

**NEW SPECIES AND NEW COMBINATIONS IN BRASILIAN
EUPATORIEAE (ASTERACEAE)**

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ABSTRACT

A new combination is made for *Ageratum pohlii*, and the species *Austro eupatorium cordato-acuminatum*, *Campovassouria barbosa*, *Campuloclinium hatschbachii*, *Diacranthera hebeclinia*, *Heterocondylus macrocephalus*, *Praxelis spletii*, and *Trichogonia munhozii* are described as new.

KEY WORDS: Eupatorieae, Brazil, *Ageratum*, *Austro eupatorium*, *Campovassouria*, *Campuloclinium*, *Diacranthera*, *Heterocondylus*, *Praxelis*, *Trichogonia*.

One new combination and the following new species of Eupatorieae from Brazil have been put aside during identification efforts in the last 15 years.

Ageratum pohlii (Sch.Bip. ex Baker) H. Rob., **comb. nov.** Basionym: *Alomia pohlii* Sch.Bip. ex Baker, Fl. bras. 6(2): 190 (1873)

Austro eupatorium cordato-acuminatum H. Rob., **sp. nov.** TYPE: BRAZIL. Espirito Santo: Forno Grande (Mun. Castelo), arbusto ramoso, 1.50 m, capitulo alvo, paredões rochosos, 18 May 1999, G. Hatschbach, M. Hatschbach & J.M. Silva 69165 (holotype MBM, isotype US). (Fig. 1).

Ad Austro eupatorium morii affinis sed ab tote speciebus congeneribus in laminis foliorum base cordatis et apice caudato-acuminatis differt.

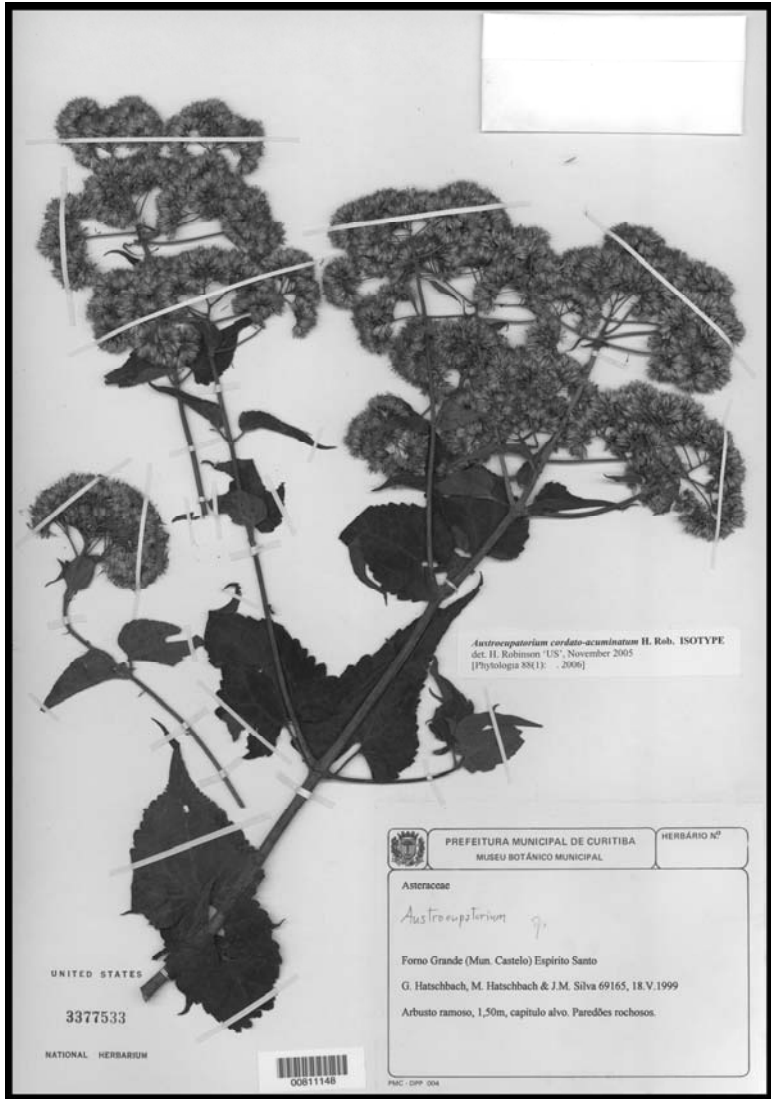


Fig. 1. *Austroeupatorium cordato-acuminatum* H. Robinson, isotype, United States National Herbarium (US).

