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A NEW GENUS *VERNONANTHURA* (VERNONIEAE, ASTERACEAE)

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ABSTRACT

Vernonanthura is described for 62 Neotropical species previously placed in *Vernonia* with *Baccharis brasiliana* L. as type. The genus differs from *Vernonia* in the woody habit, the erect sometimes xylopodial bases, the thyrsoid to pyramidal inflorescences, and the often prominent basal appendages on the anther thecae.

KEY WORDS: Asteraceae, Vernonieae, *Vernonanthura, Vernonia*, new genus

During the last decade, the author has produced a number of papers in which many genera have been segregated from *Vernonia* Schreb. Among these papers are many that treat the "*Lepidaploa* Complex" (Robinson 1987a, b, c; 1988a, b, c; 1990), the members of which are considered part of the subtribe Vernoniinae, but which were initially distinguished as a group from typical *Vernonia* only by the extremely scorpioid cymose or seriate cymose forms of their inflorescences or by their lophate pollen grains. In the papers on the *Lepidaploa* Complex, the limits of typical *Vernonia* in eastern North America, México, and the Bahamas have been left imprecisely defined, and some Neotropical elements of the Vernoniinae that were less obviously distinct from *Vernonia* were left in the latter genus, in spite of the realization that they eventually needed to be removed. Improved knowledge of the limits of typical *Vernonia* and the need for fully revised concepts for floristic treatments make the description of the present new genus necessary at this time. The new genus includes the largest group of Neotropical species that has remained in *Vernonia*. None of the existing generic names in the Vernonieae has been found to apply to this group. The new name is derived from the generic name *Vernonia* plus the complex ending derived from "anthera" (anther) and "oura" (tail), referring to the frequently tailed anther bases.

Vernonanthura H. Robinson, *gen. nov.* TYPE: *Baccharis brasiliana* L.

Plantae erectae fruticosae vel arborescentes raro volubiles (*Vernonanthura cocleana* [Keeley] H. Robinson); xylopodia saepe praesentia; caules teretes vel angulati (*V. pinguis* [Griseb.] H. Robinson) medulla solida, pilis simplices vel T-formibus. Folia alternata sessilia vel longe petiolata; laminae lineares vel lanceolatae vel late oblongae vel obovatae, base obtusae vel attenuatae raro cordatae vel auriculatae (*V. amplexicaulis* [Fries] H. Robinson) margine integrae ad dense serratae apice obtusae vel breviter acuminatae supra glabrae vel pilosulae vel scabrae subtus glabrae vel tomentosae glandulo-punctatae, nervis secondariis patentiter pinnatis. Inflorescentiae thyrsoideae vel pyramidaliter paniculatae, ramis dense ad laxe vel leniter seriato-cymosis vel corymbiformis, foliis in nodis inferioribus inflorescentiae leniter vel valde minoribus, bracteolis superiores parvis, pedunculis nullis vel brevibus plerumque ad 8 mm longis raro longioribus (*V. tweedieana* [Baker] H. Robinson). Capitula homogama; involucra plerumque late campanulata; bracteis $1\frac{1}{2}$-3plo numeriores quam floribus plerumque 16-30 (ca. 60 in *V. crassa* [Vell. Conc.] H. Robinson) in seriebus 4-10 valde imbricatis subcoriaceis ovatis vel oblongis apice obtusis raro bracteis inferioribus apice acutis et reflexis (*V. angulata* [H. Robinson] H. Robinson) interioribus persistentibus; receptacula epaleacea. Flores 4-30 in capitulo; corollae lavandulae vel albae anguste infundibulares, faucibus distinctis interne glabris, lobis linearibus glanduliferous, pilis nullis, ductis interioribus longitudinalibus numerosis; thecae antherarum base breviter vel longe appendiculatae; appendices apicales oblongo-ovatae, appendices et connectivae saepe abaxialiter glanduliferae, parietibus cellularum tenuibus; base stylorum disciformiter nodulosi. Achaenia prismatica vel obovata glabra vel dense setulifera et glandulifera 8-10 costata, idioblastis non glandularibus plerumque in aggregatis 1-3 cellularibus, rhaphides subquadratis vel late oblongis; carpopodia superne constricta in partibus superioribus saepe setulifera et glandulifera; setae pappi biseriatae, seriebus exterioribus brevibus et plerumque squamiformibus, seriebus interioribus capillaris apice plerumque distincte latiores. Grana pollinis in diametro plerumque 37-40 μm typus A tricolporata, tectis perforatis inter colpis continuis, $x = 17$ (Jones 1979, 5 spp.; Keeley 1978, 1 sp.; Stutts 1988, 5 spp.).

