

Names, types, and distribution of neotropical species of *Erythroxylum* (Erythroxylaceae)

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Plowman, T. & N. Hensold (Department of Botany, Field Museum of Natural History, 1400 S. Lakeshore Dr., Chicago, IL 60605–2496, U.S.A.; email: nhensold@fieldmuseum.org). Names, types, and distribution of neotropical species of *Erythroxylum* (Erythroxylaceae). *Brittonia* 56: 1–53. 2004.—A list is provided of all 358 taxa of *Erythroxylum* described from the Neotropics through the year 2000, including type specimen citations, probable synonymy, geographic distribution, and designation of 41 new lectotypes and one new neotype. The list includes 187 accepted species, eight accepted varieties, 27 infraspecific names of uncertain status, and 136 synonyms. A searchable specimen database and type image archive may be accessed at <www.fieldmuseum.org/research_collections/database.htm>.

Key words: *Erythroxylum*, Erythroxylaceae, Neotropics.

The genus *Erythroxylum*, best known for the species *E. coca* L., from which the drug cocaine is derived, contains roughly 230 species of tropical trees and shrubs, about 187 of which are native to the Neotropics. The neotropical species were the focus of intense systematic and ethnobotanic study by Timothy Plowman for about 15 years until his untimely death in 1989 at the age of 45. Although Plowman published about 50 scientific papers on taxonomy, ethnobotany, and chemistry of the genus during his short career, he never was able to complete a planned treatment of the genus for *Flora Neotropica* Monographs. He did, however, leave behind massive data resources, including the unpublished manuscript “List of types of *Erythroxylum* (Erythroxylaceae) examined for *Flora Neotropica*,” dated 22 February 1988, which summarized nomenclature, types examined, lectotype designations, and synonymy. He also left at the Field Museum (F) a well-maintained collection of nearly 5000 specimens (including more than 700 of his own numbers) and a specimen cardfile of ca. 9000 collections, from which it was possi-

ble to compile geographic distributions for all taxa.

The following list includes all 358 names of neotropical *Erythroxylum* published through the year 2000, with literature citations, type information, and herbaria where types were seen by Plowman. A total of 167 species and 8 varieties are accepted here; an additional 20 species are provisionally accepted. For most taxa described at the species level, Plowman indicated whether he accepted the taxon or considered it a synonym. Of the 81 infraspecific names not explicitly accepted, synonymy is assigned for only 54; the rest may belong to the indicated species but the acceptability of the infraspecific taxon is left undetermined.

Lectotypes for 41 names are designated, following Plowman’s recommendations. In addition, a neotype is designated for the widespread Caribbean species *E. rotundifolium* Lunan. Lectotypifications for names in sect. *Rhabdophyllum* will be published separately by Iracema Loiola, the current specialist in the group (cf. Loiola, 2001).

The list of types has been expanded to include distributional information for ac-

[†] T. Plowman, deceased 7 January 1989.

cepted taxa and for species of uncertain status compiled from Plowman's specimen cardfile and other Field Museum holdings. Also indicated for these taxa are the presence or absence of stipule striations, a character of primary taxonomic importance in the genus. Following Schulz (1907), non-striated stipules are characteristic of sections *Leptogramme*, *Heterogyne*, *Archerythroxyllum*, *Megalophyllum*, *Mastigophorum*, and *Microphyllum*; striated stipules characterize sections *Pogonophorum*, *Macrocalyx*, and *Rhabdophyllum*.

Other editorial changes to the list include the following: (1) The few paleotropical taxa which appeared in the original list have been deleted. (2) A few older names missed by Plowman, as well as taxa published since his death, have been added. (3) Plowman's own specimen annotations were compared with the list of accepted taxa and cases of ambiguity in the application of certain names are indicated. (4) Several nomenclatural and typification problems that Plowman had missed, or that were affected by recent changes to the International Code of Botanical Nomenclature (ICBN) (Greuter et al., 2000), are noted and discussed. Most of the extraneous notes, except for comments on synonymy, are by the junior author.

In order to provide a comprehensive bibliography of pertinent taxonomic literature published since Schulz's (1907) treatment, several works not cited elsewhere in this paper are here mentioned: Amaral, 1980a, 1990; Amaral & Leoni, 1992; Amaral & Mendonça, 1998; Barbosa & Amaral, 2001; Bohm et al., 1982; Borhidi, 1976; Britton, 1907; Cogollo & Pipoly, 1993; Gentner, 1972; Lopez Almirall, 1985; Mendonça & Amaral, 2002; Mendonça et al., 1998; Oviedo Prieto, 1992; Payens, 1958; Plowman, 1976, 1979a, 1981, 1982a, 1982b, 1983, 1985, 1986, 1988a, 2001; Sobral, 1987; Standley, 1946.

The information here presented is supplemented by a website, maintained by the Field Museum, which includes a searchable specimen database (at <www.fieldmuseum.org/research/collections/database.htm>), as well as an image archive of more than 700 scanned photographs of type specimens of

Erythroxyllum (at <www.fieldmuseum.org/research/collections/botany/collections/type-photo.htm>).

Names and Types of Neotropical *Erythroxyllum*

Symbols used in the manuscript:

Names in capitals and small capitals = Accepted or provisionally accepted name

? = Taxonomic status uncertain

+ = Name added to the list by the junior author; taxonomic status unverified

* = Distributional record based on recent material not seen by Plowman

** = Syntype from which Plowman had planned to select a lectotype

E. ACROBELES W. A. Gentner, J. Wash. Acad. Sci. 47: 6, fig. 3. 1957. TYPE: COLOMBIA. El Valle: Costa del Pacífico, Río Cajambre, 5–80 m, 5–15 May 1944, *J. Cuatrecasas 17581* (HOLOTYPE: F 1366191 = F photo negative number 52561; ISOTYPES: COL = F neg. 55529, F 1366192 = F neg. 59667).

Distribution: Colombia (Valle). Stipules non-striate.

E. ACUMINATUM Ruíz & Pav., Fl. peruv. 4: t. 399, fig. b. ca. 1830. TYPES: PERU. [Huánuco:] Chacahuassi, 1787, *Ruiz & Pavón s.n.* (LECTOTYPE designated by Plowman, 1989, p. 24: MA = photo at GH; ISOLECTOTYPES: F 844177 = F neg. 55566, G—2, MA—2 = photo at GH, OXF = F neg. 60338); PERU. Pozuzo, *Ruiz & Pavón s.n.* (SYNTYPE, not located).

E. patens Ruíz ex O. E. Schulz.

Distribution: Brazil (Acre*); Ecuador (El Oro, Guayas, Los Rios, Manabí, Santiago-Zamora); Peru (Amazonas*, Cajamarca*, Huánuco, Madre de Dios, San Martín, Tumbes). Stipules striate.

Plowman treated *Erythroxyllum patens* as the older name, but the illustration of *E. acuminatum* constitutes valid publication under Art. 44.1 of the ICBN (Greuter et al., 2000).

E. acutifolium Steud. ex Peyr. in Mart., Fl.

bras. 12(1): 166. 1878. TYPE: SURINAME. Suriname River, 1842, *F. W. Hostmann & A. Kappler 1263* (HOLOTYPE: ? ; ISOTYPES: CGE = F neg. 56834; F 839255 = F neg. 55455, G, MO 2180222, W-3).

E. CITRIFOLIUM A. St.-Hil.

E. ACUTUM W. A. Gentner, *J. Wash. Acad. Sci.* 47: 6, fig. 2. 1957. TYPE: COLOMBIA. Nariño: Gorgonilla Island, 130–200 m, 8 Feb 1939, *E. P. Killip & H. García-Barriga 33082* (HOLOTYPE: US; ISOTYPES: BM, COL 131137 = F neg. 55528, NY = F neg. 55492, US).

Distribution: Colombia (Nariño). Stipules non-striate.

E. AFFINE A. St.-Hil., *Fl. bras. merid.* 2, ed. 4^o: 97. 1829. *E. kunthianum* var. *angustifolium* Mart. TYPE: BRAZIL. Rio de Janeiro: Cabo Frio, Sep [1818], *A. St. Hilaire B²102* (HOLOTYPE: P = F neg. 35193; ISOTYPES: MPU = F neg. 58976, P-2).

E. blanchetii O. E. Schulz.

Distribution: Brazil (Alagoas, Bahia, Espírito Santo, Pernambuco, Rio de Janeiro). Stipules striate. Bracketed dates for St. Hilaire's collections are according to Dwyer (1955).

E. affine A. Rich., *Hist. phys. Cuba, Pl. vasc.* 258. ca. 1841, non A. St.-Hil. 1829. *E. areolatum* var. *affine* O. E. Schulz. TYPE: CUBA. near Jagua, s.d., *J. M. Valenzuela in herb. R. de la Sagra s.n.* (HOLOTYPE: P = F neg. 58492; ISOTYPE: W; possible isotype, K (*Sagra* 252)). [Note: Valenzuela's name does not appear on the label, but he is acknowledged as the collector in the protologue.]

E. CONFUSUM Britton.

E. ALATERNIFOLIUM A. Rich., *Hist. phys. Cuba, Pl. vasc.* 256. ca. 1841. TYPE: CUBA. Vuelta de Abajo, s.d., *R. de la Sagra (257)* (HOLOTYPE: P = F neg. 58493; ISOTYPES: P-2; probable ISOTYPES: CGE, K, W).

Distribution: Cuba. Stipules non-striate.

E. alaternifolium var. *parvifolium* Alain, *Contr. Ocas. Mus. Hist. Nat. Colegio "De La Salle"* 9: 22. 1950. TYPE: CUBA. Pinar del Río: Loma de Cajalbana, 1 Oct 1949, *Bro. Alain & J. Acuña 1141* (HOLOTYPE: LS, now in HAC; ISOTYPES: GH = F neg. 60624, NY).

E. alaternifolium var. *pedicellare* Griseb., *Cat. pl. Cub.* 41. 1866. TYPE: CUBA. Mayari-abajo, 2 Aug "1860–1864," *C. Wright 2139* (HOLOTYPE: GOET = F neg. 55536; ISOTYPES: F, LE = F neg. 57122, MO, NY, P, S, W).

E. PEDICELLARE (Griseb.) O. E. Schulz.

E. alaternifolium var. *suborbiculare* Alain, *Contr. Ocas. Mus. Hist. Nat. Colegio "De La Salle"* 9: 22. 1950. TYPE: CUBA. Pinar del Río: Loma de Cajalbana, 1 Oct 1949, *Bro. Alain & J. Acuña 1140* (HOLOTYPE: LS, now in HAC; ISOTYPES: NY = F neg. 57814).

E. albertianum J. G. Kuhlmann & W. A. Rodrigues, *Publ. Inst. Nac. Pesq. Amaz. Bot.* 5: 3. 1957. TYPE: BRAZIL. Amazonas: Manaus, ad Igarapé de Cachoeira Alto do Tarumã ad terra firme, 12 Sep 1954, *W. A. Rodrigues (INPA) 83* (HOLOTYPE: INPA).

E. MUCRONATUM Benth.

E. alemquerense Huber, *Bol. Mus. Paraense Hist. Nat.* 5: 419. 1909. TYPES: BRAZIL. Pará: "in silvis inundatis ad villam Alemquer," 27 Dec 1903, *A. Ducke (MG) 4915* (LECTOTYPE designated by Plowman, 1984, p. 137: MG 4915 = F neg. 45847; ISOLECTOTYPES: B, destroyed = F neg. 12605, F 602308 fragment ex MG, RB 20442); BRAZIL. Pará: Óbidos, 20 Dec 1907, *A. Ducke (MG) 9174b* (SYNTYPES: MG 9174b, RB 20441).

E. ANGUIFUGUM Mart.

E. AMAZONICUM Peyr. in Mart., *Fl. bras.* 12(1): 167. 1878. TYPES: BRAZIL.

Amazonas: in vicinibus Barra [Manaus], Prov. Rio Negro, Jan 1851 (data at K), *R. Spruce s.n.* ("Erythroxyllum (4)") (LECTOTYPE designated by Plowman, 1984, p. 136: M = F neg. 19451; ISOLECTOTYPES: BM, CGE, E, G, GH, K—2 = F neg. 55598, LE, M = F neg. 19451, NY = F neg. 55563, OXF, P); BRAZIL. Amazonas: in vicinibus Barra [Manaus], Prov. Rio Negro, Dec 1850–Mar 1851, *R. Spruce s.n.* ("Erythroxyllum (5)") (SYNTYPES: BM, G, GH, LE, M = F neg. 55564, OXF, P = F neg. 58494, W).

E. mucronatum var. *majus* Sagot.

Distribution: Central America: Panama (Panamá). South America: Brazil (Amazonas, Mato Grosso, Pará, Rondônia); Colombia (Antioquia, Chocó, Meta, Valle, Vaupés); French Guiana; Guyana; Suriname; Venezuela (Amazonas, Anzoátegui, Aragua, Bolívar, Distrito Federal, Falcón, Lara, Miranda, Monagas, Yaracuy). Stipules striate.

The numbers 1095 and 1096 on the lectotype and syntype labels at M, respectively, are herbarium accession numbers and not the collection numbers of Spruce.

E. AMBIGUUM Peyr. in Mart., Fl. bras. 12(1): 142. 1878. TYPE: BRAZIL. Rio de Janeiro: s.d., *Martius s.n.* (853) (HOLOTYPE: BR = F neg. 58524).

Distribution: Brazil (Espírito Santo*, Paraná, Rio de Janeiro, Santa Catarina, São Paulo). Stipules non-striate.

This is a possible synonym of *Erythroxyllum frangulifolium* A. St.-Hil.

E. ambiguum var. *hymenophyllum* O. E. Schulz in Engl., Pflanzenr. IV. 134: 81. 1907. TYPES: BRAZIL. São Paulo: Xiririca am Rio Ribeira, 16 Oct 1894, A. Löfgren & G. Edwall in *Commiss. Geogr.* 2754 (LECTOTYPE **here designated**: SP 18430?); BRAZIL. São Paulo: Morro Guaraú, littoral, 30 Oct 1891, A. Löfgren in *Commiss. Geogr.* 1629 (SYNTYPE: B, destroyed = F neg. 12607).

A specimen labelled *Löfgren 1629* at SP

has been annotated by both Plowman and A. Amaral as *Erythroxyllum deciduum* A. St.-Hil. It does not remotely correspond to the protologue and was considered by both specialists to be mislabeled.

E. amplifolium (Mart.) O. E. Schulz in Engl., Pflanzenr. IV. 134: 107. 1907, non Baillon, 1886. *E. microphyllum* var. *amplifolium* Mart.

E. VACCINIIFOLIUM Mart.

Plowman had identified some specimens at F under this illegitimate name, and may have had doubts about placing it in synonymy. His notebooks contain a list of characters he used at one time to distinguish this species from *E. vacciniifolium*, within the Distrito Federal of Brazil.

E. amplifolium f. *lancifolium* (Peyr.) O. E. Schulz in Engl., Pflanzenr. IV. 134: 108. 1907. *E. microphyllum* f. *lancifolium* Peyr.

E. VACCINIIFOLIUM Mart.

E. amplifolium var. *myrtilloides* (Peyr.) O. E. Schulz in Engl., Pflanzenr. IV. 134: 108. 1907. *E. microphyllum* f. *myrtilloides* Peyr.

E. CUNEIFOLIUM (Mart.) O. E. Schulz?

E. AMPLUM Benth., London J. Bot. 2: 372. 1843. TYPE: BRAZIL. Amazonas: Rio Negro, near Barcellos [most duplicates mislabeled "Brit. Guiana"], 1839, *R. H. Schomburgk 1027* (HOLOTYPE: K = F neg. 55807; ISOTYPES: BM, CAS 303286, E, F = F neg. 62193, G–4, K, L, NY–2, OXF = F neg. 60339, P–2, U, W–2).

Distribution: Brazil (Amazonas, Pará); French Guiana; Peru (Amazonas*, Huánuco, Loreto, Pasco). Stipules striate.

Plowman (1989) treated this as a synonym of *Erythroxyllum macrophyllum* Cav. var. *macrophyllum*, but recognized it as a distinct species in his unpublished manuscript. Loiola (2001) also treated it as a distinct species.

E. ANDREI Plowman, Fieldiana, Bot., n.s., 19: 2, fig. 1. 1987. TYPE: BRAZIL. Ba-

hia: Mun. Maraú, rd BR-030, trecho Porto de Campinhos-Maraú, km 11, restinga, 26 Feb 1980, A. M. de Carvalho, L. A. M. Silva & T. S. dos Santos 198 (HOLOTYPE: CEPEC 19131 = F neg. 60054; ISOTYPES: F 1884879 = F neg. 60193, K, NY, RB).

Distribution: Brazil (Alagoas, Bahia).
Stipules striate.

E. ANGUIFUGUM Mart., Flora 21, Beibl. 2(4): 84. 1838. TYPE: BRAZIL. Mato Grosso: prope Cujabá in Morro de Ernesto ubique, Oct–Nov, [1830–1832 or 1837], A. L. P. da Silva Manso s.n. (*Herb. Fl. Bras.* 265) (HOLOTYPE: M = F neg. 19454; ISOTYPES: BR, E, F 1537799 = F neg. 55565, G, GH, K, L–2, LE, MO 1886717 p.p., NY–2 = F neg. 55493, P–2, W).

E. alemquerense Huber, *E. herzogii* O. E. Schulz, *E. luculentum* J. F. Macbr., *E. anguifugum* var. *riparium* O. E. Schulz.

Distribution: Bolivia (Beni, La Paz, Pando, Santa Cruz); Brazil (Acre, Amazonas, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Paraná, Rondônia, Roraima); Paraguay (Amambay*, Concepción, San Pedro); Peru (Loreto, Madre de Dios*). Stipules non-striate.

E. anguifugum var. *riparium* O. E. Schulz in Engl., *Pflanzenr.* IV. 134: 109. 1907. TYPES: BRAZIL. Goiás, banks of the Rio de Peixe, Oct 1839, *G. Gardner 3055* (LECTOTYPE designated by Plowman, 1984, p. 136: K = F neg. 55600; ISOLECTOTYPES: OXF = F neg. 60343, W); BRAZIL. Mato Grosso: "aussenrand der Uferwaldes am oberen Parantinga," s.d., *R. K. F. Pilger 798* (SYNTYPE: B, destroyed?).

E. ANGUIFUGUM Mart. (Plowman, 1984).

+*E. APICULATUM* Diogo, *Bol. Mus. Nac. Rio de Janeiro* 1: 358, t. I, IIB. 1924. TYPE: BRAZIL. "Piauí" [probably Bahia or eastern Goiás]: Chapada do Rio Preto, 6 Jul 1912, *P. von Lützelburg 1374* (HOLOTYPE: RB?).

Distribution: Brazil (Bahia or Goiás).
Stipules non-striate, fide protologue.

E. AREOLATUM L., *Syst. Bot.* ed. 10, 2: 1035. 1759. TYPE: JAMAICA. No locality or date, *P. Browne s.n.*, *Herb. Linn.* 591.1 (LINN).

Distribution: North America: Mexico (Campeche*, Nayarit, Veracruz). Central America: Belize; Guatemala; El Salvador; Honduras; Nicaragua. West Indies: Bahamas; Cayman Islands; Cuba; Dominican Republic; Haiti; Jamaica; Puerto Rico; St. Eustatius. South America: Brazil(?-the only record is a Riedel specimen at LE); Guyana. Stipules non-striate.

E. areolatum var. *affine* O. E. Schulz in Urb., *Symb. antill.* 4: 194. 1907. *E. affine* A. Rich., non A. St.-Hil. TYPE: CUBA. near Jagua, s.d., *J. M. Valenzuela in herb. R. de la Sagra s.n.* (HOLOTYPE: P = F neg. 58492; ISOTYPE: W; possible isotype, K [*Sagra 252*]).

E. CONFUSUM Britton.

Schulz is to be cited as the sole author of this variety, since the basionym is illegitimate.

+*E. areolatum* f. *macrophyllum* Griseb. ex O. E. Schulz in Engl., *Pflanzenr.* IV. 134: 64. 1907. TYPE: JAMAICA. Manchi-oneal, 600 m, 9 Mar 1858, *N. Wilson 361*, (HOLOTYPE: B, destroyed?; ISOTYPE: GOET—annotated by O. E. Schulz).

Schulz indicates that *Wilson 361* is a mixed collection with the typical form of the species. The specimen at GOET is a single sterile shoot.

E. areolatum Vell., *Fl. flumin.* 194. 1825 [1829]; *Fl. flumin. icon.* 4: t. 175. 1827 [1831]; non L. 1759. TYPE: BRAZIL. Illustration of Vellozo, *Fl. flumin. icon.* 4: t. 175. 1831.

E. SUBEROSUM A. St.-Hil.

E. ARGENTINUM O. E. Schulz in Engl., *Pflanzenr.* IV. 134: 99. 1907. TYPES: ARGENTINA. Tucumán: La Cruz, 22–28

Dec 1872, *P. G. Lorentz & G. H. E. W. Hieronymus 145* (LECTOTYPE **here designated**: G; ISOLECTOTYPES: F 50451 = F neg. 59666, K—2 = F neg. 55599, NY = F neg. 55495); ARGENTINA. Jujuy: zwischen Jujuy und El Prete, s.d., *G. H. E. W. Hieronymus & P. G. Lorentz 990* (SYNTYPE: B, destroyed); ARGENTINA. Jujuy: zwischen dem Rio Grande de Jujuy und Palo Blanco, Nov, *G. H. E. W. Hieronymus & P. G. Lorentz 232* (SYNTYPE: B, destroyed); ARGENTINA. Salta: Oran, s.d., *P. G. Lorentz & G. H. E. W. Hieronymus 370* (SYNTYPE: B, destroyed); ARGENTINA. Salta: Oran, 25 Sep 1873, *P. G. Lorentz & G. H. E. W. Hieronymus 444* (SYNTYPES: B, destroyed = F neg. 12608, G, NY = F neg. 55494); ARGENTINA. Salta: im Distrikt des Rio del Tala in der Sierra zwischen El Rincon und Clavisan, s.d., *G. H. E. W. Hieronymus & P. G. Lorentz s.n.* (SYNTYPE: B, destroyed); ARGENTINA. Tucumán: Hauptbestandteil der subtropischen Walderung von Siambon, Sierra de Tucumán, s.d., *P. G. Lorentz 148* (SYNTYPE: B, destroyed); ARGENTINA. Tucumán: Hauptbestandteil der subtropischen Walderung von Siambon, Sierra de Tucumán, s.d., *P. G. Lorentz 486* (SYNTYPE: B, destroyed); BRAZIL. Rio Grande do Sul: Rio Camacuam, *von Ihering 38* (SYNTYPE: B, destroyed); BRAZIL. Rio Grande do Sul: Porto Alegre, *G. Malme 85a* (SYNTYPE: B, destroyed).

Distribution: Argentina (Catamarca, Jujuy, Salta, Tucumán); Bolivia (Chuquisaca*, Tarija); Brazil (Bahia, Paraná, Rio Grande do Sul, Santa Catarina, São Paulo). Stipules non-striate.

E. argentinum var. *calophyllum* O. E. Schulz in Engl., Pflanzenr. IV. 134: 99. 1907. TYPES: BRAZIL. Rio Grande do Sul: Rio Grande, "in dumetis dunarum ripa sinus Lacey Mangueira," 30 Oct 1901, *G. Malme 85, Iter Regnell II* (LECTOTYPE **here designated**: S); BRAZIL: "Southern Brazil," [1826–1836], *P. King's Voyage 40* (SYNTYPE: not located); BRAZIL. Rio Grande do Sul:

Without locality, s.d., *Tweedie s.n.* (SYNTYPE: LE); BRAZIL. Rio Grande do Sul: Porto Alegre, "im Gebüsch unweit Parthenon," s.d., *Lindman (Iter Regnell) A1625* (SYNTYPE: not located); BRAZIL. Santa Catarina: Ilha Santa Catarina, 1832, *C. Gaudichaud-Beaupré 260* (SYNTYPES: G—annotated by O. E. Schulz, P); BRAZIL. Santa Catarina: Ilha Santa Catarina, s.d., *D'Urville s.n.* (SYNTYPE: W); BRAZIL. Santa Catarina: "auf der Insel Santa Catharina bei S. Antonio," s.d., *Ule 520* (SYNTYPE: not located) BRAZIL. Santa Catarina: "in insula Alvarenga prope São Francisco," 2 Oct 1897, *W. Schwacke 13091* (SYNTYPE: P); BRAZIL. Santa Catarina: "auf einer Insel bei São Francisco," s.d., *Ule 354* (SYNTYPE: not located).

E. aristigerum Peyr. in Mart., Fl. bras. 12(1): 157. 1878. TYPES: BRAZIL. Pará: "Alto Amazonas in vicinis Santarem," Nov 1849–Mar 1850, *R. Spruce 129 (Erythroxylon "I")* (LECTOTYPE designated by Plowman, 1984, p. 142: M = F neg. 57598; ISOLECTOTYPES: BM, CGE, G = F neg. 26393, OXF, W; unnumbered sheets and probable ISOLECTOTYPES at G, K = F neg. 55597, NY = F neg. 57825, P, W); BRAZIL. Pará: "Alto Amazonas in vicinis Santarem," Nov 1849–Mar 1850, *R. Spruce 176* (SYNTYPE, specimen with this number not located).

E. SQUAMATUM Sw.

E. aristigerum var. *bahiense* (Peyr.) O. E. Schulz in Engl., Pflanzenr. IV. 134: 103. 1907. *E. bahiense* Peyr.

E. SQUAMATUM Sw.

+*E. ARMATUM* Oviedo & Borhidi, Acta Bot. Hung. 37: 92. 1992. TYPE: CUBA. Prov. Guantánamo: Maisi, El Canto, al este de la Cueva del Agua, s.d., *R. Oviedo et al. s.n.* (HOLOTYPE: HAC 39163–n.v.; ISO-TYPE: BP–n.v.).

Distribution: Cuba. Stipules non-striate? The authors do not describe stipule stri-

ations. The species is said to be close to *Erythroxyllum spinescens* A. Rich.

?E. ARROJADOI O. E. Schulz, Notizbl. Bot. Gart. Berlin-Dahlem 76: 426. 1923. TYPE: BRAZIL. Goiás, campinas near Duro, Aug 1912, *P. von Lützelburg 1521* (HOLOTYPE: M = F neg. 19455); Cf. also BRAZIL. "Piauí" [northwestern Bahia or eastern Goiás]: Rio Preto, Jun–Jul 1912," *P. von Lützelburg 1521 (RB 5839)* (R 5553 = F neg. 57481, R 70662 = F neg. 57482). [Note: The collector was mistakenly cited as Zehntner in the protologue.]

Distribution: Brazil (Goiás). Stipules striate.

E. bahiense Peyr. in Mart., Fl. bras. 12(1): 160. 1878. *E. aristigerum* var. *bahiense* (Peyr.) O. E. Schulz. TYPE: BRAZIL. Bahia: Ilhéus, 1835, *J. S. Blanchet 2331* (LECTOTYPE designated by Plowman, 1984, p. 142; LE–annotated by Peyritsch; ISOLECTOTYPES: F 1537819 = F neg. 55559, G, K = F neg. 55596, NY, OXF = F neg. 60340, P–2, W).

E. SQUAMATUM Sw.

E. BANGH Rusby, Mem. Torrey Bot. Club 3(3): 11. 1893. TYPE: BOLIVIA. La Paz: Prov. Murillo, Songo [Zongo], Nov 1890, *M. Bang 843* (HOLOTYPE: NY = F neg. 55560; ISOTYPES: F 163565 = F neg. 55561, GH, LE, MO 1886684, NY–2, US, W, Z).

Distribution: Bolivia (La Paz). Stipules striate.

+E. BARACOENSE Borhidi, Acta Bot. Acad. Sci. Hung., 22(3–4): 303. 1976 [1977]. TYPE: CUBA. Oriente: In summo montis calcarei Yunque de Baracoa, 27 Jul 1960, *M. López Figueiras UO 2292* (HOLOTYPE: SV–n.v.).

Distribution: Cuba (Oriente).

Stipule striation and species affinities were not indicated in the protologue.

?E. BARAHONENSE O. E. Schulz & Ekman,

Ark. Bot. 22A(8): 53. 1929. TYPE: DOMINICAN REPUBLIC. "In peninsula Barahona in Mare-à-Chat ad rupes sterilissimus quaternario calcareas," 11 Sep 1926, *E. L. Ekman H6949* (HOLOTYPE: S = F neg. 58440, photo at NY; ISOTYPES: IJ–n.v., LL = F neg. 57367).

Distribution: Dominican Republic. Stipules non-striate.

This is a possible synonym of *Erythroxyllum echinodendron* Ekman or *E. minutifolium* Griseb.

E. BARBATUM O. E. Schulz in Engl., Pflanzenr. IV. 134: 21, fig. 6. 1907. TYPES: BRAZIL. "Rio de Janeiro," "Nov 1879," *A. Glaziou 10353* (collection made by another collector, probably from Ceará, LECTOTYPE designated by Plowman, 1984, p. 137; P = F neg. 58495; ISOLECTOTYPES: C, K = F neg. 55594); BRAZIL. "Rio de Janeiro," "Nov 1879," *A. Glaziou 10387 pro parte* (collection made by another collector, probably from Ceará, SYNTYPES: C, K, fragments at upper left and lower right of sheet = F neg. 55595, P). [Note: *Glaziou 10387* is a mixed collection which includes a syntype collection of *E. rimosum* O. E. Schulz.]

Distribution: Brazil (Bahia*, Ceará, Goiás, Maranhão, Mato Grosso, Pará, Piauí). Stipules striate.

For further discussion of *Glaziou 10387*, see *Erythroxyllum rimosum* O. E. Schulz.

E. belizense Lundell, Phytologia 1: 215. 1937. TYPE: BELIZE. El Cayo Dist.: Mountain Pine Ridge, San Agustín, 6 Aug 1936, *C. L. Lundell 6810* (HOLOTYPE: MICH; ISOTYPES: F 894307 = F neg. 55496, F 1965300 = F neg. 60885, GH, NY = F neg. 55558, TEX, US).

E. BEQUAERTII Standl.

E. BEQUAERTII Standl., J. Arnold Arbor. 11: 47. 1930. TYPE: MEXICO. Yucatán: Chichen Itzá, 28 Jun 1929, *J. Bequaert 102* (HOLOTYPE: F 603414 = F neg. 52557; ISOTYPES: A, US).