Subshrubs to 1.5 m tall, moderately branched; stems reddish brown, terete with slight ridges, sparsely hirsutulous; internodes to 9 cm long. Leaves opposite, petioles 0.5-1.5 cm long; blades ovate, 4-10 cm long, 1.5-5.5 cm wide, bases strongly cordate in stem leaves, subcordate in branch leaves, margins with 10-12 teeth, closer and larger above widest part of blade, smaller and remote distally, apex very narrowly and sometimes abruptly acuminate, upper surface densely pilose, lower surface densely hirsutulous, especially on veins; trinervate from basal sinus with pair of strongly ascending secondary veins that reach to distal 1/3. Inflorescences terminal on stems and branches, broad, dome-shaped, corymbiform; with many widely spreading branches, uppermost branches often at 90° angles, puberulous; peduncles 0-3 mm long. Heads ca. 5 mm high, 2-3 mm wide; involucre bracts brownish-yellow, subimbricate, ca. 15, in ca. 3 series, ovate to narrowly oblong, 1.5-4.5 mm long, 0.5-1.2 mm wide, acute to mostly obtuse at membranaceous tips, outside glabrous, with 2 or 4 ribs; receptacle glabrous. Florets mostly 6 in a head; corollas white, ca. 3.5 mm long, glabrous, basal tube ca. 1.3 mm long, strongly constricted above base of style, throat ca. 1.7 mm long, lobes ca. 0.3 mm long; anther collars ca. 0.2 mm long; thecae ca. 1 mm long; apical appendages oblong-ovate, ca. 0.25 mm long, 0.17 mm wide; style base hirsute with ascending hairs. Achenes ca. 2 mm long, with scattered glandular dots; carpodium short and broad; pappus of ca. 30 capillary bristles, 2-3 mm long, tapering to tips, apical cells with blunt narrow tips. Pollen grains ca. 22 µm in diam.

Austro eupatorium cordato-acuminatum is known only from the type collection. The most distinctive features of the species are the strongly cordate base and strongly acuminate tip of the leaf blades. The closest relative might be *A. morii* R.M. King & H. Rob. of Bahia, but the latter has leaf blades with truncate bases, nearly hairless leaf surfaces, and 10-12 florets in the heads.

***Campovassouria barbosa* H. Rob., sp. nov.** TYPE: BRAZIL.

Paraná: Serra Capivari Grande (Mun. Campina Grande do Sul), arbusto 1.50 m, capitulo lilás, alto do morro, 23 Oct 2001, *E. Barbosa, O.S. Ribas & E.F. Costa* 672 (holotype MBM, isotype US). (Fig. 2).



Fig. 2. *Campovassouria barbosae* H. Robinson, isotype, United States National Herbarium (US).

Ad Campovassouriam cruciatam valde affinis sed in foliis oblongo-ovatis in areolis aliquantum isodiametricis distincta.

Subshrubs or shrubs to 1.5 m tall, with branching at base? or in inflorescence; stems straight, yellowish brown, subhexagonal, ribbed when dry, densely hispid. Leaves opposite, petioles stout, ca. 0.1 cm long; blades subcoriaceous, oblong-ovate, mostly 3.5-4.5 cm long, 1.5-1.9 cm wide, base narrowly subcordate, margins narrowly recurved, remotely crenulate, apex acute, upper surface glabrous except on slightly insculptate veins, shiny, lower surface dull pale green, densely hispid and with scattered small glandular dots on larger veins, smaller veins sparsely hispid, areoles mostly glabrous; venation somewhat 5-nerved with long, arching, ascending secondary veins from near base. Inflorescences terminal on leafy stems with lower branches from leaf axils, broadly corymbiform, with heads in dense clusters; branches spreading at ca. 45° angles, hispidulous to puberulous; peduncles 0.5-3.0 mm long. Heads cylindrical, ca. 5 mm high, 1.5 mm wide; involucre bracts greenish to reddish, subimbricate, ca. 12, in ca. 4 very unequal series, mostly rather oblong, 1.5-4.5 mm long, 0.8-1.0 mm wide, apices rounded and membranaceous, outside glabrous, 3-furrowed. Florets 5 in a head; corollas white, narrowly funnelform, ca. 3.5 mm long, glabrous, basal tube ca. 1.3 mm long, throat ca. 1.5 mm long, lobes ca. 0.7 mm long; anther collars 0.25 mm long; thecae reddish, ca. 1 mm long; apical appendage ca. 0.23 mm long, 0.2 mm wide. Achenes ca. 2 mm long, glabrous, with poorly differentiated carpodium, walls with transversely aligned internal punctations; pappus white to partially reddish, of ca. 30 scabrid bristles to 3 mm long, tapered to slender tips. Pollen grains ca. 25 μ m in diam.

