



New combinations and taxonomic notes for *Tarenaya* (Cleomaceae)

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ABSTRACT

Tarenaya clade includes 37 species based on phylogenetic relationships and on the stipular spine synapomorphy, however only 10 species thought to belong to the genus have had names established in *Tarenaya*. Besides the two new species are being described, we present 25 new combinations for the species and refine the typification of 13 species. Ten lectotypes and three neotypes are designated here. One generic synonym is also typified.

Keywords: *Cleome*, *Hemiscola*, nomenclature, *Tarenaya*, type

Introduction

Tarenaya was segregated from *Cleome* by Rafinesque (1838) with one species, *T. spinosa* (based on *Cleome spinosa*), because he did not agree with the broad concept of *Cleome*. He based his proposal on the habit, type of leaf, number of leaflets, number of stamens, presence and morphology of nectaries, length of gynophore, and geographic distribution. *Tarenaya* was generally not adopted in taxonomic treatments and was instead considered to be a synonym of *Cleome* for the next ~170 years. In 1952, when Iltis [unpublished] revised the New World *Cleome* species, the genus was treated as a section, *Cleome* sect. *Tarenaya*, comprising 24 species and characterized by spines and prickles of epidermal origin (characters not shared by three species and one subspecies, currently recognized under *Cleoserrata* Iltis and unarmed forms in various species), seeds with an aril and a large cleft. Later, Jacobs (1960), Iltis (1967), Iltis & Zapata (1997), and Costa-e-Silva (2000) used *Tarenaya* informally in their classifications, and the name was finally formally established as a section by Iltis (2005) when he described a new species of *Cleome* from the Andes. By that time Iltis

(2005) considered section *Tarenaya* to comprise a group of 40 species from the New World and one from East Africa.

The recognition of *Cleome* as a paraphyletic genus (Hall *et al.* 2002; Sanchez-Acebo 2005; Hall 2008; Inda *et al.* 2008; Feodorova *et al.* 2010, Patchell *et al.* 2014) has led to the deconstruction of *Cleome s.l.*, and consequently multiple genera have been segregated and reorganized (Iltis & Cochrane 2007; 2014; 2015; Cochrane & Iltis 2014; Roalson *et al.* 2015; Thulin & Roalson 2017; Barrett *et al.* 2017; Roalson & Hall 2017; Soares Neto *et al.* 2017), including *Tarenaya* (Iltis & Cochrane 2007). This taxonomic reorganization was based on morphology, chromosome number, and phylogenetic relationships, and specific nomenclatural recombinations were made for Flora of North America (Iltis & Cochrane 2007) and Flora Mesoamericana (Iltis & Cochrane 2014; 2015).

The *Tarenaya* clade is defined by an easily recognized synapomorphy: a pair of spines at the base of the petioles (stipular spines) and is well supported in all phylogenetic studies of the family (Hall *et al.* 2002; Sanchez-Acebo 2005; Hall 2008; Inda *et al.* 2008; Feodorova *et al.* 2010, Patchell *et al.* 2014; Barrett *et al.* 2017). Not all of the presumed species of *Tarenaya* have been sampled for molecular phylogenetic

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studies, but based on those sampled to date, and on the stipular spine synapomorphy, *Tarenaya* comprises 37 species. *Hemiscola*, another segregate genus recognized by Iltis & Cochrane (2007), shares the stipular spines and is embedded within *Tarenaya*. For these reasons, the unification of these genera in a broader concept of *Tarenaya* has been proposed (Feodorova *et al.* 2010, Patchell *et al.* 2014). Its species range from Mexico to Argentina, except for one species found exclusively in East Africa (Iltis 2005; Iltis & Cochrane 2015).

Despite broad agreement that *Tarenaya* should be recognized at the generic level, only 10 of the 37 species thought to belong to the genus have had names established in *Tarenaya* (Iltis & Cochrane 2007; 2014; Arana & Oggero 2016; Soares Neto *et al.* 2018). In addition to these species, two new species are being described (RL Soares Neto *et al.* unpubl. res.). In this study, we present 25 new combinations for those species hypothesized to be part of the *Tarenaya* lineage, but that do not have nomenclatural combinations within *Tarenaya*. We also include combinations necessary to include *Hemiscola* with *Tarenaya*. Ten lectotypes, three neotypes, and one typification of a generic name are provided to stabilize the nomenclature discussed here.