E. belizense Lundell.

Distribution: Mexico (Chiapas, Guerrero, Quintana Roo, Yucatán); Belize (El Cayo); Guatemala (Petén). Stipules non-striate.

E. BETULACEUM Mart., Beitr. Erythroxyton 59. 1840. TYPES: BRAZIL. Bahia: Monte Santo, s.d., *C. Martius s.n.* (LECTOTYPE here designated: M = F neg. 57599; ISOLECTOTYPE: BR); BRAZIL. Bahia: Jacobina Velha, 1836–1838 or 1838–1839, *J. S. Blanchet 2783* (SYNTYPES: BM, BR, E, F 1537823, F 1988071 = F neg. 62202, G–3, K–2, LE, OXF = F neg. 60344, W–2).

E. cearense Diogo, possibly *E. rosuliferum* O. E. Schulz.

Distribution: Brazil (Bahia, Ceará, Goiás, Minas Gerais, Pará, Pernambuco, Piauí). Stipules non-striate.

The publication cited above is a pre-print of a later, more widely distributed publication (Martius, 1841). The page reference for a name in the latter publication can be calculated by adding 280 to the pre-print page number. The date of 1841 for this publication was established by I. Haesler, librarian at M, in a letter to Plowman in 1985.

E. BEZERRAE Plowman, Brittonia 38: 196, fig. 4. 1986. TYPE: BRAZIL. Piauí: Padre Vieira-Cocal, 6 Dec 1979, *P. Martins & E. Nunes s.n.* (HOLOTYPE: EAC 7593; ISO-TYPE: F 1910511 = F neg. 61089, K).

Distribution: Brazil (Piauí). Stipules striate.

E. BICOLOR O. E. Schulz in Engl., Pflanzenr. IV. 134: 107. 1907. TYPE: BRAZIL. Minas Gerais: Serra de Antonio Pereira, 27 Oct 1892, *W. Schwacke 8764* (HOLOTYPE: B, destroyed = F neg. 12610).

Distribution: Brazil (Minas Gerais). Stipules striate.

E. blanchetii O. E. Schulz in Engl., Pflanzenr. IV. 134: 56. 1907. TYPE: BRAZIL. Bahia, s.d., *J. S. Blanchet 279* (HOLOTYPE: G-DEL = F neg. 26394; ISOTYPE: P).

E. AFFINE A. St.-Hil.

E. bolivianum Burck, Teysmannia 1: 456, t. 3. 1890. TYPE: INDONESIA. Java: Bogor Botanical Garden (LECTOTYPE designated by Plowman, 1989, p. 8: illustration of living plant obtained from the firm of T. Christy, London, *Pl.* 3 of Burck, 1890). Specimen possibly from same plant: Bogor Botanical Garden, 3 May 1906, *A. Pulle s.n.* (U 459 = F neg. 55785).

E. COCA Lam. var. COCA.

E. bongardianum C. A. Mey. ex Peyr. in Mart., Fl. bras. 12(1): 145. 1878. TYPE: BRAZIL. without locality or date, *G. H. von Langsdorff s.n.* (LECTOTYPE designated by Plowman, 1987, p. 39: LE-annotated by Peyritsch = F neg. 61703; ISOLECTOTYPES (probably but labeled "*Riedel s.n.*" and not annotated by Peyritsch): F 1924949 fragment, LE—3 = F neg. 55704, OXF). Excluded SYNTYPE: BRAZIL. Bahia: prope Ilhéus, in silvis umbrosis, Feb 1822, *L. Riedel (612)* (LE-annotated by Peyritsch = F neg. 59917, LE, P) = *E. tenue* Plowman.

E. PASSERINUM Mart.

E. BRADEANUM O. E. Schulz, Notizbl. Bot. Gart. Berlin-Dahlem 11: 722. 1933. TYPE: BRAZIL. Rio de Janeiro: Serra do Imbé, Santo Antonio, Agulha, Apr 1932, *A. C. Brade & J. Santos Lima 11701* (HOLOTYPE: R 26545 = F neg. 57476; ISO-TYPE: R 26545 = F neg. 57475).

Distribution: Brazil (Rio de Janeiro). Stipules striate.

E. BRENNAE D'Arcy & Schanen, Ann. Missouri Bot. Gard. 62: 31, fig. 1B & 1G. 1975. TYPE: PANAMA. Panamá: Cerro Jefe, 3 mi before Goofy Lake in Cerro Azul, 20 Feb 1968, *M. D. Correa A. & R. L. Dressler 703* (HOLOTYPE: MO; ISOTYPES: DUKE, PMA 1115 = F neg. 60807).

Distribution: Panama (Canal Zone, Panamá). Stipules non-striate.

- E. brevipedatum* St.-Lag., Ann. Soc. Bot. Lyon 7: 125. 1880, nom. illeg. superfl. F neg. 58523; ISOTYPE: S = F neg. 58438).
- E. BREVIPES* DC.
- E. BREVIPES* DC., Prodr. 1: 573. 1824. TYPES: U.S.A. Puerto Rico: "in rupestribus maritimis," s.d., C. G. Bertero s.n. (LECTOTYPE designated by Plowman, 1988b, p. 544: G-DC = F neg. 33397; ISOLECTOTYPES: B, G-DC, MO); DOMINICAN REPUBLIC. "Santo Domingo," [referring to the island; not the city of the same name], C. G. Bertero s.n. (SYNTYPE: G-DC).
- E. brevipedatum* St.-Lag., *E. brevipes* f. *grandifolium* O. E. Schulz, *E. brevipes* f. *parvifolium* O. E. Schulz, *E. ovatum* var. *angustifolium* O. E. Schulz.
- Distribution: West Indies: Cuba, Dominican Republic, Guadeloupe, Haiti, Jamaica, Puerto Rico, St. Martin, Virgin Islands. Stipules non-striate.
- E. brevipes* f. *grandifolium* O. E. Schulz in Urb., Symb. antill. 4: 313. 1905, "grandifolia." Type not specified.
- E. BREVIPES* DC. (Plowman, 1988b).
- Schulz applied the name to specimens with leaves ≥ 30 mm in length and ≥ 15 mm in width.
- E. brevipes* f. *parvifolium* O. E. Schulz in Urb., Symb. antill. 4: 313. 1905, "parvifolia." Type not specified.
- E. BREVIPES* DC. (Plowman 1988b).
- Schulz applied the name to specimens with leaves ≤ 9 mm in length, and ≤ 7.5 mm in width.
- E. brevipes* var. *spinescens* (A. Rich.) Gri-seb., Cat. pl. Cub. 41. 1866.
- E. SPINESCENS* A. Rich.
- E. BUXUS* Peyr. in Mart., Fl. bras. 12(1): 137, t. 25, fig. 2. 1878. TYPE: BRAZIL. Minas Gerais: Uberaba ["Caldas" in protologue, and printed on label; "Uberaba" handwritten on label], 30 Oct 1848, A. F. Regnell III.229 (HOLOTYPE: BR =
- Distribution: Brazil (Minas Gerais, São Paulo); Paraguay (Amambay). Stipules striate.
- Mendonça & Amaral (1999) treat *Erythroxyllum verruculosum* O. E. Schulz as a synonym of *E. buxus*.
- E. CAATINGAE* Plowman, Fieldiana, Bot., n.s., 19: 5, fig. 3. 1987. TYPE: BRAZIL. Bahia: Raso de Catarina, 14 May 1981, H. P. Bautista 445 (HOLOTYPE: HRB 2356; ISOTYPES: CEPEC 26479 = F neg. 60333, F 1912521 = F neg. 60332).
- Distribution: Brazil (Bahia, Ceará, Paraíba, Pernambuco, Rio Grande do Norte). Stipules non-striate.
- E. CAMPESTRE* A. St.-Hil., Fl. bras. merid. 2, ed. 4^o: 97. 1829. *E. campestre* var. *magnifolium* Mart. TYPE: BRAZIL. Minas Gerais: Coração de Jesus, "in parte occidentali desertaque provinciae Minas Geraes dictá Certão," Sep [1817], A. St. Hilaire cat. B'1932 (HOLOTYPE: P = F neg. 58496; ISOTYPES: MPU, P).
- E. campestre* var. *obovale* Mart., *E. cotinifolium* A. St.-Hil.
- Distribution: Bolivia (Beni, Santa Cruz); Brazil (Bahia, Ceará, Distrito Federal, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Paraná, São Paulo); Paraguay (Amambay, Concepción). Stipules striate.
- E. campestre* var. *acutifolium* Mart., Beitr. Erythroxyllon 95. 1840. No type specified.
- E. campestre* var. *magnifolium* Mart., Beitr. Erythroxyllon 95. 1840. *E. CAMPESTRE* A. St.-Hil. TYPE: As for *E. campestre* A. St.-Hil.
- E. campestre* var. *obovale* Mart., Beitr. Erythroxyllon 95. 1840. *E. cotinifolium* A. St.-Hil. TYPE: As for *E. cotinifolium* A. St.-Hil.

E. CAMPESTRE A. St.-Hil.

Plowman annotated a Martius collection at M, corresponding to *Erythroxylum suberosum* A. St.-Hil., as the lectotype. However the protologue indicates that the variety is based on the type of *E. cotinifolium* A. St.-Hil.

E. campestre var. *ovatifolium* Mart., Beitr. Erythroxylon 95. 1840. No type specified.

E. CAMPINENSE Amaral, Acta Amazônica 6: 213, figs. 1–2. 1976. TYPE: BRAZIL. Amazonas: Reserva Experimental do Instituto Nacional de Pesquisas da Amazonia, rd Manaus-Caracará, Km 61, 3 Aug 1973, G. T. Prance et al. 18722 (HOLOTYPE: INPA 42035; ISOTYPE: GH = F neg. 55497).

Distribution: Brazil (Amazonas). Stipules striate.

E. CARTHAGENENSE Jacq., Enum. syst. pl. 21. 1760. TYPE: None designated.

E. rigidulum DC., *E. rigidulum* var. *exareolatum* O. E. Schulz.

Distribution: Colombia (Atlántico, Bolívar, Magdalena); Venezuela (Zulia). Stipules non-striate.

Plowman provisionally indicated as neotype Jacquin's illustration (Select. stirp. amer. hist. 134, t. 87. fig. 1. 1763), but added "also cf. possible Jacquin fragment at B-WILLD no. 8873 = B neg. 3914B."

E. CASSINOIDES Planch. & Linden ex Triana & Planch., Ann. Sci. Nat. Bot., sér. 4, 18: 340. 1862. TYPES: COLOMBIA. Prov. Mariquita, Santa Anna, Feb 1843, J. Linden 1195 (LECTOTYPE **here designated**: P = F neg. 59247; ISOLECTOTYPES: G, GENT = F neg. 61783); COLOMBIA. Prov. Mariquita, entre Piedras et Ibagué, 500–1200 m, Jul 1853, J. J. Triana 3435 (5597.3) (SYNTYPES: BM?, COL 6457 = F neg. 55535, P = F neg. 59245).

Distribution: Colombia (Antioquia, Cundinamarca, Norte de Santander, Tolima). Stipules non-striate.

E. CATARACTARUM Spruce ex Peyr. in Mart., Fl. bras. 12(1): 149. 1878. TYPE: BRAZIL. Amazonas: prope Panuré ad Uaupés, ad saxa granitica cataractarum inundata per totum fluvium Uaupés, Nov 1852, R. Spruce 2614 (LECTOTYPE designated by Plowman, 1984, p. 137: K = F neg. 55592; ISOTYPES: C = F neg. 21473, CGE, E, F = F neg. 61594, F fragment ex W, G, GH = F neg. 55499, NY = F neg. 55498, OXF, P, W)

Distribution: Brazil (Amazonas); Colombia (Bolívar*, Casanare, Guainía, Meta, Santander, Vaupés, Vichada); Peru (Loreto*); Venezuela (Amazonas, Apure, Guárico, Miranda). Stipules non-striate.

E. CATHARINENSE Amaral, Fl. Ilustr. Catar. I, fasc. ERIT: 41, t. 9–10. 1980. TYPE: BRAZIL. Santa Catarina: Pilões, Palhoça, 350 m, 7 Jun 1956, R. Reitz & R. Klein 3253 (HOLOTYPE: M; ISOTYPES: B, HBR, NY = F neg. 57472, Z).

Distribution: Brazil (Santa Catarina). Stipules striate.

E. cearense Diogo, Bol. Mus. Nac. Rio de Janeiro 1: 29. 1923. TYPE: BRAZIL. Ceará, s.d., A. Löfgren (554) (HOLOTYPE: R 70919 = F neg. 57479).

E. BETULACEUM Mart.

Treated as a synonym of *E. rosuliferum* O. E. Schulz by Amaral (1980b).

E. chiapense Lundell, Wrightia 4: 175. 1971. TYPE: MEXICO. Chiapas: Venustiano, near Carranza, 800 m, 13 Jun 1945, E. Matuda 5902 (HOLOTYPE: LL = F neg. 57369; ISOTYPE: F 1967982 = F neg. 61362).

E. HAVANENSE Jacq.

E. chilpei E. Machado, Anales Ci. 6: 162, unnumbered fig., p. 163. 1968. TYPE: PERU. Cuzco: Santa Ana, 900 m, 8 Jul 1915, O. F. Cook & G. B. Gilbert 1711 (HOLOTYPE: US 604886 = F neg. 55489).

E. COCA Lam. var. COCA.

The protologue was reprinted with slight

alterations under the name *Erythroxyllum chilpe* in Machado's treatment of the Peruvian species (Machado, 1972: 36, t. 4).

E. cienaguense E. Machado, Anal. Ci. 7: 182–184, 1969. TYPE: PERU. Tumbes: El Ciénago, al SE de Zorritos, 280–300 m, 28 May 1957, R. Ferreyra 12254 (HOLOTYPE: US 2428224; ISOTYPE: USM?).

E. GLAUCUM O. E. Schulz.

Plowman's manuscript listed a later publication date for this name (Machado, 1972: 37, t. 5). He was probably unaware of the earlier citation (cf. *Erythroxyllum chilpe* Machado and *E. hardinii* Machado).

E. CININNATUM Mart., Beitr. Erythroxyllum 77, t. 2., figs. 20, 26. 1840. TYPES: BRAZIL. Rio de Janeiro: Serra dos Orgãos, 1834, B. Luschnath s.n. (LECTOTYPE **here designated**: BR—annotated by Martius = F neg. 58522; ISOLECTOTYPE: P = F neg. 58497); BRAZIL. Rio de Janeiro: São Sebastião, s.d., H. W. Schott (4419) (SYNTYPES: F 839295, as Pohl 4419 = F neg. 55500, F = F neg. 60019, W).

Distribution: Brazil (Rio de Janeiro). Stipules non-striate.

The protologue mentions only the collections of Schott and Martius, without specific locality information. However, Martius distributed Luschnath's collections under his own numbers, and both Peyritsch (1878) and Schulz (1907) cite the above collections for this species, while neither cite a Martius collection.

E. CITRIFOLIUM A. St.-Hil., Fl. bras. merid. 2, ed. 4^o: 94. 1829. TYPE: BRAZIL. Goiás: Villa Boa, July [1816–1821], A. St. Hilaire cat. C'755 (HOLOTYPE: P = F neg. 35186; ISOTYPES: MPU = F neg. 58977, P = F neg. 58450).

E. acutifolium Steud. ex Peyr., *E. citrifolium* var. *latifolium* O. E. Schulz, *E. citrifolium* var. *minus* O. E. Schulz, *E. duckei* Huber, *E. gomphioides* Triana & Planch., *E. micranthum* Bong. ex Peyr., *E. paraense* Peyr.

Distribution: Central America: Costa Rica; Nicaragua; Panama. South America: Bolivia (Cochabamba*, La Paz, Santa

Cruz*); Brazil (Alagoas, Amapá, Amazonas, Bahia, Espírito Santo, Goiás, Maranhão*, Mato Grosso, Minas Gerais, Pará, Paraíba, Pernambuco, Rio de Janeiro, Rondônia, Roraima, São Paulo); Colombia (Antioquia, Boyacá, Cauca, Chocó, Cundinamarca, Huila, Meta, Santander, Tolima, Valle); Ecuador (Morona-Santiago, Napo); French Guiana; Guyana; Peru (Amazonas, Junín, Loreto, Madre de Dios, Pasco, San Martín); Suriname; Venezuela (Amazonas, Bolívar, Distrito Federal, Falcón, Lara, Mérida, Táchira, Zulia). Stipules striate.

E. citrifolium var. *latifolium* O. E. Schulz in Engl., Pflanzenr. IV. 134: 37. 1907. TYPE: GUYANA. Locality not specified, 1839, R. H. Schomburgk 590 (LECTOTYPE designated by Plowman, 1989, p. 7: K = F neg. 55591; ISOLECTOTYPES: E, F 533080 = F neg. 59665, G, GH, L, MO 1612858, NY—2 = F neg. 55553, OXF, W—2); FRENCH GUIANA. Without locality or date, Leprieur 258 (SYNTYPE: not located); FRENCH GUIANA. Without locality or date, Leprieur 260 (SYNTYPE: not located); FRENCH GUIANA. Without locality, 1834, Leprieur 321 (SYNTYPE: F); SURINAME. Without locality or date, G. M. Versteeg (*Gouini Exped.*) 428 (SYNTYPE: not located).

E. CITRIFOLIUM A. St.-Hil. (Plowman, 1989).

E. citrifolium var. *minus* O. E. Schulz in Engl., Pflanzenr. IV. 134: 37. 1907. TYPE: BRAZIL. Rio de Janeiro: between Maché and Campos, June, L. Riedel 386 (LECTOTYPE designated by Plowman, 1989, p. 7: LE; ISOLECTOTYPES: BR, M, P, W); BRAZIL. Bahia: Without locality, 1833, J. S. Blanchet 1552 (SYNTYPES: BM, F); BRAZIL. Bahia: Without locality, 1834, J. S. Blanchet 1828 (SYNTYPES: BM, F, NY, OXF, W); BRAZIL. Mato Grosso: Cuyabá, s.d., Rudolf Endlich 270 (SYNTYPE: not located); BRAZIL. Mato Grosso: Cuyabá, s.d., Rudolf Endlich 271 (SYNTYPE: not located); BRAZIL. Rio de Janeiro: Without locality, s.d., A. Glaziou 2941 (SYNTYPE: not located); BRAZIL. Rio de Janeiro: Without locality, Mar 1872, A. Glaziou 2942 (SYNTYPE: K,

MPU); BRAZIL. Rio de Janeiro: Without locality, 19 Oct 1869, *A. Glaziou 7533* (SYNTYPES: E, F 1538276, F 1914305, GH, K, LE, R); BRAZIL. Rio de Janeiro: Without locality, s.d., *A. Glaziou 9671* (SYNTYPE: not located); BRAZIL. Rio de Janeiro: Without locality, s.d., *P. W. Lund 501* (SYNTYPE: C); BRAZIL. Rio de Janeiro: Without locality, s.d., *M. Vauthier 568* (SYNTYPE: not located); BRAZIL. Rio de Janeiro: "Rio Dours pres de Tingua" [from handwritten label], 8 Dec 1878, *A. Glaziou 10351* (SYNTYPE: F 1538272); BRAZIL. Rio de Janeiro: Tijuca, s.d., *Novara-expedition s.n.* (SYNTYPE: not located); BRAZIL. Rio de Janeiro: Tijuca, 1839, *J. B. A. Guillemain 9* (SYNTYPE: F 1538247); BRAZIL. Rio de Janeiro: Tijuca, Jul, *L. Riedel s.n.* (SYNTYPE: not located); BRAZIL. Rio de Janeiro: Tijuca, s.d., *G. H. E. W. Hieronymus & G. Niederlein s.n.* (SYNTYPE: not located); BRAZIL. Rio de Janeiro: Tijuca, Jan, *H. Schenck 2198* (SYNTYPE: not located); BRAZIL. Rio de Janeiro: Sobral prope Parahyba do Sul, Nov 1881, *W. Schwacke 3348* (SYNTYPE: RB); BRAZIL. Rio de Janeiro: Rio Novo, Sep, *W. Schwacke 11818* (SYNTYPE: not located); BRAZIL. Rio de Janeiro: Rio Novo, s.d., *Araujo in hb. W. Schwacke 11942* (SYNTYPE: not located); BRAZIL. Rio de Janeiro: in sylvaticis Mandiocensibus, Oct, *L. Riedel 710* (SYNTYPE: BM, K); BRAZIL. Rio de Janeiro: bei Tinguá und Maranabaia, s.d., *H. W. Schott 5616* (SYNTYPES: F, W); BRAZIL. Rio de Janeiro: Corcovado bei São Sebastião, Aug, *C. Martius s.n.* (SYNTYPE: not located). Excluded SYNTYPE: BRAZIL. Rio de Janeiro: Barreto at Praia Grande, 26 Sep 1872, *A. Glaziou 6110* (SYNTYPES: B, destroyed, C = F neg. 21474, K = F neg. 55742, P—2) = Type of *E. lygoides* O. E. Schulz. Excluded SYNTYPE: BRAZIL. Minas Gerais: Lagoa Santa, s.d., *E. Warming 684* (SYNTYPE: C) = *E. daphnites* Mart., fide Plowman specimen cardfile.

E. CITRIFOLIUM A. St.-Hil. (Plowman, 1989, 1991).

Schulz cited *Glaziou 6110* as a syntype of this taxon as well as the type of *Erythroxylum lygoides*. It is possible that two elements

were distributed under this number, but Plowman's notes do not indicate it.

+*E. CLARENSE* Borhidi, *Acta Bot. Acad. Sci. Hung.* 22(3–4): 303. 1976 [1977]. TYPE: CUBA. Prov. Las Villas: Sierra de Escambray, en la cresta rocosa del Pico Potrerillo, 930 m, 2 Apr 1959, *Bro. Alain 6691* (HOLOTYPE: herbarium not indicated in protologue). [Paratype: Sierra de Escambray, *J. Acuña & J. T. Roig 24269* (SV).]

Distribution: Cuba (Las Villas). Stipules non-striate?

Stipule striation not indicated in the protologue, but compared by the author to *Erythroxylum alaternifolium* A. Rich.

E. COCA Lam., *Encycl.* 2: 393. 1786. TYPE: BOLIVIA. Prov. Sica Sica, cultivé par les Yungas, 29 Jun 1749, *J. de Jussieu s.n.* (HOLOTYPE: P-JUSS 11448; ISOTYPES: C, F 937653 fragment, P—2 = F negs. 58451 & 58452; original drawing, P).

E. bolivianum Burek, *E. chilpei* E. Machado.

Distribution (*Erythroxylum coca* var. *coca*): Ecuador to Bolivia; also widely cultivated (Plowman, 1979b). Stipules non-striate.

E. COCA var. *IPADU* Plowman, *Bot. Mus. Leafl.* 27: 45. 1979. TYPE: PERU. Loreto: Río Ampiyacu, Puca Urquillo, 5 Apr 1977, *T. Plowman, R. E. Schultes & O. Tovar 6663* (HOLOTYPE: ECON; ISOTYPES: F, GH, K, MO, S, US, USM).

Distribution: Brazil (Acre, Amazonas, Pará); Colombia (Amazonas, Putumayo, Vaupés); Colombia (Loreto, Madre de Dios*). Stipules non-striate.

E. coca var. *novogranatense* D. Morris, *Bull. Misc. Inform.* 25: 5, fig. 2. 1889. *E. NOVOGRANATENSE* (D. Morris) Hieron. var. *NOVOGRANATENSE*. TYPE: ENGLAND. Royal Botanical Gardens, Kew, cultivated plant grown from seed presumably sent by A. Dixon from Peru in 1869 and illustrated in *The Garden* 9: 445. 1876, Apr 1887, *Kew Gardens s.n.*

(LECTOTYPE designated by Plowman, 1988b, p. 546: K = F neg. 55738).

E. coca var. *spruceanum* Burck, Teysmannia 1: 456, t. 2. 1890. TYPE: INDONESIA. Java: Bogor Botanical Garden, cultivated, s.d., *sine col.* 9 (HOLOTYPE: BO 190761—annotated by Burck = F neg. 55731; PROBABLE ISOTYPES: L 901340 = F neg. 55783, U 11339 = F neg. 55784).

E. NOVOGRANATENSE (D. Morris) Hieron. var. *NOVOGRANATENSE*.

E. COELOPHLEBIUM Mart., Beitr. Erythroxy-lon 116, t. 1, figs. 14–15. 1840. TYPES: BRAZIL. Rio de Janeiro: São Sebastião, in hills and humid woods, Aug 1818, *C. Martius s.n.* (LECTOTYPE **here designated**: M = F neg. 57594); BRAZIL. Rio de Janeiro: Serra d'Estrella, s.d., *H. W. Schott 5617* (SYNTYPES: BR = F neg. 58521, F 839035 fragment, F 1988068 = F neg. 60020, M, W).

Distribution: Brazil (Bahia, Espírito Santo, Rio de Janeiro, São Paulo). Stipules non-striate.

E. coelophlebium var. *brevifolium* Mart. ex O. E. Schulz in Engl., Pflanzenr. IV. 134: 79. 1907. TYPES: BRAZIL. Rio de Janeiro, 1831–1834, *B. Luschnath s.n.* (LECTOTYPE **here designated**: BR = F neg. 58510); BRAZIL. Rio de Janeiro, s.d., *F. Sellow L.156* (SYNTYPE: B, destroyed).

E. coelophlebium var. *grisebachii* (Peyr.) O. E. Schulz in Engl., Pflanzenr. IV. 134: 79. 1907. *E. GRISEBACHII* Peyr., q.v.

?*E. coelophlebium* var. *petiolatum* (Peyr.) O. E. Schulz in Engl., Pflanzenr. IV. 134: 79. 1907. *E. petiolatum* Peyr.

E. COELOPHLEBIUM Mart., unless varietally distinct.

E. COLUMBINUM Mart., Beitr. Erythroxy-lon 99. 1840. TYPE: BRAZIL. Bahia: Prope Almada et oppidum St. Georgii Insulan-orum, fl. Jan, fr. Mar, 1835–1837, *B.*

Luschnath 19 = Herb. Fl. Bras. 677 (HOLOTYPE: M = F neg. 57595; ISOTYPES: BR = F neg. 58519, F 936239 fragment ex P & 839063 fragment ex W, G–2, GH, K, LE, L–2, MO 1886705, NY, P–2, W–2).

Distribution: Brazil (Bahia, Espírito Santo). Stipules striate.

E. comosum O. E. Schulz in Engl., Pflanzenr. IV. 134: 32, fig. 8. 1907. TYPE: PERU. Loreto: Cerro de Escaler, 1200 m, Nov 1902, *E. Ule 6531* (HOLOTYPE: B, destroyed; LECTOTYPE designated by Plowman, 1984, p. 140: K = F neg. 55590; ISOTYPES: F 612472 fragment, G, L = F neg. 57232).

E. MUCRONATUM Benth.

E. compactum Rose, Contr. U.S. Natl. Herb. 8: 313. 1905. *E. suave* var. *compactum* (Rose) O. E. Schulz. TYPE: MEXICO. Puebla: rocky hills near Tehuacán, 3 Aug 1897, *C. G. Pringle 6771* (HOLOTYPE: US; ISOTYPES: BM, CM 260308, F 60342 = F neg. 55554, G, GH, GOET, LE, LL, MICH, MO 1894357, NY = F neg. 57823, P–2, PR, US, W, Z).

E. ROTUNDIFOLIUM Lunan (Plowman, 1991).

According to Plowman (1991), this taxon may merit varietal status under *Erythroxy-lum rotundifolium*.

E. COMPRESSUM Peyr. in Mart., Fl. bras. 12(1): 163. 1878. TYPE: BRAZIL. Bahia: Ilhéus, Feb 1822, *L. Riedel 636* (HOLOTYPE: ? ; ISOTYPES: BR = F neg. 58520, F 1882691, LE = F neg. 55720).

Distribution: Brazil (Bahia). Stipules striate.

Peyritsch apparently erred in his citation of the type collection as *Luschnath s.n.*, according to Plowman's notes.

E. CONFUSUM Britton in Britton & Millsp., Bahama fl. 199. 1920. TYPE: Not determined.

E. affine A. Rich. non A. St.-Hil., *E. areolatum* var. *affine* O. Schulz, *E. eugenioides* Lundell.

Distribution: North America: Mexico (Chiapas, Quintana Roo, Yucatán). Central America: Belize, Guatemala. West Indies: Bahamas, Cuba, Jamaica. Stipules non-striate.

Plowman treated this species as if it were a nomen novum for *Erythroxyllum affine* A. Rich. non A. St.-Hil., described from Cuba. However, Britton cited this name in synonymy with a question mark. Therefore, according to Art. 52.2, Note 1 and Ex. 9, of the ICBN (Greuter et al., 2000), it must be treated as a newly described species, and a lectotype selected from material seen by Britton at NY.

E. CORDATO-OVATUM Huber, Bol. Mus. Paranaense Hist. Nat. 5: 418. 1909. TYPE: BRAZIL. Pará: Faro, 9 Sep 1907, A. Ducke (MG) 8686 (HOLOTYPE: MG 8686 = F neg. 45845, F 602711 fragment ex MG; ISOTYPES: B, destroyed = F neg. 12611, F 752503 fragment ex B, RB 20435).

Distribution: Brazil (Amazonas, Pará). Stipules non-striate.

E. CORIACEUM Britton & P. Wilson, Mem. Torrey Bot. Club 16(2): 71. 1920. TYPE: CUBA. Oriente: Bank of Río Guayabo, above the falls, 18 Jan 1910, J. A. Shafer 3601 (HOLOTYPE: NY = F neg. 55501).

E. lindelianum Urb.

Distribution: Cuba. Stipules non-striate.

E. costaricense Donn. Sm., Bot. Gaz. (Crawfordsville) 23: 240. 1897. *E. lucidum* var. *costaricense* (Donn. Sm.) O. E. Schulz. TYPE: COSTA RICA. Golfo Dulce, forests of Santo Domingo, near sea level, Mar 1896, A. Tonduz s.n. (Cat. Donnell-Smith 7261) (HOLOTYPE: CR 10092; ISOTYPES: BM, G, GH = F neg. 55502, K, NY = F neg. 57824, Z). [The herbarium number CR 10092 was assigned both to this collection and to A. Tonduz s.n. (Cat. Donnell-Smith 7262), *Casearia hirsuta* Sw.]