Campovassouria barbosa is known only from the type collection. The broad leaves with more or less isodiametric areoles contrast strongly with other material of the genus. The narrowly subauriculate bases of the leaf blades are matched in material of *C. cruciata* (Vell.) R.M. King & H. Rob., although this is not usually obvious. There remains some question as to whether the strongly decussate/cruciate-leaved material of typical *C. cruciata* should be specifically distinct from or include the more common narrow-leaved and mostly alternate-

leaved form that has been known as *C. bupleurifolia* (DC.) R.M. King & H. Rob.

Campuloclinium hatschbachii H. Rob., **sp. nov.** TYPE: BRAZIL. Minas Gerais: Serra do Cabral, Armazén da Laje (Mun. Joaquim Pelício), Ereta, capítulos rosados, Campo rupestre, solo arenoso, 16 Mar 1997, *G. Hatschbach, M. Hatschbach & E. Barbosa 66355* (holotype MBM, isotype US). (Fig. 3).

A Campuloclinium irwinii in receptaculis conicus et in basis stylorum glabris similia sed in habitis minimis ephemeris et in corollis roseis differt.

Annual herbs to 40 cm tall; unbranched except sometimes in inflorescence; stems reddish-green, terete, faintly striated, hirsutulous; internodes 0.5-1.0 cm long near base, to 7 cm long above; root apparently simple, slender. Leaves opposite, sessile, very small nearest base, largest and most crowded above base, reduced and like bracteoles above basal 1/3, largest leaves oblong elliptical, 1.5-2.0 cm long, to 0.5 cm wide, base cuneate, margins serrulate with up to 12 blunt teeth, apex short-acute, surfaces pilose and densely gland-dotted; trinervate with hirsutulous midrib and strongly ascending secondary veins from base. Inflorescences with 1-3 heads, terminal on long upper internodes of plant, peduncles 0.8-4.8 cm long, hispidulous and gland-dotted. Heads 8-9 mm high, 6-9 mm wide; involucre bracts subequal, 15-18, in ca. 2 series, mostly green often with reddish margins, sometimes slightly yellowish on gibbous base, obovate, 4.5-5.5 mm long, 1.8-2.0 mm wide, short-acute, outside pilosulous and densely gland-dotted; receptacle conical, glabrous, non-alveolate. Florets 30-60 in a head; corollas reddish, narrowly funnelform, ca. 3.5 mm long, with scattered glandular dots outside, basal tube ca. 1 mm long, throat ca. 1.5 mm long, lobes 0.5-0.7 mm long; anther collars ca. 0.3 mm long; thecae ca. 1 mm long; apical appendage ca. 0.15 mm long, 0.2 mm wide; style base without hairs. Achenes ca. 3.5 mm long, with persistently pale setulose ribs, short-stipitate at base, with broadened annular carpopodium; pappus white, of ca. 22 capillary bristles 2.0-2.5 mm long. Pollen grains ca. 20µm in diam.

