

NOTES ON THE BRAZILIAN PLANTS COLLECTED BY
GEORG WILHELM FREYREISS AND PUBLISHED
BY CARL PETER THUNBERG IN *PLANTARUM BRASILIENSIIUM*

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Abstract. In three dissertations entitled *Plantarum Brasiliensium* and presided by Carl Peter Thunberg, ten new species were treated in each of three parts by Johan Immanuel Billberg, Carl Gustav Ahlberg, and Carl Otto Holm, respectively, from collections made by Georg Wilhelm Freyreiss in his travel to Minas Gerais in 1814–1815. Eight of these species are currently accepted, but several have been overlooked by authors or remained unresolved until the present. Here we present the taxonomic status for all these names based on the analyses of the original specimens collected by Freyreiss, currently housed at UPS and elsewhere, pertinent literature available, and other herbarium collections. As a result, six new synonyms, one lectotypification and one new combination are proposed.

Resumo. Em três dissertações intituladas *Plantarum Brasiliensium* e presididas por Carl Peter Thunberg, foram tratadas dez espécies novas em cada uma das três partes por Johan Immanuel Billberg, Carl Gustav Ahlberg e Carl Otto Holm, respectivamente, a partir de coleções feitas por Georg Wilhelm Freyreiss em sua viagem a Minas Gerais em 1814–1815. Oito dessas espécies são atualmente aceitas, mas várias foram ignoradas pelos autores ou permaneceram irresolutas até o presente. Aqui apresentamos o estado taxonômico para todos esses nomes a partir de análises dos espécimes originais de Freyreiss, atualmente conservados em UPS e outros herbários, juntamente com a literatura pertinente disponível e outras coleções de herbários. Como resultado, seis sinônimos novos, uma lectotipificação e uma combinação nova são propostos.

Keywords: Brazil, historical collections, nomenclature, taxonomy

Georg Wilhelm Freyreiss was born in Frankfurt am Main on 12 July 1789, and died in Brazil, in “Villa Viçosa” [currently Nova Viçosa, Bahia], on 1 April 1825 (Urban, 1906). Biographical information about Freyreiss is relatively scarce (e.g., Martius, 1837; Hooker, 1842; Lasègue, 1845; Löwenberg, 1878; Lindman, 1900; Papavero, 1971), and greatly is based on what Lindman (1900) has written on his translation to Swedish of the “chapter” 3 of Freyreiss’s manuscript, “*Reise zu mehreren Stämmen der Urbewohner der Capitanie Minas Geraes—Aufenthalt unter solchen—Schilderung ihrer Sitten und Gebräuche—Proben der Sprachen*,” kept by the Royal Swedish Academy of Sciences, where he reported about his trip to the interior of Brazil (“*Reisen in Brasilien*,” Freyreiss, 1902, 1907, 1968, 1982). From this, we learn that Freyreiss’s travelogue is a series of five fragments (chapters), which was dated in Rio de Janeiro in May 1815, and was dedicated and presented to Lorentz Westin (1787–1846), then Swedish-Norwegian general consul in Rio de Janeiro, who sponsored Freyreiss’s trip to Minas Gerais in 1814–1815. The manuscript has 91 pages in folio and several watercolors of natural objects (e.g., Brazilian birds). Freyreiss, as a naturalist, had distinguished himself as an ornithologist. He moved in 1809 to St. Petersburg, and in 1812 he left Russia with Georg Heinrich von Langsdorff (1774–1852), then newly appointed Russian consul general in Brazil, on the way to Rio de Janeiro. However, as the journey became interrupted by stormy weather just in its beginning, Freyreiss wintered

in Karlshamn. During his stay there, he visited Stockholm and Uppsala, and made the acquaintance of the eminent botanists Olof Peter Swartz (1760–1818) and Carl Peter Thunberg (1743–1828), who furnished Freyreiss with letters of recommendation to Westin, who was already resident in Rio (Lindman, 1900; Freyreiss, 1902).

Once in Rio, where he arrived on 29 August 1813, Freyreiss soon became a good friend of Westin, who provided him with the means to travel and collect natural history specimens. In July 1814, Freyreiss went to Minas Gerais, profiting by a trip made by Wilhelm Ludwig von Eschwege (1777–1855), then the director of the mining companies of Brazil, by appointment of the Brazilian Government, and one of the most learned students of Brazilian geography and natural resources (Lindman, 1900; Freyreiss, 1902; Papavero, 1971).

Leaving Rio on 29 June 1814, Freyreiss took a boat as far as Porto da Estrela, took the Estrada Real to Minas Gerais and stopped in Fazenda Sumidouro (1 July), where he stayed waiting for the arrival of Eschwege, which happened on 29 July (Freyreiss, 1907). On the next day they continued the trip and arrived in Rio Paraibuna on 1 August. After crossing the Rio Paraibuna, they entered the Province of Minas Gerais, via Fazenda Juiz de Fora (3 August), Fazenda Chapéo de Uvas (4 August), Fazenda Mantiqueira (5 August), Barbacena (which they left on 7 August), Congonhas do Campo (9 August), to Vila Rica (presently Ouro Preto; 10 August), where Eschwege had his

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headquarters (Freyreiss, 1907; Papavero, 1971).

Leaving Vila Rica on the 2nd of September for the sertão de Abaeté, Freyreiss and Eschwege returned to Congonhas do Campo (3 September), and went on to the Rio Paraopeba, visiting two farms (Bicas and Varginhas; 5 September), the city of Pompeu (on 10 and 11 September), the Rio São Francisco (12 September), the village of Santana (16 September), and the Rio Indaiá (17 September). They went to visit a lead factory (the Real Fábrica de Chumbo, situated 80 leagues away of Vila Rica), where they remained for about a month, leaving on 11 October for Vila Rica, where Freyreiss remained for a month, which he dedicated to “the discovery of the most important objects of natural history” (Freyreiss, 1907; Papavero, 1971).

On 22 December 1814 (Freyreiss, 1907, 1982; in Freyreiss, 1902, the departure is indicated as on 14 December), Freyreiss again left Vila Rica for another trip, at this time passing by Mariana, Santana dos Ferros (currently Guaraciaba; 24 December), Santa Rita (= Santa Rita do Turvo, currently Viçosa; 25 December), Presídio de São João Batista (currently Visconde do Rio Branco; 26 to 29 December). This voyage was made with the main purpose of studying Indian tribes but, according to the narrative, Freyreiss (1902, 1907) stated that he also herborized plants and made collections of natural history objects. In the end of his narrative, Freyreiss mentioned that he had to leave Vila Rica for Rio de Janeiro in January 1815.

On his return to Rio, Freyreiss wrote the manuscript in question. After meeting Friedrich Sellow (1789–1831) in Langsdorff’s house, Freyreiss decided to join the trip that was being planned. Sellow and Freyreiss received letters of recommendation to the authorities of the Brazilian Provinces and the title of “financed naturalists,” granted by the Brazilian Government, with an annual pension of 400:000 (400,000 “reis”). Everything was ready for the trip, when in July 1815, Prince Maximilian zu Wied-Neuwied, who was also a naturalist, and was interested in undertaking a trip to the interior of Brazil, arrived in Rio de Janeiro. Wied-Neuwied, who was a guest of Langsdorff, decided to accompany Sellow and Freyreiss on their voyage (Papavero, 1971; see also Hackethal, 2013). Detailed accounts of the itinerary of the Wied expedition can be found in Urban (1906), Bokermann (1957), Rocha (1972) and Moraes (2009). From Lindman (1900), we also learn that on 17

January 1816 Freyreiss became a foreign correspondent of the Royal Academy of Sciences in Stockholm and in a letter from Bahia to Swartz, dated 25 April 1817, he has written that “at the end of a two-year journey [the Wied expedition] [he] was bringing home 63 mammals, 920 birds, 19 amphibians, 7 fish, 850 species of plants and 400 varieties of seeds, increasing the Museum Westianum.”