Like most American Vernonieae, *Vernonanthura* has a basic chromosome number of $x = 17$. The new genus is clearly a member of the subtribe Vernoniinae in having a well developed basal stylar node and apical anther appendages with thin walled cells and often with glands. Within the subtribe,

the new genus is unlike members of the *Lepidaploa* Complex and similar to *Vernonia* in the Type A rather than lophate pollen, in the lack of truly scorpioid cymes or cymes with large foliose bracts in the inflorescence, in the lack of hairs or spicules on the corolla lobes, and in the subquadrate to short oblong rather than elongate raphids in the achene walls. In all these respects the new Neotropical genus seems to be a close relative of the North Temperate *Vernonia*.

As presently recognized, *Vernonia* sensu stricto is mostly eastern North American, with a few species such as *V. ervendbergii* A. Gray, *V. faustiana* (Chapman & Jones) Turner, *V. greggii* A. Gray, and *V. schaffneri* A. Gray extending into México, and *V. blodgettii* Small and *V. insularis* Gleason reaching the Bahamas. Unlike *Vernonia*, *Vernonanthura* ranges throughout the Neotropical Region from México to Argentina. In the West Indies it includes those species placed by Keeley (1978) in the subsects. *Buxifoliae* Ekman and *Polyanthes* Ekman. Jones (1976) treated some of the Mexican species in his revision of subsect. *Paniculatae* ser. *Umbelliformes* Gleason. South American species were placed by Cabrera in subsects. *Chamaedrys* Cabrera and *Nitidulae* Cabrera, and many are placed in subsects. *Nudiflorae* Cabrera and *Polyanthes* Ekman. Species of the new genus were placed by Stutts (1988) in the ser. *Brasilianae* Stutts, *Nitidulae* (Cabrera) Stutts, and *Puberulae* Stutts, subser. *Chamaedrys* (Cabrera) Stutts, *Laxae* Stutts, *Nudiflorae* Stutts, and *Chaquensis* Stutts. In Baker (1873) members of the genus fell mostly into his informal subsections *Lepidaploae Scorpioideae*, *Scorpioidea Verae*, and *Lepidaploae Paniculatae*. No previous treatment seems to have recognized the species of *Vernonanthura* as a single group apart from other elements of *Vernonia*.

Gleason (1922) noted the most useful distinction between *Vernonia* sensu stricto and other species in tropical North America by his key character, "Inflorescence corymbiform, its branches irregular in length; heads few to many, on peduncles of irregular length or some nearly sessile; species of northern México, the United States, and the Bahama Islands," All the typical *Vernonia* species examined show such inflorescences with shallowly rounded, flattened, or cymose form. In contrast, the inflorescence in *Vernonanthura* is pyramidal to thyrsoid in form with only individual branches showing corymbose or cymose shape. In cases where whole plants are available, a second difference between *Vernonia* and *Vernonanthura* can be seen. In *Vernonia* the bases of the stems arise from a creeping stem, and they are herbaceous. In *Vernonanthura* the stems are erect from a woody base without evident creeping stems. The bases often have xylopodia, as noted in the subsection *Chamaedrys* by Stutts (1988). The plants are shrubs or even trees. A third difference is significant in *Vernonanthura*, but is not found in all the species. *Vernonia* is recognized in the traditional concepts of the genus for its lack of tailed anther bases, and this is actually true of *Vernonia* sensu stricto. However, in *Vernonanthura* a number of species have tails. In some cases, such as *V. diffusa* (Less.) H. Robinson,