E. MACROPHYLLUM Cav. (Plowman, 1991).

E. cotinifolium A. St.-Hil., Fl. bras. merid. 2, ed. 4^o: 98. 1829. *E. campestre* var.

obovale Martius. TYPE: BRAZIL. Minas Gerais: Near Juruoca not far from Prov. São Paulo, Apr [1821 or 1822], A. St. Hilaire cat. D 460^{bis} (HOLOTYPE: P = F neg. 58453; ISOTYPES: MPU fragment, P).

E. CAMPESTRE A. St.-Hil.

E. CRYPTANTHUM O. E. Schulz in Engl., Pflanzenr. IV. 134: 110. 1907. TYPES: BRAZIL. Rio de Janeiro, "Apr 1893" (K), A. Glaziou 13586 (LECTOTYPE **here designated**: K = F neg. 55589; ISOLECTOTYPES: B, destroyed, C, F 667129 fragment ex C, G, LE, P); BRAZIL. Rio de Janeiro, "8 Jan 1888" (US), A. Glaziou 16722 (SYNTYPES: B, destroyed = F neg. 12612, G, K, P, US = F neg. 60622); BRAZIL. São Paulo: Cubatão at Bacupari-mirim, 9 Aug 1899, A. Löfgren in *Commiss. Geogr.* 5981 (SYNTYPES: B, destroyed, SP = F neg. 60946).

Distribution: Brazil (Rio de Janeiro, São Paulo). Stipules non-striate.

E. cuatrecasasii W. A. Gentner, J. Wash. Acad. Sci. 47: 6, fig. 1. 1957. TYPE: COLOMBIA. El Valle: Río Yurumanguí, 5–50 m, 19 Feb 1944, J. Cuatrecasas 15736 (HOLOTYPE: F = F neg. 52562; ISOTYPES: COL 77141 = F neg. 55530).

E. GRACILIPES Peyr.

E. CUMANENSE Kunth in Humb., Bonpl. & Kunth, Nov. gen. sp. 5, ed. f^o: 137; ed. 4^o: 177. 1822. TYPE: VENEZUELA. Cumaná, s.d., *Humboldt & Bonpland s.n.* (1252) (HOLOTYPE: P = F neg. 35189; ISOTYPE: B-WILLD 8875 = B neg. 3916 = F neg. 12613).

Distribution: West Indies: Curaçao; South America: Colombia (Bolívar); French Guiana, Guyana, Suriname, Trinidad & Tobago; Venezuela (Anzoátegui, Aragua, Distrito Federal, Falcón, Lara, Miranda, Nueva Esparta, Sucre). Stipules non-striate.

Placed in synonymy of *Erythroxyllum havanense* Jacq. by D'Arcy & Schanen (1975) but recognized as distinct by Plowman (1991).

E. CUNEIFOLIOIDES E. W. Berry, Johns Hop-

kins Univ. Studies in Geology 6: 206, t. 5, fig. 1. 1925. [Fossil of leaf.] TYPE: ARGENTINA: Chubut Territory, Mirhoya, *E. W. Berry?* (HOLOTYPE: n.v.)

E. CUNEIFOLIUM (Mart.) O. E. Schulz in Engl., Pflanzenr. IV. 134: 121, fig. 21. 1907. *E. microphyllum* var. *cuneifolium* Mart.

E. trollii O. E. Schulz; possibly *E. microphyllum* f. *myrtilloides* Peyr., *E. amplifolium* var. *myrtilloides* (Peyr.) O. E. Schulz.

Distribution: Argentina (Chaco, Corrientes, Entre Ríos, Formosa, Jujuy, Misiones, Salta, Santa Fe, Santiago del Estero); Bolivia (Chuquisaca, Santa Cruz, Tarija); Brazil (Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Paraná, Rio Grande do Sul, Rio de Janeiro, Santa Catarina, São Paulo); Paraguay (Alto Paraguay, Alto Paraná, Amambay, Boquerón, Caaguazú, Canendiyu, Central, Chaco, Concepción, Cordillera, Guairá, Itapúa*, Nueva Asunción, Paraguari, Pres. Hayes, San Pedro). Stipules non-striate.

E. cuneifolium var. *silvaticum* O. E. Schulz in Engl., Pflanzenr. IV. 134: 122. 1907. TYPES: ARGENTINA. Oran, 16 Oct 1873, *P. G. Lorentz & G. H. E. W. Hieronymus* 480 (LECTOTYPE **here designated**: K = F neg. 55588); BRAZIL. São Paulo: Itapetinga, 550 m, s.d., *M. Wacket s.n.* (SYNTYPE: W); BOLIVIA. Chaco, Fortín Crevaux ad Río Pilcomayo, 20 Apr 1902, *R. E. Fries* 1660 (SYNTYPE: US 1055261 = F neg. 60623); BOLIVIA. Tratarenda, 28 Mar 1902, *R. E. Fries* 1483 (SYNTYPE: US 1055260 = F neg. 61751).

E. cuneifolium var. *squarrosum* O. E. Schulz in Engl., Pflanzenr. IV. 134: 122. 1907. TYPES: BRAZIL. São Paulo: Faxina, 650 m, s.d., *R. Wettstein & V. F. Schiffner s.n.* (SYNTYPE: n.v.); BRAZIL. Rio Grande do Sul: Porto Alegre, Morro da Policia, Nov, *G. Malme Iter Regnell II.545* (SYNTYPE: n.v.).

E. CUSPIDIFOLIUM Mart., Beitr. Erythroxyton 79, t. 2, fig. 21. 1840. TYPE: BRAZIL. No locality or date, *F. Sellow s.n.* (HO-

LOTYPE: ? ; ISOTYPES: B, destroyed, K = F neg. 56510, NY, P, W = F neg. 60018).

Possible synonyms: *E. ectinocalyx* Mart., *E. ellipticum* Peyr., *E. exaltatum* Bong. ex Peyr., *E. exaltatum* var. *ellipticum* O. E. Schulz, *E. intermedium* Peyr.

Distribution: Brazil (Bahia, Espírito Santo, Minas Gerais, Paraná, Rio Grande do Sul, Rio de Janeiro, Santa Catarina, São Paulo). Stipules non-striate.

In his unpublished manuscript, Plowman mistakenly cited as holotype a syntype of *Erythroxyton ectinocalyx* Mart. at M (=F neg. 19457). The location of the actual holotype is not known. The isotypes cited above are all annotated "E. kunthia Mart. non St. Hil.," on a Berlin herbarium label, perhaps in Peyritsch's hand.

?*E. CYCLOPHYLLUM* O. E. Schulz in Engl., Pflanzenr. IV. 134: 93. 1907. TYPE: BRAZIL. São Paulo: [about 1 mi NW by N from the Tanque de Zunica as far as the Caveira Santa in the level dry shrubby campos, 3 Feb 1827,] *W. J. Burchell* 4117 (HOLOTYPE: K = F neg. 55587).

Distribution: Brazil (São Paulo). Stipules non-striate.

Plowman supplemented locality data for all Burchell types according to Smith & Smith (1967). Plowman's notes indicate that he suspected this to be a synonym of *Erythroxyton nummularia* Peyr.

E. DAPHNITES Mart., Beitr. Erythroxyton 83. 1840. TYPE: BRAZIL. Goiás: Rio Claro, Cavalcante, Trahiras, 1817–1821, *J. E. Pohl* (2123) (LECTOTYPE designated by Plowman, 1984, p. 138 [as "2133"]: M = F neg. 57586; ISOTYPES: BR = F neg. 58509, W = F neg. 59996).

Distribution: Bolivia (La Paz*, Santa Cruz); Brazil (Distrito Federal, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, São Paulo); Peru (Madre de Dios*). Stipules striate.

?*E. DAVIDII* D'Arcy & Schanen, Ann. Missouri Bot. Gard. 62: 30, fig. 1J. 1975. TYPE: PANAMA. Darién: Cana Trail between Cerro Campamento La Escalera to

"paramo" E of Tres Bocas, 30 Apr 1968, J. H. Kirkbride & J. Duke 1284 (HOLOTYPE: MO).

Distribution: Panama (Darién). Stipules non-striate.

This is a possible synonym of *Erythroxyllum panamense* Turcz.

E. DECIDUUM A. St.-Hil., Pl. usuel. bras. t. 69, fig. B, p. 3. 1828. *E. nitidum* var. *angustifolium* Mart., *E. deciduum* var. *angustifolium* (Mart.) O. E. Schulz. TYPES: BRAZIL. Minas Gerais: Corgo de Mathias, near Contendas, Sep [1817], A. St. Hilaire cat. B'616 (LECTOTYPE **here designated**: P = F neg. 35195, fragment on left side of sheet (fr); ISOLECTOTYPES: F 935965 fragment ex P; MPU = F neg. 58978, fragment on left side (fr); P = F neg. 58454).

E. goyazense Taub., *E. hasslerianum* Chodat, *E. nanum* A. St.-Hil., *E. nitidum* var. *longifolium* Mart.

Distribution: Argentina (Corrientes, Misiones); Brazil (Bahia, Distrito Federal, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Paraná, Rio Grande do Sul, Rio de Janeiro, Santa Catarina, São Paulo); Paraguay (Alto Paraná, Caaguazú, Canendiyu, Cordillera, Guairá, Paraguari, San Pedro); Peru (Pasco). Stipules non-striate.

St. Hilaire (1829: 95) later published a more complete description, in which he cited two collection localities, the second represented by A. St. Hilaire cat. C' 936 (Minas Gerais, Campos de Boa Vista near Santa Ana). This is the flowering specimen mounted on the mixed sheet at MPU, and may also be that on the mixed sheet at P. An additional specimen of this number (P = F neg. 58455) was annotated by Plowman in 1984 as the lectotype, but he later changed his mind, since the flowering condition was not mentioned in the 1828 publication.

E. deciduum var. *angustifolium* (Mart.) O. E. Schulz in Engl., Pflanzenr. IV. 134: 58. 1907. *E. DECIDUUM* A. St.-Hil., *E. nitidum* var. *angustifolium* Mart.

E. deciduum var. *brevifolium* (Mart.) O. E. Schulz in Engl., Pflanzenr. IV. 134: 58. 1907. *E. NITIDUM* Spreng., *E. nitidum* var. *brevifolium* Mart.

E. deciduum var. *glaucum* (Mart.) O. E. Schulz in Engl., Pflanzenr. IV. 134: 59. 1907. *E. nitidum* var. *glaucum* Mart.

Taxonomic placement uncertain, fide Plowman.

E. deciduum var. *opacum* O. E. Schulz in Engl., Pflanzenr. IV. 134: 58. 1907. TYPES: ARGENTINA. Near Paggi, s.d., G. Niederlein Exped. Argent. Limit. 2204 (SYNTYPE: not located); BRAZIL. Minas Gerais: Without locality, s.d., P. Clausen 737A (SYNTYPES: G, NY); BRAZIL. Minas Gerais: Uberaba, 1848, A. F. Regnell 1.46f (SYNTYPES**: LE = F neg. 55702, M); BRAZIL. Minas Gerais, Aug-Apr [sic] 1840, P. Claussen 440 pro parte (SYNTYPES: BR = F neg. 58508, G, P); BRAZIL. Minas Gerais, s.d., J. F. Widgren s.n. (SYNTYPE: n.v.); BRAZIL. Minas Gerais: Caldas, s.d., G. A. Lindberg 237 pro parte (SYNTYPE: n.v.); BRAZIL. Minas Gerais: Caldas, s.d., A. F. Regnell 1.46g (SYNTYPE: n.v.).

According to Schulz, the Claussen and Lindberg collections, cited as "pro parte" above are mixed collections with typical *Erythroxyllum deciduum*.

E. DENSUM Rusby, Descr. S. Amer. pl. 33. 1920. TYPE: COLOMBIA. Magdalena: 6 mi NE of Masinga, 2500 ft, 28 Mar 1898-1901, H. H. Smith 845 (HOLOTYPE: NY = F neg. 55490; ISOTYPES: A, B, destroyed, CM 211122, F 137841 = F neg. 55491, G, GH = US neg. 3660, MICH, MO 1886702, MPU, P-2, US, WIS).

E. lineolatum var. *sanctae-martae* O. E. Schulz.

Distribution: Colombia (Cundinamarca, Magdalena); Venezuela (Anzoátegui, Aragua, Barinas, Distrito Federal, Falcón, Mérida, Miranda, Monagas, Nueva Esparta, Sucre, Táchira). Stipules non-striate.

The duplicate of the type at B was the

holotype of *Erythroxylum lineolatum* var. *sanctae-martae* O. E. Schulz.

E. DISTORTUM Mart., Beitr. Erythroxyton 66, t. 1, figs. 17–19. 1840. TYPE: BRAZIL. Bahia: “in sepibus et silvis prope oppidum S. Georgi Insulanorum,” Jan (1835–1837?), *B. Luschnath* (20) = *Herb. Fl. Bras.* 678 (HOLOTYPE: BR; ISOTYPES: BM, BR (“20”), F 838051 fragment ex W = F neg. 55507, F 1538252 = F neg. 55504, F 1988022 = F neg. 62192, G, GH, K, L–2, LE–3, LE (“20”), MO 1886696 = F neg. 55503, MO 1886695 (“no. 158”) = F neg. 55506, NY = F neg. 55505, P, R 7772, W–2).

Distribution: Brazil (Bahia, Pernambuco, Rio de Janeiro). Stipules striate.

E. distortum var. *paraguariense* Chodat & Hassl., Bull. Herb. Boissier, sér. 2, 4: 1288. 1904. E. PARAGUARIENSE (Chodat & Hassl.) O. E. Schulz. TYPES: PARAGUAY. Near Concepción, Sep [1901–1902], *E. Hassler* 7458 (SYNTYPES**): A, BM, F 1538261–annotated by O. E. Schulz = F neg. 55480, G–3 = F neg. 41098, K, MO 1574131, MPU, NY, P, W); PARAGUAY. Ibu-mi, in region of Upper Río Apa, Oct 1902, *E. Hassler* 7675 (SYNTYPES: A, B–annotated by O. E. Schulz, destroyed = F neg. 12636, BM, F = F neg. 55479, G–3–annotated by O. E. Schulz = F neg. 41097, K, NY, P, W).

E. DIVARICATUM Peyr. in Mart., Fl. bras. 12(1): 146. 1878. TYPES: GUYANA. “In savannis ad ripas fluminis Rupununi,” Apr 1841, *R. H. Schomburgk* 925 (LECTOTYPE designated by Plowman, 1984, p. 138; W; ISOLECTOTYPES: CGE, F 1988066 = F neg. 62194, G–3, K = F neg. 55586, NY–2 = F neg. 55508, P, W–2); GUYANA. “Ad ripas fluminis Rupununi,” Apr 1841, *M. R. Schomburgk* 1270 (SYNTYPE: B, destroyed = F neg. 12614).

Distribution: Brazil (Amazonas, Pará, Roraima); Guyana, Venezuela (Amazonas, Bolívar). Stipules non-striate.

E. duckei Huber, Bol. Mus. Paraense Hist.

Nat. 5: 416. 1909. TYPE: BRAZIL. Pará: Rio Cuminá, affl. flum. Trombetas, Dec 1906, *A. Ducke* (MG) 7907 (HOLOTYPE: MG 7907 = F neg. 45844; ISOTYPES: B, destroyed = F neg. 12615, F 602695 fragment ex MG, RB 20440).

E. CITRIFOLIUM A. St.-Hil.

?E. DUMOSUM Alain, Candollea 17: 115. 1960. TYPE: CUBA. Oriente: Charrascal de la Cueva, Sierra de Nipe, 27–31 May 1960, *M. López Figueiras* UO 1059 (HOLOTYPE: LS, now at HAC).

Distribution: Cuba. Stipules non-striate.

?E. DURUM S. Moore, Trans. Linn. Soc. London, Bot., ser. 2, 4: 322. 1894. TYPES: BRAZIL. Mato Grosso: Santa Cruz, Sep, *S. Moore* 342 (LECTOTYPE **here designated**: BM; ISOLECTOTYPE: NY = F neg. 55509); BRAZIL. Mato Grosso: Rio Brasinho, Oct, *S. Moore* 500 (SYNTYPE: BM = F neg. 56259).

Distribution: Brazil (Mato Grosso). Stipules striate.

Treated by Schulz (1907) as a synonym of *Erythroxylum floribundum* Mart. (*E. macrophyllum* Cav.) However, Plowman may have remained undecided, giving no indication of synonymy in his manuscript, nor in his annotations of the syntypes.

?E. ECHINODENDRON Ekman ex O. E. Schulz in Urban, Repert. Spec. Nov. Regni Veg. 21: 641. 1925. TYPE: CUBA. Santa Clara: Near Santa Clara, 25 Mar 1924, *E. L. Ekman* 18845 (HOLOTYPE: S = F neg. 58439; ISOTYPE: NY = F neg. 55510).

Distribution: Cuba. Stipules non-striate.

This is a possible synonym of *Erythroxylum minutifolium* Griseb.

?E. ectinocalyx Mart., Beitr. Erythroxyton 75, t. 1, figs. 8–10, t. 2, fig. 22. 1840. TYPES: BRAZIL. Rio de Janeiro: “Prov. Sebastianopolitanae,” 1817, *C. Martius* s.n. (LECTOTYPE **here designated**: BR–annotated by Peyritsch = F neg. 58507; ISOLECTOTYPE: B–annotated by Martius, destroyed = F neg. 12616); BRAZIL.

Minas Gerais: "dumetis et silvis Caa-poam," Jul 1818, *C. Martius s.n.* (SYNTYPE: M—annotated by Martius = F neg. 19457). [Protocologue: "in silvulis Caa-poam prov. Sebastianopolitanae et Minarum: Martius & Pohl." The Pohl specimen was not located.]

E. CUSPIDIFOLIUM Mart.?

The photograph of the syntype collection (F neg. 19457) was mistakenly distributed as the type of *Erythroxylum cuspidifolium* Mart., following Schulz's later annotation of the sheet. However the original label, not seen in the photo, reads *E. ectinocalyx* Mart., with locality and date as indicated above.

?*E. ellipticum* Peyr. in Mart., Fl. bras. 12(1): 145. 1878, non R. Br. 1863. *E. exaltatum* var. *ellipticum* O. E. Schulz. TYPE: BRAZIL. Rio de Janeiro: Macahé, Jun 1832, *L. Riedel 388* (LECTOTYPE **here designated**: LE—annotated by Peyritsch = F neg. 55716; ISOTYPES: F 936528 fragment ex P, GH, M, P = F neg. 35190, US).

E. CUSPIDIFOLIUM Mart.?

A syntype collection of *Erythroxylum hamigerum* O. E. Schulz bears the identical collection number, *L. Riedel 388*, as the type of *E. ellipticum* but represents a different taxon from a different locality.

E. ellipticum Ramírez, Anales Inst. Méd.-Nac. México 3: 36, t. 1, figs. 1–2. 1897, non R. Br. 1863, nec Peyr. 1878. TYPE: MEXICO. Vera Cruz: Motzorongo, 1890, *F. Altamirano 892* (LECTOTYPE designated by Plowman, 1989, p. 17: MEXU = F neg. 54904; ISOTYPE: MEXU).

E. MACROPHYLLUM Cav. var. *MACROPHYLLUM* (Plowman, 1989).

E. ENGLERI O. E. Schulz in Engl., Pflanzenr. IV. 134: 46. 1907. TYPE: BRAZIL. Minas Gerais, 8 Dec 1892, *A. Glaziou 18918* (SYNTYPES**: B, destroyed = F neg. 12617, K = F neg. 55584, P–2); BRAZIL. Minas Gerais: Lagoa Santa, 16 Feb 1865, *E. Warming s.n.* (SYNTYPE: C = F

neg. 57703); BRAZIL. Mato Grosso: Cuiabá, 1902–1903, *G. Malme s.n. (Iter Regnell II)* (SYNTYPE: S = F neg. 58441); BRAZIL. Goiás: [Ribeirão Padre to Rio Preto, affluent of Rio Maranhão, ca. 14°08'S, 47°55'W, 1828–1830,] *W. J. Burchell 7776* (SYNTYPE: K = F neg. 55585); BRAZIL. Minas Gerais: bei Capão, *W. Schwacke 8342* (SYNTYPE: n.v.); BRAZIL. Mato Grosso: Cuiabá, *L. Riedel s.n.* (SYNTYPE: n.v.).

E. paradoxum O. E. Schulz.

Distribution: Brazil (Distrito Federal, Goiás, Maranhão*, Mato Grosso, Minas Gerais). Stipules non-striate.

E. eugenioides Lundell, Wrightia 4(6): 175. 1971. TYPE: GUATEMALA. Dept. Petén: Dos Lagunas, Ixcarrío, on Alta Mira road 4 km N, bordering La Laguneta Bajo, 13 May 1969, *E. Contreras 8535* (HOLOTYPE: LL = F neg. 57371; ISOTYPE: F 1967983 = F neg. 61343).

E. CONFUSUM Britton.

?*E. exaltatum* Bong. ex Peyr. in Mart., Fl. bras. 12(1): 151. 1878. TYPE: BRAZIL. Rio de Janeiro: "in silvaticis," Sep–Oct 1832, *L. Riedel 884* (LECTOTYPE **here designated**: LE—annotated by Peyritsch = F neg. 55719; ISOTYPES: B, destroyed, BM, BR, C, E, F 1882638 fragment, GH, L, M = F neg. 19458, MO, P, US, W).

E. CUSPIDIFOLIUM Mart.?

?*E. exaltatum* var. *ellipticum* O. E. Schulz in Engl., Pflanzenr. IV. 134: 104. 1907. *E. ellipticum* Peyr. non R. Br. TYPE: As for *E. ellipticum* Peyr.

E. CUSPIDIFOLIUM Mart.?

E. exaltatum var. *riedelianum* Fisch. & C. A. Mey. ex O. E. Schulz in Engl., Pflanzenr. IV. 134: 104. 1907. TYPES: BRAZIL. Bahia, 1821, *L. Riedel K* (LECTOTYPE **here designated**: LE—annotated by O. E. Schulz = F neg. 55717; ISOLECTOTYPES: K = F neg. 55583, LE–2); BRAZIL. Bahia, 1821, *L. Riedel J* (SYNTYPES: BR, LE–2 = F neg. 55718).

E. excelsum Glaziou, Bull. Soc. Bot. France 52: 63. 1905. TYPES: BRAZIL. Rio de Janeiro: Floresta de Tijuca, Corcovado, Mar 1873 [2 Sep 1872 on B sheet], A. Glaziou 6109 (LECTOTYPE **here designated**: K = F neg. 55763; ISOLECTOTYPES: B, destroyed = F neg. 12647, C, P, S); BRAZIL. Rio de Janeiro: Mt. Corcovado, 30 May 1876, A. Glaziou 8461 (SYNTYPES: C, P = F neg. 58483); BRAZIL. Rio de Janeiro: Mt. Corcovado, 29 Jun 1880, A. Glaziou 11808 (SYNTYPES: C, K = F neg. 55759, P = F neg. 58484).

E. PULCHRUM A. St.-Hil.

Plowman treated this as a nomen nudum in his unpublished manuscript, but the protologue includes a short description. Schulz (1907), who was probably unaware of Glaziou's name, cited all three syntypes of *Erythroxylum excelsum* as syntypes of his *E. speciosum*. The same specimen is here designated as lectotype for both names. According to Plowman's notes, *Glaziou 11808* may be a different species from the other syntypes (see discussion of *E. striolatum* O. E. Schulz).

E. ficifolium Peyr. in Mart., Fl. bras. 12(1): 169. 1878. TYPES: BRAZIL. Rio de Janeiro, 1878?, A. Glaziou 9358 (SYNTYPES**: G, LE = F neg. 55714, P-2); BRAZIL. Rio de Janeiro: Laranjeiras, 5 Sep 1870, A. Glaziou 4763 (SYNTYPES: C—annotated by Peyritsch = F neg. 21476, P = F neg. 58456); BRAZIL. Rio de Janeiro: Aqueduct, s.d., J. C. Mikan 2020 (SYNTYPE: W—annotated by Peyritsch).

E. MAGNOLIIFOLIUM A. St.-Hil.

E. filipes Huber, Bol. Mus. Paraense Hist. Nat. 5: 415. 1909. TYPE: BRAZIL. Pará: Rio Trombetas, Oriximiná, 8 Dec 1906, A. Ducke (MG) 7878 (HOLOTYPE: MG 7878, not located at MG, possibly lost; ISOTYPE: RB 20436 = F neg. 61667).

E. MACROPHYLLUM Cav. var. MACROPHYLLUM (Plowman, 1989).

E. FIMBRIATUM Peyr. in Mart., Fl. bras. 12(1): 162. 1878. TYPE: BRAZIL. Amazonas: In silvis ad Ega [Tefe], Dec 1819,

C. Martius s.n. (HOLOTYPE: M = F neg. 19459).

Distribution: Central America: Costa Rica. South America: Brazil (Acre, Amazonas, Rondônia); Colombia (Cundinamarca); Ecuador (Napo, Pastaza); French Guiana; Peru (Amazonas, Huánuco, Loreto, Pasco, San Martín); Venezuela (Bolívar). Stipules striate.

Erythroxylum plowmanianum Cogollo & Pipoly is a possible synonym (Loiola, 2001).

E. fiscalense Standl., Publ. Field Mus. Nat. Hist., Bot. Ser., 22(1): 33. 1940. TYPE: GUATEMALA. Dept. Guatemala: Fiscal, 1100 m, 12 Dec 1938, P. C. Standley 59568 (HOLOTYPE: F 984643 = F neg. 52558; ISOTYPE: MICH).

E. ROTUNDIFOLIUM Lunan.

?E. FLACCIDUM Salzm. ex Peyr. in Mart., Fl. bras. 12(1): 141. 1878. TYPE: BRAZIL. Bahia: In collibus umbrosis, 1830, P. Salzmänn 84 (SYNTYPES**: E, G-2, K = F neg. 55581, LE, MPU, NY = F neg. 55511, P-3, W—annotated by Salzmänn, but not Peyritsch); BRAZIL. Bahia: Moritiba, 1845 (1843, F), J. S. Blanchet 3531 (SYNTYPES: BM, BR, F 1537757 = F neg. 55556, G-2, P-2, W = F neg. 39695); BRAZIL. “Rio de Janeiro” [Bahia]: Maracás, 1818, C. Martius s.n. (SYNTYPE: M = F neg. 19460).

Distribution: Brazil (Bahia, Minas Gerais*). Stipules non-striate.

This is a possible synonym of *Erythroxylum subrotundum* A. St.-Hil.

+E. FLAVICANS Borhidi, Acta Bot. Acad. Sci. Hung. 22(3-4): 303-304. 1977 [“1976”]. TYPE: CUBA. Oriente: Sierra del Cristal, in fruticetis semper-virentibus serpentinosis montanis Mt. Saca Lengua, 650 m, 11 Apr 1976, A. Borhidi, M. Vales, R. Oviedo (SV) 27819 (HOLOTYPE: SV-n.v.; ISOTYPE: BP-n.v.).

Distribution: Cuba (Oriente). Stipules non-striate?

Stipule striation is not mentioned in the

protologue, but the species is compared to *Erythroxyllum dumosum* Alain.

E. flexuosum O. E. Schulz in Engl., Pflanzenz. IV. 134: 41. 1907. TYPES: BRAZIL. São Paulo: Mogy-Mirim, 20 Mar 1874, C. W. H. Mosén 1792 (SYNTYPES**: P, S = F neg. 58442); BRAZIL. Minas Gerais, 1894, A. Glaziou 20224 (SYNTYPES: B, destroyed = F neg. 12618, K = F neg. 55582, P); BRAZIL. São Paulo: "Mugy," in fruticetis siccis, Sep 1833, Riedel C (SYNTYPE: BR = F neg. 58506); BRAZIL. No locality or date, J. Schüch 190 (SYNTYPE: W = F neg. 60015).

E. PELLETERIANUM A. St.-Hil.

E. floribundum Mart., Beitr. Erythroxyllon 118. 1840. TYPE: BRAZIL. Pará: "Pará" [Belém], in silvis udis, May 1820, C. Martius s.n. (HOLOTYPE: M = F neg. 19461; ISOTYPES: G, K = F neg. 55580, L, M-3).

E. MACROPHYLLUM Cav. MACROPHYLLUM (Plowman, 1989).

E. FOETIDUM Plowman, Brittonia 40(3): 256. 1988. TYPE: VENEZUELA. Amazonas: 14–15 km NE of Puerto Ayacucho along road to El Burro, 85 m, 5°47'N, 67°32'W, 15 Apr 1978, G. Davidse & O. Huber 15072 (HOLOTYPE: VEN 133960, F neg. 23963; ISOTYPES: F 1863254 = F neg. 62530, MO 2713682).

Distribution: Venezuela (Amazonas, Apure, Bolívar, Falcón); possibly Colombia (Meta), fide Plowman (1988). Stipules non-striate.

E. FRANGULIFOLIUM A. St.-Hil., Pl usuel. bras. t. 69, p. 3. 1828. TYPE: BRAZIL. Rio de Janeiro, [July 1821], A. St. Hilaire cat. C²⁹⁴, 2^e partie (LECTOTYPE **here designated**: P = F neg. 58537).

E. kunthianum A. St.-Hil.; possibly *E. ambiguum* Peyr.

Distribution: Brazil (Minas Gerais, Rio de Janeiro, São Paulo). Stipules non-striate. St. Hilaire (1829, p. 99) later provided a fuller description.

E. GAUDICHAUDII Peyr. in Mart., Fl. bras. 12(1): 169. 1878. TYPES: BRAZIL. Rio de Janeiro: In collibus umbrosis siccis, s.d., C. Gaudichaud-Beaupré 983 (SYNTYPES**: G, P-2); BRAZIL. Rio de Janeiro, 1834 (F), C. Gaudichaud-Beaupré 984 (SYNTYPES: F 1537806 = F neg. 55512, G = F neg. 60932, P-2 = F neg. 35191); BRAZIL. Rio de Janeiro, s.d., C. Gaudichaud-Beaupré 984^{bis} (SYNTYPES: P-2); BRAZIL. Rio de Janeiro, in collibus umbrosis siccis, May-Jul 1832, L. Riedel 389 (SYNTYPE: LE = F neg. 55705); BRAZIL. Rio de Janeiro: in silvaticis montis Corcovado prope Sebastianopolin," 1835, B. Luschnath s.n. (SYNTYPES: LE = F neg. 55706, M = F neg. 57589); BRAZIL. Rio de Janeiro, s.d., C. Beyrich s.n. (SYNTYPE: n.v.).