Materials and methods

Type specimens that have been examined in person by the authors are annotated with exclamation marks. Images of type specimens examined online are annotated as “[image!]”, and a barcode number, if available, is given. Original protologues were studied for all names treated here.

Results and discussion

***Tarenaya* Raf.**, Sylva Tellur. 111. 1838. Type: *Tarenaya spinosa* (Jacq.) Raf., Sylva Tellur. 111. 1838. *Cleome spinosa* Jacq., Enum. Syst. Pl. 26. 1760. *Cleome* sect. *Tarenaya* (Raf.) Iltis, Novon 15(1): 146. 2005.

=*Hemiscola* Raf., Sylva Tellur. 111. 1838. Type: *Hemiscola aculeata* (L.) Raf., Sylva Tellur. 111. 1838. *Cleome aculeata* L., Syst. Nat., ed. 12. 3: 232. 1768.

=*Scolosperma* Raf., Sylva Tellur. 111. 1838. Type: *Scolosperma dendroides* (Schult.f.) Raf., Sylva Tellur. 111. 1838. *Cleome dendroides* Schult.f., Syst. Veg., ed. 15 bis [Roemer & Schultes] 7(1): 28. 1829.

=*Lianodes* Kuntze, Lex. Gener. Phaner. 129. 1903. nom. nud., nom. inval.

=*Neocleome* Small, *p.p.*, Man. S.E. Fl. 577. 1933. Type, designated here: *Neocleome spinosa* (Jacq.) Small, Man. S.E. Fl. 577. 1933. *Cleome spinosa* Jacq., Enum. Syst. Pl. 26. 1760.

Notes—Small (1933), when delimiting the genus *Neocleome*, made two new combinations, *N. spinosa* and *N. serrata*, but did not designate a type species for the new genus. One of these species is now placed in *Tarenaya*

(*N. spinosa*), but the other (*N. serrata*) is assigned to the genus *Cleoserrata*. We believe Small intended to include in *Neocleome* a broader diversity of *Tarenaya* (he states: “... about 70 species, natives, mainly, of tropical regions.”) and we therefore typify *Neocleome* based on *Tarenaya spinosa*.

Herbs to subshrubs or shrubs, annual or perennial, branched from the base; pubescent to puberulent-glandular indument at branches or totally glabrous; stipular spines at the base of petioles; leaves palmately-compound with 3–7(–12) leaflets; racemes corymbiform, flowers bracteate, the lower with leaf-like bracts with 3–5 leaflets, becoming 1-foliolate in the inflorescence axis; flowers tetramerous, zygomorphic petals unguiculate, white or white becoming pink or purplish at apex, pink to purplish, or a pair of each color; nectary annular; stamens 6, elongated by a short androgynophore enrolled by the nectary; mature capsules cylindrical, ellipsoid, fusiform, oblanceoloid, sessile or short to long elongated stalks; seeds horseshoe-shaped, longitudinally striate and transversely ridged, cleft covered by a membrane attaching both tips (cotyledonar and radicular “claws”).

1. ***Tarenaya aculeata*** (L.) Soares Neto & Roalson, comb. nov. *Cleome aculeata* L., Syst. Nat., ed. 12. 3: 232. 1768. Type: Habitat in America, *D. Zoega s.n.* (lectotype, designated by Al-Shehbaz (1988): BM-LINN 850.17 [image!]). ≡ *Hemiscola aculeata* (L.) Raf., Sylva Tellur. 111. 1838.

