Dorr, L.J. 2023. New combinations in *Ayenia* (Malvaceae, Byttnerioideae) for the flora of Ecuador. Phytoneuron 2023-04: 1–5. Published 17 February 2023. ISSN 2153 733X

# NEW COMBINATIONS IN *AYENIA* (MALVACEAE, BYTTNERIOIDEAE) FOR THE FLORA OF ECUADOR

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## ABSTRACT

Two new combinations are proposed for species of *Ayenia* (Malvaceae, Byttnerioideae) that occur in the Flora of Ecuador: **Ayenia corchorifolia** (Turcz.) Dorr, **comb. nov.** and **Ayenia geminifolia** (Turcz.) Dorr, **comb. nov.** New combinations also are proposed for two subspecies of *A. catalpifolia*: **Ayenia catalpifolia** subsp. **africana** (Hiern.) Dorr, **comb. nov.** and **Ayenia catalpifolia** subsp. **sidifolia** (A. St.-Hil.) Dorr, **comb. nov.** The typical subspecies of *A. catalpifolia* alone occurs in Ecuador. Full synonymies for the taxa recognized are presented and lectotypes are designated for three names.

Whitlock and Hale (2011) using molecular data established that the genus *Byttneria* Loefl. (Malvaceae, Byttnerioideae) is paraphyletic with *Ayenia* L. nested within it. *Ayenia* s. str., confined to the New World, was revised by Cristóbal (1960) who later also revised the New World species of *Byttneria* (Cristóbal 1976). Christenhusz and Byng (in Christenhusz et al. 2018) chose to resolve the paraphyly by transferring *Byttneria* names to *Ayenia* because the latter genus has nomenclatural priority. This may not have been the most elegant solution as there are many more species names in *Byttneria* than *Ayenia* and the former genus is the type of the subfamily name Byttnerioideae, which continues to be recognized. A lack of familiarity with the nomenclature of either of the two genera led Christenhusz and Byng (in Christenhusz et al. 2018) to propose several replacement names in *Ayenia* when other synonyms of *Byttneria* were available for transfer. Likewise, several names in *Byttneria* were overlooked.

*Ayenia* s. str. and *Byttneria* both occur in the Flora of Ecuador (Dorr 1999), but not all of the species of *Byttneria* found in Ecuador currently have names in *Ayenia*. Therefore, two combinations are proposed here. Two combinations also are proposed to maintain the subspecies Cristóbal (1976) recognized in the American-African species complex *B. catalpifolia* Jacq. (≡ *A. catalpifolia* (Jacq.) Christenh. & Byng) for which only the typical subspecies occurs in Ecuador.

Complete synonymies for the taxa recognized are presented. A number of type specimens cited below were seen only as electronic images and are marked "as image." Photographs of type specimens in European herbaria assembled and distributed by the Field Museum (Grimé and Plowman 1987) are cited as "F neg. no." The herbarium codes utilized are those listed in Thiers (2023).

### Two new combinations in South American *Ayenia*

**AYENIA CORCHORIFOLIA** (Turcz.) Dorr, **comb. nov.** *Byttneria corchorifolia* Turcz., Bull. Soc. Imp. Naturalistes Moscou 25(3): 152. 1852 ("*Büttneria*"). **TYPE: ECUADOR. Guayas.** Cerro of Santana, Guayaquil, May 1846, *W. Jameson 600* (holotype: KW001000162 [as image]!; isotypes: BM000522456 [as image]!, BM000522458!, G00358363! [= F neg. no. 23838], K000381163 [as image]!, US00588595!).

= *Byttneria salicifolia* C. Presl, Rel. Haenk. 2: 114. 1835 ("*Büttneria*"), non Humboldt & Bonpland ex Schultes, Syst. Veg. 5: 470. 1819 ("*Büttneria*"). **TYPE: MEXICO.** "Habitat in terris occidentalibus Mexici," Jun 1834, *T. Haenke 28* (holotype: PR-n.v.; isotype: W 0026584 [= F neg. no. 32202] [as image]!).