V. discolor (Less.) H. Robinson, and *V. petiolaris* (A.DC.) H. Robinson, the tails are highly developed, as long as the tails of *Piptocarpha* R. Br. of the Piptocarphinae, which is traditionally distinguished from *Vernonia* on the basis of that character. The prominently tailed species of *Vernonanthura*, like many Old World species with tailed anthers (Robinson & Kahn 1986), should never have been placed in *Vernonia* as traditionally defined. The type species of *Vernonanthura*, *V. brasiliana* (L.) H. Robinson, has shorter, but nevertheless, distinct tails. These sterile bases of the anthers are obvious in opened florets under the dissecting microscope by their texture. Most other species of *Vernonanthura* have some sterile cells at the anther base, often forming some teeth, but there are members of the genus that have anther bases essentially like those of *Vernonia*.

Other possible distinctions of *Vernonanthura* remain to be critically examined. The corolla lobes of many *Vernonanthura* have elongate internal structures that appear to be thin walled, rather obvious, parallel ducts filling the lobe, and other species seem to share the character in a weaker form. These structures have not been studied in detail, but they have not been noticed in *Vernonia* or *Eremosis* (A.DC.) Gleason. The corolla lobes of *Vernonia*, have thicker and more roughened tips than those of *Vernonanthura*. In one case where a hair was seen on a corolla lobe in *Vernonanthura*, it was not T-shaped, but a few of the rare hairs seen microscopically in *Vernonia* were T-shaped. Most members of the new genus closest to the type have carpopodia with setulae or glands intruding onto the upper, constricted, sclerified part. The glands or setulae do not arise directly from sclerified cells, but their bases are often completely surrounded by such cells. The sclerified parts of carpopodia in *Vernonia* sensu stricto are not constricted above and bear no setulae or glands.

The genus contains the following 62 Neotropical species that have been examined by the author. The list excludes some species that have not been studied as carefully, and the synonymies exclude combinations made in *Cacalia* Burm. by Kuntze (1891) except one name that is a basionym. Four comparatively familiar names, *Vernonia missionis* Gardner, *V. nitidula* Less., *V. polyanthes* Less., and *V. ruficoma* Schlecht. *ex* Baker fall into synonymy respectively under the names *Vernonanthura cymosa* (Vell. Conc.) H. Robinson, *V. montevidensis* (Spreng.) H. Robinson, *V. phosphorica* (Vell. Conc.) H. Robinson, and *V. membranacea* (Gardner) H. Robinson.

Vernonanthura almedae (H. Robinson) H. Robinson, *comb. nov.* BASIONYM: *Vernonia almedae* H. Robinson, Phytologia 46:107. 1980.

Vernonanthura amplexicaulis (Fries) H. Robinson, *comb. nov.* BASIONYM: *Vernonia amplexicaulis* Fries, Ark. Bot. 5(13):5. 1906.

Vernonanthura angulata (H. Robinson) H. Robinson, *comb. nov.* BASIONYM: *Vernonia angulata* H. Robinson, Phytologia 45:170. 1980.

Vernonanthura auriculata (Griseb.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia auriculata* Griseb., *Symb. Fl. Argent.* 164. 1879.

Vernonanthura beyrichii (Less.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia beyrichii* Less., Linnaea 4:275. 1829.
Vernonia denticulata A.DC., *Prodr.* 5:36. 1836.

Vernonanthura brasiliana (L.) H. Robinson, *comb. nov.* BASIONYM: *Baccharis brasiliana* L., *Sp. Pl.* ed. 2, 1205. 1763. *Vernonia brasiliana* (L.) Druce, Rep. Bot. Exch. Cl. Brit. Isles 3:426. 1913 (1914).
Vernonia scabra Pers., *Syn. Pl.* 2:404. 1807.
Vernonia odoratissima H.B.K., *Nov. Gen. Sp.*, ed. fol. 4:32. 1818.
Vernonia assana Mart. *in* A.DC., *Prodr.* 5:38. 1836.

Vernonanthura buxifolia (Less.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia buxifolia* Less., Linnaea 4:313. 1829; based on *Lepidaploa buxifolia* Cass. *Lepidaploa buxifolia* Cass., *Dict. Sci. Nat.* 26:18. 1823; *nom. inval.*, described in *Lepidaploa* prior to validation at generic level.
Vernonia domingensis A.DC., *Prodr.* 5:30. 1836.
Vernonia montana Gleason, Bull. New York Bot. Gard. 4:191. 1906.