2. ***Tarenaya afrospina*** (Iltis) Soares Neto & Roalson, comb. nov. *Cleome afrospina* Iltis, Amer. J. Bot. 54(8): 955. 1967. Type: REPUBLIC CONGO. Environs Coquilhatville, Ile du Fleuve [du R. Congo], 28 September 1928 [1925], *W. Robyns* 767 (holotype: BR 88677575 [image!]; isotypes: BR 8867063, [image!], BR 88677070 [image!], BR 8867520 [image!], GH GH00042345 [image!], K K000230602 [image!], US US00100469 [image!]).

3. ***Tarenaya atropurpurea*** (Schott) Soares Neto & Roalson, comb. nov. *Cleome atropurpurea* Schott, in Schreib. Nachr. Oestr. Naturf. 1: 129. 1820. Type: BRAZIL. Sine loco, *H.W. Schott s.n.* (lectotype, designated here: W 0060314 [image!]). Additional syntype: BRAZIL. Rio de Janeiro, *H.W. Schott* 4442 (W 0060315 [image!]).

= *Cleome dendroides* Schult.f., Syst. Veg., ed. 15 bis 7(1): 28. 1829. *Cleome arborea* Weinm., Syll. Pl. Nov. 1: 227. 1824, nom. illeg., non *C. arborea* Schrad. 1821. Neotype, designated here: t. 3296 in Curtis’s Botanical Magazine, v. 61, ser. 2: v. 8. 1834. ≡ *Scolosperma dendroides* (Schult.f.) Raf., Sylva Tellur. 111. 1838.

Notes—The species commonly known as *Cleome dendroides* requires the application of an older name. Here we make the combination *Tarenaya atropurpurea*, as *Cleome atropurpurea* is the oldest name for this taxon. Iltis considered this name “nom. subnud.” as annotated on the syntype *Schott* 4442; however, Schott clearly presents a



diagnosis of this species with his publication of *Cleome atropurpurea*. For this reason, we apply that name here. There are two original collections of Schott at W, and we designate W 0060314 as the lectotype as it is the more complete specimen with leaves and flower buds. The other syntype material is of significant importance, though, as it includes mature fruits, which are lacking from the lectotype.

Cleome arborea Weinm. was described based in an individual cultivated in the Horto Imperiali Paulowskiensi, near St. Petersburg, from seeds from Brazil. Schultes *filius* (1829) renamed *Cleome arborea* as *C. dendroides*, taking into account the earlier homonym, *C. arborea* Kunth. Schultes *filius* cited one collection of Weinmann's, probably the type, which was not found in LE nor in any other herbarium. Hooker (1834) in Curtis's Botanical Magazine presented notes about this *Cleome*, improving its description and also presenting a beautiful illustration highlighting the stipular spines, purple flowers, fruits, and seeds. This illustration is here chosen as the neotype for this name.

4. ***Tarenaya bicolor*** (Gardner) Soares Neto & Roalson, comb. nov. *Cleome bicolor* Gardner, London J. Bot. 2: 330. 1843. Type: BRAZIL. [Rio de Janeiro] Organ Mountains, hab. in open rocky and cultivated places, April 1837, G. Gardner 309 (lectotype, designated here: BM BM000573983 [image!]; isolectotypes: E E00326206 [image!], E E00326207 [image!], F, G G00226190 [image!], G G00226191 [image!], GH 00042326 [image!], K K000220447 [image!], K K000220448 [image!], P P00076106 [image!], NY 00215151!, US 00100471 [image!], WIS 0258903!).

Notes—Gardner 309 has a large number of known duplicates designated only as “typus” without any herbarium holding a clear holotype. Many of these specimens are good representatives of the species, bearing flowers and mature fruits, characters useful in recognizing this species. The specimen BM000573983, however, is from the Gardner herbarium and is labeled with Gardner's handwriting and, therefore, is being designated as the lectotype.

