

THE BOLIVIAN SPECIES OF VERNONIA

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Rapid progress has been made in extending knowledge of the flora of Bolivia during the past quarter-century. Bang and Buchtien, stationed in the country, have distributed numerous specimens, several European botanists have collected in it, particularly along its southern boundary, and the expeditions of Rusby, Williams, and White have been especially productive. While many parts of its great extent are practically unknown botanically and will doubtless yield many unreported species, it may be desirable to summarize the species of *Vernonia* so far as they are at present represented at the New York Botanical Garden.

This vast genus is greatly developed in southern Brazil, Paraguay, and Uruguay, where it forms one of the most important components of the flora. These areas have mostly been approached from the east, and it is not known how many of their species extend westward into Bolivia. Another center of development is along the Andean chain of mountains, from Colombia to Bolivia. Since the mountainous portion of Bolivia has been more thoroughly botanized than the eastern portion of the country, the species of this general distribution and relationship are better known.

Lying at the western limits of the *Vernoniae* of the Brazilian center, and at the southern extremity of those of the Andean region, Bolivia exhibits only the end results of evolution, and the species give little clue accordingly to their mutual relationships within the genus. The following arrangement of species may need considerable revision after careful study has been made of the probable evolution of the Brazilian species.

The three sections *Stenocephalum*, *Critoniopsis*, and *Lepidaploa* have been distinguished on the usual morphological characters. Within the last-named section, groups have been segregated according to the inflorescence, since experience with North American species has indicated that this character may be of great evolutionary importance.

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Involucre cylindrical, few-flowered, its scales closely imbricate, permanently erect, coriaceous, subulate or spinose at the tip; inflorescence spicate.

Section 1. STENOCEPHALUM.

Involucres small, of few but imbricate scales, the inner deciduous at maturity, the outer eventually spreading, or permanently erect; pappus fragile, the outer series poorly differentiated; inflorescence a widely and freely branched compound cyme.

Section 2. CRITONIOPSIS.

Involucres small to large, few- to many-flowered, the scales persistent, prominently spreading or reflexed at maturity; achenes ribbed; pappus mostly in two distinct series.

Section 3. LEPIDAPLOA.

All or most of the heads subtended by foliaceous bracteal leaves, sessile or nearly so.

Subsection 3a.

Heads subtended by minute scale-like bracteal leaves or none, sessile or pediceled.

Cymes long, divergent, straight or curved, but maintaining a considerable distance without branches; heads crowded, sessile.

Subsection 3b.

Cymes reduced to 1 or a few heads, which are sessile and terminal or on long terminal or subterminal peduncles; heads mostly large.

Subsection 3c.

Cymes abbreviated, the heads in capitulate clusters, sessile; involucre funnel-form, bearing numerous scales on its narrowed base.

Subsection 3d.

Cymes freely branched, the branches appearing at the bases of many of the sessile heads and producing a large paniculate cluster.

Subsection 3e.

Cymes freely branched and greatly reduced, mostly bearing 1 or 2 heads only, which therefore appear peduncled.

Subsection 3f.

Section 1. STENOCEPHALUM

1. *V. apiculata* Mart., DC. Prodr. 5: 51. 1836.

Oripati, Yungas, Bang 2166; Apolo, Williams 20,123.

Section 2. CRITONIOPSIS

Leaves sessile and clasping by a broad auriculate base, broadest at or near the middle, densely pubescent or tomentose beneath, the larger ones 15–20 cm. long; inflorescence very large and open; heads about 8-flowered; involucre obconic, about 4 mm. high, straw-colored or brown; scales obtuse or rounded; achenes thinly pubescent in 5 lines; pappus white, the deciduous bristles 4 mm. long, the paleae 1 mm. long, scarcely wider than the bristles.

Stem, branches, inflorescence, and lower leaf-surface densely shaggy with gray-brown hairs 3–5 mm. long; leaves broadly oblong-elliptic; involucre hairy toward the base, becoming glabrate toward the summit.

2. *V. jubifera*.

Stem, branches, inflorescence, and lower leaf-surface densely appressed-pubescent or subtomentose; leaves ovate-oblong; involucre scales thinly villous or glabrate toward the tip.

3. *V. Conwayi*.

Leaves petioled, 10–15 cm. long; involucre 3 mm. high; scales rounded to obtuse or acute, mostly tomentose at the tip; pappus gray or tawny.

Leaves and stem essentially glabrous; leaves acuminate; heads 5-flowered; achenes very thinly hirsute.

