johnstonii*
- Plants without spines 4
- 4. Leaves alternate, subsessile, ovate-lanceolate, 5–15 mm long, 3–7 mm wide; florets 21–40 *C. jussieui*
- 4. Leaves opposite, sessile, elliptic-lanceolate, 6–28 mm long, 3–8.5 mm wide; florets 20–45 *C. weberbaueri*

Chuquiraga johnstonii Tovar, Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot. 5: 8. 1952. TYPE: Pasco, Daniel Carrión, Yanahuanca, J. F. Macbride & W. Featherstone 1209 (holotype, GH; isotypes, F, US).

Shrubs 9–12 dm high, much-branched, the branches pubescent, spiny, the spines axillary, 3.5–10 mm long, curved at the base. **Leaves** opposite, subsessile; blades oblanceolate, rarely lanceolate, 10–20 mm long, 3–6.5 mm wide, coriaceous, the adaxial surfaces glabrous, lustrous, the abaxial surfaces tomentose, usually 1-nerved, apically mucronate, the margins incassate. **Capitulescences** of solitary heads, terminal and axillary. **Capitula** with involucre campanulate, 28–30 mm high, 20–25 mm wide; phyllaries 7–9-seriate, the outer triangular-ovate, ca. 4 mm long, ca. 4 mm wide, the inner linear-lanceolate, 25–29 mm long, 1.4–1.8 mm wide, apex spinulose, pubescent; florets 18–40, the corollas yellow, 16–17 mm long, the tube 1.5–7 mm long, 2–2.2 mm wide, pubescent, the lobes linear-lanceolate, 4 lobes 6–7 mm long, equal, the lobe 10–12 mm long, 0.8–1 mm wide at the base, acute, pubescent; anthers 11–12 mm long, the terminal appendage membranous, obtuse; styles 25–28 mm long. **Achenes** 3.3–3.5 mm long, 1.8–2 mm wide, pubescent, the hairs rigid, whitish then brunneous; pappus of 17–19 bristles, yellow-orange, 10–14 mm long.

DISTRIBUTION—Native of the interandean region of central Peru (3600–3900 m).

Chuquiraga johnstonii most closely resembles *C. spinosa* but differs in possessing stems with infrequent, small spines to only 10 mm long, leaves conspicuously tomentose beneath, yellow capitula and restricted distribution in the south-central Andean Cordillera. *Chuquiraga weberbaueri* also has sericeous leaves, but it is readily distinguished from *C. johnstonii* by its much larger leaves and capitula.

HUANCAVELICA. Huancavelica: near Vichi, *Proaño 19* (USM). Tayacaja: 3 km N of Salcabamba Village, *Stork & Horton 10329* (F). **HUANUCO. Ambo:** km 324 Huánuco to Cerro de Pasco, *Duncan et al. 2702* (F, MO); Quinna, *Sawada 84* (F). **PASCO. Pasco:** cerca a Salcachupan, entre Cerro de Pasco y San Rafael, *Ferreyra 6598* (F, MO, USM); La Quinoa and Chicrin, *Ellenberg 3769* (US), *3773* (US); *Gentry et al. 19222* (MO); 95 km S from Huánuco, on road to Pasco, *Gentry et al. 37501* (F, MO).

2. *Chuquiraga jussieui* J. F. Gmelin, Syst. Nat. 1205. 1796. TYPE: Peru, without exact locality, *J. de Jussieu, herb. A. L. de Jussieu 8320* (holotype, P-JU, not seen).

C. peruviana J. St. Hil., Fam. Nat. 1: 394. 1805. TYPE: not seen.

C. pseudoruscifolia Muschl., Bot. Jahrb. Syst. 50, Beibl. 111: 93. 1913. SYNTYPES: Peru, Puno, Sandia, Cuyocuyo, *A. Weberbauer 936* (syntype, B, presumably destroyed; isosyntype, MOL; photograph ex B, FM neg. 15847); Puno, *A. Weberbauer 500* (B, presumably destroyed); Ancash, Cajatambo, Ocos, *A. Weberbauer 2805* (B, presumably destroyed); La Oroya, *A. Weberbauer s.n.* (B, presumably destroyed).

[For additional synonymy, consult Escurra (1985).]

Shrubs 6–12 dm high, much-branched, the branches pubescent, hairs flexuose. **Leaves** alternate, subsessile; blades ovate-lanceolate, 5–15 mm long, 3–7 mm wide, glabrous, coriaceous, lustrous, mucronate, the margins incassate, uninerved, the midrib prominent. **Capitulescences** of solitary, sessile, terminal heads. **Capitula** with involucre campanulate, 34–50 mm high, 15–22 mm wide; phyllaries 8–12-seriate, orange, the outer elliptic-lanceolate, 8–18 mm long, ca. 3 mm wide, the inner linear-lanceolate, 22–32 mm long, 1.5–1.8 mm wide, yellowish acute, spinulose, pubescent; florets 21–40, the corollas yellow, 17–22 mm long, the tube 7–9 mm long, 1.4–1.5 mm wide, pubescent, the lobes acute, pubescent; anthers 11–12 mm long; styles 21–22 mm long, brown-orange, sericeous, glandular. **Achenes** 3–5 mm long, 1.2–

1.5 mm wide, dense pubescent; pappus of 20–22 bristles, yellowish, 14–15 mm long.

DISTRIBUTION—Known from the páramos of Colombia and Ecuador, jalca formations in northern Peru, and the drier puna formations of central and southern Peru and Bolivia (3100–4500 m).

Escurra (1985) did not lectotypify *C. pseudoruscifolia*, but the only likely extant element is *Weberbauer 936* (MOL), since all others were presumably destroyed at B.

AREQUIPA. Condesuyos: Chuquiribamba, *Hartweg 18* (NY). **CUSCO.** Quispicanchi: Marcapata–Cusco, 11 km from peak, *Aronson & Berry 540* (F); Marcapata, *Stafford 991* (F). **LAMBAYEQUE.** Ferreñafe: 7 km NW of Incahuasi, *Dillon & Skillman 4139* (F); Huasicaj, Incahuasi, *Llatas 1333* (F). **LA LIBERTAD.** Patáz: Tiragra, *Young 3059* (F). **PIURA.** Huancabamba: San Antonio–Talano, *Sagástegui & Cabanillas 8631* (F). **PUNO.** Azángaro: Muñani, *Macedo s.n.* (USM). Chuchuito: Juli, *Soukup 231* (F). Huancané: Miajachi–Huancané, *Aguilar s.n.* (MO); near Huancané, *Shepard 85* (NY). Puno: Cerro Putina, *Soukup 420* (F, GH). **Sandia.** Limbani, *Stafford 1111* (F).

3. *Chuquiraga rotundifolia* Wedd., *Chlor. And.* 1: 4. t. 4A. 1855. LECTOTYPE (designated by Escurra, 1985): Peru, “sommet des Andes Tacora,” *d’Orbigny s.n.* (lectotype, P, not seen; photograph ex P, FM neg. 52102). **Figure 6.**

Chuquiraga spinosa subsp. *rotundifolia* (Wedd.) Escurra, *Darwiniana* 26: 242. 1985.

Shrubs 4–12 dm high, branched, upper branches pubescent, spiny, spines divaricate, 4–15 mm long, yellowish. **Leaves** opposite, sessile; blades round to oval, 4–14 mm long, 3.5–10 mm wide, coriaceous, entire, uninerved, acuminate, the adaxial surfaces slightly pubescent, the abaxial surfaces densely pubescent. **Capitulescences** of solitary heads or aggregates of 2–3, sessile heads. **Capitula** with involucre turbinate, 34–40 mm high, 7.5–9.5 mm wide; phyllaries 5–8-seriate, the outer ovate-lanceolate, 5–9 mm long, ca. 4 mm wide, brunneous, mucronate, pubescent outside, the inner linear-lanceolate, 26–31 mm long, 2–3 mm wide, apex spinulose; florets 10–16, the corollas yellow, 19–22 mm long, the tube 7–9 mm long, 1.4–1.8 mm wide, pubescent, the lobes linear-lanceolate; anthers 12–14 mm long, apex obtuse; styles 28–35 mm long. **Achenes** 3–4 mm long, 1.4–1.5 mm wide, densely pubescent; pappus of 17–21 bristles, yellowish, 15–18 mm long.

DISTRIBUTION—Known from the puna of southern Peru and adjacent northern Chile and Bolivia (3000–4000 m).

Chuquiraga rotundifolia is characterized by its round or oval leaves, turbinate involucre, and brown, mucronate, 5–6-seriate phyllaries.

AREQUIPA. Arequipa: entre Chihuata y la Cumbre, *Ferreya 2592* (F, MO, USM); S slopes of Nevado Chachani, on road to Sumbay, *Hutchison & Wright 7234* (F, MO); 26 mi out of Arequipa on road to Puno, *Maguire & Maguire 44451* (F, MO, NY); above Arequipa, *Pennell 13214* (F, GH, NY); Nevado de Chachani, *Pennell 13271* (F, GH, NY); *López 131* (US); *Rauh 40534* (USM); *West 7135* (MO). **Condesuyos:** above Salamanca, *Weberbauer 6858* (F, MOL, US, USM). **AYACUCHO.** Lucanas: 83 km W of Puquio, 76 km E of Nazca, *Gentry et al. 23271* (F); Puquio, *Rauh & Hirsch P427* (NY), *P428* (NY, USM). **MOQUEGUA.** Mariscal Nieto: cordillera above Torata, *Weberbauer 4778* (F). **TACNA.** Tarata: 16 km on trail from Candarave to Puno, *Metcalf 30394* (MO, US); 4 km NE of Tarata, *Pearson 31* (F). Without locality data, *Rauh 526* (USM).

4. *Chuquiraga spinosa* Less., *Linnaea* 5: 259. 1830. LECTOTYPE (designated by Escurra, 1985): Peru, without exact locality, *J. Dombey 447* (lectotype, P, not seen). Non *Chuquiraga spinosa* (Ruiz Lopez & Pavón) D. Don, 1830.

Chuquiraga spinosa subsp. *huamanpinta* Escurra, *Darwiniana* 26: 243. 1985. TYPE: Peru, Lima, “bei Ticlio Bajo, östl. v. Lima,” *L. Diers 946* (holotype, LP, not seen).

Shrubs 4–15 dm high, branched, upper branches finely pubescent, spiny, the spines axillary, yellowish, divaricate, 12–18 mm long. **Leaves** opposite, sessile; blades ovate-lanceolate, 4.5–20 mm long, 2.6–5 mm wide, pubescent, then glabrescent, lustrous, uninerved, midrib prominent, attenuate at base, apex spinulose, entire, the margins incrassate. **Capitulescences** of solitary heads, terminal and axillary. **Capitula** with involucre 32–45 mm high, 12–24 mm wide, campanulate; phyllaries 8–10-seriate, deep red-orange, the outer lanceolate, apically rounded-mucronate to acute-spinulose, densely pubescent, the inner linear-lanceolate, 25–30 mm long, 1.8–2.8 mm wide, pubescent; florets 9–14, the corollas yellowish-orange, 19–22 mm long, the tube 6.5–8 mm long, 1.7–2.2 mm wide, pubescent, the lobes 12–14 mm long, acute, pubescent; anthers 12.5–15 mm long, obtuse, sagittate; styles 30–34 mm long, deep red-orange. **Achenes** 3–4 mm long, 1.9–2.2 mm wide, densely pubescent; pappus of 15–21 bristles, yellowish, 13–20 mm long.

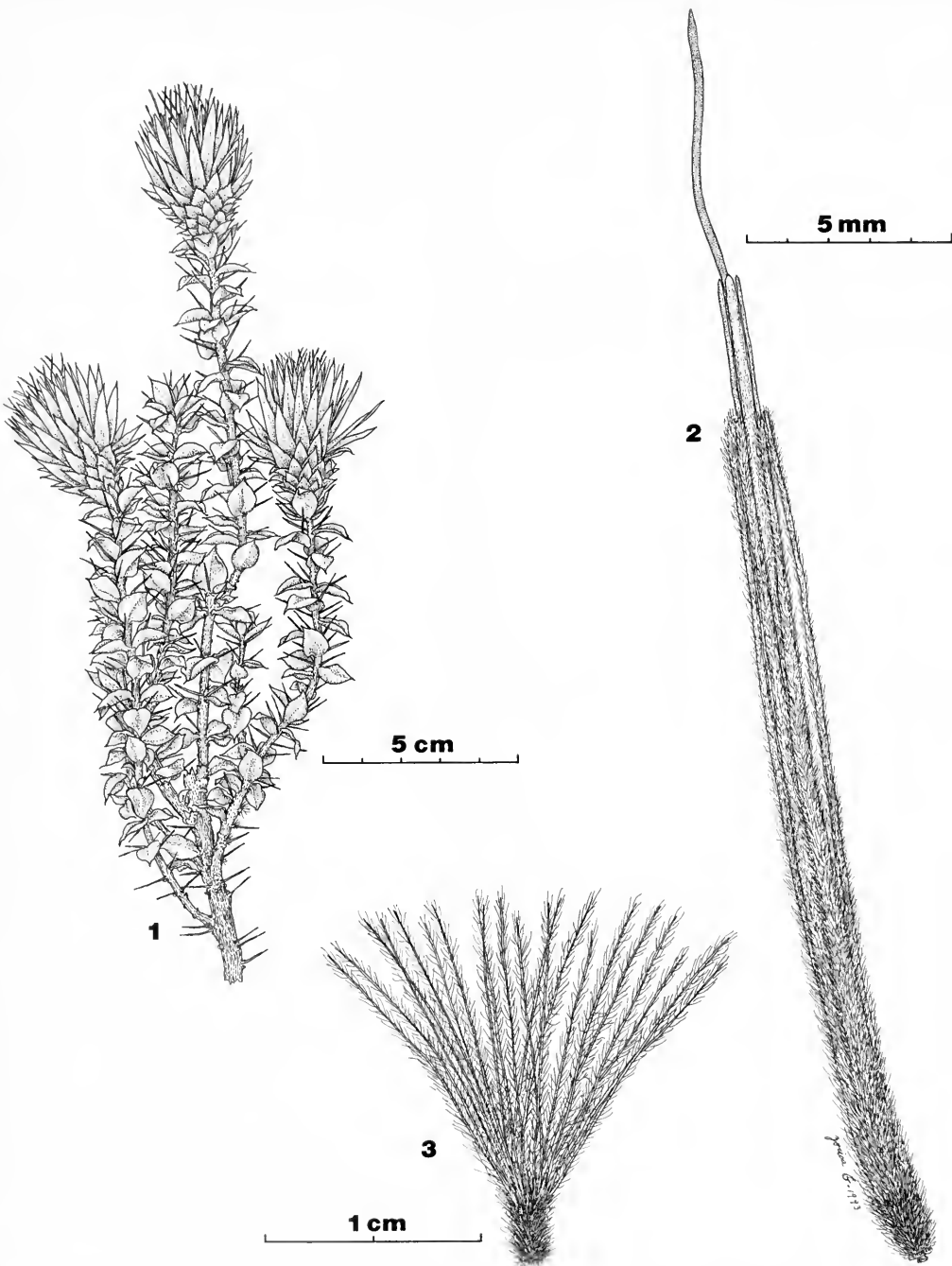


FIG. 6. *Chuquiraga rotundifolia*. 1, habit; 2, floret; 3, achene with pappus. (Drawn from P.C. Hutchison & J.K. Wright 7234, F.)

DISTRIBUTION—Known from the Andean Cordillera of central Peru (3500–4800 m).

Chuquiraga spinosa is one of the most common and characteristic species in the Central Puna of Peru. The dense spiny habit, conspicuous rigid and

glabrescent leaves, and yellowish-orange florets distinguish it from the other related species.

ANCASH. Bolognesi: near Carpa, *Antunez 332* (USM); Pampa de Lampas, *Cerrate 1511* (USM); between Tal-

lenga and Pachapaque, *Ferreyra* 7473 (USM); 10 km E of Catac, *Gentry et al.* 37460 (F, MO, USM); Pachacoto, *Tovar & Rivas* 9618 (USM); between Ocros and Paso de Chonta, *Weberbauer* 2805 (USM). **Huaras:** near Huaras, *Bernardi et al.* 16605 (F, US). **Recuay:** arriba de Carpa, *López et al.* 8327 (F); Huascarán National Park, *Todzia et al.* 2600 (F). **Yungay:** Parque Nacional Huascarán, *Zardini* 1561 (MO). **APURIMAC. Andahuaylas:** Coracora-Andahuaylas, *Weberbauer* 5834 (F). **AYACUCHO. Huanta:** N of Huanta, near Huailay, *Weberbauer* 7593 (F). **CUSCO. Urubamba:** Chinchero, *Sallo & Franquemont* 276 (F). **HUANCANELICA. Huancavelica:** near Conaica, *Tovar* 740 (USM); Chassca, above Conaica, *Ferreyra & Tovar* 8008 (USM). **JUNIN. Huancayo:** near Huancayo, *Killip & Smith* 22135 (F); Hda. Acopalca, *Ochoa* 637 (F, GH); Acopalca, *Soukup* 3683 (F, US), 3691 (F, US); between Acopalca and Pariahuanca, *Stork* 10926 (F, UC). **Jauja:** above Chicchi, *Ochoa* 29 (USM). **Junin:** entre Carhuamayo y Junin, *Ferreyra* 5237 (F, MO, USM); Ondores, *Johns* 81-3 (F); Lago Junin, *Landrum* 4629 (NY); 3 mi N of Junin on road to Cerro de Pasco, *Maguire & Maguire* 44401 (F, NY, USM). **Tarma:** between Tarma and Huancayo, *Anderson* 1045 (US); San Pedro de Cajas, *Antunez* 26 (F, USM); 1 km W of Tarma, *Dillon & Turner* 1387 (F); between Tarma and the Cumbre, *Ferreyra* 3780 (USM); Pampa de Junin, *Ferreyra* 3945 (USM); Logo Junin, *Hutchison et al.* 5886 (F, K, MICH, MO, NY, US, USM); between Tarma and Jauja, *Iltis & Ugent* 153 (US); above Tarma, *Infantes* 637 (USM); between Oroya and Tarma, *Palmer* 94 (USM); Huacapa, *Smith et al.* 1395 (F); Laguna Parinacochas, *Tovar* 423 (MO); Tarmatambo, *Tovar* 2334 (USM); Incatacuna, *Tovar* 1081 (MO, USM); Acobamba, *Woytkowski* 53 (F). **Yauli:** above Oroya, *Cerrate* 914 (MO, USM); Lima-Oroya, *Davidson* 9010 (MO); 1 km W of Anticona Pass, *Dillon & Turner* 1482 (F); 3 km from Yauli, *Duncan et al.* 2651 (F); near Morococha, *Grant* 7567 (F); near Oroya, *Kalenborn* 34 (GH, US, MO); near Yauli, *Soukup* 3999 (F, USM); between Tarma and Huancayo, *Sullivan et al.* 1050 (USM); *Townsend* 1523 (US); Tucto, near Morococha, *Weberling* 5909 (USM). **LIMA. Canta:** near La Viuda, *Meza* 197 (MO, USM); above Canta, *Sánchez* 41 (USM); Mishquipuquio, *Sánchez* 40 (MO, USM); Chuchun, Cordillera La Viuda, *Meza s.n.* (USM). **Huaro-chiri:** km 94, near San Mateo, *Ferreyra* 5322 (USM); above Chicla, *Ferreyra* 6904 (USM); Casapalca, *Ferreyra* 8009 (USM); 20 km NE of San Mateo, *Gentry et al.* 19184 (F, MO); 10 km NE of Suchi, *Gentry* 21678 (F, MO, USM); NW of Ticlio, *Gentry & Smith* 44837 (F); *Simpson* 8558 (USM); *Maisch s.n.* (USM); between San Mateo and Ticlio, *Hjerting & Petersen* 1283 (MO, USM); near Huaro-chiri, *Hrdlica s.n.* (US); Viso, *Macbride & Featherstone* 632 (F, GH); near Escamarca, *Ferreyra* 19090 (USM). **Yauyos:** Cochapunco, above Tupe, *Cerrate* 1215 (MO, USM); 17 km de Tupe, *Cerrate & Tovar* 1234 (F, USM); Omas, Cerro Quilca, entre Tamará y Ayaviri, *Ochoa & Salas* 14666 (F, US); Huacracocha, near Tupe, *Tovar* 650 (USM); above Tupinacha, *Tovar* 632 (USM). **PASCO. Pasco:** La Viuda, *Ellenberg* 4064 (US); Bosque de Piedras, *Urquiza* 27 (USM). Without locality data, *Rauh* P1758 (USM); Peruvian Andes, *Capt. Wilkes Exped. s.n.* (GH).

5. *Chuquiraga weberbaueri* Tovar, Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot. 5: 9. 1952. TYPE: Peru, La Libertad, Bolivar, cerca Nevado Cajamarquilla, Sep 1946, 4200-

4600 m, *R. Ferreyra* 1304 (holotype, F 1488740; isotypes, MO, USM).

Shrubs 8–15 dm high, branched, the branches pubescent. **Leaves** opposite, sessile; blades elliptic-lanceolate, 6–28 mm long, 3–8.5 mm wide, coriaceous, apically mucronate, the adaxial surfaces lustrous, the abaxial surfaces sericeous, uninerved, the margins entire, incrassate. **Capitulescences** of solitary, terminal heads. **Capitula** with involucre campanulate, 28–45 mm high, 15–30 mm wide; phyllaries 6–7-seriate, orange-yellowish, the outer triangular-ovate, 4–6 mm long, ca. 4 mm wide, the inner linear-lanceolate, 27–33 mm long, 2–2.5 mm wide, sericeous, spinulose, abaxial surfaces pubescent; florets 20–45, the corollas yellow, 17–23 mm long, the tube 5–7 mm long, 1.6–2 mm wide, pubescent, the lobes 11.5–16 mm long, acute, abaxial surfaces pubescent; anthers 10.5–15 mm long; styles 25–33 mm long, red-orange. **Achenes** 3–4 mm long, 1.8–2.2 mm wide, densely pubescent, brunneous; pappus of 17–18 bristles, brunneous, 14–18 mm long.

DISTRIBUTION—Endemic to the jalca formations of northern Peru (3200–4600 m).

Chuquiraga weberbaueri is characterized by its dense, nodose branches; sessile, sericeous, tomentose leaves; and campanulate involucre with phyllaries 6–7-seriate.

CAJAMARCA. Cajamarca: cerca Cajamarca, *Sánchez* 1146 (CPUN). **LA LIBERTAD. Huamachuco:** Montaña de Huaylillas, *Weberbauer* 7009 (F, GH, MOL); *West* 8128 (GH).

VII. DASYPHYLLUM

Dasyphyllum Kunth, Nov. Gen. Sp. 4: 13. (fol.) 1816, 17 (quarto). 1820. TYPE: *D. argenteum* Kunth

Flotovia Spreng. Syst. Veg. 3: 359. 1826. TYPE: *F. glabra* Spreng.

Trees or **shrubs**, erect to scandent, with or without axillary spines. **Leaves** alternate, shortly petiolate; blades lanceolate to oblong or oval, coriaceous, 3–5-nerved, the margins entire. **Capitulescences** of solitary heads or racemose or glomerulate, terminal or axillary. **Capitula** homogamous; involucre campanulate or turbinate; receptacles plane, pubescent with bristles or scales, epaleate; phyllaries 5–8-seriate, imbricate, the outer lanceolate,

micronate, the inner lanceolate, sericeous; florets 5–many, hermaphroditic, the corollas tubular, white to violet or rarely yellow, usually isomorphic or slightly dimorphic, usually villous, the limb 5-lobed; anthers 5, basally sagittate, terminal appendage bifid to emarginate, rarely truncate; styles filiform, bifid. **Achenes** cylindrical, densely villous to glabrous; pappus of plumose bristles, 1-seriate.

Dasyphyllum consists of approximately 37 species of shrubs or small trees restricted to South America from the Andean Cordillera of Colombia and Venezuela to eastern Brazil and central Chile. The habit of *Dasyphyllum* is very close to *Chuquiraga*; it can be distinguished from that genus, however, in having three- or five-nerved leaves, the stamens united at the lower part of the tube of the corolla, the anthers slightly sagittate with the terminal appendage bifid or truncate, the florets with white, pale violet, or yellowish corollas, and tricolpate pollen grains. It is readily distin-

guished from *Barnadesia*, which possesses generally reddish corollas, acute anther appendages, and lophate pollen. In addition, *Dasyphyllum* finds its greatest diversity in the subtropical region east of the Andean Cordillera, while *Chuquiraga* and *Barnadesia* find their greatest diversity within the Cordillera.

Although Tovar (1953) recognized *Flotovia* as a distinct genus, Cabrera (1959) combined it with *Dasyphyllum*, and it is not accepted in the present treatment.

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Key to Peruvian Species of *Dasyphyllum*

1. Corolla apices velutinous 2
2. Stems without spines 3
 3. Leaves glabrescent, the blades obovate-elliptic, 20–35 mm long, 10–18 mm wide; capitula with (11–)12(–13) florets *D. cabrerai*
 3. Leaves pubescent, the blades ovate-oblong, ca. 33 mm long, ca. 14 mm wide; capitula with 13–15 florets *D. weberbaueri*
2. Stems with paired, divergent, straight or curved spines 4
 4. Spines longer than leaves, 25–50 mm long *D. ferox*
 4. Spines greatly reduced, 3–5 mm long 5
 5. Stems velutinous, spines straight, 3–5 mm long; capitulescences racemose *D. brevispinum*
 5. Stems glabrous, spines strongly curved proximally, ca. 5 mm long; capitulescences cymose-paniculate *D. brasiliense*
1. Corolla apices glabrous 6
 6. Capitula with (11–)15–20(–30) florets; achenes glabrous *D. hystrix*
 6. Capitula with 6–10 florets; achenes pubescent 7
 7. Leaf blades elliptic lanceolate, generally 15–30 mm long, 4–12 mm wide; involucre turbinate, 11–13 mm long; florets 6 *D. leioccephalum*
 7. Leaf blades ovate-elliptic, generally 5–15 mm long, 3.5–5 mm wide; involucre campanulate, 8–11 mm long; florets 7–10 *D. horrida*

Dasyphyllum brasiliense (Spreng.) Cabr., *Revista Mus. La Plata, Secc. Bot.* 9: 74. 1954.
Figure 7.

Joannea brasiliensis Spreng., *Neu. Entd.* 2: 132. 1821.
 TYPE: Brazil, "Brasilia aequinoctialis," *Sello s.n.* (holotype, P, not seen; photograph ex P, FM neg. 15838).

Dasyphyllum brasiliense is composed of some five varieties differing primarily in their leaf shape and size, pubescence type, and number of florets per capitula (Cabrera, 1959). Peruvian material is referable to following variety.

1a. *Dasyphyllum brasiliense* var. *barnadesioides*

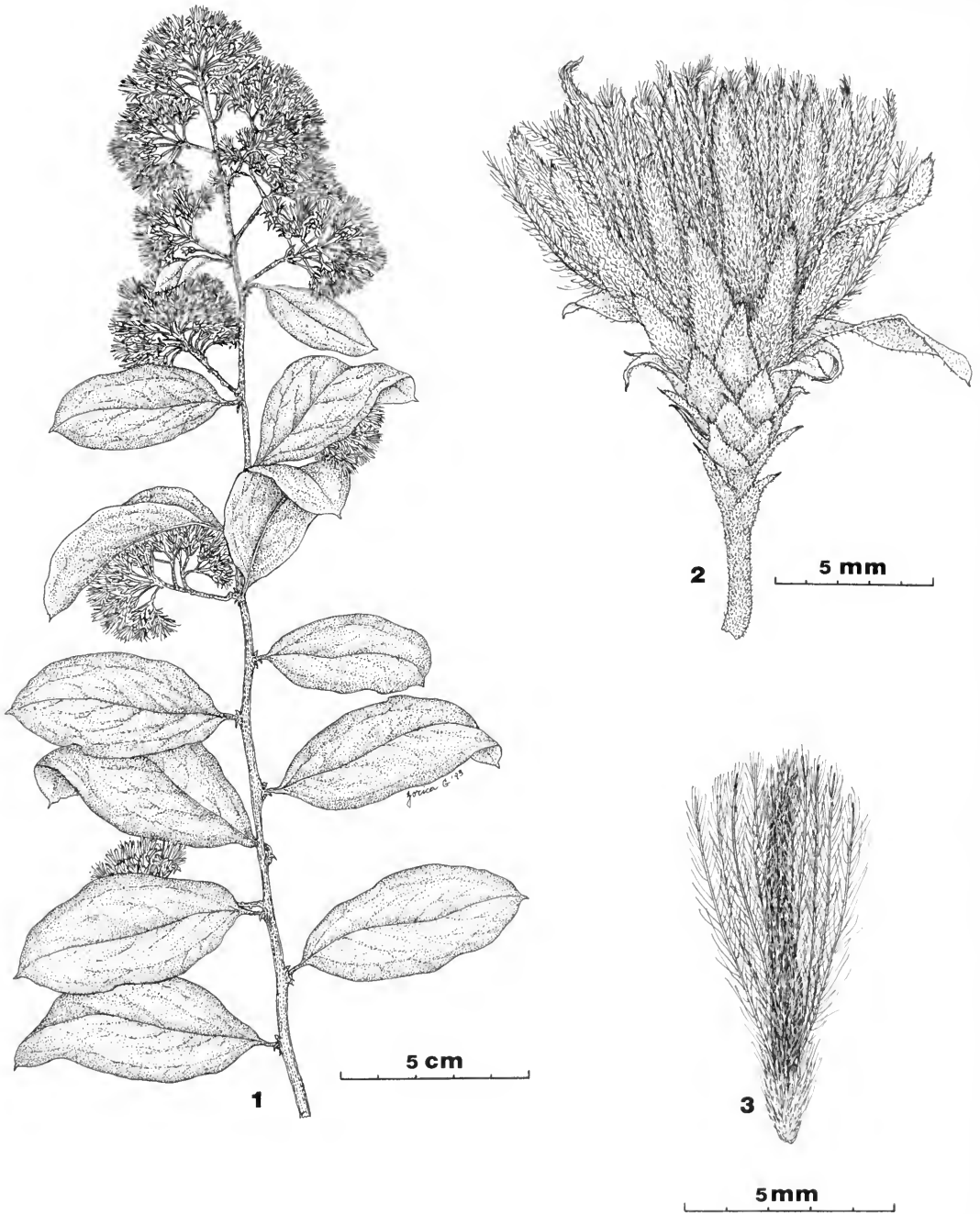


FIG. 7. *Dasyphyllum brasiliense*. 1, habit; 2, capitulum; 3, achene with pappus. (Drawn from *Marin 1567B*, F.)

(Tovar) Cabr., *Revista Mus. La Plata, Secc. Bot.* 9: 76. 1954.

800–900 m, *A. Weberbauer s.n.* (holotype, USM 10322).

Flotovia barnadesioides Tovar, *Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot.* 7: 10. 1953. TYPE: Peru, Junín, Tarma, Colonia Perené, 9 Sep 1920,

Shrubs slightly voluble, 1–1.4 m high, branched, the branches tomentose, axillary spines curved proximally, ca. 5 mm long. **Leaves** lanceolate-el-

ptic, 20–92 mm long, 7–32 mm wide, mucronate, innervated, pubescent, the margins revolute. **Capitulescences** cymose-paniculate, axillary. **Capitula** 1–12 mm high, 6–7 mm wide; involucre campanulate; phyllaries 7–8-seriate, the outer ovate, 5–2.5 mm long, 1–1.5 mm wide, acuminate, densely pubescent, the inner lanceolate-linear, 9.5–10 mm long, 1.2–1.4 mm wide, mucronate, pubescent; florets 10–12, the corollas 7.5–7.8 mm long, the tube 3–3.2 mm long, yellowish; anthers 3–2.4 mm long; styles 9–9.5 mm long, papillose at apex. **Achenes** 2–2.4 mm long, campanulate, pubescent; pappus of 16–17 bristles, 7–7.5 mm long.

DISTRIBUTION—Known from the subtropical region of the eastern slope of the Andean Cordillera of central Peru to Bolivia (800–1800 m).

Dasyphyllum brasiliense var. *barnadesioides* is indistinguishable from the typical variety by pubescent leaves and is distinctive among Peruvian species in possessing small downwardly curved spines. The other varieties are restricted to lower elevations in Argentina, Brazil, and Paraguay (Cabrera, 1959).

USCO. Convención: Hacienda Choquellohuanca, *Mar. 1567* (F).

3. *Dasyphyllum brevispinum* Sagást. & Dillon, *Brittonia* 37: 6. 1985. TYPE: Peru, Cajamarca, desvío Bosque de Cachil (Cascas–Contumazá), 25 Jun 1982, 2200–2300 m, A. López M., A. Sagástegui A., J. Mostacero, & S. López 9136 (holotype, HUT; isotypes, F 1964136, G, MO, NY, US).

Shrubs to 3 m tall, much-branched; stems erect, velutinous, axillary spines paired, 3–5 mm long, divergent, straight. **Leaves** with petioles 2–3 mm long, velutinous; blades elliptic, 30–45 mm long, 5–20 mm wide, coriaceous, both surfaces densely velutinous, basally acute, apically obtuse to rounded. **Capitulescences** racemose on axillary branchlets, 3–8-headed, often glomerulate distally. **Capitula** sessile to subsessile, 5–7 mm high, 5–6 mm wide; involucre cylindrical to narrowly campanulate; phyllaries ca. 7-seriate, the outer narrowly ovate, 3–4 mm long, 2–3 mm wide, coriaceous, velutinous, ciliolate, obtuse, spinulose, the inner linear to lanceolate, 7–8 mm long, 1–1.5 mm wide, coriaceous, velutinous, acute to obtuse, spinulose; florets 13–16, the corollas whitish, ca. 5 mm long, the lobes ca. 1.5 mm long, narrowly lanceolate,

apically velutinous; anthers ca. 1.7 mm long. **Achenes** cylindrical, ca. 2 mm long, sericeous to velutinous; pappus ca. 5.5 mm long, yellowish-brown.

DISTRIBUTION—Known only from the type locality.

The description presented here was taken from the original description.

3. *Dasyphyllum cabreræ* Sagást., *Bol. Soc. Argent. Bot.* 19: 61. 1980. TYPE: Peru, Amazonas, Bongará, distrito Pomacocha, El Ingenio (km 12), 1500 m, 28 Jul 1970, A. Díaz, L. Vásquez, & L. Cerna 1105 (holotype, HUT; isotype, PRG).

Shrubs to 2 m; stems sericeous, lacking spines. **Leaves** petiolate; petioles 1–2 mm long; blades obovate to elliptic, 20–35 mm long, 10–18 mm wide, coriaceous, trinervate, the abaxial surfaces laxly pubescent, the adaxial surfaces glabrous, basally attenuate, apically rounded to obtuse, mucronulate. **Capitulescences** racemose, terminal and axillary. **Capitula** sessile to subsessile, ca. 9 mm high, ca. 5 mm wide; involucre narrowly campanulate; phyllaries 5–6-seriate, the outer ovate, 3–5 mm long, coriaceous, acute, mucronate, tomentose, the inner linear-lanceolate, 7–9 mm long; florets (11–12)–(13), the corollas ca. 5 mm long, the limb glabrous. **Achenes** (immature) cylindrical, ca. 2 mm long, velutinous; pappus of 15–18 bristles, ca. 5 mm long.

DISTRIBUTION—Known only from the type locality.

The description presented here was taken from the original description.

4. *Dasyphyllum ferox* (Wedd.) Cabr., *Revista Mus. La Plata, Secc. Bot.* 9: 54. 1959.

Flotovia ferox Wedd. *Chlor. And.* 1: 5. 1855. LECTOTYPE (here designated): Bolivia, La Paz, *D'Orbigny 1533* (lectotype, P, not seen; photograph of isolectotype ex W, FM neg. 33314). *Chuquiraga ferox* (Wedd.) Britton, *Bull. Torrey Bot. Club* 19: 266. 1892.

Shrubs to 3 m high, branched, branches pubescent, axillary spines 10–40 mm long, divaricate. **Leaves** oblong-lanceolate, 7–32 mm long, 6–24 mm wide, glabrescent, trinerved, subsessile. **Capitulescences** glomerulate, terminal. **Capitula** subsessile, 11–13 mm high, 4–5 mm wide; involucre

turbinate-campanulate; phyllaries 6–7-seriate, the outer ovate-lanceolate, 2–4 mm long, 1.5–2 mm wide, apiculate, the inner lanceolate, 10–11 mm long, 1.2–1.4 mm wide, mucronate, pubescent; florets 10–19, the corollas white, 8–10 mm long, the tube 3.5–5 mm long, the lobes 4.5–5 mm long, linear; anthers 3–4 mm long, the terminal appendage apically bifid; styles 9–13 mm long, papillose. **Achenes** 4–5 mm long, cylindrical; pappus of 18–20 bristles, 7–9 mm long, whitish-yellow.

DISTRIBUTION—Known from throughout the Andean Cordillera of Peru to Bolivia (3000–3700 m).

Dasyphyllum ferox most closely resembles *D. armatum* (Koster) Cabr., a native of southern Bolivia and northern Argentina, but *D. ferox* differs in possessing oblong-elliptic leaves, densely pubescent phyllaries, and pubescent corolla apices.

Cabrera (1959) cited the two collections from Weddell's protolog as "cotypus" but did not choose a lectotype collection. Here, the lectotype specimen of d'Orbigny was chosen over Weddell's unnumbered collection (F 970337 ex P).

ANCASH. **Recuay:** Recuay, *Macbride 2513* (F, GH, US); *Ames 38* (USM); *López et al. 7488* (F, MO). **Huaras:** Puente Bedoya, *Proaño 32* (USM). **Bolognesi:** Chiquián, *Ferreyra & Cerrate 7335* (USM). **CUSCO.** **Canchis:** Siucani, *Vargas 930* (F, MO, USM), *9834* (F, GH, UC). **Urubamba:** near Urubamba, *Solomon 3091* (MO); Vilcanota Valley, *Cook & Gilbert 101* (US). **JUNIN.** **Tarma:** Cerro San Sebastián, *Ferreyra 510* (USM); *Macbride & Featherstone 1028* (GH, US); 1 km W of Tarma, *Stork 10944* (F, UC). **LA LIBERTAD.** **Otusco:** Puente Chiquin, *López & Sagástegui 8065* (F, MO). **Santiago de Chuco:** Angamarca, *López 1121* (US); 70 km N of Agallpampa, *López 1128* (USM). **LIMA.** **Canta:** San Buenaventura, Pennell 14509 (F); near Canta, *Sánchez 019* (USM); Obrajillo, *Capt. Wilkes Exped. s.n.* (GH, US).

5. *Dasyphyllum horridum* (Muschl.) Cabr., *Revista Mus. La Plata, Secc. Bot. 9: 49. 1959.*

Chuquiraga horrida Muschl., *Bot. Jahrb. Syst. 50, Beibl. 111: 92. 1913.* TYPE: Peru, Apurímac, An-

Key to Peruvian Varieties of *Dasyphyllum hystrix*

1. Leaf blades elliptic-lanceolate, 10–25 mm long, 2–6 mm wide *D. hystrix* var. *hystrix*
 1. Leaf blades narrowly lanceolate, 25–30 mm long, 9–12 mm wide *D. hystrix* var. *peruvianum*

6a. *Dasyphyllum hystrix* var. *hystrix*.

Shrubs to 2 m high, branched, branches pubescent, spines to 25 mm long, divaricate. **Leaves**

dahuaylas, Hacienda Cotahuacho, *A. Weberbauer 5847* (holotype, B, presumably destroyed; isotypes, F, GH, US).

Flotovia horrida (Muschl.) Tovar, *Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot. 7: 7. 1953.*

Shrubs 1–3 m high, branched, branches sometimes ferruginous, spines axillary, divaricate, 4–17 mm long. **Leaves** with blades ovate-elliptic, 5–15 mm long, 3.6–5 mm wide, slightly pubescent, trinerved. **Capitulescences** of solitary heads or small aggregates, subsessile, terminal or axillary. **Capitula** with involucre 11–12 mm high, 4–4.5 mm wide, campanulate or turbinate; phyllaries 5–6-seriate, the outer ovate, 1–2 mm long, 1.5–2 mm wide, the inner lanceolate, 8–9 mm long, mucronate, pubescent; florets 7–10, the corollas 7–8 mm long, the tube 3–5 mm long, the lobes 4 mm long, linear-lanceolate, slightly coiled; anthers 3–3.2 mm long, the terminal appendage bifid; style 9.5–10.5 mm long, papillose. **Achenes** 3–4 mm long, cylindrical, densely pubescent; pappus of 22–24 bristles, ca. 6.2 mm long.

DISTRIBUTION—Endemic to the Andean Cordillera of southern Peru (2600–3200 m).

Dasyphyllum horridum is strongly spiny and most closely resembles *Dasyphyllum ferox*, but it differs in its smaller, ovate-elliptic leaves, capitula with fewer florets (7–10), and glabrous corolla lobes.

CUSCO. **Calca:** near Calca, *Vargas 708* (MO).

6. *Dasyphyllum hystrix* (Wedd.) Cabr., *Revista Mus. La Plata, Secc. Bot. 9: 51. 1959.*

Flotovia hystrix Wedd., *Chlor. And. 1: 6. pl. 3B. 1855.*
 TYPE: Bolivia, La Paz, Lagunillas, *D'Orbigny 1381* (holotype, P, not seen).

Dasyphyllum hystrix contains two varieties based on leaf shape and size.

elliptic-lanceolate, 10–25 mm long, 2–6 mm wide, trinerved. **Capitulescences** of solitary heads, terminal. **Capitula** sessile; involucre globose; florets ca. 20, the corollas white, glabrous; anthers with terminal appendages bifid. **Achenes** glabrous.

DISTRIBUTION—Known from the Andean Corillera of southern Peru to central Bolivia (3400–3700 m).

CUSCO. Convención: Rosariomayo, Vargas 20693 (US).

5b. *Dasyphyllum hystrix* var. *peruvianum* Cabr., Revista Mus. La Plata, Secc. Bot. 9: 52. 1959. **TYPE:** Peru, La Libertad, Santiago de Chuco, alrededores de Santiago de Chuco, A. López Miranda 980 (holotype, LP; isotype, USM).

DISTRIBUTION—Known from intermontane regions of northern Peru (3000–3100 m).

This variety is quite similar to variety *hystrix*, but it is distinguished by possessing narrowly lanceolate, 5-nerved leaf blades, 25–30 cm long, 9–12 mm wide.

LA LIBERTAD. Santiago de Chuco: Agua de Loro, López Miranda 1961 (HUT, USM).

6. *Dasyphyllum leiocephalum* (Wedd.) Cabr., Revista Mus. La Plata, Secc. Bot. 9: 50. 1959.

Flotovia leiocephala Wedd., Chlor. And. 1: 6. 1855. **TYPE:** Peru, Cusco, Gay 1220 (holotype, P, not seen; isotype fragment ex P, F 971917).

Shrubs 15–25 dm high, branched, spiny, spines 1–16 mm long, axillary, divaricate. **Leaves** alternate, elliptic-lanceolate, (5–)15–30 mm long, 4–12 mm wide, mucronate, trinerved, more or less pubescent. **Capitulescences** of solitary heads, sessile, axillary. **Capitula** with involucre 11–13 mm high, 4.5–5 mm wide, turbinate-fusiform; phyllaries 5-seriate, brunneous, lustrous, the outer ovate-lanceolate 2–3 mm long, ca. 2 mm wide, the inner lanceolate, 11–11.5 mm long, acuminate, mucronate; florets 6, the corollas yellow, 6–8 mm long, the tube 4.5–5 mm long, the lobes coiled; anthers 3.2–3.6 mm long, bifid; style filiform, 12–14 mm long, papillose. **Achenes** 4–5 mm long, cylindrical, densely pubescent; pappus of 15–19 bristles, 6–7 mm long.

DISTRIBUTION—Endemic to the Andean Corillera of southern Peru (2800–3000 m).

Dasyphyllum leiocephalum suggests *D. horridum* but differs in the sessile and solitary capitula with 6 florets, the turbinate involucre, and the lustrous brunneous phyllaries.

APURIMAC. Andahuaylas: Chincheros, Ricci 5730 (USM); Stork & Horton 10737 (GH, UC). **CUSCO. Calca:** San Salvador, Marín 2053 (USM). **Quispicanchis:** Huacarpay, Chávez 2018 (MO). **Urubamba:** Pumamarca, Vargas 7602 (USM); Urubamba, Zamalloa 56 (USM); Vargas 11060 (UC). **NO EXACT LOCALITY.** Ellenberg 1004 (USM).

8. *Dasyphyllum weberbaueri* (Tovar) Cabr., Revista Mus. La Plata, Secc. Bot. 9: 66. 1959.

Flotovia weberbaueri Tovar, Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot. 7: 11. 1953. **TYPE:** Peru, Piura, Ayavaca, Quiros, A. Weberbauer 6345 (holotype, GH; isotype, F, 2 sheets).

Shrubs to 3 m high, branched, branches striate, pubescent. **Leaves** with blades ovate-oblong, 12–33 mm long, 7–14 mm wide, rounded at the apex, more or less pubescent. **Capitulescences** of aggregate racemes. **Capitula** with involucre 9–10 mm high, 5–6 mm wide, campanulate; receptacle plane, pubescent; phyllaries 6–7-seriate, yellowish, the outer ovate, 2–2.5 mm long, ca. 1.5 mm wide, mucronate, pubescent, the inner lanceolate, 6.8–7 mm long, 1–1.5 mm wide, spinulose, pubescent; florets 13–15, the corollas 6.8–7.2 mm long, the tube 3.4–3.6 mm long; anthers 3–3.5 mm long, the terminal appendage bifid; styles 7–7.8 mm long, papillose near apex. **Achenes** cylindrical, 3–4 mm long, pubescent; pappus of 16–19 bristles, ca. 5.2 mm long.

DISTRIBUTION—Endemic to the intermontane region of northern Peru (2000–2200 m).

Dasyphyllum weberbaueri resembles *D. cabreræ* in overall habit and capitulescences, but it differs by having more pubescent ovate-oblong leaves and capitula with 13–15 florets.

This species is rare and currently only known from the type.

VIII. FULCALDEA

Fulcaldea Poiret, Encycl. Meth., Bot. Suppl. 5: 375. 1827. **TYPE:** *Turpinia laurifolia* Humb. & Bonp. = *Fulcaldea laurifolia* (Humb. & Bonpl.) Poiret

Shrubs or small trees to 8 m in height; trunks to 25 cm in diameter, paired axillary spines usually present. **Leaves** alternate, subsessile to petiolate; blades ovate, triplinerved, the margins entire. **Capitulescences** of corymbose or paniculate cymes,

terminal and axillary. **Capitula** homogamous with only 1 floret; involucre cylindrical; phyllaries 5–7-seriate; floret hermaphroditic, actinomorphic, 5-merous, the corolla tubular, densely villous, 5-lobed; anthers ecaudate; styles exerted, apically bifid, the distal portion swollen and papillose, the branches rounded, glabrous. **Achenes** cylindrical; pappus of plumose bristles, 1-seriate.