5. ***Tarenaya boliviensis*** (Iltis) Soares Neto & Roalson, comb. nov. *Cleome boliviensis* Iltis, Novon 15(1): 147. 2005. Type: BOLIVIA. La Paz: “Plantae Andium Boliviensium, Prov. Larecaja, vicinus Sorata, Challapampa, ad rivum, in schistosis, Reg.[ion] temp[urada], 2600 m, September 1857–January 1958”, G. Mandon 938 (holotype: WIS 0258904!, isotypes: BM, F, G G00226276 [image!], G G00226277 [image!], GH 00042328 [image!], K K000220474 [image!]; LE 00001884 [image!], LE 00001885 [image!], LPB, MPU 013699 [image!], MPU 013700 [image!], NY!, P P00076103 [image!], P P00741914 [image!], P P00741915 [image!], PR, S S-R-7312 [image!], W, WIS 0258905!).

6. ***Tarenaya chapalensis*** (Iltis) Soares Neto & Roalson, comb. nov. *Cleome chapalensis* Iltis, Bol. Inst. Bot. Univ. Guadalajara 5: 428. 1998. Type: [MEXICO. Michoacán] Wet

roadsides and shallow water courses, on road to La Barca, 1/3 km N of the R.R., station at Zamora, 19°58'N, 102°16'W, 1520 m, 29 July 1960, H.H. Iltis et al. 490 (holotype: WIS WIS0258906!, isotypes: BM BM000629040 [image!], ENCB, F [image!], G, GH 00042307 [image!], GUADA, IBUG IBUG0001788 [image!], IEB 000157790 [image!], K K000220427 [image!], LE, LIL, MEXU 00140923 [image!], MICH 112011 [image!], MO 107291!, MSC, NY 00387673!, SMU, TEX, UC 1332256 [image!], US, WIS WIS0258910!, WIS0258907!, WIS0259808!, WIS0258909!, WIS0258912!, WIS 0258911!, WIS0258913!, XAL XAL0106658 [image!], ZEA).

7. ***Tarenaya crenopetala*** (A.DC.) Soares Neto & Roalson, comb. nov. *Cleome crenopetala* A.DC., Mém. Soc. Phys. Genève 6(1): 220. t. 2. 1833. Lectotype, designated here: t. 2. in DC. & A.DC., Cinq. notice sur. les pl. rares du Jardin de Genève, Mém. Soc. Phys. Genève 6 (1). 1833.

Notes—According to the protologue, the description of this species was based on an individual growing in the gardens of Geneva from seeds from Uruguay. No specimen was found in any herbaria matching the type, and, therefore, the illustration presented together with the original description is being here designated as the lectotype.

We are also correcting here the authorship of *Cleome crenopetala* that has been erroneously attributed to Augustin de Candolle, but was in fact described by Alphonse de Candolle, as can be seen at the end of the original description.

8. ***Tarenaya diffusa*** (Banks ex DC.) Soares Neto & Roalson, comb. nov. *Cleome diffusa* Banks ex DC., Prodr. 1: 241. 1824. Type: BRAZIL. Rio de Janeiro: v. s. in h. Banks (holotype: BM BM000573979 [image!]). ≡ *Cleome aculeata* var. *diffusa* (Banks ex DC.) Kuntze, Revis. Gen. Pl. 3(3): 7. 1898. ≡ *Hemiscola diffusa* (Banks ex DC.) Iltis, Novon 17(4): 448. 2007.

9. ***Tarenaya domingensis*** (Iltis) Soares Neto & Roalson, comb. nov. *Cleome domingensis* Iltis, Brittonia 10: 56. 1958. Replaced name: *Cleome erosa* Urb., Symb. Antill. (Urban) 7(2): 224. 1912, nom. illeg., non *Cleome erosa* (Nutt.) Eaton, 1836. Type: DOMINICAN REPUBLIC. [Santo Domingo] Hab. in Sto. Domingo ad Rio Jimenoa, 1190 m alt., in margine sylvarum, May 1910, H. von Türckheim 3303 (holotype: B B100242710 [image!]; isotype: NY 00074435!).

10. ***Tarenaya eosina*** (J.F.Macbr.) Soares Neto & Roalson, comb. nov. *Cleome eosina* J.F.Macbr., Publ. Field Mus. Nat. Hist., Bot. Ser. 4: 170. 1929. Replaced name: *Cleome microcarpa* Hassl., Repert. Spec. Nov. Regni Veg. 12: 254. 1913, nom. illeg., non *Cleome microcarpa* Ule 1908. Type: PARAGUAY. Bella Vista, E. Hassler 11013 (holotype: G; isotype: MPU MPU013707 [image!]).