4. *V. boliviana*.

Leaves and stem pubescent or tomentose; heads 5–8-flowered; achenes nearly or quite glabrous.

Leaves softly ferruginous-tomentose beneath, acuminate at the base, acute or subacuminate at apex, entire.

5. *V. pycnantha*.

Leaves tomentose beneath only on the prominently reticulate veins, truncate or subcordate at base, acuminate at apex, minutely spinose-denticulate.

6. *V. yungasensis*.

2. *V. jubifera* Rusby, Mem. Torrey Bot. Club 6: 53. 1896.
Between Mapiri and Tipuani, Bang 1554 (type).
3. *V. Conwayi* Rusby, Bull. N. Y. Bot. Gard. 8: 125. 1912.
Near Inglis-Inglis, Williams 1493 (type).
4. *V. boliviana* Britton, Bull. Torrey Bot. Club 18: 332. 1891.
Near Yungas, Rusby 1729 (type); Coroico, Yungas, Bang 2409; without further data, Bang.
5. *V. pycnantha* Benth., Pl. Hartweg. 134. 1844.
Yungas, Rusby 1728.
6. *V. yungasensis* Britton, Bull. Torrey Bot. Club 18: 332. 1891.
Near Yungas, Rusby 1731, Rusby 1732 (type).

Section 3. LEPIDAPLOA

Subsection 3a

Bracts resembling the leaves in shape, and but little if any reduced in size.

Leaves linear.

Heads small, the involucre 6-7 mm. high; leaves somewhat revolute, narrowly linear, 2-3 mm. wide, the lateral veins suppressed.

7. *V. rubricaulis*.

Heads large, the involucre 10-16 mm. high; leaves thick and heavy, broadly linear, 5-15 mm. wide, the lateral veins prominent.

Outer involucral scales broadly ovate, subacute and mucronulate; involucre about 11 mm. high; leaves closely tomentose beneath.

8. *V. ligulaefolia*.

Outer involucral scales lanceolate, long-acuminate or subulate, involucre about 16 mm. high; leaves thinly pubescent beneath.

9. *V. ixiamensis*.

Leaves broader than linear.

Involucre 6 mm. high.

10. *V. saltensis*.

Involucre 10-13 mm. high, broadly campanulate to hemispheric.

Middle scales subacute or obtuse, closely appressed, almost glabrous, the inner purple and prominently puberulent with short yellowish hairs.

11. *V. varroniaefolia*.

Middle scales sharply acute to subulate, usually spreading.

12. *V. robusta*.

Bracts much smaller than the leaves.

Involucre narrowly campanulate or subcylindric, its scales obtuse or subacute, appressed, closely imbricate; heads about 8-flowered; achenes hirsute on the ribs only.

13. *V. obtusata*.

- Involucre broadly obconic, its scales long-acuminate or subulate, imbricate at the base, loosely erect or somewhat spreading above.
- Leaves of an ovate type, about twice as long as broad, softly pubescent above, tomentose beneath, the lateral veins prominent, curved-ascending and parallel. 14. *V. Mandonii*.
- Leaves of an oblong type, the lateral veins not prominent or parallel.
- Leaves very minutely puberulent beneath; involucre scales minutely strigose, appearing almost glabrous; involucre 9–12 mm. high. 15. *V. tarijensis*.
- Leaves hirsute beneath; involucre 6–7 mm. high, its scales sericeous or hirsute.
- Stem densely pubescent or subtomentose with purplish hairs. 16. *V. cuneifolia*.
- Stem thinly pubescent.
- Leaves densely pubescent beneath and not resinous; pappus brown or straw-colored. 17. *V. remotiflora*.
- Leaves strigose-pubescent and resinous beneath; pappus white. 18. *V. argyropappa*.
- Leaves linear, lanceolate, or narrowly oblong; pappus dull brown.
- Leaves rounded, truncate, or subcordate at base, the pubescence of the lower surface strigose, on the surface and veins alike. 19. *V. aristosquamosa*.
- Leaves acuminate at base, the pubescence of the lower surface all or chiefly on the veins.
- Scales purple; leaves comose on the veins beneath. 20. *V. Buchtieni*.
- Scales straw-colored; leaves thinly pilose on the veins beneath. 21. *V. deflexa*.
7. *V. rubricaulis* HBK., Nov. Gen. & Sp. 4: 33. 1818.
Several varieties of this widely distributed species have been recognized by Hieronymus in adjacent parts of South America. It seems to be commoner east of Bolivia, from which few specimens have as yet been collected. Velasco, Kuntze; without precise locality, White 1520.
8. *V. ligulaefolia* Mart., DC. Prodr. 5: 45. 1836.
The single sheet examined, Williams 90, from Apolo, was questionably referred to this species by Ekman. It agrees well with the original description, except in the size of the leaves, but only the upper ones are represented.
9. *V. ixiamensis* Rusby, Bull. N. Y. Bot. Gard. 8: 125. 1912.
This striking and well-marked species has recently been recollected at or near the type locality. Ixiamos, Williams 284 (type), Cardanos 2017.
10. *V. saltensis* Hieron., Engler's Jahrb. 22: 691. 1897.
The detailed original description applies perfectly to the single Bolivian specimen examined, Fiebrig 2741, from Chiquiaca.