Vernonanthura canaminina (Gleason) H. Robinson, *comb. nov.* BASIONYM: *Vernonia canaminina* Gleason, Amer. J. Bot. 10:309. 1923.

Vernonanthura catharinensis (Cabrera) H. Robinson, *comb. nov.* BASIONYM: *Vernonia catharinensis* Cabrera, Sellowia 13:180. 1961.

Vernonanthura chamaedrys (Less.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia chamaedrys* Less., Linnaea 4:259. 1829.
Vernonia ilex Chodat, Bull. Herb. Boissier, ser. II. 4:410. 1902.

Vernonanthura cichoriifolia (Chodat) H. Robinson, *comb. nov.* BASIONYM: *Vernonia cichoriifolia* Chodat, Bull. Herb. Boissier, ser. II. 2:300. 1902.

Vernonanthura chaquensis (Cabrera) H. Robinson, *comb. nov.* BASIONYM: *Vernonia chaquensis* Cabrera, Darwiniana 6:358. 1944.

Vernonanthura cocleana (Keeley) H. Robinson, *comb. nov.* BASIONYM: *Vernonia cocleana* Keeley, Brittonia 39:44. 1987.

Vernonanthura condensata (Baker) H. Robinson, *comb. nov.* BASIONYM: *Vernonia condensata* Baker, J. Bot. 8:202. 1875.

Vernonia sylvestris Glaz., Bull. Soc. Bot. France 56, Mém. 1(3):373. 1909; *nom. nud.*
Vernonia bahiensis Toledo, Arq. Bot. Estado São Paulo, n.s. 1:52. 1939.

Vernonanthura cordata (H.B.K.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia cordata* H.B.K., *Nov. Gen. Sp.*, ed. fol. 4:31. 1818.
Vernonia morelana Gleason, Bull. Torrey Bot. Club 46:241. 1919.

Vernonanthura crassa (Vell. Conc.) H. Robinson, *comb. nov.* BASIONYM: *Chrysocoma crassa* Vell. Conc., *Fl. Flumin.* 305. 1825 [1829]. *Vernonia crassa* (Vell. Conc.) Ekman *ex* Malme, Kongl. Svenska Vetenskapsakad. Handl. III. 12(2):24. 1933.

Vernonanthura cronquistii (S.B. Jones) H. Robinson, *comb. nov.* BASIONYM: *Vernonia cronquistii* S.B. Jones, Rhodora 78:194. 1976.

Vernonanthura cuneifolia (Gardner) H. Robinson, *comb. nov.* BASIONYM: *Vernonia cuneifolia* Gardner, London J. Bot. 5:215. 1846.
Vernonia itapensis Chodat, Bull. Herb. Boissier, ser. II. 2:301. 1902.

Vernonanthura cupularis (Chodat) H. Robinson, *comb. nov.* BASIONYM: *Vernonia cupularis* Chodat, Bull. Herb. Boissier, ser. II. 2:299. 1902.

Vernonanthura cymosa (Vell. Conc.) H. Robinson, *comb. nov.* BASIONYM: *Chrysocoma cymosa* Vell. Conc., *Fl. Flumin.* 327. 1825 [1829]; not *Vernonia cymosa* Blume, 1826.
Vernonia missionis Gardner, London J. Bot. 4:115. 1845.

Vernonanthura deppeana (Less.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia deppeana* Less., Linnaea 6:398. 1831.

Vernonanthura diffusa (Less.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia diffusa* Less., Linnaea 4:272. 1829.

Vernonanthura discolor (Less.) H. Robinson *comb. nov.* BASIONYM: *Vernonia discolor* Less., Linnaea 4:274. 1829.

Vernonanthura fagifolia (Gardner) H. Robinson, *comb. nov.* BASIONYM: *Vernonia fagifolia* Gardner, London J. Bot. 5:216. 1846.

Vernonanthura ferruginea (Less.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia ferruginea* Less., Linnaea 4:271. 1829.
Vernonia polycephala A.DC., *Prodr.* 5:39. 1836.
Vernonia crenata Gardner, London J. Bot. 5:218. 1846.