= *Byttneria parviflora* Benth., Pl. Hartw. 114. 1843 ("*Buettneria*"), non *Ayenia parviflora* Sessé & Mociño, Pl. Nov. Hispan. 154. 1890 ("*Paruiflora*"). *Ayenia pauxilla* Christenh. & Byng, Global Fl. 4: 137. 2018, nom. nov. **TYPE: ECUADOR. Guayas.** "In sylvis prope Guayaquil", 1841–43, *K.T. Hartweg 641* (holotype: K000381160 [as image]!; isotypes: B† [= F neg. no. 9590], BM000522472!, E00265885 [as image]!, F0073519F-fragm. [ex G] [as image]!, F0073520F-fragm. [as image]!, G00358361 [as image]!, K000381161 [as image]!, LD1216935 [as image]!, LE00015071 [as image]!, NY00222213!, P02286209!, P02286210!, W 0026582 [as image]!, W 1189-0008645 [as image]!).

= *Byttneria glabrescens* Benth., Bot. Voy. Sulphur 3: 71. 1844 ("*Buettneria*"), non *Ayenia glabrescens* K. Schum. in Martius, Fl. Bras. 12(3): 102, t. 23, fig. 2. 1886. **LECTOTYPE** (here designated): **ECUADOR. Guayas.** Puna, Guayaquil, [1841], *A. Sinclair s.n.* (lectotype: K000381158 [as image]!; isolectotypes: K000381156 [as image]!, K000381157 [as image]!, K000381159 [as image]!).

= *Byttneria eriogona* Mildbr., Notizbl. Bot. Gart. Berlin-Dahlem 11(102): 144. 1931 ("*Buettneria*"). **TYPE: PERU. Lambayeque.** Hacienda de Chinama, Aug 1868, *A. Raimondi 411* (holotype: B† [= F neg. no. 17938]; isotype: USM-n.v.).

= *Byttneria dielsii* Mildbr., Biblioth. Bot. 116: 106. 1937 ("*Buettneria Dielsii*"). **TYPE: ECUADOR. Chimborazo.** Tal des Río Chanchan bei Huigra, ca. 1400 m, 22 Sep 1933, *F.L.E. Diels 1163* (holotype: B†).

**Notes.** *Ayenia corchorifolia* is found only in South America. Thus, the type locality of *Byttneria salicifolia* is probably not Mexico, but somewhere along the Pacific coast of South America, which also was visited by T. Haenke while on the Malaspina expedition (Malaspina 1885).

Cristóbal's (1976) designation of a lectotype (first step) for *Byttneria glabrescens* is completed here. She described a Sinclair specimen at K as the "tipo" but did not distinguish between the duplicates at K, including the several sheets in William Hooker's herbarium one of which is designated as the lectotype in accordance with Bentham's (1846: 182) statement that the Sinclair specimens were presented to Sir William Hooker "in whose herbarium the originals of these species will be found."

Although Cristóbal (1976) recognized both *Byttneria parviflora* and *B. glabrescens*, the names were synonymized by Dorr (1999). Neither epithet can be transferred to *Ayenia* and the earliest name available for transfer is *B. corchorifolia*.

**AYENIA GEMINIFOLIA** (Turcz.) Dorr, **comb. nov.** *Byttneria geminifolia* Turcz., Bull. Soc. Imp. Naturalistes Moscou 25(3): 153. 1852 ("*Büttneria*"). **TYPE: ECUADOR. Pichincha.** Quito, s.d., *W. Jameson 118* (holotype: KW001000160 [as image]!; isotypes: BM000630583 [as image]!, G00358359!, G00358360 [as image]!, K000381153 [as image]!, K000381154 [as image]!, S09-9361!).

= *Byttneria ovata* Lam., Encycl. 1(2): 522. 1785 ("*Buttneria*"), non *Ayenia ovata* Hemsl., Diagn. Pl. Nov. Mexic. 1: 4. 1878. *Ayenia lappa* Christenh. & Byng, Global Fl. 4: 136. 2018, nom. nov. **LECTOTYPE** (as "holotipo" designated by Cristóbal 1976): "*ayenia Spinosa* h.R.," s.d., sine coll. (lectotype: P-LAM [as IDC microfiche LM-93/16]!).

– *Ayenia spinosa* hort. ex Lam., Encycl. 1(2): 522. 1785, nom. nud., pro syn.

= *Byttneria obtusata* Benth. ex Hochr., Annuaire Conserv. Jard. Bot. Gèneve 11–12: 5. 1907 ("*Buettnera*"). *Ayenia obtusata* (Benth. ex Hochr.) Christenh. & Byng, Global Fl. 4: 137. 2018.