Fulcaldea consists of a single distinctive species distributed from southern Ecuador to northwestern Peru (650–2800 m). Although Harling (1991) stated that the genus was endemic to Ecuador, ample collections exist from northern Peru.

1. *Fulcaldea laurifolia* (Humb. & Bonpl.) Poir., *Encycl. Meth., Bot. Suppl.* 5: 375. 1827. **Figure 8.**

Turpinia laurifolia Humb. & Bonpl., *Pl. Aequin.* 1: 113. pl. 33. 1808. TYPE: Ecuador, Loja, "crescit in calidis Andium Peruvianorum inter vicum Lucarque [Lucarqui] et amnem Macara [Macará]. Floret Novembri," *Bonpland s.n.* (holotype, P, not seen; isotypes, F ex P, FM 974434; G, not seen, photograph ex G, FM neg. 52108).

Barnadesia laurifolia (Humb. & Bonpl.) Kuntze, *Rev. Gen. Pl.* 3: 135. 1898.

B. laurifolia (Humb. & Bonpl.) Hieron., *Bot. Jahrb. Syst.* 28: 651. 1900.

Shrubs 3–4 m high, much-branched; stems 4–8 mm in diameter, glabrous, axillary spines 10–20 mm long, the lower branches nodulose. **Leaves** petiolate, the petioles 5–10 mm long, glabrous; blades oblong-lanceolate to ovate, 55–90 mm long, 20–34 mm wide, occasionally falcate, apically acute or acuminate, both surfaces glabrous, 3-nerved from near the base. **Capitulescences** corymbose cymes, terminal or axillary. **Capitula** 10–15 mm high, 2–3.5 mm wide; involucre 9–12 mm high, 2–3 mm wide; outer phyllaries ovate, 1.5–4 mm long, 1.5–2 mm wide, densely pilose to villous, ciliolate the inner lanceolate, 11–12 mm long, 1.2–1.5 mm wide, acuminate, the faces glabrous, densely ciliate; the single floret with the corollas white or violaceous, 8–10 mm long, 1–1.2 mm wide, the lobes 1.8–2.5 mm long, pubescent; anthers 2.8–3.2 mm long. **Achenes** 6–7 mm long, 1.2–1.4 mm wide, pubescent; pappus ca. 10 mm long, spreading, whitish to purplish.

DISTRIBUTION—Known from the intermontane region of southern Ecuador to northwestern Peru (1000–1200 m).

Fulcaldea laurifolia possesses a habit quite similar to some *Barnadesia* species; however, it differs in having a solitary floret per head, strongly plumose pappus bristles, a swollen style apex, and unique pollen grains. Other than Peruvian collections having slightly smaller and more falcate leaves, there appear to be few differences between the Ecuadorian and Peruvian representatives.

The isotype collection housed at F (neg. 974434) is probably from the type gathering of Bonpland originally held by Paris. The specimen contains a hand-written label with the protolog, the stamp "Ex Herbario Musei Parisiensis," and a small label indicating the origin of the specimen as "Herb. Schultz Bip." Since this species is still extremely rare in herbaria, it is probable that the specimen, sent to F on exchange from Paris, was a portion of the collection made by Bonpland.

PIURA. Ayavaca: Puente Tandopa, *Hutchison & Wright 6685* (F, MO, US); Olleros (Pacae-La Pampa), *Sagástegui & Cabanillas 8675* (F, MO); Ayavaca, *Soukup 4324* (F, US); Olleros, *Weberbauer 6357* (F, GH, US). **Huancabamba:** ca. 11 km S of Canchaque, *Dillon & Sánchez 6213* (F, CPUN); below Canchaque, *Ferreya et al. 10932* (MO, USM); La Afiladera, carretera a Canchaque, *López & Sagstegui 8774* (F, MO).

IX. GERBERA

Gerbera L., *Opera Varia* 247. 1758 (nom. cons.), non Boehmer, 1760, nec. J. F. Gmelin, 1791.

TYPE: *Gerbera linnaei* Cass. = *Arnica gerbera* L. (typ. cons.)

Acaulescent, scapose, perennial **herbs**, often with a woolly crown. **Leaves** basal, usually obviously petiolate; blades oval, lanceolate, or lyrate in outline, the margins entire, serrulate, dentate, or sinuate-pinnatifid, the abaxial surfaces usually tomentose, woolly, or sometimes glabrescent, the adaxial surfaces usually glabrous. **Capitulescences** of solitary, monocephalous scapes, the peduncles bracteate or ebracteate, the heads usually erect. **Capitula** heterogamous, radiate; involucre turbinate to broadly campanulate; receptacles flat, epaleate; phyllaries 2–6-seriate, the outer shorter than the inner; ray florets 1–2-seriate, usually pistillate, staminodia often present, the corollas white, yellow, pink, or red, bilabiate, the outer lip produced into a generally elongate ligula, the inner lip short, usually bifid; disc florets hermaphroditic and fertile, or the inner functionally staminate, the corollas bilabiate, both lips short; anther bases sagittate, caudate, the tails entire or ciliate; style

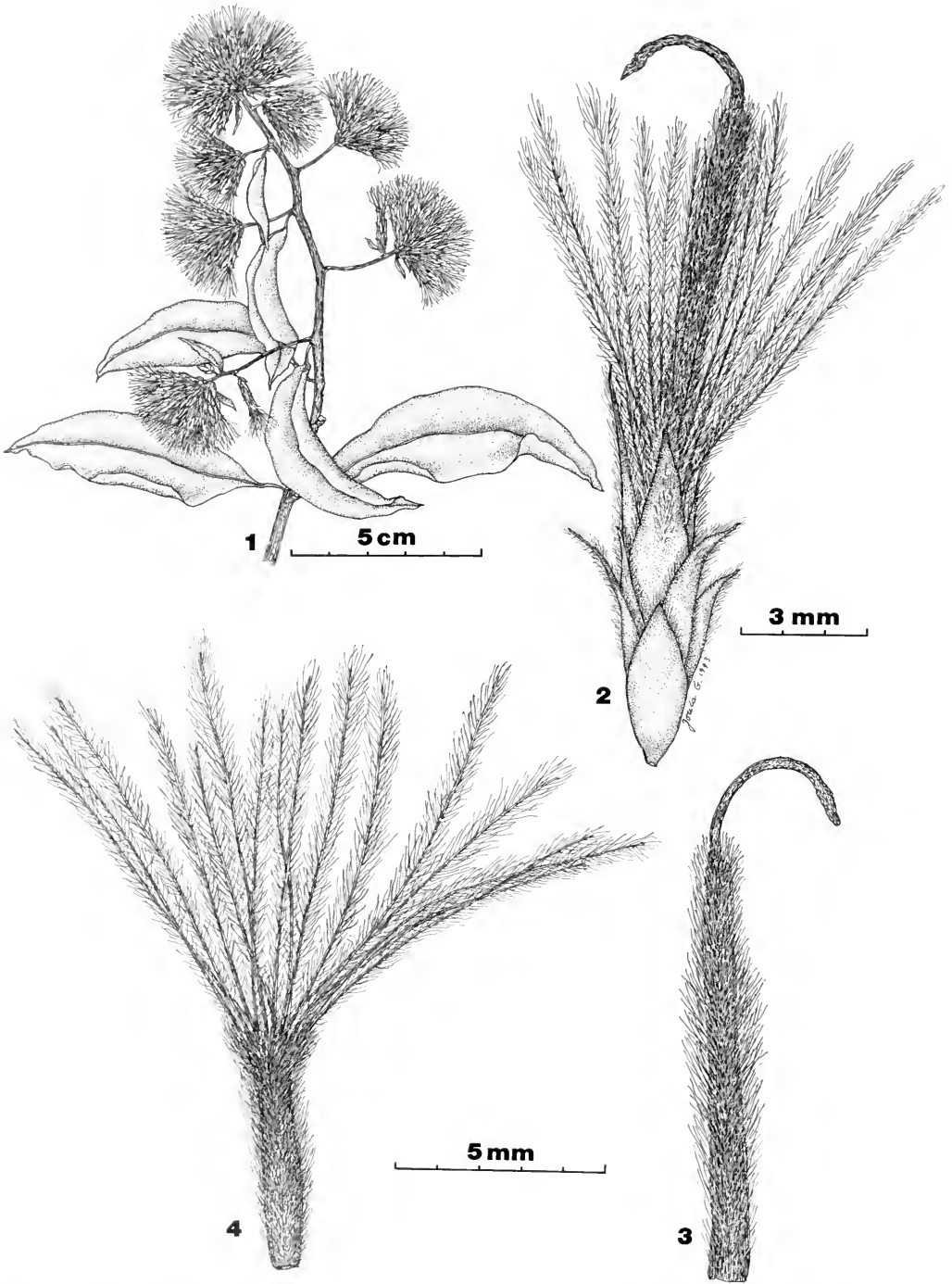


FIG. 8. *Fulcaldea laurifolia*. 1, habit; 2, capitulum; 3, floret with style; achene with pappus. (Drawn from *A. Sagástegui & J. Cabanillas 8675, F.*)

branches of the disc florets broadly lanceolate, the tips rounded or subacute with short pollen-sweeping trichomes outside. **Achenes** cylindrical, ribbed, villous to pilose, rarely glabrous or nearly so, attenuated at the apex; pappus of scabrid bristles, 1-seriate.

Gerbera is an Old World genus of approximately 35 species, distributed in the Sino-Himalayan region, Madagascar, and tropical and southern Africa; only one South African species is cultivated in Peru. The limits between *Gerbera* and *Trichocline* are established with some difficulty (Hansen, 1990); the former genus is here defined with achenes lacking multicellular, glandular trichomes. Zardini (1974) transferred one native South American species to *Gerbera*; however, that species is here treated under *Trichocline* (Hansen, 1991).

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- ZARDINI, E. M. 1974. Sobre la presencia del género *Gerbera* en America. *Bol. Soc. Argent. Bot.*, **16**: 105.

1. *Gerbera jamesonii* Bolus ex Hook. f.

Scapose, perennial **herbs** to 5 dm. **Leaves** petiolate; petioles 15–18 cm long; blades oblong-spathulate in outline, 15–18 cm long, 4–7 cm wide, the abaxial surfaces villous, the adaxial surfaces strigillous, the margins deeply lobed to lyrate-pinnatifid. **Capitulescences** of solitary heads, the peduncles 30–50 cm long, 3–5 mm in diameter, ebracteate, striate, villous. **Capitula** with hemispheric involucre, ca. 20 mm long, ca. 20 mm wide; phyllaries 3-seriate, the outer linear 7–8 mm long, the inner lanceolate 15–16 mm long, 2–2.5 mm wide, all arachnoid-villous; ray florets 25–33, the corollas scarlet to orange-red or salmon, the outer lip 30–35 mm long, 3.5–4 mm wide, apically 3-toothed; disc florets 75–100, the corollas yellow, 8–9 mm long, the outer lip 3–3.5 mm long, ca. 1.5 mm wide, 3-toothed, the inner lip ca. 3 mm long,

ca. 1 mm wide, bipartite. **Achenes** isomorphic, cylindrical, 4–5 mm long, densely villous, the trichomes slender, acute; pappus ca. 7–9 mm long, stramineous.

Gerbera jamesonii is a native of South Africa (Transvaal) and only found in cultivation in Peru. It is easily recognized by its scapose habit with long peduncles and large heads with showy rays.

LIMA. Lima: Jesus Maria, cultivated, Museo de Historia Natural, *Plowman 10989* (F).

X. GOCHNATIA

Gochnatia Kunth, *Nov. Gen. Sp.* 4: (fol.) 15, 1818, (qu.) 19. 1820. **TYPE:** *G. vernonioides* Kunth

Trees or **shrubs**, frequently tomentose (extra-Peruvian species occasionally dioecious or gynodioecious); stems lacking spines. **Leaves** alternate, sessile or petiolate; blades circular or oval to linear-lanceolate, coriaceous to subcoriaceous, the margins entire or dentate. **Capitulescences** cymose-corymbose or racemose, or of solitary heads, terminal and axillary. **Capitula** homogamous, discoid, sessile or pedicellate; involucre campanulate to turbinate; receptacles plane or alveolate or, more rarely, pubescent with glands or hairs; phyllaries imbricate, multiseriate, ovate to lanceolate; florets isomorphic, hermaphroditic, the corollas actinomorphic, yellow, tubular, deeply 5-lobed, the lobes linear, acute, recurved, equal to or shorter than the tube; anthers linear, the terminal appendages lanceolate, the bases caudate, the tails entire or lacinate; styles bilobed, the branches apically rounded, glabrous. **Achenes** cylindrical to turbinate, sericeous or glandular; pappus of scabrid bristles, 2–many-seriate, yellowish.

Gochnatia consists of some 66 species with a disjunct distribution between the paleotropics of Southeastern Asia, China, India, Thailand, Laos, Vietnam (2 spp.), and the Neotropics (64 spp). Approximately 6 species are recorded from Mexico and adjacent Texas, 26 species are endemic to the Antilles, Cuba, Bahamas, Haiti, Dominican Republic, and Puerto Rico, and the remaining 34 species are confined to South America. The South American species are found in Peru, Chile, Argentina, Bolivia, Brazil, and Paraguay and occupy a wide variety of habitats from intermontane val-

leys of the western Andean Cordillera to campo and sierra habitats in Argentina, Paraguay, and Brazil. In Peru, all *Gochnatia* are small shrubs confined to mid-elevation (1500–3100 m), seasonally dry sites within the Andean Cordillera.

Reference

CABRERA, A. L. 1971. Revisión del género *Gochnatia* (Compositae). *Revista Mus. La Plata, Secc. Bot.*, 12: 1–160.

Key to Peruvian Species of *Gochnatia*

1. Leaves oblong, elliptic, or obovate; involucre cylindrical; total florets 9–12 *G. arequipensis*
1. Leaves ovate; involucre campanulate; total florets 15–30 2
 2. Leaf margins dentate to serrate *G. vargasii*
 2. Leaf margins entire 3
 3. Leaves to 80 mm long; involucre 10–11 mm high; phyllaries acute, mucronate *G. vernonioides*
 3. Leaves to 25 mm long; involucre 14–17 mm high; phyllaries attenuate, aristate-mucronate *G. patazina*

1. *Gochnatia arequipensis* Sandwith, *Kew Bull.* 1934: 100. 1934. TYPE: Peru, Arequipa, “Volcán de Arequipa, in collibus aridis,” 1854, *W. Lechler 2751* (holotype, K).

G. iserniana Cuatr., *Anal. Univ. Madrid* 4: 22. 1935. TYPE: Peru, Arequipa, Quenqueña, 11 Aug 1863, *J. Isern 448* (holotype, MA, not seen; isotype, LP).

Shrubs to 2 m high, much-branched, the branches tomentose. **Leaves** subsessile; blades oblong, elliptic or obovate, 10–25 mm long, 6–8 mm wide, apically obtuse or acute, the adaxial surfaces slightly tomentose and glandular, the abaxial surfaces densely tomentose, the margins entire or remotely denticulate. **Capitulescences** of solitary heads or in groups of 2–3. **Capitula** sessile; involucre cylindrical, 10–12 mm high, 5–6 mm wide; phyllaries imbricate, 6–7-seriate, the outer ovate-lanceolate, 2–2.5 mm long, 1–1.5 mm wide, acute, mucronate, lanuginose, the inner linear-lanceolate, 8–9 mm long, 1–1.2 mm wide, acute, mucronate, glabrous; florets 9–12, the corollas with tubes 8–9 mm long, the lobes linear, 4–5 mm long. **Achenes** turbinate, densely sericeous, 4–5 mm long; pappus ca. 12 mm long.

DISTRIBUTION—Endemic to the intermontane region of southern Peru (2400–3100 m).

Gochnatia arequipensis most closely resembles *G. cardenasii* with its more cylindrical involucre and reduced number of florets. It is easily distinguished from its nearest geographic neighbor, *G. vargasii*, in possessing smaller, strictly entire leaves and much smaller capitula.

AREQUIPA. Arequipa: slopes of Misti Volcano, *Nuñez 92* (USM); slopes of Chachani, *Rauh & Hirsch P579* (NY); *Hutchison & Wright 7220* (MO, US, USM), *Vargas 8281* (US), *19920* (US); *Eyerdam & Beetle 22120* (GH); *Chiguata, Tovar 5130* (MO, USM). **La Union:** Cotahuasi, *Weberbauer 6866* (GH, MO, US, USM); without locality, *Rauh s.n.* (USM), *1969* (USM). **TACNA. Tacna:** near Tarata, *Beck 2024* (US).

2. *Gochnatia patazina* Cabr., *Revista Mus. La Plata, Secc. Bot.* 12: 28. 1971. TYPE: Peru, La Libertad, Pataz, entre Huaylillas y Taya-bamba, *A. López M. & A. Sagástegui A. 3409* (holotype, LP; isotype, HUT).

Shrubs to 1.5 m high, branches more or less tomentose. **Leaves** subsessile; blades ovate, 10–25 mm long, 8–20 mm wide, obtuse, the adaxial surfaces slightly tomentose, the abaxial surfaces tomentose, the margins entire. **Capitulescences** of solitary heads at branch apices, terminal or axillary. **Capitula** sessile; involucre campanulate, 10–14 mm high, 8–10 mm wide; phyllaries imbricate, 5-seriate, all aristate-mucronate, the outer ovate, 4–6 mm long, 1.5–2 mm wide, attenuate, slightly lanuginose, the inner linear-lanceolate, 8–9 mm long, 1–1.2 mm wide, lanuginose, attenuate; florets 30–40, the corollas with tubes 5–8 mm long, the lobes linear, 3–4 mm long; anthers 5–6 mm long. **Achenes** turbinate, 4–5 mm long, dense sericeous; pappus ca. 9 mm long.

DISTRIBUTION—Native to the intermontane region within the Departments of Ancash and La Libertad (2300–3000 m).

Gochnatia patazina most closely resembles *G.*

vernonioides but differs in possessing smaller leaves (< 25 mm long) and larger capitula with 40 florets.

ANCASH. Huaras: near Huaraz, *Macbride & Featherstone 2520* (US); *Velarde Nuñez 3178* (LP), *3179* (LP). **Yungay:** between Río Santa and Mancos, *Smith & Blas 4901* (USM); Keusho, *La Torre 425* (USM).

3. *Gochnatia vargasii* Cabr., *Revista Mus. La Plata, Secc. Bot. 12: 19. 1971*. TYPE: Peru, Apurimac, Abancay, "bajando a C'onoc," 2150 m, *C. Vargas 16317* (holotype, LP; isotype, USM).

Shrubs to 2 m high, much-branched, the branches tomentose. **Leaves** petiolate; petioles 2–3 mm long, tomentose; blades ovate, 20–25 mm long, 10–15 mm wide, obtuse, the adaxial surfaces glabrous, the abaxial surfaces tomentose, the margins dentate. **Capitulescences** of solitary heads, terminal. **Capitula** sessile; involucre campanulate, 10–12 mm high, 8–10 mm wide; phyllaries 5-seriate, coriaceous, imbricate, the outer ovate, mucronate, tomentose, glabrescent, the inner lanceolate, 8–10 mm long, 1.5–2 mm wide, acute, mucronate, tomentose; florets 30–35, the corollas with tubes 7.5–8 mm long, the lobes 3.5–4 mm long. **Achenes** turbinate, ca. 5 mm long; pappus ca. 8 mm long.

DISTRIBUTION—Known only from the type locality.

Gochnatia vargasii appears to share relationships with *G. boliviana* S. F. Blake and *G. vernonioides* and *G. patazina* but is distinguished by its dentate leaves and the ovate outer phyllaries.

APURIMAC. without exact locality, *Rauh 1556* (USM).

4. *Gochnatia vernonioides* Kunth, *Nov. Gen. Sp. 4: 20, t. 309. 1820*. TYPE: Peru, "crescit in regione calida Provinciae Bracamorensis in ripa fluvii Amazonum, alt. 195 hex," *Humboldt & Bonpland s.n.* (holotype, P, not seen). **Figure 9.**

Shrubs 1–2 m high much-branched, the branches dense pubescent, white-tomentose. **Leaves** subsessile; blades elliptic-lanceolate to ovate, apically acute, 25–60 mm long, 12–25 mm wide, the adaxial surfaces slightly glandulose, the abaxial surfaces tomentose, the margins entire. **Capitulescences** of solitary or weakly cymose heads, 2–3-headed, terminal and axillary. **Capitula** sessile; in-

volucre campanulate, 8–12 mm high, 6–8 mm wide; phyllaries 4–5-seriate, imbricate, the outer ovate, 4–6 mm long, 2–2.5 mm wide, mucronate, lanuginose, the inner linear-lanceolate, 8–9 mm long, 1.2–1.6 mm wide, mucronate, densely pubescent; florets 26–29, the corollas with tubes 6–7 mm long, the lobes 4–5 mm long, glabrous; anthers 5–6 mm long. **Achenes** turbinate, 3.8–5 mm long, 0.8–1 mm wide, densely sericeous; pappus 8–10 mm long.

DISTRIBUTION—Known from the intermontane region of northern Peru (1600–2600 m).

Gochnatia vernonioides is abundant in seasonally dry habitats on both sides of the valley of the Río Marañón at Balsas and is represented by more collections than any other Peruvian species. It undoubtedly shares relationships with *G. patazina*, its nearest geographic neighbor; however, *G. vernonioides* is readily distinguished by its smaller involucre and generally larger leaves.

AMAZONAS. Chachapoyas: Tingo, *Ferreyra 7097* (MO, US, USM); near Chachapoyas, *Ferreyra 14428* (MO, USM); E of Chachapoyas, *King & Bishop 9169* (MO, US) *9156* (US), *9221* (MO, US); Chachapoyas–Leimebamba, *López et al. 4364* (F, MO, NY); Balsas–Leimebamba, *Sagástegui 7487* (F, US), *Hutchison & Wright 5856* (F, GH, MO, NY, UC, US, USM); Chachapoyas, 1834–1840, *Mathews s.n.* (GH). **CAJAMARCA. Celendín:** Limón, *Sánchez 2804* (CPUN, F).

XI. JUNGIA

Jungia L. fil., *Suppl. pl. 58: 1781*. TYPE: *Jungia ferruginea* L. fil.

Subshrubs, annual or perennial **herbs**, or **lianes**; stems lacking spines. **Leaves** alternate, cauline or rarely strictly basal; petiolate, petioles with or without basal stipuliform bracts; blades oblong-lanceolate to cordiform or round, pinnate- or palmate-veined, the margins lobed, serrate, dentate, or incised. **Capitulescences** paniculate or corymbiform, terminal or axillary. **Capitula** homogamous; involucre campanulate, cylindrical, or turbinate; receptacles plane, paleate, the pales scarious or similar to phyllaries; phyllaries 2-seriate, the inner series embracing florets, equal to unequal, imbricate, lanceolate, oblong, or spatulate, apically acute to acuminate, mucronate, glabrous to densely pubescent and/or glandular; florets isomorphic, hermaphroditic, the corollas white, yellow, pink, reddish, or violaceous, bilabiate, the outer lip lanceolate or elliptic, 4-nerved, triden-

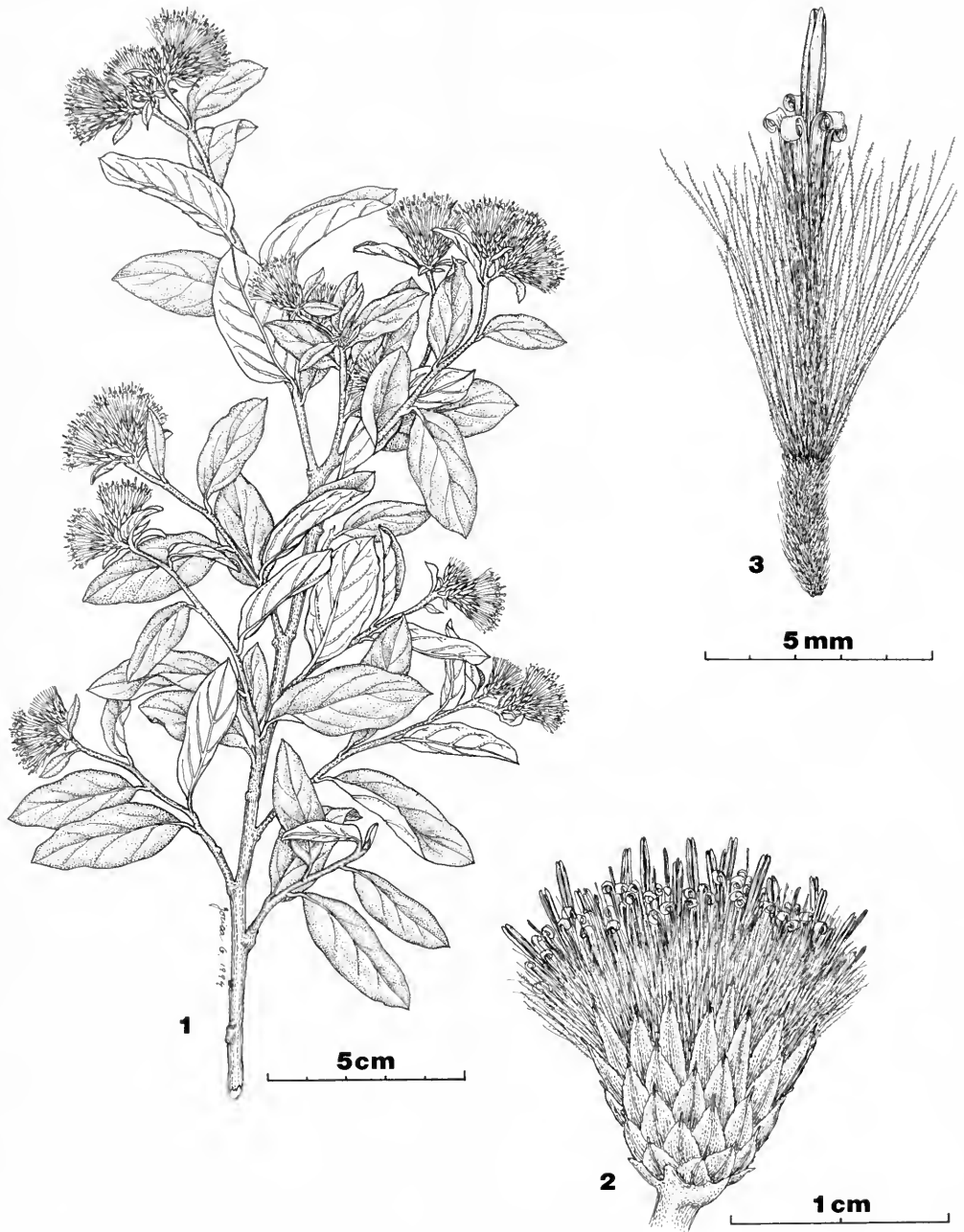


FIG. 9. *Gochnatia vernonioides*. 1, habit; 2 capitulum; 3, floret with achene. (Drawn from P.C. Hutchison & J.K. Wright 5856, F.)

tate, the inner lip bifid to subentire, lacinate, coiled; anthers caudate; styles branches claviform, truncate, penicillate. **Achenes** cylindric, rarely 4-costate, glabrous to pubescent and/or glandular; pappus of

plumose bristles, 1-seriate, white to gray, reddish, tawny, or stramineous.

Jungia contains approximately 30 species ranging from Mexico through Central America and

along the Andean Cordillera from Colombia to Argentina, Brazil, and Chile. No fewer than 10 species are recorded from Peru and these generally occupy moist, montane environments at elevations above 2000 m. Of the Peruvian species, only *J. axillaris* occupies drier sites below 2000 m on the western escarpment.

References

- CERRATE-VALENZUELA, E. 1951. Revisión de las especies peruanas del género *Jungia*. Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot., 4: 1–24.
 HARLING, G. 1992. Two new species of *Jungia* (Compositae) from Peru. Novon, 2: 16–18.

Key to Peruvian Species of *Jungia*

1. Annual herbs or short-lived perennial herbs 2
 2. Leaves essentially basal, the blades oblanceolate to oblong-elliptic, penni-nerved; petioles without stipuliform bracts; florets 70–80 *J. stuebelii*
 2. Leaves cauline, the blades orbicular to cordiform, palmate-nerved; petioles generally with basal, stipuliform bracts; florets 14–18 3
 3. Capitulescences densely corymbose to paniculate; phyllaries densely villous; pappus stramineous *J. vitocensis*
 3. Capitulescences open paniculate; phyllaries glandular-puberulent to pilose; pappus whitish to blackish-brown 4
 4. Stems succulent; pappus blackish-brown; achenes 4.5–6 mm long *J. amplistipula*
 4. Stems not succulent; pappus whitish; achenes 3–5 mm long *J. floribunda*
1. Erect, ascending, scandent, or vining, perennial herbs, or shrubs 5
 5. Cauline leaves generally less than 4 cm long and 4 cm wide *J. axillaris*
 5. Cauline leaves generally equal to or greater than 4 cm long and 4 cm wide 6
 6. Abaxial leaf surfaces densely black punctulate *J. spectabilis*
 6. Abaxial leaf surfaces lacking black punctations 7
 7. Leaf blades triangular-cordate to ovate-cordate, concolorous, the abaxial surfaces densely sericeous-tomentose, the adaxial surfaces densely strigose *J. weberbaueri*
 7. Leaf blades orbicular, rotund-cordate, or cordiform, discolorous, the abaxial surfaces tomentose to strigillose, the adaxial surfaces bullate, strigillose, or glabrous 8
 8. Petioles possessing stipuliform bases; leaf blades with adaxial surfaces bullate; phyllaries 6–7.5 mm long, densely glandular, apically acuminate *J. rugosa*
 8. Petioles lacking stipuliform bases; leaf blades with adaxial surfaces smooth; phyllaries 3.5–6 mm long, ferruginous-pilose to flavo-tomentose, apically acute to obtuse or rounded 9
 9. Phyllaries ferruginous-pilose, apically obtuse or rounded; corollas white to purple or lavender *J. discolor*
 9. Phyllaries flavo-tomentose, apically acute; corollas yellow *J. paniculata*

1. *Jungia amplistipula* Cerrate, Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot. 4: 10. 1951. TYPE: Peru, Ayacucho, Lucancas, near Pucquio, R. Ferreyra 7202 (holotype, USM; isotypes, MO).

Annual herbs, 12–14 dm high, erect, stems semisucculent, pubescent. Leaves cauline; petioles 9–120 mm long, stipuliform bracts 25–40 mm long, 25–45 mm wide, round, the margins lobed; blades cordiform, 50–120 mm long, 50–155 mm wide, membranaceous, the adaxial surfaces pubescent-

glabrescent, the abaxial surfaces arachnoid, palmi-nerved 5–7-veined, the margins 9–12-lobed, the lobes unequal, dentate, mucronate. Capitulescences panicles to 30 cm long, terminal or axillary. Capitula pedunculate; involucre 6.5–7 mm high, 5–6 mm wide; phyllaries 2-seriate, the inner 6.5–7 mm long, 1.8–2 mm wide, acute; florets 17–18, the corollas white, 8–8.5 mm long, the tube 4–4.5 mm long, the outer lip 4.5–5 mm long, 4-nerved, tridentate, the inner lip 2.5–3 mm long; anthers 3.8–4 mm long, the tails to 1 mm long. Achenes (4.5–)5.5–6 mm long, glandular-puberulent; pap-

pus of 30–32 bristles, ca. 5 mm long, blackish-brown.

DISTRIBUTION—Known from the Andean Cordillera of northern to southern Peru (2700–3400 m).

Jungia amplistipula most closely resembles *J. floribunda* but differs in its succulent stem, leaves with 9–12 lobes and paniculate capitulescences.

CUSCO. Calca: Pisac, *Marén 308* (F); Pissac, *Vargas 5064* (USM); Ccachca, *Vargas 13217* (USM). **Convecion:** Lucumayo, *Vargas 4237* (US). **Cusco:** Cusco, *Soukup 79* (F), *252* (F), *929* (USM); Saxaihuman, *Herrera 2365* (F); Sacsahuman, *Pennell 13580* (F), *Vargas 4165* (USM). **Paruro:** Ayusbamba a Mayhus, *Vargas 888* (F). **Paucartambo:** Llulluchayoc, *Vargas 4356* (USM); Pilco, *Woytkowski 280* (USM). **Urubamba:** Ollataytambo, *Cook & Gilbert 498* (US); *Ellenberg 1159* (US); Huayocari to Yanacocha, *Núñez et al. 7006* (F); Machupicchu y el Camino Inca, *Núñez & Luna 8855* (F); Huiñaihuaina, *Vargas 4138* (USM); Santa Rita, *Vargas 2662* (USM). **HUANCAVELICA. Castrovirreyna:** near Cordova, *Metcalf 30275* (GH, UC, US). **LIMA. Huarochiri:** above San Bartolomé, Monte Zarate, *Ferreyra 9719* (MO, USM). **PIURA. Huanca-bamba:** Abra de Porculla, *Ferreyra 13745* (USM).

2. *Jungia axillaris* (DC.) Spreng., Syst. Veg. 4. Park 1: 301. 1827.

Dumerilla axillaris DC., Ann. Mus. Hist. Nat. Par. 19: 72. t. 15, pl. 6. 1812. TYPE: "in Peruvia, Chili et Panamaide," *Lagasca s.n.* (holotype, P, not seen).

Jungia seleriana Muschl., Bot. Jahrb. Syst. 50, Beibl. 111: 107. 1913. SYNTYPES: Peru, "Agua ver-rugas ad viam ferream Lima-Oroya," *Seler 227* (B, presumably destroyed, photograph ex B, FM neg. 16127); Peru, "inter Narquimam et Matucanam, ad viam ferream Lima-Oroya," *A. Weberbauer 69* (B, presumably destroyed).

Perennial herbs, 12–15 dm high, branched, the branches 5–6 cm long, pubescent. Leaves petio-late; petioles 7–23 mm long, 2 stipuliform bracts at the base, amplexicaul, 2–8 mm long, the margins dentate-mucronate; blades cordiform, 14–37 mm long, 13–63 mm wide, palmi-nerved, 5 veins prominent, the adaxial surfaces glabrous, the ab-axial surfaces glandulose, the margins 7-lobed, acute, unequal, dentate-mucronate. Capitulescences paniculate, terminal or axillary. Capitula pedunculate; involucre 9–9.8 mm high, 5–6 mm wide, campanulate; phyllaries 2-seriate, the inner 8–9 mm long, 1.8–2 mm wide, acuminate, ciliate, red-purple, lanceolate, pubescent outside, hairs white at apex, brown at base; florets 20–25, the corollas violaceous, 10–12 mm long, the tube 6–6.5 mm long, the outer lip 4–4.5 mm long,

4-nerved, tridentate, pubescent, the inner lip 3.5–4.2 mm long; anthers 6–6.5 mm. Achenes 2–7 mm long, glabrescent; pappus of 45–51 bristles, ca. 7 mm long, white.

DISTRIBUTION—Known from the western es-carpment of the Andean Cordillera in northern to southern Peru (1000–3400 m).

Jungia axillaris is distinguished by its numer-ous, cordiform leaves, large paniculate capitulescences, and violet corollas. This species occupies drier sites usually at elevations below 2000 m but occasionally can be found higher.

ANCASH. Bolognesi: abajo de Raquia, Pativilca–Huaras, *Sagástegui et al. 12292* (F). **Huaras:** Tambo de Pariocoto [Pariacota], *Macbride & Featherstone 2551* (GH). **Huarmey:** Lomas de Lupin, *Cerrate 803* (MO, USM), *812* (MO, USM); *Ferreyra 764A* (MO, USM), *3922* (MO, USM), *8061* (MO, USM), *8372* (MO, USM), *13790* (MO, USM). **AYA-CUCHO. Lucanas:** 43 km E of Nazca on road to Puquio, *Gentry et al. 23253* (F, MO). **CUSCO. Cusco:** near Cusco, *Gay s.n.* (GH). **LA LIBERTAD. Trujillo:** Pate, Hda. Cal-ambay, *Ridoutt & Vargas 2248* (F). **LIMA. Cajatambo:** Churín, *Ferreyra 6160* (MO, USM). **Canta:** Obrajillo, *Mathews s.n.* (GH, US). **Huarochiri:** Río Rimac, *Angulo 2298* (F); between Lima and San Mateo, *Duncan et al. 2711* (F, MO); between Lima and Oroya, *Ferreyra 3922* (USM), *5327* (USM); Santa Eulalia Valley, *Hutchison & Saravia 7096* (F); Chosica, *Rose 18540* (US); between Lima and Oroya, *Stevens 22101* (F). **NO EXACT LOCALITY.** *Capt. Wilkes Exped. s.n.* (US), *Haenke 1831* (F).

3. *Jungia discolor* Muschl., Bot. Jahrb. Syst. 50, Beibl. 111: 106. 1913. TYPE: Peru, Caja-marca, Hualgayoc, Chugur, 2700–2900 m, 21 May 1904, *A. Weberbauer 4083* (holotype, B, presumably destroyed; photograph ex B, FM neg. 664115).

Scandent shrubs or climbing vines; stems 5–8 m long, striate, puberulent, glabrescent. Leaves petio-late; petioles 20–50(–70) mm long, strigillose-puberulent, lacking stipuliform bases; blades ro-tund-cordate, 35–90 mm long, 55–100 mm wide, generally strongly discolorous, the adaxial surfaces sparsely strigillose, prominent-reticulate, ferrugi-nous, the abaxial surfaces sparsely to densely strigillose, tawny, the margins shallowly 6–8-lobed, crenate-undulate, mucronulate. Capitulescences cymose-paniculate, terminal and axillary, the pe-duncles 50–100 mm long, the pedicles 10–20 mm long, ferruginous-tomentose. Capitula sessile to pedicellate; involucre 4–6 mm long, 4–6 mm wide, campanulate; phyllaries 2-seriate, all apically ob-tuse to rounded, mucronulate, the outer oblong to oblong-linear, 4–5 mm long, 1–1.5 mm wide,

densely ferruginous-pilose, the inner 5.5–6 mm long, oblong to obovate, the keel ferruginous-pilose; florets 12–15(–20), the corollas white to purple or lavender, 6–7 mm long, the tube ca. 4.5 mm long, the outer lip 3–4 mm long, ca. 1.5 mm wide, 3-fid, the inner lip ca. 2.5 mm long, deeply 2-fid; anthers 4.5–5 mm long. **Achenes** cylindric, ca. 2 mm long, glabrous; pappus of 30–40 bristles, white, 5–6 mm long.

DISTRIBUTION—Known from the Andean Cordillera in north-central Peru (2700–3400 m).

Jungia discolor is distinctive among the Peruvian species in possessing exstipulate, discoloured, shallowly lobed leaves and oblong to obovate phyllaries with obtuse to subtruncate apices. *Jungia discolor* most closely resembles *J. coarctata* Hieron., an Ecuadorian species, which shares the characteristic exstipulate leaves with abundant, mucronate teeth on the shallow lobes, but that species has longer, acute phyllaries and nearly concoloured leaves.

AMAZONAS. Chachapoyas: Puma-urcu, SSE of Chachapoyas, *Wurdack* 690 (F). **CAJAMARCA. Hualgayoc:** Hacienda Taulis, *Hutchison & Bismarck* 6510 (F, MO). **HUANUCO. Huánuco:** Villcabamba, Hacienda on Río Chinchao, *Macbride* 5180 (F). **Pachitea:** Muña, trail to Tambo de Vaca, *Macbride* 4331 (F). **SAN MARTIN. Mariscal Cáceres:** Río Abiseo National Park, *Young* 3723 (F).

4. *Jungia floribunda* Less., *Linnaea* 5: 38. 1830.
TYPE: Eastern Brazil, *F. Sellow* s.n. (holotype, B, presumably destroyed; photograph ex B, FM neg. 16119).

Annual herbs, 60–70 cm high, pubescent. **Leaves** petiolate; petioles 2.2–6.2 mm long, pubescent, upper leaves with paired stipuliform bracts, unequal, 7–20 mm long, 10–25 mm wide; blades cordiform, 30–40 mm long, 40–70 mm wide, the adaxial surfaces glabrous, the abaxial surfaces arachnoid, palmi-nerved, 5–7-veined, the margins 7–8-lobed, crenate, rounded, unequal. **Capitulescences** cymose, 10–15-headed. **Capitula** pedunculate; involucre 6–9 mm high, 3.5–5 mm wide, turbinate; phyllaries 2-seriate, the inner 7–8 mm long, 1.8–2.5 mm wide, acute; florets 14–15, the corollas yellowish-white, 7.5–8 mm long, the tube 4–4.6 mm long, the outer lip ligulate, 4.2–4.6 mm long, 1–2 mm wide, 4-nerved, tridentate, the inner lip 2–4 mm long, 0.8–1.2 mm wide, bifid. **Achenes** cylindric, 3–5 mm long, 0.8–1 mm wide, pubescent; pappus of 23–24 bristles, ca. 5 mm long, gray to white.

DISTRIBUTION—Known from the Andean Cordillera from northern to central Peru (2000–3400 m).

Jungia floribunda is a herbaceous annual characterized by upper leaves with large stipules and the capitula in dichotomous cymes. Potential isotypes may be housed at P and a fragment from *Sellow* 3643 (F 971243 ex P) matches the species.

Harling (1992) recently described a new species, *Jungia gracilis*, based on material from the Chachapoyas region (*King & Bishop* 9278) that he compares to *J. spectabilis*. No decision is here made as to the validity of this new species, and the type material is cited under *J. floribunda*.

AMAZONAS. Chachapoyas: Utcubamba Valley, *King & Bishop* 9165 (MO, US), 9213 (MO), 9278 (MO); Ubilón, *Ferreyra* 15622 (F, US, USM). **CAJAMARCA. Cajamarca:** Chetilla, ruta a Lullapuquio, *Sánchez & Cabanillas* 4104 (F). **Chota:** between Chota and Cajamarca, *Cerrate* 1625 (USM). **Contumazá:** Tambo de Luria, *López & Sagástegui* 9032 (MO); above Cascas, *López & Sagástegui* 9003 (MO); Guzmango, *Sagástegui* 2901 (F); Quebrada Honda, *Sagástegui* 3766 (F); Trinidad, *Sagástegui* 8950 (MO); Cruz del Hueco, *Sagástegui* 9945 (MO); Cerro Chungarrán, Guzmango, *Sagástegui* 9210a (F, MO); Pampa de la Sal, *Sagástegui* 10751 (MO), 10032 (MO); Cruz Grande, *Sagástegui* 8996 (MO); Herilla, *Sagástegui & Samamé* 2945 (F). **HUANCAVELICA. Castrovirreyana:** near Cordova, *Metcalfe* 30275 (MO). **HUANUCO. Huánuco:** near Huánuco, *Macbride & Featherstone* 2134 (F, US); Mito, *Macbride & Featherstone* 1586 (F, US); Huacachi, estación near Muña, *Macbride* 4067 (F). **LA LIBERTAD. Otuzco:** Agallpampa, *López* 1866 (F). **Patáz:** Tayabamba, *López & Sagástegui* 8163 (MO).

5. *Jungia paniculata* (DC.) A. Gray, *Proc. Am. Acad. Sci.* 5: 145. 1861.

Dumerilia paniculata DC., *Ann. Mus. Hist. Nat. Paris* 19: 72, t. 16, pl. 7. 1812. TYPE: Peru, *J. de Jussieu* s.n. (holotype, P-JU, not seen; photograph ex P, FM neg. 1037999).

Shrubs 15–20 dm high, branched, the branches glandular pubescent. **Leaves** petiolate; petioles 5–25 mm long, lacking stipuliform bracts; blades cordiform, 40–90 mm long, 40–90 mm wide, the adaxial surfaces puberulent, the abaxial surfaces white tomentose, palmi-nerved, 5 veins prominent, the margins 5–7-lobed, acute, unequal, mucronate-dentate. **Capitulescences** paniculate; bracts filiform. **Capitula** peduncles 15–80 mm long; involucre 4.2–6 mm high, 2.5–4.5 mm wide, turbinate; phyllaries 2-seriate, the inner 3.5–5.5 mm long, 1.2–1.8 mm wide, flavo-tomentose, acute; florets 17–27, the corollas yellow, 6–8 mm long, the tube 3.5–5.2 mm long, the outer lip liguliform 2–3.2

mm long, 4-nerved, tridentate, the inner lip 2–3.2 mm long; anthers 2.8–5 mm long. **Achenes** turbinate, 2–2.8 mm long, sparsely pubescent; pappus of 25–31 bristles, ca. 5.8 mm long, white.

DISTRIBUTION—Known from the Andean Cordillera of northern and central Peru (2500–3500 m).

Jungia paniculata has been traditionally accepted as the valid name for a species distributed from central and north-central Peru. Harling (1992) argued that the “true” *J. paniculata* is known from Colombia and Ecuador and is rare in northern Peru (only recorded in Cajamarca) and has described a new species *J. schuerae*, based on material gathered near Matucana, Lima. The illustration in DeCandolle’s publication depicts a plant with much less congested capitulescences and the photograph from J. de Jussieu’s herbarium in Paris also shows this characteristic. Since the exact locality for J. de Jussieu’s collection has not been established and since type material of Harling’s new species has not been studied yet, some of the material treated here may potentially represent his new taxon.

ANCASH. Bolognesi: Usgor, *Ferreyra & Cerrate 7563* (USM), *Cerrate 459* (USM); Chiquián, *Mostacero et al. 1344* (F), **Carhuas:** Vicos, *Hutchison & Wright 4299* (F, MO, US). **Huaras:** Marcara, *Proaño 149* (USM); Puente Bedoya, *Proaño 39* (USM); Baños de Chancos, *Sandeman 4593* (F); above Cochabamba, *Smith & Buddensiek 10958* (F). **Huari:** Chavin, *Rauh 40472* (USM). **Huaylas:** Santo Toribio, *Mostacero et al. 1975* (F). **Yungay:** Lagunas Llanganuco, *Gentry et al. 37370* (F, MO, USM); Huascarán National Park, *Smith 11295* (F); Llanganuco, *Zardini 1516* (MO). **CAJAMARCA. Cajamarca:** El Gavilán, *Sánchez 237* (CPUN, F, USM); Llacanora, *Sánchez 2246* (F, MO, US). **Celendin:** above Balsas, *Hutchison & Wright 5232* (F, MO, UC, USM); Llangat, *Mostacero et al. 947* (F). **HUANUCO. Dos de Mayo:** below Chavanillo, *Macbride & Featherstone 1987* (F, GH, US). **LA LIBERTAD. Patáz:** Huancaspata, *López & Sagástegui 8236* (GH, MO). **Santiago de Chuco:** Santiago de Chuco, *López 977* (USM), *1951* (F), *Sagástegui et al. 11712* (F). **LIMA. Canta:** road to Canta, *Cerrate 8680* (USM); ca. 1.5 km NE of Canta, *Dillon & Molau 3180* (CPUN, F, HUT, MO, NY, TEX, USM); Chiuchin, *Ferreyra 19167* (USM); San Juan, *Ferreyra 18358* (USM); Ingenio, *Meza 73* (USM); along Río Chillón, below Obrajillo, *Pennell 14430* (F, GH, US, USM); Huaripa, *Sánchez 56* (USM); Canta, *Soukup 2815* (F). **Huarochari:** San Mateo *Cerrate 5328* (USM); Santa Eulalia, *Hutchison & Saravia 7097* (F, USM); Viso, *Macbride & Featherstone 757* (F, GH, US). **Lima:** near Lima, *Cerrate 2924* (USM); *Cerrate 2393* (USM); market in Lima, *Cerrate 7709* (MO); Infernillo, *Ferreyre 6246* (USM); Monte Zarate, *Gutte & Muller 9509* (USM); Matucana, *Infantes 1987* (USM), *Ridoutt s.n.* (USM 15371), *Vargas 4750* (USM). **NO EXACT LOCALITY.** *Ellenberg 1724* (USM), *Ames s.n.* (USM).