11. ***Tarenaya guaranitica*** (Chodat & Hassl.) Soares Neto & Roalson, stat. & comb. nov. *Cleome rosea* Vahl



ex DC. var. *guaranitica* Chodat & Hassl., Bull. Herb. Boissier, sér. 2, 3: 797. 1903. Type: PARAGUAY. Chololo: ad marginem silvae, in valle fluminis Y-aca, December 1900, *E. Hassler 6707* (holotype: G G001064449 [image!]); isotypes: B B100242716 [image!], BM BM000537896 [image!], G G00106446 [image!], G G00106447 [image!], G G00106448 [image!], K K000220457 [image!], NY 00215161!, P P00076111 [image!], S S-R-7343 [image!], WIS WIS0259073!; WIS0259074 [frag!]). *Cleome guaranitica* Briq., Annuaire Conserv. Jard. Bot. Genève 17: 371. 1914.

12. ***Tarenaya horrida*** (Mart. ex Schult.f.) Roalson & Soares Neto, comb. nov. *Cleome horrida* Mart. ex Schult. & Schult.f., Syst. Veg., ed. 15 bis 7(1): 32. 1829. Type: BRAZIL. Espírito Santo: Itapemirim, *Prinz Max. von Neuwied s.n.* (lectotype, designated here: BR 698551 [image!], isolectotypes: BR 698580 [image!]; WIS 0258937!). ≡ *Cleome spinosa* L. f. *horrida* (Mart. ex Schult. & Schult. f.) Eichler, Fl. Bras. 13(1): 253. 1865. ≡ *Cleome spinosa* Jacq. var. *horrida* (Mart. ex Schult. & Schult. f.) Fawc. & Rendle, Fl. Jamaica 3: 226. 1914.

Notes—Two specimens at BR are annotated as the holotype. Both are from the same collection by Prinz Max. von Neuwied and so are presumed syntypes. We here designate BR 698551 as the lectotype because it has both flowers and fruits on it, both of which are necessary for distinguishing *T. horrida* from closely related species.

13. ***Tarenaya houstonii*** (R.Br.) Soares Neto & Roalson, comb. nov. *Cleome houstonii* R.Br. Hort. Kew., ed. 2 [W.T. Aiton] 4: 131. 1812. Lectotype, designated here: t. 45. in Martyn, Hist. Plant. Rar. v. 5, 1736.

Notes—*Cleome houstonii* was described based on *Sinapistrum indicum*, which was described based on plants grown from seeds from Cuba and cultivated in England by Houston in the year 1730. Although Candolle (1824) cited dried material from Jamaica, and Grisebach (1864) also cited a material collected by Houston from Jamaica, no specimen has been found for this collection. The illustration presented with the description of *Sinapistrum indicum* is a good plate highlighting a branch with bud, flowers, and fruits and provides details of the petals, stamens, and ovary. This plate provides all of the characters necessary to recognize the species and is therefore here designated as the lectotype.

14. ***Tarenaya inermis*** (Malme) Soares Neto & Roalson, comb. nov. *Cleome inermis* Malme, Ark. Bot. 22A, no. 7: 5. 1928. Type: BRAZIL. Rio Grande do Sul: Cachoeira, in silvula clara, 10 January 1902, *G. Malme II 1041* (lectotype, designated here: S S-R-7321 [image!]; isolectotypes: B B 10 0242693 [image!], S S10-16936 [image!], WIS 0258939!, WIS 0258940!).

Notes—There are two type collections of *Malme 1041* in S, and therefore one needs to be designated the lectotype. We designate S-R-7321 as the lectotype as it is more mature, having expanded inflorescences and mature fruits.