Distribution: Brazil (Rio de Janeiro). Stipules non-striate.

E. glaucocladum Peyr. in Mart., Fl. bras. 12(1): 154. 1878. TYPE: BRAZIL. Bahia: Villa do Nazaré [on CGE, K sheets; this locality ca. 13°02'S, 30°00'W], 1815–1817, F. Sellow s.n. (LECTOTYPE **here designated**: LE—annotated by Peyritsch = F neg. 53144; ISOTYPES: B, destroyed = F neg. 12631, F 752523 fragment ex B, BM = F neg. 56258, BR, CGE = F neg. 56835, K = F neg. 56504, NY = F neg. 55482, P-2, W).

E. NITIDUM Spreng.

The isotype at B was also the holotype of *Erythroxyllum nitidum* Spreng.

E. GLAUCUM O. E. Schulz in Engl., Pflanzenz. IV. 134: 96. 1907. TYPES: ECUADOR. Guayas: On sandy banks of Río Guayaquil, Dec 1845, W. Jameson 512 (LECTOTYPE designated by Plowman, 1989, p. 11: K = F neg. 55579; ISOLECTOTYPES: B, destroyed, BM-3, F, G-2 = F neg. 26397, LE); ECUADOR. Guayas: savannas at Balao, s.d., H. F. A. von Eggers 14569 (SYNTYPES: F, M = F neg. 19462); ECUADOR. El Oro: littoral of Santa Rosa, Dec, F. C. Lehmann 5101 (SYNTYPES: K = F neg. 55578).

E. cienaguense E. Machado.

Distribution: Ecuador (El Oro, Guayas, Imbabura, Manabí); Peru (Tumbes). Stipules non-striate.

E. glaucum var. *patiacum* O. E. Schulz, Rept. Spec. Nov. Regni Veg. 30: 179. 1932. TYPE: COLOMBIA. Cauca: Patía, s.d., *F. C. Lehmann B.T.820* (HOLOTYPE: NY = F neg. 55513; ISOTYPES: K = F neg. 56517, L = F neg. 57233).

E. HAUGHTII W. A. Gentner.

E. GLAZIOU O. E. Schulz in Engl., Pflanzenr. IV. 134: 103. 1907. TYPES: BRAZIL. Rio de Janeiro, s.d., *A. Glaziou 12470* (SYNTYPES**: B, destroyed = F neg. 12620, G—annotated by O. E. Schulz = F neg. 60933, LE, P-3); BRAZIL. Without locality, 1816, *Geyer s.n.* (SYNTYPE: LE = F neg. 55703).

Distribution: Brazil (Rio de Janeiro). Stipules non-striate.

E. gomphioides Planch. & Linden ex Triana & Planch., Ann. Sci. Nat. Bot., sér. 4, 18: 341. 1862. TYPES: VENEZUELA. Mérida: in savannas, 8000 ft, Jul 1843, *J. Linden 1418* (LECTOTYPE designated by Plowman, 1984, p. 137: P; ISOLECTOTYPES: BM, BR, CGE, F 633656 = F neg. 55557, F 1538286 fragment ex G, G-2, GENT, K = F neg. 55577, LE, OXF, P, W-2); COLOMBIA. Valle de Magdalena, s.d., *J. Goudot s.n.* (SYNTYPES: P-2 = F neg. 35192).

E. CITRIFOLIUM A. St.-Hil.

The elevation of "8000 ped." cited in the protologue is probably an error; the species normally occurs at elevations less than 1500 meters (Plowman & Berry, 1999).

E. GONOCLADOS (Mart.) O. E. Schulz in Engl., Pflanzenr. IV. 134: 122. 1907, "gonocladum." *E. microphyllum* var. *gonocladus* Mart.

Distribution: Brazil (Bahia, Minas Gerais, Paraná, Rio de Janeiro, Santa Catarina, São Paulo.) Stipules non-striate.

E. gonocladus var. *angustifolium* O. E.

Schulz in Engl., Pflanzenr. IV. 134: 124. 1907. TYPE: BRAZIL. São Paulo: Rio Grande between Santos and São Paulo, 1902, *M. Wacket s.n.* (LECTOTYPE **here designated**: W = F neg. 60014).

E. gonocladus var. *macrophyllum* O. E. Schulz in Engl., Pflanzenr. IV. 134: 123. 1907. TYPE: BRAZIL. São Paulo: Serra do Cubatão between São Paulo and Santos, Dec 1833, *L. Riedel 1803* (LECTOTYPE **here designated**: LE—annotated by O. E. Schulz = F neg. 55708; ISOLECTOTYPE: BR); BRAZIL. Minas Gerais: Serra Itacolomi, Aug 1824, *L. Riedel 349 pro parte* (SYNTYPE: LE = F neg. 55709); BRAZIL. Rio de Janeiro, 1883, *A. Glaziou 13589* (SYNTYPES: G, K, LE = F neg. 55710); BRAZIL. São Paulo: [from Pico da Serra de Cubatão, 1.5 mi toward São Paulo, ca. 23°51'S, 46°28'W, 22 Dec 1826], *W. J. Burchell 3730* (SYNTYPE: K = F neg. 55576; sheet at LE is not *Erythroxyllum*); BRAZIL. São Paulo: [from Pico da Serra de Cubatão, 1.5 mi toward São Paulo, ca. 23°51'S, 46°28'W, 22 Dec 1826], *W. J. Burchell 3763* (SYNTYPE: K = F neg. 55575); BRAZIL. No locality or date. *F. Sellow C.1353* (SYNTYPE: n.v.) [*Riedel 349* is a mixed collection with the typical variety, according to Schulz.]

E. gonocladus var. *serpyllifolium* (Peyr.) O. E. Schulz in Engl., Pflanzenr. IV. 134: 123. 1907. *E. microphyllum* f. *serpyllifolium* Peyr.

E. goyazense Taub., Bot. Jahrb. Syst. 21: 440. 1896, "goyazensis." TYPE: BRAZIL. Goiás: Meiaponte, Aug 1892, *E. Ule 2772* (HOLOTYPE: B, destroyed; ISOTYPES: with no. 188, P-2 = F neg. 58458 & 58459).

E. DECIDUUM A. St.-Hil.

E. GRACILIPES Peyr. in Mart., Fl. bras. 12(1): 159. 1878. TYPE: VENEZUELA. Amazonas, Rio Casiquiare prope San Carlos, Aug 1853, *R. Spruce 3068* (LECTOTYPE designated by Plowman, 1984, p. 138:

BR; ISOTYPES: BM, K = F neg. 55574, MPU, P-2, S, W-2).

E. cuatrecasii W. A. Gentner, *E. novogranatense* var. *macrophyllum* O. E. Schulz (Plowman 1989), *E. recurrens* Huber.

Distribution (*E. gracilipes* var. *gracilipes*): Bolivia (Beni/Pando, Santa Cruz*); Brazil (Amazonas, Mato Grosso, Pará, Rondônia); Colombia (Amazonas, Antioquia, Caquetá, Chocó, Meta, Norte de Santander, Nariño, Putumayo, Valle); Ecuador (Morona-Santiago, Napo, Pastaza, Zamora); French Guiana; Guyana; Peru (Huánuco, Loreto, Madre de Dios); Venezuela (Amazonas, Apure, Barinas, Bolívar, Delta Amacuro, Distrito Federal, Guárico, Mérida, Miranda, Táchira, Zulia). Stipules non-striate.

E. GRACILIPES var. EXAREOLATUM O. E. Schulz in Engl., Pflanzenr. IV. 134: 83. 1907. TYPE: BRAZIL. Amazonas: forests at Ega [Tefe], Dec 1819, *C. Martius s.n.* (HOLOTYPE: M = F neg. 19463).

Distribution: Brazil (Amazonas). Stipules non-striate.

The type is an excluded syntype of *Erythroxylum mamacoca* Mart.

E. GRANDIFOLIUM Peyr. in Mart., Fl. bras. 12(1): 161. 1878. TYPE: BRAZIL. "In silvis prope Esperança prov. Rio de Janeiro" [but probably from Ilhéus, Bahia], May 1822, *L. Riedel 774* (HOLOTYPE: LE = F neg. 57601; ISOTYPES: B, destroyed, LE = F neg. 55707). [Collector not cited by Peyritsch.]

Distribution: Brazil (Bahia). Stipules non-striate.

?E. GRISEBACHII Peyr. in Mart., Fl. bras. 12(1): 161. 1878. *E. coelophlebium* var. *grisebachii* (Peyr.) O. E. Schulz. TYPE: SURINAME. "Lava-Flusse," Nov, A. Kappler 2113 (ISOTYPES: L = F neg. 57235, P-2 = F neg. 58460, W-2).

Distribution: Suriname. Stipules non-striate.

This is a possible synonym of *Erythroxylum kapplerianum* Peyr.

E. GUANCHEZII Plowman, Brittonia 40(3): 261. 1988. TYPE: VENEZUELA. Amazonas: "Esmeralda ad flumen Orinoco," Dec 1853 (fr), *R. Spruce 3251* (HOLOTYPE: GH = F neg 61065; ISOTYPES: CGE, E, F 837989 (fragment ex W), F 1537761 = F neg 61064, G, GH, K, LE, MG, NY, RB 131604, W).

Distribution: Venezuela (Amazonas). Stipules non-striate.

E. GUATEMALENSE Lundell, Wrightia 4(6): 176. 1971. TYPE: GUATEMALA. Dept. Izabal: Puerto Méndez, Ciénaga, in high forest bordering the river, 23 May 1970, *E. Contreras 9875* (HOLOTYPE: LL = F neg. 57368; ISOTYPES: DUKE 225218 = F neg. 55515, F 1967980 = F neg. 61361, MICH).

Distribution: North America: Mexico (Campeche Chiapas, Tabasco). Central America: Belize, El Salvador, Guatemala, Honduras, Nicaragua. Stipules non-striate.

E. HAMIGERUM O. E. Schulz in Engl., Pflanzenr. IV. 134: 23. 1907. TYPE: BRAZIL. Bahia: Ilhéus, 1836, *J. S. Blanchet 2335* (SYNTYPES**: B, destroyed?, BM, F 1538104 = F neg. 55488, G-2 = F neg. 26399, K, M, NY, OXF = F neg. 60336, P, W); BRAZIL. Bahia: Castelnovo, s.d., *L. Riedel 388* (SYNTYPE: M = F neg. 57590); BRAZIL. Bahia: Castelnovo, in silvis, Nov 1821, *L. Riedel 427* (SYNTYPES: BR = F neg. 58515, F 1988065 = F neg. 62220 GH, K, LE-3 = F neg. 55729, P-3, US 13869 = F neg. 55487, W-2).

Distribution: Brazil (Bahia). Stipules striate.

The collection number *L. Riedel 388* has been applied to two collections from different localities, the above cited syntype, as well as the type collection of *Erythroxylum ellipticum*.

E. hardinii E. Machado, Anales Ci. 7(1-2): 14, unnumbered fig., p. 15. 1969. TYPE: PERU. San Martín: Quebradas de Crisnejas cerca del pueblo de Uchiza, apar-

entamente en el lugar y sitios aledaños se cultivo hace mucho tiempo, 15 Feb 1965, *E. Machado 1256* (HOLOTYPE: US 2803917 = F neg. 55486; ISOTYPES: MOL, NCSC).

E. NOVOGRANATENSE var. *TRUXILLENSE* (Rusby) Plowman.

The protologue was reprinted in Machado's treatment of Peruvian *Erythroxylum* (Machado, 1972: 61, t. 12).

E. hasslerianum Chodat, Bull. Herb. Boissier 6, Appendix 1: 15. 1898. TYPE: PARAGUAY. Cordillera de Altos, Oct 1898, *E. Hassler 3308* (SYNTYPES**): G?, K = F neg. 55573, NY = F neg. 55518, P, W); PARAGUAY. Cordillera de Altos, Jan 1898, *E. Hassler 2988* (SYNTYPES: A = F neg. 55517, K = F neg. 55572, S, W).

E. DECIDUUM A. St.-Hil.

E. hasslerianum f. *angustifolium* Chodat & Hassl., Bull. Herb. Boissier, sér. 2, 4: 1288. 1904, "angustifolia." TYPE: PARAGUAY. In dumetis prope Tobaty, Sep 1900, *E. Hassler 6151* (HOLOTYPE: G = F neg. 60934; ISOTYPE: NY = F neg. 55516).

Treated by Loiola (2001) as a synonym of *Erythroxylum deciduum* A. St.-Hil.

?*E. hasslerianum* f. *ellipticum* Chodat & Hassl., Bull. Herb. Boissier, sér. 2, 4: 1288. 1904, "elliptica." TYPE: PARAGUAY. In campo San Blas (Yeruti), Dec 1898–1899, *E. Hassler 5773* (HOLOTYPE: G = F neg. 49606; ISOTYPES: F = F neg. 59670, G–2, NY = F neg. 57821).

E. PACHYNEURUM O. E. Schulz?

Synonymy was not indicated in Plowman's manuscript; however, the type is the same number as a syntype of *Erythroxylum pachyneurum* O. E. Schulz.

E. HAUGHTII W. A. Gentner, J. Wash. Acad. Sci. 47: 6, fig. 4. 1957. TYPE: COLOMBIA. Cauca: Near Mercaderes, 1100 m, 27 Oct 1946, *O. Haught 5143* (HOLOTYPE: US).

E. glaucum var. *patiacum* O. E. Schulz.

Distribution: Colombia (Cauca, Huila, Valle). Stipules non-striate.

E. HAVANENSE Jacq., Enum. syst. pl. 21. 1760. TYPE: CUBA. No specimen known. NEOTYPE designated by Plowman, 1988b, p. 545, incorrectly designated as a lectotype: Jacq., Select. Stirp. Amer. Hist. t. 87, fig. 2. 1763.

E. chiapense Lundell, *E. havanense* var. *continentis* O. E. Schulz, *E. obtusum* DC., *E. ovatum* Cav., *E. ovatum* var. *splendens* O. E. Schulz.

Distribution: North America: USA (Florida); Mexico (Chiapas, Distrito Federal, Jalisco, Michoacán, Oaxaca, Sinaloa, Veracruz, Yucatán). Central America: Costa Rica, El Salvador, Honduras, Nicaragua, Panama. West Indies: Antigua, Cuba, Dominica, Grenada, Guadeloupe, Martinique, Montserrat, St. Kitts & Nevis, St. Lucia, St. Vincent & Grenadines, Turks & Caicos Isl. South America: Colombia (Atlántico, Bolívar, César, Magdalena); Guyana, Trinidad & Tobago; Venezuela (Anzoátegui, Aragua, Bolívar, Carabobo, Distrito Federal, Guárico, Lara, Mérida, Miranda, Nueva Esparta, Portuguesa, Sucre, Zulia). Stipules non-striate.

E. havanense var. *continentis* O. E. Schulz in Engl., Pflanzenr. IV. 134: 92. 1907. TYPES: COSTA RICA. "Bords des chemins et forets de Nicoya," Apr 1900, *A. Tonduz s.n. CR 13886* (LECTOTYPE designated by Plowman, 1988b, p. 545: K = F neg. 56503; ISOLECTOTYPES: B, destroyed?, G, LE); VENEZUELA. "Im Küstenlande," Caracas, Río Cotuche, 9 July 1891, *H. F. A. von Eggers 13325* (SYNTYPES: A, L = F neg. 57234; sheet at L labeled erroneously from Ecuador); COLOMBIA. Magdalena: Santa Marta region, Bonda, 150 ft, 18 Mar 1899, *H. H. Smith 1709 pro parte* = "1709A" (SYNTYPES: A, DUKE, F 138580 p.p. = F neg. 59662, F 1537763 = F neg. 59663, GH, MO, NY, US); COLOMBIA. Magdalena: Santa Marta region, 5 mi S of Mamatoco, 500 ft, 10 Apr 1899, *H. H. Smith 1709 pro parte* = "1709B" (SYNTYPES: A, DUKE, F 138580 p.p. = F neg. 59662, GH, NY, US).

E. HAVANENSE Jacq. (Plowman, 1988b, 1989).

The collection *H. H. Smith 1709* represents three different gatherings, distinguished by Plowman as *1709A*, *1709B*, and *1709C*, the last being *Erythroxylum cumansense* Kunth.

?*E. havanense* var. *haitiense* O. E. Schulz, Ark. Bot. 22A(8): 53. 1929. TYPE: HAITI. Massif du Nord prope Hinche in Morne Pedregal ad viam Carvajal, 400 m, 13 May 1926, *E. L. Ekman H 6099* (HOLOTYPE: S = F neg. 58443; ISOTYPES: K = F neg. 56506, LL).

E. BREVIPES DC.?

E. herzogii O. E. Schulz, Repert. Spec. Nov. Regni Veg. 7: 57. 1909. TYPE: BOLIVIA. Prov. Velasco, Misiones de Guarayos, "am Rand der Palmeninseln in der Pampa von Yaguarú," Aug 1907, *T. Herzog 456* (HOLOTYPE: B, destroyed; LECTOTYPE designated by Plowman, 1984, p. 137: Z = F neg. 58974).

E. ANGUIFUGUM Mart.

E. HONDENSE Kunth in Humb., Bonpl. & Kunth, Nov. gen. sp. 5, ed. f^o: 136; ed. 4^o: 176. 1822. TYPE: COLOMBIA. Tolima: Honda, 130 hex [235 m], May–Jun 1801, *Humboldt & Bonpland 1695* (HOLOTYPE: P = F neg. 35194; ISOTYPES: B-WILLD 8881 = B neg. 3922 = F neg. 12622, F 937279 fragment ex P, P-2 = F neg. 58462).

Distribution: Colombia (Antioquia, César, Cundinamarca, Huila, Magdalena, Norte de Santander, Tolima, Valle); Ecuador (Manabí); Venezuela (Falcón, Nueva Esparta, Zulia). Stipules non-striate.

+*E. HORRIDUM* Borhidi & Oviedo, Acta Bot. Acad. Sci. Hung. 22(3–4): 302. 1976 [1977]. TYPE: CUBA. Oriente [Holguin]: In fruticetis serpentinos aridis ad Ceja de Melones, prope opp. Holguin, 24 Sep 1975, *A. Borhidi, R. Capote, R. Oviedo (SV) 27791* (HOLOTYPE: SV–n.v.; ISOTYPE: BP–n.v.)

Distribution: Cuba. Stipule striation was not described in the protologue.

E. HYPOLEUCUM Plowman, Bot. Mus. Leaflet 29: 280. 1983. TYPE: VENEZUELA. Amazonas: 1 km al E de Maroa, 2°45'N, 67°35'W, 125 m, 20 Apr 1970, *J. A. Steyermark & G. Bunting 102807* (HOLOTYPE: F 1848445 = F neg. 59661; ISOTYPES: MO 2685581, VEN).

Distribution: Brazil (Amazonas); Venezuela (Amazonas). Stipules non-striate.

E. IMPRESSUM O. E. Schulz in Urban, Symb. antill. 5: 202. 1907. TYPES: TRINIDAD. 20 Apr 1877, *J. H. Hart 917* (LECTOTYPE designated by Plowman, 1984, p. 139: K = F neg. 55571); TRINIDAD. 13 Apr 1874, *O. Kuntze 919* (SYNTYPES: B, destroyed, NY = F neg. 55519).

Distribution: South America: Brazil (Amazonas); Colombia (Vichada); Guyana; Trinidad & Tobago; Venezuela (Amazonas, Bolívar). Stipules non-striate.

E. INCRASSATUM O. E. Schulz in Urb., Symb. antill. 5: 210. 1907. TYPES: JAMAICA. *O. Swartz s.n.* (SYNTYPES**: B, destroyed?, BM, S, UPS); JAMAICA. Moneague, 3 Jul 1850, *R. C. Alexander Prior s.n.* (SYNTYPES: GOET, K-2 = F neg. 55570).

Distribution: Jamaica. Stipules non-striate.

?*E. intermedium* Peyr. in Mart., Fl. bras. 12(1): 151. 1878. TYPES: BRAZIL. Rio de Janeiro, s.d., *A. Glaziou 1437* (SYNTYPES**: BR, GH–s.n. = F neg. 55520, P); BRAZIL. No locality or date, *F. Selow s.n.* (SYNTYPE: n.v.).

E. CUSPIDIFOLIUM Mart.?

E. JAMAICENSE Fawcett & Rendle, J. Bot. 55: 38. 1917. TYPE: JAMAICA. Clarendon Parish, Peckham Woods, 2500 ft, 28 Sep 1912, *W. Harris 11203* (HOLOTYPE: UCWI–n.v.; ISOTYPES: F 474804 = F neg. 55522, K = F neg. 55569, NY = F neg. 55521).

Distribution: Jamaica. Stipules non-striate.

E. KAPPLERIANUM Peyr. in Mart., Fl. bras. 12(1): 159. 1878. TYPE: SURINAME. Ad fl. Lava super, Nov, A. *Kappler 2116* (LECTOTYPE designated by Plowman, 1984, p. 139; M = F neg. 19464; ISOTYPES: F = F neg. 62197, L, P-2 = F negs. 58461 & 58463, W-2).

E. ligustrinum var. *grandifolium* Sagot; and possibly *E. coelophlebium* var. *grisebachii* (Peyr.) O. E. Schulz, *E. grisebachii* Peyr., *E. mapuerae* Huber.

Distribution: Brazil (Amapá, Amazonas, Pará, Rondônia); Colombia (Vaupés); French Guiana; Guyana; Suriname; Venezuela (Amazonas, Bolívar). Stipules non-tri-riate.

E. kirkianum O. E. Schulz, Repert. Spec. Nov. Regni Veg. 30: 179. 1932. TYPE: BRAZIL. Amazonas: Manaus, 25 m, 17 Oct 1929, E. P. Killip & A. C. Smith 30189 (HOLOTYPE: NY = F neg. 55524; ISOTYPES: F 616276 = F neg. 55523, US).

E. MUCRONATUM Benth.

E. kunthianum A. St.-Hil., Fl. bras. merid. 2, ed. 4^o: 96. 1829. TYPE: BRAZIL. Rio de Janeiro: Bois de l'Aqueduc, [1816], A. St. Hilaire cat. A'225 (LECTOTYPE **here designated**: P-annotated by St.-Hilaire, fragment on lower left corner of sheet, tagged "225" on stem, annotated on sheet as "*E. kunthianum* var. α "; ISOLECTOTYPES: MPU, fragment at upper left corner of sheet = F neg. 58980; P = F neg. 58541; P, fragment on left side of sheet = F neg. 58539). [Three of the four known specimens are mounted together with specimens of *E. passerinum* Mart. (see below).] Excluded SYNTYPE: BRAZIL. (Espírito Santo?): "Voyage au Rio Doce," s.d., A. St. Hilaire s.n. (MPU, fragments at upper right and lower left corners of sheet = F neg. 58980; P—annotated by St.-Hilaire, fragment at upper right corner of sheet, annotated on sheet as "*E. kunthianum* var. β "; P, fragment on right side of sheet = F neg. 58539; P = F neg. 58540) = *E. passerinum* Mart. [Three of the four specimens are mounted on the same sheet with A. St. Hilaire cat. A'225 (see above).] Excluded SYNTYPE: BRAZIL. Minas Gerais,

Fazenda de Bom Jardim, Minas Novas, May [1817], A. St. Hilaire cat. B'1469 (P—annotated by St.-Hilaire, P = F neg. 58542, MPU = F neg. 58981) = syntype of *E. macrocalyx* Mart.

E. FRANGULIFOLIUM A. St.-Hil.

It is not clear whether the material of *Erythroxylum passerinum* Mart., mounted on three mixed sheets with A. St. Hilaire Cat. A'225 (*E. frangulifolium*) represents a syntype, or a curatorial artifact. There are only two sheets at Paris bearing St. Hilaire's catalog numbers, Cat. A'225 as "*E. kunthianum*," and Cat. B'1469 as "*E. kunthianum* var. β " (now recognized as *E. macrocalyx*). The first, by implication, was probably intended to represent "var. α ," or the typical variety, but after the specimens were mounted (presumably after St.-Hilaire's time) it was realized that this was a mixed sheet, and someone (perhaps Weddell) annotated the two fragments separately on the sheet as "var. α " (*E. frangulifolium*) and "var. β " (*E. passerinum*). Whether this specimen of *E. passerinum* contributed to St. Hilaire's concept of *E. kunthianum* is not known. However, at least two of the specimens of *E. passerinum* bear tags reading "Voyage au Rio Doce," referring to St. Hilaire's expedition from Rio de Janeiro to Espírito Santo in August to November 1818. This is incompatible with the catalog numbers as well as the localities cited in the protologue and on the specimen labels (Dwyer, 1955).

E. kunthianum var. *angustifolium* Mart., Beitr. Erythroxyton 102. 1840. E. AFFINE A. St.-Hil. TYPE: As for *E. affine* A. St.-Hil.

E. kunthianum var. *subsessile* Mart., Beitr. Erythroxyton 102, t. 1, fig. 11. 1840. E. SUBSESSILE (Mart.) O. E. Schulz. TYPE: BRAZIL. Rio de Janeiro: In silvis prope Tinguá, s.d., H. W. Schott (or J. E. Pohl)(4418) (LECTOTYPE **here designated**: W = F neg. 40516; ISOLECTOTYPES: F 839265 = F neg. 55433, F 1988063 = F neg. 62201, NY = F neg. 55432, US 1690868 = F neg. 55434, W-2).

- E. LAETEVIRENS O. E. Schulz in Engl., Pflanzenr. IV. 134: 42. 1907. TYPE: BRAZIL. Bahia: Santo Antonio, "an sumpfigen Stellen," 1840, *J. S. Blanchet 3155* (HOLOTYPE: B, destroyed; LECTOTYPE designated by Plowman, 1984, p. 139: K = F neg. 55568; ISOTYPES: BM, F 1537820 = F neg. 55525, G-2 = F neg. 26400, OXF = F neg. 60341, W). [Note: The locality on sheets at F and G sheets is "Marais" and on BM sheet is "prope urbem Barra" (Barra do Rio Grande?), 1840.]
- Distribution: Brazil (Bahia, Ceará, Maranhão, Piauí). Stipules striate.
- E. LANCIFOLIUM Peyr. in Mart., Fl. bras. 12(1): 144. 1878. TYPE: BRAZIL. Rio de Janeiro: "Petropolis or Itamaraty," 1878?, *A. Glaziou 6486* (SYNTYPES*: B-annotated by O. E. Schulz, destroyed = F neg. 12624, G, K, LE = F neg. 57043, P-3, R 853); BRAZIL. Rio de Janeiro: "Petropolis or Itamaraty," 1883-1884, *A. Glaziou 14551* (SYNTYPES: B, destroyed, F 668116 = F neg. 55526, G, K = F neg. 55567, LE = F neg. 57044, NY, P-2 = F neg. 58464).
- Distribution: Brazil (Rio de Janeiro). Stipules non-striate.
- E. laurinum* Planch. & Linden ex Triana & Planch., Ann. Sci. Nat. Bot., sér. 4, 18: 341. 1862. TYPE: COLOMBIA. Llano de San Martín, Villavicencio, 400 m, Feb 1856, *J. J. Triana s.n.* (LECTOTYPE designated by Plowman, 1984, p. 140: BM; ISOTYPES: BM, BR, COL = US neg. 1316, G, K, P-2 = F neg. 58465).
- E. MACROPHYLLUM Cav. var. MACROPHYLLUM (Plowman, 1989).
- E. LEAL-COSTAE Plowman, Bot. Mus. Leaf. 29: 273. 1983. TYPE: BRAZIL. Bahia: Salvador, entre o Aeroporto e o Stella Maris, Dunas de Itapuã, 23 Mar 1975, *A. Leal Costa s.n.* (HOLOTYPE: ALCB; ISOTYPE: F 1871789 = F neg. 59660).
- Distribution: Brazil (Bahia). Stipules striate.
- E. LENTICELLOSUM Huber, Bol. Mus. Paranaense Hist. Nat. 5: 420. 1909. TYPE: BRAZIL. Pará: In regione fl. Ariramba ad ripas affluentis Jaramacará, 21 Dec 1906, *A. Ducke (MG) 8051* (HOLOTYPE: MG 8051 = F neg. 45846; ISOTYPE: RB 16611).
- Distribution: Brazil (Pará); Venezuela (Amazonas). Stipules non-striate.
- E. LEPTONEURUM O. E. Schulz in Engl., Pflanzenr. IV. 134: 101. 1907. TYPES: BRAZIL. Pará: Caripi, juxta Pará, Aug 1849, *R. Spruce (157)* (LECTOTYPE designated by Plowman, 1984, p. 139: M = F neg. 19465; ISOLECTOTYPES: B, destroyed, CGE, GH = F neg. 58416, W); BRAZIL. *C. Martius s.n.* (SYNTYPE: M = F neg. 57585); BRAZIL. Goiás: Natividade, Nov 1839, *G. Gardner 3049* (SYNTYPE: K = F neg. 55469); BRAZIL. *M. Newman s.n.* (SYNTYPE: G = F neg. 59994).
- Distribution: Brazil (Amapá?, Goiás, Maranhão, Mato Grosso, Pará, Rondônia); French Guiana. Stipules non-striate.
- E. LIGUSTRINUM DC., Prodr. 1: 574. 1824. TYPE: FRENCH GUIANA. "Cayenne," 1766-1769, *Patris s.n.* (HOLOTYPE: G-DC; ISOTYPES: G, P = F neg. 58469).
- Distribution (E. LIGUSTRINUM var. LIGUSTRINUM): Brazil (Amapá, Maranhão, Pará); French Guiana; Venezuela (Amazonas). Stipules non-striate.
- Plowman (1984: 118) emended the description of this species.
- E. LIGUSTRINUM var. CARAJASENSE Plowman, Supl. Acta Amazonica 14(1/2): 122, fig. 2. 1984. TYPE: BRAZIL. Pará: Serra dos Carajás, Serra Norte, ca. 25 km E of AMZA Exploration Camp, ca. 6°S, 50°15'W, 16 Oct 1977, *C. C. Berg & A. J. Henderson BG 572* (HOLOTYPE: MG 59147; ISOTYPES: F 1774552 = F neg. 59668, NY, RB 195074, UEC 4459).
- Distribution: Brazil (Pará). Stipules non-striate.