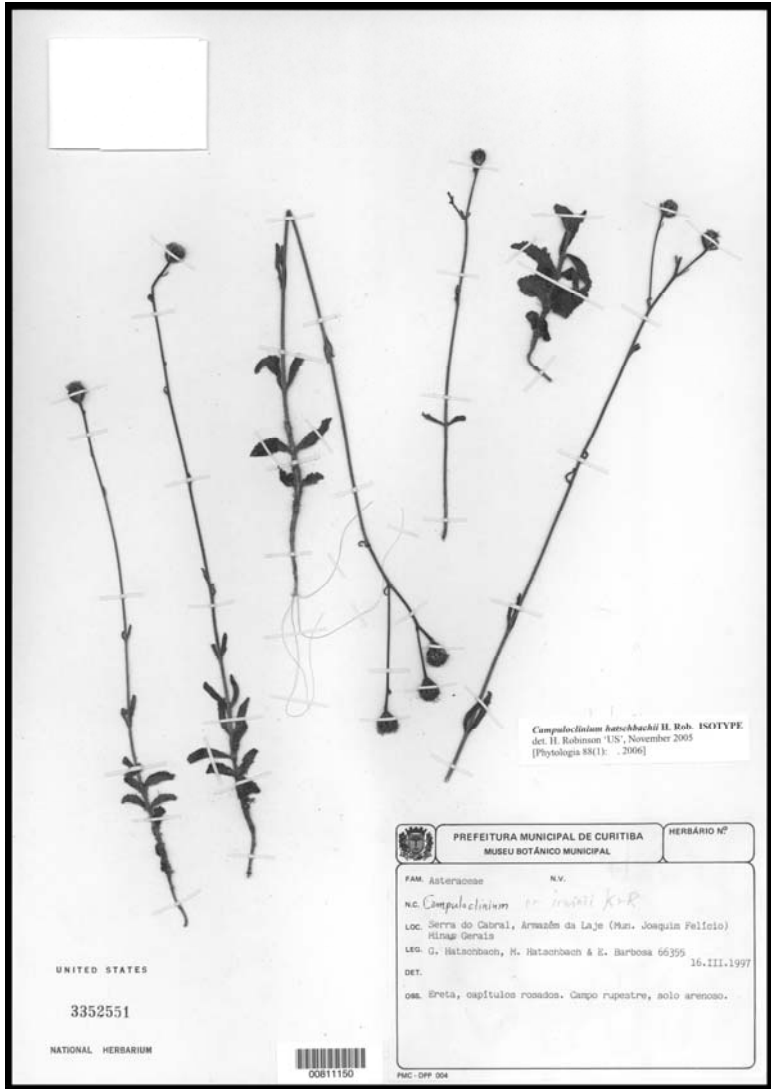


Fig. 3. *Campuloclinium hatschbachii* H. Robinson, isotype, United States National Herbarium (US).



Diacranthera hebeclinia H. Rob. ISOTYPE
det. H. Robinson 'US', November 2005
[Phytologia 88(1): .2006]

MERBARIO CENTRO DE PESQUISAS DO CACAU - CEPEC
PROJETO MATA ATLÂNTICA NORDESTE
ICONSÓRCIO CEPLAC/Jardim Botânico de Nova Friburgo
FLORA DA REGIÃO DE UNA
B. Hoffm.
COMPOSITAE

BRASIL, BAHIA, Município de Una, Reserva Biológica do
Mico-leão (IBAMA), Estrada no km 46 da Rod. BA-001 Itaboraí/Una,
Vergão da Mata Atlântica Sul Baiana, 13°07'S e 39°05' W

Inflorescências alvas.

André H. de Carvalho, A. M. Amorim, S. C. Sant'Ana,
J. G. Jardim & G. V. F. P. Campos. NO: 6125.
13 setembro 1995.

Projeto Financiada pela Fundação João D. & Catherine T. MacArthur

UNITED STATES
3328660
NATIONAL HERBARIUM



Fig. 4. *Diacranthera hebeclinia* H. Robinson, isotype, United States National Herbarium (US).

Campuloclinium hatschbachii is known only from the type collection. The species is evidently a smaller, more ephemeral relative of *C. irwinii* R.M. King & H. Rob. The latter shares the hairless base of the style and the more conical receptacle, but it is cited as a perennial, and has larger leaves and more numerous heads with white corollas. The latter species also has much more extensive yellow coloration on the bases of the involucre bracts.

Diacranthera hebeclinia H. Rob., **sp. nov.** TYPE: BRAZIL. Bahia: Municipio de Una, Reserva Biológica do Mico-leão (IBAMA), Entrada no km 46 da Rod. BA-001 Ilhéus/Una, Região da Mata Higrófila Sul Baiana, 15°09'S 39°05'W, inflorescências alvas, 13 Sept 1995, A.M. de Carvalho, A.M. Amorim, S.C. Sant'Ana, J.G. Jardim & G.V.F. Pitanga 6125 (holotype CEPEC, isotypes NY, US). (Fig. 4).

A Diacrantheram resinosa affinis sed in caulibus fere glabris in foliis longioribus acuminatis non glandulo-punctatis in bracteis involucri apice brevioribus et in receptaculis pilosis distincta.

Herbs to 1 m tall, sparsely branched; stems pale brownish, terete, rather smooth, glabrous; internodes 2.5-5.5 cm long, with solid pith. Leaves opposite below, alternate distally, petioles slender, 2.5-4.5 cm long; blades membranaceous, ovate-lanceolate, 7-15 cm long, 2.5-6.0 cm wide, base narrowly long-acuminate, grading into petiole, margins with 6-12 serrations mostly beyond widest part, apex narrowly short-acuminate, surfaces nearly glabrous, with sparse, very minute puberulence, no glandular dots, lower surface slightly paler; triplinervate with pair of stronger secondary veins from 1.0-3.5 cm above base of blade, spreading at ca. 35° angles, slightly arching. Inflorescence terminal, shallowly cymiform with heads in rather dense clusters, branching alternate to subopposite; peduncles (0.5-)4.0-8.0 mm long, puberulous. Heads 6-7 mm high, ca. 5 mm wide; involucre bracts weakly subimbricate, 20-25, in ca. 4 series, a few at base very narrow, ca. 1.0-1.5 mm long, most bracts yellowish, rather membranaceous, ovate to elliptical or obovate, 2.5-4.0 mm long, 0.7-1.3 mm wide, acute, glabrous or very sparsely, minutely puberulous outside, striate with many veins; receptacle convex, nearly conical,