15. ***Tarenaya latifolia*** (Vahl ex DC.) Soares Neto & Roalson, comb. nov. *Cleome latifolia* Vahl ex DC., Prodr. 1: 239. 1824. Type: [GUIANA] In Guiana, v. s. in h. Vahl. (neotype, designated here: French Guiana, 1858, *P.A. Sagot 1170*, P P00076114 [image!]; isoneotypes: GOET [photo at WIS], P P00745091 [image!], P P00076129 [image!]).

Notes—De Candolle described *Cleome latifolia* based on a specimen seen in the Vahl herbarium; however, we have found no records of such specimen in C (Olof Ryding, pers. comm.), nor in G-DC. Given such, we are designating as the neotype *Sagot 1170*, one of the specimens studied by Eichler (1865) for *Flora Brasiliensis* and Iltis (1952) in his revision of New World *Cleome*.

16. ***Tarenaya microcarpa*** (Ule) Soares Neto & Roalson, comb. nov. *Cleome microcarpa* Ule, Engl., Bot. Jahrb. Syst. 42: 201. 1908. Type: BRAZIL. Piauí: Piauí: Catinga der Serra Branca, January 1907, *E. Ule 7428* (lectotype, designated here: HBG HBG-522391 [image!]; isolectotypes: B B 10 0242701 [image!], K 000220462 [image!], F neg 5766 [image!]).

Notes—HBG-522391 is being designated as lectotype, because of the two collections seen by Ule, the collection at HBG is the one labeled as “*Cleome microcarpa* s. nv.”, while the specimen at B was labeled first as “*Cleome viridiflora* s. nv.” (crossed off) and later as *C. chlorantha* s. nv. (ined.).

17. ***Tarenaya psoraleifolia*** (DC.) Soares Neto & Roalson, comb. nov. *Cleome psoraleifolia* DC., Prodr. 1: 239. 1824. Type: BRAZIL. v. s. in h. Mus. Par. [*A. Ferreira s.n.*] (holotype: P P00141286 [image!]).

18. ***Tarenaya regnellii*** (Eichler) Soares Neto & Roalson, comb. nov. *Cleome regnellii* Eichler, Vidensk. Meddel. Naturhist. Foren. Kjøbenhavn 190: 1870. Type: BRAZIL. Ad Caldas in prov. Minas Geraes [Minas Gerais], *A.F. Regnell coll. III n. 147* (lectotype, designated here: BR 698554 [image!]; isolectotypes: B B 10 0242684 [image!], BR 698555 [image!], F neg. [image!], K K000220449 [image!], LD 1314574 [image!], LE 00001896 [image!], S (2 sheets) [image!], WIS 0259069!, WIS 0259070!).

Notes—We here designate specimen BR 698554 as the lectotype for several reasons. The B specimen label bears three names, each in a different script, entered in the sequence *Cleome rosea*, *C. polygama* (scratched), and then *C. regnellii*, the latter in a fancy penmanship that does not appear to be that of Eichler. On that label in this same calligraphy also appears a full citation of the place of publication of Eichler’s species, making it unlikely that this annotation pre-dated the publication of his 1870 paper. These facts impede the selection of the B specimen as lectotype. However, two sheets in BR, BR 698554 and BR 698555, are annotated as *C. regnellii* in Eichler’s handwriting. Eichler, who with Urban completed the *Flora Brasiliensis*, certainly saw Martius’s herbarium, which included specimens collected by many others and which is now at BR.



For these reasons, it seems plausible that the BR collections, having been seen by Eichler, are the proper type material. BR 698554 is a better, more complete specimen than BR 698555 and is therefore chosen as the lectotype.

19. ***Tarenaya rosea*** (Vahl ex DC.) Soares Neto & Roalson, comb. nov. *Cleome rosea* Vahl ex DC., Prodr. 1: 239.1824. Type: [BRAZIL. Rio de Janeiro] Ad Rio-Janeiro Brasiliae. v. s. in. h. Juss., *P. Commerson* 255 (holotype: P P00671649!).