- E. ligustrinum* var. *grandifolium* Sagot, Ann. Sci. Nat. Bot., sér. 6, 11: 179. 1881. TYPE: FRENCH GUIANA. "In sylvis Maroni, insula Portal" [Portal Island], Jul 1857, *P. Sagot s.n.* (LECTOTYPE designated by Plowman, 1984, p. 139: P = F neg. 58527; ISOTYPES: K, P-3 ("1098"), W = F neg. 60013).
- E. KAPPLERIANUM* Peyr.
- E. lindelianum* Urb., Repert. Spec. Nov. Regni Veg. 18: 113. 1922. TYPE: CUBA. Oriente: Sierra de Nipe in charrascales ad Rio Canapú, 25 Feb 1915, *E. L. Ekman 4766* (HOLOTYPE: B, destroyed; ISOTYPES: NY (sterile), S = F neg. 58444).
- E. CORIACEUM* Britton & P. Wilson.
- E. LINDEMANII* Plowman, Phytologia 58: 172, fig. 1. 1985. TYPE: VENEZUELA. Amazonas: Depto. Atures, 51 km NNE of Puerto Ayacucho along the road to El Burro, laja near La Esperanza, ca. 100 m, 5°59'N, 67°22'W, 21 Apr 1978 (fl), *G. Davidse & O. Huber 15450* (HOLOTYPE: F 1895307 = F neg. 60880; ISOTYPES: MO 2713735, VEN 133958).
- Distribution: Colombia (Guainía); Guyana; Suriname; Venezuela (Amazonas). Stipules striate.
- E. LINEOLATUM* DC., Prodr. 1: 575. 1824. TYPE: FRENCH GUIANA. "Cayenne," s.d., *Patris s.n.* (HOLOTYPE: G-DC = F neg. 8013; ISOTYPES: G = F neg. 60927, P? = F neg. 60947, collector not cited).
- Distribution: Colombia (Antioquia); French Guiana; Guyana; Suriname; Trinidad & Tobago; Venezuela (Amazonas, Aragua, Barinas, Bolívar, Carabobo, Sucre). Stipules non-striate.
- E. lineolatum* var. *sanctae-martae* O. E. Schulz, Repert. Spec. Nov. Regni Veg. 30: 180. 1932. TYPE: COLOMBIA. Magdalena: Santa Marta region, 6 mi NE of Masinga, 2500 ft, 28 Mar 1898-1901, *H. H. Smith 845* (HOLOTYPE: B, destroyed; ISOTYPES: A, CM, F 137841 = F neg. 55491, G, GH, MICH, MO 1886702, MPU, NY = F neg. 55490, P-2, US, WIS).
- E. DENSUM* Rusby.
- The isotype at NY is also the holotype of *Erythroxyllum densum*.
- E. LOEFGRENII* Diogo, Bol. Mus. Nac. Rio de Janeiro 1: 30. 1923. TYPE: BRAZIL. Ceará: Without locality, 14 Mar 1918, A. Löfgren 292 (HOLOTYPE: R 5563 = F neg. 57477).
- Distribution: Brazil (Bahia, Ceará, Minas Gerais). Stipules non-striate.
- E. LONGIPES* O. E. Schulz in Urb., Symb. antill. 5: 195. 1907. TYPE: CUBA. Without locality, 1860-1864, *C. Wright 2137* (HOLOTYPE: B, destroyed; ISOTYPES: G, GOET, K, MO 2180220 = F neg. 55485, NY fragment, P).
- Distribution: Cuba. Stipules non-striate.
- E. LORETENSE* Plowman, Candollea 43(1): 421, fig. 1. 1988. TYPE: PERU. Loreto: Prov. de Maynas, Caño Yarina, Reserva Nacional de Pacaya, Río Pacaya (Río Ucayali), 24 Mar 1977, *F. Encarnación 1075* (HOLOTYPE: F 1949368 = F neg. 62533; ISOTYPES: K, F 1969394 = F neg. 62532, NY, US 2905577).
- Distribution: Brazil (Amazonas, Pará); Peru (Loreto). Stipules non-striate.
- E. lucidum* Kunth in Humb., Bonpl. & Kunth, Nov. gen. sp. 5, ed. f°: 138; ed. 4°: 179. 1822. TYPE: COLOMBIA. [Tolima or Cundinamarca?:] Between La Mesa and Honda, 140 hex [250 m], Jun 1801, *Humboldt & Bonpland 1714* (HOLOTYPE: P; ISOTYPES: B-WILLD 8887 = B neg. 3938 = F neg. 12626, F 937296 fragment, P-2 = F neg. 58529 & 58530).
- E. MACROPHYLLUM* Cav. var. *MACROPHYLLUM* (Plowman, 1989).
- E. lucidum* var. *costaricense* (Donn. Sm.) O. E. Schulz in Engl., Pflanzenr. IV. 134: 25. 1907. *E. costaricense* Donn. Sm.
- E. MACROPHYLLUM* Cav. (Plowman, 1991).

E. luculentum J. F. Macbr., *Candollea* 5: 372. 1934. TYPE: PERU. Loreto [on border with COLOMBIA. Amazonas]: La Victoria on the Amazon River, 24 Aug 1928, *Ll. Williams* 2788 (HOLOTYPE: F 608726 = F neg. 52563; ISOTYPE: G fragment).

E. ANGUIFUGUM Mart.

E. LYGOIDES O. E. Schulz in Engl., *Pflanzenr.* IV. 134: 46. 1907. TYPE: BRAZIL. Rio de Janeiro: Barreto at Praia Grande, 26 Sep 1872, *A. Glaziou* 6110 (HOLOTYPE: B, destroyed; ISOTYPES: C = F neg. 21474, K = F neg. 55742, P-2).

Distribution: Brazil (Rio de Janeiro, São Paulo). Stipules striate.

The type was also cited by Schulz as a syntype of *Erythroxylum citrifolium* var. *minus*. Either Schulz erred or there are two elements distributed under this number.

E. MACROCALYX Mart., *Beitr. Erythroxylon* 104, t. 8. 1840. TYPES: BRAZIL. Bahia: "In silvis prope villam S. Georgii Insulanorum," Jan 1819, *C. Martius s.n.* (LECTOTYPE **here designated**: M = F neg. 19466); BRAZIL. Minas Gerais: "in pascuis prope praedium vulgo Fazenda de Bom Jardim in parte Minas Gerais dicta Minas Novas," May, *A. St. Hilaire cat. B¹1469* (SYNTYPES: P-2 = F neg. 58542, MPU = F neg. 58981)

Distribution: Brazil (Bahia, Minas Gerais). Stipules striate.

E. MACROCHAETUM Miq., *Linnaea* 22: 798. 1849. TYPE: BRAZIL. Bahia: Jacobina, 1845 (1842, BM; 1843, G), *J. S. Blanchet* 3572 (ISOTYPES: B?, destroyed, BM, BR, C = F neg. 21475, F 1537804 = F neg. 55543, F 1537805 = F neg. 59659, G-2, K-2, LE = F neg. 57050, M, MO 1886685, P-3, W).

E. macrochaetum var. *zehntneri* O. E. Schulz, *E. zehntneri* Diogo.

Distribution: Brazil (Bahia, Minas Gerais, Pernambuco). Stipules non-striate.

E. macrochaetum var. *zehntneri* O. E.

Schulz, *Notizbl. Bot. Gart. Berlin-Dahlem* 76: 426. 1923. TYPE: BRAZIL. Bahia: Caeteté, Nov 1912, *P. von Lützelburg* 4049 (= *L. Zehntner* 622) (HOLOTYPE: M = F neg. 57574; ISOTYPE: R 70665 = F neg. 57480).

E. MACROCHAETUM Miq.

Synonymy was not indicated by Plowman, but the isotype is also the holotype of *Erythroxylum zehntneri* Diogo, which he referred to *E. macrochaetum*.

E. macrocnemium Mart., *Beitr. Erythroxylon* 122, t. 1, fig. 13. 1840. *E. MACROPHYLLUM* var. *MACROCNEMIUM* (Mart.) Plowman. TYPE: PERU. Huánuco: Cuchero, "in silvis," 1829, *E. Poeppig* (46) (LECTOTYPE designated by Plowman, 1984, p. 140: W = F neg. 60012; ISOTYPES: LE = F neg. 57023, W).

E. MACROPHYLLUM Cav., *Diss.* 401, t. 227. 1789. TYPE: FRENCH GUIANA. "Cayenne," s.d., *Stoupy s.n.* (HOLOTYPE: MA = F neg. 29348).

E. costaricense Donn. Sm., *E. ellipticum* Ramírez, *E. filipes* Huber, *E. floribundum* Mart., *E. laurinum* Planch. & Linden ex Triana & Planch., *E. lucidum* Kunth, *E. lucidum* var. *costaricense* (Donn. Sm.) O. E. Schulz, *E. tabascense* Britton.

Distribution (including *E. macrophyllum* var. *macrophyllum* and material with no variety indicated): Central America: Mexico (Chiapas, Oaxaca, Tabasco, Veracruz); Belize, Costa Rica, Guatemala, Honduras, Nicaragua, Panama. West Indies: Grenada. South America: Bolivia (Beni, Cochabamba*, La Paz, Pando, Santa Cruz); Brazil (Acre, Amapá, Amazonas, Bahia, Goiás, Maranhão, Mato Grosso, Pará, Rondônia, Roraima); Colombia (Amazonas, Antioquia, Caquetá, Chocó, Cundinamarca, Magdalena, Meta, Norte de Santander, Tolima, Valle); Ecuador (Morona-Santiago, Napo, Pastaza); French Guiana; Guyana; Peru (Amazonas, Cuzco, Huánuco, Junín, Loreto, Madre de Dios, Pasco, Puno*, San Martín, Ucayali); Suriname; Venezuela (Amazonas, Aragua, Barinas, Carabobo, Bolívar, Mérida, Miranda, Portuguesa, Sucre, Táchira, Yaracuy, Zulia). Stipules striate.

Erythroxylum macrophyllum Cav. is a polymorphic species which Plowman (1989, 1991) felt needed much more study. For further discussion, see *E. skutchii* Standl.

E. MACROPHYLLUM var. ECUADORENSE Plowman in G. Harling & L. Andersson, eds., Fl. Ecuador 36: 18, fig. 2. 1989. TYPE: ECUADOR. Pastaza: Curaray (Jesús Petishka), virgin rainforest near military post, ca. 200 m, 18 Mar 1980, G. Harling & L. Andersson 17375 (HOLOTYPE: GB = F neg. 40517; ISOTYPES: F = F neg. 62670, QCA).

Distribution: Ecuador (Napo, Pastaza). Stipules striate.

E. MACROPHYLLUM var. MACROCNEMIUM (Mart.) Plowman, Candollea 43(1): 429. 1988. *E. macrocnemium* Mart.

Distribution: Peru (Amazonas, Huánuco, Loreto, Pasco, San Martín). Stipules striate.

E. MACROPHYLLUM var. SAVANNARUM Plowman, Brittonia 40(3): 263, figs. 5–7. 1988. TYPE: VENEZUELA. Amazonas: Road NE from Puerto Ayacucho towards El Burro, 36.5 km from Puerto Ayacucho, 28 Apr 1984, T. Plowman & F. Guánchez 13757 (HOLOTYPE: F 1934047 = F neg 25046; ISOTYPES: B, CAY, COL, F, G, GB, GH, K, MA, MG, MO, MY, NY, P, TFAV, U, UC, US, VEN).

Distribution: Colombia (Meta, Vichada); Venezuela (Amazonas, Apure, Bolívar). Stipules striate.

E. MAGNOLIIFOLIUM A. St.-Hil., Fl. bras. merid. 2, ed. 4^o: 93. 1829. TYPE: BRAZIL. Rio de Janeiro: Tagoahay, May [1821 or 1822], A. St. Hilaire cat. D 808 (HOLOTYPE: P = F neg. 58531; ISOTYPES: MPU = F neg. 58982, P).

E. ficifolium Peyr.

Distribution: Brazil (Rio de Janeiro). Stipules non-striate.

E. MAMACOCA Mart., Beitr. Erythroxylon

85. 1840. TYPES: PERU. Huánuco: Cuchero, sylvae saxosae, Feb 1830, *E. Poeppig* (1760) [LECTOTYPE **here designated**: W = F neg. 60003; ISOLECTOTYPES: F 839225 = F neg. 55527, W (year as 1829)]. [Protologue: "In silvis Prov. Maynas calidis udiusculis, nec non prope Egam, oppidulum brasiliense in Prov. Rio Negro juxta fluvium Amazonum situm. In Maynas cl. Poeppigius legit."] Excluded SYNTYPE: BRAZIL. Amazonas: forests at Ega [Tefe], Dec 1819, C. Martius s.n. (M = F neg. 19463) = holotype of *E. gracilipes* var. *exareolatum* O. E. Schulz.

Distribution: Peru (Huánuco). Stipules non-striate.

The protologue citation from Prov. Maynas (now Prov. Loreto) is presumably erroneous. Although Martius did not cite a collection number, Peyritsch (1878) cited *Poeppig 1760*, with the same locality data as the protologue. However, both duplicates at W are labeled "Cuchero" and one is annotated *Erythroxylum mamacoca* Mart. in what appears to be Martius's handwriting.

E. mapuerae Huber, Bol. Mus. Paraense Hist. Nat. 5: 421. 1909. TYPE: BRAZIL. Pará: Rio Mapuera, "in silvis ripariis ad cataractas 'da Escola' nuncupatas," 2 Dec 1907, A. Ducke (MG) 9007 (HOLOTYPE: MG 9007 = F neg. 45843; ISOTYPES: B, destroyed = F neg. 12629, F 602727 fragment ex MG, RB 20437).

E. KAPPLERIANUM Peyr.

E. MARACASENSE Plowman, Fieldiana, Bot., n.s., 19: 8, fig. 4. 1987. TYPE: BRAZIL. Bahia: Mun. Maracás, rd BA-026, 15 km SW de Maracás, 17 Nov 1978, S. A. Mori, T. S. dos Santos & C. B. Thompson 11120 (HOLOTYPE: CEPEC 15262; ISOTYPES: F 1861962 = F neg. 60124, K, NY, RB).

Distribution: Brazil (Bahia, Goiás, Minas Gerais). Stipules striate.

E. MARTII Peyr. in Mart., Fl. bras. 12(1): 160. 1878. TYPES: BRAZIL. Bahia: Ilhéus, in sylvis aboriginibus, 1835–1837, B.

Luschnath s.n. = *Herb. Fl. Bras.* 679 (LECTOTYPE **here designated**: BR—annotated by Peyritsch; ISOLECTOTYPES: B, destroyed = F neg. 12630, BM, F 838050 fragment ex W, GH = F neg. 55483, K, L, M, NY = F neg. 55484, W-2); BRAZIL. Bahia, 1834 (G), *J. S. Blanchet 1827* (SYNTYPES: F 1537758 = F neg. 55544, G, MO 1886700, NY, P = F neg. 58532).

Distribution: Brazil (Bahia). Stipules non-striate.

E. MATTOS-SILVAE Plowman, *Fieldiana, Bot.*, n.s., 19: 12, fig. 6. 1987. TYPE: BRAZIL. Bahia: Mun. Ilhéus, ramal novo para o povoado da Vila Brasil, com entrada no Km 28 da rd Ilhéus-Una, início do ramal (Km 3), lado direito, 13 Jan 1985, *L. A. Mattos Silva, D. Daly & T. S. dos Santos 1817* (HOLOTYPE: CEPEC 35860; ISOTYPES: F 1943448 = F neg. 60194, HRB, MBM, NY, RB).

Distribution: Brazil (Bahia). Stipules striate.

E. MEMBRANACEUM Plowman, *Fieldiana, Bot.*, n.s., 19: 17, fig. 9. 1987. TYPE: BRAZIL. Bahia: Mun. Aurelino Leal, rd Ubaitaba-Lages [Lage do Banco], 8 km de Ubaitaba, 24 Apr 1965, *R. P. Belém & M. Magalhães 932* (HOLOTYPE: CEPEC 1057 = F neg. 60130; ISOTYPES: F 1622274 = F neg. 60188, IAN 119424, NY UB).

Distribution: Brazil (Bahia). Stipules striate.

E. MEXICANUM Kunth in Humb., *Bonpl. & Kunth, Nov. gen. sp.* 5, ed. f^o: 137; ed. 4^o: 178. 1822. TYPE: MEXICO. Guerrero: Chilpancingo, 700 hex [1260 m], Apr, *Humboldt & Bonpland s.n.* (HOLOTYPE: P = F neg. 35198; ISOTYPES: B-WILLD 8883 = B neg. 3924, F 937347 fragment, F 982709 fragment, P = F neg. 58533).

Distribution: North America: Mexico (Chiapas, Guerrero, Jalisco, México, Michoacán, Nayarit, Oaxaca, Sinaloa, Sonora,

Tamaulipas, Veracruz). Central America: Costa Rica, El Salvador, Nicaragua, Panama. Stipules non-striate.

Placed in synonymy of *Erythroxyllum havanense* Jacq. by D'Arcy & Schanen (1975), but not by Plowman (1991).

E. micranthum Bong. ex Peyr. in *Mart., Fl. bras.* 12(1): 164, t. 30, fig. 1. 1878. TYPE: BRAZIL. Pará: Santarem, "in campis siccis," Nov 1828, *L. Riedel 1537* (LECTOTYPE designated by Plowman, 1984, p. 137: LE = F neg. 57037; ISOTYPES: BR = F neg. 58505, LE?, s.n. = F neg. 57021, OXF).

E. CITRIFOLIUM A. St.-Hil.

E. MICROPHYLLUM A. St.-Hil., *Fl. bras. merid.* 2, ed. 4^o: 100, t. 103. 1829. TYPES: BRAZIL. São Paulo: São Paulo, [Sep 1819–May 1820], *A. St. Hilaire cat. C'1118* (LECTOTYPE **here designated**: P = F neg. 58534); BRAZIL. Minas Gerais: Villa Rica (Ouro Preto), [Dec 1816–Mar 1818], *A. St. Hilaire cat. B'158* (SYNTYPES: P = F neg. 58457; F 982711 fragment ex P, MPU = F neg. 58983); BRAZIL. Minas Gerais: Itambé, *A. St. Hilaire s.n.* (SYNTYPE: P); BRAZIL. Minas Gerais: Serra de Caraça, *A. St. Hilaire s.n.* (SYNTYPE: P).

E. microphyllum var. *angustifolium* Mart., *E. pusillum* Fern. Casas.

Distribution: Argentina (Chaco, Corrientes, Misiones); Brazil (Minas Gerais, Paraná, Rio Grande do Sul, Rio de Janeiro, Santa Catarina, São Paulo); Paraguay (Alto Paraná*, Caaguazú). Stipules non-striate.

The lectotype, *A. St. Hilaire cat. C'1118*, corresponds to "var. α " of *St. Hilaire*; the other syntypes correspond to his "var. β ."

E. microphyllum var. *amplifolium* Mart., *Beitr. Erythroxyllum* 64, t. 3. 1840. *E. amplifolium* (Mart.) O. E. Schulz non Bailon 1866. TYPE: BRAZIL. No locality or date, *F. Sellow s.n. [1366 at B]* (ISOTYPES: B, G, LE, M, second fragment from left on mixed sheet = F neg. 57600, P = F neg. 58472, W = F neg. 60030). [Number on M sheet is Sellow (48).]

E. VACCINIIFOLIUM Mart.

E. microphyllum var. *angustifolium* Mart., Beitr. Erythroxyton 63. 1840. TYPE: BRAZIL. São Paulo, São Paulo, [Sep 1819–May 1820], A. St. Hilaire cat. C'1118 (HOLOTYPE: P = F neg. 58534).

E. MICROPHYLLUM A. St.-Hil.

The holotype of var. *angustifolium* is also designated above as the lectotype of *Erythroxyton microphyllum*.

E. microphyllum var. *cuneifolium* Mart., Beitr. Erythroxyton 63. 1840. E. CUNEIFOLIUM (Mart.) O. E. Schulz. TYPES: BRAZIL. São Paulo, 1817–1818, C. Martius s.n. (SYNTYPE: M, fragment on right side of sheet = F neg. 19453, not annotated by Martius); BRAZIL. São Paulo, s.d., F. Sellow (1140) (SYNTYPES: G, P).

E. microphyllum var. *gonoclados* Mart., Beitr. Erythroxyton 63. 1840. E. GONOCLODOS (Mart.) O. E. Schulz. TYPES: BRAZIL. Minas Gerais: Villa Rica (Ouro Preto), A. St. Hilaire cat. B'158 (LECTOTYPE **here designated**: P = F neg. 58457; ISOLECTOTYPES: F 982711 fragment ex P, MPU = F neg. 58983); BRAZIL. Minas Gerais: Itambé, A. St. Hilaire s.n. (SYNTYPE: G-DEL = F neg. 26396, P); BRAZIL. Minas Gerais: Serra de Caraça, A. St. Hilaire s.n. (SYNTYPE: P). [One unnumbered St. Hilaire collection at NY, without locality data but presumably a syntype = F neg. 58471.]

Martius based his taxon on *Erythroxyton microphyllum* “var. β” A. St.-Hil. The syntype collected at Itambé is also the lectotype of *E. microphyllum* f. *serpyllifolium* Peyr.

E. microphyllum f. *lancifolium* Peyr. in Mart., Fl. bras. 12(1): 134. 1878, “lancifolia.” *E. amplifolium* f. *lancifolium* (Peyr.) O. E. Schulz. TYPE: BRAZIL. Illustration of *E. microphyllum* var. *amplifolium* Martius, Beitr. Erythroxyton, t. 3. 1840.

E. VACCINIIFOLIUM Mart.

Peyritsch equated his taxon with *Eryth-*

roxylum microphyllum var. *amplifolium* subvar. “***” Mart., and cited Martius’s illustration of the variety. Martius’s description of subvar. “***” suggests that he considered it the typical form of his var. *amplifolium*.

[*E. microphyllum* “f. lucida squamata” Peyr. in Mart., Fl. bras. 12(1): 134. 1878.]

According to Arts. 24.2 and 23.6 (c), Ex. 15 of the ICBN (Greuter et al., 2000), infraspecific epithets formed of two adjectives in the nominative are not to be regarded as names.

?*E. microphyllum* f. *myrtilloides* Peyr. in Mart., Fl. bras. 12(1): 134. 1878. *E. amplifolium* var. *myrtilloides* (Peyr.) O. E. Schulz. TYPE: BRAZIL. Minas Gerais: Lagoa Santa, 13 Aug 1863, E. Warming s.n. (LECTOTYPE **here designated**: P; ISOLECTOTYPES: GH, NY).

E. CUNEIFOLIUM (Mart.) O. Schulz?

The isolectotype sheet at NY was annotated by Peyritsch as “*Erythroxyton cuneifolium* f. *myrtilloides*.” Peyritsch equated this taxon with Martius’s “*E. microphyllum* var. *amplifolium* Mart. “subvar. *.”

E. microphyllum f. *reticulatum* (Mart.) Peyr. in Mart., Fl. bras. 12(1): 134. 1878, “reticulata.” *E. microphyllum* var. *reticulatum* Mart.

Treated by Schulz (1907) as a synonym of *Erythroxyton amplifolium* (Mart.) O. E. Schulz, non Baillon.

E. microphyllum var. *reticulatum* Mart., Beitr. Erythroxyton 64. 1840. *E. microphyllum* f. *reticulatum* (Mart.) Peyr. TYPE: Not determined.

E. microphyllum f. *serpyllifolium* Peyr. in Mart., Fl. bras. 12(1): 134. 1878, “serpyllifolia.” *E. gonoclados* var. *serpyllifolium* (Peyr.) O. E. Schulz. TYPES: BRAZIL. Minas Gerais: Itambé, A. St. Hilaire s.n. (LECTOTYPE **here designated**: G-DEL = F neg. 26396; ISOLECTOTYPE: P); BRA-

ZIL. São Paulo: Itu, Jan 1826, in umbrosis siccis, *L. Riedel* E (SYNTYPES: BR, LE = F neg. 55713).

The lectotype is also a syntype of *Erythroxyllum microphyllum* var. *gonoclados* Mart.

+*E. microphyllum* f. *suberosum* Peyr. in Mart., Fl. bras. 12(1): 134. 1878, "suberosa." TYPE: Not determined.

Treated by Schulz (1907) as a "species incertae."

E. MIKANII Peyr. in Mart., Fl. bras. 12(1): 138. 1878. TYPE: BRAZIL. Rio de Janeiro: Tocaja [Rio Itocaía, near present town of Itaipu-Açu], Feb, *J. C. Mikan* (70) (HOLOTYPE: W = F neg. 32427, F 838060 fragment ex W).

Distribution: Brazil (Bahia, Rio de Janeiro). Stipules striate.

E. MINUTIFOLIUM Griseb., Cat. pl. Cub. 41. 1866. TYPE: CUBA. "In parte occidentali," 1863, *C. Wright* 2133 (HOLOTYPE: GOET = F neg. 55537; ISOTYPES: LE = F neg. 57038, MO 1894380 = F neg. 55545, NY-2, P, W).

Possible synonyms: *E. barahonense* O. E. Schulz & Ekman, *E. echinodendron* Ekman ex O. E. Schulz.

Distribution: Cuba, Dominican Republic, Haiti. Stipules non-striate.

E. minutifolium var. *cubense* O. E. Schulz in Urb., Symb. antill. 7: 511. 1913. TYPE: CUBA. Prov. Santa Clara, near Castillo de Jagua at Cienfuegos Bay, 25 Feb 1910, *N. L. Britton*, *F. S. Earle* & *P. Wilson* 4626 (HOLOTYPE: B, destroyed; ISOTYPES: F = F neg. 57324, NY).

E. MUCRONATUM Benth., London J. Bot. 2: 372. 1843. TYPE: GUYANA. Pirara River, in savannas, 1839, *R. H. Schomburgk* 766 (HOLOTYPE: K = F neg. 55744; ISOTYPES: BM, CGE, G = F neg. 26401, NY = F neg. 55454, P = F neg. 58535, W).

E. albertianum J. G. Kuhlmann & W. A. Rodrigues,

E. comosum O. E. Schulz, *E. kirkianum* O. E. Schulz, *E. venezuelense* Steyerf.

Distribution: Bolivia (Beni, La Paz, Pando, Santa Cruz*); Brazil (Acre, Amapá, Amazonas, Bahia, Goiás, Mato Grosso, Pará, Pernambuco, Rondônia, Roraima); Colombia (Caquetá); Ecuador (Pastaza); French Guiana; Guyana; Peru (Amazonas*, Junín, Loreto, Madre de Dios, San Martín); Suriname, Trinidad & Tobago; Venezuela (Amazonas, Bolívar). Stipules striate.

E. mucronatum var. *majus* Sagot, Ann. Sci. Nat. Bot., sér. 6, 11: 179. 1881, "major." TYPE: FRENCH GUIANA. Maroni, insula Portal, s.d., *P. Sagot* s.n. (HOLOTYPE, not located).

E. AMAZONICUM Peyr.

E. multiflorum Lundell, Amer. Midl. Naturalist 29: 474. 1943. TYPE: PANAMA. Canal Zone: Vic. of Juan Mina, on hill at Canal Zone boundary, 27 Jul 1940, *H. H. Bartlett* & *T. Lasser* 16566 (HOLOTYPE: MICH; ISOTYPES: GH = F neg. 55546, MO 2002176, VT).

E. SKUTCHII Standl.

Treated as a synonym of *Erythroxyllum macrophyllum* Cav. by Plowman (1991), but see discussion under *E. skutchii*.

E. MYRSINITES Mart., Beitr. Erythroxyllon 65, t. 4. 1840. TYPE: BRAZIL. No locality or date, *F. Sellow* (3056) (SYNTYPES*: BR, G, K = F neg. 56508, M = F neg. 57583, W); BRAZIL. No locality or date, *C. Martius* s.n. (SYNTYPE: not located). [Protologue: "In prov. São Paulo and Minas Gerais, Sellow & Martius."]

Distribution: Argentina (Corrientes, Misiones); Brazil (Minas Gerais, Paraná, Rio Grande do Sul, Santa Catarina, São Paulo); Paraguay (Guairá, Misiones); Uruguay (Artigas, Rivera). Stipules striate.

E. nanum A. St.-Hil., Fl. bras. merid. 2, ed. 4º: 97. 1829. *E. nitidum* var. *longifolium* Mart. TYPE: BRAZIL. Minas Gerais: Barbacena, Mar [1821-1822], *A. St. Hi-*

laire cat. D 390 (HOLOTYPE: P = F neg. 35197; ISOTYPE: P = F neg. 58536).

E. DECIDUUM A. St.-Hil.

- E. NELSON-ROSAE Plowman, Supl. Acta Amazonica 14(1/2): 124, fig. 3. 1984. TYPE: BRAZIL. Pará: Serra dos Carajás, 25–30 km NW of Serra Norte mining camp, ca. 5°55'S, 50°26'W, 5 Dec 1981, D. C. Daly, R. Callejas, M. G. da Silva, E. L. Taylor, C. Rosário & M. R. dos Santos 1719 (HOLOTYPE: MG 89706; ISOTYPES: F 1910388 = F neg. 60609, GH, K, MO, NY, US).

Distribution: Brazil (Pará). Stipules non-striate.

- E. NITIDUM Spreng., Syst. Veg. 2: 390. 1825. *E. nitidum* var. *brevifolium* Mart., *E. deciduum* var. *brevifolium* (Mart.) O. E. Schulz. TYPE: BRAZIL. Bahia: [Villa do Nazaré, according to CGE and K sheets], s.d., F. Sellow (53) (HOLOTYPE: B, destroyed = F neg. 12631, F 752523 fragment; ISOTYPES: BM = F neg. 56258, BR, CGE = F neg. 56835, K = F neg. 56504, LE, NY = F neg. 55482, P-2, W).