with many fine hairs on ridges. Florets ca. 35 in a head; corollas white, 3.5 mm long, funnellform from cylindrical base, mostly glabrous, basal tube ca. 1.5 mm long, throat ca. 2 mm long, lobes ca. 0.5 mm long, with glandular dots outside, broad isodiametric cells inside; anther collar ca. 0.2 mm long; thecae reddish, ca. 0.8 mm long; apical appendage ca. 0.1 mm long, bilobed; style base with hirsute node. Achenes ca. 2 mm long, glabrous, carpodium with few short thin-walled cells at base, with longer thin-walled cells procurrent on bases of achene ribs; pappus of 25-27 white capillary bristles, not broadened at tips. Pollen grains ca. 25 μm in diam.

Diacranthera hebeclinia is named after the numerous short hairs on the receptacle. A review of specimens has shown that *D. resinosus* (Spreng.) R.M. King & H. Rob. and its closely related northern relative *D. ulei* R.M. King & H. Rob. have some scarcely noticeable hairs on the receptacle, but usually appear hairless. The new species, is thoroughly distinct in other features such as the nearly glabrous stems, the nearly glabrous leaves with no evident glandular dots, the acuminate tips of the leaves, and the blunter tips of the essentially glabrous involucrel bracts.

Heterocondylus macrocephalus H. Rob., **sp. nov.** TYPE: BRAZIL. Minas Gerais: Pico do Inficionado, Serra do Caraça, Catas Altas, 2050 m, 2 Sep 1999, *M.F. Vasconcelos s.n.* (holotype BHCB, isotype US). (Fig. 5).

A Heterocondylam pandurifoliam et H. decipiens in habitis herbaceis et folia oppositis simila sed in laminis folii latis basi valde petioliformibus et in bracteis involucri exterioribus brevibus distaliter recurvatis interiore et exteriori glanduliferis et in floribus 50-60+ in capitulis distincta.

Herbs 0.5 m tall? with few branches; stems terete, densely covered with spreading stipitate glands; internodes below inflorescence 0.8-1.0 cm long. Leaves opposite, petioliform bases 0.5-1.0 cm long, distinctly winged to base, wings nearly meeting across node; blade ovate, 2-5 cm long, 1.2-3.0 cm wide, abruptly broadened at base, margins with 7-17 blunt serrulations, apex short-acute, upper surface dark green, evenly



Fig. 5. *Heterocondylus macrocephalus* H. Robinson, isotype, United States National Herbarium (US).

hirtellous with gland-tipped hairs, lower surface paler green, hirtellous with gland-tipped hairs, denser and longer on veins, trinervate with ascending secondary veins from 1-4 mm above level of blade expansion. Inflorescence terminal and from upper axils, corymbiform, with reduced opposite leaves proximally, with minute, linear, alternate bracteoles above; peduncles 1.5-3.5 cm long, in groups of 3, densely hirtellous to hirsute with stipitate glands. Heads broadly campanulate, 15-18 mm high, 18-20 mm wide; involucre bracts subimbricate, ca. 40, in ca. 4 unequal series with outer bracts more herbaceous, bracts lanceolate, 4-12 mm long, 0.5-1.5 mm wide, tips very narrowly acute to attenuate, margins and outer surface with many gland-tipped hairs, tips of outer bracts often recurved with glands on both surfaces. Florets 50-60 or more in a head; corollas creamy-white, glabrous, ca. 8 mm long, basal tube 2.5 mm long, not or slightly constricted above base, throat ca. 4.5 mm long, lobes oblong-ovate, ca. 1.2 mm long; anther collars ca. 0.4 mm long, with densely annulate thickenings on cell walls; thecae ca. 2.3 mm long; apical appendages oblong-ovate, ca. 0.6 mm long, 0.32 mm wide; style base abruptly enlarged, glabrous. Achenes ca. 5 mm long, fusiform, with mostly sparse, short, stipitate glands on ribs and sides, with tapering, somewhat asymmetric basal stipe; carpodium asymmetric with many rows of quadrate cells; pappus of ca. 18 white, capillary bristles in 1 series, ca. 6 mm long, not broadened distally. Pollen grains 25-27 μm in diam.