6. *Jungia rugosa* Less., *Linnaea* 5: 36. 1830. TYPE: Ecuador, Prov. Chimborazo, “locis frigidis in radicibus montis nobilissimi Chimborazo, alt. 1860 hex. Regno Quitensi,” *Humboldt 3143* (holotype, v, presumably destroyed; photograph ex v, FM neg. 664249; isotype fragment, F 1012092 ex p).

Jungia jelskii Hieron., *Bot. Jahrb. Syst.* 36: 512. 1905. TYPE: Peru, Cajamarca, Chota, entre Chota y Cutervo, *Jelski 639* (holotype, v, presumably destroyed; photograph ex v, FM neg. 664243).

Jungia malvaefolia Muschl., *Bot. Jahrb. Syst.* 50, Beibl. 111: 105. 1913. TYPE: Peru, Ancash, Huari, Conin, *A. Weberbauer 2912* (holotype, v, presumably destroyed; photograph ex v, FM neg. 16122).

Shrubs 2–3 m high; stems glandular pubescent, ferruginous. **Leaves** petiolate; petioles 10–65 mm long, hirsute to glandular pubescent, the bases with stipuliform bracts, occasionally reduced or absent; blades cordiform, 13–70(–100) mm long, (9–)12–78 mm wide, the adaxial surfaces conspicuously rugose-bullate, strigillose or villosulous to glabrescent, the abaxial surfaces prominently reticulate-nerved, tomentose, the margins 5-lobed, unequal, obtuse, crenate. **Capitulescences** paniculate, terminal or axillary. **Capitula** peduncles (17–)22–65 mm long, pubescent, the bracteoles densely ciliate, glandular; involucre 6–9(–10) mm high, 4–6(–7) mm wide, campanulate; phyllaries 2-seriate, the outer lanceolate, 6–7 mm long, ca. 1.5 mm wide, glandular, apically acute to attenuate, the inner oblong-lanceolate, 6.8–7.5(–11.5) mm long, 1.8–2.6(–3) mm wide, apically acute to attenuate; florets 20–35, the corollas yellowish-white to white, 9–9.5(–14) mm long, the tube 5–6.5 mm long, the outer lip 2.5–4.5(–6.5) mm long, 4–5-nerved, tridentate, the inner lip 2.5–4(–6) mm long; anthers 4–6 mm long. **Achenes** cylindrical, 2.5–5 mm long, 0.4–1 mm wide, cylindrical, subglabrous to puberulent with 1-seriate, multicellular, glandular trichomes; pappus of 35–37 bristles, 8–9 mm long, white.

DISTRIBUTION—Known from the Andean Cordillera of Ecuador to southern Peru (2900–3800 m).

Jungia rugosa is readily distinguished by its characteristic bullate upper leaf surfaces and glandular phyllaries. The apex of the phyllaries is variable from acute to attenuate, but the densely glandular pubescence and ciliate margins is essentially invariable. The foliar characteristics of both *J. jelski* and *J. malvaefolia* agree well with those

of *J. rugosa*, and their distributional ranges also coincide.

AMAZONAS. Luya: 41 km SW of Leimebamba, Gentry et al. 23148 (F). **ANCASH.** Carhuaz: Quebrada Ulta, Smith 11408 (F). **Huari:** Quebrada Rurichinchay, Smith et al. 12472 (F). **Huaylas:** Caraz-Laguna Parón, López et al. 8361 (F); Quebrada Parón, Smith 10572 (F); Caras, Weberbauer 3224 (MOL). **Yungay:** Laguna Llanganuco, Mostacero et al. 1398 (F); Quebrada Yanapacha, Smith et al. 10450 (F). **APURIMAC.** Abancay: Sayroite, Vargas 1032 (GH); near Socclaccasa, West 3925 (UC). **Graú:** Lambrana-Chuquibambilla, Hoogte & Roersch 1451 (F). **CAJAMARCA.** Contumazá: Pampa de la Sal, Sagástegui et al. 10751 (F); Salcot, Sánchez & Sánchez 3138 (F). **CUSCO.** Anta: Limatambo, Vargas 8198 (MO, USM). Calca: Amparaes, Núñez 6763 (MO); near Lares, Vargas 3581 (MO, USM). **Paucartambo:** Paucartambo Valley, Herrera 2975 (US, USM); Paucartambo-Pilcopata, Molau 764 (USM); Tres Cruces, Pennell 14149 (F, GH, NY); Pillahuata, Vargas 1926 (USM); Llulluchayoc, Vargas 4309 (USM). **Urubamba:** Ollantaytambo, Cook & Gilbert 802 (US), 493 (US), 1367 (US); Pisac, Ellenberg 4833 (US); Taccac, Marín 1579 (US); Peñas, road to Panticalla, Vargas 4398 (USM). **LA LIBERTAD.** Bolívar: Unamen, López & Sagástegui 3321 (F); Laguna de Srurhuas, Young 3555 (F). **Patáz:** Yalen to los Alisos, Young 2929 (F). **LAMBAYEQUE.** Ferreñafe: near Incahuasi, Ferreyra & Vreeland 20905 (USM). **PIURA.** Huancabamba: Cienego largo, Sagástegui et al. 8261 (F).

7. *Jungia spectabilis* D. Don, Trans. Linn. Soc. London 16: 227. 1833. TYPE: Ecuador, Prov. Guayas, Guayaquil, *Tafalla s.n.* (holotype, MA, not seen).

Jungia floribunda Spruce ex Benth. & Hook., Gen. pl. 2: 502. 1873, non Less. 1830. TYPE: Ecuador, "in Andibus Ecuadorensibus," R. Spruce 5966 (holotype, K, not seen; photograph ex c, FM neg. 22568).

Shrubs 8–15 dm high, branched, branches more or less tomentose. **Leaves** petiolate; petioles 3–6.5 mm long, puberulent-tomentose; blades cordiform 150–200 mm long, 200–300 mm wide, the adaxial surfaces sparsely strigillose to glabrescent, the abaxial surfaces finely strigillose, the veins prominent-reticulate, densely black punctulate, the margins 7–9-lobed, crenate. **Capitulescences** paniculate. **Capitula** pedunculate, the pedicles to 5 cm long; involucre campanulate, 6–9 mm long, 3–7 mm wide; phyllaries 1-seriate, 10–12, lanceolate, glandular-puberulent, basally callose, apically attenuate; florets 21, the corollas white, bilabiate, the outer lip elliptic, tridentate, the inner lip bifid, coiled, linear. **Achenes** cylindrical-fusiform, 5–6 mm long; pappus of ca. 24 bristles, 5–6 mm long, white.

DISTRIBUTION—Known from the intermontane region of Ecuador and northern Peru (1400–3200 m).

Jungia spectabilis is readily distinguished by its large leaves with numerous black punctations on the abaxial surfaces. Harling (1991) attributed type fragments (*Tafalla s.n.*) to F; however, no such collection has been located at F.

CAJAMARCA. Contumazá: Cascas, Zubiate 1050 (USM); Contumazá, Peña *s.n.* (USM). **Hualgayoc:** Monte Seco, Soukup 3824 (F, US). **San Miguel:** entre el Naranjo y La Alhaja, Niepos, Llatas 1242 (F). **San Pablo:** Sangal, Sánchez 2849 (F). **LA LIBERTAD.** Otusco: Agallpampa, López 868 (USM). **PIURA.** Huancabamba: El Tambo, Aceto 250 (USM); Canchaque, Sagástegui 8131 (MO), 8545 (F, MO).

8. *Jungia stuebelii* (Hieron.) Crisci, Bol. Soc. Argent. Bot. 13: 341. 1971.

Leuceria stuebelii Hieron., Bot. Jahrb. Syst. 21: 372. 1896. TYPE: Peru, Cajamarca, Celendín, "crescit supra Celendín inter Pascasmayo et Moyobamba, 3200 m," A. Stübel 35g (holotype, v, presumably destroyed; photograph ex v, FM neg. 16059).

Jungia longifolia Cerrate, Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot. 4: 7. 1951. TYPE: Peru, Ancash, Chiquián, Bolognesi, Huancar, Cerrate 193 (holotype, USM).

Annual herbs, 4.5–12 dm high, erect, pubescent. **Leaves** petiolate or sessile; petioles 30–85 mm long; blades oblanceolate to oblong-elliptic 95–205 mm long, 40–80 mm wide, penninerved, 7–8-veined, pubescent. **Capitulescences** paniculate. **Capitula** peduncles 3–8 mm long; involucre 10–13 mm high, 8–12 mm wide, campanulate; phyllaries 2-seriate, 10–12 mm long, 2–2.5 mm wide, pubescent, acute, reddish-brown; florets 70–80, the corollas white, 10.5–12.5 mm long, the tube 5–5.5 mm long, the outer lip 6–7.2 mm long, 1–2.8 mm wide, 4-nerved, tridentate, the inner lip bifid, 3.8–4 mm long. **Achenes** cylindrical, 3.2–3.5 mm long, 0.8–1 mm wide, pubescent; pappus of 28–32 bristles, 5–6 mm long, tawny.

DISTRIBUTION—Known from the intermontane region of north and central Peru (2600–3800 m).

Jungia stuebelii closely resembles *J. floribunda* from which it differs in having basal, lanceolate, penninerved leaves and capitula with 70–80 florets.

ANCASH. Bolognesi: Chiquián, Cerrate 461 (MO, USM); Pasamarca, near Chiquián, Cerrate 1614 (USM); near Chiquián Ferreyra 5744 (MO, USM, US). **Carhuas:** Cor-

dillera Blanca, valley of the Río Marcará, road to Vicos, *Hutchison & Wright* 4385 (F, UC, USM); near Carhuas, *Infantes* 1131 (USM). **Huaras:** Olleros, *King & Collins* 9048 (US). **Huari:** above Chavin, *Ferreya* 14555 (USM). **Huaylas:** Tocanca-Punta, *Mostacero et al.* 1961 (F); Huascarán National Park, Alpamayo-Cashapampa, *Smith & Valencia* 10040 (F); Quebrada Parón, *Smith* 10609 (F); Auquispuquio, *Smith et al.* 11954 (F); 12075 (F). **Yungay:** Quebrada de Llanganuco, *Edwin & Schunke* 3838 (F); Llanganuco, *Ferreya* 14355 (MO, USM), *López et al.* 8342 (F, MO), *Smith & Cautivo* 10313 (F), *Smith et al.* 10338 (F), *Perez* 22 (USM). **CAJAMARCA. Cajamarca:** El Gavilán, *Ferreya* 3267A (USM); Kumulca baja, *Sánchez* 195 (CPUN, F); Quinuamayo, entre Kumulca y Encañada, *Sánchez & Ruiz* 466 (F, USM); entre Cerro Gavilán-Cajamarca, *Sánchez* 578 (F, USM), *Sánchez & Molau* 2938 (F); Encañada, *Sagástegui* 7385 (US); Jalca Kumulca, *Sagástegui et al.* 8116a (F, MO); Baños del Inca, *Soukup* 4636 (F, US). **Celendín:** Challuayaco, *Sánchez & Cabanillas* 3477 (MO). **Contumazá:** Pampa de la Sal, *Sagástegui et al.* 10033 (F, MO); arriba de Lledén, *Sagástegui et al.* 10809 (F, MO); Cascabamba, *Sagástegui* 9035 (MO); Guzmango, *Sagástegui & López* 10560 (MO). **San Miguel:** Cerro Quillón, *Sagástegui* 9603a (F, MO), 6363 (MO). **LA LIBERTAD. Huamachuco:** Nevado Huaylillas, *Riccio & La Rosa* 3626 (US). **Otusco:** Agallpampa, *López* 341 (USM). **Santiago de Chuco:** Cerro La Botica, *López* 1016 (F, USM); *Sagástegui et al.* 11885 (F). **NO EXACT LOCALITY.** *Ellenberg* 1688 (USM).

9. *Jungia vitocensis* Cuatr., *Anales Ci. Univ. Madrid*, Fasc. 2. 230. 1935. TYPE: Peru, Junín, Tarma, camino a Vitoc, en las alturas de Palca, 4 Nov 1863, *J. Isern* 462 (holotype, MA, not seen; isotype fragment F 843173 ex MA).

Annual or perennial **herbs**, erect, branched, the stems tomentose. **Leaves** petiolate; petioles 10–40(–170) mm long, tomentose; blades orbicular, 70–110(–180) mm long, 70–100(–180) mm wide, the adaxial surfaces pilose to strigillose, the abaxial surfaces densely to sparsely tomentose, the margins ca. 9-lobed, the lobes rounded, mucronate-dentate. **Capitulescences** corymbose to paniculate, bracts to 25 mm long, linear. **Capitula** peduncles 20–25 mm long, tomentose; involucre campanulate; phyllaries 12–14, lanceolate, densely villous, acuminate, yellowish, the inner 6–7 mm long, 1–1.5 mm wide; florets 14–18, the corollas bilabiate, 6–7 mm long, the tube 2.5–3.5 mm long, the outer lip ovate, tridentate, the inner lip lanceolate, bifid. **Achenes** cylindrical, ca. 3.5 mm long, 5-costate, pilose; pappus of ca. 30 bristles, 5–6 mm long, stramineous.

DISTRIBUTION—Known from the eastern slopes of the Andean Cordillera of central Peru.

Jungia vitocensis is readily distinguished by its densely villous phyllaries and long-pedunculate capitulescences. This is apparently a rare species and is potentially related to *J. rugosa*, from which it differs in possessing more orbicular leaves and pilose achenes.

HUANUCO. Huánuco: Huacachi, estación near Muña, *Macbride* 4138 (F, US).

10. *Jungia weberbaueri* Cerrate, *Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot.* 4: 22. 1951. TYPE: Peru, Huánuco, Pachitea, [Río] Huallaga, Chaglla, *A. Weberbauer* 6701 (holotype, MO); isotype, F 628611; photograph ex F, FM neg. 1504494). **Figure 10.**

Shrubs 15–20 dm high, scandent, branched, the branches terete, pubescent, ochraceous. **Leaves** petiolate; petioles 20–55 mm long, pubescent, paired stipuliform bracts; blades triangular-cordate to ovate-cordate, 35–140 mm long, 25–92 mm wide, ochraceous, palmi-nerved, the bases cordiform, the apices obtuse, the adaxial surfaces densely strigose, the abaxial surfaces densely tomentose, the veins prominent, the margins subentire to remotely lobed. **Capitulescences** paniculate, terminal or axillary. **Capitula** with involucre 3.5–5 mm high, 4.5–5.5 mm wide, campanulate; phyllaries 2-seriate, the inner 4.2–4.5 mm long, 2.2–2.4 mm wide, apically obtuse to truncate, mucronate, strigulose pubescent, ochraceous, coriaceous; florets 11–12, the corollas violaceous, to 8 mm long, the tube 3–5 mm long, the outer lip 2.8–3 mm long, 4-nerved, tridentate, the inner lip 2.8–3 mm long, bifid; anthers 4–4.2 mm long. **Achenes** cylindrical, 1–2 mm long, glabrous; pappus of 58–61 bristles, ca. 7 mm long, yellowish-brown.

DISTRIBUTION—Known from the eastern slope of the Andean Cordillera of central Peru (2800–2900 m).

Jungia weberbaueri is distinctive among the Peruvian species in possessing ochraceous, triangular-cordate to ovate-cordate leaf blades. The involucre of *J. weberbaueri* most closely resembles that of *J. discolor* in possessing phyllaries with obtuse to truncate apices, but the latter species has rotund-cordate, strongly discolored leaves.

HUANUCO: Huánuco: Carpish, between Huánuco and Tingo María, *Ferreya* 2098 (MO, US, USM), 2294 (MO, US, USM).

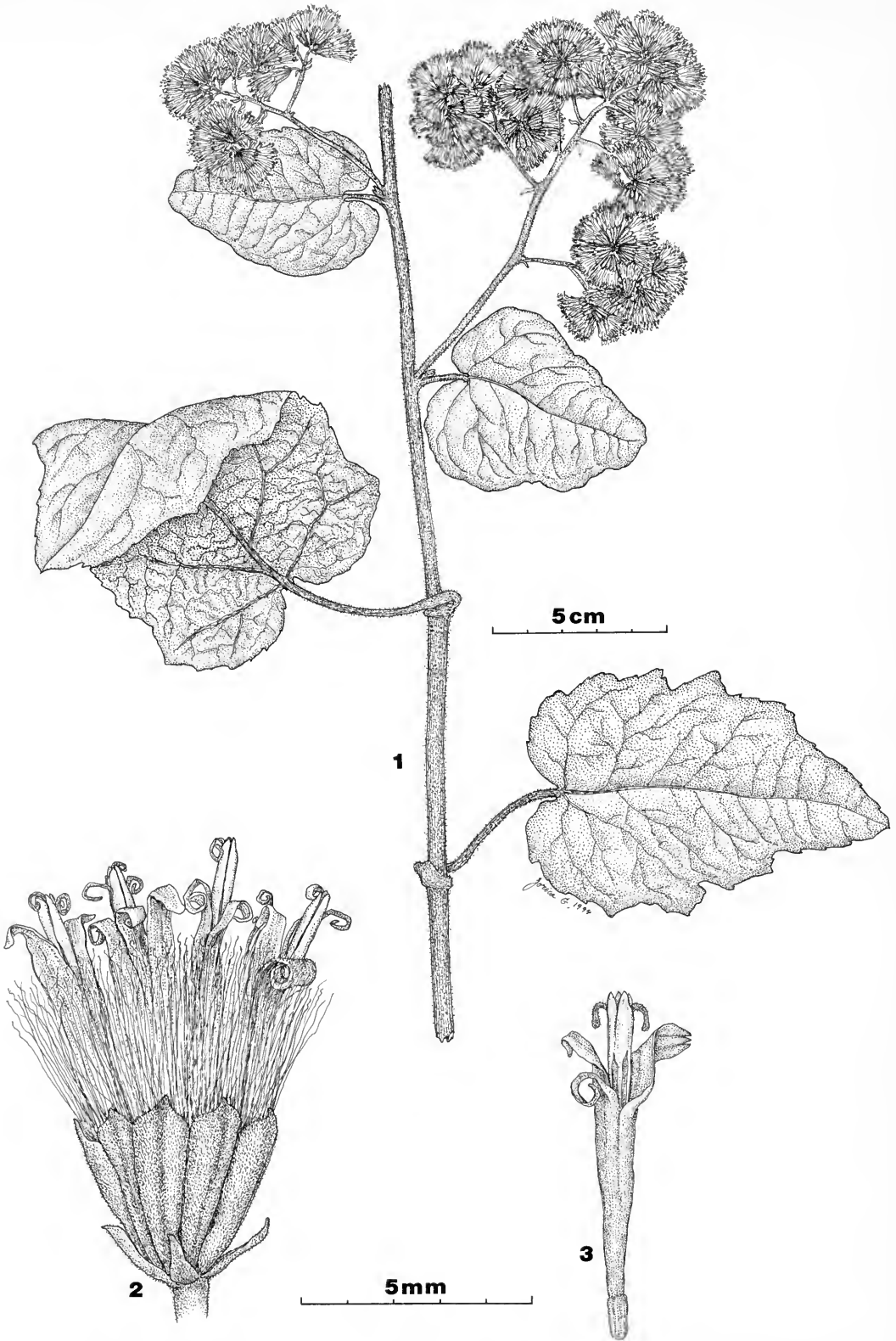


FIG. 10. *Jungia weberbaueri*. 1, habit; 2, capitulum; 3, floret with achene. (Drawn from I. Sánchez et al. 6068, F.)



FIG. 11. Flowering individual *Leucheria daucifolia*. (Drawn from D. Stafford 686, F.)

XII. LEUCHERIA

Leucheria Lag., Amer. nat. Españ. 1: 32. 1811.
TYPE: *Leucheria hieracioides* Cass.

Chabraea DC., Ann. Mus. Nat. Hist. 19: 65, 71. t. 13. 1812. TYPE: *Perdicium purpureum* Vahl. = *Chabraea purpurea* (Vahl) DC. (non *Chabraea* Adanson, 1763).

Annual or perennial **herbs**, lanuginose to glandulose; stems lacking spines. **Leaves** in basal rosette, rarely alternate; blades linear, lanceolate, spatulate, oblong or ovate, the margins entire, dentate, or pinnate- to bipinnate-lobed. **Capitulescences** of solitary heads or terminal and/or axillary cymose-corymbs or cymose-paniculate. **Capitula** homogamous, conspicuously pedunculate; involucre campanulate to hemispherical; receptacle slightly convex to plane, glabrous or paleate; phyllaries 2–3-seriate, the outer phyllaries lanceolate, acute, lanuginose or glabrescent, the inner smaller; florets isomorphic, hermaphroditic, the corollas white, the limb bilabiate, the outer lip ligulate, 3-dentate, the inner lip bifid, coiled; anthers linear, sagittate; styles cylindric, the branches truncate. **Achenes** ovate or oblong, papillose or villose; pappus of plumose bristles, isomorphic, united at base.

Leucheria is a genus of some 46 species and

exclusively distributed in South America from central Peru to Tierra del Fuego (0–5000 m). The genus is easily recognized by its basal rosette of bipinnatifid leaves, white corollas, and plumose pappus bristles. *Leucheria* is readily distinguished from *Perezia*, in possessing 1–2-seriate involucre rather than the 3–6-seriate involucre in the latter genus. Only the following species is known from Peru.

Reference

CRISCI, J. G. 1976. Revisión del género *Leucheria* (Compositae: Mutisieae). Darwiniana, 20: 9–126.

1. *Leucheria daucifolia* (D. Don) Crisci, Darwiniana 20: 52. 1976. **Figure 11.**

Ptilurus daucifolius D. Don, Trans. Linn. Soc. London 16: 219. 1830. TYPE: Peru, “summis alpiibus cordilleras de los Andes Hispanicis dictis,” Ruiz Lopez & Pavón s.n. (holotype, P, not seen).

Chabraea daucifolia (D. Don) Wedd., Chl. And. 1: 35. 1855.

Chabraea laciniata Wedd., Chlor. And. 1: 34, t. 10. 1855. TYPE: Peru, no exact locality, Gay s.n. (holotype, P, not seen). Non *Leucheria laciniata* Hook. & Arn., 1835.

Perennial, cespitose **herbs**. **Leaves** petiolate, petioles 20–40 mm long; blades oblong in outline, 30–50 mm long, 10–15 mm wide, membranaceous, the margins bipinnatifid. **Capitulescences** cymose-corymbiform. **Capitula** 4–12, pedunculate, densely pubescent at the base; involucre campanulate to hemispherical; receptacle slightly convex, glabrous; phyllaries 2–3-seriate, lanceolate, 12–15 mm long, 3–5 mm wide lanuginose-fuscescent, acute; florets ca. 150, the corollas white, bilobed, the lobes coiled; anthers ca. 3 mm long, bases sagittate; styles filiform, the branches ca. 1 mm long. **Achenes** 2–3 mm long, oblong.

DISTRIBUTION—Known from puna within the Andean Cordillera of central Peru to central Bolivia (3800–4800 m).

Leucheria daucifolia is separated from all other members of the tribe as perennial herbs with a basal rosette of bipinnatifid leaves, pedunculate capitulescences, and florets with white corollas, truncate style branches, and plumose pappus bristles. While no authentic type material has been examined in the current study, there can be no

confusion as to the application of the name when Crisci (1976) is followed.

ANCASH. Bolognesi: above Chiquián, *Weberbauer* 224 (F). **Recuay:** Huascarán National Park, *Smith & Escalona* 10206 (F). **AREQUIPA. Arequipa:** Shihuata-La Cumbre, *Ferreya* 2599 (us, USM). *C. & B. Maguire* 44453 (us); Nevado Chachani, *Pennell* 13309 (F, GH); Nevado Chachani, *Rauh & Hirsch* P552 (NY); Arequipa market, *Rose* 18817 (us); Pichu Pichu, *Stafford* 686 (F); between Arequipa to Puno, *Straw* 2307 (us, USM). Nevado Chachani, *Straw* 2333 (USM). **CUSCO. Chumbivilcas:** Sto Tomás, *Hoogte & Roersch* 1580 (F). **Espinar:** Yauri, *Carlier* 195 (USM); Wara-Wara, Tocroyoc, *Hoogte & Roersch* 2364 (F). **JUNIN. Huancayo:** Huaytapayana, *Rauh & Hirsch* P1776 (NY). **Junin:** Huampucocha, *Cerrate* s.n. (USM 32738). **Yauli:** above Yauli, *Weberbauer* 222 (F). **LIMA. Canta:** Culluay, *Capt. Wilkes Exped. s.n.* (GH). **Huarocharí:** above Tucto, Lima-Oroya, *Duncan* 2675 (F, MO); Casapalca, *Macbride & Featherstone* 865 (F, us); above Casapalca, *Caprichosa, Amstutz* 137 (us). **PASCO. Daniel Carrion:** Cordillera Huayhuash, *Adcock* s.n. (us). **PUNO. Carabaya:** Macusani, *Soukup* 474 (F); Balcanpata-Apacheta, *Vargas* 17618 (us). **NO EXACT LOCALITY.** *Rauh* 552 (USM), 1776 (USM).

XIII. LYCOSERIS

Lycoseris Cass., *Dict. Sci. Nat.* 33: 474. 1824.
TYPE: *Atractylis mexicana* L. fil. = *Lycoseris mexicana* (L. fil.) Cass.

Diazeuxis D. Don, *Trans. Linn. Soc. London* 16: 251. 1830. TYPE: *Diazeuxis mutisiana* D. Don = *Lycoseris mexicana* (L. fil.) Cass.

Dioecious, perennial herbs, lianas, or subshrubs; stems scandent, lacking spines. Leaves alternate, simple, shortly petiolate to subsessile; blades ovate to lanceolate or elliptic, 3–5-penninerved (camptodromous) or strongly 3-nerved from near the base (perfect to imperfect acrodromous), the adaxial surfaces glabrescent, the abaxial surfaces arachnoid to lanuginose, white, the

margins entire to remotely denticulate. Capitulescences of solitary, terminal heads, rarely multiheaded, corymbose or racemose. Capitula functionally unisexual: involucre campanulate to globose; receptacle convex, pubescent with needlelike bristles between florets; phyllaries 6–8-seriate, imbricate, the outer lanceolate, the inner linear to oblong, apically acuminate to obtuse, appressed to reflexed; staminate heads radiate; ray florets pistillate, 1-seriate, the ovaries rudimentary, the corollas orange to orange-red, occasionally yellow or violet, bilabiate, the outer lip ligulate, (1–)3(–5)-dentate; disc florets tubular, the corollas 5-lobed, orange; anthers basally sagittate, the apical appendage lanceolate; styles cylindrical, the style branches connate; pistillate heads radiate or discoid; ray florets with bilabiate corollas or absent; disc florets narrowly tubular, the limb 5-lobed, actinomorphic, the stamens rudimentary, ovary well developed, style exerted, branches short, rounded, papillose. Achenes columnar, glabrous, 5-costate; pappus of 150–200 bristles, 1-seriate, yellowish-white.

Lycoseris consists of 11 species of dioecious subshrubs distributed from Guatemala to northwestern and western South America. The genus is distinctive among the Peruvian members of the tribe in possessing scandent or vining habits, rather large capitula with orange-yellow to orange-red corollas, and a distribution below 1000 m along the eastern escarpment of the Andean Cordillera.

Reference

EGERÖD, K., AND B. STÄHL. 1991. Revision of *Lycoseris* (Compositae—Mutisieae). *Nord. J. Bot.*, 11: 549–574.

Key to Peruvian Species of *Lycoseris*

1. Leaf blades narrowly ovate to lanceolate; phyllaries reflexed *L. peruviana*
1. Leaf blades elliptic to narrowly lanceolate; phyllaries appressed *L. trinervis*

1. *Lycoseris peruviana* Egeröd, *Nord. J. Bot.* 11: 564. 1991. TYPE: Peru, Dept. San Martín, Pasaraya to Saposoa, 700 m, 6 Aug 1958, [male], *F. Woytkowski* 5080 (holotype, F; isotypes, NY, US).

Procumbent shrubs, or lianas, branched, the branches lanuginose, striate. Leaves subsessile or petioles 5–8 mm long; blades narrowly ovate to lanceolate, 55–150 mm long, 25–55 mm wide, basally obtuse to rounded, apically acute, venation

perfect suprabasal acrodromous. **Capitulescences** of solitary, terminal heads, subsessile and usually subtended by reduced leaf. **Staminate capitula** ca. 15 mm high, 12–20 mm wide; phyllaries 5–6-seriate, strongly reflexed, the outer linear-lanceolate to spatulate, (10–)15–25 mm long, 2–3 mm wide, the inner oblanceolate, 15–20 mm long, ca. 5 mm wide, reflexed; disc florets 87–90, the corollas 11–12 mm long, the lobes 3–3.5 mm long, the anthers 6–6.5 mm long. **Pistillate capitula** 20–25 mm high, 20–30 mm wide; phyllaries 6–8-seriate, reflexed, the outer lanceolate, 12–16 mm long, 2.3–2.8 mm wide, acute, the inner gradually longer, 25–28 mm long, ca. 3 mm wide; ray florets 19–20, the corollas 18–20 mm long, the tube 8–9 mm long, the ligule 10–11 mm long, 2.2–3 mm wide. **Achenes** 4–6 mm long; pappus 12–15 mm long.

DISTRIBUTION—Endemic to quebradas and low forests along the valley of the Río Huallaga in the Department of San Martín (200–900 m).

Lycoseris peruviana is weakly distinguished from *L. trinervis* by the former's narrowly ovate to lanceolate leaf blades, short petioles, smaller female capitula, and longer, strongly reflexed phyllaries.

SAN MARTIN. Lamas. San Jose de Sisa, *Ferreyra* 7942 (MO, US, USM); 20 km SE of Moyobamba, *Woytkowski* 35256 (F). **San Martín:** W of Shapaja 2–8 km on trail to Tarapoto, *Belshaw* 3200 (F, MO, NY), 3201 (F); Pucayacu, 11 km S of Tarapoto, *Ferreyra* 7743 (F); near Tarapoto, *Ferreyra* 7749 (MO, USM), 8005 (MO, USM); Puente Colombia, *Ferreyra* 17521 (USM); 31 km S of Tarapoto, *Gentry et al.* 37734 (F); Tarapoto, *Williams* 5488 (F, US), 5744 (F, US), 5857 (F, US).

2. *Lycoseris trinervis* (D. Don) S. F. Blake, Contr. U.S. Natl. Herb. 22: 653. 1924. **Figure 12.**

Diazeuxis trinervis Ruiz Lopez & Pavón ex D. Don. Trans. Linn. Soc. London 16: 253. 1830. **TYPE:** based upon *Aster trinervis* Ruiz Lopez & Pavón, ined. **LECTOTYPE** (designated by Egeröd and Ståhl, 1991): Ecuador, Prov. Guayas, "Aster de Huayaquil, Sp. nova," *J. Tafalla s.n.* (lectotype, BM, not seen).

Centroclinium altissimum Poepp. & Endl., Nov. gen. sp. pl. 3: 52, t. 259. 1843. **TYPE:** Peru, "Tocache Huahaga, 1830," [female], *E. F. Poeppig 163* (holotype, w, not seen; isotype, NY).

Onoseris altissima (Poepp.) Kuntze, Revis. gen. pl. 354. 1891.

Lycoseris trinervis (D. Don) S. F. Blake subsp. *altissima* (Poepp.) Egeröd, Nord. J. Bot. 11: 561. 1991.

Shrubs scandent or subscandent, branched, the stems lanuginose, glabrescent. **Leaves** subsessile, or petioles 5–13 mm long; blades oblong-lanceo-

late to elliptic, 90–180 mm long, 20–50 mm wide, basally attenuate to truncate, apically acuminate, venation perfect suprabasal acrodromous. **Capitulescences** of solitary, terminal heads, the peduncles 15–25 mm long. **Staminate capitula** 11–16 mm high, 12–24 mm wide; phyllaries 5–6-seriate, appressed, the outer lanceolate, 11–15 mm long, ca. 2.5 mm wide, the inner linear-lanceolate to oblong, 15–20 mm long, ca. 1.5 mm wide; disc florets ca. 100, the corollas ca. 20 mm long, unequally 5-lobed, the lobes 1.5–2 mm long, the anthers ca. 6 mm long. **Pistillate capitula** 22–40 mm high, 15–30 mm wide; phyllaries 8–9-seriate, the outer lanceolate, ca. 15 mm long, ca. 3.2 mm wide, the inner linear-lanceolate, 20–22 mm long, 2.8–3 mm wide, acuminate, glabrous; ray florets ca. 21, the corollas subligulate, ca. 20 mm long, the tube ca. 15 mm long, the ligule ca. 5 mm long, 1–2 mm wide; disc florets 260–270, the corollas 18–20 mm long, the lobes ca. 1.5 mm long. **Achenes** 3.5–4 mm long; pappus 16–18 mm long.

DISTRIBUTION—Known from coastal Ecuador and disjunct to the eastern escarpment of the Andean Cordillera of north-central Peru (350–900 m).

Lycoseris trinervis is distinguished by its elliptic, strongly trinerved leaves, large pistillate capitula with up to 270 florets, and appressed phyllaries. Material annotated by Egeröd and Ståhl (1991) has been examined, and the application of this name appears unequivocal. Egeröd and Ståhl (1991) treated the Ecuadorian and Peruvian collections as a subspecies *trinervis* and *altissima*, respectively; the morphological distinctions appear so weak, however, that the subspecific taxa are not recognized here. Furthermore, with some hesitation, Egeröd and Ståhl (1991) placed two central Peruvian collections (*Soukup* 2422, *Sandeman* 4992) under *L. retroflexa* Koster, a central Bolivian species. Because these collections are stated to lack certain of the defining characteristics of *L. retroflexa*, that species is not recognized from Peru in this treatment and is here placed under *L. trinervis*.

HUANUCO. **Leoncio Prado:** 69 km NE of Tingo María on road to Tocache, *Gentry et al.* 37630 (F). **Pachitea:** Pozuzo, *Macbride* 4593 (F, GH, US). **JUNIN.** **Satipo:** Satipo, Río Chiquireni, *Madison* 10455-70 (US, USM). **Tarma:** between La Merced to Quimiri, *Ferreyra* 3689 (US, USM); 10 km S of San Ramón, *Gentry et al.* 41529 (F, MO, USM); Chanchamayo, *Isern* 37 (F 157054, F 1570155); Quimiri-La Merced, *Killip & Smith* 23933 (US); San Ramón, *Killip & Smith* 24741 (F, US); Colonia Perené, *Killip & Smith* 25099 (US); Chanchamayo Valley, *Schunke* 1607



FIG. 12. *Lycoseris trinervis*. 1, flowering branch of female individual. (Drawn from *S. Knapp 8160*, F.) 2, flowering branch of male individual. (Drawn from *J. Schunke 4880*, F.)

(F); San Ramón, *Soukup 1835* (GH, US); San Ramón, *Tovar 2288* (USM); *Woytkowski 7402* (GH, US). **LORETO. Alto Amazonas:** Santa Rosa, lower Río Huallaga below Yurimaguas, *Killip & Smith 28721* (US). **SAN MARTÍN. Mariscal Cáceres:** 4 km de Puerto Pizana, *Schunke 4480* (F, US). *San Martín:* Tarapoto, *Ferreyra 7877* (US, USM), *17413* (MO, USM); Chazuta, *Klug 4148* (F, GH, MO, NY); Chazuta, *Knapp 8160* (F); Huaquisha, *Schunke 7084* (MO, NY, USM), *12517* (F); Tocache Nuevo, *Schunke 12428* (USM). **UCAYALI. Coronel Portillo:** Bosque Nacional Alexander von Humboldt, *Gentry et al. 41415* (F); road to Tournavista, *Gentry & Diaz 58357* (F); Pucallpa, *Soukup 3063* (f). **NO EXACT LOCALITY.** "Peru," *Cuming 1160* (F), *1161* (F).

XIV. MUTISIA

Mutisia L. fil., Suppl. pl. 57. 1781. TYPE: *Mutisia clematis* L. fil.

Perennial **herbs, shrubs, or vines**; stems with or without wings, lacking spines. **Leaves** alternate, sessile or shortly petiolate; blades simple or pinnately compound, apically with or without a tendril, the margins entire to dentate. **Capitulescences** of solitary heads, terminal or axillary, or occasionally weakly corymbose; sessile or long-pedunculate. **Capitula** heterogamous, radiate, or homogamous, discoid; involucre cylindrical to campanulate; receptacle plane to convex, foveolate, glabrous; phyllaries (3-)4-8(-10)-seriate, imbricate; ray florets pistillate, the corollas bilabiate with

the outer three lobes fused into a tridentate ligule and the two inner lobes free; disc florets hermaphroditic, the corollas bilabiate, the outer lip ligulate, apically 3-fid, the inner lip divided deeply, the lobes filiform; anthers long-exserted, 15-30 mm long, the terminal appendages lanceolate, the bases sagittate or more typically auriculate, the tails sometimes fringed; style branches short, truncate to rounded. **Achenes** columnar or fusiform, ribbed or smooth, glabrous or pubescent; pappus of plumose bristles, 1-seriate, white to yellow or brown.

Mutisia contains more than 60 species, the majority of which occur in Chile, Argentina, Peru, and Bolivia. No fewer than 15 species are currently recorded from Peru. Although type material has not been studied for some species, material annotated by Cabrera (1965) was available for comparison.

References

- CABRERA, A. L. 1965. Revisión del género *Mutisia* (Compositae). *Opera Lilloana*, **13**: 1-227.
 FERREYRA, R. 1980. Especies nuevas de Compuestas Peruanas. *Bol. Soc. Peruana Bot.* Nos. 1-2, **8**: 75-82.

Key to Peruvian species of *Mutisia*

1. Lianas or shrubs; leaves pinnate, the leaflets lanceolate, ovate or elliptic 2
 2. Median and inner phyllaries with recurved apices; pappus of ligulate florets longer than the tube 3
 3. Leaflets lanate; capitula with involucre to 40 mm wide; disc florets ca. 100 *M. lanata*
 3. Leaflets glabrous or glabrescent; capitula with involucre to 30 mm or less wide; disc florets no more than ca. 60 *M. wurdackii*
 2. Median and inner phyllaries appressed, only outer phyllaries with recurved apices; pappus of ligulate florets less than half the length of the tube 4
 4. Leaves with 9-14 pairs of leaflets *M. acuminata*
 4. Leaves with 3-9 pairs of leaflets 5
 5. Leaves with 3-5 pairs of leaflets; disc florets 30-60; inner phyllaries apically obtuse *M. pulcherrima*
 5. Leaves with 8-9 pairs of leaflets; disc florets 10-25; inner phyllaries apically acute *M. venusta*
1. Shrubs; leaves simple, the blades linear to oblong or lanceolate 6
 6. Leaf blades apically acute, mucronate, without terminal tendrils 7
 7. Leaf blades with abaxial surfaces densely white-tomentose *M. ledifolia*
 7. Leaf blades with abaxial surfaces glabrous *M. orbignyana*
 6. Leaf blades apically attenuate, with terminal tendrils 8

- 8. Stems lacking wings 9
 - 9. Leaves to 16 cm long, to 6 mm wide; involucre to 45 mm high, ca. 30 mm wide *M. rauhii*
 - 9. Leaves to 9 cm long, to 4 mm wide; involucre to 35 mm high, ca. 10 mm wide *M. mathewsii*
- 8. Stems winged, the wings entire to dentate, rarely reduced or absent (cf. *cochabambensis*, *lanigera*) 10
 - 10. Leaf margins denticulate *M. lanigera*
 - 10. Leaf margins essentially entire 11
 - 11. Stems with wings entire; leaves glabrous, bases rounded or cordate *M. alata*
 - 11. Stems with wings dentate; leaves glabrous or tomentose, bases sagittate to hastate ... 12
 - 12. Leaves shortly petiolate *M. cochabambensis*
 - 12. Leaves sessile 13
 - 13. Leaves with abaxial surfaces glabrous *M. arequipensis*
 - 13. Leaves with abaxial surfaces tomentose 14
 - 14. Phyllaries glabrous, the outer series not recurved *M. andersonii*
 - 14. Phyllaries lanate, the outer series with strongly recurved apices *M. hastata*

1. *Mutisia acuminata* Ruiz Lopez & Pavón, Syst. veg. fl. peruv. chil. 192. 1798. TYPE: Peru, "Ceuchin [Chiuchín] 1779 mayo," *J. Dombey s.n.* (holotype MA, not seen).

Mutisia peduncularis Cav., Icon. Pl. 5: 62. 1799. TYPE: Peru, San Buenaventura, *Nee s.n.* (holotype, MA, not seen).

Mutisia viciaefolia Cav., Icon. Pl. 5: 62. 1799. TYPE: Chile, Valparaiso, *Nee s.n.* (holotype, MA, not seen; isotype fragment ex MA, F 844679).

Shrubs 10–25 dm high, branched, branches striate, glabrous to lanuginose, erect to procumbent, sometimes semivoluble, rarely forming rounded cushions. **Leaves** sessile, pinnate; rachis with tendrils trifid, 7–15 cm long, the leaflets in 9–14 pairs, opposite to alternate, lanceolate or elliptic-lanceolate, 10–35 mm long, 5–10 mm long, apically acuminate with terminal tendril, gradually attenuate at base, entire. **Capitulescences** of solitary, terminal or axillary heads; pedunculate, peduncles

3–15 cm long, tomentose to glabrescent. **Capitula** radiate; involucre 45–60 mm high, 7–15 mm wide, cylindrical; phyllaries 18–22, 6–7-seriate, oblong-lanceolate, 6–16 mm long, 4–12 mm wide, apically obtuse, glabrous to tomentose; ray florets 5–8, the corollas red, orange, or yellow, the tube 35–50 mm long, 0.8–1.2 mm wide, the ligule 10–18 mm long, 8–10 mm wide, obtuse, sometimes 2-dentate; disc florets 10–20, the corollas yellowish or reddish, bilabiate, the tube 20–30 mm long, the outer lip tridentate, the inner lip bifid, 4–4.5 mm long; styles 4–5 mm long; anthers ca. 17 mm long. **Achenes** fusiform, 8–18 mm long, 1–2 mm wide, glabrous; pappus 18–20 mm long, yellowish brown.

DISTRIBUTION—Known throughout the Andean Cordillera from northern Peru to Bolivia and adjacent northern Argentina and Chile (1200–3800 m).

Cabrera (1966) recognized five varieties, and Peruvian material is referable to the following three.

Key to Peruvian Varieties of *Mutisia acuminata*

- 1. Leaflets with abaxial surfaces whitish- to yellowish-tomentose; phyllaries apically white-tomentose; corollas orange-yellow *M. a.* var. *bicolor*
- 1. Leaflets glabrous; phyllaries glabrous or yellowish-brown-tomentose; corollas yellow or reddish-yellow 2
 - 2. Involucre cylindrical, 45–60 mm high; corollas red to reddish-yellow *M. a.* var. *acuminata*
 - 2. Involucre campanulate, 55–60 mm high; corollas yellow *M. a.* var. *hirsuta*

1a. *Mutisia acuminata* var. *acuminata*.

DISTRIBUTION—Known from the western and central portions of the Andean Cordillera (1200–3800 m). The protolog states “habitat in Prov. Tarmae, Huarocherí et Caxatambo ad Cheuchin vicum” and the label indicates “Ceuchin,” which is undoubtedly a misspelling of Cheuchin, Department Lima.

Variety *acuminata* is distinguished by its glabrous leaflets and red to reddish-orange florets. It is used in folk medicine, especially in Cusco, and has the common name of “chinchircuma.” Chromosome number: $n = 27$.

ANCASH. **Bolognesi**: Chiquián, *Cerrate* 1319 (USM); entre Chachash y Chiquián, *Ferreyra* 6186 (US, USM), *Mostacero et al.* 1337 (F); Cajacay, *Ferreyra* 6232 (US, USM); below Puente Santa Rosa, *Gentry & Zardini* 37316 (F, MO); near Conococha, *López et al.* 7062 (NY); Pativilca-Huaras, km 99, *Smith* 8312 (F); 15 km SE of Chiquián, *Young & Eisenberg* 905 (F); Pativilca-Huaras, *Zardini* 1492 (MO). **Casma**: arriba de Chacchan, *Mostacero et al.* 525 (F). **Huaras**: Pampas Grande, entre San Juan y Huiñapajatum, *Díaz* 1978 (F); Huaras–Recuay, *López & Sagástegui* 7485 (M), 7602 (MO); between Casma and Huaras, *Maekawa s.n.* (USM). **Recuay**: Marca, *Gomez* 120 (USM); Shucta, *Sánchez* 252 (F). **Santa**: arriba de Lamparín, *Mostacero et al.* 1829 (F). **HUANUCO**. **Huamalis**: Llata, *Macbride & Featherstone* 2255 (GH, US). **JUNIN**. **Huancayo**: Huancayo, *Soukup* 1198 (MO). **Tarma**: between Tarma and Oroya, *Ferreyra* 3821 (MO, US, USM). **LIMA**. **Cajatambo**: Churín, *Ferreyra* 3542 (US, USM). **Canta**: below San Juan, Chancay Valley, *Ferreyra* 18357 (MO, USM); Guamantanga, *Mathews* 457 (GH); Ayasura *Meza* 04 (USM); near Viscas, *Pennell* 14318 (GH, NY, US); Obrajillo, *Velarde* 951 (USM). **Huarochiri**: Chacahuaro, *Cerrate s.n.* (USM); San Lorenzo, *Cerrate* 1976 (MO, USM), 1045 (MO, USM); 1778 (MO, USM); Río Blanco, *Cerrate* 4285 (USM); San Mateo, *Cerrate* 5325 (USM); 4 km E of San Mateo, *Dillon* 2505 (F, MO); near Surco, *Ferreyra* 3418 (USM); between Huaquicha and Palacala, *Ferreyra* 3455 (MO, USM); San Mateo, *Ferreyra* 5314 (US, USM); Infiernillo, *Ferreyra* 6254 (MO, US, USM); San Mateo, *Ferreyra* 8295 (MO, USM); between Surco and Matucana *Ferreyra* 5414 (USM); Huariquiña, *Ferreyra* 9189 (MO, USM); Matucana, *Ferreyra & Tovar* 20132 (USM); Suchi, NE of Chosica, *Gentry* 21681 (MO), *Goodspeed et al.* 11550 (F, UC), *Hutchison & Wright* 7075 (UC); Zarate, above San Bartolomé, *Hutchison & Wright* 7075 (UC); Río Blanco, *Killip & Smith* 21655 (F, US, NY); Matucana, *Macbride & Featherstone* 192 (GH, US), *Rose* 18640 (NY); Matucana, *Stork & Horton* 9133 (GH, UC); Río Blanco, *Vargas s.n.* (USM); *Vargas s.n.* (USM); San Pedro de Huancaura, *Soler* 28 (USM); between Chosica and Matucana, *Tovar* 1749 (USM). **Lima**: Lomas de Asia, *Grant* 7487 (GH, NY, US). **Yauyos**: near Tupe, *Tovar* 466 (USM).