11. *V. varroniaefolia* DC., Prodr. 5: 56. 1836.

The single collection examined, Bang 2218, without locality, has been provisionally referred here. Ekman has noted that it differs from the type in its larger heads, but otherwise it agrees well with the original description, and even better with that in the Flora Brasiliensis.

12. *V. robusta* Rusby, Mem. Torrey Bot. Club. 6: 54. 1896.

The material examined is sufficient to show that the species varies considerably in form of leaf and in character of involucre, without presenting any features on which species may be segregated.

Between Guanai and Tipuani, Bang 1424 (type); Atten, Williams 1441; Coripati, Yungas, Bang 2118; Velasco, Kuntze; without locality, Bang 2886.

Another sheet collected at Velasco by Kuntze has been annotated as "nicht beschreibbar" by Hieronymus, but Ekman has given it the unpublished name *V. velascensis* Hieron. It is fragmentary, lacking foliage leaves completely. The involucre is more nearly glabrous than in typical *V. robusta*, and the outer scales are much more pungent and distinctly squarrose. It is now referred provisionally to this species.

13. *V. obtusata* Less., Linnaea 6: 62. 1831.

Velasco, Kuntze.

14. *V. Mandonii* Sch.-Bip., Linnaea 34: 534. 1865-66. Name only.

The species is beautifully characterized by its broadly ovate leaves with prominent parallel veins. No description of it has been found, and it is possible that the characterization presented here in the key to the species constitutes its first valid publication.

Near Sorata, province of Larecaja, Mandon 234 (isotype).

15. *V. tarijensis* (Griseb.) Hieron., Engler's Jahrb. 22: 682. 1897.

V. sericea tarijensis Griseb., Goett. Abhandl. 24: 163. 1879.

Distinguished at once from the related species by the glabrate leaves and large heads.

Sierra de Santa Cruz, Kuntze; Velasco, Kuntze.

16. *V. cuneifolia* (Britton) n. sp.

V. arborescens cuneifolia Britton, Bull. Torrey Bot. Club 18: 331. 1891.

Stem stout, densely pubescent with short, stout, spreading, purplish hairs; leaves broadly oblong-elliptic to obovate, up to 8 cm. long by 32 mm. wide, abruptly acute or very short acuminate, entire, cuneate or acuminate at base into a short indefinite petiole, thinly pubescent above with papillose hairs, becoming glabrate and scabrous with the persistent hair-bases, thinly pubescent beneath with rather long papillose hairs, the veins prominent and more or less reticulate, impressed above; inflorescence dense, freely branched, of numerous short irregular cymes; heads about 26-flowered, numerous, irregularly spaced, up to 2 cm. apart or some approximate; bracts narrow, much reduced, the upper about equaling the heads; involucre broadly obconic, 6 mm. high, the scales appressed below, loosely erect above, brown or faintly purple-tinged, narrowly lanceolate, long-acute or subacuminate,

densely sericeous with erect hairs; achenes thinly hirsute; pappus bristles almost white, 6 mm. long, the paleae slender, scarcely wider than the bristles, 1.5 mm. long.

Reis, Rusby 2148.

17. *V. remotiflora* L. C. Rich., Act. Soc. Hist. Nat. Paris 1: 112. 1792.
Santa Cruz, Kuntze; Velasco, Kuntze.

18. *V. argyropappa* Buek, Index Prodr. 2: v. 1840.
Without locality, Bang 1428.

19. *V. aristosquamosa* Britton, Bull. Torrey Bot. Club 18: 332. 1891.
Yungas, Rusby 1657 (type); Apolo, Williams 1496; Atten, Williams 1443;
San Carlos, near Mapiri, Buchtien 1529.