Heterocondylus macrocephalus is known only from the type. The species belongs to a group in the genus including *H. amphidictius* (DC.) R.M. King & H. Rob., *H. decipiens* (Baker) R.M. King & H. Rob., *H. pandurifolius* (DC.) R.M. King & H. Rob. and the perhaps too close relative of *H. amphidictius*, *H. pumilus* (Gardn.) R.M. King & H. Rob. Of these relatives, most have less abruptly petioliform bases on the leaves, less pubescent leaves, and fewer florets in the heads. *Heterocondylus amphidictius* seems to differ further by more slender bases on the corollas and setulae on the achenes. It is the least well-known *H. decipiens* that seems closest in shape and pubescence of the upper leaf blade, pubescence outside of the involucre bracts, and the size of the head, described with 50 florets? However, type photographs of the latter show a much more slender plant with cuneate rather than petioliform bases on the leaves, and the involucre bracts are described

as 15-20 and subequal. In the new species, the outer involucral bracts have recurved tips covered with glandular hairs on both sides, a form that seems unique in the species group.

Exact relationship to the recently described *Heterocondylus inesiaie* Esteves & Goncalves –Esteves of São Paulo (2004) is not yet known.

Praxelis spletii H. Rob., **sp. nov.** TYPE: BRAZIL. Goias: Flora do Cerrado, Campos de Areias Quartzosas, GO 118, 15.5 km ao norte de Alto Paraiso, 13°46'S 47°30'O, ca. 1100 m, erva ca. 0.15 m, flores lilas-vermelhas, crescendo em solo arenoso, úmido, no local muito frequente, 29 May 1994, *Splett 271* (holotype UB, isotypes BONN, US). (Fig. 6).

A Praxelem capillarem in foliis linearibus et in corollis alicquantum asymmetricis similis sed in foliis plerumque alternis non pseudoverticillatis in setis pappi ca. 10 et in pollinis fertilibus distinctis.

Erect herbs to 0.15 m tall, with few or no leafy branches; stems green to red-tinged, hexagonal to pentagonal, glabrous with few glandular dots. Leaves mostly alternate, opposite near base, sessile, linear, mostly 0.5-1.2 cm long, ca. 0.07-0.10 cm wide, glabrous above, with numerous glandular dots below, with only a median vein evident. Inflorescence diffuse, with single heads on tips of branches or on long peduncles from upper axils; peduncles 2-5 cm long, with few minute foliiform bracteoles. Heads 9-10 mm high, 2-3 mm wide, cylindrical; involucral bracts reddish, imbricate and appressed, all deciduous, ca. 16, in ca. 5 unequal series, elliptical, 1.5-7.0 mm long, 0.5-1.5 mm wide, often with apical mucro, margins narrowly scarious, glabrous outside with 3 dark lines; receptacle conical, glabrous. Florets ca. 15 in a head; corollas reddish-purple, 6.5-7.0 mm long, basal tube ca. 1 mm long, throat ca. 2 mm long, lobes more asymmetric in peripheral florets, with outer lobes to 3 mm long, inner lobes 1.0-1.5 mm long, lobes with glandular dots outside, densely papillose inside; anther collars ca. 0.25 mm long, not enlarged at base; thecae ca. 1.2 mm long; apical appendage ovate, ca. 0.25 mm long, 0.17 mm wide, with crenulate-