The species described by Thunberg in the *Decas* of *Plantarum Brasiliensium* (Thunberg, 1817, 1818, 1821) refer therefore to Freyreiss collections acquired during his trip to Minas Gerais with Eschwege. The dissertations that Thunberg presided, except a few (Krok, 1925: 715), were written by himself and defended by the respondent. This practice was commonplace at the time and therefore all names published in these dissertations should be attributed to Thunberg and not to the respondent (Nilsson, 1892: 58; Krok, 1925). In *Plantarum Brasiliensium*, the first ten species (*Decas prima*) were defended by Johan Immanuel Billberg (1799–1845) (Thunberg, 1817, 1821b); followed by the next ten species (*Decas secunda*), defended by Carl Gustav Ahlberg (Thunberg, 1818, 1821c); and by the last ten (*Decas tertia*), defended by Carl Otto Holm (Thunberg, 1821a,d).

For convenience, species are presented in alphabetic order from current accepted names by family and genus. Original material is here referred to herbarium collections related to the names published in *Plantarum Brasiliensium*. Specimens housed in UPS-THUNB are listed using their present GUID numbers (complied with specifications by GBIF, thus a database number), followed by their traditional Thunberg’s herbarium numbers, which are stamped in the upper right corner of the specimens, and by the IDC (Inter Documentation Company) microfiche numbers (Braem, 1995), in square brackets. Whenever available, barcode or accession (in square brackets) numbers of specimens are indicated after herbarium acronyms. A specimen housed in LINN is listed using the number given by Spencer Savage (1945; see also Stearn, 1957). No effort has been made here to enumerate the full synonymy for each name, since this information can be found elsewhere in the related literature. Accepted names appear in **boldface italics**, with synonyms in *italics*. Full synonymies are not included as they can be found elsewhere. Homotypic synonyms are indicated by the symbol “≡.”

BRAZILIAN SPECIES IN THUNBERG’S *PLANTARUM BRASILIENSIMUM*

ACANTHACEAE

Avicennia germinans (L.) L., Sp. Pl. (ed. 3) 2: 891. 1764
≡ *Bontia germinans* L., Syst. Nat. (ed. 10) 2: 1122. 1759.
Lectotype (designated by Stearn, 1958: 35): JAMAICA. P. *Browne s.n.* (LINN 813.2).

Synonym: *Avicennia elliptica* Thunb., Pl. Bras. 3: 37. 1821;
idem in Flora 4(2): 602. 1821; Schauer in Martius,
Fl. Bras. 9: 305. 1851; Juel (1918: 433). TYPE:
BRAZIL. Loco haud indicato, [Freyreiss s.n.] in Mus.
Westinian. (Holotype: UPS:BOT:V-125614 [UPS-
THUNB 14627; IDC 613/22]; Isotype, S [13-15358]).

Further synonyms and information in Moldenke (1960a, b).

Ruellia macrantha (Nees) Gower, Garden (London, 1871–
1927) 31: 604, t. 603. 1887 ≡ *Dipteracanthus macranthus*
Nees, Fl. Bras. 9: 37. 1847; idem in DC., Prodr. 11: 117.
1847 ≡ *Ruellia macrantha* Mart. ex Nees, loc. cit., *nom.*
invalid.; Lindau in Engler & Prantl, Naturl. Pflanzenfam.
4(3b): 310. 1895. TYPE: BRAZIL. São Paulo, “in sylvis
supra Serra do Mar,” 1817, *Martius s.n.* (Syntype: GZU
000249607); idem, Minas Gerais, “in sylvis umbrosis

ad Mariana," March 1818, *Martius s.n.* (Syntype: GZU 000249607); idem, Minas Gerais, "Serra de S. Antonio," October 1818, *Sellow s.n.* (1414) (Syntypes: B[†] [F neg. 5935], HAL 113800, K 000534082, K 000534083); idem, Minas Gerais, "in umbrosis Enter os Morros," May 1824, *Riedel s.n.* (Syntype: LE); idem, Minas Gerais, Serro, "Villa do Principe," August 1840, *Gardner 5132* (Syntypes: BM 000624586, K 000534079, K 000534081); idem, Minas Gerais, Sabará, 1833, *Vauthier 181* (Syntypes: MPU 018194, P 03047355, P 03047356, P 03047360).

Synonym: *Bignonia elliptica* Thunb., Pl. Bras. 3: 34. 1821; idem in Flora 4(2): 602. 1821; DC., Prodr. 9: 144. 1845; Bureau and K. Schumann in Martius, Fl. Bras. 8(2): 288. 1897; Juel (1918: 321); Gentry (1992: 183). TYPE: BRAZIL. Minas Gerais, Ouro Preto, "Villa Rica," August 1814, *Freyreiss s.n.* in Mus. Westinian. (Holotype: UPS:BOT:V-125218 [UPS-THUNB 14235; IDC 597/10]).

Sandwith (1937: 231) was the first to establish the identity of *Bignonia elliptica* Thunb. Since the epithet "*elliptica*" is preoccupied in *Ruellia* by *R. elliptica* Rusby (1900), no nomenclatural change was needed for the present case.

ASTERACEAE

Chromolaena laevigata (Lam.) R.M. King & H. Rob., Phytologia 20(3): 202. 1970 = *Eupatorium laevigatum* Lam., Encycl. 2: 408. 1786. TYPE: "Cette plante nous a été communiqué par M. de Jussieu; nous la croyons originair d'Amérique. (v.s.)," *Jussieu s.n.* (Holotype: P-LA 00308874; Isotype, P-JU [8394], P-JU).

Synonym: *Eupatorium australe* Thunb., Pl. Bras. 2: 26. 1818; idem in Flora 4(1): 332. 1821; Baker in Martius, Fl. Bras. 6(2): 286. 1876; Juel (1918: 351). TYPE: BRAZIL. Minas Gerais, loco haud indicato, January–February 1815, *Freyreiss s.n.* in Mus. Westin. (Holotype: UPS:BOT:V-131111 [UPS-THUNB 18809; IDC 789/6]).

Further synonyms in Hind (2011).

Gochnatia polymorpha (Less.) Cabrera, Notas Mus. La Plata, Bot., 15: 43. 1950; Cabrera, Revista Mus. La Plata, N. S., 12: 115. 1971 = *Spadonia polymorpha* Less., Syn. Gen. Compos. 101. 1832 = *Moquinia polymorpha* (Less.) DC., Prodr. 7(1): 23. 1838. TYPE: BRAZIL. Loco haud indicato, s.d., *Sellow s.n.* (Syntypes: BR 0000005318131, BR 0000005318469, K 000502518, LE [6 sheets], NY 00259989, P 00703381). Other specimens: BRAZIL. Espírito Santo, "S. Augustin...Villa de Victoria" [S. Agostinho, Vitória], December 1815, *Wied s.n.* (Menke nr. 47) (BR 0000005576265, BR 0000005576180).