1b. *Mutisia acuminata* var. *bicolor* Cabr., Opera Lilloana 13: 63. 1966. TYPE: Peru, Dept. Arequipa, Río Chulucanas, *N. Angulo* 1794 (holotype, LP, not seen).

DISTRIBUTION—Endemic to the intermontane regions of southwestern Peru (2400–3200 m).

Variety *bicolor* is distinguished by its white-tomentose leaflets, densely ferrugino-tomentose phyllaries, and orange-yellow florets.

APURIMAC. **Aimaraes**: Chalhuanca, *Gentry et al.* 23306 (F p.p.). **AREQUIPA**. **Arequipa**: near Arequipa, *Arenas* 27 (USM), 69 (USM), 167 (USM), *Rauh* 541 (USM), *Simpson* 8567 (USM), *Straw* 2279 (USM); above Yura, *Straw* 2348 (USM). **AYACUCHO**. **La Mar**: Tambo Cusi-cancha, *Madison* 10398-70 (USM). **Lucanas**: near Puquio, *Gentry et al.* 23283 (F, MO). **TACNA**. **Tarata**: near Tarata, *Muller* 3697 (USM), *Rauh* 690 (USM).

1c. *Mutisia acuminata* var. *hirsuta* (Meyen) Cabr., Opera Lilloana 13: 59. 1966.

Mutisia hirsuta Meyen, *Reise um die Erde* 1: 451. 1834. TYPE: Peru, *Meyen s.n.* (holotype, B, presumably destroyed; photograph ex B, FM neg. 15934).

DISTRIBUTION—Common along the Andean Cordillera from north-central Peru to northern Bolivia and adjacent northern Chile (2000–4000 m).

Variety *hirsuta* has glabrous leaves, yellowish-orange florets, and conspicuous yellowish-brown-tomentose phyllaries.

APURIMAC. **Aimaraes**: Chalhuanca, *Gentry et al.* 23306 (F p.p., MO). **Andahuaylas**: near Andahuaylas, *West* 3728 (UC). **AREQUIPA**. **Arequipa**: slopes of Chachani, *Hutchison & Wright* 7222 (F, MO, NY, UC, US, USM); 12 mi NE of Arequipa, *Maguire & Maguire* 44447 (F, NY, USM). **Cailloma**: Valle del Colca, *Treacy* 656 (F); Qayra, *Treacy* 791 (F). **AYACUCHO**. **Lucanas**: San Antonio to Malaya, *Metcalf* 30310 (UC). **CAJAMARCA**. **Contumazá**: Cascas, *López & Sagástegui* 9051 (F, MO); arriba de Trinidad, *Sagástegui et al.* 8955 (F); Guzman-go, *Sagástegui et al.* 9211 (F); La Montaña, *Sagástegui et al.* 9313 (F); Contumazá–Cascabamba, *Sagástegui et al.* 9996 (F, MO). **CUSCO**. **Calca**: Pissac, *Marín* 199 (USM), *Ugent* 3874 (USM). **Canchis**: Sicuani, *Cook & Gilbert* 126 (GH); Sicuani to Marangani, *Dillon et al.* 1055 (F, NY); Marangani-Sicuani, *Rauh & Hirsch* 690 (NY, USM). **Cusco**: Sacsayhuaman, *Ferreyra* 17099 (USM); Huancar, *Muller & Gutte* 9420a (USM); San Sebastián, *Pennell* 13601 (F, GH, NY); San Geronimo, *Solomon* 3002 (MO, USM). **Urubamba**: Tarapata, above Ollataytambo, *Plowman & Davis* 4743 (GH); near Cusco, *West* 8054 (GH, MO, UC). **HUANCAVELICA**: **Huancavelica**: Yauli, *Stork & Horton* 10876 (GH, UC). **JUNIN**. **Jauja**: between Araura and Llocllapampa, *Saunders* 482 (F); km 61 between Jauja and La Oroya, *Smith* 1859 (F, USM). **Tarma**: Tarma, *Constance & Tovar* 2211 (UC); 19 km NE of Tarma, *Dillon & Turner* 1328 (F); 11 km W of Tarma, *Edwin & Schunke* 3884 (F, USM); entre Tarma and Oroya, *Ferreyra* 3781 (USM); Tarma, *Hutchison* 627 (UC); Oroya, *Kalenborn* 153 (GH); near Tarma, *Killip & Smith* 21846 (US);

hills above Tarma, *Landrum 4636* (F, NY), *Macbride & Featherstone 1014* (GH, US); Tarmatambo, *Tovar 1087* (USM). **LA LIBERTAD.** **Santiago de Chuco:** Santiago de Chuco, *Sagástegui et al. 11765* (F). **LIMA.** **Huarochoiri:** 5 km W of Matucana, *Edwin & Schunke 3792* (F, NY); 11 km E of San Mateo, *Edwin & Schunke 3800* (F, NY); between San Mateo and Matucana, *Ferreya 7697* (US, USM); 2 km W of Matucana, *Hutchison 1044* (F, GH, MO, UC); Matucana, *Soukup 2081* (US); Río Blanco, *Vargas s.n.* (USM). **MOQUEGUA.** **Mariscal Nieto:** between Torata and Carumas, *Dillon et al. 3330* (F), *4805* (F).

2. *Mutisia alata* Hieron., Bot. Jahrb. Syst. 19: 73. 1894. TYPE: Ecuador, Prov. Azuay, "inter Huasi-huaico et Contrayerba," 2900–3400 m, *F. C. Lehmann 4571* (holotype, B, presumably destroyed; photograph ex B, FM neg. 15921; isotypes, F 685113, GH, US).

Scandent shrubs, to 5 m high; stems 3-winged, the wings entire glabrous, 3–6 mm wide. Leaves simple, sessile; blades linear-lanceolate, 80–120 mm long, 10–20 mm wide, apically attenuate, tendril elongate, curved, basally amplexicaul, glabrous, the margins entire, revolute. Capitulescences of solitary heads, erect. Capitula radiate; involucre campanulate, 30–40 mm high, 12–20 mm wide; phyllaries 5–6-seriate, the outer ovate, 5–10 mm long, 10–12 mm wide, the apical appendage attenuate, 7–10 mm long, squarrose, the inner ovate-lanceolate, 35–40 mm long, 10–12 mm wide, apically obtuse, purplish, mucronate; ray florets 8–10, the corollas orange, bilabiate, the tube 20–24 mm long, ligulate, the ligule lanceolate, 35–40 mm long, 7–10 mm wide, tridentate, the inner lip bifid; disc florets 30–35, the corollas bilabiate, 35–40 mm long, yellow. Achenes ca. 5 mm long, cylindrical, costate; pappus 20–25 mm long, tawny.

DISTRIBUTION—Known from the intermontane region of northern Peru and southern Ecuador (2000–4000 m).

Mutisia alata most closely resembles *M. andersonii* but is distinguished from that species in possessing leaf blades with glabrous abaxial surfaces and rounded basal auricles.

CAJAMARCA. **Celendín:** between Cajamarca and Celendín, *Gibbs G74-12* (F); entre Celendín-Gelig y Balsas, *Sánchez 478* (F). **Chota:** Huambos, *Ochoa 1594* (US); without locality, *Hutchison Wright 5242* (UC, USM).

3. *Mutisia andersonii* Sodiro ex Hieron., Bot. Jahrb. Syst. 29: 80. 1900. TYPE: Ecuador, Pichincha, Pangor, *Sodiro 63/1* (holotype, B, presumably destroyed, photograph ex B, FM neg. 15923).

Suffrutescent vines, climbing, branched, branches lanuginose, glabrescent, winged, the wings narrow, dentate. Leaves simple, sessile; blades linear-lanceolate, 70–110 mm long, 8–10 mm wide, apically attenuate, tendril simple, curved, basally amplexicaul, the adaxial surfaces reticulate-veined, the abaxial surfaces densely lanuginose, the margins entire, revolute. Capitulescences of solitary, terminal heads; peduncles 10–30 mm long. Capitula radiate; involucre campanulate, 35–45 mm high, 15–28 mm wide; phyllaries 6–7-seriate, reddish, glabrous, the outer ovate 10–12 mm long, ca. 10 mm wide, apically lanceolate, the inner oblong, ca. 30 mm long, 6–7 mm wide, glabrous, apically obtuse, mucronate; florets dimorphic; ray florets 10–15; corolla yellow, rarely orange, bilabiate, ligulate, the tube 20–22 mm long, ligule lanceolate, tridentate, 30–40 mm long, 5–8 mm wide, inner lip bifid; disc florets with corollas bilabiate, the tube 20–22 mm long, outer lip 12–14 mm long, tridentate, the inner lip bifid. Achenes cylindrical, ca. 5 mm long; pappus 25–30 mm long.

DISTRIBUTION—Known from the Andean Cordillera of central Ecuador and disjunct to south-central Peru (2000–4000 m).

HUANCAVELICA. **Tayacaja:** Hacienda Huari, *Velarde 2100* (USM). **LIMA.** **Canta:** "Chipraca," *Acleto 733* (USM); Purumarca, near Canta, *Sánchez 01* (USM).

4. *Mutisia arequipensis* Cabr., Opera Lilloana 13: 171. 1966. TYPE: Peru, Arequipa, Condesuyos, encima de Salamanca, 3900–4000 m, *A. Weberbauer 6857* (holotype, GH; isotypes, US 1473434, USM).

Suffrutescent vines, climbing or procumbent, the branches glabrous, winged, the wings dentate. Leaves simple, sessile; blades linear-lanceolate, 30–50 mm long, 3–4 mm wide, inconspicuously hastate, apically attenuate, terminal tendril simple, basally sagittate, the margins entire or with scattered denticulations. Capitulescences of solitary, terminal heads; peduncles 5–10 mm long. Capitula radiate; involucre campanulate, 20–30 mm long, 8–10 mm wide; phyllaries 4–5-seriate, apically lanuginose, the outer ovate, 2–4 mm long, ca. 5 mm wide, the apical appendage coiled, 3–4 mm long, the inner oblong-ovate, 15–20 mm long, 7–8 mm wide, apically obtuse; florets dimorphic; ray florets 9–10, the corollas red, the ligules lanceolate, tridentate, 15–17 mm long, 3–3.5 mm wide, inner lip bisect; disc florets 15–20, the co-

rollas bilabiate, the tube 20–22 mm long, the outer lip tridentate, the interior bifid. **Achenes** cylindrical, ca. 3 mm long, glabrous; pappus ca. 18 mm long.

DISTRIBUTION—Endemic to the puna of central Peru (3400–4000 m).

Mutisia arequipensis closely resembles *M. andersonii* and *M. hastata* but differs in possessing a glabrous habit, narrower leaves, and reddish florets. It is also close to *M. mathewsii* but distinguished from that species by its dentate stem wings and leaves with plane margins.

AREQUIPA. Cailloma: Valle del Colca, ca. 100 km N de Arequipa, Treacy 829 (F), 840 (F).

5. *Mutisia cochabambensis* Hieron., Bot. Jahrb. Syst. 19: 74. 1894. **TYPE:** Bolivia, Cochabamba, N. H. Bang 881 (holotype, B, presumably destroyed; isotypes, GH, MO, NY, US).

Suffrutescent **herbs**, climbing, branched, the branches narrowly winged or unwinged, densely leafy, glabrous. **Leaves** simple, subsessile; petioles 1–2 mm long; blades linear to lanceolate, 60–100 mm long, 5–15 mm wide, the adaxial surfaces glabrous or tomentose, apically attenuate with curved, solitary tendril, bases sagittate, the lobes acute, the margins entire. **Capitulescences** of solitary, terminal heads; peduncles 15–25 mm long. **Capitula** radiate; involucre campanulate, 25–35 mm high, 10–15 mm wide; phyllaries 16–20, 3–4-seriate, reddish, the outer narrowly ovate, 5–10 mm long, 7–8 mm wide, apical appendage apiculate, the inner oblong, 25–30 mm long, 8–10 mm wide, apically obtuse, lanuginose; florets dimorphic; ray florets 9–10, orange, the ligule lanceolate, tridentate, ca. 25 mm long, 4–6 mm wide, inner lip bisect; disc florets bilabiate, the tube 20–24 mm long, the outer lip tridentate, the inner lip bisect. **Achenes** cylindrical, 4–5 mm long, striate; pappus ca. 25 mm long, white.

DISTRIBUTION—Known from the Andean Cordillera of southeastern Peru to central Bolivia (3200–3700 m).

Mutisia cochabambensis most closely resembles *M. mandoniana* Wedd. ex Schultz-Bip. but differs in possessing shortly petiolate, strictly glabrous leaves and much smaller heads.

APURIMAC. Aimaraes: Lucre, Abra Ratcay, Vargas 1616 (GH). **CUSCO.** Calca: Totorá, Marín 2130 (USM). **Espinari:** Yauri, Virginniyoc, Núñez et al. 7891 (F). **Paruro:** Pucaccasa, Vargas 1195 (MO, UC). **Quispicanchis:**

Hacienda Ccapana, Herrera 1128 (US), 1051 (GH); Oropesa, Balls 6833 (UC, US). **Urubamba:** Gutierrezchayoj, King et al. 288 (F); trail up Antakillqu hillside, Davis et al. 1688 (F). **TACNA.** Tacna: NE of Tarata, Pearson & Pearson 1155 (UC).

6. *Mutisia hastata* Cav., Icon. Pl. 5: 64. 1799. **TYPE:** No exact locality, “ex Cordillera del Planchón,” L. Née s.n. (holotype, MA, not seen, isotype ex MA, F 845291).

Suffruticose **vines**, procumbent; stems 4-winged, conspicuously dentate, the teeth triangular, acute, retrorse, 3–5 mm long, lanuginose to glabrescent. **Leaves** simple, sessile; blades linear-lanceolate, 50–100 mm long, 5–10 mm wide, apically attenuate with curved solitary tendril, the bases sagittate with acute lobes, the adaxial surfaces glabrous, the abaxial surfaces densely tomentose, the margins entire to distally dentate, revolute. **Capitulescences** of solitary, terminal heads; peduncles 10–40 mm long. **Capitula** radiate; involucre campanulate, 35–40 mm high, 15–20 mm wide; phyllaries 8–10-seriate, reddish, the outer ovate, ca. 10 mm long, ca. 5 mm wide, apically lanceolate or linear, recurved, lanuginose, mucronate, the inner ovate-oblong, 25–30 mm long, 10–12 mm wide obtuse, mucronate, apices lanuginose; florets dimorphic; ray florets ca. 10, the corollas orange to red, the tube ca. 12 mm long, the ligule lanceolate, 25–35 mm long, 4–5 mm wide, apically tridentate, the inner lobe bisect; disc florets with corollas yellow, bilabiate, the tube ca. 20 mm long, the lobes ca. 10 mm long, outer lobe tridentate, the inner lobe bifid. **Achenes** cylindrical, glabrous; pappus 22–25 mm long, grayish.

DISTRIBUTION—Endemic to the Andean Cordillera of central Peru (3400–3600 m).

Mutisia hastata most closely resembles *M. andersonii* but differs in possessing outer phyllaries with strongly recurved and lanose apices. The type locality was cited as from Chile, “Cordillera del Planchón”; however, it is likely an error in labeling and actually collected by Née in Peru. The type material at F was sent from MA and has a separate label indicating the origin of the material as “Cavanilles.”

ANCASH. Bolognesi: entre Tallenga y Pachapaque, Ferreyra & Cerrate 7475 (US, USM). **Recuay:** Marca, Gómez 163 (USM). **HUANCAVELICA.** Tayacaja: Trancapampa, entre Huari y Acobamba, Tovar 4550 (USM). **HUANUCO.** Huánuco: Mito, Macbride & Featherstone 1857 (US). **LIMA.** Canta: Obrajillo, Capt. Wilkes Exped.

s.n. (GH, US). **Huarochari:** 10 km NE of Suchi, *Gentry 21639* (F).

7. *Mutisia lanata* Ruiz Lopez & Pavón, *Syst. veg. fl. peruv. chil.* 1: 192. 1798. TYPE: Peru, Huánuco, "Habitat in Peruviae nemoribus prope Muña vicum in Pozuzo via," *Ruiz Lopez & Pavón s.n.* (holotype, MA, not seen; isotype, BM, not seen).

Suffruticose **herbs**, scandent, to 10 m high, the stems narrowly winged, tomentose. **Leaves** sessile, pinnate; rachis 8–20 cm long, apex with trifid tendril, the leaflets 4–5 pairs, ovate to lanceolate, 45–100 mm long, 17–35 mm wide, alternate or subopposite, apically acute to obtuse, basally rounded, the adaxial surfaces albo-arachnoid to glabrescent, the abaxial surfaces ferrugino-tomentose, the margins entire. **Capitulescences** of solitary heads, more or less nutant, the peduncles 6–20 cm long, tomentose. **Capitula** radiate: involucre campanulate, 35–40 mm high, 30–50 mm wide; phyllaries 6–7-seriate, the outer ovate, the apical appendage linear-lanceolate densely ferrugino-tomentose, strongly recurved, the inner oblong, the apical appendage attenuate, densely ferrugino-tomentose; florets dimorphic; ray florets 20–25, the ligules lanceolate, red, tridentate, ca. 40 mm long, ca. 10 mm wide; disc florets 90–100, the corollas yellow, bilabiate, 12–15 mm long, the outer lip tridentate, the inner lip bifid. **Achenes** cylindric, glabrous; pappus 25–30 mm long.

DISTRIBUTION—Known from the intermontane region from central Peru to Bolivia (1800–3400 m).

Mutisia lanata is easily distinguished by its conspicuous tomentose habit, red ray florets and yellow disc florets. While no authentic type material has been seen in this study, Cabrera (1960) consulted the type of this species in both Madrid (MA) and London (BM), and comparison with material annotated by him allows for the application of the name.

CUSCO. Calca: San Miguel, *Cook & Gilbert 1145* (US); San Miguel Valley, *Herrera 2020* (GH); Monte Lares, *Marín 2139* (USM); Lares, *Vargas 3593* (MO). **Paucartambo:** near Paucartambo, *Balls 6713* (UC, US); 9–12 km NE of Paucartambo, *Gentry et al. 23419* (F); Acanaco, *Molau 774* (USM), *Plowman & Davis 4923* (GH, USM); Tres Cruces, *Pennell 14142* (GH, NY, US); Sunchubamba, *Vargas 2267* (NY); Hacienda Paccho, *Vargas 9469* (MO); Pilla-huata, *Velarde 1165* (USM), *Woytkowski 21* (USM); Tambomayo River, *West 7096* (UC); Pavayoc, *Woytkowski 623* (USM). **Quispicanchis:** Ocongate to Marcapata, *Aron-*

son & Berry 523 (F); near Marcapata, *Metcalfe 30728* (GH, MO, UC, US); entre Abra Walla Walla y Marcapata, *Núñez et al. 9102* (F); above Marcapata, *Wasshausen & Encarnación 822* (US); Marcapata, *Weberbauer 7880* (GH, NY, US). **Urubamba:** Torontoy–Ollantaytambo, *Cook & Gilbert 834* (US); near Urubamba, *Herrera 2020* (GH, USM). **HUANCAVELICA. Tayacaja:** Huari–Acobamba, *Tovar 4563* (USM). **HUANUCO. Huánuco:** Huacachi, near Muña, *Macbride 4060* (GH, US). **Pachitea:** Pano, *Macbride & Featherstone 2223* (GH, US). **JUNIN. Huancaayo:** "Ceja de Montaña," *Esposito s.n.* (USM). **Tarma:** between Pinto and Andamarca, *Raimondi s.n.* (USM). **PASCO. Oxapampa:** Los Chacos, near Oxapampa, *Smith & Pretel 1495* (F). **PUNO. Carabaya:** Ollachea to San Gaban, *Boeke 3048* (US); Ollachea, *Soukup 457* (GH, USM).

8. *Mutisia lanigera* Wedd., *Chlor. And.* 1: 16. 1855. TYPE: Bolivia, Carangas, *d'Orbigny 1341* (holotype, P, not seen; photograph ex P, FM neg. 38028).

Suffrutescent, scandent to vining **herbs**, prostrate, branched, the branches glabrous, winged, the wing conspicuously dentate. **Leaves** simple, sessile; blades lanceolate, 35–60 mm long, 5–12 mm wide, the margins of basal portion dentate, with 6–8 pairs of teeth, glabrous, apically rounded, tendril simple. **Capitulescences** of solitary, terminal heads; peduncles 5–15 mm long, lanuginose. **Capitula** radiate; involucre campanulate, 25–40 mm high, 10–15 mm wide; phyllaries 5–7-seriate, the outer ovate, 3–6 mm long, 5–6 mm wide, apically recurved, lanuginose, the inner lanceolate to oblong, 25–28 mm long, 7–8 mm wide, lanuginose; florets dimorphic; ray florets 9–10, the corollas orange, pistillate, the corollas ligulate, the ligule elliptic, tridentate, 12–15 mm long, 4–5 mm wide, the inner lip bisect; disc florets bilabiate, the outer lip tridentate, the inner lip bifid. **Achenes** cylindric, glabrous; pappus ca. 20 mm long.

DISTRIBUTION—Endemic to the altiplano of southern Peru, northern Bolivia, and adjacent Chile (3700–4100 m).

Mutisia lanigera is readily recognized by its prostrate habit, winged branches, and dentate leaves.

AREQUIPA. Arequipa: Above Chihuata, *Straw 2316* (US, USM); between Sumbay and Cañahuas, *Weberbauer 1388* (USM). **Condesuyos:** near Chichas, *Weibel 07* (USM). **PUNO. Puno:** Santa Rosa, near Ilave, *Pearson & Pearson 22* (US).

9. *Mutisia ledifolia* Dec. ex Wedd., *Chlor. And.* 1: 20. 1855. LECTOTYPE (designated by Cabrera, 1965): Bolivia, "cumbre de la cuesta

de Lagunillas departamento Potosí," *d'Orbigny* 1272 (lectotype, P, not seen).

Shrubs 5–20 dm high, branched, the branches glabrous, costate, the branchlets brown, laxly white-tomentose. **Leaves** simple, sessile; blades linear-oblong, 14–40 mm long, 2–5 mm wide, apically acute, mucronate-spinulose, basally attenuate, the adaxial surfaces glabrous, the abaxial surfaces densely white-tomentose, the margins entire, revolute. **Capitulescences** of solitary, sessile, terminal heads. **Capitula** radiate; involucre campanulate, 15–20 mm high, 5–7 mm wide; phyllaries 5-seriate, oblong, 10–14 mm long, 2–3 mm wide, glabrous, apically slightly lanuginose, obtuse, rarely acute, mucronate; florets dimorphic; ray florets ca. 6, ligulate, the ligules white, the abaxial surfaces reddish, 10–25 mm long, 2–3 mm wide, tridentate, the tube 10–12 mm long, the inner lip bisect; disc florets 10–15, yellow, the tube 9–11 mm long, bilabiate. **Achenes** cylindrical, 9–10 mm long; pappus 10–12 mm long, white to violaceous.

DISTRIBUTION—Known from the altiplano of southern Peru, central Bolivia, and northern Argentina (3000–4200 m).

PUNO. Puno: vicinity of Lake Titicaca, *Monheim* 159 (NY).

10. *Mutisia mathewsii* Hook. & Arn., Companion Bot. Mag. 1: 107. 1835. **TYPE:** Peru, Ayacucho, Vilcanota, *Mathews* 1119 (holotype, BM, not seen; isotypes, GH, P; photograph ex GH, USM).

Mutisia weberbaueri Muschl., Bot. Jahrb. Syst. 50, Beibl. 111: 104. 1913. **TYPE:** Peru, Ayacucho, Huamanga, Totorabamba, 3600–3700 m, *A. Weberbauer* 5490 (holotype, B, presumably destroyed; isotype F).

Mutisia mathewsii var. *anomala* Cabr., Opera Lilloana 13: 117. **TYPE:** Peru, Ayacucho, Lucanas, between Nasca and Puquio, *Hutchison* 1244 (holotype, UC; isotypes, F 1569717, US, USM).

Suffrutescent **vines**, scandent, branched, the branches striate, glabrous. **Leaves** simple, sessile; blades linear, 30–90 mm long, 1.5–4 mm wide, the adaxial surfaces glabrous, the abaxial surfaces lanuginose, acuminate with terminal, simple tendril, basally sagittate, the margins entire, revolute. **Capitulescences** of solitary, terminal heads, the peduncle 6–20 mm long, glabrous. **Capitula** radiate; involucre campanulate, 25–35 mm high, 8–10

mm wide; phyllaries 5–6-seriate, glabrous, apically lanuginose, the outer ovate, apical appendage attenuate, more or less recurved, albo-tomentose, the inner oblong, 28–30 mm long, 5–6 mm wide, apically obtuse, mucronate; florets dimorphic; ray florets 9–10, orange, the tube 16 mm long, the ligule lanceolate, 20–25 mm long, 3–5 mm wide, inner lip absent; disc florets 20–25, bilabiate, the tube 15–20 mm long, the outer lip tridentate, the inner lip bifid. **Achenes** cylindrical or fusiform, costate, glabrous; pappus ca. 25 mm long.

DISTRIBUTION—Known from the puna formations from central to southern Peru (3500–4300 m).

Mutisia mathewsii is easily recognized by its linear leaf blades and arachnoid-tomentose phyllaries. Cabrera (1966) established the variety *anomala* for Peruvian material with the characters of retrorsely divided stem wings and leaf blades with distal 1–2-denticulations; however, capitular characteristics are uniform within the species.

ANCASH. Huaras: Parque Huascarán, Quebrada Shallap, *Smith et al.* 10770 (F). **Recuay:** near Tunel Cauhuish, between Recuay and Chavin, *Ferreya* 14527 (USM). **Yungay:** Huascarán National Park, Quebrada Demanda, *Smith & Cautivo* 10303 (F). **AYACUCHO.** No exact locality: *Palomino s.n.* (USM). **LIMA.** Yauyos: Huacrachocha, *Cerrate* 1270 (USM). **JUNIN.** Yauli: *Macbride & Featherstone* 907 (US). **LIMA.** Huarochiri: above Surco, *Ferreya* 6338a (USM).

11. *Mutisia orbignyana* Wedd., Chlor. And. 1: 22. 1855. **LECTOTYPE** (designated by Cabrera, 1965): Bolivia, Potosí, St. Bartolo, *d'Orbigny* 1387 (lectotype, P, not seen; isotype fragment ex P, F 972437; isotype fragment ex G, F 1023190; photograph ex G, FM neg. 28876).

Shrubs erect, 1–2 m high, branched, branches glabrous. **Leaves** simple, sessile; blades linear-lanceolate, 35–70 mm long, 4–8 mm wide, acute, attenuate at base, glabrous, the margins entire. **Capitulescences** of solitary, terminal heads, subsessile. **Capitula** discoid; involucre turbinate, 25–30 mm high, 7–10 mm wide; phyllaries 4–5-seriate, reddish, glabrous, the outer ovate, 5–10 mm long, apically linear, the inner oblong-lanceolate, 30–35 mm long, 3.5–4.5 mm wide, mucronate; florets 5–8, isomorphic, orange, the corolla bilabiate, the tube 10–12 mm long, the outer lip 4-dentate, apically lanuginose, the inner lip linear. **Achenes** cylindrical, costate, glabrous, 4–5 mm long; pappus 17–18 mm long.

DISTRIBUTION—Known from southern Peru to Bolivia and northern Argentina (3400–4000 m).

AREQUIPA. *Cailloma*: Chivay, *López Guillen 305* (US); Valle del Colca, *Treacy 841* (F). **Condesuyos**: above Chuquibamba, *Weberbauer 6847* (F, GH, US, USM).

12. *Mutisia pulcherrima* Muschl., Bot. Jahrb. Syst. 50, Biebl. 111: 102. 1913. TYPE: Peru, Chachapoyas, inter Tambos Bajazan et Almirante, *A. Weberbauer 4444* (holotype, B, presumably destroyed; photograph ex B, FM neg. 15945).

M. macrantha Muschl., Bot. Jahrb. Syst. 50, Biebl. 111: 103. 1913. TYPE: Peru, Amazonas, Chachapoyas, Molinopampa, 2400 m, *A. Weberbauer 4383* (holotype, B, presumably destroyed; photograph ex B, FM neg. 15941).

Vines, to 8 m high, branched, branches hanging, glabrous. **Leaves** pinnate, sessile; rachis 12–22 cm long, apex with trifid tendril, leaflets 3–5 pairs, alternate to subopposite, elliptic-lanceolate, 50–80 mm long, 20–27 mm wide, petiolules 1–2 mm long, apically acute, mucronate, basally attenuate to rounded, glabrous. **Capitulescences** of solitary, terminal heads, pendulous, the peduncles 16–30 cm long. **Capitula** radiate; involucre cylindrical, 60–70 mm high, 25–30 mm wide; phyllaries 5–6-seriate, the outer ovate, 10–20 mm long, ca. 5 mm wide, the inner oblong, 55–60 mm long, 10–12 mm wide, apically rounded, mucronate; florets dimorphic; ray florets 14–15, pistillate, the corollas orange, ligulate, the ligules lanceolate, 50–60 mm long, 12–15 mm wide; disc florets bilabiate, the tube 12–15 mm long, the outer lip tridentate, the inner lip bifid; anthers 25–30 mm long. **Achenes** cylindrical, glabrous; pappus 20–25 mm long.

DISTRIBUTION—Native to the intermontane region of northern Peru (2300–2800 m).

Mutisia pulcherrima is distinguished by its elongate pendent branches and large capitula with conspicuous orange florets.

AMAZONAS. Chachapoyas: Leimebamba, *Ferreya & Acleto 15276* (MO, USM); Calla-Calla, *Hutchison & Wright 5613* (NY, UC, USM); "Peruvia," *Mathews 18* (GH); between Jumbilla and Pomacocha, *Tillet 673* (US); Calla-Calla, *Wurdack 1162* (US, USM). **CAJAMARCA. Hualgayoc**: Taulis, *Hutchison & Wright 6504* (UC, USM).

13. *Mutisia rauhii* Ferreyra, Bol. Soc. Peruana Bot. Nos. 1–2, 8: 75. 1980. TYPE: Peru, Cusco,

Anta, E of Cordillera Salcantay, 3600 m, *W. Rauh 1451* (holotype, USM 29417).

Scandent, **shrubs**, 2–3 m high, branched, branches ascendent, 3–4 mm in diameter, striate, glabrous. **Leaves** simple, sessile; blades linear, 80–160 mm long, 3–6 mm wide, the adaxial surfaces glabrous, the abaxial surfaces lanuginose, apically with simple tendril, basally amplexicaul, the margins entire, revolute. **Capitulescences** of solitary, terminal heads, the peduncles 45–70 mm long, glabrous, bracteate, the bracts 30–45 mm long, 5–6 mm wide, basally sagittate, glabrous. **Capitula** radiate; involucre campanulate, 40–45 mm high, 25–30 mm wide; phyllaries 6–7-seriate, the outer ovate, 7–16 mm long, subulate, rigid, the inner elliptic, 40–45 mm long, 14–16 mm wide, obtuse, mucronate, glabrous, the margins more or less transparent; ray florets 12–13, the corollas 75–80 mm long, the tube 28–30 mm long, glabrous, the outer lip 5.2–5.5 mm long, 6–11 mm wide, 6-nerved, glabrous, acute, the inner lip bifid, 2.5–3 mm long, glabrous; styles 48–50 mm long; disc florets 38–40, the corollas 48–52 mm long, the tube 35–37 mm long, 3–4 mm wide, the limb 5-lobed, the outer lip ca. 14 mm long, the inner lip subequal, ca. 8 mm long; anthers 2.2–2.4 mm long; style 5.2–5.5 mm long. **Achenes** cylindrical, 3–4 mm long, glabrous; pappus 25–30 mm long, yellowish.

DISTRIBUTION—Known only from the type locality.

Mutisia rauhii most closely resembles *M. cochabambensis*, from which it differs in having larger leaves and capitula, phyllaries 6–7-seriate and ligules to 55 mm long.

14. *Mutisia venusta* S. F. Blake, Proc. Biol. Soc. Wash. 46: 191. 1933. TYPE: Peru, Cusco, Urubamba, Piñasniocj, Panticalla Pass, *O. F. Cook & G. B. Gilbert 1235* (holotype, US 604430; isotype, GH). **Figure 13.**

Scandent, vining **shrubs**, branched, branches more or less lanuginose. **Leaves** sessile, pinnate; rachis 6–15 cm long, trifid at apex, the leaflets oblong in 6–10 pairs, opposite to subopposite, sessile, glabrous, 20–45 mm long, 8–15 mm wide. **Capitulescences** of solitary, terminal heads, the peduncles 5–18 cm long, glabrescent. **Capitula** radiate; involucre cylindrical, 60–90 mm high, 15–20 mm wide; phyllaries 7–8-seriate, glabrous, the

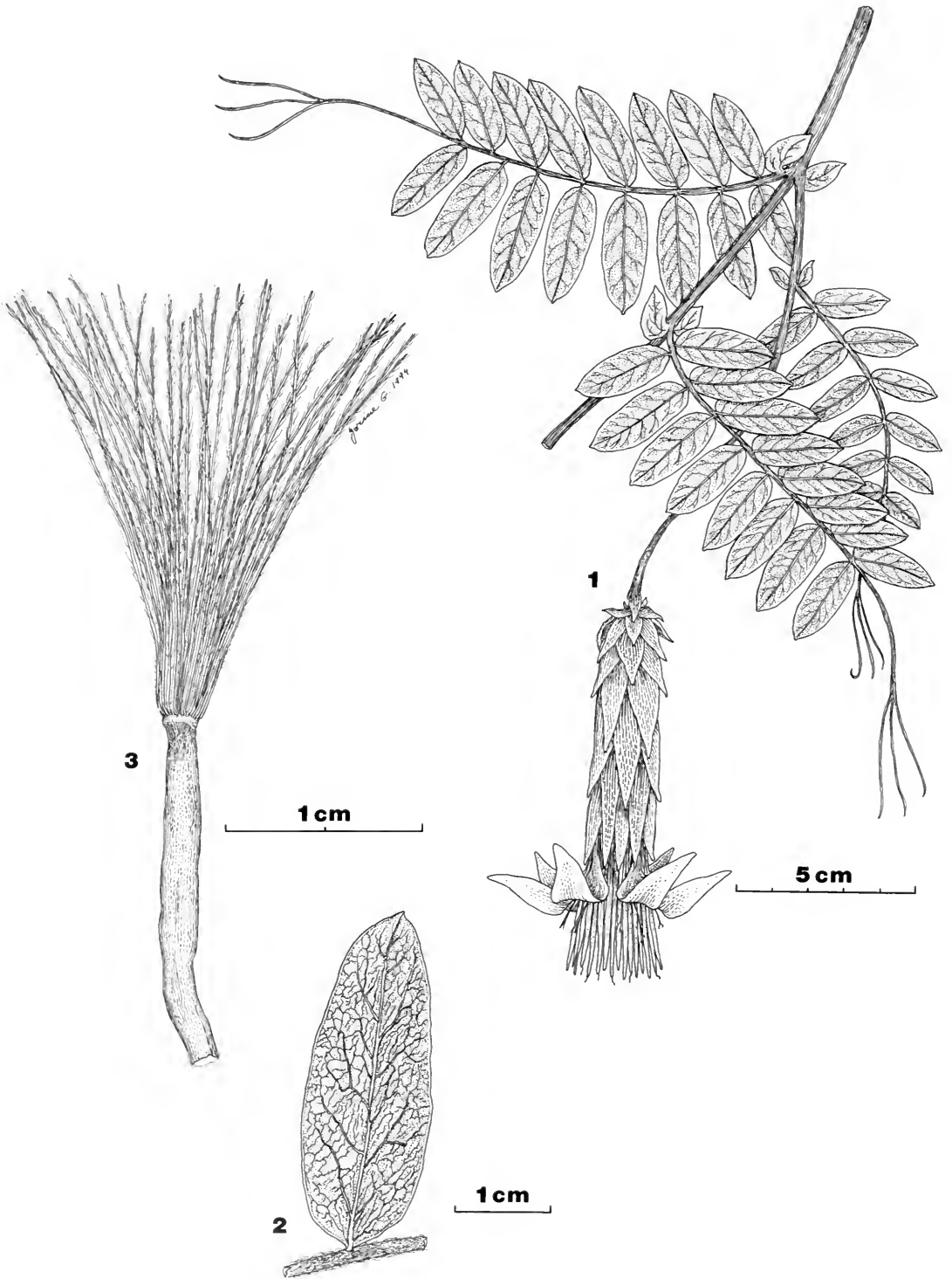


FIG. 13. *Mutisia venusta*. 1, habit; 2, detail of leaflet; 3, achene with pappus. (Drawn from O.F. Cook & G.B. Gilbert 1235, us.)

inner oblong-lanceolate, acute, 65–80 mm long, 5–6 mm wide; florets dimorphic; ray florets 7–8, the tube 6–7 mm long ligulate, ligules lanceolate, tridentate, 30–40 mm long, 8–10 mm wide; disc florets 18–20, the corollas bilabiate, the tube 10–12 mm long, the outer lip tridentate, the inner lip bipartite. **Achenes** cylindric, glabrous; pappus ca. 24 mm long.

DISTRIBUTION—Known from the Andean Cordillera of southern Peru (3400–4000 m).

Mutisia venusta most closely resembles *M. acuminata*, from which it differs in having longer involucre, lanuginose leaf rachis with 8–9 pairs of obtuse leaflets, and gradually attenuate phyllaries.

APURIMAC. **Abancay:** Ampai, without collector, 2416 (USM). **CUSCO.** **Calca:** Lares, *Marín 2141* (USM). **Urubamba:** Piñasniocj, Panticalla Pass, *Cook & Gilbert 1879* (US); Peñas, *Marín 1634* (USM), *Vargas 4420* (MO); Machupicchu, *Núñez & Arque 8342* (F).

15. *Mutisia wurdackii* Cabr., *Opera Lilloana* 13: 43. 1966. TYPE: Peru, Amazonas, Bongará, Pomacocha, *J. J. Wurdack 840* (holotype, LP; isotype, US 2373593).

Vines, to 9 m high, branched, branch striate, hirsute, glabrescent. **Leaves** sessile, pinnate; rachis 12–22.5 cm long, apex with trifid tendril, twisted, the leaflets ovate-lanceolate in 6–8 pairs, 5–6 cm long, 2–4 cm wide, acute, the adaxial surfaces glabrous, the abaxial surfaces lanuginose. **Capitulescences** of solitary, terminal heads, the peduncles 8–15 cm long, lanuginose at apex. **Capitula** radiate; involucre cylindric, 35–45 mm high, 20–25 mm wide; phyllaries 6–7-seriate, the outer ovate-deltoid, 6–12 mm long, 6–7 mm wide, apically attenuate, densely tomentose; the inner oblong, 30–35 mm long, 8–12 mm wide, apically rounded or truncate, densely tomentose; florets dimorphic; ray florets 8–12, the corollas red, ligulate, the tube 25–35 mm long, the ligules lanceolate, tridentate, 25–30 mm long, 4–5 mm wide, the inner lip bifid; disc florets 40–60 mm long, yellow, bilabiate, the tube 2.8–3.4 mm long, the outer lip tridentate, the inner lip bifid. **Achenes** cylindric, 15–25 mm long, 1.5–2 mm wide, glabrous; pappus ca. 40 mm long. Chromosome number: $n = ca. 25$.

DISTRIBUTION—Native to the intermontane region of northern Peru (1700–2400 m).

Mutisia wurdackii most closely resembles *M. microcephala* Sodiro of Ecuador, but it differs in

having six to eight pairs of leaflets, red corollas, and a pappus to 40 mm long.

AMAZONAS. **Bongará:** between Pomacocha and Jumbilla, *Ferreya 20611* (USM); Pomacocha to Jazan, *Ferreya & Acleto 15200* (MO, USM), *15255* (USM); between Utcubamba and Pomacocha, *Hutchison & Wright 3881* (F, MO, NY, UC, US, USM); without locality, *Hutchison 4886* (USM). **Chachapoyas:** Leimebamba, *Boeke 1784* (MO, NY); 16 km SW of Pomacocha, *Gentry et al. 61354* (F); Cerros Calla Calla, *Hutchison & Wright 5613* (F); entre Calla-Calla y Leimebamba, *Sánchez 971* (F).

XV. ONOSERIS

Onoseris Willd., Sp. Pl. 3: 1702. 1804. TYPE: *Atractylis purpurea* L. fil. = *Onoseris purpurea* (L. fil.) S. F. Blake²

Cursonia Nutt., Trans. Amer. Philos. Soc. 7: 422. 1841. TYPE: *Cursonia peruviana* Nutt. = *Onoseris odorata* (D. Don) Hook. & Arn.

Shrubs, lianas, or perennial or annual **herbs**; stems lacking spines. **Leaves** alternate or entirely basal; sessile or petiolate; blades linear to cordiform, usually lanceolate in outline, hastate, sagittate, or lyrate, usually discolored, the adaxial surfaces glabrescent, the abaxial surfaces arachnoid to lanate, the margins crenate to denticulate. **Capitulescences** of solitary, terminal heads or paniculate in groups of 2–8(–300). **Capitula** usually heterogamous, radiate, or occasionally homogamous, discoid; involucre campanulate, turbinate, hemispheric; receptacles plane to convex, fimbriate, pubescent to glabrous; phyllaries 4–12-seriate, imbricate; florets isomorphic or heteromorphic; ray florets pistillate, the corollas bilabiate, violet or purple, the outer lip ligulate, 6-nerved, 3-dentate, the inner lip bifid or entire; disc florets hermaphroditic, tubular, yellow, the limb cylindric, 5-lobed, the lobes equal or unequal, less than $\frac{1}{3}$ the length of the corolla, erect to recurved. **Achenes** cylindric to subterete, (4–)5(–6)-costate, glabrous to pubescent; pappus of barbellate bristles, 2–many-seriate, isomorphic or rarely with inner bristles longer, yellowish.

Onoseris contains approximately 30 species distributed from Mexico and Central America south throughout the Andean Cordillera from Colombia and Venezuela to northern Argentina. In Peru, no fewer than 18 species are currently recognized.

² For additional synonymy, consult Ferreyra (1944).

References

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Key to Peruvian Species of *Onoseris*

- 1. Leaf blades orbicular or cordiform, palmate-veined from base 2
- 2. Involucres hemispherical, ca. 30 mm high, ca. 30 mm wide; phyllaries densely ferrugino-glandulose, the inner ca. 25 mm long, strongly flexuose *O. acerifolia*
- 2. Involucres campanulate, ca. 20 mm high, ca. 15 mm wide; phyllaries densely albo-lanuginose, sparsely glandulose, the inner ca. 15 mm long, erect *O. cabreriae*
- 1. Leaf blades linear, lanceolate, or oblanceolate to spatulate or lyrate, pinnate-veined 3
- 3. Plants annual herbs 4
- 4. Leaf bases auriculate, amplexicaul *O. amplexicaulis*
- 4. Leaf bases acute to attenuate or cuneate 5
- 5. Plants to 50 cm tall; leaf blades typically ≥ 5 cm long, ≥ 2 cm wide; inner phyllaries filiform, long-attenuate, strongly reflexed or twisted *O. odorata*
- 5. Plants to 20 cm tall; leaf blades typically < 5 cm long, < 2 cm wide; inner phyllaries acuminate, erect 6
- 6. Involucres narrowly campanulate, 4–6 mm wide; ray florets 7–9; disc florets 8–10 *O. minima*
- 6. Involucres campanulate, (5–)6–9 mm wide; ray florets 8–13; disc florets 20 or more 7
- 7. Stems erect; leaf blades entire to subentire; involucres ca. 12 mm high; inner phyllaries 0.7–0.8 mm wide *O. cumingii*
- 7. Stems prostrate to ascending; leaf blades dentate; involucres ca. 8 mm high; inner phyllaries 1.5–2 mm wide *O. annua*
- 3. Plants perennial herbs 8
- 8. Leaf blades linear to linear-lanceolate or narrowly spatulate, typically 1.5–10 mm wide ... 9
- 9. Phyllaries 9–11-seriate, the inner linear, ca. 1 mm wide, apically long-attenuate; ray florets 20–24 *O. lopezii*
- 9. Phyllaries 4–7-seriate, the inner lanceolate to oblong, 1.5–2.5 mm wide, apically acute to acuminate; ray florets 5–15 10
- 10. Leaf blades linear, the margins strictly entire; phyllaries 4–5-seriate, the inner oblong, ca. 2.5 mm wide, apically rounded to obtuse; ray florets 9–11 *O. linearifolia*
- 10. Leaf blades narrowly lanceolate to elliptic, the margins remotely denticulate to sinuose-dentate; phyllaries 6–7-seriate, the inner lanceolate, 1.2–1.5 mm wide, apically acute to acuminate; ray florets 5–8 or 15 11
- 11. Phyllaries nigrescent, ferrugino-tomentose; ray florets ca. 15 . *O. chrysactinioides*
- 11. Phyllaries yellowish-green, albo-tomentose; ray florets 5–8 ... *O. gnaphalioides*
- 8. Leaf blades lanceolate, oblanceolate, spatulate, or lyrate, typically 10–30(–120) mm wide 12
- 12. Plants caulescent; leaves cauline, the blades narrowly lanceolate or hastate 13
- 13. Leaf blades hastate to sagittate; phyllaries 10–12-seriate, the inner long-attenuate, yellowish-green *O. castelnaeana*
- 13. Leaf blades lanceolate; phyllaries 5–6-seriate, the inner acuminate, nigrescent, stramineous-tomentose *O. albicans*
- 12. Plants acaulescent; leaves forming a basal rosette, the blades lanceolate, oblanceolate, spatulate, or lyrate 14

14. Capitulescences paniculate with 7–10 heads; peduncles 40–60 cm long; leaves (including petioles) 30–40 cm long, the distal portion hastate, apically attenuate *O. peruviana*
14. Capitulescences of solitary heads or rarely of 2–3 heads on a single peduncle; peduncles 10–40 cm long; leaves (including petioles) 5–30 cm long, the distal portion sagittate to cordate or rhomboid to spathulate, apically subacute to obtuse or rounded . . . 15
15. Plants procumbent; leaves with distal portion rhomboid to spathulate; capitulescences procumbent or laxly ascending (southern Peru, coastal habitats below 500 m) *O. humboldtiana*
15. Plants erect; leaves with distal portion sagittate to cordate; capitulescences erect (northern Peru, montane habits above 1000 m) 16
16. Leaves lanceolate; sessile; outer phyllaries ovate, erect, the inner lanceolate, ca. 1.5 mm wide, apically acuminate, erect; achenes densely pilose *O. weberbaueri*
16. Leaves oblanceolate or lyrate; petiolate; outer phyllaries apiculate, strongly recurved, the inner long-attenuate, ca. 1 mm wide, apically twisted; achenes sparsely puberulent to glabrous 17
17. Leaf blades lyrate; petioles 4–15 cm long, winged and lobed; achenes glabrous *O. speciosa*
17. Leaf blades oblanceolate; petioles 3–4 cm long, winged; achenes sparsely puberulent *O. macbridei*

1. *Onoseris acerifolia* Kunth, Nov. Gen. Sp. 4: 8. 1820. TYPE: Peru, “in prov. Bracamorensis in deveysis Parami de Yamoca inter pagos Colazey et Chontali,” *Humboldt & Bonpland s.n.* (holotype, P, not seen; photograph ex P, FM neg. 38101).