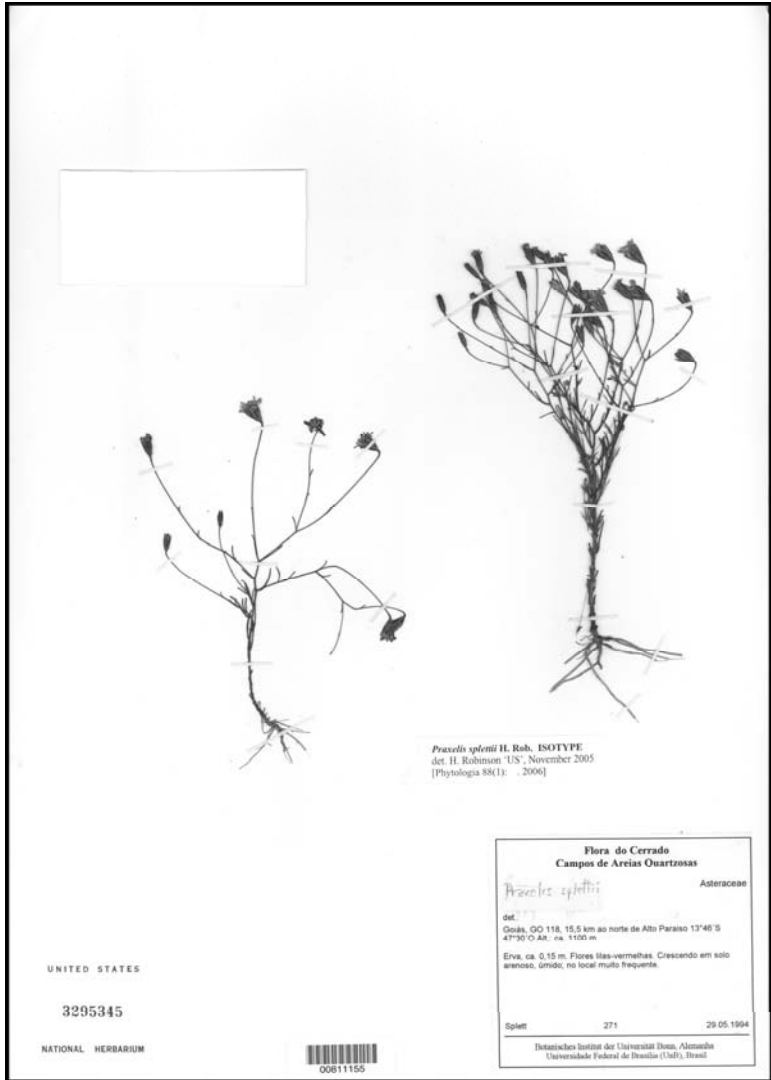


Fig. 6. *Praxelis spletii* H. Robinson, isotype, United States National Herbarium (US).

serrulate edge; style base plain. Achenes immature, ca. 2 mm long, 3-angled, densely setuliferous on ridges with soft hairs; pappus of ca. 10 whitish bristles, 2-4 mm long, tapering to tips. Pollen grains ca. 18 μm in diam.

Praxelis spletii is reminiscent of *Eitenia* R.M. King & H. Rob. in habit and in the asymmetric corollas, but the leaves are linear, not ovate, the heads are cylindrical, the achenes have 3-ridges, and the pappus does not have 5 distinct stout bristles. The pappus bristles vary in size, but are not abruptly differentiated between large and small. Closer relation is evidently to *Praxelis capillaris* (DC.) Sch.Bip., which also tends to have asymmetric corollas, but the latter has narrower filiform leaves in pseudoverticils, involucre not reddish, pappus bristles ca. 15 and more equal in size, and non-functional pollen. In the same related group is *P. riedelii* Sch.Bip., with opposite leaves with narrow but distinct laminae and lobes, non-asymmetric corollas, and functional pollen.

***Trichogonia munhozii* H. Rob., sp. nov.** TYPE: BRAZIL. Goias: Alto Paraíso, rod. Para Colinas do Sul, Rio das Cobras, 14 June 1993, sublenhosa, 1 m, capítulos alvos, campo rupestre, solo rochoso, G. & M. Hatschbach 59528 & E. Barbosa (holotype MBM, isotype US). (Fig. 7).

A Trichogoniam dubiam et T. laxam in caulis breviter stipitato-glanduliferis in foliis bullatis et in capitulis ca. 60-floribus valde affinis sed in capitula brevioribus in achenia setuliferis et in pappis brevibus distincta.

Erect to reclining subshrub to 1 m tall, with many ascending branches; stems terete, densely felted with short stipitate glands, often with intermixed non-glandular hairs. Leaves alternate, petioles 0.2-0.8 cm long, grading into blade; blade rather oblanceolate, mostly 2.5-7.0 cm long, 0.5-1.7 cm wide, base narrowly cuneate, margins crenulate, apex short-acute, upper surface bullate with insculpate veins, densely antrorsely puberulous, lower surface with strongly exscupate veins, densely hispidulous, with many glandular dots; venation pinnate with