Synonyms: *Baccharis tomentosa* Thunb., Pl. Bras. 3: 38. 1821, *nom. illegit.*; idem in Flora 4(2): 602. 1821; Juel (1918: 340). TYPE: BRAZIL. Minas Gerais, loco haud indicato, January–February 1815, *Freyreiss s.n.* in Mus. Westin. (Holotype: UPS:BOT:V-131664 [UPS-THUNB 19353; IDC 812/8]; Isotype, S [13-15357]).

Albertinia incanescens Mart. ex Colla, Herb. Pedem. 3: 290. 1834. Lectotype (designated by Moraes et

al., 2013: 214): BRAZIL. Bahia, "Estrada de Minas" [via Felisbertia], *Anonymous* [Wied] *s.n.* (TO; Isolectotype, K 000373362).

Further information and synonyms in Cabrera (1971).

Ophryosporus freyreissii (Thunb.) Baker in Martius, Fl. Bras. 6(2): 188. 1876.

Basionym: *Eupatorium freyreissii* Thunb., Pl. Bras. 2: 25. 1818, as "*freyreysi*"; idem in Flora 4(1): 332. 1821; Juel (1918: 351). TYPE: BRAZIL. Minas Gerais, Ouro Preto, "crescit juxta villam Ricam prope Aurifodinas," August 1814, *Freyreiss s.n.* in Mus. Westin. (Holotype: UPS:BOT:V-131128 [UPS-THUNB 18826; IDC 789/23]).

Further information in Robinson (1906).

Stevia urticifolia Thunb., Pl. Bras. 1: 13. 1817, as "*urticaefolia*"; idem in Flora 4(1): 331. 1821; Baker in Martius, Fl. Bras. 6(2): 201, t. 55. 1876; Juel (1918: 378); Hind (2011). TYPE: BRAZIL. Minas Gerais, Ouro Preto, "crescit in montibus circa Villam Ricam," August 1814, *Freyreiss s.n.* in Mus. Westin. (Holotype: UPS:BOT:V-131184 [UPS-THUNB 18877; IDC 792/7-8]).

Further information in Hind (2011).

BEGONIACEAE

Begonia rufa Thunb., Pl. Bras. 1: 11. 1817; idem in Flora 4(1): 331. 1821; A. DC. in Martius, Fl. Bras. 4(1): 384. 1861; Juel (1918: 164). TYPE: BRAZIL. Minas Gerais, Ouro Preto, "crescit locis humidis juxta Villam Ricam," August 1814, *Freyreiss s.n.* in Mus. Westin. (Holotype: UPS:BOT:V-135904 [UPS-THUNB 22361; IDC 938/11]).

Synonyms in Golding and Wasshausen (2002).

BERBERIDACEAE

Berberis laurina Thunb., Pl. Bras. 1: 8, t. 2, fig. 1. 1817; idem in Flora 4(1): 330. 1821; Eichler in Martius, Fl. Bras. 13(1): 230, t. 52. 1864; Juel (1918: 164). TYPE: BRAZIL. Minas Gerais, Ouro Preto, "crescit juxta villam Ricam," September 1814, *Freyreiss s.n.* in Mus. Westin. (Holotype: UPS:BOT:V-008784 [UPS-THUNB 8784; IDC 369/6]; Isotype, BR 0000013053437).

Specimen S [13-15360] ex Herb. Swartzii is annotated with "*Berberis laurina* Thunb. in Dec. I^a Plant. Bras. / Brasilia / Freyreis," but it does not belong to that species.

BIGNONIACEAE

Bignonia binata Thunb., Pl. Bras. 3: 35. 1821; idem in Flora 4(2): 602. 1821; DC., Prodr. 9: 189. 1845; Bureau and K. Schumann in Martius, Fl. Bras. 8(2): 128. 1896; idem, 288. 1897; Juel (1918: 321); Lohmann in Hokche et al. (2008: 272) = *Clytostoma binatum* (Thunb.) Sandwith, Recueil Trav. Bot. Néerl. 34: 231. 1937. TYPE: BRAZIL. Minas Gerais, loco haud indicato, January–February 1815, *Freyreiss s.n.* ex Mus. Westinian. (Holotype: UPS:BOT:V-125208 [UPS-THUNB 14225; IDC 596/24]).

Synonym: *Bignonia noterophylla* Mart. ex DC., Prodr. 9: 148. 1845 = *Clytostoma noterophyllum* (Mart. ex DC.) Bureau & K. Schum. in Martius, Fl. Bras.

8(2): 153. 1896. TYPE: BRAZIL. Pará, “in sylvis ad Santarém,” September 1819, *Martius s.n.* (Syntype: M 0086398 [F neg. 20458]); idem, Pará, “in sylvis inundat. ad Santarém,” September 1819, *Martius s.n.* (Syntype: M 0086399); idem, Pará, “locis inundatis,” 1819, *Martius s.n.* (Syntype: M 0086400).

Jacaranda jasminoides (Thunb.) Sandwith, Recueil Trav. Bot. Néerl. 34: 232. 1937; Gentry and Morawetz in Gentry (1992: 83).

Basionym: *Bignonia jasminoides* Thunb., Pl. Bras. 3: 36. 1821; idem in Flora 4(2): 602. 1821; DC., Prodr. 9: 167. 1845; Bureau and K. Schumann in Martius, Fl. Bras. 8(2): 288. 1897; Juel (1918: 321). TYPE: BRAZIL. Loco haud indicato, *Freyreiss 103* in Mus. Westinian. (Holotype: UPS:BOT:V-125224 [UPS-THUNB 14241; IDC 597/16]).

Further synonyms in Gentry (1992).

BROMELIACEAE

Billbergia amoena (Lodd.) Lindl., Bot. Reg. 13: t. 1068. 1827.

Basionym: *Tillandsia amoena* Lodd., Bot. Cab. 1: t. 76. 1818. TYPE: *Loddiges Hortus in Lindley s.n.*, s.d. (Holotype: CGE n.v.).

Billbergia amoena (Lodd.) Lindl. var. *minor* (Antoine & Beer ex Beer) L.B. Smith, Arq. Bot. Estado São Paulo, Nova Sér., 1(5): 104. 1943.

Basionym: *Billbergia pyramidalis* (Sims) Lindl. var. *minor* Antoine & Beer ex Beer, Bromel. 108. 1856. TYPE: *Berlin Hortus s.n.* (B ?, unlocated, probably destroyed).

Synonym: *Billbergia speciosa* Thunb., Pl. Bras. 3: 30, pl. 1821 (Fig. 1); idem in Flora 4(2): 602. 1821; Mez in Martius, Fl. Bras. 3(3): 410. 1892; idem in A. DC., Monogr. Phan. 9: 320. 1896; Juel (1918: 76). TYPE: BRAZIL. Minas Gerais, Ouro Preto, “crescit prope villam Ricam,” “parasitica in caulibus arborum,” August 1814, *Freyreiss s.n.* in Mus. Westin. (Holotype: UPS:BOT:V-007821 [UPS-THUNB 7821; IDC 328/22]; Original material, S [06-10410]).

Further synonyms in Smith and Downs (1979).