Suffruticose, perennial **herbs**, 50–80 cm high, erect, stems terete, densely glandular-pubescent. **Leaves** alternate; petioles to 75 mm long, glandular-pubescent; blades orbicular-cordiform, 10–90 mm long, 11–120 mm wide, the adaxial surfaces arachnoid and glandular-pubescent, the abaxial surfaces white-lanuginose and glandular-pubescent, the margins lobed. **Capitulescences** of terminal, solitary heads; peduncles 2–8 cm long, glandular, bracteate, the bracts 5–10 mm long, 1.5–2 mm wide, glandular. **Capitula** radiate; involucre 7–25 mm high, 5–20 mm wide, hemispheric; phyllaries 6–7-seriate, the inner 22–29 mm long, 1.5–3 mm wide, attenuate at apex, the abaxial surfaces arachnoid and glandular; ray florets 13–21, the corolla 33–44 mm long, the tube 6–9 mm long, glandular, the outer lip 27–35 mm long, violaceous, the abaxial surfaces arachnoid, glandular, tridentate, the inner lip 5–17 mm long, attenuate, twisted; disc florets with corollas 14–16.5 mm long, the tube 12.5–14 mm long, 5-lobed, the lobes acute, slightly coiled; anthers 5.6–7 mm long. **Achenes** [ray] 2.4–4.5 mm long, 1 mm wide, pubescent; pappus ca. 12 mm long, yellow; [disc] 2.5–5 mm

long, 1–1.5 mm wide, pubescent; pappus ca. 13 mm long, isomorphic, yellow.

DISTRIBUTION—Endemic to the intermontane region of northern Peru (380–1800 m).

Onoseris acerifolia is characterized by its arachnoid-tomentose pubescence mixed with glandular trichomes, orbicular-cordate leaves, large capitula, and elongate, attenuate, flexuose, densely glandular phyllaries. It most closely resembles *O. cabreræ*; however, that species has smaller leaves and capitula and more rigid phyllaries.

AMAZONAS. **Bagua:** km 248, between Pongo de Rentema and Amojao, *Ferreyra 13676* (MO, USM); Pongo de Rentema, *Ferreyra 19440* (USM); Bagua, *Rauh 40314* (USM); 22 km N of Bagua Chica on road to Chiriaco, *Gentry et al. 23108* (F). **Luya:** arriba de Balsas, *Sánchez 348* (F). **CAJAMARCA.** **Jaén:** cerca de la carretera a Jaén, *Angulo 2096* (F, NY); between Porculla and Jaén, *Ferreyra 13636* (USM); Porculla–Pucará, *Ferreyra 14417* (MO, USM); road to Las Pirias, *Ferreyra & Sánchez 19569* (USM); above Shumbe Alto, *Ferreyra & Sánchez 19611* (USM); 6 km E of Pucará, *Gentry et al. 22704* (F); Río Huancabamba, 90 km E of Olmos, *Hutchison 1395* (F, NY, USM); between Acapulco and Pucará, *Hutchison & Wright 3514* (F, UC, USM); Pucará to Chamaya, *Plowman et al. 14249* (F); km 81, Chamaya, *Velarde 5880* (USM); Jaén, *Weberbauer 6203* (F). **San Ignacio:** Chuchuhuasi–Huaquilla, *López et al. 8970* (F). **LA LIBERTAD.** **Patáz:** Chagual–Patáz, *Alayo 74* (F).

2. *Onoseris albicans* (D. Don) Ferreyra, J. Arnold Arb. 25: 389. 1994.

Centroclinium albicans D. Don, Trans. Linn. Soc. London 16: 256. 1829. TYPE: Peru, Ruiz Lopez & Pavón s.n. (holotype, P, not seen).

Onoseris integrifolia Less., Linnaea 5: 343. 1830. TYPE: Peru, J. Dombey 25 (holotype, B, presumably destroyed; isotypes, MA, P, not seen; isotype ex P, F 972679; photograph ex P, FM neg. 8266).

Perennial herbs, 30–80 cm high, white-lanuginose. Leaves alternate, subsessile to petiolate; petioles 5–10 mm long; blades lanceolate, 20–95 mm long, 6–35 mm wide, the adaxial surfaces arachnoid, the abaxial surfaces lanuginose, apically and basally acuminate to acute, the margins sinuose-dentate, revolute. Capitulescences of solitary, terminal capitula; peduncle 70–245 mm long, white-lanuginose, bracts subulate, 4–9 mm long. Capitula radiate; involucre 12–20 mm high, 7–13 mm wide, campanulate; phyllaries 5–6-seriate, the inner 10–12 mm long, 2–2.4 mm wide, acuminate; ray florets (13–)21–34, the corollas violaceous, 26–40 mm long, the tube 5.5–7 mm long, ca. 0.8 mm wide, the outer lip 20–33 mm long, 3.6–4.8 mm wide, 6-nerved, the abaxial surfaces arachnoid, tridentate, the inner lip bipartite, 2.2–3.5 mm long, ca. 0.9 mm wide; disc florets with corollas, 12–16 mm long, the tube 10–13 mm long, the lobes yellow; anthers 5–7.5 mm long. Achenes [ray] 2.5–5 mm long, 0.8–1 mm wide, glabrescent; pappus ca. 13 mm long, heteromorphic, yellow; [disc] 2.5–6.5 mm long, 1–1.3 mm wide, glabrescent; pappus ca. 14 mm long, heteromorphic, yellow.

DISTRIBUTION—Known from the Andean Cordillera of northern Peru to central Bolivia (1400–3200 m).

Onoseris albicans closely resembles *O. salicifolia*, an Ecuadorian species, but differs in possessing leaves with white-arachnoid pubescence, revolute margins, campanulate involucre, and glabrescent achenes.

APURIMAC. Abancay: near Abancay, Ferreyra 9818 (USM). Grau: Kairancka, Vargas 5816 (MO, USM). CAJAMARCA. Cajamarca: below San Pablo, Hutchison & Wright 5072 (F, MO, NY, USM); Vista Alegre, Sagástegui et al. 10142 (F); Asunción-San Juan, Sagástegui et al. 10150 (F), 11994 (F); Yumagual, Sánchez 233 (F); Hacienda Huacaruro, Ute s.n. (MO, USM). Chota: Llama, Ferreyra 8402 (MO, USM); between Cochabamba and Lajas, Ferreyra 8470 (MO, USM); Lajas, Mostacero et al. 1533 (F). Contumazá: Tambo La Lima, López et al. 9025 (F); Contumazá, Sagástegui et al. 9842 (F). Cutervo: near Cutervo, Ferreyra & Acleto 15390 (USM). Hualgayoc: San Miguel, s.d. (USM). CUSCO. Anta: Challatambo, Cuzco to Abancay, Balls 6835 (F). Cusco: Oropesa, Beck 8368 (F). Paruro: near Paruro, Vargas 132 (F, GH); Hacienda Ayusbamba, Vargas 981 (MO). Urubamba: Chinchero to

Urquillos, King et al. 301 (F); Limatambo, Rauh & Hirsch P1352 (F, NY); Urquillos, Vargas 11097 (F). No exact locality: Herrera 2586 (F). HUANCVELICA. Huancavelica: 5 km E of Mejorada, Stork & Horton 10903 (F). HUANUCO. Ambo: near Ambo, Ferreyra 6627 (USM). Huánuco: Mitotambo, Ferreyra 6695 (F, MO, USM); Acomayo, Ridout s.n. (USM); Dunkafael, Sawada P77 (F); Acomayo, Woytkowski 34277 (F, MO). Pachitea: near Panao, Ferreyra 1806 (GH, MO, USM). JUNIN. Huancayo: near Huancayo, Hjerting & Petersen 1386 (USM). Yauli: near Oroya, Kalenborn 71 (MO). LA LIBERTAD. Otusco: 65 km E of Trujillo on road to Otusco, Dillon & Turner 1495 (F); near Otusco, Ferreyra 2970 (MO, USM); Agallpampa-Samne, Ferreyra 3084 (MO, USM); Samne-Otusco, Ferreyra 7615 (MO, USM); Sinsicap, López 1078 (USM); Casmiche, Sagástegui et al. 11685 (F). LAMBAYEQUE. Lambayeque: Olmos-Porculla, Ferreyra 13619 (USM), 13767 (MO, USM); Abra de Porculla, Plowman et al. 14268 (F). LIMA. Canta: near Canta, Soukup 2814 (GH). Huarochiri: 3 km W of San Mateo, Dillon 2501 (F); between Lima and San Mateo, Duncan et al. 2707 (F); near Matucana, Ferreyra 718 (USM), 2003 (USM), 7698 (F), 8293 (MO, USM), 16896 (MO, USM); near Surco, Ferreyra 14870 (MO, USM); San Mateo, Ferreyra 5269 (MO, USM), 5312 (MO, USM), 7698 (MO, USM); Obrajillo, Ferreyra 18336 (MO, USM); Viso, Goodspeed et al. 11524 (F, GH); km 90 Lima-Oroya, Goodspeed & Weberbauer 33062 (GH, MO), Macbride & Featherstone 240 (F); Rose 18641 (F, NY), Ugent 5295 (USM), Hutchison 690 (USM), Soukup 2076 (GH, MO, USM); Puruchuco, Mathews s.n. (GH); Colca, Meza 153 (USM); below Obrajillo, Pennell 14496 (F, GH); Chosica-Matucana, Vargas 4781 (USM). PASCO. Daniel Carrion: 13 km NE of Yanahuanca, Bird 1265 (F). PIURA. Huancabamba: Cerro Porculla, Edwin & Schunke 3740 (F, USM); Abra de Porculla, Gentry et al. 22670 (F). WITHOUT EXACT LOCALITY. Ochoa 1559 (USM), 368 (USM), Rauh 1352 (USM).

3. *Onoseris amplexicaulis* Ferreyra, J. Arnold Arb. 25: 364. 1944. TYPE: Peru, Lima, Huarochiri, Matucana, J. F. Macbride & W. Featherstone 310 (holotype, F 516844; isotype, GH).

Annual herbs, 11–25 cm high, erect, lanuginose. Leaves sessile; blades oblanceolate to lanceolate, 14–75 mm long, 3–20 mm wide, the adaxial surfaces arachnoid, the abaxial surfaces lanuginose, apically acuminate to acute, basally auriculate, amplexicaul, the margins sinuose-dentate, revolute. Capitulescences of solitary, terminal heads; peduncles 15–48 mm long, lanuginose, bracteate, the bracts 3–5 mm long, subulate, the abaxial surfaces arachnoid. Capitula radiate; involucre 7–11 mm high, 5–6 mm wide, campanulate; phyllaries 4–5-seriate, the inner 11–12 mm long, 2–2.2 mm wide; ray florets 8–13, the corollas 18–21 mm long, the tube 3–3.5 mm long, the outer lobe 15–18 mm long, 3.5–4 mm wide, 6-nerved, the abaxial surfaces arachnoid, tridentate, the inner lobe bipartite, 2–2.5 mm long, filiform; disc florets with co-

rollas 7.8–8.5 mm long, the tube 6.6–7 mm long, the lobes acute; anthers 3–3.5 mm long. **Achenes** [ray] 2–4 mm long, 1 mm wide, pubescent; pappus ca. 6 mm long, isomorphic, yellow; [disc] 2.5–4.2 mm long, 1 mm wide, pubescent; pappus ca. 8 mm long, isomorphic, yellow.

DISTRIBUTION—Endemic to Andean Cordillera of central Peru (1800–2400 m). *Onoseris amplexicaulis* is very similar to *O. annua*, but it differs in possessing amplexicaul leaf bases.

LIMA. Huarochiri: near Matucana, *Ferreyra 1375* (USM), 7600 (F, MO, USM); Huariquiña, *Ferreyra 9172* (USM), 9185 (MO, USM); near Surco, *Ferreyra 656* (MO, USM), 2028 (USM), 3420 (MO, USM), 16894 (MO, USM); Matucana, *Macbride & Featherstone 131* (F); near Matucana, *Rose 18668* (NY).

4. *Onoseris annua* Less., *Linnaea* 5: 341. 1830. **TYPE:** Peru, “Chinchin” [Chiuchin], *J. Dombey s.n.* (holotype, B, presumably destroyed; isotype, F ex P; photograph ex B, FM neg. 15887).

Annual herbs, 4–16 cm high, erect, lanuginose. **Leaves** alternate, petiolate; petioles 1.5–2 mm long, lanuginose; blades lanceolate, 10–25 mm long, 5–10 mm wide, bases attenuate, the adaxial surfaces arachnoid, the abaxial surfaces lanuginose, the margins dentate. **Capitulescences** of solitary, terminal heads; peduncles 1–7 cm long, lanuginose. **Capitula** radiate; involucre 9–10 mm high, 5–7 mm wide, campanulate; phyllaries 5–6-seriate, the inner 9–10 mm long, 1.4–2 mm wide, acute, the abaxial surfaces arachnoid; ray florets ca. 13, the corollas 18–20 mm long, the tube 3.5–4 mm long, the outer lip 10.5–16 mm long, 2.2–2.5 mm wide, 6-nerved, tridentate, the inner lip bipartite, 2–2.3 mm long, filiform. **Achenes** [ray] 2–2.2 mm long, pubescent; pappus ca. 5 mm long, heteromorphic, yellow; disc florets yellow, the corollas 7–7.5 mm long, the tube 5.6–6 mm long, the lobes acute; [disc] 2.2–3.5 mm long, pubescent; pappus ca. 6 mm long, heteromorphic, yellow.

DISTRIBUTION—Known from the Andean Cordillera of northern and central Peru (2200–3400 m).

Onoseris annua most closely resembles *O. amplexicaulis* but lacks auriculate leaf bases.

ANCASH. Bolognesi: near Chiquián, *Pennell 15408* (MO, USM), *Ferreyra 5670* (F, MO, USM), 7376 (MO, USM). **Huaylas:** between Caras and Huallanca, Cañon del Pato,

Ferreyra & Rojas 14578 (USM); “Incapamanam,” *Carriello 647* (USM). **LIMA. Cajatambo:** near Churín, *Ferreyra 3518* (USM), 3520 (USM), 3548 (MO, USM). **Chancay:** Chiuchín, *Ferreyra 19164* (USM). **Huarochiri:** Monte Zarate, above San Bartolomé, *Ferreyra 9711A* (USM).

5. *Onoseris cabreræ* Ferreyra, *Bol. Soc. Argent. Bot.* 19: 19. 1980. **TYPE:** Peru, Amazonas, Chachapoyas, encima de Balsas, hacia Cordillera Calla-Calla, 1300–1400 m, 21 Aug 1963, *R. Ferreyra & C. Acleto 15339* (holotype, USM 15746).

Perennial herbs, suffrutescent, 5–10 dm high, erect, stem pubescent, glandulose. **Leaves** alternate, petiolate; petioles 40–80 mm long; blades cordiform, 50–110 mm long, 60–130 mm wide, palmatilobed with 8–10 segments, acute, mucronate, the margins dentate. **Capitulescences** terminal cymes, 2–4-headed; peduncles hirsute-glandular, bracteate, bracts 3–7 mm long, 1–1.5 mm wide. **Capitula** radiate; involucre campanulate, 18–20 mm high, 12–16 mm wide; phyllaries 5–6-seriate, lanceolate, the inner 16–17 mm long, 1–1.2 mm wide, attenuate at apex, the abaxial surfaces lanuginose, hirsute-glandular; ray florets 17–18, the corollas purple, 30–32 mm long, the tube 5–6 mm long, hirsute-glandular, the outer lip 26–32 mm long, 2.5–3 mm wide, 6-nerved, the abaxial surfaces lanuginose, hirsute-glandular, tridentate, the 3 lobes acute, coiled, the inner lip 3–6 mm long, filiform, twisted; disc florets 36–43, the corollas yellow, 12–13 mm long, the tube 11.5–12.5 mm long, the lobes acute, coiled; anthers 8.5–9 mm long. **Achenes** [ray] cylindric, ca. 3 mm long, pubescent; pappus ca. 10 mm long, isomorphic, yellowish; [disc] cylindric, 3–5 mm long, 1.2 mm wide, hirsute; pappus ca. 11 mm long, isomorphic, yellowish.

DISTRIBUTION—Known from the intermontane region of north-central to southern Peru (1200–2600 m).

Onoseris cabreræ most closely resembles *O. acrifolia*, but, unlike that species, it possesses a more sparse hirsute-glandular pubescence, peduncles with bracts conspicuously rigid, and campanulate involucre with ascending phyllaries.

AMAZONAS. Chachapoyas: above Balsas, *Hutchinson & Wright 5448* (UC, US, USM). **APURIMAC. Andahuaylas:** Pincos, *Stork & Horton 10655* (F, GH, MO, UC, USM). **CUSCO. Anta:** between Limatambo and Apurímac, *Rauh 1528* (USM); Cuesta Mandor, *Vargas 5874* (USM). **HUANCAVELICA. Tayacaja:** above Quinta-

bamba, *Tovar 4587* (USM). LA LIBERTAD. Patáz: 5 km above Chagual, *Hutchison et al. 6233* (F, UC, US, USM).

6. *Onoseris castelnaeana* Wedd., *Chlor. And.* 1: 10. 1855. TYPE: Peru, [Cusco], Jun 1847, *M. F. Castelnau 35* (holotype, P, not seen; isotype fragment ex P, F; photograph ex P, FM neg. 38105).

Seris castelnaeana (Wedd.) Kuntze, *Revis. gen. pl.* 1: 364. 1891.

Perennial herbs, decumbent, lanuginose. Leaves alternate; petioles 8–30 mm long; blades sagittate to hastate, 26–60 mm long, 7–29 mm wide, the adaxial surfaces arachnoid, the abaxial surfaces lanuginose, apically acute, the margins slightly dentate. Capitulescences weakly cymose, 2–3-headed; peduncles 5–16 cm long, lanuginose, bracteate, the bracts 4–6 mm long, subulate, arachnoid-tomentose. Capitula radiate; involucre 18–28 mm high, 8–12 mm wide, campanulate; phyllaries 10–12-seriate, the inner 22–24 mm long, 1.8–2 mm wide, acuminate, arachnoid-tomentose; ray florets 13–21, the corollas violaceous, 46–48 mm long, the tube 11–12 mm long, the outer lip 35–36 mm long, 3–3.5 mm wide, 6-nerved, the abaxial surfaces arachnoid, tridentate, the inner lip bipartite, 6–7 mm long, glabrous, attenuate, filiform; disc florets yellow, the corollas 18–22 mm long, the tube 15–19 mm long, the lobes acute, the abaxial surfaces pubescent; anthers 7–8 mm long. Achenes [ray] 4–4.2 mm long, 1–1.2 mm wide, pubescent; pappus ca. 18 mm long, isomorphic, yellow; [disc] 3–3.5 mm long, 1–1.2 mm wide, pubescent; pappus ca. 19 mm long, isomorphic, yellow.

DISTRIBUTION—Known from the intermontane region of southern Peru (2400–2900 m).

Onoseris castelnaeana is characterized by its sagittate to hastate leaves, 10–12-seriate involucre, and phyllaries with apices conspicuously reflexed.

APURIMAC. Abancay: near Abancay, *Vargas 404* (GH). Aimaraes: 15 km NW of Chalhuanca, below Pakayca, *Gentry et al. 23341* (F). CUSCO. Anta: Limatambo, *Rauh & Hirsch 1527* (NY, USM). Paruro: Chaupimoco, *Vargas 403* (GH).

7. *Onoseria chrysactinioides* Sagást. & Dillon, *Brittonia* 37: 8. 1985. TYPE: Peru, Cajamarca, Contumazá, Lledén, *Sagástegui et al. 10839* (holotype, HUT; isotypes, F, HUT, MO).

Perennial herbs to 4 dm tall, branched; stems ascending, lanulose. Leaves clustered at apices of branchlets; petioles 2–12 mm long; blade linear, 30–65 mm long, 2–7 mm wide, the abaxial surfaces densely albo-tomentose, the adaxial surfaces lanate, grey, basally acuminate, apically acute, the margins shallowly repand, remotely denticulate, revolute. Capitulescences of solitary heads, scape, the peduncles to 20 cm long, minutely bracteolate distally. Capitula 12–15 mm high, ca. 12 mm wide; involucre campanulate; receptacle with prominent lacinate crests, planar; phyllaries 6–7-seriate, linear-lanceolate, the outer (2–)4–6 mm long, 0.5–1.5 mm wide, the abaxial surfaces lanate, apically attenuate, the inner (10–)13–17(–20) mm long, 1–2(–3) mm wide, the abaxial surfaces ferruginous-tomentose, the margins scarious, apically acuminate; ray florets ca. 15, 1-seriate, pistillate, the corollas lilac, bilabiate, the outer lip ligulate, 20–25 mm long, 4–5 mm wide, 6-nerved, apically tridentate, the abaxial surfaces lanate, the inner lip reduced to 2 linear lobes, 3–5 mm long, apically clavate, glabrous; disc florets 25–40, the corollas lilac, tubular, 5–6 mm long, glabrous, the 5 lobes 1.5–2.5 mm long. Achenes cylindrical, (3)4–5(6) mm long, ribbed, glabrous or sparsely pilose apically; pappus 8–12 mm long, isomorphic, stramineous.

DISTRIBUTION—Known only from the type locality.

Onoseris chrysactinioides resembles both *O. linearifolia* and *O. lopezii* but is readily distinguished from both by its petiolate, shallowly repand, dentate leaves clustered at the branch apices, and ferruginous-tomentose inner phyllaries.

CAJAMARCA. Contumazá: arriba de Lledén, *Sagástegui et al. 14018* (F); San Martín, *Sagástegui et al. 14025* (F).

8. *Onoseris cumingii* Hook. & Arn., *Companion Bot. Mag.* 1: 103. 1835. TYPE: “North Peru,” without exact locality, *H. Cuming 995* (holotype, K; photographs ex P, FM neg. 38106).

Annual herbs, erect, 12–30 mm high, lanuginose. Leaves sessile to petiolate; petioles 2–4 mm long, lanuginose; blades oblanceolate, 8–65 mm long, 3–20 mm wide, the adaxial surfaces arachnoid, the abaxial surfaces lanuginose, acute, the margins entire to remotely denticulate, revolute. Capitulescences of solitary, terminal heads; peduncles 22–120 mm long, lanuginose, bracteate, bracts 2.5–5 mm long, subulate, the abaxial sur-

faces arachnoid. **Capitula** radiate; involucre 8–12 mm high, 7–9 mm wide, campanulate; phyllaries 5–6-seriate, the inner 8–10 mm long, 0.8–1.4 mm wide, acuminate, the abaxial surfaces pubescent arachnoid-tomentose; ray florets 8–13, the corollas 15–25 mm long, the tube 2.5–4 mm long, the outer lip 12.5–21 mm long, 2.5–3.5 mm wide, 6-nerved, the abaxial surfaces arachnoid, tridentate, the inner lip bipartite, 0.5–3 mm long, filiform; disc florets with corollas 8–11 mm long, the tube 6–8.5 mm long, geniculate, the lobes acute; anthers 3.8–4.5 mm long. **Achenes** [ray] 1.5–3 mm long, glabrescent; pappus ca. 5 mm long, heteromorphic, yellow; [disc] ca. 3.5 mm long, ca. 1 mm wide, glabrescent; pappus ca. 6 mm long, heteromorphic, yellow.

DISTRIBUTION—Endemic to coast region of northern Peru.

Onoseris cumingii very closely resembles *O. odorata* but differs in possessing oblanceolate leaves and tomentose, acuminate phyllaries that lack pilose or hirsute pubescence common to the involucre of the latter species.

PIURA. Talara: Cerro Pan de Azucar, *Haught 30* (F, NY, US).

9. *Onoseris gnaphalioides* Muschl., Bot. Jahrb. Syst. 50, Beibl. 111: 94. 1913. **TYPE:** Peru, Ancash, Caraz, *A. Weberbauer 3012* (holotype, B, presumably destroyed; photograph ex B, FM neg. 15891; isotype, USM 33393; isotype fragment ex B, F 1013035).

O. hyssopifolia Kunth β *teretifolia* Wedd., Chlor. And. 1: 10. 1855. **SYNTYPES:** Peru, "Cuzco," *Gay s.n.* (P, not seen); Bolivia, "d'Ayopaya," *Weddell 4140* (P, not seen).

Perennial **herbs**, 11–70 cm high, decumbent, lanuginose. **Leaves** subsessile; blades lanceolate, 12–55 mm long, 3–8 mm wide, the adaxial surfaces arachnoid, the abaxial surfaces tomentose, apically acuminate to acute, the margins revolute, sinuose-dentate. **Capitulescences** of solitary, terminal heads; peduncle 22–165 mm long, bracts 2–7 mm long, subulate. **Capitula** radiate; involucre 8–12 mm high, 4–7 mm wide, campanulate; phyllaries 6–7-seriate, the inner 11–12 mm long, 1.8–2.2 mm wide, acute, the abaxial surfaces arachnoid; ray florets 5–8, the corollas 17–19 mm long, violaceous, the tube 5–6 mm long, the outer lip 12–13 mm long, 2.8–3.4 mm wide, 6-nerved, the abaxial surfaces arachnoid, tridentate, the inner

lip bipartite, the lobes filiform, attenuate; disc florets ca. 15, the corollas 7.5–10 mm long, the tube 6.5–8 mm long the lobes acute; anthers 3–3.5 mm long. **Achenes** [ray] 2.5–5 mm long, 1 mm wide, glabrescent; pappus ca. 7 mm long, isomorphic, yellow; [disc] 2–4 mm long, 1 mm wide, glabrescent; pappus ca. 8 mm long, isomorphic, yellow.

DISTRIBUTION—Known from the Andean Cordillera of northern Peru to Bolivia (1700–3200 m).

Onoseris gnaphalioides most closely resembles *O. hyssopifolia* Kunth, a Colombian and Ecuadorian species, but differs in having more dentate leaves and more conspicuous arachnoid pubescence on the adaxial surfaces.

AMAZONAS. Bagua: between Bagua and Bellavista, *Diaz s.n.* (USM); near Bagua Grande, *Hutchison 1495* (F, NY, USM). **Chachapoyas:** Cerro Calla-Calla, *Edwin & Schunke 3621* (F); above Balsas, *Pennell 15182* (USM). **ANCASH. Huaylas:** Caráz, *Ute s.n.* (USM). **Yungay:** Mancos, Cordillera Negra, *Smith & Blas 4869* (USM). **APURIMAC. Abancay:** near Abancay, *Hutchison 1749* (USM); Curahuasi, *Marín 2066* (F); Puente Cuyac, *Ferreya 2747* (MO, USM), 9835 (MO, USM); *Saunders 746* (F, NY), *Chávez 3068* (MO); Río Pachachaca, 10 km SW of Abancay, *Iltis & Ugent 796* (F, NY); 20 km N of Abancay, *Stork et al. 10542* (F, GH, MO); Cconoc, *Chávez 3246* (MO); Abancay, *Vargas 405* (F). **Graú:** Kairancka, *Vargas 5860* (USM). **AYACUCHO. Andahuaylas:** Pinkos, *Herrera 1491* (GH). **Cangallo:** Ocros–Andahuaylas, *Hjerting & Petersen 1415* (USM). **Huanta:** near Huanta, *Hjerting & Petersen 1394* (USM). **CAJAMARCA. Cajamarca:** near Cajamarca, *Coronado s.n.* (USM); Cumbre El Gavilán, *Ferreya 8596* (USM); Chaquil, *Ferreya 13233* (USM); near Cajamarca, *Pennell 15071* (USM); Fundo Colpa, *Sánchez 324* (USM). **Celendín:** 10 km SW of Balsas, *Dillon & Turner 1701* (F). **Jaén:** between Porculla and Jaén, *Ferreya 13639* (MO, USM); Pucará, *Ferreya 14416* (MO, USM), 15650 (USM); 6 km E of Pucará, *Gentry et al. 22713* (F); 90 km E of Olmos, *Hutchison 1394* (GH, UC, USM); 15 km E of Acapulco, between Olmos and Jaén, *Hutchison & Wright 3512* (F, GH, K, MO, US, USM); 1 km W of Pucará, *Hutchison & Wright 3608* (F, MO, NY, US, USM); 97 km E of Olmos, *Plowman et al. 14228* (F); 1 km W of Chamaya, *Stein & Todzia 2227* (F). **CUSCO. Anta:** Sisal, Limatambo, *Vargas 3693* (MO). **HUANCAVELICA. Tayacaja:** between Quichicapota and Mantaro, *Stork & Horton 10399* (F); Scurubamba, *Tovar 3709* (USM); Valle del Mantaro, bajo Colcabamba, *Weberbauer 6470* (F, GH). **LA LIBERTAD. Patáz:** Tayabamba, *López & Sagástegui 3405* (USM). **PIURA. Huancabamba:** near Huancabamba, *Friedberg s.n.* (USM); no exact locality, *Ellenberg 1116* (USM), *Edwin 3621* (USM).

10. *Onoseris humboldtiana* Ferreyra, Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot. 11. 2. 1959. **TYPE:** Peru, Ica, Nasca, Lomas de San Nicolas, 500 m, *Ferreya 13400* (holotype, USM 33422; isotype, USM 16000, MO).

Perennial **herbs**, procumbent, acaulescent, caudex woody, lanuginose. **Leaves** alternate; petioles 5–10 mm long, lanuginose; blades spatulate, 15–40 mm long, 11–20 mm wide, attenuate at base, lanuginose, acute, the margins more or less dentate. **Capitulescences** of terminal, solitary heads, peduncles 38–75 mm long, lanuginose. **Capitula** radiate; involucre 18–21 mm high, 7–9 mm wide, campanulate; phyllaries 7–8-seriate, lanceolate, the inner 12–15 mm long, 1.6–2 mm wide, attenuate at apex, the abaxial surfaces arachnoid; ray florets 21–28, the corollas 18–22 mm long, the tube 5–5.5 mm long, pubescent, the outer lip 13–16.5 mm long, 3–3.8 mm wide, violaceous, 6-nerved, the abaxial surfaces arachnoid, tridentate, the inner lip bipartite, 2–2.5 mm long, filiform; disc florets 14–16, the corollas 10–12 mm long, yellow, the tube 9–10.5 mm long, the lobes acute; anthers 5–5.6 mm long. **Achenes** [ray] 2–2.6 mm long, 1 mm wide, pubescent; pappus ca. 8 mm long, isomorphic, yellow; [disc] 1.8–2.2 mm long, pubescent; pappus ca. 9 mm long, isomorphic, yellow.

DISTRIBUTION—Known only from the type locality.

Onoseris humboldtiana closely resembles *O. amplexicaulis*, from which it differs in having a woody, basal caudex, spatulate leaves, and 7–8-seriate involucre.

11. *Onoseris linearifolia* Sagást., *Phytologia* 57: 415. 1985. **TYPE**: Peru, Cajamarca, Cajabamba, alrededores de Cajabamba, 2600 m, 18 Nov 1983, *Sagástegui et al. 11264* (holotype, HUT; isotypes, F, HUT).

Perennial **herbs**, stems to 30 cm long, erect to ascending, terete, lanate. **Leaves** sessile; blades narrowly linear, 10–25 mm long, 1.5–2.5 mm wide, basally attenuate, apically obtuse, mucronate, the adaxial surfaces lanuginose, the abaxial surfaces densely tomentose, the margins entire, revolute. **Capitulescences** of solitary, terminal heads; peduncles ca. 15 cm long, lanuginose, minutely bracteate, the bracts ca. 1.5 mm long. **Capitula** radiate; involucre campanulate, 10–12 mm high, 8–10 mm wide; phyllaries 4–5-seriate, the outer ovate to ovate-lanceolate, 1.5–2.5 mm long, 0.8–1.2 mm wide, apically acute, the abaxial surfaces lanose, the inner oblanceolate, 8–10 mm long, 1.8–2.2 mm wide, apically acute, the abaxial surfaces lanose; ray florets 9–11, the corollas lilac, ca. 25 mm long, the tube ca. 6 mm long, the abaxial surfaces glabrous, the outer lip violaceous, ca. 12–20 mm

long, ca. 3 mm wide, 6-nerved, the abaxial surfaces arachnoid, tridentate, the inner lip bifid, the lobes filiform, ca. 1 mm long; disc florets 15, the corolla 8–10 mm long, the tube ca. 7–8 mm long, the lobes acute, yellow, glabrous; anthers 3 mm long. **Achenes** [ray] cylindric, ca. 6 mm long, sparsely pilose; pappus ca. 8 mm long, isomorphic, stramineous; [disc] cylindric, ca. 6 mm long, sparsely pilose; pappus 8–10 mm long, isomorphic, stramineous.

DISTRIBUTION—Known only from region of the type locality.

Onoseris linearifolia most closely resembles *O. chrysactinioides* but is easily distinguished by its narrowly linear leaves with obtuse apices, smaller capitula, and 4–5-seriate involucre.

CAJAMARCA. Cajabamba: ca. 8 km NW of Cajabamba, *Dillon et al. 2857* (F); entre Chancay y Valle Condebamba, *Sánchez et al. 956* (F, USM).

12. *Onoseris lopezii* Ferreyra, *Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot.* 11: 4. 1959. **TYPE**: Peru, La Libertad, Santiago de Chuco, Los Quengos, *A. López M. 439* (holotype, USM 33500, originally cited as USM 16001; isotype, HUT). **Figure 14**.

Perennial **herbs**, to 40 cm high; stems procumbent, lanuginose. **Leaves** sessile; blades linear, 17–65 mm long, 2.5–8 mm wide, apically acuminate, bases semiamplexicaul, the adaxial surfaces arachnoid, the abaxial surfaces lanuginose, the margins entire. **Capitulescences** of solitary, terminal heads; peduncles 17–24 cm long, lanuginose, bracteate, the bracts 5–25 mm long, 1–2 mm wide, subulate, lanuginose. **Capitula** radiate; involucre 16–19 mm high, 14–17 mm wide, campanulate; phyllaries 9–11-seriate, lanceolate, the inner 11–16 mm long, 1.8–2.2 mm wide, attenuate at apex, the abaxial surfaces arachnoid; ray florets 20–24, the corollas 35–44 mm long, the tube 4.8–6 mm long, 1 mm wide, glabrous, the outer lip violaceous, 33–38 mm long, 4–5 mm wide, 6-nerved, the abaxial surfaces arachnoid, tridentate, the inner lip bipartite, 1.5–3 mm long, attenuate at apex, twisted; disc florets 50–55, the corolla 13–16 mm long, the tube 10.5–13 mm long, the lobes acute, yellow, glabrous; anthers 7–8 mm long. **Achenes** [ray] ca. 3.5 mm long, 1 mm wide, pubescent; pappus ca. 11 mm long, isomorphic, yellow; [disc] 2.5–4.2 mm long, 1 mm wide, pubescent; pappus ca. 14 mm long, isomorphic, yellow.

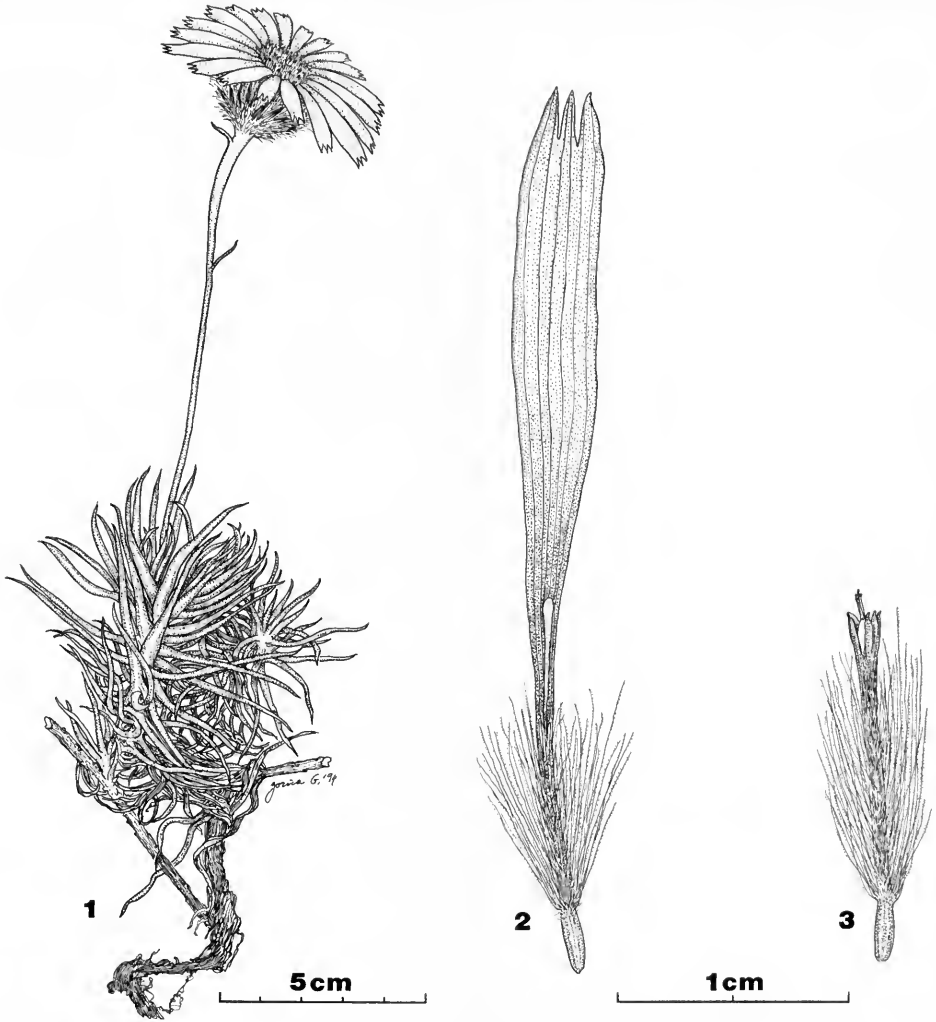


FIG. 14. *Onoseris lopezii*. 1, habit; 2, ray floret with achene; 3, disc floret with achene. (Drawn from M.O. Dillon & M. Whalen 4053, F.)

DISTRIBUTION—Known from the Andean Cordillera of northern Peru (2500–3500 m).

Onoseris lopezii is related to *O. gnaphalioides* but differs in its basal amplexicaul leaves and larger involucre and phyllaries.

ANCASH. Huaras: above Huaras, *Ferreyra* 14305 (USM), *Muñoz* 1004 (USM); Tacllan, *Proaño* 85 (USM); SW of Huaras, *Pennell* 15275 (USM), 15279 (USM). **CAJAMARCA. Cajamarca:** Encañada, *Ferreyra* 15001 (F, MO, NY, USM); near Cajamarca, *Fosberg* 28144 (MO, USM); 8 km E of Cajamarca, *King & Bishop* 9124 (F); El Cumbe, *López* 2618 (USM), 1302 (USM); arriba de San Juan, *López* 8736 (F), 8744 (F); SW of Cajamarca, *Pennell* 15014 (MO, USM); Pullucana, *Sagástegui et al.* 8056 (F, MO); arriba de Santa Apolonia, *Sagástegui* 9965 (F); Quebrada de la Esperanza, *Sánchez & Torral* 3281 (F); ca. km 25 be-

tween Cajamarca and Celendín, *Smith & Sánchez* 4233 (F). **Celendín:** ca. 31 km NE of Cajamarca, *Dillon & Turner* 1579 (F); ca. 24 km E of Celendín on road to Balsas, *Dillon & Whalen* 4053 (F); above Balsas, *Hutchison & Wright* 5210 (F, MO, NY, USM); Llangat, *Mosbacher et al* 963 (F); near Celendín, *Rauh* 40295 (USM). **LA LIBERTAD. Huamachuco:** near Huamachuco, *López* 1005 (USM); Hacienda Cochabamba, *López & Sagástegui* 2783 (USM); Cachibamba, *Infantes s.n.* (MO, USM). **Santiago de Chuco:** Cachicadán, *Sagástegui et al.* 11821 (F).

13. *Onoseris macbridei* Ferreyra, Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot. 2: 2. 1949. **TYPE:** Peru, Cajamarca, Chota, Yamaluc, *R. Ferreyra* 846 (holotype, USM 33511, USM 15629 in original citation; isotype, F).

Perennial herbs, 6–14 cm high, acaulescent, caudex tomentose. Leaves in basal rosettes, 12–14, petiolate; petioles 8–32 mm long, winged, the lobes triangular, acute; blades oblanceolate in outline, the distal portion ovate-hastate, 28–100 mm long, 10–40 mm wide, acute, the adaxial surfaces arachnoid, the abaxial surfaces lanuginose, the margins sinuose-dentate. Capitulescences of solitary, terminal heads; peduncles 55–100 mm high, lanuginose, bracteate, bracts 3.5–6 mm long, 1–1.5 mm wide, subulate, the abaxial surfaces lanuginose. Capitula radiate; involucre 20–27 mm high, 10–12 mm wide, turbinate; phyllaries 11–12-seriate, 3-nerved, the inner 21–24 mm long, 1.4–2 mm wide, attenuate at apex, the abaxial surfaces arachnoid-glandulose; ray florets 18–23, the corollas 2.9–3.3 mm long, the tube 9.5–10 mm long, glandular-pubescent, the outer lip 19–23 mm long, 3–3.5 mm wide, 6-nerved, the abaxial surfaces arachnoid-glandulose, tridentate, the inner lip bipartite, filiform; disc florets with corollas 13.6–15.2 mm long, the tube 11.6–12.8 mm long, the lobes acute, coiled, yellow, the abaxial surfaces pubescent; anthers 5.8–6 mm long. Achenes [ray] 3–6 mm long, 1 mm wide, pubescent; pappus ca. 11 mm long, isomorphic, yellow; [disc] 3.6–4 mm long, pubescent; pappus ca. 13 mm long, isomorphic, yellow.

DISTRIBUTION—Native to the intermontane region of northern Peru (1800–2900 m).

Onoseris macbridei most closely resembles *O. speciosa*, from which it differs in having smaller habit, solitary capitula, turbinate involucre, and 11–12-seriate phyllaries with recurved apices.

ANCASH. Yungay: Mancos, *Smith & Blas 4914* (F, USM). CAJAMARCA. Chota: *Ferreya 8458* (MO, USM); Lajas, *Sagástegui 14044* (F). Cutervo: near Cutervo, *Ferreya & Acleto 15379* (MO, USM). Jaén: Pucará to Chama, *Plowman et al. 14257A* (F). Santa Cruz: Hacienda El Molino, *Muñoz 1012* (USM).

14. *Onoseris minima* Domke, Notizbl. Bot. Gart. Berlin-Dahlem 13: 247. 1936. TYPE: Peru, Arequipa, Socosani, NW of Arequipa, 1933–1934, *D. B. Stafford 295a* (holotype, K).

Annual herbs, 2–10(–14) cm high, erect, lanuginose. Leaves sessile; blades lanceolate, 18–45 mm long, 3–12 mm wide, basally attenuate, apically acuminate, the adaxial surfaces arachnoid, the abaxial surfaces lanuginose, the margins slightly dentate. Capitulescences of solitary, terminal heads; peduncles 5–35 mm long, lanuginose. Capitula radiate; involucre 9–12 mm high, 4–6 mm, narrowly

campanulate; phyllaries 4–5-seriate, the inner 10–12 mm long, 2–2.2 mm wide lanceolate, attenuate at apex, the abaxial surfaces arachnoid; ray florets 7–9, the corollas 10–11 mm long, the tube 3.2–3.5 mm long, glabrous, the outer lip 6.8–7.5 mm long, 1.6–1.8 mm wide, 6-nerved, the abaxial surfaces arachnoid, tridentate, the inner lip filiform; disc florets 8–10, the corollas 6–6.5 mm long, the tube 5–5.2 mm long, 5-lobed, the lobes acute; anthers 2.2–2.4 mm long. Achenes [ray] ca. 2.7 mm long, pubescent; pappus ca. 4.5 mm long, heteromorphic, yellow; [disc] 2.6–3 mm long, pubescent; pappus ca. 6 mm long, heteromorphic, yellow.

DISTRIBUTION—Known only from the type locality in southwestern Peru (1200–1900 m).

Onoseris minima closely resembles *O. annua* but differs in its slightly sinuous-dentate leaf margins and attenuate, glabrous phyllaries.

MOQUEGUA. Mariscal Nieto: Monte Estuquiña, NW of Moquegua, *Weberbauer 7440* (F, GH, NY, US); between Río Las Trancas and “Llaxwa,” *Hrdlicka s.n.* (US).

15. *Onoseris odorata* (D. Don) Hook. & Arn., Companion Bot. Mag. 1: 103. 1835.

Chaetachlaena odorata D. Don, Trans. Linn. Soc. London 16: 257. 1832. TYPE: “in Guayaquila Peruvianorum,” *J. Tafalla s.n.* (holotype, P, not seen).

O. longipedicellata Muschl., Bot. Jahrb. Syst. 50, Beibl. 111: 96. 1913. TYPE: Peru, Lima, San Bartolomé, estación via férrea entre Lima y Oroya, 1700–1800 m, *A. Weberbauer 1698* (holotype, B, presumably destroyed; photograph ex B, FM neg. 15894).

O. parva Muschl., Bot. Jahrb. Syst. 50, Beibl. 111: 95. 1913. TYPE: Peru, Arequipa, Mollendo, *A. Weberbauer 1492* (holotype, B, presumably destroyed; photograph ex B, FM neg. 15895).