**TYPE: ECUADOR.** In Andibus Ecuadorensibus ["Huatasi"], 1857-9 ["Aug 1859"], *R. Spruce 6024* (holotype: G-n.v.; isotypes: B† [= F neg. no. 9588], BM000630593!, F0073516F-fragm. ex G [as image]!, G00358357 [as image]!, G00358358 [as image]!, GH00368308!, GOET011190 [as image]!, K000201193 [as image]!, LD-n.v., LE-n.v., MPU016459 [as image]!, NY00222209!, P02286207!, W 1889-0008365 [as image]!, W 1889-0209776 [as image]!).

**Notes.** The lectotype Cristobál (1976) selected for *Byttneria ovata* is labeled with an unpublished name (i.e., "*Ayenia spinosa*") along with the cryptic notation "h.R." (i.e., Hortus Regius or Jardin du Roi). The lectotype consists of three branches, one of which is aberrant with atypically toothed and almost lobed leaves. A specimen in MPU (MPU016458 [as image]!) also has three branches, one of which also is identically aberrant but this material is dated "1787" and cannot be considered a duplicate of the lectotype despite its clearly coming from the same cultivated plant.

The holotype of *Byttneria obtusata*, which according to the protologue should be in the Delessert Herbarium (G), has not been located. The isotype in F is clearly marked as having been distributed from the Delessert Herbarium and has an original label. Presumably it is a fragment of the holotype. All but one of the isotypes cited have printed locality data. The exception in Herbarium Benthamianum (K) has a handwritten label and is the source of the more precise locality and date inserted in brackets above.

Unlike Cristóbal (1976), I consider *Byttneria obtusata* to be a synonym of *B. ovata* (= *Ayenia geminifolia*). The only significant difference between the two taxa appears to be the dense pubescence on the undersurface of the leaves of the former taxon. The distribution of the very few specimens with this pubescence shows no geographic pattern other than that all were collected in the high Andes (as is true of *B. ovata*). The supposed difference in leaf shape is less reliable than it would appear at first glance, especially since specimens with more ovate to obtuse leaves are glabrous (e.g., *Sparre 13407*, S!, US00578946!) and others with more typical "ovata" leaves are pubescent (e.g., *Fagerlind & Wibom 759*, S!). Additionally, there is an early collection from Peru (P06723200 [as image]!) that clearly shows broadly ovate *B. obtusata*-like leaves on a branch with typical *B. ovata* leaves. The flowers of *B. ovata* and *B. obtusata* are identical (see Cristobál 1976, figs. 36, C, 41, C) as are their fruit.

**The *Ayenia catalpifolia* complex**

**AYENIA CATALPIFOLIA** (Jacq.) Christenh. & Byng, Global Fl. 4: 137. 2018. *Byttneria catalpifolia* Jacq., Hort. Schoenbr. 1: 21, t. 46. 1797 ("*Bütneria catalpaefolia*" p. 21; "*Büttneria catalpæfolia*" t. 46). *Ayenia catalpifolia* (Jacq.) Christenh. & Byng, Global Fl. 4: 135. 2018. **LECTOTYPE** (as "holotype" designated by Cristóbal 1976): **VENEZUELA.** "Crescit ad Caracas," [cultivated in] Hort. Schönbr., 1793, *herb. Jacq.* (lectotype: W 0071222 [as image]!; possible isolectotype: W-n.v.).

= *Sparattanthelium cordatum* Meisn. in Martius, Fl. Bras. 5(2): 294, t. 106. 1866. **LECTOTYPE** (here designated): **BRAZIL** ["Brasilien"]. [Bahia?]. Sine loc., s.d., *F. Sello* [= *Sellow*] *s.n.* (lectotype: US00099572!).

– *Byttneria amazonica* Poepp. ex K. Schum. in Martius, Fl. Bras. 12(3): 92. 1886 ("*Büttneria Amazonica*"), nom. nud., pro syn.

= *Byttneria tahitensis* Nadeaud, Énum. Pl. Tahiti 68. 1873 ("*Tahitensis*"). **LECTOTYPE** (designated by Florence 2004): **TAHITI**. Vallées de Fautaua, s.d., *J. Nadeaud 434* (lectotype: P00646022 [as image]!; isolectotypes: G00358318 [as image]!, P00646023 [as image]!).