20. ***Tarenaya siliculifera*** (Eichler) Soares Neto & Roalson comb. nov. *Cleome siliculifera* Eichler, Fl. Bras. 13(1): 260. 1865. Type: [BRAZIL. Minas Gerais] Prov. Minarum: Habitat prope Cocaes et in Serra dos Pinheiros, [1839], *J. Pohl s.n.* (lectotype, designated here: BR 698586 [image!]; isotypes: F (frag. + neg.) [image!], G G00226314 [image!], M M-0010385 [image!], LE, W [image!], WIS 0259077!).

Notes—As with the type of *C. regnellii* above, it is most likely that the BR specimen represents material used by Eichler, and we therefore lectotypify *C. siliculifera* with BR 698586.

21. ***Tarenaya titubans*** (Speg.) Soares Neto & Roalson, comb. nov. *Cleome titubans* Speg., Anales Soc. Ci. Argent. 15: 97. 1883. Type: ARGENTINA. [Buenos Aires] Provincia Bonaërensi: Inter dumeta in paludosis secus, “el Rio de la Plata”, loco dicto “las Conchas”, May 1881, *C.L. Spegazzini s.n.* (neotype, designated here: ARGENTINA. Buenos Aires, Quilmes, loc. Bernal, March 1973, *F.M. Rodríguez* 191, SI 066837 [image!]; isoneotype: SI 066836 [image!]).

Notes—The Spegazzini type collection at LP does not appear to include the type of *Cleome titubans*, as expected. Costa-e-Silva (2000) also referenced her inability to find the type of this species for her review of Brazilian *Cleome*. Because no original material of *C. titubans* has been found among Spegazzini’s collections, a neotype is designated here.

22. ***Tarenaya torticarpa*** (Iltis & T. Ruiz Zapata) Soares Neto & Roalson, comb. nov. *Cleome torticarpa* Iltis & T. Ruiz Zapata, Novon 7(4): 367. 1997. Type: VENEZUELA. Estado Falcón: Distrito Federación, Parque Nacional Cueva de la Quebrada el Toro, 10°50’N, 69°07’W, en selva de galería, bajo sombra, 200 m abajo de la “toma de agua” en la estación del Parque, 600 m, 29 October 1983, *Thirza Ruiz Zapata & Teo Ruiz* 4138 (holotype: MY; isotypes: COL, F, K, MER, MO!, NY NY00387680!, NY NY00345549!, US, VEN, WIS WIS0259083!, WIS0259084!, WIS0259085!).

23. ***Tarenaya trachycarpa*** (Klotzsch ex Eichler) Soares Neto & Roalson, comb. nov. *Cleome trachycarpa* Klotzsch ex Eichler, Fl. Bras. 13(1): 252. 1865. Type: [BRAZIL] Habitat in Brasilia austro-orientali, *Sello* [F. Sellow] 2059 (holotype: B 10 0242688 [image!]). ≡ *Cleome psoraleifolia* DC. var. *trachycarpa* (Klotzsch ex Eichler) Kuntze, Revis. Gen. Pl. 3(3): 7. 1898.

24. ***Tarenaya virens*** (J.F.Macbr.) Soares Neto & Roalson, comb. nov. *Cleome virens* J.F.Macbr., Candollea 5: 360. 1934. Type: PERU. Loreto: La Victoria on the Amazon River, August-September 1929, *L. Williams* 2596 (holotype: F [image!]; isotype: G G00226308 [image!]).

25. ***Tarenaya werdermannii*** (Alf.Ernst) Soares Neto & Roalson, comb. nov. *Cleome werdermannii* Alf.Ernst., Notizbl. Bot. Gart. Berlin-Dahlem 13: 378. 1936. Type: BOLIVIA. Depto. Sta. Cruz: Misiones Guarayos-Sta. Cruz de la Sierra, ca. 250–300 m ü. M., October 1926, *E. Werdermann* 2597 (lectotype, designated here: B B10 0242682 [image!]; isolectotypes: B B10 0242698 [image!], LPB [image!], MO 1000057!, S [image!], WIS WIS0259089 [frag.]).

Notes—Both specimens of *Werdermann* 2597 at B are good representatives for this species, but B 100242682 is chosen as the lectotype, because it is labeled “typus” in Ernst’s hand.

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