Vernonanthura fuertesii (Urban) H. Robinson, *comb. nov.* BASIONYM:
Eupatorium fuertesii Urban, Repert. Spec. Nov. Regni Veg. 17:9. 1921.
Vernonia fuertesii (Urban) H. Robinson, Phytologia 38:149. 1977.
Vernonia barkeri Ekman *ex* Urban, Ark. Bot. 23A(11):49. 1931.

Vernonanthura havanensis (A.DC.) H. Robinson, *comb. nov.* BASIONYM:
Vernonia havanensis A.DC., *Prodr.* 5:37. 1836.
Vernonia cubensis Griseb., *Cat. Pl. Cub.* 144. 1866.
Vernonia stictophylla Wright, Sauv. Anal. Cien. Havana 6:176. 1894.

Vernonanthura hieracioides (Griseb.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia hieracioides* Griseb., Mem. Amer. Acad. Arts 8:511. 1861.
Vernonia orientis Gleason, Bull. Torrey Bot. Club 40:330. 1913.

Vernonanthura ignobilis (Less.) H. Robinson, *comb. nov.* BASIONYM:
Vernonia ignobilis Less., Linnaea 6:658. 1831.

Vernonanthura laxa (Gardner) H. Robinson, *comb. nov.* BASIONYM:
Vernonia laxa Gardner, London J. Bot. 5:214. 1846.

Vernonanthura liatroides (A.DC.) H. Robinson, *comb. nov.* BASIONYM:
Vernonia liatroides A.DC., *Prodr.* 5:34. 1836.
Vernonia ehrenbergiana Schultz-Bip., Linnaea 20:513. 1847.
Eupatorium tulanum Klatt, Abh. Naturf. Ges. Halle 15:324. 1882.
Vernonia capreaefolia Gleason, Bull. New York Bot. Gard. 4:200. 1906.

Vernonanthura loretensis (Hieron.) H. Robinson, *comb. nov.* BASIONYM:
Vernonia loretensis Hieron., Bot. Jahrb. Syst. 22:676. 1897.

Vernonanthura lucida (Less.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia lucida* Less., Linnaea 4:260. 1829.

Vernonanthura mariana (Mart. *ex* Baker) H. Robinson, *comb. nov.* BASIONYM: *Vernonia mariana* Mart. *ex* Baker, *Fl. Bras.* 6(2):107. 1873.

Vernonanthura membranacea (Gardner) H. Robinson, *comb. nov.* BASIONYM: *Vernonia membranacea* Gardner, London J. Bot. 5:217. 1846.
Vernonia ruficoma Schlecht. *ex* Baker, *Fl. Bras.* 6(2):105. 1873.

Vernonanthura menthaefolia (Poeppig *ex* Spreng.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia menthaefolia* Poeppig *ex* Spreng., *Syst. Veg.*, ed. 16, 3:412. 1826.
Eupatorium perrinianum Spreng., *Syst. Veg.*, ed. 16, 3:412. 1826.
Vernonia ottonis Schultz-Bip., Linnaea 20:508. 1847.
Vernonia grisebachii Schultz-Bip., J. Bot. 1:231. 1863.

Vernonanthura montevidensis (Spreng.) H. Robinson, *comb. nov.* BASIONYM: *Baccharis montevidensis* Spreng., *Syst. Veg.*, ed. 16. 3:460. 1826; not *Vernonia montevidensis* Nees *ex* Otto & A. Dietr.
Vernonia nitidula Less., Linnaea 4:266. 1829.
Vernonia gochnatioides Hook. & Arn. *ex* A.DC., *Prodr.* 7:264. 1838.
Vernonia florida Gardner, London J. Bot. 5:212. 1846.
Vernonia arechavaletae André, Rev. Hort. 73:284. 1901.

Vernonanthura mucronulata (Less.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia mucronulata* Less., Linnaea 4:266. 1829.
Vernonia collina Gardner, London J. Bot. 5:213. 1846.

Vernonanthura nudiflora (Less.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia nudiflora* Less., Linnaea 4:258. 1829.