20. *V. Buchtieni* n. sp.

Stems suffruticose, erect, sparingly branched, 3-4 dm. high, softly pubescent above, becoming thinly pubescent or glabrate with age; leaves rather crowded, the blades linear-oblong, broadest near the middle, 5-6 cm. long, 6-11 mm. wide, acute, entire, gradually acuminate or cuneate to the base, sessile or on petioles 2-3 mm. long, thinly pubescent with papillose hairs or becoming glabrate above, comose beneath with brownish hairs on the midvein and margin and sparingly hirsute on the surface, the midvein prominent beneath, the lateral veins faint, sharply ascending and irregular; cymes 2-4, terminal and subterminal, scarcely branched, as much as 8 cm. long, bearing 2-6 heads; bracts resembling the leaves but smaller, the lower 25 mm. long, the upper gradually reduced to 10 mm. long; heads sessile, about 21-flowered; involucre campanulate, 7 mm. high, dull purple; scales appressed below, loosely erect or somewhat spreading above, narrowly lanceolate, long-acuminate, nearly glabrous; achenes thinly hirsute, 3 mm. long; pappus dull brown, the bristles 6 mm. long, the outer scales broadly linear, 0.9-1.1 mm. long.

Type: Buchtien 1528, collected near Mapiri, at an altitude of 700 meters, and deposited in the herbarium of the New York Botanical Garden.

V. Buchtieni is closely related to *V. deflexa* Rusby, from which it differs in the characteristic pubescence of the leaves and the color of the involucre.

21. *V. deflexa* Rusby, Bull. N. Y. Bot. Gard. 4: 376. 1907.
Atten, Williams 1444.

Subsection 3b

Leaves oblanceolate, the principal ones 2 dm. or more long, mostly sharply toothed; inflorescence very large; involucre scales subacute or obtuse.

22. *V. megaphylla*.

Leaves ovate or lanceolate, the principal ones not exceeding 1 dm. in length; inflorescence medium in size; involucre scales acuminate to subulate.

23. *V. scorpioides*.

22. *V. megaphylla* Hieron., Verhandl. Bot. Ver. Brandenburg 48: 195. 1907.
V. digitata Rusby, Bull. N. Y. Bot. Gard. 8: 125. 1912.

The huge leaves and unusually long straight cymes distinguish this

species at once. It should be noted that Hieronymus' statement that the leaves are 1.5 cm. wide is probably a misprint for 1.5 dm.

Mapiri, Buchtien 1527; above Corendo, White 911; cataracts of the Bopi River, Rusby 488; Mapiri, Williams 713 (type of *V. digitata*).

23. *V. scorpioides* (Lam.) Pers., Syn. 2: 404. 1807.

V. cincta Griseb., Goett. Abhandl. 24: 162. 1879.

V. breviramosa Rusby, Bull. N. Y. Bot. Gard. 8: 123. 1912.

Material identified as *V. cincta* Griseb. by Hieronymus can not be separated specifically from this common and widely distributed species.

Apolo, Williams 1431 (type of *V. breviramosa*); Santa Cruz, Kuntze; Velasco, Kuntze; Yapacani, Kuntze; Coroico, North Yungas, Buchtien 432, 3928; North Yungas, Buchtien 4746; South Yungas, Buchtien 277; Yungas, Rusby 1704, Bang 405, 222; Antahuacana, Buchtien 4747; Canamina, Rusby 47; Tunari, Kuntze; Charopampa, Williams 769.

Subsection 3c

Involucral scales lance-subulate; involucre barely exceeding 10 mm. in

height, the common peduncle prolonged 1-2 dm. above the leaves. 24. *V. simplex*.

Involucral scales broad and obtuse; involucre mostly about 15 mm. high.

Heads solitary or rarely 2 or 3; leaves narrowed to the base, not softly tomentose beneath; involucral scales nearly glabrous.

Leaves linear, long-acuminate, minutely puberulent and conspicuously glandular beneath. 25. *V. grandiflora*.

Leaves oblanceolate, obtuse or barely acute, prominently reticulate-veined, closely gray-tomentulose beneath. 26. *V. coriacea*.

Heads several, closely glomerate; leaves rounded at the base, oblong-lanceolate, densely and softly ferruginous-tomentose beneath; involucral scales tomentose. 27. *V. Kuntzei*.

24. *V. simplex* Less., Linnaea 4: 280. 1829.