Smith (1943) placed with doubt *Billbergia speciosa* Thunb. under synonymy of *B. amoena* var. *minor*. Later, Smith and Downs (1979: 1983) reasserted this synonymy, but quoted with doubt the type of *B. speciosa* as being “? *Freyreis s n* (S), Brazil.” The specimen in question, S [06-10410] ex Herbarium Swartzii, is annotated with “*Billbergia speciosa* Thunb. Diss. pl. Bras. Dec. I. / Brasilia / Freyreis,” and has been identified by Smith on 23 February 1931 as *Billbergia iridifolia* (Nees & Mart.) Lindl. In fact, this specimen resembles the type collection of *Bromelia iridifolia* Nees & Mart., which was collected by *Prinz zu Wied* in Bahia {“circa viam Filisbertiam ... in trunco arboris,” January 1817, (Nees von Esenbeck nr. CXVIII) (Holotype: BR 0000008677457 [photo at MO 1102940]; Isotypes, BR 0000008677488, LE)}, but its morphological pattern is within the broad variability found in Thunberg’s taxon. However, it is trickier because Smith and Downs (1979:

1996) has synonymized “*Billbergia speciosa* Thunberg, ...; in part, not as to plate. Based on *Freyreis s n* (UPS), Villa Rica (Ouro Preto), Minas Gerais, Brazil,” under *Billbergia elegans* Mart. ex Schult., Syst. Veg. 7(2): 1265. 1830, therefore taking the holotype of *Billbergia speciosa* Thunb. as a different taxon from the plate published by Thunberg. This interpretation was also annotated by Smith in February 1966, on a label attached to the specimen at UPS. Although Thunberg’s plate of *Billbergia speciosa* (Fig. 1) is really not a “piece of art,” like Smith’s (1943) bad evaluation on that, it is quite clear that the *Freyreiss* specimen at UPS is the one used to prepare the illustration (Fig. 2).

CAMPANULACEAE

Siphocampylus macropodus (Thunb.) G. Don, Gen. Hist. 3: 702. 1834.

Basionym: *Lobelia macropoda* Thunb., Pl. Bras. 1: 6. 1817; idem in Flora 4(1): 330. 1821; C. Presl, Prodr. Monogr. Lobel. 37. 1836; Kanitz in Martius, Fl. Bras. 6(4): 152. 1878; Juel (1918: 328). TYPE: BRAZIL. Minas Gerais, Ouro Preto, “crescit in montibus juxta Villam Ricam,” s.d., *Freyreiss s.n.* in Mus. Westin. (Holotype: B 10 0242580 [Mus. Bot. Berol. Film Nr. 3303]).

Further synonym in Lammers (2007).

For unknown reasons, the holotype of *Lobelia macropoda* is currently housed in B. The sheet S [11-14260] ex Herb. Swartzii is noted with “*Siphocampylus macropodus* G. Don,” “*Lobelia macropoda* Thunb. Diss. Dec. pl. Brasil.,” “Brasilia: Freyreis,” but it no doubt is referable to *Centropogon cornutus* (L.) Druce.

Siphocampylus westinianus (Thunb.) Pohl, Pl. Bras. Icon. Descr. 2: 115. 1831.

Basionym: *Lobelia westiniana* Thunb., Pl. Bras. 1: 5, t. 1, fig. 1. 1817; idem in Flora 4(1): 330. 1821; Römer and Schultes, Syst. Veg. 5: 53. 1819; C. Presl, Prodr. Monogr. Lobel. 37. 1836; Kanitz in Martius, Fl. Bras. 6(4): 152. 1878; Juel (1918: 330). TYPE: BRAZIL. Minas Gerais, Ouro Preto, “crescit in locis humidis ad Villam Ricam,” *Freyreiss s.n.* in Mus. Westin. (Holotype: B 10 0242531 [Mus. Bot. Berol. Film Nr. 3275]).

Further synonyms and information in Wimmer (1926) and Lammers (2007).

For unknown reasons, the holotype of *Lobelia westiniana* is also currently housed in B.

ERICACEAE

Agarista coriifolia (Thunb.) Hook. f. ex Nied., Bot. Jahrb. Syst. 11: 236. 1889 = *Leucothoe coriifolia* (Thunb.) DC., Prodr. 7: 605. 1839; Sleumer, Bot. Jahrb. Syst. 78: 462. 1959.

Basionym: *Andromeda coriifolia* Thunb., Pl. Bras. 1: 9: 1817; idem in Flora 4(1): 330. 1821; Meissner in Martius, Fl. Bras. 7: 166. 1863; Juel (1918: 391); Judd (1995: 320). TYPE: BRAZIL. Minas Gerais, Ouro Preto, “crescit prope villam Ricam,” August 1814, *Freyreiss s.n.* in Mus. Westin. (Holotype: UPS:BOT:V-085230 [UPS-THUNB 10287; IDC 432/9]).

Further synonyms in Sleumer (1959: 462) and Judd (1995: 320).



FIGURE 1. Original plate of *Billbergia speciosa* Thunb. Image courtesy Missouri Botanical Garden. <http://www.botanicus.org>.



FIGURE 2. Holotype of *Billbergia speciosa* Thunb., collected by Freyreiss (specimen UPS-THUNB).

ERIOCAULACEAE

Paepalanthus freyreissii (Thunb.) Körn. in Martius, Fl. Bras. 3(1): 370. 1863 = *Dupatya freyreissii* (Thunb.) Kuntze, Revis. Gen. Pl. 2: 745. 1891.

Basionym: *Eriocaulon freyreissii* Thunb., Pl. Bras. 1: 7, t. 1, fig. 2. 1817, as “*freyreissii*”; idem in Flora 4(1): 330. 1821; Juel (1918: 86). TYPE: BRAZIL. Minas Gerais, Ouro Preto, “crescit in montibus prope villam Ricam, in locis udis sphagno repletis,” August 1814, *Freyreiss s.n.* in Mus. Westin. (Holotype: UPS:BOT:V-002826 [UPS-THUNB 2826; IDC 119/11]; Isotypes, MEL 2353908, S [R-3889]).

EUPHORBIACEAE

Croton pannosum Thunb., Pl. Bras. 2: 24. 1818; idem in Flora 4(1): 332. 1821; Müller Argoviensis in Martius, Fl. Bras. 11(2): 274. 1873, as “*pannosus*”; Juel (1918: 192) = *Oxydectes pannosa* (Thunb.) Kuntze, Revis. Gen. Pl. 2: 612. 1891. TYPE: BRAZIL. Minas Gerais, loco haud indicato, February 1815, *Freyreiss s.n.* in Mus. Westin. (Holotype: UPS:BOT:V-138395 [UPS-THUNB 22648; IDC 950/16]).

FABACEAE

Bauhinia forficata Link, Enum. Hort. Berol. Alt. 1: 404. 1821. TYPE: BRAZIL. “Semina misit Sereniss. Princeps. a Neu Wied,” s.d. (Holotype: B⁺). Icon.: Plate 36 (Link and Otto, 1825: 79).

Synonyms: *Bauhinia armata* Thunb., Pl. Bras. 3: 33. 1821; idem in Flora 4(2): 602. 1821; Juel (1918: 215). TYPE: BRAZIL. Minas Gerais, loco haud indicato, January–February 1815, *Freyreiss s.n.* in Mus. Westinian. (Holotype: UPS:BOT:V-084807 [UPS-THUNB 9902; IDC 416/5]).

Bauhinia breviloba Benth. in Martius, Fl. Bras. 15(2): 197. 1870. TYPE: BRAZIL. Rio de Janeiro, “ad Rio Itabapua in confinibus prov. Rio de Janeiro et Espiritu Santo,” 1815, *Wied s.n.* (208) (Syntypes: BR 0000006411398, BR 0000006411381, MEL 260652).

Further synonyms in Vaz (2011).

Calliandra staminea (Thunb.) Barneby, Mem. New York Bot. Gard. 74(3): 92. 1998.

