

New synonyms and lectotypifications in Brazilian *Erythroxylum* (Erythroxylaceae)

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Erythroxylum Browne (1756: 278) includes about 230–240 species and is the only genus of Erythroxylaceae Kunth (1821: 175) occurring in the Neotropical region (Plowman & Berry 1999, Plowman & Hensold 2004). The eastern and northeastern Brazil and Venezuela are considered centers of its diversity and endemism (Daly 2004). For Brazil, 123 species are recognized, with the greatest species richness in the Atlantic Forest Domain, especially in its northeastern region, where 46 species have been reported, with 17 of them endemic (Loiola & Costa-Lima 2014).

In our taxonomic studies of *Erythroxylum* of the Atlantic Forest of northeastern Brazil, herbarium specimens from ALCB, ASE, BAH, BHCN, CEPEC, CESJ, CVRD, EAC, EAN, FLOR, HABIT*, HB, HTSA*, HST*, HUEFS, HUESB*, HRB, HUCPE*, HUVA, HVASF, IAN, IBGE, INPA, IPA, JOI, JPB, MAC, MBM, MBML, MOSS, PEUFR, R, RB, RFFP, SP, TEPB, UB, UEC, UFP, UFRN, UPCB, VIC, and VIES [the acronyms are those of Thiers (2014); * = not in Thiers], along with the types and online type collections from BM, BR, C, E, F, G, GH, K, L, LE, M, MO, MPU, NY, P, S, U, US, and W, have been analyzed. One of the results of that analysis are new synonymizations for *Erythroxylum pulchrum* Saint-Hilaire (1829: 94), *E. rimosum* Schulz (1907: 53), and *E. subrotundum* Saint-Hilaire (1829: 69), presented below. *Erythroxylum rimosum* and the new synonyms of *E. pulchrum*, *E. rimosum*, and *E. subrotundum* were based on syntype collections, and, in accordance with Art. 9.2 of the International Code of Nomenclature for algae, fungi and plants (ICN, McNeill *et al.* 2012), lectotypes are designated here. These lectotypes had already been suggested by T.C. Plowman in his unpublished “List of types of *Erythroxylum* (Erythroxylaceae) examined for Flora Neotropica” (dated 22 February 1988), deposited at the Field Museum. To avoid future confusion, voucher specimens indicated by Plowman have been used in the designation of lectotypes.

Nomenclature

1. *Erythroxylum pulchrum* Saint-Hilaire (1829: 94). Type:—BRAZIL. Rio de Janeiro: Rio de Janeiro, woods near city, October 1816–1821, *A. St. Hilaire* #C2 134C (holotype: P = F neg. 58478!; isotype: MPU 012223! = F neg. 58984!).

= *Erythroxylum pulchrum* var. *macrophyllum* Schulz (1907: 61). Type:—BRAZIL. Rio de Janeiro: Rio de Janeiro, Mt. Corcovado, s.d., *A. Glaziov* 6108 (lectotype: K 000407424!, **designated here**; isoelectotypes: L 0018062!, LE, NY, P), **syn. nov.**

Schulz (1907) proposed *Erythroxylum pulchrum* var. *macrophyllum* on the basis of the leaf blade length (12–21.4 cm long vs. 6.5–11.2 cm long in *E. pulchrum* var. *pulchrum*). Our analysis of specimens from herbarium collections, including types, as well as of live material, showed that that character is highly variable, even within a single individual: larger leaf blades (up to 30 cm long) are often found in young individuals and on the lowest basal branches.

2. *Erythroxylum rimosum* Schulz (1907: 53). Type:—BRAZIL. Ceará: Dry hilly places near Crato, October 1838, *G. Gardner* 1492 (lectotype: K 000407433! = F neg. 55752! and IPA neg. 351!, **designated here**; isoelectotypes: B = F

neg. 12643!, destroyed, BM!, CGE [2 sheets], F fragment ex W!, G!, NY 00399929!, OXF, P! = F neg. 58479!, W [2 sheets = W 0018435, W 0065374]!).