Centroclinium reflexum Hook., Bot. Mag. 58. pl. 3114. 1831. TYPE: Peru, cultivated at GL from seed supplied by Cruickshanks, no voucher seen.

O. reflexa (Hook.) Less., Syn. Comp. 119. 1832. [For additional synonymy, see Ferreyra (1944).]

Annual herbs, 4–70 cm high, lanuginose. Leaves subsessile to petiolate; petioles 5–10 mm long; blades lanceolate, 12–90 mm long, 4–25 mm wide, the adaxial surfaces arachnoid, the abaxial surfaces lanuginose, acute at each end, the margins dentate. Capitulescences of solitary, terminal heads; peduncles 25–230 mm long, bracteate. Capitula radiate; involucre 8–15 mm high, 5–8 mm wide, campanulate; phyllaries 5–6-seriate, the inner 12–18 mm long, 1.5–2 mm wide, apically long-attenuate to acuminate, recurved; ray florets 13–21, the

corollas violaceous or purple, 14–30 mm long, the tube glabrous, 2.5–4 mm long, the outer lip 11–26 mm long, 2.5–5 mm wide, glabrous, 6-nerved, tridentate, the outer lip bipartite; disc florets with corollas 7–11 mm long, the tube geniculate; anthers 3–5 mm long. **Achenes** [ray] 1.8–4 mm long, slightly pubescent; pappus ca. 6 mm long, heteromorphic, yellow; [disc] 2.2–4 mm long, pubescent; pappus ca. 8 mm long, heteromorphic, yellow.

DISTRIBUTION—Known from along the Peruvian coast and western slopes of the Andean Cordillera (100–3700 m).

Onoseris odorata has a remarkable distribution extending from the coastal desert to high-elevation habitats within the Andean Cordillera. It is easily recognized by its long-attenuate to acuminate, recurved phyllaries and membranous, lanceolate leaves.

No type material of *O. longipedicellata* has been located; however, a photograph of the holotype clearly shows the reflexed, long-attenuate phyllaries common to *O. odorata*, and the leaves are within the size range for that species (e.g., *Sagástegui & Dillon* 12291).

While no type material of *O. reflexa* has been examined in this study, the excellent illustration in the original publication shows the reflexed, long-attenuate phyllaries characteristic of *O. odorata*.

ANCASH. Bolognesi: between Chasquitambo and Cajacay, *Ferreyra* 14289 (USM); between Conococha and Chasquitambo, *Ferreyra* 14470 (USM); 70 km E of Paramonga, *Richardson* 2084 (MO, USM); abajo de Raquia, *Sagástegui et al.* 12291 (F). **Huaras:** Chancas, below Punta Caillan, *Ferreyra* 14631 (USM), 14395 (MO, USM). **Huaylas:** bajada de Huaylas a Huallanca, *Mostacero et al.* 1977 (F). **Recuay:** Marca, *Gomez* 121 (USM). **AREQUIPA. Camaná:** Lomas de Ocoña, *Ferreyra* 11712 (MO, USM); Lomas de Camaná, *Ferreyra* 8850 (MO, USM), *Richardson* 2152 (USM), *Tovar* 3449 (USM). **Caraveli:** between Nasca and Chala, *Ferreyra* 1384 (USM); Lomas de Atiquipa, *Ferreyra* 6488 (USM), 8820 (USM), 12112 (MO, USM), 13492 (MO, USM), 19834 (USM); Lomas de San Nicolas, *Ferreyra* 13417 (MO, USM); Lomas de Jahuary, *Ferreyra* 19853 (USM); Lomas de Chaparra, *Ferreyra* 1409 (MO, USM); between Chala and Atico, *Ferreyra* 6353 (MO, USM); Atico, *Ferreyra* 2513 (MO, USM), 8884 (MO, USM), 11535 (MO, USM), 12013 (MO, USM), 13931 (USM), 18623 (MO, USM); Lomas de Capacc, *Hutchison* 1279 (F, NY); near Chala, *Raimondi s.n.* (USM); Puerto Chala *Rauh* 62 (MO); Lomas de Capac, near Chala, *Tovar* 2694 (USM), 2703 (MO, USM), 2661 (MO, USM). **Islay:** Mollendo, *Chávez et al.* 43 (USM); Lomas de Mollendo, *Ferreyra* 12594 (MO, USM); between Mollendo and Matarani, *Ferreyra* 11568 (MO, USM); Lomas de Mejía, *Ferreyra* 6411 (USM); Mollendo, *West* 8240 (MO). **AYACUCHO.** Lucanas: between Nasca and Puquio, *Ferreyra* 5454 (F, MO, USM), 5481 (USM). **CAJAMARCA.** Cajamarca: La Yunga, Ca-

banillas & Dioses 14 (MO); Chilete–San Pablo, *Sagástegui et al.* 7915 (MO); between Magdalena and San Juan, *Ugent* 5392 (USM). **Chota:** between Huambos and Llama, *Ferreyra* 871 (MO, USM). **Contumazá:** between Llallen and Tembladera, *Ferreyra* 8598 (MO, USM); El Portachuelo de San Antonio, *López et al.* 9208 (F); abajo de Rupe, *López et al.* 9218 (F); El Portachuelo, *Sagástegui et al.* 9227 (F). **Jaén:** near Jaén, *Angulo* 2115 (F, NY). **San Miguel:** Casa Blanca, *Sagástegui et al.* 8775 (F); Quinden, *Sánchez et al.* 3038 (F). **San Pablo:** Tayas, *Sánchez* 2813 (F); La Moyuna, *Sánchez et al.* 2997 (F). **ICA.** Ica: near Ica, *Ferreyra* 2542 (USM). **Nasca:** Lomas de Pongo, *Rauh & Hirsch* P476 (NY). **LA LIBERTAD.** Otusco: between Samne and Otusco, *Ferreyra* 7659 (USM); above Samne, *Ferreyra* 14087 (MO, USM); Hacienda Membrillar, *Vargas* 370 (USM). **Trujillo:** Laredo to Simbal, *Angulo & López* 459 (USM); Lomas de Viru, *Angulo & López* 460 (USM); Cerro Chiputur, *López & López* 9150 (F); Lomas de Viru, *Mostacero et al.* 1444 (F); Cerro Cabezón, *Sagástegui & Cabanillas* 8744 (F), *Sagástegui & Mostacero* 10444 (F). **LAMBAYEQUE.** Chiclayo: Tinajones, *Cerrate* 5254 (MO, USM); Hacienda Espinal, *Ferreyra* 12377 (MO, USM). **Jaén:** between Olmos and Motupe, *Cerrate* 4996 (USM); km 713, *Cerrate* 5201 (USM); Portachuelo a Olmos, *Cerrate* 5220 (MO, USM), *Ferreyra* 6043 (MO, USM), 9131 (MO, USM); Naupe, *López et al.* 7680 (MO); Olmos, *Ferreyra et al.* 16304 (USM). **LIMA.** Canta: near Quives, *Ferreyra* 19870 (USM); near Canta, *Ferreyra* 7249 (MO, USM); Canta–Yaso, *Ferreyra* 18354 (USM); near Yaso, *Tovar* 1025 (MO, USM), *Ferreyra* 7249 (MO, USM); near Viscas, *Ferreyra* 14454 (F), 14468 (F, GH, USM), 14479 (F, USM); Quive, *Pennell* 14302 (F); Obrajillo, *Capt. Wilkes Exped. s.n.* (F, GH); cerros N de Chosica, *Weberbauer* 170 (USM). **Huaroquiri:** near Chosica, *Weberbauer* 5314 (F), *Ferreyra* 6110 (USM); between Oscolla and Surco, *Ferreyra* 9179 (MO, USM); Surco, *Ferreyra* 2026 (MO, USM); between Chosica and Matucana, *Ugent* 5286 (USM); Tornameza, *Ferreyra* 7031 (USM); km 49, Lima–Oroya, *Cerrate* 4295 (USM); km 56, Lima–Oroya, *Ferreyra* 8240 (MO, USM), 10483 (USM), 11077 (MO, USM), 13586 (MO, USM), *Cerrate* 5330 (MO, USM); km 61–62, Lima–Oroya, *Ferreyra* 9163 (MO, USM), 9177 (USM); km 70, Lima–Oroya, *Cerrate* 5090 (MO, USM), *Ferreyra* 3477 (MO, USM), 8927 (MO, USM), 10545 (USM); below Surco, *Ferreyra* 16893 (MO, USM); Monte Zarate, *Ferreyra* 9746 (USM); near Matucana, *Mexia* 4088 (MO). **Lima:** Lomas de Manchay, *Biegman s.n.* (USM); 7 km E of Trapiche, *Hutchison* 1014 (F, USM), 1027 (F, USM). **TUMBES.** near Cancas, *Ferreyra* 12205 (MO, USM).

16. *Onoseris peruviana* Ferreyra, J. Arnold Arb. 25: 373. pl. 4. 1944. TYPE: Peru, Junín, Tarma, La Merced, *J. F. Macbride* 5425 (holotype, US 1191547; isotype, F 536457).

Perennial herbs, 1–2 m high, erect, canescent-tomentose. Leaves petiolate, rosulate at base; petioles 85–195 mm long, winged with ovate-lanceolate lobes, 3–8 pairs, opposite or alternate, 48–58 mm long, 18–28 mm wide; blades oblanceolate in outline, the distal portion hastate, 100–190 cm long, 86–205 mm wide, the adaxial surfaces arachnoid, glabrescent, the abaxial surfaces lanuginose,

apically acuminate, the margins sinuose-dentate. **Capitulescences** paniculate with 7–9 heads; peduncles 40–46 cm long, lanuginose, bracteate, the bracts 3–6 mm long, subulate, arachnoid. **Capitula** radiate; involucre 14–20 mm high, 7–10 mm wide, campanulate; phyllaries 6–7-seriate, the inner 18–20 mm long, 2.4–2.5 mm wide, acuminate, arachnoid; ray florets ca. 13, the corollas 19–20 mm long, the tube 9.5–10 mm long, the outer lip violaceous, 9.5–10 mm long, 1.8–2 mm wide, 6-nerved, the abaxial surfaces arachnoid, tridentate, the inner lip 6–7 mm long, attenuate, twisted; disc florets with corollas 16–17 mm long, the tube 14.8–15.6 mm long, the lobes acute, yellow; anthers 4.5–4.8 mm long. **Achenes** [ray] 4.2–5 mm long, 1 mm wide, pubescent; pappus ca. 14 mm long, isomorphic, yellow; [disc] 4.5–5 mm long, 1–1.2 mm wide, pubescent; pappus ca. 15 mm long, isomorphic, yellow.

DISTRIBUTION—Known from lower elevations along the eastern escarpment of the Andean Cordillera of central to southern Peru (600–900 m).

Onoseris peruviana most closely resembles *O. silvatica* Greenman from Costa Rica but differs in possessing a tomentose habit and hastate leaves with dentate margins.

CUSCO. **Convención:** Hacienda Luisiana, *Dudley 11487* (F, USM). **JUNIN.** **Tarma:** Valley of Chanchamayo, *Ferreyra 20294* (USM); Colonia Perené, *Killip & Smith 24937* (US); Río Seco, Chanchamayo, *Soukup 2501* (USM); Satipo, *Woytkowski 5882* (GH, UC).

17. *Onoseris speciosa* Kunth, Nov. Gen. Sp. 4: 7. t. 305. 1820. **TYPE:** Ecuador, Chimborazo, “Alausi,” *Bonpland 3235* (holotype, V, presumably destroyed; isotype, F; photograph ex B, FM neg. 15897).

Onoseris stuebelii Hieron., Bot. Jahrb. Syst. 21: 366. 1895. **TYPE:** Peru, “Tambo de Carizal, in valle fluminis Utcubamba,” *A. Stübel 35a* (holotype, V, presumably destroyed; isotype, GH; photograph ex B, FM neg. 15898).

Perennial herbs, 30–65 cm high, acaulescent, tomentose. Leaves in basal rosette; petioles 18–160 mm long, winged, lobed, the lobes ovate 1–4 pairs opposite or alternate; blades lyrate in outline, 35–100(–300) mm long, 20–90(–150) mm wide, apically acute, rarely obtuse, the adaxial surfaces arachnoid, the abaxial surfaces lanuginose, the margins sinuose-dentate. **Capitulescences** corym-

bose, 1–3-headed; peduncles to 60 cm long, lanuginose-pubescent, bracteate, bracts 3–5 mm long, subulate. **Capitula** radiate; involucre 18–24 mm high, 11–16 mm wide, campanulate; phyllaries 6–7-seriate, the inner 20–24 mm long, 1.2–2 mm wide, lanceolate, attenuate at apex, arachnoid-glandulose; ray florets ca. 21, the corollas 29–39 mm long, the tube 8–9.5 mm long, pubescent, the outer lip 21–30 mm long, 2.8–3.8 mm wide, 6-nerved, arachnoid-glandulose, tridentate, the inner lip bipartite, 8–14 mm long, attenuate, twisted at apex; disc florets with corollas 14–16 mm long, the tube 12.2–15 mm long, the lobes 1.8–2.8 mm long, acute; anthers 6–7 mm long. **Achenes** [ray] 4–6 mm long, 1.2 mm wide, pubescent; pappus ca. 12 mm long, isomorphic, yellow; [disc] 3.8–6 mm long, 1.2 mm wide, pubescent; pappus ca. 14 mm long, isomorphic, yellow.

DISTRIBUTION—Known from the Andean Cordillera of southern Ecuador to northern Peru (1100–2600 m).

Onoseris speciosa is easily recognized by its acaulescent habit and capitulescences with 1–3 large heads on peduncles to 40 cm long.

AMAZONAS. **Bagua:** Bagua Grande, *Ferreyra 14433* (MO, USM). **Bongará:** Pomacocha–Shipasbamba, *Wurdack 1097* (MO, USM). **Chachapoyas:** between Chachapoyas and Tingo, *Ferreyra 7132* (F, MO, NY, USM); near Chachapoyas, *Ferreyra 14442* (MO, USM); Pumachaca, *Friedberg s.n.* (USM); Cerros Calla-Calla, *Hutchison & Wright 5453* (F, USM); Taquia, SW of Chachapoyas, *Pennell 15175* (USM), *15572* (USM); Sonche to Chachapoyas, *Wurdack 1533* (GH, NY, USM); without locality, *Maekawa 3053* (NY). **Luya:** Yunquilla *Cevalco s.n.* (USM). **CAJAMARCA.** **Cajabamba:** Condebamba valley, *Smith & Vasquez 3393* (F). **Cajamarca:** Magdalena, *Guzman s.n.* (USM); Quebrada San Vicente, *Pennell & Reichlin 15015* (USM); E of Cajamarca, *Sánchez 762* (F, USM); between Chancay and Valley of Condebamba, *Sánchez 949* (F, USM); Vista Alegre, *Sagástegui et al. 10141* (F). **Celendin:** Hacienda El Limón, *Ferreyra 15069* (USM). **Chota:** Montán, near Cochabamba, *Ochoa 1544* (USM). **Cutervo:** above Socota, *Stork & Horton 10147* (F, UC). **Jaén:** Chontali, *Chimoy 33* (USM); between Pucará and Porculla, *Ferreyra 13712a* (USM); *13712* (USM); *13632* (USM); Colasay, *Woytkowski 7046* (UC). **LAMBAYEQUE.** **Lambayeque:** near Abra Porculla, *Ferreyra 13624* (USM), *13751* (MO, USM). **PIURA.** **Ayavaca:** below Ayavaca, *Ochoa 1799* (USM). **Huancabamba:** El Tambo, *Acleto 238* (USM), *258* (USM); near Huancabamba, *Acleto 467* (USM); Quebrada Shumaya, *Fosberg 27874b* (MO, USM); Porculla, *Llatas 2449*. (F).

18. *Onoseris weberbaueri* Ferreyra, Journ. Arn. Arb. 25: 386. 1944. **TYPE:** Peru, Cajamarca, Jaén, between Ríos Tabaconas and Marañón, 1100–1300 m, *A. Weberbauer 6163* (holo-

type, F 628892; photograph ex F, FM neg. 49246).

Perennial **herbs**, to 65 cm high, erect, lanuginose. **Leaves** in basal rosettes; blades lanceolate, 70–120 mm long, 15–25 mm wide, sessile, the adaxial surfaces arachnoid, the abaxial surfaces lanuginose, apically acuminate, the margins sinuose-dentate. **Capitulescences** of solitary, terminal heads; peduncles 35–42 cm long, lanuginose, bracts 2–2.5 mm long, subulate. **Capitula** radiate; involucre 18–20 mm high, 8–10 mm wide, campanulate; phyllaries 6–7-seriate, the inner 17–20 mm long, 1.2–2 mm wide, acute, arachnoid; ray florets ca. 13, the corollas violaceous, 36–38 mm long, the tube 11–12 mm long, the outer lip 25–26 mm long, 3.6–4 mm wide, 6-nerved, the abaxial surfaces arachnoid-pubescent, tridentate, the inner lip bipartite, 13–14 mm long, attenuate at apex, twisted; disc florets with corollas 17–18 mm long, the tube 15–16 mm long, the lobes 2.5–2.8 mm long, violaceous; anthers 5–6 mm long. **Achenes** [ray] 4–5 mm long, to 1 mm wide, pubescent; pappus ca. 14 mm long, isomorphic, yellow; [disc] 3–4.5 mm long, ca. 1 mm wide; pappus ca. 15 mm long, isomorphic, yellow.

DISTRIBUTION—Native to the savannas of intermontane regions in northern Peru (380–1300 m).

Onoseris weberbaueri most closely resembles *O. speciosa* but is distinguished by the long peduncles and lanceolate leaves with dentate margins.

AMAZONAS. **Bagua:** near Pongo de Rentema, Río Marañón, *Ferreyra 13671* (MO, USM); Bagua Chica, *Ferreyra 14186* (MO, USM), *13643* (MO, USM); 22 km N of Bagua Chica, *Gentry et al. 23110A* (F); Bagua Chica, *Hutchison & Wright 3632* (F, K, MO, NY, US, USM). **CAJAMARCA.** **Jaén:** above Shume Alto, *Ferreyra 19630* (USM); Quebrada San Agustín, *Ferreyra & Sánchez 19657* (USM); near Jaén, *Friedberg 579* (MO, USM); Pucará, Río Huancabamba, *Hutchison & Wright 3522* (F, MO, NY); Pucará to Chamaya, *Plowman et al. 14257* (F); Santa Rosa, Río Marañón, *Woytkowski 5735* (USM).

XVI. PEREZIA

Perezia Lag., Amer. nat. Españ. 1: 31. 1811. TYPE: *Perdicium magellanicum* L. fil. = *Perezia magellanica* (L. fil.) Lag.³

Perennial **herbs**, rhizomatose, or tap rooted, caulescent or scapose; caudex glabrous; stems erect or procumbent, pubescent, glabrous or glandular, lacking spines. **Leaves** basal or caulescent, the margins entire, lobed, or pinnatilobed, the lobes rounded, ciliate, spinulose. **Capitulescences** many-branched panicles or cymes or of solitary capitula. **Capitula** homogamous, radiate; involucre campanulate to cylindrical; receptacles plane, epaleate; phyllaries 3–7-seriate, imbricate, lanceolate to oblong, soft or rigid; florets hermaphroditic, isomorphic, the corollas blue, pink, or whitish, bilabiate, the outer lip tridentate, the inner lip bifid; anthers sagittate; styles cylindrical, the branches apically truncate, papillose. **Achenes** cylindrical or oblong, glandulose, papillose-pubescent; pappus of scabrid to barbellate bristles, 1–2-seriate, white, tawny, or ochraceous.

Perezia has recently been redefined to include only the South American section *Perezia*; North American members of *Perezia* section *Acourtia* have been elevated to generic status (Reveal and King, 1973; Crisci 1974). Vuilleumier (1969) monographed section *Perezia* and treated 30 species distributed in high-elevation habitats of the Andean Cordillera (Colombia, Ecuador, Peru, Chile, Bolivia, and Argentina) to lowland steppe and grassland habitats (Argentina, Brazil, Paraguay, and Uruguay). In Peru, seven species are recorded from high-elevation environments throughout the Andean Cordillera.

The species concepts and synonymy presented here largely reflect the detailed monographic work of Vuilleumier (1969), and more detailed discussions of variation and distribution can be found in that publication.

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³ For additional synonymy, consult Vuilleumier (1969).

Key to Peruvian Species of *Perezia*

1. Plants essentially acaulescent with heads sessile in leafy rosette, or with flowering scapes equal to or less than 10 cm high; cauline leaves less than 2 cm long, bracteiform 2
2. Plants generally shorter than 3 cm tall; basal rosette of 5 or fewer, lyrate leaves 1–3 cm long, 4–8 mm wide *P. pygmaea*
2. Plants generally taller than 3 cm; basal rosette of 5 or more, pinnatifid to entire leaves (2–)4–10 cm long, (5–)10–20 mm wide 3
3. Leaf blades with entire, densely and evenly ciliolate to spinulose margins *P. ciliosa*
3. Leaf blades pinnatifid with 6–15 pairs of lobes, the margins with long, contorted cilia . 4
 4. Leaves with lanceolate lobes, apically acute to attenuate, the margins serrate to dentate; the outer phyllaries ovate, apically acute, entire or ciliate-spinulose *P. coerulescens*
 4. Leaves with lance-ovate lobes, apically obtuse to rounded, the margins conduplicate; the outer phyllaries oblong to pandurate, apically rounded, ciliate *P. pinnatifida*
1. Plants caulescent with heads borne on leafy scapes or stems (10–)20–80 cm high; cauline leaves greater than 2 cm long 5
5. Basal leaf blades lanceolate to oblanceolate, the margins irregularly dentate; capitulescences of dense panicles or corymbs of 10–50 heads; involucre 10–12 mm high, 8–9 mm wide *P. multiflora*
5. Basal leaf blades oblanceolate to spatulate, the margins entire to lobed-dentate; capitulescences of solitary, terminal heads or weakly paniculate with 2–9 heads; involucre 15–30 mm high, 10–20(–35) mm wide 6
6. Flowering scapes decumbent; outer phyllaries entire *P. sublyrata*
6. Flowering scapes erect; outer phyllaries serrate or spiny *P. pungens*

1. *Perezia ciliosa* (Phil.) Reiche, Anal. Univ. Chile 116: 426. 1905.

Clarionea ciliosa Phil., Anal. Mus. Nac. Chile 8: 35. 1891. TYPE: Chile, Tarapacá, Cerro de Copacoya, 3500 m, 18 Feb 1885, *F. Philippi* 2250 (holotype, SGO, not seen; isotype, LP, not seen; photograph ex B, FM neg. 16066).

Small rosetted, perennial **herbs**, 3–10 cm tall; underground rhizome thick. Basal **leaves** elliptical or lanceolate, 20–100 mm long, 5–20 mm wide, glabrous, apically acute, the margins entire, densely and evenly ciliate; petioles winged and membranous; stem leaves 2–11, lanceolate, 5–10 mm long, 2–3 mm wide, scalelike apically acute, ciliate, glabrous. **Capitulescences** of solitary heads, terminal; peduncles 3–10 cm long, 1–7 per rosette. **Capitula** with involucre campanulate, 8–21 mm high, 9–20 mm wide; phyllaries 4–6-seriate, the outer ovate, 3–9 mm long, 1–3 mm wide, apically acute, entire or ciliate, the margins scarious, the inner lanceolate, 7–20 mm long, 1–3 mm wide, apically acute, entire, the margins scarious, reddish; florets blue or whitish, 14–43, the outer florets 8–25 mm long, the ligules 2–7 mm long. **Achenes** 4–5 mm long, villous; pappus 6–13 mm long.

DISTRIBUTION—Known from the Andean Cordillera of southern Peru (Arequipa) to Bolivia and Argentina (3500–4500 m).

Perezia ciliosa was reported from Arequipa (Volcán El Misti, *Stafford* 578, κ) by Vuilleumier (1969, p. 104); however, no material referable to this species has been encountered in this study and the description is taken from the previously mentioned work.

2. *Perezia coerulescens* Wedd., Chlor. And. 1: 39, 10A. 1855. TYPE: Peru, Cusco, *C. Gay s.n.* (holotype, P, not seen).

Perezia nivalis Wedd., Chlor. And. 1: 39. 1855. TYPE: Peru, Carabaya, 1847, *Weddell* 1848 (holotype, P, not seen; photograph ex P, FM neg. 38126), non *Homoianthus nivalis* Phil.

Perezia coerulescens Wedd. var. *amplibracteata* Tovar, Publ. Mus. Hist. Nat. “Javier Prado,” Ser. B, Bot. 8: 16. 1955. TYPE: Peru, Huancavelica, Huantanayoc–Tansiri, *O. Tovar* 1129 (holotype, USM 15714).

Perezia cirsiifolia Weddell, Chlor. And. 1: 41. 1855. TYPE: Bolivia, Larecája, Cordillera de Sorata, 5100 m, *H. Weddell s.n.* (holotype, P, not seen; isotype fragment ex P, F 971659; photograph ex P, FM neg. 38122).

Perennial **herbs**, acaulescent, rhizomatose. Bas-

al leaves in rosettes, petiolate; petioles 6–27 mm long, 4–6 mm wide, winged, membranaceous; blades oblanceolate to spatulate, 15–38 mm long, 6–12 mm wide, apically ovate, the margins deep wavy, pinnatilobed, 6–11 pairs of lobes, or sinuate-denticulate, rarely more or less entire, ciliate, slightly pubescent; cauline blades lanceolate, 10–20 mm long, 3–5 mm wide, glabrescent, the margins dentate-spinulose. **Capitulescences** of solitary, terminal heads; scape to 30 mm long, 1–4 in each rosette. **Capitula** with involucre campanulate 12–22 mm high, 7–12 mm wide; phyllaries 4–6-seriate, the outer oblong to ovate, dentate to spiny or rarely entire, the inner 13–20 mm long, 2–5 mm wide, elliptic-lanceolate to linear, apex spinose, pubescent; florets 7–25, the corollas blue, violet or whitish, 20–25 mm long, the tube 12–16 mm long, the outer lip 8–9 mm long, 2–4 mm wide, glabrous, the inner lip bipartite, coiled; anthers ca. 7 mm long; styles 14–16 mm long. **Achenes** cylindrical, 2.5–3.5 mm long, 1–1.5 mm wide, 5–6-costate, pubescent; pappus ca. 15 mm long.

DISTRIBUTION—Known from the Andean Cordillera of Ecuador, Peru, Bolivia, and northwestern Argentina (3800–5000 m).

Perezia coerulescens is a highly variable species most closely resembling *P. pinnatifida* but is distinguished from that species by its lanceolate lobes and ovate outer phyllaries with dentate, ciliate-spinose margins. Vuilleumier (1969, p. 138) reported hybridization between the two aforementioned species and some collections possess characteristics of both. In *P. coerulescens*, the leaf morphology is highly variable with a trend from dissected to entire leaves visible from mid-Peru through Bolivia. The name *P. virens* (D. Don) Hook. & Arn. has been applied to material here referred to as *P. coerulescens*; however, *P. virens* is a synonym of *P. poeppigii* Less., a central Chilean species (Vuilleumier, 1969, p. 144).

ANCASH. Carhuaz: Quebrada Ishinca, *Smith & Budensiek 11209* (F). **Recuay:** ca. 3 km below Cahuish Tunnel, *Smith & Goodwin 8757* (F). **Santa:** Coñocrangra, *Mostacero et al. 1929* (F). **Yungay:** above Yungay, *Weberbauer 3277* (USM). **AREQUIPA. Arequipa:** above Chiguata, *Straw 2303* (USM). **Cailloma:** Viscachani-Pampa de Tocra, *Perea 10* (USM); Cailloma, *Schmidt s.n.* (F 1222045); Pichu Pichu, *Stafford 808* (F). **AYACUCHO. Lucanas:** 93 km E of Puquio, *Gentry et al. 23293* (F). **CUSCO. Cusco:** Pico Sencca, *Vargas 2171* (F). **Quispicanchis:** Hacienda de Urco, *Schmidt s.n.* (F 1222644). **Urubamba:** Chincheros, *Tauca, King et al. 187* (F); Macchu-Picchu, *Peyton 99* (MO), *724* (MO); Yucay, *Soukup 721* (F); Santa Rosa, *Stafford 556* (F). **HUANCAVELI-**

CA. Castrovirreyna: Chiclococha, *Tovar 2888* (GH, USM). **Huancavelica:** above Kircay, *Amstutz 115* (MO); Huaytanayoccc-Tansiri, *Tovar 1149* (USM); Tansiri, near Mantata, *Tovar 1152* (USM), *1186* (GH), *1156* (USM). **HUANUCO. Dos de Mayo:** Valle Huallanca, *Tovar & Rivas 9922* (USM); Yanashallas, *Macbride & Featherstone 2481* (F, GH, US). **Huánuco:** Mito, *Macbride & Featherstone 1936* (F, GH, US). **JUNIN. Huancayo:** Huancayo, *Soukup 3235* (F). **Jauja:** Ricran, *Perez 37* (USM). **Yauli:** Laguna Punrun, *Aguilar s.n.* (USM); Yauli-San Cristobal, *Duncan et al. 2664* (F, MO); Casapata, *Encarnacion 193* (USM); near Morococha, *Grant 7562* (F); Oroya, *Kalenborn & Kalenborn 178* (MO, US); Pampa de Junín, *Tovar 2384* (USM); near Capillacocha, Carhuamayo, *Tovar 2414* (USM). **LIMA. Canta:** La Viuda, *Díaz, s.n.* (USM); Mishquipuquio, Huamantanga, *Sánchez 30* (USM), *31* (MO, USM); Carhuapampa, carretera Canta-Lachaqui, *Meza 160* (USM); above Huascoy, *Waechter s.n.* (USM). **Huaro-chiri:** Ticlio, between Casapalca and Oroya, *Diers 926* (USM); above Casapalca, Mina Caprichosa, *Hutchison & Tovar 4250* (F, GH, MO, UC, US, USM); Casapalca, *Macbride & Featherstone 843* (F, GH); Antaicocha, *Pennell 14661* (F, US). **MOQUEGUA. Mariscal Nieto:** between Torata & Carumas, *Dillon et al. 3349* (F). **PUNO. Azangaro:** Salcedo, Mt. Putina, *Vargas 9626* (F). **Carabaya:** ca. 20 km SE of Macusani, *Dillon et al. 1089* (F); Fauchinta, *Vargas 7169* (USM); without locality, *Soukup 364* (F, USM); *Rauh s.n.* (USM). **Huancané:** Moho, *Aguilar s.n.* (USM). **Puno:** San Antonio de Esquilache, *Stafford 706* (F), *738* (F), *741* (F), *871* (F).

3. *Perezia multiflora* (Humb. & Bonpl.) Less., *Linnaea* 5: 19. 1830.

Chaetanthera multiflora Humb. & Bonpl., *Pl. Aequin.* 2: 168, pl. 135. 1809. TYPE: Ecuador, Pichincha, Volcán Antisana, *Humboldt & Bonpland s.n.* (holotype, P, not seen; photograph ex P, FM neg. 38125).

Perezia bidentata Meyen, *Reise um die Erde* 1: 470. 1834. TYPE: Peru, Puno, Talarum, 14000–15000 ft, Apr 1831, *Meyen s.n.* (presumably destroyed, B, photograph ex B, GH).

Perennial herbs, erect, 10–70 cm high, glandular-pubescent. Basal leaves in rosette, petiolate or sessile; petioles 10–20 mm long, membranaceous; blades usually lanceolate to oblanceolate in outline, 60–250 mm long, 10–30 mm wide, coriaceous, glabrescent, the margins irregular dentate, spinulose, mucronate; cauline leaves linear-lanceolate, 20–75 mm long, 8–26 mm wide, basally amplexicaul, glandular-pubescent. **Capitulescences** of panicles or corymbs; scapes 10–40 cm high, glandulose. **Capitula** with involucre campanulate, 10–12 mm high, 8–9 mm wide; phyllaries 3–4-seriate, the outer ovate to triangular, spiny toward the bases, the margins irregular dentate, the inner ovate-lanceolate, 9–10 mm long, 3–3.2 mm wide, acuminate, spinulose, 3-nerved, glandular-pubescent; florets 34–44, the corollas

blue, whitish or violaceous, 6–10 mm long, the tube 5–6 mm long, glabrous, the outer lip 3.5–4 mm long, 1.8–2 mm wide, 4-nerved, glabrous, tridentate, the inner lip bipartite, ca. 3 mm long, linear-lanceolate, slightly coiled; anthers 2.8–3 mm long; styles filiform, 6–7 mm long. **Achenes** 2.5–4 mm long, 1–1.5 mm wide, cylindrical, pubescent; pappus ca. 8.6 mm long.

DISTRIBUTION—Known from the Andean Cordillera of northern Peru, Bolivia, and northwestern Argentina (3500–4800 m).

Perezia multiflora is readily distinguished by its basal rosette of lanceolate, spinulose and irregularly dentate leaves, robust paniculate capitulescences with 9 or more heads, and blue corollas. It is abundant along the Andean Cordillera where it is used in folk medicine and called *escorzonera*.

ANCASH. **Huaras:** ca. 35 km W of Huaras, *Dillon et al.* 3140 (F); Punta Caylan, *Ferreyra 14326* (USM). **Huari:** near Tunnel Cahuish, *Ames s.n.* (USM), *Smith & Buddensiek 11086* (MO, USM). **Huaylas:** Quebrada Los Cedros, Alpamayo, *Smith et al.* 9879 (F). **Recuay:** Carpa, *Smith & Escalona 10220* (F). **APURIMAC.** **Andahuaylas:** near Andahuaylas, *Ferreyra 2806* (MO, USM). **AREQUIPA.** **Arequipa:** no exact locality, *Guenther & Buchtien 911* (HBG). **AYACUCHO.** **Lucanas:** near Puquio, *Ferreyra 5496* (MO, USM). **CAJAMARCA.** **Cajamarca:** Porcón, *Sánchez 123* (F). **Hualgayoc:** near Coymolache, *Ferreyra 8570* (MO, USM); vicinity of Bambamarca, *King & Bishop 9116* (MO). **CUSCO.** **Calca:** Amparaes, *Chávez 3308* (MO); Pisac, *Marín 807* (USM), *1327* (F). **Canas:** Checca, *Vargas 1485* (MO); slopes of San Andres de Checca, *Vargas 11021* (F). **Espinar:** Yauri, *Núñez et al.* 7855 (F). **Paruro:** cerca a Occopata, *Vargas 889* (F). **Quispicanchis:** Ausangate, *Humbert 30787* (US). **Urubamba:** Taucá, *King et al.* 180 (F). **LA LIBERTAD.** **Jalca** de Huaguil, *López 1416* (MO, USM). **HUANCAVELICA.** **Huancavelica:** Quebradas W from Huancavelica, *Stork & Horton 10846* (F, GH); Machacchuy, *Tovar 867* (GH); Tansiri, Huaytanayoc, cerca a Manta, *Tovar 1174* (GH). **HUANUCO.** **Huánuco:** above Huánuco, *Ridout s.n.* (USM); Huánuco, *Soukup 2182* (F). **JUNIN.** **Huancayo:** between Acopalca and Pariahuanca, *Stork 10937* (F); near Huancayo, *Weberbauer s.n.* (USM). **Jauja:** between Concepción and Saitipo, *Ochoa 252* (USM). **Junin:** Oroya, *Kalenborn 112* (MO, US); Hondonos, *Tovar 2395* (USM); Nevado Acopalca, *Soukup 3684* (F, USM). **Tarma:** puna between Tarma and Oroya, *Ferreyra 3826* (USM), *10968* (USM); La Oroya, *Grant 7522* (F). **Yauli:** ca. 1 km W of Anticona Pass, *Dillon & Turner 1481* (F, MO, USM); Hacienda Pucará, *Hutchison & Tovar 4217* (F); near Atocsayco, *Pearson 845* (F), *1182* (F). **LIMA.** **Canta:** Carhuapampa, *Meza 165* (MO, USM); Auquimarca, *Peraldo 3263* (F). **Huorochiri:** Casapalca, *Asplund 11440* (US); above Chiela, *Ferreyra 6512* (MO, US, USM); Río Blanco, *Macbride & Featherstone 654* (F, GH, US); Río Blanco, *Killip & Smith 21705* (F, US); Cerro Colorado near Antaicocha, E of Canta, *Pennell 14652* (F, GH, US). **PASCO.** **Cerro de Pasco:** Bosque de Piedras, *Urquiza 3* (USM). **PUNO.** **Carabaya:** cerca de abra de Antapampa, *Vargas 7004* (F); between Ma-

cusani and Nuñoa, *Vargas 7143* (USM). **Huancané:** Moho, *Shepard 109* (MO, USM), Tincopalca, *López 7361* (MO); near Huancané, *Aguilar 149* (MO, USM). **Puno:** Cerros de Puno, *Zuñiga 33* (USM); Araranca, *Pennell 13429* (F, GH, US). **TACNA.** **Tacna:** Cordillera de Volcán Tacora, Chislluma, *Werdermann 1142* (F, GH, US).

4. *Perezia pinnatifida* (Humb. & Bonpl.) Wedd., *Chlor. And.* 1: 40. 1855.

Chaetanthera pinnatifida Humb. & Bonpl., *Pl. Aequin.* 2: 170, pl. 136. 1809. **LECTOTYPE** (designated by Vuilleumier, 1969): Ecuador, Cotopaxi, *Humboldt & Bonpland s.n.* (lectotype, pl. 136 in *Plantae Aequinoctialis*).

Perennial herbs to 10 cm tall, rhizomatose, the rhizome incrassate. Basal leaves rosette, usually longer than the stem, petiolate; petioles 27–70 mm long, 5–8.5 mm wide, membranaceous, transparent; blades lanceolate to lyrate in outline, 35–60 mm long, 10–15 mm wide, the margins pinnatifid with 10–15 pairs of lobes, slightly imbricate, rounded, obtuse, glandular-pubescent, entire, ciliate; cauline leaves lanceolate, 23–45 mm long, 3.5–5.5 mm wide, sessile, the margins dentate, pubescent, gradually smaller to the apex. **Capitulescences** of solitary, terminal heads, the scapes 4–9 cm long, pubescent. **Capitula** with involucre campanulate, 10–25 mm high, 10–13 mm wide; phyllaries 4–5-seriate, the outer oblong, rounded, the inner linear-lanceolate, 15–24 mm long, 3–5 mm wide, acuminate, membranaceous, 3-nerved, glandulose-pubescent, glabrescent distally; florets 20–25, the corollas blue-whitish, 15–24 mm long, the tube 9–14 mm long, the outer lip 6–9 mm long, 2–3 mm wide, 4-nerved, apex tridentate, glabrous, the inner lip bipartite, coiled; anthers 5–6 mm long, sagittate; style filiform, 11–13 mm long, branches truncate, papillose. **Achenes** 3–4 mm long, 1–1.2 mm wide, cylindrical, pubescent, 6–8 costate; pappus ca. 18 mm long.

DISTRIBUTION—Known from the Andean Cordillera of Colombia, Ecuador, Peru, Bolivia, and northwestern Argentina (3000–4600 m).

Perezia pinnatifida closely resembles *P. coerulescens*, from which it differs in its incrassate rhizome, elongated petioles, strongly pedunculate capitula, and pandurate outer phyllaries.

ANCASH. **Bolognesi:** Pampa de Lampas, *Cerrate 1450* (MO, USM); Ocos, *Weberbauer 2780* (USM); Río Pumapampa, *Tovar & Rivas 9640* (USM). **Huaras:** near Huaras, *Cerrate 7707* (MO, USM); between Huaras and La Union, *Tovar & Rivas 9852* (USM). **APURIMAC.** **Andahuaylas:** near Andahuaylas, *Hjerting & Petersen 1441* (USM).

AREQUIPA. Caraveli: near Quicacha, *Guevara s.n.* (USM). **CUSCO.** Urubamba: Antakillqa, *Davis et al.* 1703 (F, USM); Chinchero, *Franquemont & Franquemont* 369 (F). **HUANCVELICA.** Huancavelica: Paso de Chonta, *Tovar* 2947 (GH, USM). **JUNIN.** Yauli: Yauli, *Macbride & Featherstone* 929 (F); Nevado Acopalca, *Soukup* 3698 (MO, USM). **LIMA.** Canta: Auquimarca, *Peraldo* 3280 (F). **Huorochiri:** Langa, *Cerrate et al.* 4725 (MO, USM); Lake Avascocha, Casapalca, *Saunders* 1150 (F). **Yauyos:** Huacacochoa, *Cerrate & Tovar* 639 (USM); Río Blanco, *Macbride* 3031 (F, GH). **PASCO.** Pasco: Huarón, *Macbride & Featherstone* 1136 (F). **PUNO.** Puno: San Antonio de Esquilache, *Stafford* 1280 (F).

5. *Perezia pungens* (Humb. & Bonpl.) Less., *Linnaea* 5: 20. 1830. **Figure 15.**

Chaetanthera pungens Humb. & Bonpl., *Pl. Aequin.* 2: 146, pl. 127. 1809. TYPE: Ecuador, Pichincha, *Humboldt & Bonpland s.n.* (holotype, v, presumably destroyed; photographs ex v, FM neg. 16084; isotype, p, not seen).

Perezia ciliaris D. Don ex Hook. & Arn., *Companion Bot. Mag.* 1: 34. 1835. LECTOTYPE (designated by Vuilleumier, 1969): Chile, *J. Dombey s.n.* (lectotype, p, isolectotype, G, photograph ex G, FM neg. 8278; isolectotype fragment ex p, F 972652).

Clarionea macrocephala Schultz-Bip. in *Lechler, Berb. Amer. Austr.* 57. 1857. Vuilleumier (1969) lists this taxon as a nomen nudum and cites *Tovar's* (1955) transfer to *Perezia* as invalid.

Perezia stuebelii Hieron., *Bot. Jahrb. Syst.* 21: 372. 1895. TYPE: Peru, Cajamarca, between Pacasmayo and Moyobamba, *A. Stübel* 34 (holotype, v, presumably destroyed, photographs ex v, FM neg. 16088).

Perezia weberbaueri Hieron. ex Domke, *Notizbl. Bot. Gart. Berlin-Dahlem* 13: 249. 1936. TYPE: Peru, Puno, Sandia, Cuyocuyo, *A. Weberbauer* 933 (holotype, v, presumably destroyed; photograph ex v, FM neg. 16091; isotype fragment, F 1012351).

Perezia conaicaensis Tovar, *Publ. Mus. Hist. Nat.* "Javier Prado," Ser. B, Bot. 8: 31. 1955. TYPE: Peru, Huancavelica, Huancavelica, Conaica, Laría, 8 km SW of Conaica, 3900–4000 m, 30 Mar 1952, *O. Tovar* 903 (holotype, USM; isotype, GH).

Perezia coriacea Tovar, *Publ. Mus. Hist. Nat.* "Javier Prado," Ser. B, Bot. 8: 21. 1955. TYPE: Peru, Huánuco, Huánuco, Mitotambo, above Mito, *R. Ferreyra* 9431 (holotype, USM 31602; isotypes, GH, MO).

Perezia fosbergii Tovar, *Publ. Mus. Hist. Nat.* "Javier Prado," Ser. B, Bot. 8: 22. 1955. Peru, Cajamarca, Celendín, Las Lajas, *F. R. Fosberg* 28123 (holotype, USM).

Caulicent, perennial herbs, 10–80 cm tall, rhizomatose. Basal leaves in a loose rosette, or rarely marcescent at flowering, sessile to petiolate; petioles 10–120 mm long; blades spatulate to oblanceolate, 50–200 mm long, 15–50 mm wide, gradually tapering to an attenuate base, apically obtuse to rounded, glabrous to strigillose or glandular-

puberulent, the margins entire to lobed-dentate, slightly revolute, ciliate to spinulose; cauline leaves lanceolate to elliptic or oblong, 15–50 mm long, 3–18 mm wide, sessile, the bases truncate or auriculate and clasping, apically attenuate to obtuse, the margins entire to denticulate, ciliate to spinulose. **Capitulescences** of solitary, terminal heads or weakly paniculate with 2–9 heads, the primary peduncles 10–80 cm long, bracteolate. **Capitula** with involucre campanulate to turbinate, 15–30 mm high, 10–20 mm wide; phyllaries 4–6-seriate, the outer lanceolate, narrowly ovate, or spatulate, 5–20 mm long, 3–7 mm wide, ciliolate, serrate or spiny, coriaceous to scarious or membranous, the inner lanceolate to oblong, 14–18 mm long, 3–5 mm wide, apically acuminate, entire to denticulate, glandular-puberulent, 3-nerved; florets 10–68, the corollas white, blue, violet, or pinkish, 16–21 mm long, the tube 8–10 mm long, the outer lip 7–10 mm long, 2.8–3.2 mm wide, 4-nerved, tridentate, pubescent, the inner lip bifid, 6–7 mm long, coiled; anthers 5–6 mm long; styles 10–12 mm long. **Achenes** cylindrical, 2.2–4 mm long, 1–1.5 mm wide, glandular-papillose to strigillose, 5–8-costate; pappus 12–13 mm long.

DISTRIBUTION—Known from high-elevation habitats within the Andean Cordillera of southern Ecuador, Peru, Bolivia, and adjacent northern Argentina (3000–4600 m).

Perezia pungens is readily recognized among Peruvian species by its basal rosette of spatulate leaves and erect, foliose capitulescences with one to nine heads. It most closely resembles *P. sublyrata* but is distinguished from that species by its generally longer stems, larger capitula, entire to weakly dentate basal leaf blades, and ciliolate to spinulose outer phyllaries. *Perezia pungens* is here considered a highly variable species with several different ecotypes recorded from within its range. Vuilleumier (1969) recognized *P. ciliaris* as a distinct species but detected putative hybrids between it and *P. pungens* in the region of northern Peru and southern Ecuador. She speculated (p. 95) that these two species might merely be ecotypes, and, after examining a large suite of specimens from throughout the range, it appears likely that *P. ciliaris* merely occupies drier sites and only differs quantitatively from typical *P. pungens*. Harling (1991, p. 102) was also unable to distinguish these two species in Ecuador and placed all within the range of *P. pungens*.