Ixiamos, Williams 282; Sorata, Rusby 2669.

25. *V. grandiflora* Less., Linnaea 6: 660. 1831.

Chrysocoma pumila Vell., Fl. Flum. 8: 331. 1825. Not *Vernonia pumila* Kotschy & Peyr. 1867.

Velasco, Kuntze.

26. *V. coriacea* Less., Linnaea 6: 661. 1831.

Apolo, Williams 134; Reis, Rusby 1588; without locality, Bang 2888.

27. *V. Kuntzei* Hieron., Engler's Jahrb. 22: 678. 1897.

This well-marked species differs notably from the others of the subsection in its glomerate heads, and is referred here with considerable hesitation.

Santa Cruz, Kuntze (isotype).

Subsection 3*d*

28. *V. squamulosa* Hook. & Arn., in Hook. Comp. Bot. Mag. 2: 44. 1836.

A singular species, strongly reminiscent of the group *Buxifoliae* of *Hispaniola* in its general habit.

Sierra de Santa Cruz, Kuntze.

Subsection 3*e*

Corolla-lobes strongly pubescent within; achenes densely resinous. 29. *V. echitifolia*.

Corolla-lobes glabrous within; achenes pubescent.

Middle and outer involucral scales flat, acuminate to rounded but never subulate, veinless or with an inconspicuous midvein.

Panicle raised on a long, leafless peduncle; leaves obovate, softly and densely tomentose beneath.

30. *V. herbacea*.

Panicle leafy at the base.

Leaves rounded or cordate at base, broadly ovate or oblong, thick, heavy, scabrous above.

Leaves distinctly cordate or subauriculate at base, closely short-pubescent beneath; exposed portion of the glabrate involucral scales broadly ovate.

31. *V. santacruzensis*.

Leaves rounded at base; exposed portion of the pubescent or arachnoid scales lanceolate or narrowly ovate.

Lower leaf-surface and inflorescence densely ferruginous-tomentose; involucral scales green, pubescent on the back chiefly near the apex.

32. *V. ferruginea*.

Lower leaf-surface pubescent or subsericeous with papillose hairs which are later deciduous; inflorescence densely pubescent with short ascending hairs; involucral scales purple at the tip, pubescent chiefly at the margin and base.

33. *V. crassifolia*.

Leaves narrowed to the acute or obtuse base.

Leaves obtuse or rounded, mostly prominently serrate.

Exposed portion of the principal involucral scales broadly ovate, obtuse or rounded and minutely apiculate; leaves narrowly oblong, glabrate beneath or minutely pubescent with short conic hairs.

34. *V. membranacea*.

Exposed portion of the principal scales broadly lanceolate, sharply acute; leaves broadly oblong to obovate, densely pubescent or subtomentose with crooked hairs beneath.

35. *V. brasiliانا*.

Leaves acuminate, entire or obscurely serrate.

Pappus white or pale straw-colored.

Leaves glabrate beneath or minutely pubescent with short conic hairs.

36. *V. myriocephala*.

Leaves appressed-pubescent beneath with long papillose hairs.

37. *V. Lehmanni*.

Pappus tawny.

Middle and outer involucral scales sharply acute to subacuminate.

38. *V. matto-grossensis*.

- Middle and outer scales subacute to obtuse or rounded.
- Middle and outer scales lanceolate, acuminate and prolonged, with the prominently carinate midvein, into a subulate tip.
- Leaves silvery-whitened beneath with dense but short sericeous pubescence, narrowly oblong-lanceolate, acuminate, narrowed to the base.
- Leaves not densely and closely silvery beneath.
- Pappus deep brown.
- Leaves softly and closely sericeous beneath with long hairs; lateral veins prominent, conspicuously equidistant and parallel.
- Heads 11-flowered; outermost involucre scales mostly appressed, lanceolate, sharply tipped; stem and branches velutinous; leaf pubescence brownish, densely sericeous or subtomentose.
- Heads 18-21-flowered; outermost involucre scales loosely erect, acicular; stem and branches densely sericeous with erect hairs; leaf pubescence gray, comparatively loose.
- Leaves pubescent beneath with comparatively sparse irregular hairs; lateral veins not conspicuously equidistant and parallel.
- Involucre densely villous or subtomentose; stem closely and densely velutinous with brown hairs.
- Involucre thinly villous to nearly glabrous; stem villous.
- Pappus white or pale straw-colored.
- Leaves of a lanceolate type, broadest below the middle, pale green or yellowish-green, densely or softly sericeous beneath; lateral veins prominently parallel.
- Leaves rugose above and minutely scabrellate, the largest up to 15 cm. long; lateral veins scarcely elevated above the lower surface; stem velutinous with greenish-brown hairs; involucre brown, the inner scales mostly very thin and frequently somewhat spreading.
- Leaves flat above and scabrously puberulent, the largest exceeding 20 cm. in length; lateral veins 20-25 pairs, stout, heavy, conspicuously elevated above the lower surface; involucre purplish, the inner scales sharply acuminate and strictly erect.
- Leaves of an elliptic type, broadest near the middle, dark green, resinous beneath, pubescent or barely sericeous on the lower surface and prominently so on the veins; lateral veins not conspicuously parallel.
39. *V. baccharoides*.
40. *V. Bakerana*.
41. *V. densipaniculata*.
42. *V. mapirensis*.
43. *V. sordidopapposa*.
44. *V. tristis*.
45. *V. pseudomollis*.
46. *V. costata*.
47. *V. cordiaefolia*.