E. glaucocladum Peyr.

Distribution: Brazil (Bahia). Stipules non-striate.

The isotype at LE is also the lectotype of *Erythroxylum glaucocladum*.

- E. nitidum* var. *angustifolium* Mart., Beitr. Erythroxyton 113. 1840. E. DECIDUUM A. St.-Hil., *E. deciduum* var. *angustifolium* (Mart.) O. E. Schulz. TYPE: As for *E. DECIDUUM* A. St.-Hil.

- E. nitidum* var. *brevifolium* Mart., Beitr. Erythroxyton 113. 1840. E. NITIDUM Spreng., *E. deciduum* var. *brevifolium* (Mart.) O. E. Schulz. TYPE: As for *E. NITIDUM* Spreng.

- ?*E. nitidum* var. *glaucum* Mart., Beitr. Erythroxyton 113. 1840. *E. deciduum* var. *glaucum* (Mart.) O. E. Schulz. TYPE: BRAZIL. Rio de Janeiro: Santa Rita, s.d.,

J. E. Pohl (2157) (LECTOTYPE here designated: W = F neg. 60016).

Although Schulz placed this taxon in *Erythroxylum deciduum*, Plowman's notes suggest possible synonymy with *E. pruinatum*.

- E. nitidum* var. *longifolium* Mart., Beitr. Erythroxyton 113. 1840. *E. nanum* A. St.-Hil. TYPE: BRAZIL. Minas Gerais: Barbacena, Mar [1816–1821], A. St. Hilaire *cat. D 390* (HOLOTYPE: P = F neg. 35197; ISOTYPE: P = F neg. 58536).

E. DECIDUUM A. St.-Hil.

- E. NOBILE O. E. Schulz in Engl., Pflanzenr. IV. 134: 37. 1907. TYPES: BRAZIL. Bahia: "In sylvis umbrosis prope Ilhéus," Apr 1821, L. Riedel 10 (SYNTYPES**: B, destroyed = F neg. 12632, BR, F = F neg. 62196, K-2, LE = F neg. 57053, P-2, W-2); BRAZIL. Bahia: bei Bahia, J. S. Blanchet 3967 (SYNTYPES: G, K = F neg. 56507, MO, P-2 = F neg. 58528); BRAZIL. Bahia: bei Bahia, 1834, J. S. Blanchet 1747 (SYNTYPES: BM, F 1538246 = F neg. 55547, G, LE = F neg. 57051); BRAZIL. Bahia: bei Bahia auf Hügeln, P. Salzmann 86 (SYNTYPE: MPU).

Distribution: Brazil (Bahia). Stipules striate.

- E. NOVOGRANATENSE (D. Morris) Hieron., Bot. Jahrb. Syst. 20, Beibl. 49: 35. 1895. *E. coca* var. *novogranatense* D. Morris.

E. coca var. *novogranatense* D. Morris, *E. coca* var. *spruceanum* Burck, *E. novogranatense* var. *microphyllum* O. E. Schulz, *E. novogranatense* var. *tobagense* O. E. Schulz

Distribution (E. NOVOGRANATENSE var. NOVOGRANATENSE): Colombia (Antioquia, Cauca, César, Cundinamarca, Guajira, Huila, Magdalena, Norte de Santander, Putumayo, Tolima, Valle). Also cultivated widely in neotropics. Stipules non-striate.

- E. novogranatense* var. *macrophyllum* O. E. Schulz in Engl., Pflanzenr. IV. 134: 87. 1907. TYPE: VENEZUELA. "Am Ufer

des Orinoko," s.d., *R. Spruce* 3725 (HOLOTYPE: B, destroyed; ISOTYPE: K = F neg. 55737).

E. GRACILIPES Peyr. (Plowman, 1989).

E. novogranatense var. *microphyllum* O. E. Schulz in Urb., *Symb. antill.* 5: 200. 1907. TYPE: BRAZIL. Rio de Janeiro: cultivated in southeastern Brazil, 1891, *A. Glaziov* 18160 (HOLOTYPE: B, destroyed; ISOTYPES: C = F neg. 21477, G, K = F neg. 55736, P).

E. NOVOGRANATENSE (D. Morris) Hieron. var. *NOVOGRANATENSE*.

E. novogranatense var. *tobagense* O. E. Schulz in Urb., *Symb. antill.* 5: 200. 1907. TYPE: TOBAGO. "In sylva primaeva montis Morne d'Or, spontaneum, etiam colitur," 450 m, Nov 1887, *H. F. A. von Eggers* 5831 (HOLOTYPE: B, destroyed; ISOTYPES: A, K = F neg. 55734, NY). ["Ad Richmond naturalis" on A and K sheets.]

E. NOVOGRANATENSE (D. Morris) Hieron. var. *NOVOGRANATENSE*.

E. NOVOGRANATENSE var. *TRUXILLENSE* (Rusby) Plowman in *F. R. Jerí, Cocaine* 1980, 99, fig. 11. 28 Feb 1980. *E. truxillense* Rusby.

E. hardinii E. Machado.

Distribution: Colombia (Nariño); Ecuador (Carchi); Peru (Amazonas, Cajamarca, Huánuco, La Libertad, Lima, San Martín). Stipules non-striate.

The combination also appeared in a presumably simultaneously published Spanish edition entitled "Cocaina 1980" (Jerí, 1980, p. 110, fig. 11), and one week later in Plowman, *Bot. Mus. Leaflet* 27: 57, fig. 12. 1979 [6 Mar 1980].

E. NUMMULARIA Peyr. in *Mart., Fl. bras.* 12(1): 133, t. 23, fig. 3. 1878. TYPE: BRAZIL. Bahia: St. Thomé, Jun 1844, *J. S. Blanchet (Collect. Lign.)* 3755 (LECTOTYPE **here designated**: BR—annotated by Peyritsch = F neg. 58504; ISOTYPES: BM, F 1537765 = F neg. 55548, G-3, M, NY, P-2). [F = "St. Thomé," G = "St. Thomé, Jun 1844, no. 2755."]

Distribution: Brazil (Bahia, Espírito Santo, Minas Gerais, Pernambuco, Piauí*). Stipules non-striate (?).

Plowman had doubts about the stipule striation character, which in some species is difficult to determine. Schulz (1907) placed the species in sect. *Archerythroxyllum*, which has non-striate stipules, but Plowman may have felt its true affinities were elsewhere.

E. nummularia var. *micans* O. E. Schulz in *Engl., Pflanzenr.* IV. 134: 93. 1907. TYPE: BRAZIL. Bahia: "Bahia," 1844, *J. S. Blanchet* 300 (LECTOTYPE **here designated**: W—annotated by O. E. Schulz = F neg. 59995; ISOTYPES: G, P = F neg. 58474).

E. obovatum Macfad., *Fl. Jamaica* 143. 1837, nom. illeg. superfl. *E. ROTUNDIFOLIUM* Lunan.

Macfadyen's collections at K were not cited in the protologue and are not to be regarded as type material.

E. obtusum DC., *Prodr.* 1: 574. 1824. TYPE: CUBA. Without locality, s.d., *Humboldt & Bonpland s.n.* (P-n.v., fide Plowman, 1988b).

E. HAVANENSE Jacq.

E. OCCULTUM Plowman, *Bot. Mus. Leaflet* 29: 277. 1983. TYPE: BRAZIL. Rio de Janeiro: Rio de Janeiro, Mata do Horto Florestal, 28 Dec 1926, *Pessoal do Horto Florestal s.n., Herbario do Serviço Florestal do Brasil* 223 (HOLOTYPE: RB 4842; ISOTYPES: RB 4842, F 1875198 = F neg. 72956, F 1950824 = F neg. 59243).

Distribution: Brazil (Rio de Janeiro). Stipules non-striate.

E. OCHRANTHUM Mart., *Beitr. Erythroxyllon* 91. 1840. TYPE: BRAZIL. Bahia: Dist. Ilhéus, in silvis ad cataractas lacus Almadensis et ad Itahybé fluvium, Jan [1819], *C. Martius* 2077 (HOLOTYPE: M = F neg. 19467). [Protologue: "In silvis

aboriginibus prope vicum S. Petrum d'Alcantara, prov. Bahiensis, in termino Insulanorum, . . . Janeiro."]

Distribution: Brazil (Bahia, Paraíba). Stipules non-striate.

The protologue does not match the label information at M, cited above, but Martius was probably simply providing a more generalized locality in his protologue. All three localities are adjacent to one another in the itinerary supplied by Urban (1906: 59). Peyritsch's (1878) citation of the label data and the protologue as if they were two separate collections (the second from the state of Maranhão) is almost certainly an error.

E. OPACUM Rusby, Mem. New York Bot. Gard. 7: 270. 1927. TYPE: BOLIVIA. Rurrenabaque, 1000 ft, 5 Jan 1922, O. E. White 2327 (HOLOTYPE: NY = F neg. 55453; ISOTYPES: F 550655 = F neg. 55450, F 685369 = F neg. 55451, GH = F neg. 55452, K, LE = F neg. 57112, MICH, US). [Note: Collector name varies, but not number, as follows: *H. H. Rusby* (F 550655, GH, US) *M. Cárdenas* (F 685369, LE, MICH).]

Distribution: Bolivia (Beni). Stipules striate.

E. QREOPHILUM (O. E. Schulz) Steyerl. & Maguire, Mem. New York Bot. Gard. 17: 445. 1967. *E. vernicosum* var. *oreophilum* O. E. Schulz.

Distribution: Brazil (Roraima); Guyana; Venezuela (Amazonas*, Bolívar). Stipules non-striate.

E. ORINOCENSE Kunth in Humb., Bonpl. & Kunth, Nov. gen. sp. 5, ed. f^o: 137; ed. 4^o: 178; t. 453. 1822. *E. squamatum* var. *orinocense* (Kunth) Kuntze. TYPE: VENEZUELA. Bolívar: Río Orinoco ad San Borja, May, *Humboldt & Bonpland* (1106) (HOLOTYPE: P, not located; ISOTYPE: B, destroyed = F neg. 12633).

Distribution: Colombia (Norte de Santander, Vichada); Venezuela (Amazonas, Anzoátegui, Apure, Barinas, Bolívar, Cojedes,

Distrito Federal, Guárico, Miranda, Portuguesa, Zulia). Stipules non-striate.

E. OVALIFOLIUM Peyr. in Mart., Fl. bras. 12(1): 135, t. 24, fig. 2. 1878. TYPES: BRAZIL. Rio de Janeiro, "in sylvis umbrosis montosis," Sep (Nov?) 1831, L. Riedel 62 (LECTOTYPE **here designated**: LE—annotated by Peyritsch = F neg. 57118; ISOLECTOTYPES: BR = F neg. 58503, K = F neg. 55772, LE, P); BRAZIL. Rio de Janeiro, Copacabana, 27 Jun 1867, A. Glaziou 1324 (SYNTYPES: BR, K, P = F neg. 58476); BRAZIL. Rio de Janeiro, Copacabana, s.d., A. Glaziou 2102 (SYNTYPES: BR, K = F neg. 55747, P = F neg. 58475); BRAZIL. Rio de Janeiro, 1829, P. W. Lund s.n. (SYNTYPES: C = F neg. 57702, NY-2); BRAZIL. Minas Gerais: Lagoa Santa, *E. Warming* s.n. (SYNTYPE, not located).

Distribution: Brazil (Minas Gerais, Rio de Janeiro). Stipules non-striate.

E. ovatum Cav., Diss. 404, t. 233. 1789. TYPE: "America." The specimen cited as "unicum exemplar apud D. de Jussieu" was not located at P or P-JUSS, nor was a duplicate located at MA. LECTOTYPE designated by Plowman, 1988b, p. 545: Cavanilles, Diss. 404, Plate 233. 1789.

E. HAVANENSE Jacq.

E. ovatum var. *angustifolium* O. E. Schulz in Urb., Symb. antill. 5: 208. 1907. TYPE: GUADELOUPE. St. Barthélemy, s.d., J. E. Forsström s.n. (HOLOTYPE: S = F neg. 60362, middle fragment on sheet).

E. BREVIPES DC.

E. ovatum var. *splendens* O. E. Schulz in Urb., Symb. antill. 5: 208. 1907. TYPES: ST. VINCENT & THE GRENADINES: St. Vincent, prope Calliaqua, s.d., H. F. A. von Eggers 7006 (SYNTYPE: B, destroyed); BARBADOS. In Turner's Hall Wood, s.d., H. F. A. von Eggers 7168 (SYNTYPE: B, destroyed); TOBAGO. In valle fluvii Bacolet ad Calder Hall versus, s.d., H. F. A. von Eggers 5675 (SYNTYPE: B, destroyed). [Note: No duplicates

of the above syntypes have been located at C or H.]

E. HAVANENSE Jacq. (Plowman, 1988b).

- E. *OXYCARPUM* O. E. Schulz in Urb., Symb. antill. 5: 203. 1907. TYPES: GRENADA. Near Mount Helicon, St. George's, 3 May 1905, *W. E. Broadway 1778* (LECTOTYPE designated by Plowman, 1988b, p. 547: GH = F neg. 55470; ISOLECTOTYPES: B, destroyed, BR, E, F 176359 = F neg. 55448, G, NY = F neg. 55449, PR); GRENADA. "Frequenter in arenosis maritimis et locis apertis demissis prope mare," *W. E. Broadway 526* (SYNTYPES: B, destroyed, BR, K); GRENADA. "Frequenter in arenosis maritimis et locis apertis demissis prope mare" (in protologue), ["St. George's, Richmond Hill, 7 Jul 1896" on MO sheet], *W. E. Broadway 956* (SYNTYPES: B, destroyed, K, MO, NY?, PR-2, Z-2).

E. uniflorum Rusby (Plowman, 1988b).

Distribution: Central America: Panama. West Indies: Grenada. South America: Colombia (Atlántico, César, Guajira*, Magdalena, Santander); Venezuela (Distrito Federal, Falcón, Miranda, Yaracuy, Zulia). Stipules non-striate.

- E. *OXYPETALUM* O. E. Schulz in Engl., Pflanzenr. IV. 134: 100. 1907. TYPE: BRAZIL. "Rio de Janeiro" [but see note], *A. Glaziou 12473* (HOLOTYPE: B, destroyed = F neg. 12634; ISOTYPES: C, G, K = F neg. 55748, LE, P-3, R 854). [Handwritten locality and date on P and R sheets: "Minas Gerais, Formação pres de Diamantina, 7 Apr 1892."]

Distribution: Brazil (Minas Gerais, Rio de Janeiro?). Stipules non-striate.

The only record from Rio de Janeiro is based on the type collection, which probably bore a label printed with "Environs de Rio de Janeiro" as does the K sheet. The two other known records of the species are both from the Serra do Espinhaço of Minas Gerais, one of these from near Diamantina.

- E. *PACHYNEURUM* O. E. Schulz, Repert. Spec. Nov. Regni Veg. 6: 352. 1909.

TYPES: PARAGUAY. "In campis in regione fluminis Yhú," Nov 1905, *E. Hassler 9623* (LECTOTYPE **here designated**: G-annotated by O. E. Schulz = F neg. 60925; ISOLECTOTYPES: A = F neg. 55549, B, destroyed, BM, G-5 = F negs. 52268, 60926, MO 1575080, NY, S, W); PARAGUAY. "In campo San Blas," Dec 1898-1899, *E. Hassler 5773* (SYNTYPES: F 1940023 = F neg. 59670, G-3 = F neg. 49606, NY = F neg. 57821).

Possible synonym: *E. hasslerianum* f. *ellipticum* Chodat & Hassl.

Distribution: Paraguay (Caaguazú). Stipules non-striate.

The syntype *Hassler 5773* is also the type of *Erythroxyllum hasslerianum* f. *ellipticum* Chodat & Hassl.

- E. *PACIFICUM* D. R. Simpson, Fieldiana, Bot., 36(1): 7, fig. 3. 1972. TYPE: PERU. Tumbes: Prov. Zarumilla, Dist. Matapalo, Trocha Naranjal, 600 m, Forest Dendrology Project Tree no. T-39, 7 Oct 1968, *I. Canales 17* (HOLOTYPE: F 1729034 = F neg. 55550; ISOTYPES: K, HUT, LIM, MOL, NY, P, US, USM, WIS).

Distribution: Peru (Tumbes). Stipules non-striate.

- E. pallidum* Rose, Contr. U.S. Natl. Herb. 8: 314. 1905. TYPE: MEXICO. Zacatecas: Hacienda of San Juan Capistrano, 18 Aug 1897, *J. N. Rose 2416* (HOLOTYPE: US; ISOTYPE: GH = F neg. 55466 & 55481 (photos of same specimen), NY = F neg. 57819).

E. ROTUNDIFOLIUM Lunan (Plowman, 1991).

According to Plowman (1991), this taxon may merit varietal status under *Erythroxyllum rotundifolium*.

- E. *PANAMENSE* Turcz., Bull. Soc. Imp. Naturalistes Moscou 36(1): 581. 1863. TYPE: PANAMA. Chagres, 1 Apr 1850 (26 Feb 1850, F), *A. Fendler 193* (HOLOTYPE: KW = F neg. 61117; ISOTYPES: BM, F 588574 = F neg. 55552, GH, K-3, LE, MO 1916402, MO 2180223, NY, S, US, W = F neg. 32428).

Possible synonym: *E. davidii* D'Arcy & Schanen.

Distribution: North America: Mexico (Veracruz). Central America: Panama. South America: Colombia (Antioquia, Chocó, Nariño, Valle); Venezuela (Miranda*, Sucre, Yaracuy). Stipules non-striate.

E. paradoxum O. E. Schulz in Engl., Pflanzenr. IV. 134: 52. 1907. TYPES: BRAZIL. Minas Gerais: Sabará, in collibus siccis glaucosis, 6 Oct 1824, *L. Riedel* 648 (SYNTYPES**: B, destroyed = F neg. 12635, BR = F neg. 58517, LE = F neg. 57117, US 13870, W); BRAZIL. Minas Gerais: Rio Prato, s.d., *J. E. Pohl* (2156) (SYNTYPES: BR = F neg. 58516, F 839101 fragment ex W, M, W-2 = F neg. 60009); BRAZIL. Minas Gerais: Lagoa Santa, 4 Nov 1863, *E. Warming* s.n. (SYNTYPES: C = F neg. 57701, S = F neg. 58445); BRAZIL. Minas Gerais: Alegres, in siccis, Sep 1834, *L. Riedel* 2628 (SYNTYPES: BR = F neg. 58518, LE = F neg. 57116); BRAZIL. Goiás: [Cavalcante to Ribeirão Gambá, between 13°47'S, 47°30'W and 13°34'S, 47°16'S, 1828-1830], *W. J. Burchell* 7928 (SYNTYPE: K = F 55749).

E. ENGLERI O. E. Schulz.

E. paraense Peyr. in Mart., Fl. bras. 12(1): 164, t. 30, fig. 3. 1878. TYPE: BRAZIL. Amazonas: Rio Negro, prope Barra [Manaus], Oct 1851, *R. Spruce* (1854) (LECTOTYPE designated by Plowman, 1984, p. 137; M = F neg. 57578; ISOTYPES: BM, CGE, E, F 837990 fragment ex W = F neg. 55447, GH = F neg. 55445, K-2 = F neg. 55750, LE, NY = F neg. 55446, OXF, P, W).

E. CITRIFOLIUM A. St.-Hil. (Plowman, 1989).

E. PARAGUARIENSE (Chodat & Hassl.) O. E. Schulz in Engl., Pflanzenr. IV. 134: 59. 1907. *E. distortum* var. *paraguariense* Chodat & Hassl.

Distribution: Paraguay (Concepción, Cordillera, San Pedro). Stipules striate.

E. PARVISTIPULATUM Peyr. in Mart., Fl. bras.

12(1): 136, t. 23, fig. 2. 1878. TYPE: BRAZIL. Goiás: Serra de São Felix, Rio Custodio, s.d., *J. E. Pohl* (1940) (LECTOTYPE here designated: W-annotated by Peyritsch = F neg. 60010; ISOTYPES: F 839306 = F neg. 59658, M = F neg. 57579, OXF = F neg. 60345, US, W-annotated by Peyritsch = F neg. 61021).

Distribution: Brazil (Goiás). Stipules non-striate.

E. PASSERINUM Mart., Beitr. Erythroxylo 106. 1840. TYPES: BRAZIL. Bahia: ["Ilhéus, 1835," according to one BR sheet], *B. Luschnath* s.n. = *Herb. Fl. Bras.* 647 (SYNTYPES**: B, destroyed = F neg. 12637, BM, BR-2, F 1538257 = F neg. 55478, F 838053 fragment ex W, G-3, GH, K, L, LE = F neg. 57025, M = F neg. 57580, MO 1886683, NY, P, W); BRAZIL. Without locality, *F. Sellow* s.n. (SYNTYPE: not located). [Protologue: BRAZIL. Bahia: "In maritimis sabulosis prope villam Insulanorum et in silvis aestu aphyllis mediterraneis."]

E. bongardianum C. A. Mey. ex Peyr.

Distribution: Brazil (Alagoas, Bahia, Espírito Santo, Maranhão, Pernambuco, Rio de Janeiro). Stipules striate.

E. patens Ruiz ex O. E. Schulz in Engl., Pflanzenr. IV. 134: 45. 1907. TYPES: PERU. Huánuco: Puente de Pillao, 1788, *Ruiz* s.n. (LECTOTYPE designated by Plowman, 1989, p. 23; F 612268 = F neg. 59657; ISOLECTOTYPES: B, destroyed = F neg. 12638, BM, BR, MA?, OXF); ECUADOR. Guayas: Guayaquil, *T. Haenke* s.n. (SYNTYPE: B, destroyed); ECUADOR. Manabí: El Recreo, 21 Jan 1897, *H. F. A. von Eggers* 15570 (SYNTYPES: F = F neg. 62400, K-2 = F negs. 55751, 56518, L, LE, M, PR, US).

E. ACUMINATUM Ruiz & Pav.

Plowman treated *Erythroxyllum patens* as the valid name for this taxon, but *E. acuminatum* is the earlier name.

E. PATENTISSIMUM O. E. Schulz in Engl., Pflanzenr. IV. 134: 119. 1907. TYPES:

PARAGUAY. Concepción, Oct 1902, *E. Hassler* 7602 (SYNTYPES**): A, B, destroyed = F neg. 12639, F 1537802 = F neg. 55477, G-2 = F neg. 41093, K, MO 1574144, NY, P-2, W); PARAGUAY. Estancia 14 de Mayo, 31 Dec 1902, *G. Malme (Iter Regnell II) s.n.* (SYNTYPE: S = F neg. 58446).

Distribution: Brazil (Mato Grosso); Paraguay (Alto Paraguay, Chaco, Concepción). Stipules non-striate.

E. PAUCIFLORUM Rusby, Mem. Torrey Bot. Club 6: 13. 1896. TYPE: BOLIVIA. Between Tipuani and Guanai, Dec 1892, *M. Bang* 1639 (HOLOTYPE: NY; ISOTYPES: A, F 166005 = F neg. 59656, GH = F neg. 55538, MICH, MO 1886689, NY, US).

Distribution: Bolivia (La Paz, Santa Cruz). Stipules striate.

E. PAUFERRENSE Plowman, Brittonia 38: 193, fig. 3. 1986. TYPE: BRAZIL. Paraíba: Areia, Escola de Agronomia do Nordeste, 8 May 1953, *J. Coelho de Moraes s.n.* (HOLOTYPE: IAN 80773 = F neg. 60938; ISOTYPES: EAN 714, INPA 2381, US 2221823).

Distribution: Brazil (Paraíba). Stipules striate.

The type was cited in the protologue as *J. Coelho de Moraes* 714, an error noted by *Loiola* (2001).

E. PEDICELLARE (Griseb.) O. E. Schulz in Urb., Symb. antill. 5: 211. 1907. *E. alternifolium* var. *pedicellare* Griseb.

Distribution: Cuba. Stipules non-striate.

E. PELLETERIANUM A. St.-Hil., Pl. usuel. bras. t. 69, p. 3. 1828. TYPE: BRAZIL. Minas Gerais: Itajuru, near village of S. Miguel de Mato Dentro, Jan [1817 or 1818], A. St. Hilaire cat. B¹ 564 (HOLOTYPE: P = F neg. 58477; ISOTYPES: F 935934 fragment ex P, MPU, P).

E. flexuosum O. E. Schulz, *E. praecox* S. Moore, *E. verruculosum* O. E. Schulz.

Distribution: Bolivia (Santa Cruz); Brazil

(Bahia, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Paraná, Rio de Janeiro, São Paulo); Paraguay (Amambay, Canendiyu, Cordillera, Paraguari). Stipules striate.

A fuller description was later provided by St. Hilaire (1829: 100, t. 102).

Mendonça & Amaral (1999) treated *Erythroxylum verruculosum* as a synonym of *E. buxus* Peyr.

E. perpusillum Fern. Casas, Anales Jard. Bot. Madrid 39: 179, figs. 3-4. 1982. TYPE: PARAGUAY. Caaguazú: Cerca y al sur de Yhú, 24 Sep 1980, *J. Fernández Casas* 3897 & *J. Molero* (HOLOTYPE: MA; ISOTYPES: G = F neg. 41096, NY = F neg. 60180).

E. MICROPHYLLUM A. St.-Hil.

?*E. petiolatum* Peyr. in Mart., Fl. bras. 12(1): 153. 1878. *E. coelophlebium* var. *petiolatum* (Peyr.) O. E. Schulz. TYPES: BRAZIL. Rio de Janeiro, s.d., A. *Glaziou* 2943 (SYNTYPES**): BR, GH = F neg. 55444); BRAZIL. Rio de Janeiro, s.d., A. *Glaziou* 5757 (SYNTYPES: C, P = F neg. 35200, R).

E. COELOPHLEBIUM Mart., or a variety of this species.

E. PETRAE-CABALLI Plowman, Fieldiana, Bot., n.s., 19: 20, fig. 11. 1987. TYPE: BRAZIL. Bahia: Cachoeira, vale dos Rios Paraguaçu e Jacuípe, Morro Belo, approx. 39°05'W, 12°32'S, 40-120 m, Dec 1980, *Grupo Pedra do Cavalo* (*L. Scardino, L. Noblick, Paranhos, Guedes, Queiróz, Paganucci, Nascimento, Suely, Quaglia*) 967 (HOLOTYPE: CEPEC 26980 = F neg. 60331; ISOTYPES: ALCB 8103, BAH 2984, BOTU, F = F neg. 61753, HRB 7253, HUEFS 1026, MBM, RB, SP).

Distribution: Brazil (Bahia). Stipules striate.

+E. × PEYRITSCHII O. E. Schulz in Engl., Pflanzenr. IV. 134: 55. 1907. TYPES: BRAZIL. Minas Gerais: near Lagoa Santa in cerrados, s.d., *E. Warming s.n.* (LECTOTYPE here designated: C = F neg.

57704); BRAZIL. Minas Gerais: near Lagoa Santa in cerrados, 13 Oct 1863, *E. Warming s.n.* (SYNTYPE: C = F neg. 57705); BRAZIL. Goiás: [Méia Ponte to Caisára (possibly Córrego de Cahyssara, SW of Pirenópolis), 23 Oct 1827], *W. J. Burchell 6319* (SYNTYPE: K = F neg. 55593).

Distribution: Brazil (Minas Gerais).

Schulz (1907) considered this taxon to be a hybrid of *Erythroxylum campestre* A. St.-Hil. and *E. suberosum* A. St.-Hil. Plowman annotated two syntypes as *E. suberosum* A. St.-Hil.; but he did not select a lectotype.

+*E. PLOWMANIANUM* Cogollo & Pipoly, *Novon* 3: 126, fig. 1. 1993. TYPE: COLOMBIA. Antioquia: Mun. San Luís, Cañon del Río Claro, sector occidental, margen izquierda, subida a la Dolina, 35–475 m, 8 Jul 1983 (fl, fr), *A. Cogollo & R. Borja 476* (HOLOTYPE: JAUM–n.v.; ISOTYPES: COL–n.v., HUA–n.v., MO–n.v.).

Distribution: Colombia (Antioquia). Stipules striate.

Loiola (2001) suggested this is a synonym of *Erythroxylum fimbriatum* Peyr.

+*E. PLOWMANII* Amaral, *Naturalia* 15: 148, fig. 1. 1990. TYPE: BRAZIL. Espírito Santo: Mun. Linhares, Reserva Florestal da Companhia Vale do Rio Doce, estr. do Paraju, antiga 211, Km 2.570, lado esquerdo, 20 Nov 1979, *I. A. Silva 121* (HOLOTYPE: CVRD 477–n.v.; ISOTYPE: BOTU 17453–n.v.).

Distribution: Brazil (Espírito Santo). Stipules striate.

E. POLYGONOIDES Mart., *Beitr. Erythroxylon* 80. 1840. TYPE: BRAZIL. Bahia: “Silvis ad Soteropolin” [Salvador], 1818, *C. Martius s.n.* (HOLOTYPE: M = F neg. 57582).

Distribution: Brazil (Bahia). Stipules striate.

E. POPAYANENSE Kunth in Humb., *Bonpl. & Kunth*, *Nov. gen. sp.* 5, ed. f°: 138; ed.

4°: 179. 1822. TYPE: COLOMBIA. Cauca: Near Popayán, “locis temperatis,” 900 hex [1620 m], Oct, *Humboldt & Bonpland s.n.* (HOLOTYPE: P = F neg. 35201; ISOTYPES: B-WILLD 8884 = B neg. 3925, F 937348 fragment ex P, P).

Distribution: Colombia (Antioquia*, Cauca, Cundinamarca). Stipules striate.

E. praecox S. Moore, *Trans. Linn. Soc. London, Bot.*, ser. 2, 4: 321. 1894. TYPE: BRAZIL. Mato Grosso: “In sylva primaeva ad Santa Cruz,” Sep 1891–1892, *S. Moore 341* (HOLOTYPE: BM = F neg. 56261; ISOTYPE: NY = F neg. 55539).

E. PELLETERIANUM A. St.-Hil.

E. pringlei Rose, *Contr. U.S. Natl. Herb.* 8: 314. 1905. TYPE: MEXICO. Guerrero: Mtns. about Iguala, 5 Oct 1900, *C. G. Pringle 8405* (HOLOTYPE: US; ISOTYPES: BM, CM 214026, G—2, GH = F neg. 55540, GOET, LE, P, NSW, US, W, Z). [Note: The collection number is cited erroneously in the protologue as “8406.”]