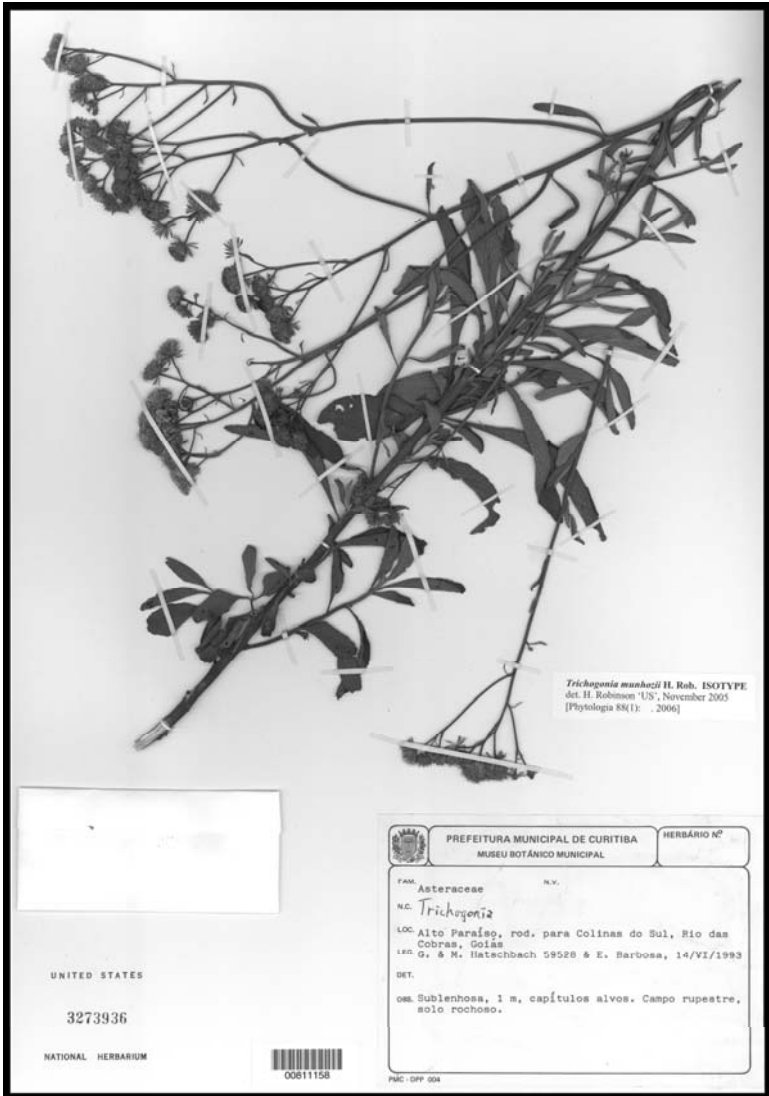


Fig. 7. *Trichogonia munhozii* H. Robinson, isotype, United States National Herbarium (US).

strongly ascending secondary veins. Inflorescences broad flat-topped cymes, branches ascending, densely felted with short stipitate glands; peduncles 2-10 mm long. Heads broadly campanulate, 5-7 mm high; involucre bracts eximbricate, 25-30, in 2 series, narrowly oblong elliptical to oblanceolate, ca. 5 mm long, 1 mm wide, apices narrowly acute, densely puberulous and with some glandular dots outside; florets 60-70 in a head; corollas white, very thin-walled, 3.0-3.5 mm long, densely covered with minute stipitate glands below, with numerous longer non-glandular hairs on upper throat and lobes, basal tube cylindrical, ca. 1 mm long, throat funnellform, 1.5-2.0 mm long, lobes ca. 0.5 mm long; anther collars ca. 0.4 mm long; thecae pale reddish, ca. 0.9 mm long; apical appendages oblong-ovate, ca. 0.1 mm long, 0.1 mm wide; style branches not or scarcely broadened at tips. Achenes 2.5-3.0 mm long, with scarcely stipitate base, setulae are dense along the ribs and scattered on the upper surfaces between the ribs; pappus bristles ca. 20, non-contiguous, 0.5-1.0 mm long, densely short-plumose. Pollen grains ca. 22 μm in diam.

PARATYPE: BRAZIL. Distrito Federal: Fazenda Agua Limpa, divisa com o Cristo Redemtor (Jardim Botânico de Brasília) e o IBGE, na mata de galeria do córrego Taquara, campo sujo rupestre úmido, 15°55'478"S 47°54'225"O, 22 Apr 2000, C. Munhoz, N. Rodrigues & K.M.O. Ramos 1158 (holotype BHC, isotype US).

Trichogonia munhozii was identified first from the Munhoz specimen from the Jardim Botânico de Brasília, although the much more ample Hatschbach collection is here selected as the type.

The species belongs to that group in the genus with glanduliferous corolla tubes, and is one within that group with 60 or more florets in the heads. The two most closely related species, *Trichogonia dubia* (B.L. Rob.) R.M. King & H. Rob. and *T. laxa* Gardn. have the same kind of bullate, crenulate, cuneate-based leaf blades. However, both have somewhat larger heads, often 8 to 10 mm high. The first, *T. dubia* has no pappus and no setulae or glands on the achene, but *T. laxa* has long and fully plumose pappus bristles and sparse, spreading, minute, slender stipitate glands on the achene. The epappose non-setuliferous achenes of *T. dubia* may represent a calvouse-achened form of *T. laxa*,

which it otherwise resembles, but *T. munhozii* has smaller heads with shorter florets and achenes.

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