AMAZONAS. Chachapoyas: Calla-Calla, *Raimondi*

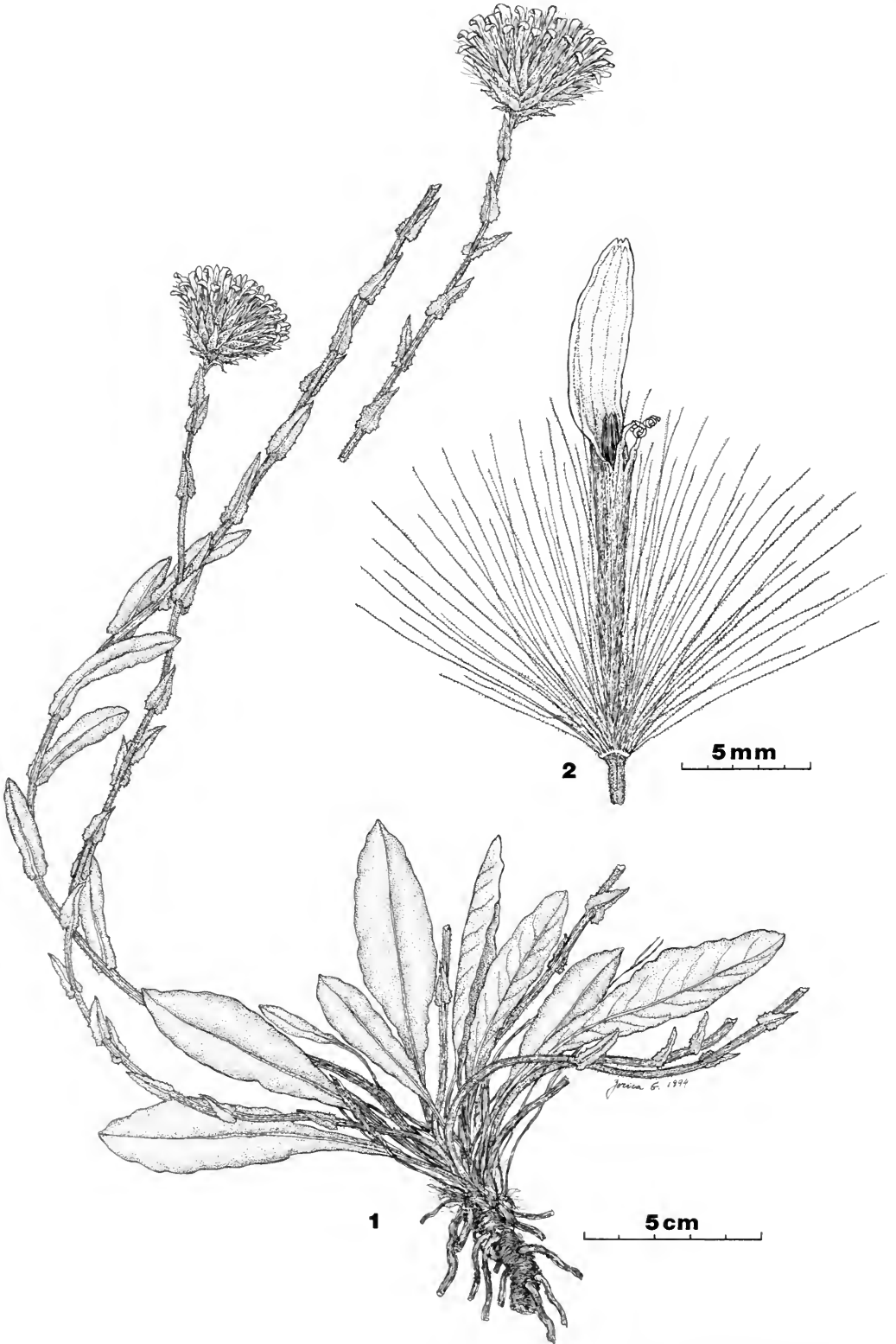


FIG. 15. *Perezia pungens*. 1, habit; 2, floret with achene. (Drawn from A. Weberbauer 6973, F.)

s.n. (USM). **ANCASH. Bolognesi:** Laguna Huamanhueque, *Cerrate 1556* (USM); Pampa de Lampas, *Cerrate 1463* (USM); Cerros de Chiquián, *Cerrate 1391* (USM). **Huaras:** between Punta Cayllan and Cajamarquilla, *Ferreyra 14310* (USM); arriba Huaras, *Tovar & Rivas 9527* (USM); near Huaras, *Weberbauer s.n.* (USM). **Huari:** Quebrada Rima Rima, *Smith et al. 12206* (F); Quebrada de Yuracocha, *Smith et al. 12725* (F). **Huaylas:** Quebrada Alpamayo, *Smith et al. 9797* (F); Auquispuquio, *Smith et al. 12096* (F). **Recuay:** between Recuay and Chavin, *Ferreyra 14532* (USM). **Santa:** arriba de Lamparín, *Mostacero et al. 1843* (F). **Yungay:** 25 km E of Yungay, *Edwin & Schunke 3808* (F); Llanganuco, *Ferreyra 14357* (GH, USM), *16845* (USM); Yungay to Yauya, *Gentry et al. 37395* (F, MO, USM). **AREQUIPA. Cailloma:** Valle de Colca, ca. 100 km N de Arequipa, *Treacy 770* (F). **AYACUCHO. Huanta:** Hacienda Pargora, *Killip & Smith 23303* (US). **CAJAMARCA. Cajamarca:** Cumbe Mayo, *Sánchez 3431* (F, CPUN). **Celendín:** Cruz Conga, Cumulca, *Ferreyra 13277* (USM); Cumulca, jalca near Celendín, *Ferreyra 15128* (USM); above Balsas, *Hutchison & Wright 5214* (F, MO, UC); near Celendín, *Ochoa 1515* (USM); Quinua-mayo, *Pennell & Reichlin 15055* (USM); Jalca de Kumlca, *Sagástegui et al. 12055* (F). **Contumazá:** Cascabamba, *Sagástegui et al. 9030* (F); Las Campanillas, *Sagástegui et al. 9153* (F); Pozo Kuán, *Sagástegui et al. 10076* (F), *10770* (F); Pozo Chuño, *Sagástegui et al. 14005* (F). **Hualgayoc:** near Coymolache, *Ferreyra 8573* (USM); Koi-molache, *Sánchez et al. 795* (F); Hualgayoc, *Weberbauer 3957* (USM). **San Miguel:** arriba de El Tingo, *Mostacero et al. 1209* (F); Cerro Quillón, *Sagástegui et al. 9590* (F). **Santiago de Cusco:** Cerro La Botica, *Sagástegui et al. 11880* (F). **CUSCO. Calca:** Pisac, *Marín 1898* (F, US). **Convencion:** Lucumayo Valley, *Cook & Gilbert 1261* (US). **Cusco:** Sacsayhuamán, *Vargas 4091* (F); Ayanacu, *Vargas 16268* (US). **Paucartambo:** Acjanaco, *Cano 3404* (F); Valle del Paucartambo, hacienda Churu, *Herrera 2328* (F); Pillahuata Valley, *Herrera 3335* (US); Tres Cruces, *Pennell 13814* (F, GH, US); Escalera yoc, *Vargas 11180* (F, GH, US); Acjanacu Pass, *Vuilleumier 250* (F); Corihuayrachina, *Woytkowski 624* (USM). **Quispicanchis:** Quispicanchis, *Herrera 1085* (US); **Urubamba:** Chincheros, *Davis et al. 1648* (F, USM), *1693* (F); Gutierrezchayoj, *King et al. 285* (F, USM); Lomas de Puyupatamarca, *Vargas 2730* (F, USM). **HUANCAVELICA. Huancavelica:** Conaica-Laria, *Tovar 792* (USM); Huando, *Tovar 1281* (USM). **Tayacaja:** Hacienda Alalay, between Mariscal Cáceres and Pampas, *Tovar 1289* (USM); Motcca, *Tovar 252* (US, USM); Sachahuaccta, *Tovar 934* (USM). **HUANUCO. Dos de Mayo:** Huallanca, *Tovar & Rivas 9906* (USM). **Huánuco:** Chinche, *Macbride & Featherstone 1258* (F); Mito, *Macbride & Featherstone 1664* (F); 15 km SE of Huánuco, *Macbride & Featherstone 2116* (F, GH). **JUNIN. Huancayo:** Huancayo, *Soukup 2971* (F). **Junín:** Laguna Punrun, *Aguilar s.n.* (USM); Cordillera Raura, *Rauh & Hirsch P1831* (NY). **Tarma:** Acobamba, *Woytkowski 69* (F). **Yauli:** Yauli, *Macbride & Featherstone 925* (F). **LA LIBERTAD. Otusco:** Hacienda Llaguen, *López 605a* (USM). **Patáz:** between Tayabamba and Huancaspata, *López & Sagástegui 8204* (GH). **LIMA. Cajatambo:** Oyón, *Ferreyra 3552* (USM). **Canta:** Paclla, above Canta, *Meza 196* (USM). **Huarochari:** Chaccha, *Cerrate & Tovar 1600* (USM); Manzanacha, *Tovar & Cerrate 1737* (USM); Infernillo, *Ferreyra 6243* (USM). **PIURA. Huancabamba:** Huancabamba, *Townsend A215* (F). **PUNO. Huancané:** Moho, *Aguillar 177* (USM); Amantani, *Aguilar 446* (USM).

Sandia: above Cuyocuyo, *Díaz s.n.* (USM). **No exact locality:** *Weberbauer 6973* (USM).

6. *Perezia pygmaea* Wedd., *Chlor. And.* 1: 40. 1855. TYPE: Bolivia, La Paz, ravine of Chuquiaguillo, *H. Weddell s.n.* (holotype, P, not seen; photograph ex P, FM neg. 38128).

Perennial herbs to 3 cm high, rhizomatose. Leaves in rosette, petiolate; petioles 3–10 mm long; blades oblanceolate or elliptic-lanceolate, 10–30 mm long, 5–6 mm wide, basally attenuate, apically obtuse, the margins pinnatifid, rarely entire, 3–5 pairs of lobes, ciliate, glabrescent. Capitulescences of solitary, terminal heads; subsessile, the scapes glandulose-pubescent, bracteate, bracts linear. Capitula with involucre cylindrical, 10–15 mm high, 5–6 mm wide; phyllaries 4–5-seriate, the outer ovate, 7–15 mm long, 2–5 mm wide, broadly scarious, the inner elliptic-lanceolate, 10–12 mm long, 2–3 mm wide, greenish, mucronate, the apices entire, slightly pubescent, 3-nerved; florets 7–15, the corollas blue, 13–15 mm long, the tube 7–8 mm long, the outer lip 6–7 mm long, 3–3.5 mm wide, glabrous, 4-nerved, tridentate, the inner lip linear-lanceolate, bipartite, 4–5 mm long; styles 9–11 mm long. Achenes 2–3 mm long, 1–1.5 mm wide, 5–7-costate, glandular-papillose; pappus ca. 11 mm long, white.

DISTRIBUTION—Known from high-elevation habitats within the Andean Cordillera from central Peru to northwestern Argentina (4000–5100 m).

Perezia pygmaea closely resembles *P. coerulescens* but differs in possessing smaller leaves, cylindrical involucre, and phyllaries and pappus to only 12 mm long.

CUSCO. Quispicanchis: Ausangate, *Rauh 1140* (USM). **HUANCAVELICA. Castrovirreyna:** Laguna Choclococha, *Tovar 2920* (GH, USM). **Huancavelica:** cerca Manta, *Tovar 1115* (USM); **JUNIN. Junín:** Cazapato, Lago Junín, *Aguilar 1089* (USM). **Yauli:** near Morococha, *Grant 7576* (GH). **LIMA. Huarochari:** Mina Caprichosa, above Casapalca, *Hutchison & Tovar 4259* (F, NY, UC, US, USM); Casapalca, *Macbride & Featherstone 846* (F, GH); Laguna Tuctococha, *Tovar & Cerrate 1624* (USM). **PUNO. Azángaro:** Putina, *Monheim 55* (USM).

7. *Perezia sublyrata* Domke, *Notizbl. Bot. Gart. Berlin-Dahlem* 13: 248. 1936. TYPE: Peru, Puno, Santa Rosa, 14,500 ft, Apr–May 1934, *D. Stafford 345* (holotype, K; isotype, BM, not seen).

Perezia sublyrata var. *glabrescens* Tovar, Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot. 8: 11. 1955. TYPE: Peru, Cusco, Paucartambo, near Río Quencomayo, below Colquepata, F. W. Pennell 13789 (holotype; GH; isotypes, F 558098, NY).

Perennial herbs to 25 cm tall, rhizomatose. Basal leaves in rosette, petiolate; petioles 20–40 mm long, 3–3.5 mm wide at the base, membranaceous; blades oblanceolate to spatulate in outline, conspicuously lyrate, 20–100 mm long, 11–20 mm wide, basally attenuate, apically obtuse, glabrescent, the margins ciliate-spinulose; cauline leaves linear-lanceolate to spatulate, 7–26 mm long, 2–5.4 mm wide, sessile, the margins entire to remotely sinuate-dentate, mucronate. Capitulescences of solitary, terminal heads; scapes 35–110 mm high, decumbent, glandulose-pubescent. Capitula solitary, terminal; involucre campanulate, 16–20 mm high, 9–12 mm wide; phyllaries 4–6-seriate, the outer oblong-lanceolate, 7–13 mm long, 2–6 mm wide, entire or slightly dentate at the base, apically acute, mucronate, the inner 14–18 mm long, 3–5 mm wide, ovate-lanceolate to lanceolate, membranaceous, glabrescent, rarely glandulose outside, 3-nerved, apically acute, the margins scarious, entire; florets 20–24, the corollas violaceous, 21–24 mm long, the tubes 11–14 mm long, the outer lip 8–10 mm long, 2–3 mm wide, glabrous, 4-nerved, tridentate, the inner lip bipartite, coiled; anthers 5–6 mm long; styles 16–18 mm long. Achenes 2.5–3 mm long, 1–1.5 mm wide, ovoid, glandulose, 5–6-costate; pappus ca. 14 mm long.

DISTRIBUTION—Known from high-elevation habitats from central Peru to Bolivia (3300–4400 m).

Perezia sublyrata is characterized by the lyrate leaves with laminar petioles and decumbent flowering scapes.

JUNIN. Yauli: near Oroya, Kalenborn 115 (GH, US). PUNO. Puno: Araranca, Pennell 13442 (F, GH, US).

XVII. PLAZIA

Plazia Ruiz Lopez & Pavón, Fl. peruv. prodr. 104. 1794. TYPE: *Plazia conferta* Ruiz Lopez & Pavón

Key to Peruvian Species of *Plazia*

1. Leaves 22–42 mm long, 5–6 mm wide, glabrous; capitula with ca. 42 florets; ray florets 18–20; achenes glabrous *P. conferta*

Harthamnus H. Robinson, Phytologia 45: 451. 1980. TYPE: *Harthamnus boliviensis* H. Robinson = *Plazia daphnoides* Wedd.

Shrubs to 1 m, the branches erect; stems lacking spines. Leaves simple, sessile, in whorls at branch tips; blades oblanceolate, glabrous to glandular, usually appressed, the margins entire. Capitulescences of solitary, terminal heads, sessile. Capitula heterogamous, radiate; involucre campanulate; receptacles plane, glabrous; phyllaries 5–7-seriate, lanceolate; ray florets 7–20, the corollas ligulate-bilabiate, the outer lip 4-nerved, tridentate, the inner lip bifid; styles cylindrical, glabrous, bifid, the branches short, inconspicuous; disc florets 10–42, the corollas tubular, actinomorphic, glabrous, the limb deeply 5-lobed, the lobes greater than $\frac{1}{3}$ the length of the corolla, coiled; anthers linear, the terminal appendages lanceolate, fused into a column, truncate, the bases caudate; styles claviform, the branches short, rounded. Achenes dimorphic, glabrous or glandular-pubescent; pappus of scarbrid bristles, isomorphic, yellow.

Plazia consists of perhaps three species confined to the Andean Cordillera of Peru, Bolivia, Chile, and Argentina. The genus is easily recognized by its woody habit, sessile capitula, and purple to pink, connate anther appendages exerted from the disc florets. In Peru, the following two species are recorded from central to southern departments, usually in high-elevation, dry sites.

References

- CABRERA, A. L. 1951. Notas sobre Compuestas de la América Austral. Darwiniana, 9: 363–386.
———. 1960. Notas sobre tipos de Compuestas Sudamericanas en herbarios Europeos. III, Los tipos de Ruiz y Pavón. Bol. Soc. Argent. Bot., 8: 195–215.
FERREYRA, R. 1980. El género *Plazia* en el Perú. Bol. Soc. Peruana Bot., 8: 101–105.
ROBINSON, H. 1980. *Harthamnus*, a new genus of Mutisieceae from Bolivia. Phytologia, 45: 451–455.

1. Leaves 10–20 mm long, 3–4 mm wide, glandular-pubescent; capitula with 17–19 florets; ray florets 7–8; achenes glandular-pubescent *P. daphnoides*

1. *Plazia conferta* Ruiz Lopez & Pavón, Syst. veg. fl. peruv. chil. 187. 1798. TYPE: Peru, Junín, Acobamba [near Tarma], Ruiz Lopez & Pavón s.n. (holotype, MA, not seen).

Shrubs, branched, branches glabrous. **Leaves** oblanceolate, 22–42 mm long, 5–6 mm wide, glabrous, sessile, acute-mucronate, margin entire. **Capitula** with involucre 18–22 mm high, 12–16 mm wide; phyllaries 6–7-seriate, glabrous, lanceolate, the inner 22–25 mm long, 3–3.5 mm wide, acute, the outer gradually smaller; ray florets 18–20, the corollas 26–28 mm long, the tube 10–11 mm long, glabrous, the outer lip 14–15 mm long, 5–6 mm wide, 4-nerved, tridentate, the inner lip bipartite; disc florets 40–42, the corollas 15–18 mm long, the tube glabrous, the lobes 9–10 mm long, 1–1.2 mm wide, coiled; anthers 6–7 mm long. **Achenes** [ray] 4–5 mm long, 1.5–1.6 mm wide, glabrous; pappus ca. 12 mm long; [disc] 4.5–5 mm long, 1–1.2 mm wide; pappus ca. 14 mm long.

Plazia conferta is a rare species, and no new material has been collected until the gathering made by Felix Woytkowski at the type locality more than 100 years after its original description. Cabrera (1960) was unsuccessful in locating Ruiz and Pavón's type material in the major European herbaria, including Madrid.

DISTRIBUTION—Endemic to the Andean Cordillera of central Peru.

JUNIN. Tarma: Acobamba, between Tarma and San Ramon, Woytkowski 52 (USM).

2. *Plazia daphnoides* Wedd. Chlor. And. 1: 13, pl. 2B. 1855. LECTOTYPE (here designated): Peru, "Cordillera de Tacora, entre Tacna et La Paz," Weddell s.n. (lectotype, P, not seen; isolectotype ex P, F 971331). **Figure 16.**

Harthamnus boliviensis H. Robinson, Phytologia 45: 451. 1980. TYPE: Bolivia, Cochabamba, SE of Cochabamba, vicinity of Rodeo, 3500 m, 5 Mar 1979, J. A. Hart 1739 (holotype, us 2854177, not seen; photograph ex us, FM neg. 1944785).

Shrubs to 2 m, resinose. **Leaves** subsessile; blades oblanceolate to lanceolate, 10–20 mm long, 3–4 mm wide, apically acute, basally cuneate, glandular-pubescent, the margins ciliate. **Capitula** with involucre 18–20 mm high, 7–8 mm wide; phyl-

laries 5–6-seriate, pubescent, lanceolate, the inner 20–21 mm long, 2.4–3 mm wide, acuminate, the outer smaller; ray florets 7–8, the corollas 20–21 mm long, geniculate, the tube 11–11.5 mm long, the outer lip 9–9.5 mm long, 2–3 mm wide, tridentate, the inner lip bipartite, 6–7 mm long, coiled; disc florets 10–11, the corollas white, 13–14 mm long, the tube geniculate, 10–11 mm long, the lobes 7–8 mm long, coiled; anthers 5–6 mm long. **Achenes** [ray] 4.5–5 mm long, 1.2–1.4 mm wide, glandular; pappus ca. 13 mm long; [disc] 5–5.5 mm long, 1 mm wide, glandular; pappus ca. 12.5 mm long.

DISTRIBUTION—Known from the Andean Cordillera of southern Peru, Bolivia, Chile, and Argentina (3500–4000 m).

Plazia daphnoides displays the greatest distribution and frequency within the genus. The lectotype was selected from the available syntypes in the original protolog, which also included a Bolivian collection (*d'Orbigny 1386*, P) designated as β . The lectotype was collected by Weddell in the Cordillera Tacora near Tacora, a region now part of northern Chile, and there can be little doubt that Weddell derived his description from material he had collected in the area that was Peru until the 1870s.

Robinson's (1980) new genus and species, *Harthamnus boliviensis*, was discovered to be a synonym of *Plazia daphnoides* by Robinson shortly after its publication.

AYACUCHO. Ayacucho: 83 km W of Puquio, Gentry et al. 23273 (F); Coracora, Keel 698 (USM); near Puquio, Rauh P423 (USM).

XVIII. POLYACHYRUS

Polyachyrus Lag., Amer. nat. Españ. 1: 37. 1811.

TYPE: *Cephaloseris poeppigii* Kunze ex Less. = *Polyachyrus poeppigii* (Kunze ex Less.) Less.

Annual or perennial **herbs**, erect or decumbent, branched, branches terete, pubescent or glabrous. **Leaves** alternate; blades lanceolate to oblanceolate in outline, the bases amplexicaul to decurrent, the apices more or less mucronate, membranaceous or succulent, glabrous to glandular, the adaxial surfaces lanose, the abaxial surfaces albo-lanugi-

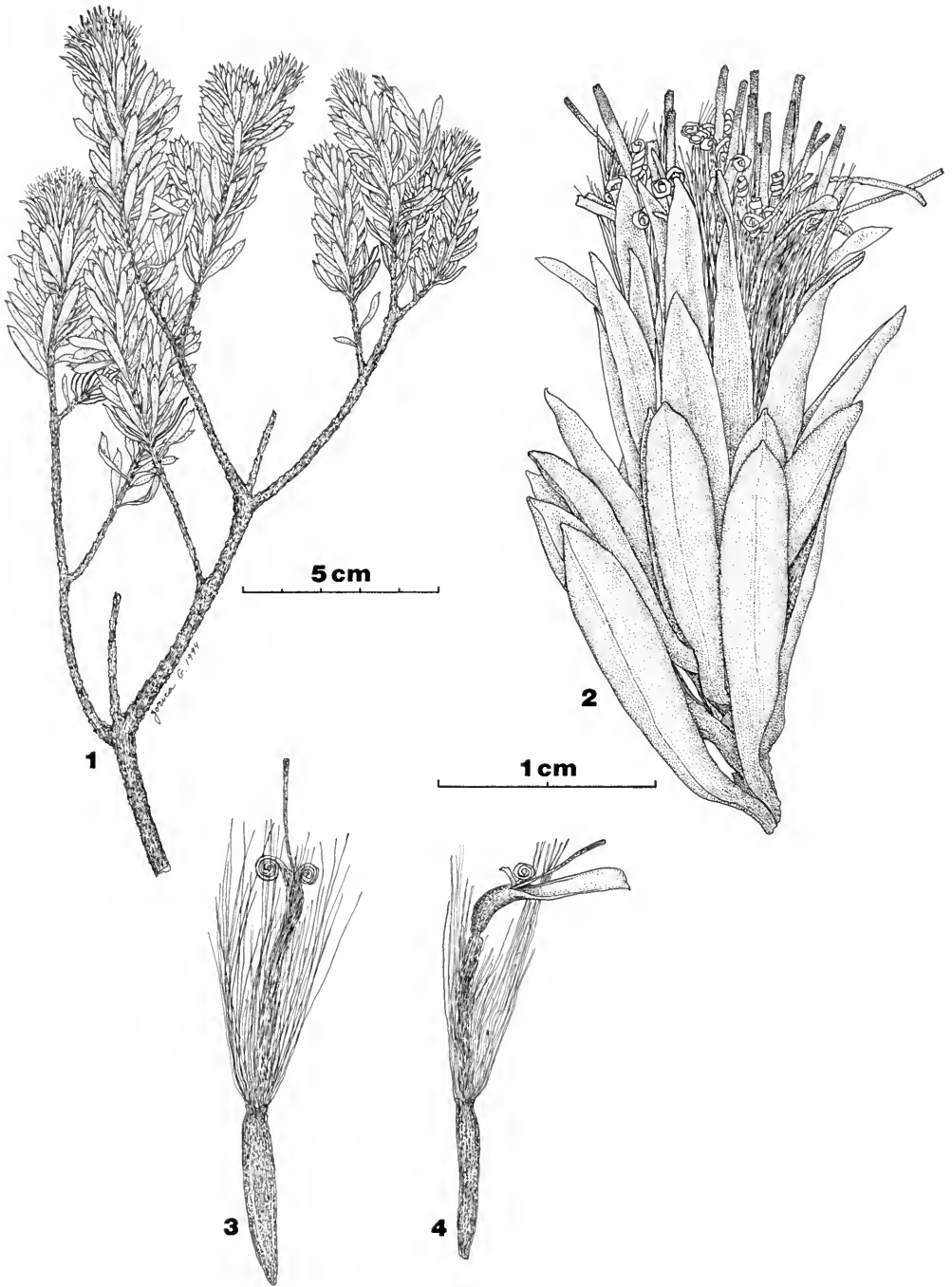


FIG. 16. *Plazia daphnoides*. 1, habit; 2, capitulum, 3, disc floret with achene; 4, ray floret with achene. (Drawn from A. Gentry et al. 23273, F.)

nose, the margins entire to pinnatilobed or pinnatisect, the lobes or teeth mucronate or spiny. **Capitulescences** of glomerulate clusters of 9 or more heads, solitary or pseudocorymbose. **Capitula** with

2 (or rarely 3) florets, sessile; involucre cochleiform with 5 bracts; receptacles plane, glabrous; phyllaries 4–5-seriate, oblong, glabrous; florets homogamous, the corollas reddish or violaceous,

bilabiate; anthers 5, exserted, sagittate; style branches apically obtuse. **Achenes** oblong, glandular-puberulent to pilose; pappus of plumose bristles, 1-seriate.

Polyachyrus contains seven species distributed throughout the Andean Cordillera of Peru and Chile, with the greatest diversity in the coastal *lomas* formations. In Peru, one species is recorded from Andean Cordillera and two from adjacent coastal localities.

Key to Peruvian Species of *Polyachyrus*

- 1. Plant annual, erect *P. annuus*
- 1. Plant perennial, decumbent 2
 - 2. Leaves succulent, the blades oblong, the adaxial surface glandular, the abaxial surfaces arachnoid *P. fuscus*
 - 2. Leaves membranaceous, the blades lanceolate, the adaxial surfaces arachnoid, the abaxial surfaces white-tomentose *P. sphaerocephalus*

1. *Polyachyrus annuus* Johnston, Contr. Gray Herb. 8: 134. 1929. TYPE: Chile, Antofagasta, Tocopilla, Caleta Duendes, *I.M. Johnston* 3538 (holotype, GH).

P. mollendoensis Johnston, Contr. Gray Herb. 8: 134. 1929. TYPE: Peru, Arequipa, Islay-Mollendo, *I. M. Johnston* 3539 (holotype, GH).

Annual **herbs**, 18–35 cm high, erect, stem pubescent. **Leaves** amplexicaul, membranaceous; blades oblong to lanceolate, 35–180 mm long, 10–50 mm wide, the adaxial surfaces arachnoid, the abaxial surfaces lanuginose, the bases auriculate, the auricle orbicular, 1–3 mm wide, the margins pinnatilobed. **Capitulescences** of 1–3 glomerules, weakly cymose. **Capitula** biflorous, terminal or axillary; peduncles 2–10 cm long, lanuginose; florets homogamous in pairs: 1 outer lip floret with 1 bract and 1 interior floret with 4 bracts, 4–5 mm long, 2.5–3 mm wide, the corollas reddish to violaceous, fragrant, the tube 2.5–3 mm long, the outer lip 3.5–3.8 mm long, 1.8–2 mm wide, the interior bilobed, 3.5–3.8 mm long, the lobes coiled, glabrous. **Achenes** oblong, ca. 1 mm long, pilose; pappus (outer florets) 0.7–1 mm long, (inner florets) 3–4 mm long.

DISTRIBUTION—Known from coastal habitats in southern Peru to northern Chile (50–700 m).

AREQUIPA. Camaná: near Camaná, *Ferreyra* 6437

References

RICHARDI, M., AND E. WELDT. 1974. Revisión género *Polyachyrus* (Compositae). *Gayana*, 26: 3–34, pls. 1–7.

(MO, USM), 8833 (MO, USM), 11684 (MO, USM). **Caraveli:** Atico, *Ferreyra* 2518 (US, USM), 2675 (MO, USM), 11538 (MO, USM), 12027 (USM), 18628 (MO, USM). **Islay:** ca. 10 km NW of Islay, *Dillon & Dillon* 3957 (F); Mollendo, *Ferreyra* 12598 (MO, USM), 18650 (MO, USM); Mejia, *Ferreyra* 6407 (MO, USM); Mollendo, *Stafford* 901 (F); Mollendo, *Vargas* 8591 (GH); E of Mollendo, *Worth & Morrison* 15758 (GH, MO). **MOQUEGUA.** **Mariscal Nieto:** near Ilo, *Ferreyra* 11611 (MO, USM), 12571 (MO, USM); Mostacilla, *Vargas* 8591 (USM). **TACNA.** Tacna: Morro Sama, *Ferreyra* 12556 (MO, USM).

2. *Polyachyrus fuscus* (Meyen) Walpers in Meyen, Nov. Actorum Acad. Caes. Leop.-Carol. Nat. Cur. 19, Suppl. 1: 288. 1843.

Diaphoranthus fuscus Meyen, Reise um die Erde 1: 406. 1864. TYPE: Chile, Cordillera de Copiapó, 4000 ft, *F. J. F. Meyen* s.n. (holotype, v, presumably destroyed; photograph ex B, FM neg. 15992). *P. nesites* Johnston, Contr. Gray Herb. 95: 85. pl. 7. fig. 4. 1931. TYPE: Peru, Ica, Pisco, Isla San Gallan, *R. Murphy* 3467 (holotype, GH).

Suffrutescent **herbs**, decumbent, branched, branches terete, glandular, 30–80 cm tall. **Leaves** succulent, amplexicaul, sessile; blades oblong, 40–70 mm long, 12–21 mm wide, the adaxial surfaces densely glandular, the abaxial surfaces lanuginose arachnoid, the margins pinnatilobed, the segments 6–10 pairs, opposite or alternate, the lobes mostly triangular, revolute. **Capitulescences** of 1–3 glomerules, 15–17 mm in diameter. **Capitula** with involucre of several phyllaries, linear, glabrous; flo-

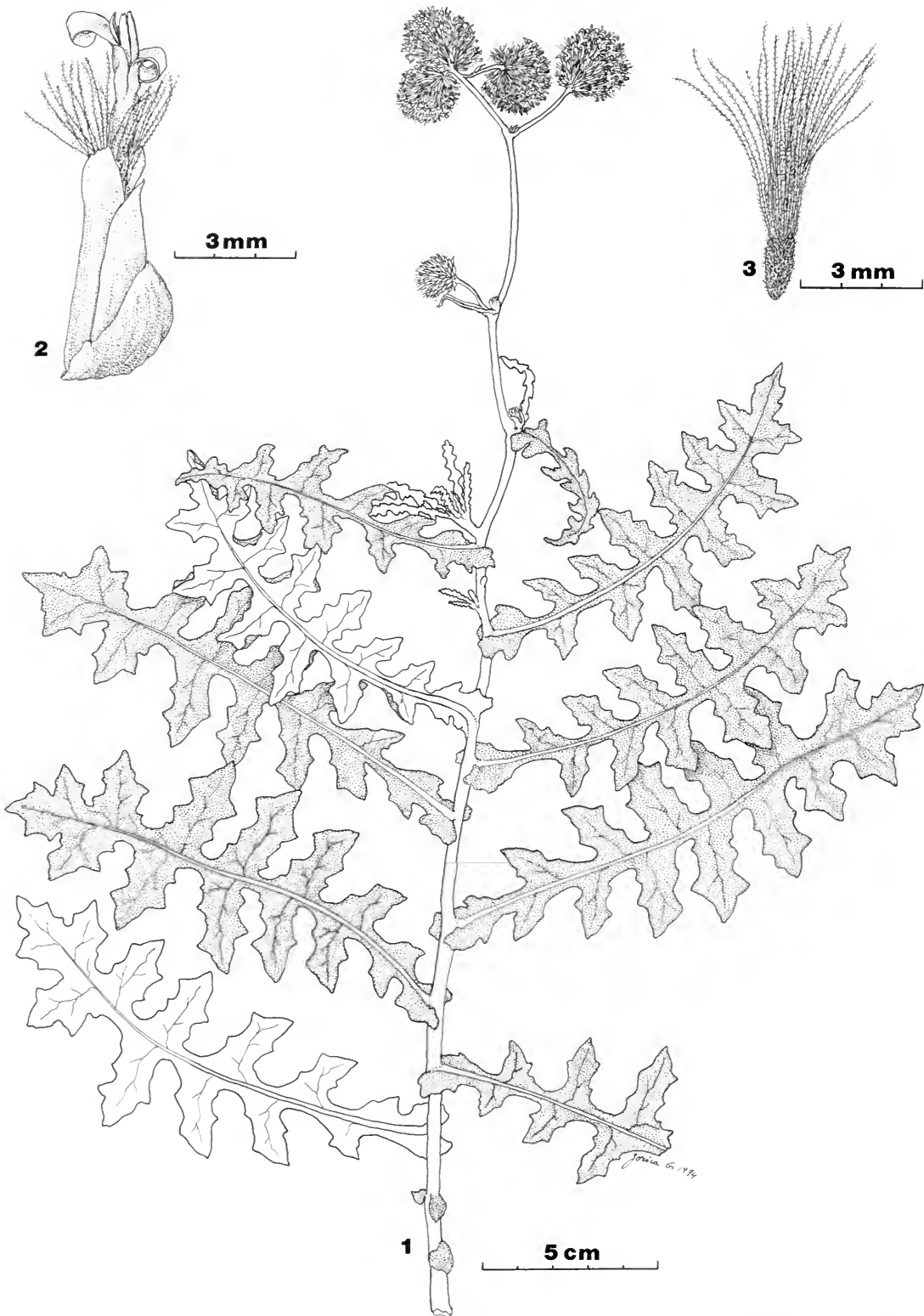


FIG. 17. *Polyachyrus sphaerocephalus*. 1, habit; 2, capitulum; 3, achene with pappus. (Drawn from P.C. Hutchison 1256, F.)

rets reddish. **Achenes** ca. 1 mm long, densely glandular-puberulent; pappus ca. 5 mm long.

DISTRIBUTION—Known from the coastal desert of northern Chile and the Peruvian island of San Gallan, near Pisco, Department of Ica.

Polyachyrus fuscus is apparently a rare species in Peru, with only one collection recorded from Isla San Gallan, but it is more common and widely distributed in northern Chile.

3. *Polyachyrus sphaerocephalus* D. Don, Trans. Linn. Soc. London 16: 230. 1830. TYPE: Peru, Ruiz Lopez & Pavón s.n. (holotype, P, not seen). **Figure 17.**

P. glandulosus Nutt., Trans. Amer. Philos. Soc. 7: 423. 1841. TYPE: Peru, Curson s.n. (holotype, PH, not seen).

P. villosus Wedd., Chlor. And. 1: 56. 1855. TYPE: Peru, Tacna, Cordillera de Tacora, d'Orbigny 290 (holotype, P, not seen; isotype ex P, F 971771).

Suffrutescent **herbs**, decumbent, branched, branches to 80 cm long, terete, glandular-arachnoid, white-lanuginose. **Leaves** amplexicaul, the upper sessile; blades oblong-lanceolate, 50–150 mm long, 12–60 mm wide, the adaxial surfaces arachnoid, the abaxial surfaces white lanuginose, the margins pinnatifid, 6–8 pairs of segments opposite. **Capitulescences** of 1–2 glomerules, terminal, 18–23 mm in diameter. **Capitula** with corolla reddish, fragrant, the tube 4–5 mm long, the outer lip 3–3.5 mm long, 4-nerved, tridentate, the inner lip bisect, coiled, 3–3.3 mm long; anthers 1.8–2 mm long. **Achenes** ca. 1 mm long, densely pilose; pappus 5–6 mm long.

DISTRIBUTION—Known from the Andean Cordillera of central to southern Peru (800–3800 m).

Polyachyrus sphaerocephalus is distinguished by its white habit, reddish florets, and fragrant smell, and it is the only member of the genus in Peru occupying habitats above 1000 m.

ANCASH. Huaras: Punta Caillan, between Casma and Huaras, Ferreyra 14394 (USM). **Recuay:** km 104 on road from Pativilca to Recuay, Dillon et al. 3093 (F); Pativilca–Huaras, Gentry et al. 37333 (F, MO, USM). **AREQUIPA. Arequipa:** Chachani, Arenas 168 (USM); Arequipa, Douglass s.n. (GH); Chachani, Hinkley & Hinkley 49 (GH, US); Yura, Straw 2346 (US, USM). **AYACUCHO. Lucanas:** Puquio, Ferreyra 7200 (US, USM); Pachan, Hutchison 1256 (F, GH, MO, UC, US, USM). **Parinacochos:** Coracora, Weberbauer 5795 (GH). **LA LIBERTAD. Otuzco:**

Cerro de los Enamorados, Leiva & Leiva 328 (F). **LIMA. Cajatambo:** near Oyon, Ferreyra 3533 (MO, US, USM). **Canta:** Culluay, Capt. Wilkes Exped. s.n. (GH); Obrajillo, Capt. Wilkes Exped. s.n. (US), Meza 217 (USM). **Huachochiri:** Río Blanco, Cerrate 909 (USM); Infiernillo, Cerrate & Jibaja 4872 (MO, USM); Tambo de Viso, Ferreyra 1241 (USM); Infiernillo, Ferreyra 8812 (USM), Ferreyra et al. 14909 (USM); Infiernillo, Goodspeed et al. 11606 (GH, UC), Killip & Smith 21574 (F, US), Ferreyra 6989 (F, US, USM), 8946 (USM), 5319 (US, USM); López 487 (US), Ferreyra 13600 (USM); Chicla, Ferreyra & Tovar 20135 (USM), Ball s.n. (GH); Chicla, Selser & Selser 238 (GH, US), Matthews 641 (GH); Matucana, Macbride & Featherstone 333 (GH, US); Huaros, Pennell 14711 (GH, US); Santa Eulalia, Goodspeed 33096 (GH, MO, US); Langa, Barclay 2341 (F, US). **MOQUEGUA. Mariscal Nieto:** Mina Cuajone, Dillon & Matekatis 3401 (F); Minas Toquepala, Vargas 13067 (US); near Carumas, Weberbauer 7336 (US, USM).

XIX. PROUSTIA

Proustia Lag. Amenidades Naturales de las Españas 1: 33. 1811. TYPE: *Proustia pyrifolia* DC.

Lophopappus Rusby, Bull. Torrey Bot. Club 21: 487, pl. 225. 1894. TYPE: *Lophopappus foliosus* Rusby.

Shrubs branched, unarmed, rarely with few nodal spines or with branchlets apically spinescent. **Leaves** alternate; blades ovate-lanceolate, lanceolate, oblong, or, rarely, linear, the margins entire or denticulate. **Capitulescences** of solitary heads, terminal and axillary or racemose. **Capitula** homogamous, discoid; involucre cylindrical to campanulate; receptacles naked; phyllaries 4–6-seriate, ovate, oblong, or lanceolate, subcoriaceous, glabrous or finely tomentose, puberulent, or resinous, apically acute to acuminate, often mucronate; florets 5–15, the corollas bilabiate, white to lavender, the lobes linear, coiled, the outer lip tridentate, the inner lip bidentate; anthers sagittate, apex acute; style cylindrical, apically bifid, the branches papillate. **Achenes** cylindrical or turbinate, 4–5 costate, pubescent; pappus of barbellate to plumose bristles, 1-seriate.

Proustia is a Neotropical genus with eight species, five of which occur within the Andean Cordillera. After examining several species of *Lophopappus*, I believe it is congeneric with *Proustia*. In addition, the structure of the pollen grains of *Lophopappus* and *Proustia* are similar with tricolpate and spinulose exine in both.

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FABRIS, H. A. 1968. Revisión género *Proustia* (Compositae). Revista Mus. La Plata, Secc. Bot., 11: 23–49.

Key to Peruvian Species of *Proustia*

1. Leaves linear, the apices long-apiculate *P. foliosa*
1. Leaves ovate or lanceolate, oblong, or spatulate 2
 2. Upper branchlets flexuose, apically acicular or spinulose *P. cuneifolia*
 2. Upper branchlets not apically acicular or spinulose 3
 3. Leaves densely tomentose on abaxial surfaces; capitula with 5–6 florets per head *P. cuneata*
3. Leaves glabrous on abaxial surfaces; capitula with 7–15 florets per head 4
 4. Leaf blades with only midvein prominent, the margins essentially entire or remotely denticulate; capitula with 18 florets *P. peruviana*
 4. Leaf blades with midvein and 2 lateral veins prominent, the margins repand, spinulose-dentate; capitula with 7–9 florets *P. berberidifolia*

1. *Proustia berberidifolia* (Cabr.) Ferreyra, comb. nov.

nulose-dentate margins and typically solitary capitula. It is known by the common names *aucupichana* and *pucka-pucka*.

Lophopappus berberidifolius Cabr., Bol. Soc. Argent. Bot. 5: 48. pl. 8. 1953. TYPE: Peru, Huancavelica, Sachahuaceta, Conaica, *O. Tovar* S. 961 (holotype, LP; isotypes, MO, USM).

AREQUIPA. Arequipa: Morro Verde, above Yura, *Straw* 2356 (USM), *Eyerdam & Beetle* 22135 (GH, MO, UC). **Cailloma:** Valle del Colca, *Treacy* 833 (F). **AYACUCHO.** Lucanas: Puquio, *Ferreyra* 9972 (MO, USM), 9775 (MO, USM). **Parinacochas:** Chaipi, *León* 10 (F). **HUANCAVELICA.** Huancavelica: Sachahuaceta, Alauima, near Conaica, *Tovar* 921 (USM); between Mejorada and Anco, *Tovar* 3330 (USM). **JUNIN.** Yauli: near Yauli, *Tovar* 3016 (USM); Paccha, *Tovar* 3287 (USM). **LIMA.** Huarochiri: Cuchilla-Blanca, *Cerrate et al.* 4675 (USM); above San Mateo, *Gutte s.n.* (USM). **MOQUEGUA.** Mariscal Nieto: 50–57 km NE of Moquegua, *Dillon et al.* 4797 (F). **TACNA.** Tarata: above Tarata 15 km, *Hutchison & Wright* 7204 (F); near Tarata, *Rauh* 40756 (USM).

Shrubs, 1–1.6 m high, branched, the branches striate, glabrous, lacking spines. **Leaves** subsessile; petioles 0.5–1 mm long; blades ovate-spathulate, 10–25 mm long, 5–10 mm wide, both surfaces glabrous, resinous, basally cuneate, trinerved from the base, apically rounded, the abaxial surfaces prominent-reticulate, the margins repand, spinulose-denticulate. **Capitulescences** of 3–4 heads, more or less glomerate. **Capitula** sessile; involucre campanulate, 10–12 mm high, 4–5 mm wide; phyllaries 14–18, 3-seriate, the outer ovate, 3–4 mm long, 2–2.5 mm wide, the inner oblong-elliptic, (6–)11–12 mm long, 2–2.5 mm wide, apically obtuse-mucronate, the margins pilose; florets 6–9, the corollas white, 12–13 mm long, bilabiate, outer lip tridentate, inner lip bipartite, coiled, 6–7 mm long; tube 5–6 mm long, cylindrical; anthers 5–6 mm long. **Achenes** turbinate, 3–5 mm long, 0.8–1 mm wide, pubescent, 5-costate; pappus of plumose bristles, ochraceous, 7–8.5(–12) mm long.

2. *Proustia cuneata* S. F. Blake, Contr. U.S. Natl. Herb. 22: 653. t. 63. 1924. TYPE: Peru, Ollantaytambo, *Cook & Gilbert* 538 (holotype, us). Non *Lophopappus cuneata* R.E. Fries, 1906.

L. blakei Cabr., Bol. Soc. Argent. Bot. 5: 48. 1953. TYPE: (nom. nov. for *P. cuneata* S. F. Blake).

DISTRIBUTION—Known from throughout the Andean Cordillera of central to southern Peru (2700–3600 m).

Proustia berberidifolia most closely resembles *P. peruviana* but is readily distinguished from that species by its resinous leaves with repand, spi-

Much-branched, spineless **shrubs**; branchlets albo-tomentose, glabrescent. **Leaves** subpetiolate; petioles 1–2 mm long; blades oblanceolate, 12–25 mm long, 4–8 mm wide, basally cuneate, apically obtuse or rounded, spinose-mucronate, repand-denticulate distally, coriaceous, the adaxial surfaces light green, inconspicuously tomentose, glabrescent, the abaxial surfaces conspicuously tomentose, the veins concealed by tomentum,

densely prominulose-reticulate. **Capitulescences** of glomerules of 2–5 heads, terminal on branchlets. **Capitula** sessile; involucre campanulate, 8–10 mm long, 4–10 mm wide; phyllaries ca. 4-seriate, ca. 14, the outer ovate, 2–2.5 mm long, 1.5–2.5 mm wide, apically acute, stiffly mucronate, tomentose, the inner oblong-elliptic, 7–7.5 mm long, mucronulate, glandular-puberulent, densely ciliolate, brownish or purplish; florets 5–6, the corollas bilabiate, white, glabrous, ca. 7.5 mm long; anthers ca. 5 mm long. **Achenes** oblong, ca. 3 mm long, 5-angled, stipitate-glandular, densely hispidulous; pappus of subplumose to barbellate bristles, ca. 7 mm long.

Proustia cuneata most closely resembles *P. berberdifolius* but is distinguished from that species by its generally larger, abaxially tomentose leaves and glomerulate clusters of two to five heads.

The new name provided by Cabrera (1953), *Lophopappus blakei*, was necessary only when Blake's *Proustia cuneata* was placed in *Lophopappus*, where the name was preoccupied by *L. cuneatus* R. E. Fries (1960), a Bolivian and Argentine species. No nomen novum is here provided for the latter species.

CUSCO. Urubamba: Ollantaitambo, *Pennell 13664* (F, US).

3. *Proustia cuneifolia* D. Don, Trans. Linn. Soc. London 16: 202. 1830. TYPE: Chile, Coquimbo, *Caldclough s.n.* (holotype, P, not seen). **Figure 18.**

Proustia pungens Poepp. ex Less., Syn. Comp. 110. 1832. TYPE: Chile, Aconcagua, *Poeppig s.n.* [884] (holotype, B, presumably destroyed; photograph ex B, FM neg. 20730).