Basionym: *Mimosa staminea* Thunb., Pl. Bras. 2: 22. 1818; idem in Flora 4(1): 332. 1821; Juel (1918: 231). TYPE: BRAZIL. Minas Gerais, Ouro Preto, “crescit ad villam Ricam,” [December] January–February 1815, *Freyreiss s.n.* in Mus. Westin. (Holotype: UPS:BOT:V-143437 [UPS-THUNB 24189; IDC 1015/12]).

Further synonym and information in Barneby (1998).

LAMIACEAE

Ocimum flexuosum Thunb., Pl. Bras. 2: 23. 1818, as “*Ocimum*”; idem in Flora 4(1): 332. 1821; Juel (1918: 405). TYPE: BRAZIL. Minas Gerais, loco haud indicato, January–February 1815, *Freyreiss s.n.* in Mus. Westin. (Holotype: UPS:BOT:V-013762 [UPS-THUNB 13762; IDC 577/16]).

Synonyms: *Ocimum carnosum* (Spreng.) Link & Otto ex Benth., Labiat. Gen. Spec. 11. 1832, *syn. nov.* = *Lumnitzera carnososa* Spreng., Syst. Veg. (ed. 16) 4(2): 223. 1827. TYPE: URUGUAY. Montevideo, December 1825–May 1826, *Sellow 3434* (B⁺). Neotype (designated by Walsingham & Paton, 2011: 81): PATRIA HAUD INDICATA [URUGUAY], s.d., *Sellow s.n.* (K 000485567; Isoneotype: HAL 0114393). *Ocimum selloi* Benth., Labiat. Gen. Spec. 6. 1832, *syn. nov.* TYPE: BRAZIL. Rio Grande do Sul, November 1823, *Sellow d 1483* (Syntype: B⁺ [F neg. 17813], HAL 0114406, K 000485565).

In Index Kewensis, *Ocimum flexuosum* Thunb. has been indicated as *nomen nudum*. However, as correctly pointed out by Juel (1918: 405), the name has a diagnosis. Despite being validly published, this name has been overlooked by the specialists and its identity remained unresolved until now. The analysis of the holotype at UPS allowed its identification as co-specific with *Ocimum carnosum* (Spreng.) Link & Otto ex Benth.

MALPIGHIACEAE

Tetrapteryx mucronata Cav., Diss. 9: 434, t. 262, fig. 2. 1790; Grisebach, Linnaea 22: 22. 1849; idem in Martius, Fl. Bras. 12(1): 80. 1858. TYPE: FRENCH GUIANA. Cayenne, 1788, *Stoupy s.n.* (Holotype: P-JU; Isotype, MA [265778]).

Synonyms: *Triopteryx floribunda* Thunb., Pl. Bras. 1: 14. 1817, as “*Tripteris*”; idem in Flora 4(1): 331. 1821; DC., Prodr. 1: 587. 1824; A. Juss., Monogr. Malpigh. 263, 267. 1843; Juel (1918: 240); Niedenzu in Engler, Pflanzenr. [Heft 91] IV. 141: 154, 197. 1928. TYPE: BRAZIL. Minas Gerais, Ouro Preto, “crescit in montibus prope viam ad Villam Ricam,” August 1814, *Freyreiss s.n.* in Mus. Westin. (Holotype: UPS:BOT:V-086702 [UPS-THUNB 10978; IDC 461/4]).

Tetrapteryx crebriflora A. Juss. in A. St.-Hil., Fl. Bras. Merid. 3: 9. 1833; Grisebach, Linnaea 13: 237. 1839; idem in Martius, Fl. Bras. 12(1): 80. 1858. Lectotype (designated by Anderson, 2007: 91): BRAZIL. Minas Gerais, Ponte Alta, *Saint-Hilaire C. 407* (P 00577480; Isolectotypes, MPU 020114, P 00577481). Other specimen: BRAZIL. Loco haud indicato, s.d., *Freyreiss s.n.* (S [13-15361]).

Anderson (2007: 91) has mistakenly quoted the photograph “F neg. 35596” as the lectotype of *T. crebriflora*. In fact, it refers to *Tetrapteryx guilleminiana* A. Juss. f. *martiniana* Nied., Verzeichnis Vorles. Königl. Lyceum Hosianum Braunsberg 1909/10: 25. 1909. Lectotype (designated by Anderson, 2007: 91): BRAZIL. Rio de Janeiro, 1836, *Ackermann s.n.* = *Martii Herbar Florae Brasil. No. 1167* (NY 1239411; Isolectotypes, AWH, B⁺ [F neg. 12729], BM 000796312, BR 0000008578136, BR 0000008578464, BR 0000008578792, BR 0000008579126, BR 0000008579485, L 0700344, L 0700345, L 0700346, L 0700347, MO 1187813, NY 1239413, P 05598411, S [08-14187]), currently a synonym of *Niedenzuella acutifolia* (Cav.) W.R. Anderson.

MELASTOMATACEAE

Lavoisiera imbricata (Thunb.) DC., Prodr. 3: 103. 1828.

Basionym: *Rhexia imbricata* Thunb., Pl. Bras. 1: 10, t. 2, fig. 2. 1817; idem in Flora 4(1): 331. 1821; Juel (1918: 244). TYPE: BRAZIL. Minas Gerais, Ouro Preto, "crescit prope Villam Ricam, juxta Aurifodinas," August 1814, *Freyreiss s.n.* in Mus. Westin. (Holotype: UPS:BOT:V-009051 [UPS-THUNB 9051; IDC 380/9]).

ORCHIDACEAE

Cattleya crispata (Thunb.) Van den Berg, Neodiversity 3: 6. 2008 = *Laelia crispata* (Thunb.) Garay, Bradea 1(27): 302. 1973 = *Hoffmannseggella crispata* (Thunb.) H.G. Jones, Hawaii Orchid J. 3(4): 15. 1974 = *Sophronitis crispata* (Thunb.) Van der Berg & M.W. Chase, Lindleyana 15: 116. 2000.

Basionym: *Cymbidium crispatum* Thunb., Pl. Bras. 2: 18. 1818; idem in Flora 4(1): 331. 1821; Juel (1918: 133). TYPE: BRAZIL. Minas Gerais, Ouro Preto, "crescit prope Aurifodinas villae Ricae," "usus bulborum ad glutinandum," August 1814, *Freyreiss s.n.* in Mus. Westin. (Holotype: UPS:BOT:V-091899 [UPS-THUNB 21356; UPS neg. n. 511; IDC 896/8]; Isotype, S [07-8064]).

Synonyms: *Laelia flava* Lindl., Edwards's Bot. Reg. 25(Misc.): 88. 1839; idem in Edward's Botanical Register 28: t. 62. 1842 = *Amalia flava* (Lindl.) Heynh., Alph. Aufz. Gew.: 29. 1846 = "*Cattleya flava*" (Lindl.) Beer, Prakt. Stud. Orchid.: 210. 1854, *nom. invalid.* = *Bletia flava* (Lindl.) Rchb. f. in Walpers, Ann. Bot. Syst. 6: 431. 1862, *nom. illegit.* = *Hoffmannseggella flava* (Lindl.) H.G. Jones, Caldasia 10: 494. 1970.