29. *V. echitifolia* Mart., DC. Prodr. 5: 60. 1836.
Cacalia Hieronymi Kuntze, Rev. Gen. 3²: 138. 1898.
 Velasco, Kuntze.
30. *V. herbacea* (Vell.) Rusby, Mem. Torrey Bot. Club 4: 209. 1895.
Chrysocoma herbacea Vell., Fl. Flum. 330. 1825.
Vernonia obovata Less., Linnaea 4: 279. 1829.
V. paucifolia Rusby, Mem. Torrey Bot. Club 3: 50. 1893.
 Yungas, Bang 247; North Yungas, Buchtien 4415; Coroico, North
 Yungas, Buchtien 3929; Sorata, Larecaja, Mandon 235; Reyes, Rusby
 1316, 1715, 1726.
31. *V. santacruzensis* Hieron., Engler's Jahrb. 22: 699. 1897.
 Sierra de Santa Cruz, Kuntze (type or isotype).
32. *V. ferruginea* Less., Linnaea 4: 271. 1829.
 Coroico, Yungas, Bang 2420.
33. *V. crassifolia* Rusby, Bull. N. Y. Bot. Gard. 8: 124. 1912.
 Apolo, Williams 1513 (type).
34. *V. membranacea* Gardn., Hook. Lond. Jour. Bot. 5: 217. 1846.
V. ruficoma Schlecht., Mart. Fl. Bras. 6²: 105. 1873.
V. rufo-papposa latifolia Hieron., Engler's Jahrb. 22: 700. 1897.
V. squamipes Rusby, Bull. N. Y. Bot. Gard. 8: 124. 1912.
 Apolo, Williams 1410, 34; Velasco, Kuntze (type or isotype of *V. rufo-
 papposa latifolia*); between Guanai and Tipuani, Bang 1420; Tumapasa,
 Williams 522 (type of *V. squamipes*).
- V. squamipes* seems to be merely an abnormal form of this species, with
 the heads raised on scaly pedicels, as was noted by Ekman.
35. *V. brasiliana* (L.) Druce, Bot. Exch. Club British Isl. 3: 426. 1914.
Baccharis brasiliana L., Sp. Pl. ed. 2. 1205. 1763.
Vernonia scabra Pers., Syn. 2: 404. 1807.
 Reis, Rusby 1589; Canamina, Rusby 45, 313.
36. *V. myriocephala* DC., Prodr. 5: 40. 1836.
 Cochabamba, Bang 1207; Antahuacana, Buchtien 2300; near Mapiri,
 Buchtien 1530, 1531; Espia, Rusby and White 304; Bopi River, Rusby 598,
 725; without locality, Mulford Expedition 2149, 718, 701.
37. *V. Lehmanni* Hieron., Engler's Jahrb. 19: 44. 1894.
 Sierra de Santa Cruz, Kuntze.
38. *V. mattogrossensis* Hieron., Engler's Jahrb. 22: 696. 1897.
 W. Velasco, Kuntze.
39. *V. baccharoides* HBK., Nov. Gen. & Sp. 4: 40. 1818.
V. Bangii Rusby, Mem. Torrey Bot. Club 6: 52. 1896.
 Charopampa, Williams 791; San Carlos, near Mapiri, Buchtien 1535,
 5734; between Mapiri and Tipuani, Bang 1483 (type of *V. Bangii*); Espia,
 Rusby and White 110, White 606; Canamina, Rusby 310, White 253.