Intricately branched **shrubs**, 1–2 m tall, the branches flexuose, the branchlets 1–8 cm long, the apex acicular or spinulose, striate, nodose, lacking nodal spines, finely pubescent, glabrescent. **Leaves** subsessile or petiolate; petioles 2–5 mm long; blades lanceolate to oblong-lanceolate or spatulate, (12–)40–90 mm long, 4–22 mm wide, coriaceous, the abaxial surfaces prominulose-reticulate, the margins entire or slightly repand-denticulate apically. **Capitulescences** of racemose, glomerulate spikes. **Capitula** sessile; involucre campanulate, 7–8 mm high, 4–5 mm wide; phyllaries 14, 5–6-seriate, the outer ovate, ca. 1 mm long, ca. 1 mm wide, coriaceous, apically obtuse, the middle ovate-lanceolate, 4–6 mm long, 2–2.5 mm wide, apically

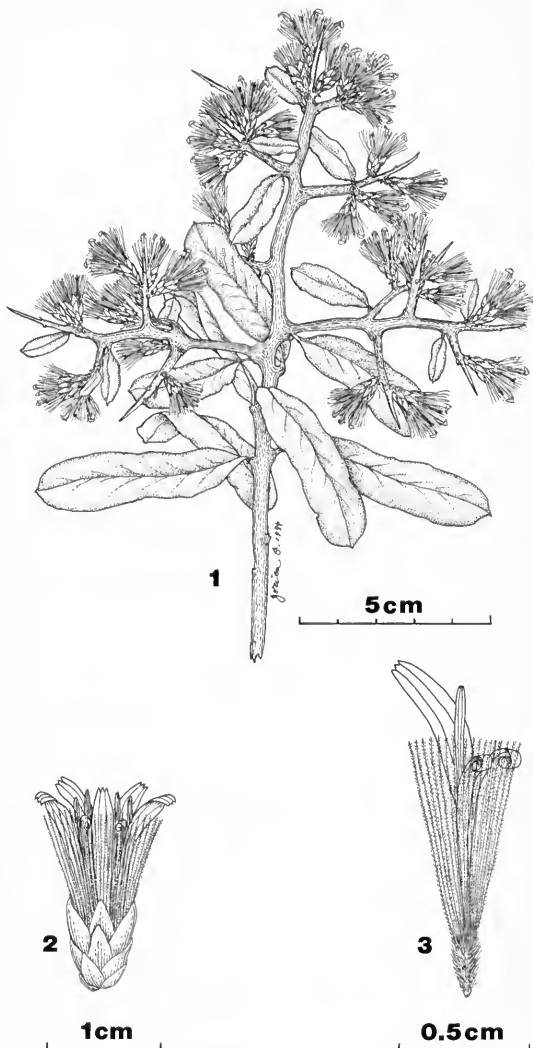


FIG. 18. *Proustia cuneifolia*. 1, habit; 2, capitulum; 3, floret with achene. (Drawn from C. Vargas C. 740, F.)

obtuse, the inner oblong to lanceolate, 6–9 mm long, 2–2.2 mm wide, apically rounded, ciliolate; florets 5–6, the corollas violaceous to purple, bilabiate, 10–15 mm long, the outer lip tridentate, 5–6 mm long, the inner lip bipartite, 5–5.5 mm long, coiled; anthers 4.5–6 mm long. **Achenes** turbinate, 3–4 mm long, 5-costate, glandular-pubescent; pappus of barbellate bristles, 9–12 mm long, tawny to violaceous.

DISTRIBUTION—Known from the intermontane region of southern Peru (3100–3600 m) and disjunct populations in the *lomas* formations along the southern coast in the Department of Arequipa (200–700 m).

Proustia cuneifolia most closely resembles *P. peruviana* but is unique among the members of the genus in Peru in that it possesses spinose branchlets. Fabris (1968) proposed several formas based on leaf form and pubescence, and Peruvian material was referred to forma *cuneifolia* and forma *oblongifolia*. An examination of an isotype of D. Don's *P. oblongifolia* (Ruiz Lopez & Pavón s.n., F 639998) shows it to be conspecific with *Proustia pyrifolia* Lag. ex DC., a Chilean species. No sub-specific categories are recognized in the current study. It is known by the common names *chamo*, *tantar*, *huanchinco*, and *huacata*.

APURIMAC. Abancay: entre Abancay y Curahuasi, *Ferreyra 9819* (MO, USM); Cusahuasi, *Vargas 740* (F). **Aimaraes:** 15 km NW of Chalhuanca, *Gentry et al. 23340* (F, MO). **No exact locality:** *Weberbauer 5762* (F). **AREQUIPA.** Cailloma: Valle del Colca, *Treacy 723* (F). **Caraveli:** Lomas de Atiquipa, near Chala, *Ferreyra 8894* (USM), *12121* (USM), *13525* (MO, USM), *13998* (MO, USM), *Ono 110104* (USM); Lomas de Okopa, near Chala, *Ferreyra 11472* (USM); Lomas de Taimara, near Atiquipa, *Ferreyra 13939* (MO, USM). **AYACUCHO.** La Mar: Tambo Cuchicanca, *Madison 10399-70* (USM). **Lucanas:** between Lucanas and Puquio, *Ferreyra 9773* (MO, USM). **CUSCO.** Calca: near Calca, *Ferreyra 9981* (USM). **Urubamba:** Caicay, *Herrera 2580* (F); Kaira, *Vargas 6747* (F); Salapuncu, *Vargas 8119* (US); Tarapata, *Vargas 11076* (F).

4. *Proustia foliosa* (Rusby) Ferreyra, comb. nov.

Lophopappus foliosus Rusby, Bull. Torrey Bot. Club 21: 487, pl. 225. 1894. SYNTYPES: Bolivia, La Paz, *M. Bang 66* (NY); Bolivia, Chuguiaguilla, *M. Bang 791* (NY).

Much-branched shrubs, the branches glabrous, erect, striate. Leaves sessile; blades linear, rarely narrow oblanceolate, 7–16 mm long, 0.8–1 mm wide, aristate, the adaxial surfaces canescent, the abaxial surfaces glandular-muricate, apically attenuate-apiculate. Capitulescences of solitary, terminal heads. Capitula sessile; involucre cylindrical to campanulate, 11–14 mm long, 4–5 mm wide, subtended by linear, glandular bracts; phyllaries 12, 4–5-seriate, the outer lance-ovate, 5–7 mm long, 2–2.5 mm wide, apically attenuate, the inner linear-lanceolate, 9–10 mm long, 1.6–1.8 mm wide, apically apiculate; florets 4–5(–8), the corollas 9–10 mm long, bilabiate, the outer lobe tridentate, the inner lip bipartite, coiled, 3–3.5 mm long, the tube 5–6 mm long; anthers 4–4.5 mm long. Achenes cylindrical, 3–4 mm long, 0.6–0.8 mm wide, hispidulose-pubescent, 5-costate; pappus of plumose bristles, 7–9 mm long.

DISTRIBUTION—Known from Andean Cordillera of southern Peru to Bolivia (3300–3750 m).

Proustia foliosa is distinguished by its linear, aristate leaves and linear, apiculate phyllaries.

AREQUIPA. Arequipa: Chivay, *Weberbauer 6888* (F, LP, US, USM). **Cailloma:** Valle del Colca, *Treacy 654* (F).

5. *Proustia peruviana* (Cabr.) Ferreyra, comb. nov.

Lophopappus peruvianus Cabr., Bol. Soc. Argent. Bot. 5: 50. 1953. TYPE: Peru, Ancash, Bolognesi, cerca de Aquia, *E. Cerrate 1552* (holotype, LP; isotype, USM).

Much-branched shrubs, 1.5–2 m high, the upper branches striate, glabrescent. Leaves sessile or subsessile; blades ovate-elliptic, 10–20 mm long, 7–9 mm wide, coriaceous, both surfaces glabrous, basally cuneate, apically acute to obtuse, mucronate, the abaxial surfaces prominulose-reticulate, the margins entire to finely denticulate. Capitulescences of solitary heads, occasionally glomerulate at branch tips with 2–3 heads. Capitula sessile; involucre cylindrical, 9–11 mm high, 5–6 mm wide; phyllaries 18–20, 4–5-seriate, the inner lanceolate, 8–9.5 mm long, 2–2.2 mm wide, apex deep brown, mucronate, the outer ovate, apex deep brown, shortly bipartite, 5–7 mm long, 2.6–3 mm wide; florets 14–18, the corollas pink to whitish, 10–12 mm long, bilabiate, the outer lip tridentate, coiled, 6–6.5 mm long, the inner lip bifid, 5–5.5 mm long, coiled, the tube 4.5–5 mm long; anthers 4–5 mm long. Achenes cylindrical, 3.8–4 mm long, 0.5–0.8 mm wide, glandular-puberulent, glabrescent, 5-costate; pappus of barbellate bristles, 7–9 mm long.

DISTRIBUTION—Known from the Andean Cordillera of northern to central Peru (3200–3500 m).

Proustia peruviana most closely resembles *P. berberidifolius* from which it differs in having typically solitary capitula with more florets and larger leaves with entire margins.

ANCASH. Bolognesi: near Chiquián, *Cerrate 2380* (USM); S of Huaraz, *Gentry et al. 37470* (F, MO). **AYACUCHO.** Lucanas: between Puquio and Abancay, *Ehlenberg 4956* (US). **CAJAMARCA.** Contumazá: Guzmango, *Sagástegui et al. 9690* (F, MO). **HUANUCO.** Huamalies: near Llata, *Macbride & Featherstone 2296* (F, US). **LA LIBERTAD.** Santiago de Chuco: Santiago de Chuco, *Sagástegui et al. 11760* (F); Hacienda Angamarca, *Weberbauer 7206* (F, US). **PIURA.** Huancabamba: Rumitana, *López et al. 8849* (F, MO).

XX. TRICHOCLINE

Trichoclina Cass., Bull. Sci. Soc. Philom. Paris 1817. 13. 1817. TYPE: *Doronicum incanum* Lam. = *Trichoclina incana* (Lam.) Cass.

Acaulescent or caulescent, rhizomatous, perennial **herbs**. **Leaves** sessile or petiolate, generally in a basal rosette, or if shortly cauline, alternate; blades simple, the adaxial surfaces tomentose or glabrescent, the abaxial surfaces usually tomentose or lanate, the margins entire, dentate, crenate, lobed, or lyrate-pinnatifid. **Capitulescences** of solitary, terminal heads; peduncles erect or ascending, bracteate or ebracteate, hollow or solid. **Capitula** heterogamous; involucre hemispherical or campanulate; receptacles plane, naked or alveolate; phyllaries imbricate, 2–6-seriate, subequal or the outer gradually shorter, often tomentose or lanate; ray florets pistillate, the corollas yellow or orange to red, violet or rarely white, bilabiate, the outer lip ligulate, tridentate, the inner lip bifid, the lobes filiform; staminodia present; styles lobed, the branches glabrous or pilose; disc florets hermaphroditic, the corollas bilabiate, the outer lip tridentate, the inner lip bifid; anthers basally sagittate; style filiform, the branches apically obtuse or subacute, papillose to pilose. **Achenes** cylindrical, turbinate, ovoid, obovoid, or elliptic, apically truncate or with a short neck, pubescent with both swollen or inflated, biseriate trichomes, and multicellular, glandular trichomes; pappus of barbelate bristles, white.

Trichoclina consists of approximately 25 species primarily restricted to austral South America and

one native to Australia. In Peru, two species are currently recognized. The genus is distinguished from *Chaptalia* in possessing larger ray florets with staminodia and nonrostrate achenes, pubescent with both swollen or inflated hairs and multicellular, glandular trichomes.

The placement of several species has been controversial. For example, Hieronymus (1896), and later Burkart (1944), suggested that two species, originally placed in *Chaptalia* (*C. ovalis* and *C. oblonga*), be moved to *Trichoclina*. Zardini (1975) argued that these species were misplaced in *Trichoclina* and returned to *Chaptalia*; that placement is adopted here. Alternatively, Zardini (1974) moved *Trichoclina hieracioides* to *Gerbera*; however, Hansen (1990, 1991) returned it to *Trichoclina*; that placement is adopted here.

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Key to Peruvian Species of *Trichoclina*

1. Leaf blades 15–50 mm long, 5–14 mm wide, the abaxial and adaxial surfaces densely white-tomentose, the margins irregularly crenate, serrate, or dentate; peduncles 2–6 cm long; involucre 5–10 mm high; ray corollas yellow, the outer lip 5–7 mm long (southern Peru) *T. caulescens*
1. Leaf blades 50–120 mm long, 15–45 mm wide, the abaxial surface sparsely to densely tomentose, the margins crenate to lyrate-pinnatifid; peduncles 8–30(–48) cm long; involucre 17–30 mm high; ray corollas pink, violet, or purple, the outer lip 15–30 mm long (northern Peru) *T. peruviana*

1. *Trichoclina caulescens* Phil., Anal. Mus. Nac. Chile, Bot. 8: 31. 1891. TYPE: Chile, Iquique, “Médanos de Pica,” Mar 1885, *F. Philippi* 2069 (holotype, SGO, not seen; photograph ex B, FM neg. 16013). **Figure 19.**

Trichoclina stuebelii Hieron., Bot. Jahrb. Syst. 21: 369. 1896. TYPE: Chile, Parinacota, “crescit inter Ta-

cora et Tomarapé,” 4200–4400 m, Oct, *A. Stübel* 101a (holotype, B, presumably destroyed; photograph ex B, FM neg. 16025).

Perennial **herbs**, essentially acaulescent, 6–12 cm tall, rhizomes vertical, 1–10 mm in diameter, lignescent. **Leaves** basally rosulate; blades oblanceolate to spatulate in outline, 15–50 mm long,

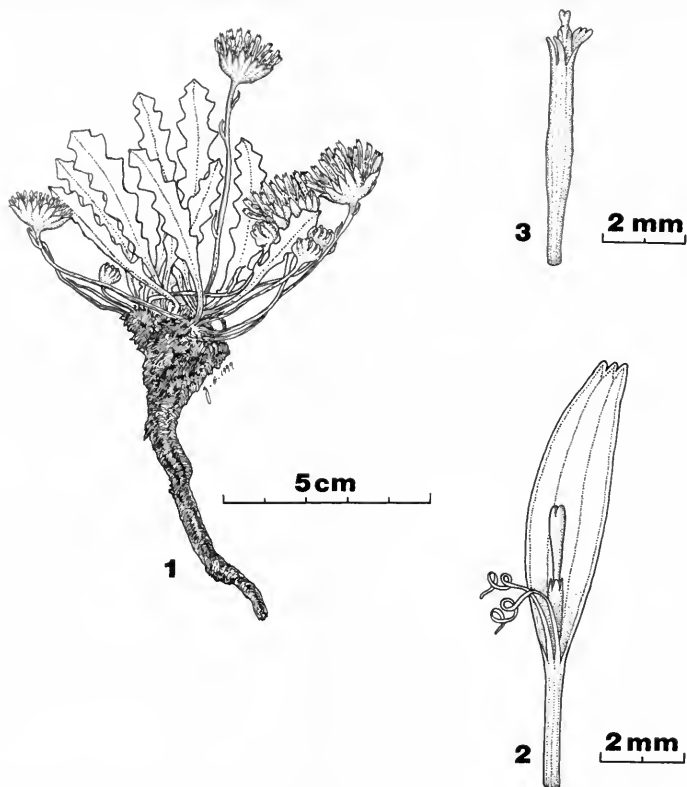


FIG. 19. *Trichocline caulescens*. 1, habit; 2, ray floret; 3, disc floret. (Drawn from A. Weberbauer 7383, F.)

5–14 mm wide, the abaxial and adaxial surfaces densely white-tomentose, the margins irregularly crenate, serrate, or dentate. **Capitulescences** of solitary, terminal heads; peduncles erect to procumbent, 2–6 cm long, densely albo-tomentose, bracteate, the bracts linear, 3–5 mm long. **Capitula** with involucre hemispherical, 5–10 mm high, 10–25 mm wide; phyllaries 2–3 seriate, densely albo-tomentose, the outer linear, ca. 3 mm long, 0.5 mm wide, the inner lanceolate, 6–7 mm long, 1.5–2 mm wide; ray florets 12–14, the corollas yellow, the outer lip 5–7 mm long, 1.5–2 mm wide; disc florets 15–25, the corollas yellow, 6–7 mm long, the outer lip ca. 1 mm long, 3-toothed, the inner lip ca. 1 mm long, bifid. **Achenes** ellipsoid, ca. 4 mm long, ca. 1.5 mm wide; pappus 4–6 mm long, white.

Trichocline caulescens is rare in southern Peru but more common in northern Chile (1850–3500 m). It is distinctive among the Peruvian species with densely white-tomentose leaves and yellowish ray corollas.

PERU. Tacna: Candarave, Weberbauer 7383 (F, OH, US).

2. *Trichocline peruviana* Hieron., Bot. Jahrb. Syst. 21: 368. 1896. TYPE: Peru, "crescit infra La Cruz de Celendin et prope Tambo Mayo inter Pacasmayo et Moyobamba," A. Stübel 481 (holotype, B, presumably destroyed; photograph ex B, FM neg. 16023).

Onoseris hieracioides Kunth, Nov. Gen. Sp. 4: 7. t. 304. 1820. TYPE: Ecuador, Chimborazo, Humboldt & Bonpland s.n. (holotype, P, not seen; photograph ex P, FM neg. 38102).

Trichocline hieracioides (Kunth) Ferreyra, Journ. Arb. 25: 344. 1944. Non Baker, 1884.

Gerbera hieracioides (Kunth) Zardini, Bol. Soc. Argent. Bot. 16: 105. 1974.

Trichocline beckeri H. Robinson, Phytologia 65: 47. 1988. TYPE: Peru, Cajamarca, surroundings of Cajamarca, 2700–3700 m, 30 May 1986, B. Becker & F. M. Terrones H. 1305 (holotype, US 3092896; isotype, PPEA).

Perennial herbs, acaulescent; rhizomes erect, to ca. 4 mm in diameter. Leaves basally rosulate;

petioles 10–120 mm long; blades oblanceolate to spatulate or lyrate, 50–120 mm long, 15–70 mm wide, acute to obtuse, the adaxial surfaces glabrous, the abaxial surfaces white-tomentose, the margins entire, weakly serrate, or lyrate-pinnatifid. **Capitulescences** of solitary, terminal heads; peduncles erect, tomentose, 14–70 cm long, bracteate, the bracts linear, 5–20 mm long, 1–2 mm wide. **Capitula** with involucre campanulate, 17–30 mm high, 15–25 mm wide; phyllaries 4–5-seriate, the outer linear, 5–12 mm long, ca. 1 mm wide, acuminate, lanuginose, the margins purple, the inner 16–30 mm long, 1.5–2.5 mm wide; ray florets 14–24, pistillate, bilobed, the tube 5–12 mm long, 0.5–1 mm wide, the outer lip ligulate, tridentate, 15–30 mm long, 2–3 mm wide, the adaxial surfaces pink, violet, or purple, the abaxial surfaces dark pink, the inner lip bifid, the lobes filiform, ca. 4 mm long, coiled; disc florets 15–26, the corollas white, violet, or pink, 13–15 mm long, the tube 4–5 mm long, the limb 8–9 mm long; anthers 6–8 mm long; style branches linear, ca. 1 mm long, papillose. **Achenes** cylindrical to fusiform, (3.5–)4–7 mm long, 1.5–1.8 mm wide; papus 12–20 mm long.

DISTRIBUTION—Known from the Andean Cordillera of southern Ecuador to north-central Peru (1500–3800 m).

Trichocline peruviana is a common element in the intermontane, subtropical region of the Peruvian Andes. Representative collections show much variability in the leaf size, amount of pubescence, and ray floret coloration. Examples with strongly lyrate leaf blades superficially resemble *Onoseris speciosa*, but they are readily distinguished by the species' blue ray florets and often multiheaded, branched peduncles.

Trichocline peruviana possesses characteristics of both *Gerbera* and *Trichocline* and, until recently, the collections cited here were treated in *Gerbera* (Zardini, 1974) under the name *G. hieracioides* (Kunth) Ferreyra. Hansen (1990, 1991) suggested that this species be removed from *Gerbera* and tentatively placed in *Trichocline*. Because the name *Trichocline hieracioides* is preoccupied by Baker's Brazilian species, *T. peruviana* was adopted as the next available name.

After examining a suite of specimens from throughout its range, including the type locality of *T. peruviana* and *T. beckeri*, it is obvious that these two species are conspecific. The smaller, strongly lyrate leaves found in collections from Cajamarca to Ancash and Huánuco are but the end of a range

of variation in leaf size and degree of dentation. Additional collections (e.g., Dillon *et al.* 6202) from the type locality of *T. beckeri* exhibit a wide range of leaf size and lobing while maintaining rather constant capitular size and floral morphology.

AMAZONAS. Chachapoyas: Cerros Calla-Calla, 8 km above Leimebamba on road to Balsas, *Hutchison & Wright 5653* (F, UC, US, USM); 1 km SW of Chachapoyas, *Wurdack 470* (US). **ANCASH.** Bolognesi: Chiquián, *Ferreyra 5794* (US). **Corongo:** Nueva Victoria, *Mostacero et al.* 1999 (F). **Huari:** between Pichiu and Recuay, *Weberbauer 2943* (USM); near Recuay, *Ferreyra 14556* (USM). **Yungay:** Llanganuco, above Yungay, *Ferreyra 14341* (USM). **CAJAMARCA.** Cajamarca: Río Manzana, *Becker & Terrones 1916* (PPEA, US); 15 km NW of Cajamarca, road to Chamis, *Dillon et al.* 6202 (CPUN, F); San Pablo, *Hutchison & Wright 5041* (UC, US, USM); Chiquiden to Cajamarca, *Ochoa 1488* (USM); La Encañada-Jalca de Kumulca, *Sagástegui et al.* 8081 (F); Hacienda Polloquito, *Sánchez 298* (CPUN, F). **Celendín:** 4 km NNE of Celendín on road to Balsas, *Edwin & Schunke 3588* (F); arriba de Celendín, entre Celendín y Balsas, *Ferreyra 15055* (US, USM); on road to Celendín, 31 km E of Cajamarca, *Hutchison & Wright 5109* (F, US), 5132 (UC, USM); 2 km E of Celendín on road to Balsas, *Hutchison & Wright 5153* (F, UC, US, USM); Canyon of Río Marañón above Balsas, 3–4 km below summit of the road to Celendín, *Hutchison & Wright 5218* (UC, US, USM); vicinity of Celendín, *Woytkowski 233* (F). **Chota:** between Chota and Bambamarca, *Ferreyra 8496* (USM), *Hutchison & Wright 5229* (UC); Llama to Chongoyape, *Ferreyra 0869* (USM); Cerro El Leonero, arriba de Chuyubamba, *Sagástegui 14062* (F). **Contumazá:** Contumazá-Cascabamba, *Sagástegui et al.* 9974 (F); Guzmango, *Sagástegui & López 10573* (F); Bosque Cachil, *Sánchez 3155* (F). **Cutervo:** near Cutervo, *Ferreyra & Acleto 15362* (USM). **HUANUCO.** Huamalíes: Llata, *Macbride & Featherstone 2233* (F). **LA LIBERTAD.** Otusco: Agallpampa, *López 479* (US, USM); above Huaranchal, *López 1349* (USM). **PIURA.** Huancabamba: camino Suruguna, *Acleto 495* (USM); carretera entre Canchaque y Huancabamba, *Díaz & Baldeón 2391* (F); ca. 15 km NE of Canchaque, *Dillon & Sánchez 6244* (CPUN, F); Abra de Porculla, entre Olmos y Jaén, *Ferreyra 13756* (USM), 15666 (US, USM); Mitopampa, *Sagástegui et al.* 8230 (F); Ayabaca, *Soukup 4352* (US); El Tambo, *Soukup 4644* (USM); between Huancabamba and Ayavaca, *Weberbauer 6336* (F, US).

XXI. TRIXIS

Trixis P. Br., Civ. nat. hist. Jamaica 312. 1756.

TYPE: *Trixis inula* Crantz

Perennial herbs, shrubs, or, occasionally, scandent, climbing. Leaves alternate, simple, sessile to petiolate; blades linear to lanceolate, elliptic, ovate or obovate, the margins entire to denticulate. **Capitulescences** paniculate or corymbose, terminal, rarely solitary. **Capitula** radiate; involucre campanulate to cylindrical, usually subtended by (1–)3–

5(–12) accessory bracts; receptacles plane, alveolate, pilose; phyllaries 5–13(–16), 1–3-seriate; florets 4–30(–60), isomorphic, hermaphroditic, the corollas yellow, yellow-orange, or whitish-yellow, often maturing white, bilabiate, the outer lip elliptic or oblong, tridentate, the inner lip bifid; stamens 5, the anthers with oblong apical appendages, basally caudate; style branches apically truncate, penicillate, the adaxial surfaces papillose, the abaxial surfaces glabrous. **Achenes** cylindrical to fusiform, 5-ribbed, usually pubescent with short, biseriate, myxogenic trichomes, and/or uniseriate, glandular trichomes; pappus of 50–150, hispidulous bristles, (2–)3–4-seriate, isomorphic, tawny to white.

Trixis contains 50–60 species ranging from southern United States to southern South America. In Peru, the genus is distributed in a wide variety of habitats from coastal desert to montane forests.

Key to Peruvian Species of *Trixis*

- 1. Phyllaries 1-seriate 2
 - 2. Leaves tomentose *T. subparadoxa*
 - 2. Leaves hirsute 3
 - 3. Capitula subtended by foliose bracts *T. neaeana*
 - 3. Capitula not subtended by foliose bracts *T. cacalioides*
- 1. Phyllaries 2- or more-seriate 4
 - 4. Leaves acuminate; capitula with 10–12 florets, white *T. divaricata*
 - 4. Leaves acute; capitula with 6 florets, yellow 5
 - 5. Blades oblanceolate, to 15 cm long; phyllaries 14–16, 3–4 seriate *T. sagasteguii*
 - 5. Blades oblong-lanceolate, to 6 cm long; phyllaries 7–8, 3-seriate *T. churinensis*

- 1. *Trixis cacalioides* (Kunth) D. Don., Trans. Linn. Soc. London 16: 187. 1830.

Perdicium cacalioides Kunth, Nov. Gen. Sp. 4: (fol.) 121. 1818; (quatro) 154. 1820. TYPE: Peru, Cajamarca, Jaén, “in declivitate orientalis Andium Peruvianorum ad ripam fluvii Matara, 430 hex.” *Humboldt & Bonpland s.n.* (holotype, P, not seen).
Trixis paradoxa Cass, Opusc. phytol. 2: 160. 1826. TYPE: Peru, *J. Dombey s.n.* (holotype, P, not seen).
Trixis hexantha S. Moore, J. Bot. 52: 264. 1914. TYPE: Peru, “valley between Pasasmayo and rail-head, 7000 ft.” *H. O. Forbes s.n.* (holotype, BM, not seen).

Shrubs 8–12 dm high, branched, branches striate, pubescent. **Leaves** subsessile; blades lanceolate to oblanceolate, 10–80 mm long, 4–30 mm wide, bases attenuate to cuneate, apically acute,

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conspicuously pubescent, hairs strigose, glandular, the margins subtire to denticulate, mucronate. **Capitulescences** corymbose, the peduncles short with 3 bracteoles. **Capitula** with involucre narrowly campanulate, phyllaries 5, 1-seriate, obtuse, rarely bidentate; florets 6–7(–10), the corollas yellow, 9–12 mm long, the outer lip 3–5 mm long, pubescent, tridentate, the inner lip bifid, lacinate, coiled. **Achenes** 2–6 mm long, 0.4–1 mm wide, pubescent with glandular trichomes; pappus 7–12 mm long, tawny.

DISTRIBUTION—Known from coastal and adjacent montane habitats of southern Ecuador, Peru, and Chile. In Peru, it is well represented in the coastal lomas formation, with occasional individuals occurring at higher elevations along the west-

ern slope of the Cordillera Occidental (100–2500 m).

Trixis cacalioides is characterized by its highly variable, strigose and glandular leaves with entire to denticulate margins and the absence of enlarged subtending bracts at the base of the involucre.

There has been some disagreement as to the correct name for this taxon, and both *T. cacalioides* and *T. paradoxa* Cass. have been applied to Peruvian material. The type material of *T. cacalioides* was gathered near Matara (Prov. Jaén, Dept. Cajamarca). The type material of *T. paradoxa* was a Peruvian collection by Dombey, and the name has been applied to both Peruvian and Ecuadorian collections (Harling, 1991) with more denticulate leaf blades with strigose pubescence. After examining a large suite of collections from varied ecological situations throughout Peru and Ecuador, it appears that the presence of teeth and pubescence of the leaves are variable. Therefore, the two are considered conspecific, with Kunth's *T. cacalioides* having priority.

ANCASH. Santa: Lomas de Lupin, *Cerrate 814* (USM); between Barranca and Huarmey, *Ferreyra 13789* (USM). **AREQUIPA:** Caraveli: Lomas de Capacc, *Ferreyra 7230* (USM); Lomas de Okopa, near Atiquipa, *Ridoutt 14522* (USM). Arequipa: slopes of Misti, *Ferreyra 14272* (USM), *Pennell 13157* (USM). **CAJAMARCA.** Chota: Carhuacuero, *Ferreyra 3168* (USM). Contumazá: near Contumazá, *Ferreyra 8597* (USM). **ICA.** Ica: Santa Cruz, *Ferreyra 13460* (USM); Los Molinos, *Angulo 2421* (HUT). **LIMA.** Cajatambo: Churín, *Ferreyra 5351* (USM), *3522*, (USM), *6157* (USM). Canta: Quives, Araguay, *Pennell 14297* (NY), *Dreyfus 12754* (USM), *Ferreyra 11781* (USM). Chancay: Lachay, *Ferreyra 9631* (USM), *9694* (USM), *Macbride & Featherstone 550* (GH, US); Magdalena, *Ridoutt 10290* (USM); San Bartolo, *Ferreyra 8214* (USM); near Trapiche, *Ferreyra 9668* (USM). Lima: Atocongo, *Maisch 13815* (USM), *Pennell 14766* (NY), *Ferreyra 2058* (USM), *3471* (USM), *12451* (USM), *Cerrate 3020* (USM); Cajamarquilla, *Ferreyra 2851* (USM), *8347* (USM), *9755* (USM), *Ridoutt 12219* (USM); near Chosica, *Ferreyra 522* (USM), *6120* (USM). Huarochirí: above Surco, *Ferreyra 6055* (USM); km 57 Lima to Oroaya, *Ferreyra 3484* (USM); Cocachaca, *Ridoutt 12484* (USM); Santa Eulalia, *Ridoutt 13037* (USM); near Surco, *Ferreyra 5330* (USM). **PIURA.** Piura: near Piura, *Haught s.n.* (GH).

2. *Trixis churinensis* Herrera, Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot. 25: 14. 1969. TYPE: Peru, Lima, Cajatambo, Churín, 2100–2200 m, *R. Ferreyra 6151* (holotype, USM 15728).

Shrubs 1.5–2 m high, branched, the branches striate, pubescent. **Leaves** subsessile; blades lanceolate to oblong-lanceolate, 20–60 mm long, 8–

22 mm wide, the adaxial surfaces glabrous, the abaxial surfaces pubescent, the margins entire. **Capitulescences** cymose. **Capitula** subsessile; involucre cylindrical; phyllaries 7–8, 3-seriate, 2 outer, 3 middle, 2–3 inner; florets 5, the corollas yellowish, the tube 5.8–6.2 mm long, the outer lip tridentate, 4-nerved, the inner lip bifid, lacinate, coiled. **Achenes** 3.5–4.5 mm long, densely papillose; pappus ca. 8.5 mm long, yellowish.

DISTRIBUTION—Known only from the type locality.

Trixis churinensis most closely resembles *T. sagasteguii*, from which it differs in having a glabrescent habit and 7–8 phyllaries.

3. *Trixis divaricata* (Kunth) Spreng., Syst. Veg. 3: 501. 1826.

Perdicium divaricatum Kunth, Nov. Gen. Sp. [quarto] 4: 155. 1820, [fol.] 4: 121. 1818. TYPE: Peru, Cajamarca, "prope Cavico ad ripam fluvii Chamaya, Jaen de Bracamoros," *Humboldt & Bonpland s.n.* (holotype, P, not seen; photograph ex P, FM neg. 37859).

T. antimenorrhoea (Schrank) Mart. ex Baker, Mart. Fl. Br. 6(3): 385. 1884.

Prionanthes antimenorrhoea Schrank, Pl. Rar. Hort. Acad. Monac. 2(6): 51. 1820. LECTOTYPE (designated by Harling, 1991): Brazil, no specimen known, 51 chosen as lectotype, not seen.

Shrubs 2–2.5 m high, erect to procumbent; stems cylindrical, striate, scarcely pubescent to tomentose. **Leaves** subsessile; blades lanceolate to elliptic-lanceolate, 40–170 mm long, 10–50 mm wide, pubescent, acuminate, the margins entire to slightly dentate. **Capitulescences** paniculate-corymbose; peduncles 6–10 mm long, pubescent, 1–3 bracteate, the bracts lanceolate, pubescent. **Capitula** with involucre campanulate to turbinate; phyllaries 2-seriate, the outer 4–5, unequal, the inner ca. 8, equal, acute; florets 10–12, the corollas white or yellowish, the tube 5–9 mm long, the outer lip 4-nerved, tridentate, the inner lip bifid, lacinate, coiled. **Achenes** 2.8–6 mm long, 0.5–1 mm wide, pubescent with uniseriate glandular trichomes; pappus ca. 11 mm long, tawny.

DISTRIBUTION—Known from the Neotropics from Costa Rica and Hispaniola to Argentina. In Peru, it is largely restricted to the eastern Andean Cordillera (1800–3000 m).

Trixis divaricata is easily distinguished by its auriculate, clasping leaf bases, abaxial arachnoid-tomentum, and flexuose, divaricately branched

capitulescences, Cabrera (1936) treated Peruvian material under *T. antimenorrhoea* var. *auriculata* (Hook.) Cabr., and Harling (1991) and Díaz-Piedrahita and Vélez-Nauer (1991) followed by accepting *T. antimenorrhoea* as the valid name. However, Kunth's name *T. divaricata*, should have priority by several months and, pending detailed studies, *T. antimenorrhoea* will be restricted to austral South America.

APURIMAC. Apurímac: Río Chalhuanca, *Angulo 1741* (HUT). **CUSCO.** Convención: Santa Ana Valley, *Herrera 3617* (CUZ). **Paucartambo:** Patria, *Marín 1708* (USM). **HUANCAVELICA.** **Tayacaja:** below Surobamba, *Tovar 3744* (USM); below Andamarca, *Tovar 1851* (USM). **HUANUCO.** Estación Pozuzo, Cueva Grande, *Macbride 4784* (US); Yamano, Chacalla, *Macbride 3793* (US). **JUNIN.** Tarma: Palca, *Soukup 3492* (USM). **PIURA.** **Huancabamba:** Canchaque, *Calle 1003* (USM). **SAN MARTÍN.** Lamas: near Lamas, *Ferreyra 7807* (USM). **Mariscal Cáceres:** Chambira, near Juanjui, *Ferreyra 4574* (USM). **San Martín:** Tarapoto, *Ferreyra 7852* (USM); Pucayacu, *Ferreyra 7738* (USM). **Saposa:** near Saposa, *Ferreyra 4620* (USM); between Bellavista and Tingo de Saposa, *Ferreyra 4766* (USM); near Baños, *Ferreyra 4729* (USM).

4. *Trixis neaeana* DC., Prodr. 7: 67. 1838. TYPE: Peru, *Nees s.n.* (holotype, P, not seen).

Shrubs to 1 m high, the stems striate. **Leaves** subsessile; blades oblong-lanceolate, 35–60 mm long, 15–25 mm wide, the adaxial surfaces glabrescent, the abaxial surfaces densely pubescent, apically acute, the margins entire. **Capitulescences** of panicles or corymbose with 2–3 leaves basal. **Capitula** with involucre cylindrical; phyllaries 5, 1-seriate, oblong, obtuse or acute; florets 5–6, the corollas yellow, bilabiate, the tube 7–8 mm long, the outer lip 2-nerved, tridentate, the inner lip bifid. **Achenes** 4–5 mm long, 1–1.2 mm wide, pubescent with uniseriate glandular trichomes; pappus 9–10 mm long, yellowish.

DISTRIBUTION—Known only from intermontane valleys of the north-central Peruvian Andes (2000–2400 m).

Trixis neaeana resembles *T. cacalioides*, but it differs in its two to three foliose bracts subtending the involucre.

ANCASH. Huaylas: near Cañon del Pato, *Ferreyra 14585* (USM); road to Huallanca, *Luna 85* (USM).

5. *Trixis sagasteguii* Cabr., Bol. Soc. Argent. Bot. 10: 42. 1962. TYPE: Peru, La Libertad, Bolívar, Catal, route Marañón–Longotea, 200 m,

A. López M. & A. Sagástegui A. 3163 (holotype, LP, not seen; isotype, HUT). **Figure 20.**

Shrubs, branched, the stems pubescent. **Leaves** subsessile, blades oblanceolate to lanceolate, 90–150 mm long, 25–40 mm wide, pubescent, acute, the margins entire or denticulate. **Capitulescences** of multiheaded, terminal panicles, shortly pedunculate. **Capitula** with involucre cylindrical; phyllaries 14–16, 3–4 seriate, lanceolate, acute, ciliate; florets 5, the corollas yellow, the tube 4–4.5 mm long, the outer lip tridentate, the inner lip bifid, lacinate, to 3 mm long. **Achenes** ca. 5 mm long, pubescent with biseriate trichomes; pappus 6–7 mm long, yellowish-white.

DISTRIBUTION—Known from extreme southern Ecuador and northern Peru. *Trixis sagasteguii* is distinguished by its capitulescences of large, triangular panicles, large sericeous leaves, and three- to four-seriate, densely pubescent involucre.

AMAZONAS. **Bongara:** Río Utcubamba, 18–19 km below Caclic, *Hutchison & Wright 5864* (F).

6. *Trixis subparadoxa* Herrera, Publ. Mus. Hist. Nat. "Javier Prado," Ser. B, Bot. 25: 6. 1969. TYPE: Peru, Cajamarca, Celendín: entre Balsas y Hacienda El Limón, *R. Ferreyra 15059* (holotype, USM 15729).

Shrubs branched, branches pubescent. **Leaves** subsessile; blades elliptic-lanceolate, 50–105 mm long, 10–30 mm wide, the abaxial surfaces densely strigose, the margins entire. **Capitulescences** paniculate-corymbose, terminal, pedunculate, the peduncle with 2 bracts linear, 6–9 mm long. **Capitula** with involucre cylindrical; phyllaries 2-seriate, 2 linear to filiform and 5 lanceolate; florets 7–8, the corollas yellow, bilabiate, the outer lip tridentate, the inner lip bifid. **Achenes** 4–5.5 mm long, pubescent with glandular trichomes; pappus 8–10 mm long, yellowish.

DISTRIBUTION—Endemic to the intermontane regions of northern Peru (900–2000 m).

Trixis subparadoxa most closely resembles *T. cacalioides* but differs in having densely strigose, strictly entire leaves and strongly differentiated, biseriate phyllaries.

AMAZONAS. **Chachapoyas:** above Balsas, *Ferreyra 20761* (USM), *13335* (USM). **CAJAMARCA.** **Jaén:** between Porculla and Jaen, *Ferreyra 13635* (USM).

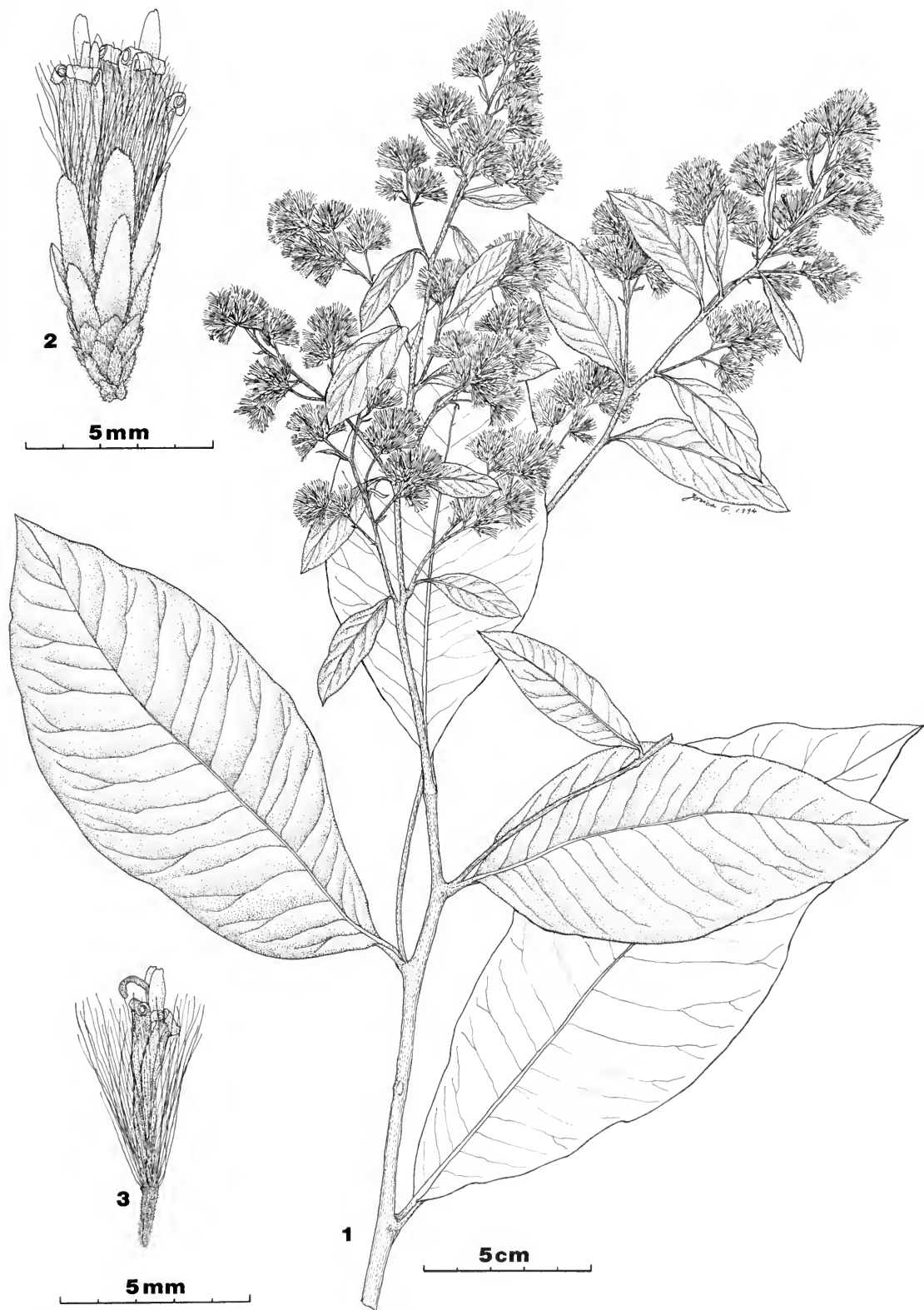


FIG. 20. *Trixis sagasteguii*. 1, habit; 2, capitulum; 3, floret with achene. (Drawn from P.C. Hutchison & J.K. Wright 5864, F.)

Acknowledgments

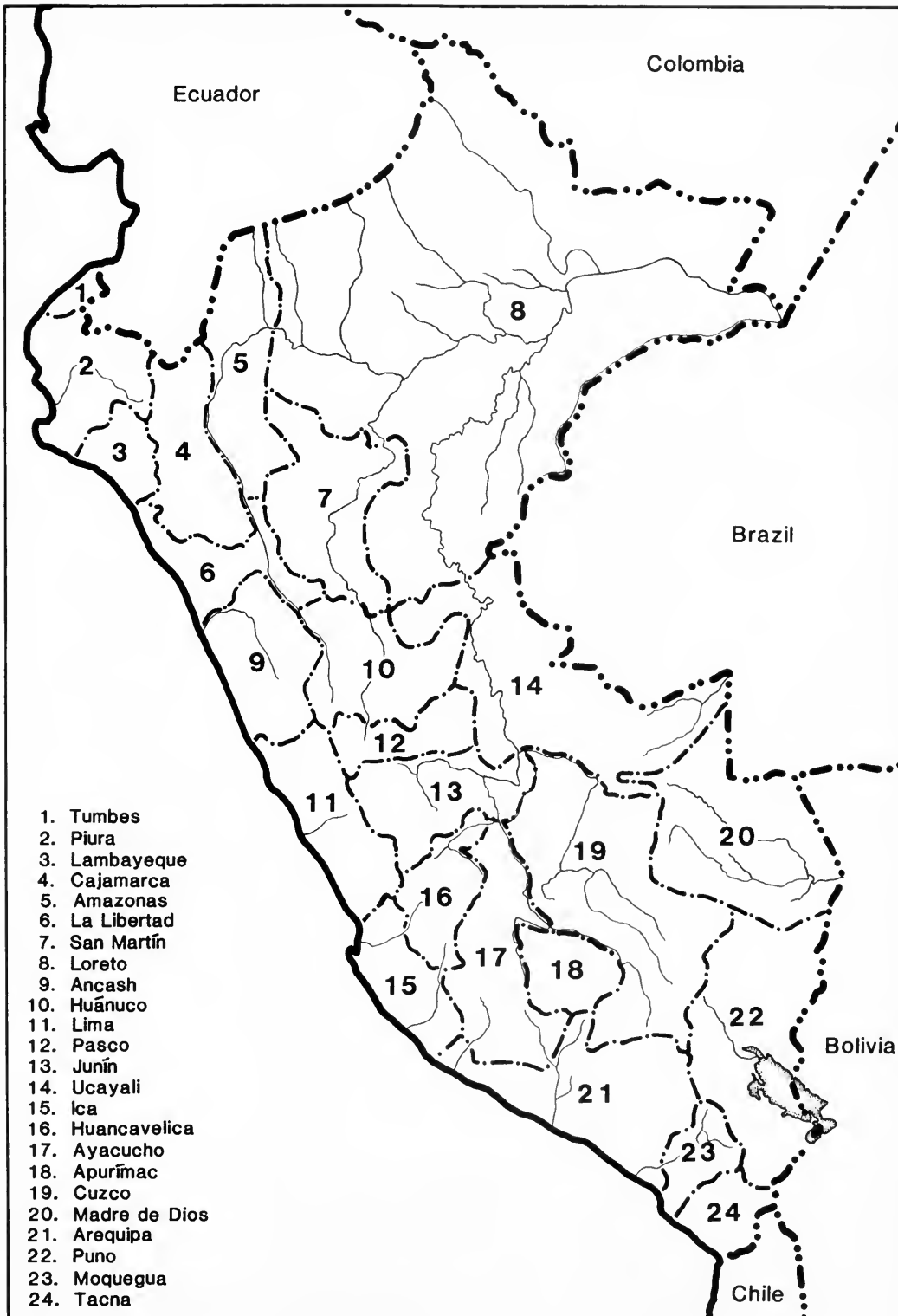
I dedicate this treatment to the memory of J. Francis Macbride, a personal friend and the first Field Museum of Natural History botanist to work on the *Flora of Peru*.

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DEPARTMENTS OF PERU

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