Epidendrum dendrobioides Thunb., Pl. Bras. 2: 17. 1818; idem in Flora 4(1): 331. 1821; Juel (1918: 138); Garay (1973: 301). TYPE: BRAZIL. Minas Gerais, Ouro Preto, "crescit in montibus circa villam Ricam," August 1814, *Freyreiss s.n.* in Mus. Westin. (Holotype: UPS:BOT:V-135080 [UPS-THUNB 21532; IDC 903/18]; Isotype, LD 1213874).

Synonyms: *Epidendrum durum* Lindl., J. Bot. (Hooker) 3: 87. 1840. TYPE: GUIANA. Loco haud indicato, *Schomburgk s.n.* (Syntype: K-L, n.v.); BRAZIL. Minas Gerais, Ouro Preto, "Villa Rica," *Pohl s.n.* (Syntype: K-L, n.v.; M, n.v.).

Epidendrum carnosum Lindl., J. Bot. (Hooker) 3: 87. 1840. TYPE: BRAZIL. Minas Gerais, "in the Diamond Plains near Tejuco, and in rocky places near Itambe," *Martius s.n.* (Syntype: M, n.v.); BRAZIL. Loco haud indicato, *Pohl s.n.* (Syntype: M, n.v.).

Zygopetalum pedicellatum (Thunb.) Garay, Bradea 1(27): 305. 1973.

Basionym: *Cymbidium pedicellatum* Thunb., Pl. Bras. 2: 19. 1818, *nom. illegit.*, non *Cymbidium pedicellatum* (L. f.) Sw., J. Bot. (Schrader) 1799(2): 224. 1800; idem in Flora 4(1): 331. 1821; Juel (1918: 134) [= *Cymbidium pedunculatum* Thunb., Mus. Upsal., Append. XXIX:

5. 1819, *nom. invalid.*]. TYPE: BRAZIL. Minas Gerais, Ouro Preto, "crescit locis humidis juxta Aurifodinas villae Ricae," August 1814, *Freyreiss s.n.* in Mus. Westin. (Holotype: UPS:BOT:V-091919 [UPS-THUNB 21376; IDC 897/3-4]).

Synonyms: *Zygopetalum mosenianum* Barb. Rodr., Gen. Spec. Orchid. 1: 108. 1877. TYPE: BRAZIL. São Paulo, "près de Santos," 25 February 1875, *Mosén* 3227 (Holotype: S [07-7835]; Isotype, P 00447900). *Zygopetalum caulescens* Rolfe, Gard. Chron., Ser. 3, 7: 544. 1890. TYPE: BRAZIL. Loco haud indicato, "plant sent to garden / by Mesars. F. Sander & Co., of St. Albans," July 1889 (Syntype: K 000589010); idem, "F. Sander & Co., of St. Albans," February 1890 (Syntype: K 000589011); "specimens have been received for determination from the Rev. F. D. Horner..." (Syntype: K 000589013) "... and Mr. J. O'Brien" (Syntype: K 000589012).

PHYLLANTHACEAE

Phyllanthus obtusatus (Thunb.) Müll. Arg., Prodr. (DC.) 15(2): 433. 1866 = *Diasperus obtusatus* (Thunb.) Kuntze, Revis. Gen. Pl. 2: 600. 1891.

Basionym: *Xylophylla obtusata* Thunb., Pl. Bras. 1: 12. 1817; idem in Flora 4(1): 331. 1821; Juel (1918: 197). TYPE: BRAZIL. Minas Gerais, Ouro Preto, "crescit in montibus Villam Ricam adjacentibus," August 1814, *Freyreiss s.n.* in Mus. Westin. (Holotype: UPS:BOT:V-007505 [UPS-THUNB 7505; IDC 315/15]).

RUBIACEAE

Mitracarpus strigosus (Thunb.) P.L.R. Moraes, De Smedt & Hjertson, *comb. nov.*

Basionym: *Spermacoce strigosa* Thunb., Pl. Bras. 3: 29. 1821, *nom. illegit.*, non *Spermacoce strigosa* Sims, Bot. Mag. 38, t. 1558. 1813; idem in Flora 4(2): 602. 1821; Juel (1918: 420). TYPE: BRAZIL. Loco haud indicato, s.d., [*Freyreiss s.n.*] in Mus. Westin. (Holotype: UPS:BOT:V-003254 [UPS-THUNB 3254; IDC 137/9-10]).

Synonym: *Mitracarpus salzmannianus* DC., Prodr. 4: 571. 1830, *syn. nov.* = *Mitracarpus frigidus* (Willd. in Roem. & Schult.) K. Schum. var. *salzmannianus* (DC.) K. Schum. in Martius, Fl. Bras. 6(6): 82. 1889. TYPE: BRAZIL. Bahia, "in sabulosis maritimis," *Salzmann s.n.* (Holotype: G; Isotypes: HAL 0113957, HAL 0113958, K 000016288, K 000174505, LE, MO 716854, MPU n.v., P 03916706, P 03916712, P 03916741).

Further synonyms in Souza et al. (2010).

Spermacoce ocymifolia Willd. in Roem. & Schult., Syst. Veg. (ed. 15) 3: 530. 1818 = *Hemidiodia ocymifolia* (Willd.) K. Schum. in Martius, Fl. Bras. 6(6): 29, t. 72. 1888 = *Diodia ocymifolia* (Willd.) Bremek., Recueil Trav. Bot. Néerl. 31: 305. 1934 = *Borreria ocymifolia* (Willd.) Bacilugo & E.L.Cabral, Opera Bot. Belg. 7: 307. 1996. TYPE: DOMINICAN REPUBLIC. Santo Domingo, *Rudolphi s.n.* (Holotype: B-W 02609 -00 0, B-W 02609 -01 0).

Synonym: *Spermacoce elliptica* Thunb., Pl. Bras. 3: 28. 1821, **syn. nov.**; idem in Flora 4(2): 602. 1821; Juel (1918: 419). TYPE: BRAZIL. Loco haud indicato, s.d., [*Freyreiss s.n.*] in Mus. Westin. (Holotype: UPS:BOT:V-003240 [UPS-THUNB 3240; IDC 136/20]).

SOLANACEAE

Solanum swartzianum Sw. ex Roem. & Schult., Syst. Veg. 4: 602. 1819 = *Solanum aureum* Thunb., Pl. Bras. 2: 20. 1818, **nom. illegit.**, **syn. nov.**, non *Solanum aureum* Dunal, Solan. Syn. 16. 1816; idem in Flora 4(1): 331. 1821; Juel (1918: 431) = *Solanum ahlbergi* Dunal, Prodr. (DC.) 13(1): 372. 1852, **syn. nov.** TYPE: BRAZIL. Minas Gerais, Ouro Preto, “crescit ad villam Ricam,” August 1814, *Freyreiss s.n.* in Mus. Westin. (Holotype: UPS:BOT:V-005146 [UPS-THUNB 5146; IDC 216/18]).

Solanum velleum Thunb., Pl. Bras. 2: 21. 1818; idem in Flora 4(1): 332. 1821; Sendtner in Martius, Fl. Bras. 10: 81, t. 5, fig. 66–69. 1846; Juel (1918: 432). TYPE: BRAZIL. Minas Gerais, Ouro Preto, “crescit juxta vias prope villam Ricam,” August 1814, *Freyreiss s.n.* in Mus. Westin. (Holotype: UPS:BOT:V-005246 [UPS-THUNB 5246; UPS neg. n. 603; IDC 220/22]).