E. ROTUNDIFOLIUM Lunan (Plowman, 1991).

Previously placed in synonymy of *Erythroxylum havanense* by D’Arcy & Schanen (1975).

E. PRUINOSUM O. E. Schulz in Engl., *Pflanzenr.* IV. 134: 76. 1907. TYPES: BRAZIL. Goiás: [São Bento to Rio Cangalho (Ribeirão Cangalha), 11°53′–12°S, 47°27′W, 1828–1830], *W. J. Burchell 8195* (LECTOTYPE designated by Plowman, 1984, p. 141: K = F neg. 55755); BRAZIL. Goiás: [Cavalcante to Ribeirão Gambá, between 13°47′S, 47°30′W and 13°34′S, 47°16′W, 1828–1830], *W. J. Burchell 7931* (SYNTYPE: K = F neg. 55753); BRAZIL. Goiás: “zwischen der Stadt Goyaz und Cavalcante” (protologue) [Rio Bagage to Rio de Serra, 14°21′S, 48°10′W, 1828–1830], *W. J. Burchell 7683* (SYNTYPES: GH, K, LE); BRAZIL. Piauí: Serra da Batalha, Sep 1839, *G. Gardner 2790* (SYNTYPES: BM, K = F neg. 55754). [Note: BM sheet says “Pernambuco”]; BRAZIL. Goiás: Sertão d’Amaroleité, Sep–Oct 1844, *M. A. Wed-*

dell 2694 (SYNTYPES: F 936968 fragment ex P, P = F neg. 35202).

Distribution: Bolivia (Santa Cruz*); Brazil (Bahia*, Distrito Federal*, Goiás, Maranhão, Mato Grosso, Piauí, Rondônia). Stipules non-striate.

E. PULCHRUM A. St.-Hil., Fl. bras. merid. 2, ed. 4^o: 94. 1829. TYPE: BRAZIL. Rio de Janeiro, woods near city, Oct [1816–1821], A. St. Hilaire cat. C² 134C, 2^e partie (HOLOTYPE: P = F neg. 58478; ISOTYPE: MPU = F neg. 58984).

E. excelsum Glaziou, *E. speciosum* O. E. Schulz, *E. utile* Saldanha.

Distribution: Brazil (Alagoas, Bahia, Ceará, Espírito Santo, Paraíba, Rio de Janeiro, São Paulo). Stipules non-striate.

E. pulchrum var. *macrophyllum* O. E. Schulz in Engl., Pflanzenr. IV. 134: 61. 1907. TYPES: BRAZIL. Rio de Janeiro: Mt. Corcovado, s.d., A. Glaziou 6108 (SYNTYPES**): K, P); BRAZIL. Rio de Janeiro, s.d., L. Riedel 390 (SYNTYPES: BM, L = F neg. 57236, LE—annotated by O. E. Schulz); BRAZIL. Rio de Janeiro: Ubatuba, J. B. A. Guillemín 590 (SYNTYPES: G—2—annotated by O. E. Schulz).

E. PUNGENS O. E. Schulz in Engl., Pflanzenr. IV. 134: 49. 1907. TYPE: BRAZIL. Bahia: Rio São Francisco, prope Utinga, Fazenda in Sertão de São Francisco, 1838 (G), 1839 (BM), J. S. Blanchet 2771 (LECTOTYPE designated by Plowman, 1987, p. 11: G—annotated by O. E. Schulz = F neg. 60928; ISOLECTOTYPES: BM = F neg. 56262, E, LE = F neg. 53150, NY = F neg. 55443, W—2 = F neg. 60008). Excluded SYNTYPE: BRAZIL. Bahia: Maracás, 1818, C. Martius s.n. (M = F neg. 19468) = *E. maracacense* Plowman.

Distribution: Brazil (Bahia, Ceará, Maranhão*, Pernambuco, Piauí). Stipules striate.

E. RAIMONDII O. E. Schulz, Notizbl. Bot. Gart. Berlin-Dahlem 10: 747. 1929.

TYPE: PERU. Cuzco: Prov. La Convención, Santa Ana, May 1865, A. Raimondi 11319 (HOLOTYPE: B, destroyed = F neg. 12641; ISOTYPES: F 612205 fragment, USM).

Distribution: Bolivia (La Paz*, Santa Cruz); Peru (Cuzco, Junín, Madre de Dios*). Stipules striate.

E. recurrens Huber, Bol. Mus. Paraense Hist. Nat. 5: 417. 1909. TYPE: BRAZIL. Amazonas: Rio Negro near Barcellos, 25 Jun 1905, A. Ducke (MG) 7199 (HOLOTYPE: MG 7199 = F neg. 45842; ISOTYPES: B, destroyed = F neg 12642, F 602689 fragment ex MG, RB).

E. GRACILIPES Peyr.

E. RETICULATUM Northr., Mem. Torrey Bot. Club 12: 43, t. 8. 1902. TYPE: BAHAMAS. South Andros, Deep Creek, 27 June 1890, J. I. & A. R. Northrop 682 (HOLOTYPE: NY 7316—n.v.; ISOTYPES: A = F neg. 55442, F 130747 = F neg. 52560, GH = F neg. 55441).

Distribution: Bahamas. Stipules non-striate.

Plowman's annotation of the F sheet as the holotype was incorrect (Lee Kass, pers. comm.)

E. REVOLUTUM Mart., Beitr. Erythroxylen 71. 1840. TYPE: BRAZIL. Bahia: São Antonio das Queimadas, Mar 1818, C. Martius 2239 (HOLOTYPE: M = F neg. 19469; ISOTYPES: M—2).

Distribution: Brazil (Bahia, Ceará, Mato Grosso, Pernambuco, Piauí, Rio de Janeiro). Stipules striate.

E. rigidulum DC., Prodr. 1: 575. 1824. TYPE: COLOMBIA. Magdalena: Santa Marta, s.d., C. G. Bertero s.n. (HOLOTYPE: G-DC = F neg. 8014; ISOTYPES: G-DC, LE = F neg. 57103, M = F neg. 57576, MO 1886690 = F neg. 55732).

E. CARTHAGENENSE Jacq.

E. rigidulum var. *exareolatum* O. E. Schulz, Repert. Spec. Nov. Regni Veg. 30: 180.

1932. TYPE: COLOMBIA. Atlántico: Barranquilla, 1928, *Bro. Elias* 540 (HOLOTYPE: US 1422476).

E. CARTHAGENENSE Jacq.

E. RIMOSUM O. E. Schulz in Engl., Pflanzenr. IV. 134: 53. 1907. TYPES: BRAZIL. Ceará: Dry hilly places near Crato, Oct 1838, *G. Gardner* 1492 (SYNTYPES**): B, destroyed, BM, CGE—2, F fragment ex W, G, K = F neg. 55752, OXF, P = F neg. 58479, W—2); BRAZIL. "Rio de Janeiro, Cabo Frio, 18 July 1877," *A. Glaziou* 10387 *pro parte* (SYNTYPES: B, destroyed = F neg. 12643, C, K, fragment at upper right of sheet = F neg. 55595, P = F neg. 58480). [Note: *Glaziou* 10387 is a mixed collection with the syntype of *E. barbatum* O. E. Schulz. The collection data are false; at least as to the material of *E. rimosum* O. E. Schulz, the collection was probably pirated from the following: BRAZIL. Ceará, Crato, *Freire Allemão* 199 (R 5501, RB = F neg. 63102).]

Distribution: Brazil (Ceará, Pará, Piauí). Stipules striate.

Gardner 1492 is cited by Schulz (1907) as a syntype of both *Erythroxylum rimosum* and *E. suberosum* var. *denudatum* O. E. Schulz; additional duplicates at GH and P were recorded by Plowman under the latter name. Plowman may or may not have confirmed these determinations, and it remains unclear whether Schulz misidentified some duplicates or the collection was mixed.

Plowman originally annotated *Gardner* 1492 (K) as *Erythroxylum* cf. *daphnites* Mart., and wrote "= *E. daphnites*" next to this collection number on the final copy of his type manuscript, but Loiola (2001) has accepted the taxon.

E. ROIGII Britton & P. Wilson, Mem. Torrey Bot. Club 16: 71. 1920. TYPE: CUBA. Isle of Pines [Isla de Juventud], Caleta Grande, Aug 1919, *J. T. Roig & Cremata* 1856 (HOLOTYPE: NY = F neg. 55440; ISOTYPE: S = F neg. 58447).

Distribution: Cuba. Stipules non-striate.

E. RORAIMAE Klotzsch ex O. E. Schulz in Engl., Pflanzenr. IV. 134: 104. 1907. TYPES: GUYANA. "Am südlichen Abhänge des Roraima und an dem Ufern des Kukenam," Nov–Dec (reçu 1838, G), *R. H. Schomburgk* 545 (LECTOTYPE designated by Plowman, 1984, p. 141: K = F neg. 55756; ISOLECTOTYPES: B, destroyed, BM, CGE, F 1537818 = F neg. 59654, G–2, K = F neg. 55756); GUYANA. "Am südlichen Abhänge des Roraima und an dem Ufern des Kukenam," Nov–Dec 1842–1843, *R. H. Schomburgk* 618 (SYNTYPES: F 1537822 = F neg. 59655, G–2, K = F neg. 55773, MO 1606166, P = F neg. 58481, W–2); GUYANA. Roraima River, Nov 1842, *M. R. Schomburgk* 952 (SYNTYPES: B, destroyed = F neg. 12644); SURINAME. "Am oberes Tapanahoui-Flüss," Aug, G. *M. Versteeg* 721 (SYNTYPE, not located).

Distribution: Brazil (Amapá, Amazonas); Colombia (Amazonas); French Guiana; Guyana; Suriname; Venezuela (Amazonas, Bolívar*). Stipules non-striate.

?**E. ROSULIFERUM** O. E. Schulz in Engl., Pflanzenr. IV. 134: 77. 1907. TYPE: BRAZIL. Ceará: Serra de Araripe, Brejo Grande, Feb 1839, *G. Gardner* 2407 (HOLOTYPE: K = F neg. 55757; ISOTYPES: BM = F neg. 56260, CGE, F 1881176 fragment, OXF).

Distribution: Brazil (Ceará, Piauí). Stipules non-striate.

A possible synonym of *Erythroxylum betulaceum* Mart. However, Amaral (1980b) recognized *E. rosuliferum*, with *E. cearense* Diogo as a synonym.

E. ROTUNDFOLIUM Lunan, Hort. Jamaic. 2: 116. 1814. TYPE: JAMAICA. Clarendon: Upper Clarendon, Peckham Woods, 5 July 1911, (♂ fl), *W. Harris* 10942 (NEOTYPE **here designated**: F; ISONEOTYPES: NY–2, UCWI–n.v.).

E. compactum Rose, *E. fiscalense* Standl., *E. obovatum* Macfad. *E. pallidum* Rose, *E. pringlei* Rose, *E. sessiliflorum* O. E. Schulz, *E. suave* O. E. Schulz, *E. suave* var. *aneurum* O. E. Schulz, *E. suave* var. *compactum* (Rose) O. E. Schulz, *E.*

suave var. *jamaicense* O. E. Schulz, *E. suave* var. *pachycladum* O. E. Schulz, *E. tikalense* Lundell.

Distribution: North America: Mexico (Campeche, Chiapas, Colima, Durango, Guerrero, Jalisco, Mérida, México, Michoacán, Oaxaca, Puebla, Quintana Roo, Yucatán, Zacatecas). Central America: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua. West Indies: Bahamas, Cayman Islands, Cuba, Dominican Republic, Haiti, Jamaica, Puerto Rico, Turks & Caicos Islands. South America: Trinidad & Tobago. Stipules non-striate.

This species was based on *Erythroxylum* sp. 2 P. Browne, for which no material has been located in the Linnaean herbarium. The locality indicated in the protologue as "Jamaica, Clarendon Cross," is a reference to living material. A representative fruiting (♀) specimen is: JAMAICA. Clarendon Parish, north slope of Round Hill, 22 Nov 1954, *G. Proctor 9493* (F, GH, NY).

According to Plowman (1991), this synonymy reflects a broad concept of the species. *Erythroxylum compactum* Rose and *E. pallidum* Rose may merit varietal status within *E. rotundifolium*.

E. RUFUM Cav., Diss. 404, t. 232. 1789. TYPE: "Santo Domingo, [The island of Hispaniola, not the city of the same name]" s.d., *J. Dupuy s.n.* (HOLOTYPE: P-JUSS 11450).

Distribution: West Indies: Cuba, Dominican Republic, Haiti, Puerto Rico. South America: Brazil (Goiás, Maranhão, Mato Grosso, Pará, Roraima); Colombia (Cauquetá*); Guyana; Venezuela (Amazonas, Apure, Bolívar, Guárico, Monagas, Zulia). Stipules striate.

E. RUIZII Peyr. in Mart., Fl. bras. 12(1): 152. 1878. TYPE: ECUADOR. Guayas: Guayaquil, 1799, *Ruiz s.n.* (HOLOTYPE: B, destroyed = F neg. 12645; LECTOTYPE designated by Plowman, 1984, p. 141: G; ISOTYPES: F 844018 = F neg. 55541, GH, MA, NY, OXF).

Distribution: Ecuador (Guayas, Manabí). Stipules non-striate.

E. RURYI Plowman, Candollea 43(1): 426, fig. 3. 1988. TYPE: BOLIVIA. Cochabamba: Prov. Chapare, Todos Santos, 300 m, 23 Oct 1966 (fl, fr), *R. F. Steinbach 425* (HOLOTYPE: US 2533350 = F neg. 62616; ISOTYPES: F 1645044 = F neg. 62615, GH, MICH, MO 2177224 = F neg. 62722, NY, U, WIS).

Distribution: Bolivia (Beni*, Cochabamba, Santa Cruz*); Peru (Cuzco, Madre de Dios). Stipules non-striate.

E. SANTOSII Plowman, Fieldiana, Bot., n.s., 19: 25, fig. 12. 1987. TYPE: BRAZIL. Bahia: Vale do Rio Alcobaça [Rio Itanhém], Teixeira de Freitas, 12 May 1971 (fl), *T. S. dos Santos 1618* (HOLOTYPE: CEPEC 6910; ISOTYPE: F 1839581 = F neg. 60125).

Distribution: Brazil (Bahia, Roraima). Stipules non-striate.

E. SCHOMBURGKII Peyr. in Mart., Fl. bras. 12(1): 148. 1878. TYPES: GUYANA. In savannas on shores of Cotinga River, Sep, *R. H. Schomburgk 517* (LECTOTYPE designated by Plowman, 1984, p. 141: K = F neg. 55758; ISOLECTOTYPES: BM, F 839021 fragment ex W, F 1537796 = F neg. 55542, G—3, OXF, P = F neg. 58482, U, W—2); GUYANA. Cotinga River, Sep 1842, *M. R. Schomburgk 796* (SYNTYPE: B, destroyed = F neg. 12646).

Distribution: Brazil (Roraima); Guyana; Venezuela (Bolívar, fide Plowman & Berry, 1999). Stipules non-striate.

E. SCHUNKEI Plowman, Acta Amazonica 14(1–2) Supl.: 127, fig. 4. 1984. TYPE: PERU. Huánuco: Prov. Pachitea, Dist. Honoria, Bosque Nacional de Iparia, a lo largo del Río Pachitea cerca del campamento Miel de Abeja (1 km arriba del pueblo de Tournavista o unos 20 km arriba de la confluencia con el Río Ucayali), en bosque alto en la Carretera Miel de Abeja, Km 4.2, 300–400 m, 4 Oct 1967, *J. Schunke V. 2188* (HOLOTYPE: F 1688195 = F neg. 59734; ISOTYPE: GH).

Distribution: Peru (Huánuco). Stipules non-striate.

E. sessiliflorum O. E. Schulz in Engl., Pflanzenr. IV. 134: 69. 1907. TYPE: MEXICO. Yucatán: Laguna Chichankanab, s.d., *G. F. Gaumer 2287* (HOLOTYPE: B, destroyed; ISOTYPES: F 59085 = F neg. 55439, MO = F neg. 55438, NY = F neg. 55437).

E. ROTUNDFOLIUM Lunan (Plowman, 1991).

E. SHATONA J. F. Macbr., Candollea 5: 371. 1934. TYPE: PERU. San Martín: Río Mayo, Tarapoto, 14 Dec 1929, *Ll. Williams 6212* (HOLOTYPE: F 627013 = F neg. 52564; ISOTYPES: G fragment, US).

Distribution: Peru (Amazonas, San Martín). Stipules non-striate.

E. SIMONIS Plowman, Brittonia 38: 189, fig. 1. 1986. TYPE: BRAZIL. Paraíba: Areia, Mata de Pau Ferro, Chã do Jardim, área atrás da casa do vigia, ca. 600 m, 28 Nov 1980, *V. B. Fevereiro, S. J. Mayo, M. Barbosa da Silva, A. G. de Padua de Oliveira & J. Flor M128* (HOLOTYPE: IPA; ISOTYPES: F 1903323 = F neg. 61088, K, NY).

Distribution: Brazil (Ceará, Paraíba, Pernambuco). Stipules striate.

E. SKUTCHII Standl., Publ. Field Mus. Nat. Hist., Bot. Ser. 22: 344. 1940. TYPE: COSTA RICA. San José: Basin of El General, 1000 m, Mar 1940, *A. F. Skutch 4847* (HOLOTYPE: F 1044337 = F neg. 52559; ISOTYPE: US).

E. multiflorum Lundell.

Distribution: Costa Rica, Panama. Stipules striate.

This taxon was treated by Plowman (1991) as a synonym of *Erythroxylum macrophyllum* Cav., sensu lato. However, it is a larger-leaved form, compared by Plowman (1988c, 1989) to *E. macrophyllum* var. *macrocnemium* (Mart.) Plowman and *E. macrophyllum* var. *ecuadorensis* Plowman.

E. speciosum O. E. Schulz in Engl., Pflan-

zenr. IV. 134: 37. 1907, nom. illeg. superfl. TYPES: BRAZIL. Rio de Janeiro: Mt. Corcovado, Mar 1873 (2 Sep 1872 on B sheet), *A. Glaziou 6109* (LECTOTYPE **here designated**: K-annotated by O. E. Schulz = F neg. 55763; ISOLECTOTYPES: B, destroyed = F neg. 12647, C, P, S); BRAZIL. Rio de Janeiro: Mt. Corcovado, 30 May 1876, *A. Glaziou 8461* (SYNTYPES: C, P = F neg. 58483); BRAZIL. Rio de Janeiro: Mt. Corcovado, s.d., *A. Glaziou 10350* (SYNTYPES: C, G, K, P); BRAZIL. Rio de Janeiro: Mt. Corcovado, 29 Jun 1880, *A. Glaziou 11808* (SYNTYPES: C, K = F neg. 55759, P = F neg. 58484).

E. PULCHRUM A. St.-Hil.

This name is superfluous, under Arts. 52.1 and 52.2 of the ICBN, since Schulz cited as syntypes all three syntypes of *Erythroxylum excelsum* Glaziou. He was probably unaware of the earlier name. *Glaziou 11808* may be a different species from the other syntypes. See discussion of *E. striolatum* O. E. Schulz.

E. SPINESCENS A. Rich., Hist. phys. Cuba, Pl. vasc. 255. ca. 1841. *E. brevipes* var. *spinescens* (A. Rich.) Griseb. TYPE: CUBA. "Guaniman [Guanimar?]" (in protologue), ["prope Habana" on P sheet], Feb 1829 [on G-DC and P sheets], *J. M. Valenzuela in herb. R. de la Sagra (57)* (HOLOTYPE: P = F neg. 58485; ISOTYPE: G-DC = F neg. 60929). [Valenzuela's name does not appear on either sheet, but he is acknowledged in the protologue as the collector.]

Distribution: Cuba, Dominican Republic. Stipules non-striate.

Plowman seems to have been undecided about the rank of this taxon.

E. SPLENDIDUM Plowman, Fieldiana, Bot., n.s., 19: 25, fig. 13. 1987. TYPE: BRAZIL. Bahia: Mun. Valença, Km 9 na estrada Valença-Guaibim, approx. 13°18'S, 39°00'W, near sea level, 6 Feb 1983, *T. Plowman & A. M. de Carvalho 12818* (HOLOTYPE: CEPEC 32439; ISOTYPES: F

1916633 = F neg. 60186, G, HRB, K, NY, RB, SP, UB, US).

Distribution: Brazil (Bahia). Stipules non-striate.

E. SPRUCEANUM Peyr. in Mart., Fl. bras. 12(1): 160, t. 30, fig. 2. 1878. TYPE: BRAZIL. Amazonas: Rio Uaupés, Panurú, Aug 1852, *R. Spruce 2417* (LECTOTYPE designated by Plowman, 1984, p. 142: K; ISOTYPES: BM, CGE, E, F 1537821 = F neg. 55476, F 837987 fragment ex W, G, GH-2, LE, NY-2, OXF-2, P-2, W-2).

Distribution: Brazil (Amazonas, Pará); Colombia (Guainía); Peru (Loreto); Venezuela (Amazonas, Barinas). Stipules non-striate.

E. SQUAMATUM Sw., Prodr. 75. 1788. TYPE: "WEST INDIES": *O. Swartz s.n.* (LECTOTYPE designated by Plowman, 1984, p. 142: S = F neg. 58448; ISOLECTOTYPE: UPS).

E. aristigerum Peyr., *E. aristigerum* var. *bahiense* (Peyr.) O. E. Schulz, *E. bahiense* Peyr., *E. squamatum* var. *microcarpum* O. E. Schulz, *E. trinerve* Huber.

Distribution: West Indies: Dominica, Grenada, Guadeloupe, St. Kitts & Nevis, St. Lucia. South America: Bolivia (Beni, Santa Cruz*); Brazil (Acre, Amapá, Amazonas, Bahia, Goiás, Mato Grosso, Pará, Pernambuco, Rondônia); Colombia (Amazonas, Valle*); Ecuador (Carchi, Los Rios, Napo, Pastaza, Pichincha); French Guiana; Guyana; Peru (Loreto, Pasco, San Martín*); Trinidad & Tobago; Venezuela (Amazonas, Miranda, Sucre). Stipules striate.

E. squamatum var. *emarginatum* Peyr. in Mart., Fl. bras. 12(1): 158. 1878, "emarginata." TYPES: GUYANA. Pirara River, 1841-1842, *R. H. Schomburgk 379* (LECTOTYPE designated by Plowman, 1984, p. 143: K = F neg. 59993; ISOLECTOTYPES: B, destroyed, BM, CGE, F 839014, F 1537800, G-3, OXF, P-2 = F neg. 58490, U, W-2); GUYANA. Pirara River, 1841-1842, *M. R. Schomburgk 639* (SYNTYPE: B, destroyed = F neg.

12654); GUYANA. *A. Richard s.n.* (SYNTYPE, not located); "Antilles." *O. Swartz s.n.* (SYNTYPE, not located).

E. VERNICOSUM O. E. Schulz.

Plowman (1984) designated the same lectotype for this taxon as for *Erythroxylum vernicosum* O. E. Schulz. The number *Schomburgk 379* is not cited in the protologue. See the discussion of the Schomburgks' numbers under *E. testaceum*.

E. squamatum var. *microcarpum* O. E. Schulz in Urban, Symb. antill. 5: 192. 1907. TYPE: FRENCH GUIANA. Cayenne, Mar 1859, *P. Sagot 1229* (HOLOTYPE: B, destroyed; ISOTYPES: K = F neg. 56514, P, U = F neg. 58159).

E. SQUAMATUM Sw.

E. squamatum var. *orinocense* (Kunth) Kuntze, Revis. gen. pl. 1: 86. 1891. *E. ORINOCENSE* Kunth.

The specimen *O. Kuntze 919*, identified by Kuntze as this variety, is a syntype of *Erythroxylum impressum* O. E. Schulz.

E. STEYERMARKII Plowman, Brittonia 34: 442, fig. 1. 1982. TYPE: VENEZUELA. Sucre: Dist. Sucre, loma pendiente y pedregosa con bosque enano tropófilo bordeando el Golfo de Santa Fé, oeste de Santa Fé en el sitio Punta Cochaima, 30 m, 19 Aug 1973, *J. A. Steyermark, V. Carreño Espinoza & B. J. Manara 107841* (HOLOTYPE: VEN 94704 = F neg. 57542; ISOTYPES: F 1849008 = F neg. 61080, NY-2). [Note: The collection number is cited erroneously in the protologue as "107840."]

Distribution: Venezuela (Amazonas, Anzoátegui, Bolívar, Nueva Esparta, Sucre, Zulia). Stipules striate.

E. STIPULOSUM Plowman, Fieldiana, Bot., n.s., 19: 31, fig. 16. 1987. TYPE: BRAZIL. Ceará: Serra do Araripe, Bom Fim, 17 Jan 1935, *P. von Lützelburg 26187* (HOLOTYPE: M = F neg. 60126).

Distribution: Brazil (Bahia, Ceará/Per-

nambuco border, Minas Gerais). Stipules striate.

?*E. striolatum* O. E. Schulz in Engl., Pflanzenr. IV. 134: 44. 1907. TYPES: BRAZIL. Rio de Janeiro: [1.5 mi south of Mr. March's house, near Teresopolis, 22°26'S, 42°59'W, 15 Feb 1826], *W. J. Burchell* 2273 (LECTOTYPE designated by Amaral et al., 1997: K = F neg. 55762). Excluded SYNTYPE: BRAZIL. São Paulo: Campinas, *J. de Campos Novaes in Commis. Geogr.* 5663 (SYNTYPE: SP 18449 = F neg. 60944) = *E. daphnites* Mart.

Distribution: Brazil (Rio de Janeiro). Stipules striate.

The synonymization of *E. striolatum* with *E. daphnites* by Amaral et al. (1997) was apparently based on their identification of the Campos Novaes specimen, and not the Burchell lectotype. Plowman, in his unpublished manuscript, provisionally identified the Burchell specimen, which he had also planned to designate as lectotype, as "*Erythroxyllum deciduum* A. St.-Hil.?" He was clearly undecided about the status of the species since in the same manuscript he wrote of *Glaziou 11808*, a syntype of *E. excelsum* Glaziou and *E. speciosum* O. E. Schulz: "This coll. = *E. striolatum*?"

E. strobilaceum Peyr. in Mart., Fl. bras. 12(1): 140. 1878. TYPE: BRAZIL. Minas Gerais: Lagoa Santa, Lapa vermelha, 11 Nov 1864, *E. Warming s.n.* (HOLOTYPE: C = F neg. 21478).

E. warmingii Peyr.

Distribution: Brazil (Bahia?, Minas Gerais). Stipules striate.

E. suave O. E. Schulz in Urb., Symb. antill. 5: 197. 1907. TYPES: BAHAMAS. Andros Island, Deep Creek, 27 Jun 1890, *J. I. & A. R. Northrop* 692 (SYNTYPES: F, NY); Fortune Island, 4 Feb 1888, *H. F. A. von Eggers* 3810 (SYNTYPES: B, E, GOET). CUBA. No locality, 1849, *R. de la Sagra* 146 (SYNTYPE: G); "in parte orientali," 1860–1864, *C. Wright* 2134 (SYNTYPES: C, GOET—3, LE, MO, NY, W); Matanzas Bay, 1849, *F. I. X. Rugel*

366 (SYNTYPE: F); "Prov. Santa Clara in districto Cienfuegos prope Calicita," 6 Dec 1895, *R. Combs* 178 (SYNTYPES: F—2, MO, NY). DOMINICAN REPUBLIC. No locality, s.d., *C. G. Bertero* 380 (n.v.); "prope Santiago in Vuelta Larga in colibus calcareis et in silvis juxta flumen Las Lavas dictum et ad Palmarejo," 12 Jun 1887, *H. F. A. von Eggers* 2435 (SYNTYPES: F, G, GOET, LE, NY). HAITI. "Prope Poste Coudan, 100 m," *W. Buch* 1016 (IJ—n.v.). U.S.A. Puerto Rico: "Prope Guanica ad Salinas," s.d., *P. Sintenis* 3445 (SYNTYPES: CM, G). Excluded SYNTYPE: U.S.A. Virgin Islands: St. Thomas, Flaghill, Oct 1880, *H. F. A. von Eggers* 153 (GOET, HBG, LE, PR, W, Z) = *E. brevipes* DC.

E. rotundifolium Lunan.

Plowman treated this species as an illegitimate renaming of *Erythroxyllum rotundifolium* Lunan (1814), and therefore did not cite any types in his manuscript. However, *E. rotundifolium* Lunan was cited with reservation ("perprobabiliter") in the synonymy of *E. suave* var. *jamaicense* O. E. Schulz. Therefore the name *E. suave* O. E. Schulz should be treated as legitimate, according to Art. 52.2, Note 1 of the ICBN (Greuter et al., 2000), and a lectotype should be selected.

E. suave var. *aneurum* O. E. Schulz in Urb., Symb. antill. 5: 199. 1907. TYPES: BAHAMAS. New Providence, *H. F. A. von Eggers* 4278 (LECTOTYPE **here designated**: C); BAHAMAS. New Providence, Hog Island near Nassau, *H. F. A. von Eggers* 4159 (SYNTYPE: C).