Vernonanthura oaxacana (Schultz-Bip. *ex* Klatt) H. Robinson, *comb. nov.* BASIONYM: *Vernonia oaxacana* Schultz-Bip. *ex* Klatt, Leopoldina 20:74. 1894.

Vernonanthura oligactoides (Less.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia oligactoides* Less., Linnaea 4:648. 1831.
Vernonia sorocabae Schultz-Bip. *ex* Baker, *Fl. Bras.* 6(2):58. 1873.
Vernonia conyzoides Chodat, Bull. Herb. Boissier, ser. II. 2:303. 1902.

Vernonanthura oligolepis (Schultz-Bip. *ex* Baker) H. Robinson, *comb. nov.* BASIONYM: *Vernonia oligolepis* Schultz-Bip. *ex* Baker, *Fl. Bras.* 6(2):56. 1873.

Vernonanthura paludosa (Gardner) H. Robinson, *comb. nov.* BASIONYM: *Vernonia paludosa* Gardner, London J. Bot. 4:113. 1845.

Vernonanthura patens (H.B.K.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia patens* H.B.K., *Nov. Gen. Sp.*, ed. fol. 4:32. 1818.
Vernonia baccharoides H.B.K., *Nov. Gen. Sp.*, ed. fol. 4:32. 1818.
Vernonia lanceolaris A.DC., *Prodr.* 5:37. 1836.
Vernonia haenkeana A.DC., *Prodr.* 5:37. 1836.
Vernonia micradenia A.DC., *Prodr.* 5:38. 1836.
Vernonia pacchensis Benth., *Pl. Hartw.* 134. 1844.
Vernonia aschenborniana Schauer, Linnaea 19:714. 1847.
Vernonia stuebelii Hieron., Bot. Jahrb. Syst. 21:337. 1895.
Vernonia bangii Rusby, Mem. Torrey Bot. Club 6:52. 1896.
Vernonia weberbaueri Hieron., Bot. Jahrb. Syst. 40:354. 1908.
Vernonia monsonensis Hieron., Bot. Jahrb. Syst. 40:335. 1908.
Vernonia salamana Gleason, Bull. Torrey Bot. Club 46:242. 1919.
Vernonia vargasii Cuatr., Bot. Jahrb. Syst. 77:83. 1956.

Vernonanthura petiolaris (A.DC.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia petiolaris* A.DC., *Prodr.* 5:37. 1836.
Vernonia hilariana Gardner, London J. Bot. 4:113. 1845.

Vernonanthura phaeoneura (Toledo) H. Robinson, *comb. nov.* BASIONYM: *Vernonia phaeoneura* Toledo, Arq. Bot. Estado São Paulo 1(4):95. 1942.

Vernonanthura phosphorica (Vell. Conc.) H. Robinson, *comb. nov.* BASIONYM: *Chrysocoma phosphorica* Vell. Conc., *Fl. Flumin.* 325. 1825 [1829].
Chrysocoma arborea Vell. Conc., *Fl. Flumin.* 326. 1825 [1829].
Vernonia polyanthes Less., Linnaea 6:651. 1831.
Vernonia psittacorum A.DC., *Prodr.* 5:36. 1836.
Vernonia corcovadensis Gardner, London J. Bot. 5:218. 1846.

Vernonanthura pinguis (Griseb.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia pinguis* Griseb., *Symb. Fl. Argent.* 165. 1879.

Vernonanthura piresii (H. Robinson) H. Robinson, *comb. nov.* BASIONYM: *Vernonia piresii* H. Robinson, Phytologia 45:178. 1980.

Vernonanthura prenanthoides (Gleason) H. Robinson, *comb. nov.* BASIONYM: *Vernonia prenanthoides* Gleason, Amer. J. Bot. 10:308. 1923.

Vernonanthura puberula (Less.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia puberula* Less., Linnaea 6:649. 1831.