XYRIDACEAE

Xyris ciliata Thunb., Pl. Bras. 3: 27. 1821; idem in Flora

4(2): 602. 1821; Schultes, Mant. 1: 351. 1822; Kunth, Enum. Pl. 4: 23. 1843; Seubert in Martius, Fl. Bras. 3(1): 222. 1855; Nilsson (1892: 58); Malme (1901: 12); Juel (1918: 148); Smith and Downs (1968: 77, t. 23, fig. 647–653, t. 24, fig. 654–656). TYPE: BRAZIL. Loco haud indicato, [*Freyreiss s.n.*] in Mus. Westinian. (Holotype: UPS:BOT:V-001269 [UPS-THUNB 1269; IDC 54/5]; Isotype, S [13-15212]).

Synonyms: *Xyris restiacea* Mart., Flora 24(2, Beibl.): 57. 1841; Seubert in Martius, Fl. Bras. 3(1): 213. 1855. TYPE: BRAZIL. Bahia, “in paludosis ad Porto Seguro,” 1816, *Wied s.n.* [Menke nr. 4; Klauenze nr. 4] = *Martii Herbar. Florae Brasil. no. 547 (10)* (Holotype: BR 0000005188406; Isotypes, GOET, MEL 2353837, MEL 2353838).

Xyris strobilifera Kunth, Enum. Pl. 4: 4. 1843; Seubert in Martius, Fl. Bras. 3(1): 213, t. 22, fig. 2. 1855. LECTOTYPE (designated here): BRAZIL. “Inter Vittoria et Bahia,” *Sellow 450* (B 10 0243267 ex Herb. Kunth); Syntype: BRAZIL. “Brasilia meridionalis,” *Sellow s.n.* (B 10 0243266 ex Herb. Kunth, K 000587044).

Nilsson (1892) was the first to propose the synonymy of *Xyris restiacea* and *X. strobilifera* under *X. ciliata*, which has been followed by later authors. The geographical range of the species was also indicated by him as being from Pernambuco (*Forsell s.n.*, 1847, at S [13-15213]) to Rio de Janeiro (*Widgren s.n.*, S [13-15211]).

LITERATURE CITED

- ANDERSON, W. R. 2007. Lectotypification of names of Malpighiaceae—I. Contr. Univ. Michigan Herb. 25: 83–93.
- BARNEBY, R. C. 1998. Silk tree, Guanacaste, Monkey’s earing. A generic system for the synandrous Mimosaceae of the Americas. Part III. *Calliandra*. Mem. New York Bot. Gard. 74: 1–223.
- BOKERMANN, W. C. A. 1957. Atualização do itinerário da viagem do Príncipe de Wied ao Brasil (1815–1817). Arquivos de Zoologia do Estado de São Paulo 10: 209–251.
- BRAEM, G. J. 1995. *Thunberg Herbarium, Uppsala University*. IDC Publishers, Leiden.
- CABRERA, A. L. 1971. Revisión de género *Gochnatia* (Compositae). Revista Mus. La Plata, N.S., 12: 1–160.
- FREYREISS, G. W. 1902. Viagem a varias tribus de selvagens na capitania de Minas-Geraes; permanencia entre ellas, descrição de seus usos e costumes; pelo naturalista allemão G. W. Freyreiss. Traducção de Alberto Löfgren. Revista Inst. Hist. Geograph. S. Paulo 6: 236–252.
- . 1907. Viagem ao interior do Brazil nos annos de 1814–1815 pelo naturalista G. W. Freyreiss; traduzido pelo Dr. Alberto Löfgren. Revista Inst. Hist. Geograph. S. Paulo 11: 158–228.
- . 1968. *Reisen in Brasilien*. Preface in Portuguese by Stig Rydén (José Ulisses Campelo, transl.). Ibero-amerikasna biblioteket och institutet. The Ethnographical Museum of Sweden, Stockholm (Etnografiska museet) Monograph series. Publication N° 13.
- . 1982. *Viagem ao interior do Brasil*. Trad. A. Löfgren. Editora Itatiaia, Belo Horizonte; Editora da Universidade de São Paulo, São Paulo.
- GARAY, L. A. 1973. Studies in American orchids VIII. Bradea 1(27): 301–308.
- GENTRY, A. H. AND W. MORAWETZ. 1992. *Jacaranda*. Pages 51–105 in: A. H. GENTRY, Bignoniaceae—Part II (Tribe Tecomeae). Fl. Neotrop. Monogr. 25 (II). The New York Botanical Garden Press, New York.
- GOLDING, J. AND D. C. WASSHAUSEN. 2002. Begoniaceae, Edition 2. Part I: Annotated Species List. Part II: Illustrated Key, Abridgment and Supplement. Contr. U.S. Natl. Herb. 43: 1–289.
- HACKETHAL, S. 2013. Pages 79–96 in: H. ZISCHLER, S. HACKETHAL AND C. ECKERT, EDS. Eine Beschäftigung, worin ich das Glück meines Lebens finde. Sellows Forschungsreisen in Brasilien. *Die Erkundung Brasiliens: Friedrich Sellows unvollendete Reise*. Galiani, Berlin.
- HIND, D. J. N. 2011. *An annotated preliminary checklist of the Compositae of Bolivia. Version 2*. Available at: www.kew.org/science/tropamerica/boliviacompositae; www.kew.org/science/tropamerica/boliviacompositae/checklist.pdf
- HOKCHE, O., P. E. BERRY AND O. HUBER, EDS. 2008. *Nuevo Catálogo de la Flora Vasculare de Venezuela*. Fundación Instituto Botánico de Venezuela Dr. Tobías Lasser, Caracas.
- HOOKE, W. J. 1842. Martius on the botany of Brazil. J. Bot. (Hooker) 4: 1–37.
- JUDD, W. S. 1995. *Agarista* D. Don ex G. Don. Pages 295–344 in J. L. LUTEYN, ED. Ericaceae—Part II. The superior-ovaryed genera (Monotropoideae, Pyroloideae, Rhododendroideae, and Vaccinioideae p.p.). Fl. Neotrop. Monogr. 66. The New York Botanical Garden Press, New York.
- JUEL, H. O. 1918. *Plantae Thunbergianae. Ein Verzeichnis der von C. P. Thunberg in Südafrika, Indien und Japan gesammelten und der in seinen Schriften beschriebenen oder erwähnten Pflanzen, sowie von den Exemplaren derselben, die im Herbarium*