40. *V. Bakerana* Britton, Bull. Torrey Bot. Club 18: 331. 1891.

Yungas, Rusby 2147 (type); Santa Cruz, Williams 1450; Apolo, Williams 2452; Coripati, Bang 2189.

41. *V. densipaniculata* Rusby, Bull. N. Y. Bot. Gard. 8: 126. 1912.

Cargadira, Williams 1534 (type).

Close to, if not identical with, *V. velutina* Hieron., authentic material of which has not been seen.

42. *V. mapirensis* n. sp.

Stems shrubby, 4 m. high, densely sericeous with erect, light-brown hairs; leaves thin, deep green, oblong-elliptic, the largest 15 cm. long by 5 cm. wide, acute or barely acuminate, entire, cuneate at base, on petioles 5–8 mm. long, glabrous and somewhat rugose above, paler green and shining below with dense sericeous pubescence, which is especially prominent on the conspicuous, parallel, curved-ascending lateral veins; inflorescence terminal, freely branched, many-headed, bearing reduced leaves at the bases of the principal branches; heads 18–21-flowered, sessile, 8–20 mm. apart; involucre broadly campanulate when pressed, 6–7 mm. high; involucre scales loosely erect, or the outermost somewhat spreading, the inner narrowly lanceolate and acuminate, the outer acicular with a prominent carinate midvein, hirsute, especially above; corollas violet; achenes densely hirsute with erect hairs, about 2.5 mm. long; pappus dull brown, the bristles 5 mm. long.

Vicinity of Mapiri, Buchtien 2462, 1533 (type, in the herbarium of the New York Botanical Garden).

43. *V. sordidopapposa* Hieron., Engler's Jahrb. 22: 697. 1897.

Without precise locality, Kuntze (type or isotype).

44. *V. tristis* Hieron., Engler's Jahrb. 22: 683. 1897.

Valley of the Rio Junta, Kuntze (type or isotype).

45. *V. pseudomollis* n. sp.

Stems closely and softly velutinous with yellowish-brown hairs; leaves firm, yellowish-green, the blades lanceolate, 10–15 cm. long by 2.5–4.5 cm. wide, acuminate, entire, abruptly narrowed to an obtuse or somewhat rounded base, on petioles 8–15 mm. long, above rugose and softly pubescent when young, becoming in age scabrellate with the persistent hair-bases, beneath densely and softly sericeous with grayish-white hairs; lateral veins 10–15 pairs, curved-ascending and prominently parallel, impressed above, barely elevated above the pubescence beneath; inflorescence terminal, freely branched, bearing a few reduced leaves at the nodes; heads sessile, about 21-flowered, 5–15 mm. apart; involucre broadly campanulate, 5–6 mm. high, varying from almost glabrous to densely pubescent; outer scales subulate, the middle long-acuminate with a prominent carinate midvein, the inner sharply acute or acuminate, flat, thin, and frequently spreading; achenes 1.5 mm. long, sericeous-hirsute; pappus white or pale straw-colored, the bristles 4.5–5 mm. long, the paleae oblong-linear, 0.7 mm. long.

Yungas, alt. 6000 ft., Rusby 1658 (type, in the herbarium of Columbia University); Apolo, Williams 1432.

46. *V. costata* Rusby, Mem. Torrey Bot. Club 6: 53. 1896.
Between Mapiri and Tipuani, Bang 1472 (type).

47. *V. cordiaefolia* HBK., Nov. Gen. & Sp. 4: 38. 1818.

V. patuliflora Rusby, Bull. N. Y. Bot. Gard. 4: 376. 1907.

This common species presents a considerable range of variation, but is nevertheless readily recognizable and constant to the characters set forth in the key.

Coroico, Yungas, Bang 2396 (type of *V. patuliflora*), Buchtien 3931, 3930; Antahuacana, Buchtien 2256; San Carlos, near Mapiri, Buchtien 1532, 1534, 2462.

Subsection 3f

Leaves auriculate-clasping at the base.

Involucre 5 mm. high, its scales few, loosely imbricate in few series, narrowly lanceolate, sharply acute; leaves narrowly elliptic, toothed above the middle to the short-acuminate tip, abruptly constricted below the middle, nearly glabrous beneath.

48. *V. prenanthoides*.

Involucre 13 mm. high, its scales numerous, closely imbricate in several series, oblong, the inner obtuse or minutely apiculate; leaves narrowly oblong, 15-20 cm. long, sharply toothed, densely pubescent beneath.