Vernonanthura rigiophylla (Kuntze) H. Robinson, *comb. nov.* BASIONYM: *Cacalia rigiophylla* Kuntze, *Revis. Gen. Pl.* 2:971. 1891; based on *Vernonia rigiophylla* Schultz-Bip. *ex* Baker. *Vernonia rigiophylla* Schultz-Bip. *ex* Baker, *Fl. Bras.* 6(2):118. 1873; not *Vernonia rigiophylla* A.DC., 1836.
Vernonia elsieae Stutts, Brittonia 35:351. 1983.

Vernonanthura sambrayana (S.B. Jones) H. Robinson, *comb. nov.* BASIONYM: *Vernonia sambrayana* S.B. Jones, Fieldiana, Bot., n.s. 5:34. 1980.

Vernonanthura serratuloides (H.B.K.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia serratuloides* H.B.K., *Nov. Gen. Sp.*, ed. fol. 4:33. 1818.
Perezia paniculata A. Gray, Proc. Amer. Acad. Arts 21:393. 1886.
Perezia vernonioides A. Gray, Proc. Amer. Acad. Arts 22:433. 1887.
Vernonia jaliscana Gleason, Bull. New York Bot. Gard. 4:198. 1906.
Vernonia umbellifera Gleason, Bull. New York Bot. Gard. 4:199. 1906.

Vernonia vernonioides (A. Gray) Bacigalupi, Contr. Gray Herb. 97:77. 1931.
Vernonia camporum M.E. Jones, Contr. West. Bot. 18:69. 1933.
Perezia nervata M.E. Jones, Contr. West. Bot. 18:74. 1933.

Vernonanthura sinclairii (Benth.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia sinclairii* Benth., *Bot. Voy. Sulphur* 109. 1845.

Vernonanthura squamulosa (Hook. & Arn.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia squamulosa* Hook. & Arn., Companion Bot. Mag. 2:44. 1836.
Cacalia praecox Kuntze, *Revis. Gen. Pl.* 3:139. 1898. *Vernonia praecox* (Kuntze) Schumann, Just's Bot. Jahresber. 26(1):382. 1900.

Vernonanthura stellata (Spreng.) H. Robinson, *comb. nov.* BASIONYM: *Conyza stellata* Spreng., *Neue Entdeck.* 2:142. 1820.

Vernonanthura subverticillata (Schultz-Bip. *ex* Baker) H. Robinson, *comb. nov.* BASIONYM: *Vernonia subverticillata* Schultz-Bip. *ex* Baker, *Fl. Bras.* 6(2):99. 1873.

Vernonanthura tuerckheimii (Urban) H. Robinson, *comb. nov.* BASIONYM: *Vernonia tuerckheimii* Urban, *Symb. Antill.* 7:421. 1912.
Vernonia microphylla Alain, Mem. New York Bot. Gard. 21:156. 1971.
Vernonia pusilliflora Alain, Mem. New York Bot. Gard. 25:279. 1973.

Vernonanthura tweedieana (Baker) H. Robinson, *comb. nov.* BASIONYM: *Vernonia tweedieana* Baker, *Fl. Bras.* 6(2):99. 1873.

Vernonanthura viscidula (Less.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia viscidula* Less., Linnaea 4:289. 1829.
Vernonia corymbulosa Mart. *ex* Baker, *Fl. Bras.* 6(2):113. 1873.

Vernonanthura westiana (Less.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia westiana* Less., Linnaea 6:650. 1831.
Vernonia hebeclada A.DC., *Prodr.* 5:36. 1836.

Vernonanthura yurimaguasensis (Hieron.) H. Robinson, *comb. nov.* BASIONYM: *Vernonia yurimaguasensis* Hieron., Verh. Bot. Vereins Prov. Brandenburg 48:195. 1907.
Vernonia albifila Gleason, Bull. Torrey Bot. Club 59:374.

An additional species, *Vernonia schulziana* Cabrera, would belong to the genus according to the treatments by Cabrera (1944) and Stutts (1988), but material has not been seen. Some additional species treated by Jones (1976) in the ser. *Umbelliformes* of México, such as *Vernonia karvinskiana* A.DC., have

narrow ducts in the interiors of their corolla lobes, and they may be related to *Vernonanthura*. Nevertheless, the tips of their involucral bracts are more expanded and their inflorescences are less pyramidal or thyrsoid, and so they are excluded for the present.

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