- Thunbergianum in Upsala aufbewahrt sind; zusammengestellt von H. O. Juel*. Arbeten utgifna med understöd af Vilhelm Ekamns universitetsfond, Uppsala, 21. A.–B. Akademiska Bokhandeln, Uppsala, Otto Harrassowitz, Leipzig, in Kommission.
- KROK, T. O. B. N. 1925. *Bibliotheca Botanica Suecana ab antiquissimis temporibus ad finem anni MCMXVII*. Almqvist & Wiksells Boktryckeri-A.-B., Uppsala och Stockholm.
- LAMMERS, T.G. 2007. *World checklist and bibliography of Campanulaceae*. The Board of Trustees of the Royal Botanic Gardens, Kew.
- LASÈGUE, A. 1845. *Musée botanique de M. Benjamin Delessert*. Librairie de Fortin, Masson et Cie., Paris.
- LINDMAN, C. A. M. 1900. Bidrag till kändedomen om Brasiliens urbefolkning. Skildringar från en resa i Minas Geraes 1814–1815 af G. W. Freyreiss. Öfversättning från författarens manuskript af C. A. M. Lindman. Pages 260–279 in YMER; Tidskrift utgifven af Svenska sällskapet för Antropoli och Geografi, Vol. 20. Samson & Wallin, Stockholm.
- LINK, H. F. AND F. OTTO. 1825. *Icones Plantarum Selectarum Horti Regii Botanici Berolinensis cum descriptionibus et colendi ratione. Fasciculi Decem*. [Part 6: p. 69–80, t. 31–36]. Berolini.
- LÖWENBERG, J. 1878. Freyreiß, Georg Wilhelm. Pages 372–373 in: *Allgemeine Deutsche Biographie, Siebenter Band*. Verlag von Duncker & Humblot, Leipzig.
- MALME, G. O. A. 1901. Beiträge zur Xyridaceen—Flora Südamerikas. Bih. Kongl. Svenska Vetensk.-Akad. Handl. 26: 1–18.
- MARTIUS, C. F. P. VON 1837. Herbarium Florae Brasiliensis: Plantae brasilienses exsiccatae, quas denominatas, partim diagnosi aut observationibus instructas Botanophilis offert Dr. C. Fr. Ph. de Martius. Monachii. Flora 20(2, Beibl.): 1–128.
- MOLDENKE, H. N. 1960a. Materials toward a monograph of the genus *Avicennia*. I. Phytologia 7: 123–168.
- . 1960b. Materials toward a monograph of the genus *Avicennia*. II. Phytologia 7: 179–232.
- MORAES, P. L. R. DE 2009. The Brazilian herbarium of Maximilian, Prince of Wied. Neodiversity 4: 16–51.
- , E. ROBBRECHT, S. DE SMEDT, S. DRESSLER, J. HEINRICH, M. H. REINER-DREHWALD, A. DRESCHER, A. SCHARFETTER, P. FRÓDÉN, H.-J. ESSER, C. GALLAGHER, L. GUGLIEMONE AND H. RAINER. 2013. *Catalogue of Brazilian plants collected by Prince Maximilian of Wied*. Scripta Botanica Belgica, Vol. 49. National Botanic Garden of Belgium, Meise.
- NILSSON, A. 1892. Studien über die Xyrideen. Kongl. Svenska Vetensk. Akad. Handl. 24(14): 1–75.
- PAPAVERO, N. 1971. *Essays on the history of Neotropical Dipterology, with special reference to collectors (1750–1905)*, Vol. 1. Museu de Zoologia, Universidade de São Paulo, São Paulo.
- ROBINSON, B. L. 1906. Studies in the Eupatorieae. Proc. Amer. Acad. Arts 42: 3–48.
- ROCHA, L. 1972. Wied, Freyreiss e Sellow no Espírito Santo. R.IHGB 297: 56–67.
- RUSBY, H. H. 1900. An enumeration of the plants collected by Dr. H. H. Rusby in South America, 1885–1886, XXIX. Bull. Torrey Bot. Club 27: 69–84.
- SANDWITH, N. Y. 1937. Notes on tropical American Bignoniaceae. Recueil Trav. Bot. Néerl. 34: 205–232.
- SAVAGE, S. 1945. *A Catalogue of the Linnaean Herbarium*. Printed for the Linnean Society of London by Taylor & Francis, Ltd., London.
- SLEUMER, H. O. 1959. Studien über die Gattung *Leucothoe* D. Don. Bot. Jahrb. Syst. 78: 435–480.
- SMITH, L. B. 1943. Bromeliaceas novas ou interessantes do Brasil—II. Arq. Bot. Estado São Paulo, Nov. Ser., 1(5): 101–122, t. 101–134.
- . 1979. Bromelioideae (Bromeliaceae). Fl. Neotrop. Monogr. 14(3): 1493–2142. The New York Botanical Garden Press, New York.
- AND R. J. DOWNS. 1968. Xyridaceae. Pages 7–211 in F. C. HOEHNÉ AND A. R. TEIXEIRA, EDs. *Flora Brasílica*, Fasc. 12 (Vol. IX:II). Instituto de Botânica, São Paulo.
- SOUZA, E. B. DE, E. L. CABRAL AND D. C. ZAPPI. 2010. Revisão de *Mitracarpus* (Rubiaceae—Spermacoceae) para o Brasil. Rodriguésia 61: 319–352.
- STEARNS, W. T. 1957. An introduction to the *Species Plantarum* and cognate botanical works of Carl Linnaeus. Pages 1–176 in *Carl Linnaeus Species Plantarum. A facsimile of the first edition 1753. Volume I*. Printed for the Ray Society, Adlard and Son Bartholomew Press, Dorking.
- . 1958. A key to West Indian mangroves. Kew Bull. 13: 33–37.
- THUNBERG, C. P. 1817. *Plantarum Brasiliensium Decas Prima. Quam venia Exp. Fac. Med. Upsal. Praeside Carol. P. Thunberg...modeste proponit Immanuel Billberg vestrogothus. In Audit. Botanico D. XIV Junii MDCCCXVII*. Typis Zeipel et Palmblad, Upsaliae.
- . 1818. *Plantarum Brasiliensium Decas Secunda. Quam venia Exp. Fac. Med. Upsal. Praeside Carol. P. Thunberg...P. P. Carolus Gustavus Ahlberg. Stip. Zedritz. Uplandus. In Audit. Botanico XVIII. Nov. MDCCCXVIII*. Typis Zeipel et Palmblad, Upsaliae.
- . 1821a. *Plantarum Brasiliensium Decas Tertia. Quam venia Exp. Fac. Med. Upsal. Praeside C. P. Thunberg...P. P. Carolus Otto Holm Uplandus. In Audit. Botanico D. [23] Mart. [Maii] MDCCCXXI*. Excudebant Regiae Academiae Typographi, Upsaliae.
- . 1821b. *Plantarum brasiliensium Decas prima, praes. C. P. Thunberg, proponit Immanuel Billberg*. Ups. 1817. Flora 4(1): 330–331.
- . 1821c. *Plantarum brasiliensium Decas secunda*. Praes. C. P. Thunberg proponit C. G. Ahlberg. Ups. 1818. Flora 4(1): 331–332.
- . 1821d. *Plantarum brasiliensium, Decas tertia, praeside Thunberg def. Car. Otto Holm*. Upsal. Mart. 1821. Flora 4(2): 601–602.
- URBAN, I. 1906. Vitae itineraeque collectorum botanicorum, Notae collaboratorum biographicae, Flora Brasiliensis ratio edendi chronologica, Systema, Index Familiarum. Pages 1–268 in C. F. P. VON MARTIUS, A. W. EICHLER AND I. URBAN, EDs. *Flora Brasiliensis. Enumeratio plantarum in Brasilia, hactenus detectarum quas suis aliorumque botanicorum studiis descriptas et methodo naturali digestas partim icone illustratas*, Vol. 1 [Part 1]. Apud R. Oldenbourg in comm., Monachii et Lipsiae.
- VAZ, A. M. S. F. 2011. Typification of names of taxa of *Bauhinia* L. (Leguminosae: Cercideae) from Brazil. Taxon 60: 1464–1474.
- WALSINGHAM, L. AND A. J. PATON. 2011. *Ocimum* L. Pages 78–81 in G. DAVIDSE, M. SOUSA SÁNCHEZ, S. KNAPP AND F. CHIANG CABRERA, EDs. *Flora Mesoamericana*, vol. 4, part 2. Missouri Botanical Garden Press, St. Louis.
- WIMMER, F. E. 1926. Lobelioideae. III. Neue Arten und kritische Bemerkungen. Repert. Spec. Nov. Regni Veg. 22: 193–218.