49. *V. auriculata*.

Leaves not auriculate-clasping.

Involucral scales all acute, or the inner lance-subulate, purple; leaves ovate, strictly entire, on petioles 2-3 mm. long.

50. *V. laurifolia*.

Inner involucral scales blunt, the outer acute to cuspidate, green, or with purple tips; leaves not ovate.

Leaves narrowly oblong; involucral scales in relatively few series.

51. *V. canaminina*.

Leaves broadly oblong to elliptic; involucral scales in numerous series.

52. *V. fulva*.

48. *V. prenanthoides* n. sp.

Stems shrubby, 2 m. high, the younger portions glabrous, prominently angled; leaves closely sessile, auriculate-clasping, elliptic, abruptly short-acuminate, sharply serrate above the middle, entire and conspicuously constricted below the middle, glabrous above, minutely puberulent with short conic hairs beneath, pinnately veined; inflorescence large, paniculate, freely branched, the cymes short, with few heads; heads about 18-flowered, sessile or on peduncles up to 3 cm. long; involucre broadly obconic, 6 mm. high, its scales irregular in length, loosely imbricate below, erect, few in number, not fully concealing the achenes, straw-colored or dull brown, lanceolate, glabrous, the outer acuminate, the inner sharply acute, achenes prominently ribbed, short-hirsute; pappus straw-colored, the bristles fragile, 5 mm. long, the paleae 0.5 mm. long.

Rurrenabaque, alt. 1,000 ft., Rusby 756 (type, in the herbarium of the New York Botanical Garden), Rusby 757.

The leaves are closely similar in outline and serration to those of *Aster*

prenanthoides; the largest in the two sheets at hand are 11 by 4 cm. Corollas are not present, but were noted by the collector as blue or white in color.

49. *V. auriculata* Griseb., Goett. Abhandl. 24: 163. 1879.

Tarija, Lorentz 874 (isotype).

50. *V. laurifolia* DC., Prodr. 5: 30. 1836.

Cargadira, Williams 1531; Yungas, Bang 617, Rusby 1617; Mapiri, Bang 1534.

51. *V. canaminina* n. sp.

Herb 6-9 dm. high, with purple flowers; stems strongly angled, glabrous, branching only in the inflorescence; leaves linear-oblong, the upper about 6 cm. long by 8 mm. wide, sharply but remotely dentate, closely sessile, scabrellate above, closely and finely tomentulose beneath; inflorescence large, loose and open; heads numerous, sessile or peduncled, about 26-flowered; involucre 8 mm. high, broadly obconic to subhemispheric, the few scales loosely and irregularly imbricate, glabrous, green or brownish below, purple at the tip, with a green or scarious margin, the outer ovate-lanceolate, acute or subacute, the inner narrowly oblong, obtuse or rounded; corolla 8 mm. long, the linear lobes glabrous, 2.5 mm. long; achenes 4 mm. long, prominently ribbed, pubescent; pappus pale straw-colored, the numerous bristles 7 mm. long, the paleae linear, erect, 0.6 mm. long.

Canamina, alt. 4,500 ft., White 752 (type, in the herbarium of the New York Botanical Garden).

Differing from *V. fulva*, with which it appears related, in its narrower and sessile leaves, its erect habit, tomentulose leaves, broader and more open inflorescence, smaller heads, shorter involucre, narrower and blunter involucre scales, and shorter pappus. The type specimen bears only two leaves, so that the shape and dimensions of the lower ones are unknown.

52. *V. fulva* Griseb., Goett. Abhandl. 24: 164. 1879.

V. senecionaefolia Britton, Bull. Torrey Bot. Club 18: 331. 1891.

V. trixioides Rusby, Mem. Torrey Bot. Club 6: 54. 1896.

Mapiri, Williams 782, Bang 1484 (type of *V. trixioides*), Buchtien 1523; Guanai Rio, Williams 1503; Machichoirisa, Williams 1607; Canamina, Rusby 312; Yungas, Rusby 1730 (type of *V. senecionaefolia*); Suri, White 226; Bopi River, Rusby 599; without definite locality, Kuntze, Mulford Biological Exploration 2148.

In addition to the preceding, *V. mollis* HBK. was reported from Bolivia by Schultz-Bipontinus, who also published the *nomina nuda* *V. centauroides* and *V. quindecimflora*. No material has been seen which could be referred to *V. brachylepis* Griseb. or to *V. centauropsidea* Hieron.

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