E. rotundifolium Lunan.

E. suave var. *compactum* (Rose) O. E. Schulz in Engl., Pflanzenr. IV. 134: 68, fig. 15. 1907. *E. compactum* Rose.

E. rotundifolium Lunan (Plowman, 1991).

E. suave var. *jamaicense* O. E. Schulz in Urb., Symb. antill. 5: 199. 1907. TYPES: JAMAICA. Prope St. Ann's, 1858, *W. T. March* 1669 [LECTOTYPE **here designated**: K = F neg. 55760; ISOLECTOTYPES:

GOET, LE (as *March s.n.*) = F neg. 57102]; JAMAICA. Without locality, s.d., *J. H. Hart 1476* (SYNTYPE: not located); JAMAICA. Prope St. Ann's, 1857, *W. T. March 1409* (SYNTYPE: F, GOET); JAMAICA. Prope St. Ann's, 1857, *W. T. March 1680* (SYNTYPE: not located); JAMAICA. Green Valley, 12 Aug 1894, *W. Harris 5613* (SYNTYPE: W = F neg. 60007); JAMAICA. Road to Warika, 24 Sep 1906, *W. Harris 9387* (SYNTYPE: NY = F neg. 55436); JAMAICA. Near Troy, 2000 ft, 17 Sep 1906, *W. Harris 9422* (SYNTYPE: BM, F 212327 = F neg. 55435, NY); JAMAICA. Prope St. Augustin, s.d., *Oersted s.n.* (SYNTYPE: not located)

E. ROTUNDFOLIUM Lunan.

E. SUBEROSUM A. St.-Hil., *Pl. usuel. bras.*, t. 69, fig. A, p. 1. 1828. TYPES: BRAZIL. Minas Gerais: Corgo de Mathias, [1819], *A. St. Hilaire cat. C'617* (LECTOTYPE designated by Plowman, 1984, p. 142: P = F neg. 35187; ISOLECTOTYPE: MPU); BRAZIL. Minas Gerais, [1819], *A. St. Hilaire cat. C'143^{bis}* (SYNTYPE: P); BRAZIL. Minas Gerais, *A. St. Hilaire cat. C 1899* (SYNTYPE: P).

E. testaceum Peyr., *E. areolatum* Vell. non L.

‡ Distribution: Bolivia (Santa Cruz); Brazil (Amapá, Amazonas, Bahia, Ceará, Distrito Federal, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Paraíba, Paraná, Pernambuco, Piauí, Rio de Janeiro, Rondônia, Roraima, São Paulo); French Guiana; Guyana; Paraguay (Amambay, Caaguazú, Canendiyu, Concepción, San Pedro); Venezuela (Bolívar). Stipules striate.

The collection number *St. Hilaire C 1899* may be an incorrect citation by Plowman; the number corresponds to a locality in Rio Grande do Sul or Uruguay, according to Dwyer (1955).

Martius (1841), followed by subsequent monographers, treated *Stuedelia brasiliensis* Sprengel (1822, p. 59) as a synonym of *Erythroxyllum suberosum* A. St.-Hil., although the older epithet would have priority. Plowman left no indication of his treat-

ment of Sprengel's species; it is possible the type is not extant.

+*E. suberosum* f. *brevipetiolatum* O. E. Schulz in Engl., *Pflanzenr.* IV. 134: 27. 1907. TYPE: BRAZIL. Southern Brazil, *Hb. Zuccarinii s.n.* (n.v.).

E. SUBEROSUM var. *DENUDATUM* O. E. Schulz in Engl., *Pflanzenr.* IV. 134: 28. 1907. TYPES: BRAZIL. Pernambuco, 1839, *G. Gardner 1142* (SYNTYPES*: B, destroyed, BM, CGE, E, F 982922, G-2, GH, NY-3 = F neg. 57815, P-3 = F neg. 35188, W-3); BRAZIL. Alagoas, Apr 1836, *G. Gardner 1256* (SYNTYPES: BM, CGE, G, K = F neg. 56511, W); BRAZIL. Ceará, Oct 1838, *G. Gardner 1492* (SYNTYPES: GH, P); BRAZIL. Goiás, Sep 1839, *G. Gardner 3048* (SYNTYPES: BM, CGE, E, G-2, GH, K = F neg. 56505, W-2); BRAZIL. Pará: [Caminho de Chamonte, 1828-1830], *W. J. Burchell 9812* (SYNTYPE: K = F neg. 55764); BRAZIL. Bahia: Jacobina, Tamanduá, Jun 1844, *J. S. Blanchet 3836* (SYNTYPES: BM, G-2); BRAZIL. Bahia, 1857, *J. S. Blanchet 2936^{bis}* (SYNTYPE: G); BRAZIL. Bahia, 1847, *J. S. Blanchet 2495* (SYNTYPE: G); BRAZIL. Espírito Santo: Vittoria, s.d., *F. Sellow 5172* (SYNTYPE: not located); BRAZIL. Mato Grosso: Cuyabá, Aug 1827, *Riedel 1108* (SYNTYPE: LE); BRAZIL. Minas Gerais: Uberaba, Sep, *Regnell 1.46e* (SYNTYPE: not located).

Distribution: Brazil (Alagoas, Bahia, Espírito Santo, Goiás, Maranhão, Mato Grosso, Minas Gerais, Pará, Paraíba, Pernambuco). Stipules striate.

A duplicate of the syntype *Gardner 1142* is also cited by Schulz (1907) as *Erythroxyllum deciduum* A. St.-Hil. but Plowman's records don't show this as a mixed collection. In addition, the syntype *Gardner 1492* is also cited as a syntype of *E. rimosum* O. E. Schulz, and it is unclear whether this is a mixed collection or an error by Schulz. Loiola (2001) considered *Gardner 1256* to be mistakenly placed here and treated it under *E. rimosum*.

E. SUBGLAUDESCENS Peyr. ex O. E. Schulz in Engl., Pflanzenr. IV. 134: 98. 1907. TYPE: BRAZIL. Goiás, Natividade, hilly places, Nov 1839, *G. Gardner 3056* (HOLOTYPE: B, destroyed = F neg. 12648; LECTOTYPE designated by Plowman, 1984, p. 142: K = F neg. 55765; ISOTYPES: BM, CGE = F neg. 56836, F 838029 fragment ex W, F 1988049 = F neg. 62198; G, OXF, P-2, W = F neg. 60005).

Distribution: Brazil (Goiás, Maranhão, Piauí). Stipules non-striate.

Plowman (1987) inadvertently lectotyped this name a second time, using the W sheet. His original lectotypification stands. Schulz's citation in the protologue of both *Gardner 3054* and *3056* was due to his copying a transcription error by Peyritsch. *Gardner 3054* (OXF) is *E. maracasense* Plowman.

E. SUBRACEMOSUM Turcz., Bull. Soc. Imp. Naturalistes Moscou 31: 390. 1858. TYPE: BRAZIL. Goiás, Villa de Natividade, Oct 1839, *G. Gardner 3053* (HOLOTYPE: KW = F neg. 61116; ISOTYPES: B, destroyed = F neg. 12649, BM, CGE, E, F 1538245 = F neg. 55474, F 838028 fragment ex W = F neg. 55475, G-3, GH-2, K-2 = F neg. 55766, OXF, P, W-2).

Distribution: Bolivia (Santa Cruz); Brazil (Goiás, Maranhão, Mato Grosso, Minas Gerais, Pará, Rio de Janeiro, Rondônia, São Paulo); Peru (San Martín). Stipules striate.

E. SUBROTUNDUM A. St.-Hil., Pl. usuel. bras. t. 69, p. 3. 1828. TYPE: BRAZIL. Rio de Janeiro: Cabo Frio, [Aug–Nov 1818], *A. St. Hilaire cat. B² 110, 2^e partie* (HOLOTYPE: P = F neg. 58486; ISOTYPES: F 936018 fragment ex P, MPU = F neg. 58975, P).

E. flaccidum Salzm. ex Peyr.?

Distribution: Bolivia (La Paz); Brazil (Alagoas, Bahia, Ceará, Distrito Federal, Espírito Santo, Goiás*, Minas Gerais, Pernambuco, Rio Grande do Norte, Rio de Janeiro). Stipules non-striate.

St. Hilaire (1829, p. 99) later provided a more complete description. According to Plowman and Berry (1999), an undescribed taxon of close affinity to *Erythroxylum subrotundum* occurs in Venezuela (Bolívar, Guárico), corresponding to *E. christii* O. E. Schulz, nom. nud.

E. SUBSESSILE (Mart.) O. E. Schulz in Engl., Pflanzenr. IV. 134: 82. 1907. *E. kunthianum* var. *subsessile* Mart.

Distribution: Brazil (Rio de Janeiro). Stipules non-striate.

E. SUBSTRIATUM O. E. Schulz in Engl., Pflanzenr. IV. 134: 62. 1907. TYPE: BRAZIL. Rio Grande do Sul, 1837, *J. Tweedie 51* (HOLOTYPE: K = F neg. 55767).

Distribution: Brazil (Rio Grande do Sul). Stipules striate.

E. tabascense Britton, N. Amer. fl. 25(1): 66. 1907. TYPE: MEXICO. Tabasco: San Sebastián, 6 Apr 1890, *J. N. Rovirosa 772* (HOLOTYPE: NY = F neg. 55431; ISOTYPE: US).

E. MACROPHYLLUM Cav. var. *MACROPHYLLUM* (Plowman, 1989, 1991).

E. TENUE Plowman, Fieldiana, Bot., n.s., 19: 35, fig. 19. 1987. TYPE: BRAZIL. Bahia: Mun. Ituberá, Km 11 na estrada Ituberá-Valença, 1–2 km, no ramal de acesso a Estação da Telebahia, ca. 13°40'S, 39°07'W, near sea level, 4 Feb 1983, *T. Plowman & A. M. de Carvalho 12812* (HOLOTYPE: CEPEC 32462; ISOTYPES: ALCB, F 1916664 = F neg. 60187, G, GH, HRB, IPA, K, LE, MBM, MO, NY, P, R, RB, SP, U, UB, US).

Distribution: Brazil (Bahia, Pernambuco*). Stipules striate.

E. tessmannii O. E. Schulz, Notizbl. Bot. Gart. Berlin-Dahlem 9: 263. 1925. TYPE: PERU. Loreto: Río Ucayali, middle Aguaytía [ca. 8°10'S], on river bank, 175 m, 5 Sep 1923, *G. Tessmann 3163* (HOLOTYPE: B, destroyed = F neg. 12651; LECTOTYPE designated by Plowman,

1984, p. 143: NY = F neg. 55458; ISOTYPES: F 612395 fragment ex B, G-2, S = F neg. 58449).

E. ULEI O. E. Schulz.

E. testaceum Peyr. in Mart., Fl. bras. 12(1): 170. 1878. TYPES: GUYANA. Taiutu River, 1840, R. H. Schomburgk (764) (LECTOTYPE designated by Plowman, 1984, p. 142: M; ISOLECTOTYPES: BM = F neg. 56257, CGE, G-2, NY = F neg. 57816, OXF, P-3 = F neg. 58488 & 58489); GUYANA. Taiutu River, April, M. R. Schomburgk 548 (SYNTYPE: Not located, probably B, destroyed); BRAZIL. Pará: Santarem, in hills on dry volcanic ash, Nov 1849, R. Spruce s.n. (*Erythroxyton* "3,") (SYNTYPES: BM, CGE, K = F neg. 56513, M-2 = F neg. 19471, P = F neg. 58487, W; Note: CGE, K, and W sheets read *Spruce* 351; M sheets read *Spruce* 76, 156). [Note: The protologue cited only *Schomburgk* 548 and *Spruce* s.n.]

E. SUBEROSUM A. St.-Hil.

The discrepancy between the Schomburgk collection number cited in the protologue and that of the lectotype is due to a peculiarity in the numbering of Schomburgk collections. The Schomburgk brothers divided their joint Guyana collections into independently numbered sets, such that in many cases, the same collection was distributed under two or three different numbers. The situation has been summarized by McVaugh (1969). Although it is not known whether *Schomburgk* 548 and 764 had identical label data, the pattern of collection pairs with different numbers and nearly identical label data, is observed among syntypes of four other *Erythroxyton* taxa: *E. divaricatum*, *E. roraimae*, *E. schomburgkii*, and *E. vernicosum*. In each case one collection number of the pair, presumably Robert's, is well-distributed, while the other, Richard's, may be known only from the photograph of the destroyed Berlin type.

E. TIANGUANUM Plowman, Brittonia 38: 198, fig. 5. 1986. TYPE: BRAZIL. Ceará: Tianguá, 24 Mar 1979 (fr), A. G. Fernandes & F. J. de Abreu Matos s.n. (HO-

LOTYPE: EAC 5746; ISOTYPE: F 1910525 = F neg. 61087).

Distribution: Brazil (Ceará). *Stipules* striate.

E. tikalense Lundell, Wrightia 4(6): 177. 1971. TYPE: GUATEMALA. Petén: Tikal, on top of Temple IV, 9 June 1960, E. Contreras 1051 (HOLOTYPE: LL = F neg. 57370; ISOTYPES: DUKE 225215 = F neg. 55421, F 1967981 = F neg. 61363).

E. ROTUNDFOLIUM Lunan.

E. TORTUOSUM Mart., Beitr. Erythroxyton 119. 1840. TYPES: BRAZIL. Goiás: Meia Ponte, s.d., J. E. Pohl s.n. (LECTOTYPE **here designated**: BR = F neg. 58512); BRAZIL. No locality or date, F. Sellow s.n. (SYNTYPE: K = F neg. 55768).

Distribution: Bolivia (Santa Cruz*); Brazil (Distrito Federal, Goiás, Mato Grosso, Minas Gerais, São Paulo). *Stipules* non-striate.

E. trinerve Huber, Bol. Mus. Paraense Hist. Nat. 5: 417. 1909. TYPE: BRAZIL. Upper Rio Ariramba, 21 Dec 1906, A. Ducke (MG) 8035 (HOLOTYPE: MG 8035; ISOTYPES: B, destroyed = F neg. 12652, RB 20438).

E. SQUAMATUM Sw.

E. trollii O. E. Schulz, Notizbl. Bot. Gart. Berlin-Dahlem 11: 723. 1933. TYPE: BOLIVIA. Montecauto, 2600 m, 24 Nov 1927, C. Troll (*Iter Andinum* 1927) 617 (HOLOTYPE: B, destroyed; ISOTYPE: M = F neg. 57577).

E. CUNEIFOLIUM (Mart.) O. E. Schulz.

E. truxillense Rusby, Druggists Circ. & Chem. Gaz. 44: 220, fig. 14. 1900. E. NOVOGRANATENSE var. TRUXILLENSE (Rusby) Plowman. TYPE: Specimen of dried leaves in a glass jar: "Truxillo coca, small coca, native of Peru and cultivated." The commercial drug presented by E. Merck & Co., New York City, s.d. Economic Museum of the New York Bo-

tanical Garden, accession no. 2684. (LECTOTYPE designated by Plowman, 1979b, p. 57: ECON; ISOLECTOTYPES: F = F neg. 56263, NY, USM).

As later acknowledged by Rusby (1901), the figure of *Erythroxylum coca* L. provided in the same publication with the protologue of *E. truxillense* erroneously depicts the leaves of the former species with the fruits of the latter species (Plowman, 1982b).

E. TUCURUIENSE Plowman, Acta Amazonica 14(1–2) Supl.: 131, fig. 5. 1984. TYPE: BRAZIL. Pará: Estrada de Ferro Tocantins, Breu Branco, 29 Sep 1948, R. L. Fróes 23580 (HOLOTYPE: IAN 42232 = F neg. 59823).

Distribution: Brazil (Maranhão, Pará). Stipules non-striate.

E. ULEI O. E. Schulz in Engl., Pflanzenr. IV. 134: 62. 1907. TYPES: PERU. San Martín: Tarapoto, Sep 1902, *E. Ule* 6346 (LECTOTYPE designated by Plowman, 1984, p. 143: K = F neg. 55769; ISOLECTOTYPES: B, destroyed = F neg. 12653, F 612471 fragment ex B, G, L = F neg. 57237); PERU. San Martín: Tocache, *E. Poeppig s.n.* (SYNTYPE: W = F neg. 59998); PERU. Without locality, yr. 183.?, *A. Matthews* 2022 (SYNTYPES: BM, CGE, F, G, K, NY, OXF = F neg. 60337, P, W); PERU. Without locality, s.d., *A. Matthews* 680 (SYNTYPE: not located); COLOMBIA. Cauca Valley, 1000 m, 1851–1857, *J. J. Triana s.n.* (SYNTYPES: BM, K, P).

E. tessmannii O. E. Schulz, *E. venosum* Rusby.

Distribution: Bolivia (Beni, La Paz, Pando*, Santa Cruz); Brazil (Acre, Distrito Federal); Colombia (Caldas, Cauca, Cundinamarca, Tolima, Valle); Ecuador (Morona-Santiago, Napo); Peru (Amazonas*, Ayacucho, Cajamarca*, Cuzco, Huánuco, Junín, Lima, Loreto, Madre de Dios, San Martín, Ucayali). Stipules non-striate.

E. UNDULATUM Plowman, Brittonia 34: 446, fig. 3. 1982. TYPE: VENEZUELA. Distrito Federal: Caracas, Jardín Botánico,

hills behind Instituto Botánico, 900–950 m, 24 Apr 1979, *P. Berry* 3479(B) (HOLOTYPE: F 1859630 = F neg. 57696; ISOTYPES: B, G, GH, K, MO, NY, US, VEN).

Distribution: Venezuela (Distrito Federal, Nueva Esparta, Sucre). Stipules non-striate.

E. uniflorum Rusby, Descr. S. Amer. pl. 33. 1920. TYPE: COLOMBIA. Magdalena: in thickets by a stream at Masinga Vieja, 800 ft, 25 Apr [1898–1901], *H. H. Smith* 788 (HOLOTYPE: NY = F neg. 55457; POSSIBLE ISOTYPES: A, CM 211123, DUKE 153498, F 137796, F 1537762 = F neg. 55456, G, GH, MICH, MO, MPU, P, US, W, WIS).

E. OXYCARPUM O. E. Schulz (Plowman, 1988b).

There are three sheets of *H. H. Smith* 788 in NY, including the holotype of *Erythroxylum uniflorum* cited above, and two additional gatherings of the same species from near Bonda, 150 ft, collected in June and July, and identified by Rusby as *E. passerinum* and *E. campestre*, respectively. Plowman had annotated these (F negs. 57817 & 57818) as isotypes but they are clearly not types (Ayers & Boufford, 1988). The remaining duplicates, probably distributed with printed labels and minimal collection data (as seen on the collection at F) cannot be clearly determined to be isotypes without further study.

E. URBANII O. E. Schulz in Urb., Symb. antill. 4: 314. 1905. TYPES: U.S.A. Puerto Rico: Manatí, "in montibus calcareis ad Rio Arriba Saliente," 9 Apr 1887, *P. Sintenis* 6613 (SYNTYPES**: B, destroyed, BR, C, G, L, MO 1894583 = F neg. 55427, NY—3 = F negs. 55426, 55429, 55430); U.S.A. Puerto Rico: "In parte orientali," 1827, *H. Wydler* 412 (SYNTYPES: B, destroyed, F 1538260 = F neg. 55428).

Distribution: Dominican Republic, Haiti, Puerto Rico. Stipules non-striate.

?*E. urbanii* var. *confertifolium* O. E. Schulz in O. C. Schmidt, Repert. Spec. Nov. Regni Veg. 32: 86. 1933. TYPE: DOMIN-

ICAN REPUBLIC: Prov. Samaná [now, Prov. El Seibo], Cordillera Central, Los Haitises, Boca del Infierno, Jun 1930, *E. L. Ekman H15389* (HOLOTYPE: B, destroyed; ISOTYPES not located).

E. utile Saldanha, Ann. Sci. Nat. Bot., sér. 5, 19: 212. 1874. TYPE: BRAZIL. Rio de Janeiro: Vale de Rio Parahyba do Sul, São Fidelis, Fazenda de Monte Cristo, s.d., *J. de Saldanha s.n.* (HOLOTYPE: R 70887 = F neg. 57706).

E. PULCHRUM A. St.-Hil.

E. VACCINIIFOLIUM Mart., Beitr. Erythroxy-lon 107, t. 9. 1840. TYPES: BRAZIL. Bahia: Rio de Contas, in campestribus petrosis irriguis opacis montosis prope villam, Oct 1818, *C. Martius (1978)* (LECTOTYPE **here designated**: M = F neg. 19472; ISOLECTOTYPES: M-2); BRAZIL. Minas Gerais: Fanado, *J. E. Pohl (3417)* (SYNTYPES: F 839117 ex W, F 1988047 = F neg. 62195, W-3 = F neg. 60004).

E. amplifolium (Mart.) O. E. Schulz non Baillon, *E. microphyllum* var. *amplifolium* Mart.

Distribution: Brazil (Bahia, Ceará, Distrito Federal, Goiás, Minas Gerais, Paraná, Piauí, Rio Grande do Sul, Rio de Janeiro, Santa Catarina, São Paulo); Uruguay (Artigas; specimen at F had been identified by Plowman as *E. amplifolium* (Mart.) O. E. Schulz, non Baillon). Stipules non-striate.

E. VAGINATUM O. E. Schulz in Engl., Pflanzenz. IV. 134: 82. 1907. TYPE: BRAZIL. "Sudbrasilianische Provinz," [1850-1861, fide Urban, 1906], *G. Schüch 325* (HOLOTYPE: W = F neg. 32429).

Distribution: Brazil (probably Ceará or Rio de Janeiro). Stipules non-striate.

Known only from the type.

E. VASQUEZII Plowman, Candollea 43(1): 424, fig. 2. 1988. TYPE: PERU. Loreto: Prov. Loreto, Quebrada Saragos (carretera Nauta-Iquitos), 4°29'S, 73°35'W, 150 m, 8 Jun 1983, *R. Vásquez 4195* (HOLOTYPE: F 1925935 = F neg. 62531; ISOTYPE: MO 3305582 = F neg. 62723).

Distribution: Peru (Loreto). Stipules non-striate.

E. venezuelense Steyererm., Fieldiana, Bot. 28(2): 271. 1952. TYPE: VENEZUELA. Bolívar: Wooded slopes of Quebrada Oparu-má, between Santa Teresita de Kavanayén and Río Pacairao (tributary of Río Mouak), 1065-1220 m, 20-21 Nov 1944, *J. A. Steyermark 60371* (HOLOTYPE: F 1218042 = F neg. 52565, NY).

E. MUCRONATUM Benth.

E. venosum Rusby, Mem. New York Bot. Gard. 7: 270. 1927. TYPE: BOLIVIA. Rurrenabaque, 1000 ft, 7 Oct 1921, *H. H. Rusby 1564* (HOLOTYPE: NY = F neg. 55424; ISOTYPE: GH = F neg. 55423, US 1232380 = F neg. 55422).

E. ULEI O. E. Schulz.

E. VERNICOSUM O. E. Schulz in Engl., Pflanzenz. IV. 134: 106. 1907. TYPES: GUYANA. Pirara River, Jun 1841-1842, *R. H. Schomburgk 379* (LECTOTYPE designated by Plowman, 1984, p. 143: K = F neg. 59993; ISOLECTOTYPES: B, destroyed, BM, CGE, F 839014 fragment ex W, F 1537800 fragment ex G, F 1988023 = F neg. 62205, G-3, OXF, P-2 = F neg. 58490, U, W-2); GUYANA. Pirara River, 1841-1842, *Schomburgk 639* (SYNTYPE: B, destroyed = F neg. 12654).

E. squamatum var. *emarginatum* Peyr.

Distribution: Brazil (Roraima); Guyana; Venezuela (Amazonas, Bolívar). Stipules non-striate.

Schomburgk 379 (K) is also the lectotype of *Erythroxyllum squamatum* var. *emarginatum* Peyr., and *Schomburgk 639* is also a syntype of the same name.

E. vernicosum var. *oreophilum* O. E. Schulz in Pilger, Notizbl. Bot. Gart. Berlin-Dahlem 54: 142. 1914. *E. OREOPHILUM* (O. E. Schulz) Steyererm. & Maguire. TYPE: BRAZIL. Acre: Rio Branco, Surumu, on rocks of Serra de Mairary, 1200 m, Feb 1909, *E. Ule 8402* (HOLOTYPE: B, destroyed; LECTOTYPE designated by Plowman, 1984, p. 141: K = F neg. 55770;

ISOTYPES: G, L = F neg. 57238, MG 13474 = F neg. 55730).

E. verruculosum O. E. Schulz in Engl., Pflanzenr. IV. 134: 40. 1907. TYPES: PARAGUAY. Cordillera de Altos, 30 Aug 1902, K. Fiebrig 67 (LECTOTYPE designated by Mendonça & Amaral, 1999, p. 6: G; ISOLECTOTYPES: B, destroyed = F neg. 12655, F = F neg. 55471); PARAGUAY. Bank of Río Piribebuy at Tobaty, Aug, *E. Hassler* 3212 (SYNTYPES: A = F neg. 55472, F 1940024 = F neg. 59669, G-2, K = F neg. 55771, MPU, P, W); BRAZIL. São Paulo: Campinas, s.d., *J. de Campos Novaes in Commiss. Geogr.* 5665 (SYNTYPE: SP = F neg. 60945); BRAZIL. São Paulo: Salto Grande, Rio Paranapanema, 500 m, July, *R. Wettstein & V. F. Schiffner s.n.* (SYNTYPE: not located).

E. PELLETERIANUM A. St.-Hil.

Mendonça & Amaral (1999) treated *Erythroxylum verruculosum* as a synonym of *E. buxus* Peyr.

E. VIRGULTOSUM Mart., Beitr. Erythroxylon 109. 1840. TYPE: BRAZIL. Rio de Janeiro: Cabo Frio, s.d., *Prinz v. Neuwied s.n.* (HOLOTYPE: BR = F neg. 58511).

Distribution: Brazil (Goiás/Pará border, Rio de Janeiro). Stipules non-striate.

E. warmingii Peyr. in Mart., Fl. bras. 12(1): 140. 1878. TYPE: BRAZIL. Minas Gerais: Lagoa Santa, "auf den Kalkfelsen Lapa Vermelha," 28 Mar 1864, *E. Warming s.n.* (HOLOTYPE: C = F neg. 57700; ISOTYPE: P = F neg. 58491).

E. STROBILACEUM Peyr.

E. WILLIAMSII Standl. ex Plowman, Brittonia 34: 453, fig. 6. 1982. TYPE: VENEZUELA. Amazonas: Puerto Ayacucho, "laja" outcrop in Parque Ayacucho, ca. 100 m, 20 Feb 1979 (fr), *T. Plowman* 7700 (HOLOTYPE: F 1852961 = F neg. 59653; ISOTYPES: F 1852960 = F neg. 59652, G, GH, INPA, K, NCU, NY, P, US, VEN).

Distribution: Colombia (Vichada); Venezuela (Amazonas, Bolívar, Guárico). Stipules non-striate.

E. zehntneri Diogo, Bol. Mus. Nac. Rio de Janeiro 1: 359, t. 3-4. 1924. TYPE: BRAZIL. Bahia: "Campos geraes de Caeteté, 29 Nov 1912, L. Zehntner 622 [=P. von Lützelburg 4049] (HOLOTYPE: R 70665 = F neg. 57480; ISOTYPE: M = F neg. 57574).

E. MACROCHAETUM Miq.

The isotype is also the holotype of *Erythroxylum macrochaetum* var. *zehntneri* O. E. Schulz.

Nomina Nuda

Names mentioned only in synonym lists are not included here.

E. americanum Fisch. ex Steud., Nomencl. bot. ed. 1. 319. 1821.

E. amplifolium var. *diversifolium* Herter, Estud. Bot. Reg. Uruguaya 4: 76. 1930.

E. christii O. E. Schulz, Repert. Spec. Nov. Regni Veg. 30: 179. 1932 (= *E. aff. subrotundum* A. St.-Hil.; cf. Plowman & Berry, 1999).

E. peruvianum W. H. Prescott, History of the Conquest of Peru 1: 129. 1847 (= *E. coca* Lam., variety not specified by Plowman).

E. squarrosom Klotzsch in Schomburgk, Reis. Br.-Guiana 3: 1179. 1848 (= *E. rufum* Cav., fide Schulz, 1907).

E. suberosum f. *oblongifolium* Miq., Linnaea 22: 798. 1849, "oblongifolia" (= *E. polygonoides* Mart.).

Excluded Names

E. catuaba da Silva ex Hamet, Compt. Rend. Hebd. Séances Acad. Sci. 203: 1178. 1936, nom. nud. pro syn.

This name has become widely applied by herbal medicine practitioners to various species of diverse families known locally as "catuaba" in different regions of Brazil, including *Erythroxylum vacciniifolium* Mart.

and *E. subrotundum* A. St.-Hil. of north-eastern Brazil. According to Ducke (1966), the name was originally published as a nomen nudum for a species from Pernambuco by Arruda da Câmara. A Bahian species was described under this name by A. J. da Silva in his unpublished medical thesis in 1904, but the description is clearly conjectural and mixes characteristics of different families. Hamet, who published an anatomical description of Silva's bark specimens, believed it was Meliaceae. It may be *Tetragastris catuaba* Soares da Cunha (Burseraceae), described in 1939.

E. sativum Albuquerque ex Meira Penna, Dicionário Brasileiro de Plantas Mediciniais, ed. 3. 165. 1946, "Erythroxilon sativum," nom. nud. pro syn.

According to Meira Penna, this is a name applied in herbal medicine to a purple-flowered herb of coastal São Paulo and is not an *Erythroxylum*.

E. subcordatum DC., Prodr. 1: 575. 1824. TYPE: DOMINICAN REPUBLIC. Without locality or date, C. G. Bertero s.n. (HOLOTYPE: G; ISOTYPES: B, M).

= *Coccoloba subcordatum* (DC.) Lindau, Polygonaceae.

The type specimen information and synonymy is taken from Howard (1958).

E. surinamense Miq. in Hoenen & de Vriese, Tijdschr. Natuurl. Gesch. Physiol. 10: 86. 1843. TYPE: SURINAME. "Crescit in locis arenosis maritimis ad Matapicca, Dec," H. C. Focke s.n. (not located; to be expected at U).

Schulz (1907) believed the plant belonged to another, unidentified, family.

Acknowledgments

Many thanks are due to Christine Niezgodna for bringing my attention to the original manuscript and many other resources Tim Plowman left in her care. Lillian Vaneek, Tim's long-time volunteer, scrupulously maintained the massive specimen cardfile which was the foundation of the specimen

database. The database was produced with the help of Kyung Hee, Gail Kushino, Paul Zahnle, and Laura Torres. Laura Torres also helped to check the manuscript against the database and Field Museum (F) collections. I am very grateful to Iracema Loliola for providing a copy of her thesis. Keron Campbell (IJ), Jochen Heinrichs (GOET), Patrick Lewis (UCWI), Konrad Pagitz (IB), Lucia Rossi (SP), and Konrad Pagitz (IB) helped resolve questions about type collections. Finally, many thanks to Fred Barrie, Paul Berry, Dan Nicolson, and Tom Zanoni for thoughtful critical reviews which greatly improved the manuscript. I am particularly grateful to Fred Barrie for heroically generous counsel on nomenclature and typification matters.

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