= *Erythroxylum suberosum* var. *denudatum* Schulz (1907: 28). Type:—BRAZIL. Pernambuco: Island of Itamaracá, 1838, *G. Gardner 1142* (lectotype: K 000407385! = IPA neg. 354!, **designated here**; isolectotypes: B, destroyed, BM 000795787!, CGE, E 00346290!, F fragment ex P!, G [2 sheets = G 00352332, G 00352332]!, GH 00043890!, NY [4 sheets = NY 00399927 = F neg. 57815!, NY 00399928, NY 00399929, NY 00399930]!, P [3 sheets], SP!, W [2 sheets = W 0018411, W 0018428]!), **syn. nov.**

Erythroxylum suberosum var. *denudatum* Schulz (1907: 28) was separated from the type variety for having more delicate branches, non-pronounced suber, smaller stipules, leaves, flowers, and drupes, and non-congested fascicles. However, *E. rimosum*, also described by Schulz in the same work, was based on the syntype collections *Gardner 1492* and *Glaziou 10387 pro parte* (the former was also cited as one of the syntypes of *E. suberosum* var. *denudatum*), with features similar to those of the new variety. On the basis of our analysis of the type material, several other herbarium collections and observations *in vivo*, these taxa are synonymized here and are considered to constitute a species distinct from *E. suberosum* Saint-Hilaire (1829: 69).

Erythroxylum rimosum and *E. suberosum* var. *denudatum* were proposed by Schulz (1907), using the same collection as a syntype (*Gardner 1492*), and Plowman & Hensold (2004) mentioned that the collection *Glaziou 10387* (one of the syntype collections of *E. rimosum*) from Cabo Frio, Rio de Janeiro, is mixed and includes a syntype collection of *E. barbatum* Schulz (1907: 21). In the latter case, they claim that the collection data are false and, at least as far as the material of *E. rimosum* is concerned, had been probably pirated from the collection of *Allemão & Cysneiros 199* (at R), collected at Crato, Ceará. Plowman (1984) says that the syntype collections of *E. barbatum* (*Glaziou 10353* and *Glaziou 10387 pro parte*), annotated by Glaziou as coming from Rio de Janeiro, are probably from Ceará. They also may have been pirated from the collections of Fr. Allemão, since neither *E. barbatum* nor *E. rimosum* occur in Rio de Janeiro, with the type collections being their only existing records. Similar piracy cases by Glaziou from the Fr. Allemão collections had already been reported by Rudd (1965) for *Ormosia fastigiata* Tulasne (1844: 108) [Fabaceae] and Wurdack (1970) for *Miconia hypoleuca* Triana (1871: 119) [Melastomataceae].

3. *Erythroxylum subrotundum* Saint-Hilaire (1829: 69). Type:—BRAZIL. Rio de Janeiro: Cabo Frio, August–November 1818, *A. St. Hilaire #B2 110* (holotype: P = F neg. 58486!; isotypes: F 936018 fragment ex P!, MPU 012233! = F neg. 58975!).

= *Erythroxylum flaccidum* Salzmann ex Peyritsch (1878: 141). Type:—BRAZIL. Bahia: “In collibus umbrosis”, 1830, *P. Salzmann 84* (lectotype: MPU 012069!, **designated here**; isolectotypes: E 00346296!, G [2 sheets = G 00352216, G 00352218]!, K 000407413! = F neg. 55581!, LE [2 sheets = LE 00002653, LE 00002654]!, MPU [3 sheets = MPU 012065, MPU 012067, MPU 012070]!, NY 399888! = F neg. 55511!, P [4 sheets = P 00723663, P 00723664, P 00723665, P 00723666]!, R!, W 0317982!), **syn. nov.**

Erythroxylum flaccidum was proposed by P. Salzmann on herbarium labels and described by Peyritsch (1878) who separated it from *E. subrotundum* on the basis of its leaf blade shape, elliptic-oblong in *E. flaccidum* and obovate in *E. subrotundum*. Schulz (1907) used the number of setae at the stipule apex (3-setose in *E. flaccidum* and 2-setose in *E. subrotundum*), besides the leaf blade shape, as their differentiating characters. Plowman & Hensold (2004) mentioned that these two names are possibly synonyms. Our analysis of herbarium specimens and observations *in vivo* show that the leaf blade shape in these species is highly variable, often in the same individual, ranging from elliptical, oblong, to obovate or suborbicular. Furthermore, the central seta on the stipules of *E. subrotundum* is very delicate and often lacking, falling off when the stipule is ripe, or in the process of herborization. The rest of the features of *E. flaccidum* also fall within the diagnostic characters of *E. subrotundum*, as well as its geographic distribution is same. Therefore, these taxa are synonymized here.

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