= *Byttneria macrocarpa* Donn. Sm., Bot. Gaz. 23: 239. 1897 ("*Buettneria*"). **TYPE: COSTA RICA. Puntarenas.** borders of the river Ceibo near Buenos Aires, Comarca de Punta Arenosas, 185 m, Jan 1892, *A. Tonduz 6689* (holotype: CR6689-n.v.; isotypes: BM001124579 [as image]!,

BR0000005620838 [as image]!, F0073493F [as image]!, P01900170!, US00478960!).

**Notes.** The protologue of *Sparattanthelium cordatum* cites simply "*Habitat in Brasilia, loco non indiato : Sello*." Cristóbal (1976) did not designate a type for and merely stated that she had examined a fragment of "*Sello 72*, Brasilien (US ex B). Lauraceae." This specimen is certainly original material. The "72" appears to have been added to the label of this unnumbered specimen at a later date. The pubescence of the lectotype agrees with that of the typical subspecies.

Cristóbal (1976) indicated that a specimen in P of *Byttneria tahitensis* was the "holotipo" but because she did not distinguish between several duplicates in that herbarium she failed to designate a lectotype (Turland et al. 2018; Art. 9.17). Florence (2004) narrowed her choice to a single specimen.

**AYENIA CATALPIFOLIA** subsp. **AFRICANA** (Mast.) Dorr, **comb. nov.** *Byttneria africana* Mast., Fl. Trop. Africa 1: 239. 1868 ("*Buettneria*"). *Byttneria catalpifolia* subsp. *africana* (Mast.) Exell & Mendoça, Consp. Fl. Angol. 1: 197. 1951. **TYPE: CONGO** ["Lower Guinea"]. s.d., *Chr. Smith s.n.* (holotype: K000241689!).

= *Byttneria africana* var. *angolensis* Hiern, Cat. Afr. Pl. 1: 92. 1896 ("var.? *angolensis*"). **LECTOTYPE** (designated by Dorr 2007): **ANGOLA. Cuanza Norte.** Distr. Golungo Alto, Sobati Quilombo-Quiacatubia, juxta flum. Muio, Feb 1855, *F.M.J. Welwitsch 351* (lectotype: BM000522462 [excluding fruit in packet]!; isolectotypes: BM000797648 [with incorrect label]!, BM000797649!, PRE0280209-0 [as image]!).

**Note.** When I designated a lectotype for *Byttneria africana* var. *angolensis* in the Flora of Tropical East Africa (Dorr 2007), I intentionally restricted the type to flowering material. I did not then fully explain the mixed nature of "*Welwitsch 351*." The number "351" evidently was a species number assigned to different collections made by Welwitsch in different localities on different dates as he combined the flowers and fruit of this taxon. Only flowering material collected in February 1855 is lectotype material. One of the isolectotypes (BM000797648!) cited here, which is in flower, has a label with locality and date ("Queta, ad fin Dec. 1856") that should have been applied to a specimen in fruit. The label on the PRE sheet is not original and has an abbreviated locality (viz., "Golungo Alto") with both collecting dates. The PRE material is flowering and "II-1855" is the correct date.

**AYENIA CATALPIFOLIA** subsp. **SIDIFOLIA** (A. St.-Hil.) Dorr, **comb. nov.** *Byttneria sidifolia* A. St.-Hil., Fl. Bras. Merid. [qu. ed.] 1(4): 146. 1825, ibid. [fol. ed.] 1(4): 116. 1825 ("*Buettneria sidæfolia*"). *Byttneria catalpifolia* subsp. *sidifolia* (A. St.-Hil.) Cristóbal, Bonplandia (Corrientes) 4: 356. 1976 ("*catalpaefolia* subsp. *sidaefolia*"). **LECTOTYPE** (here designated): **BRAZIL. Minas Gerais.** In sylvis primævis ad ripas fluminis Parahyba, prope villam Ubà, [1816], *A. St.-Hilaire s.n.* [= Catal. C[1] N° 12] (lectotype: P02286224 [as image]!; isolectotypes: MPU016456 [as image]!, P02286223 [as image]!).

**Note.** Cristóbal (1976: 356) wrote that she saw the holotype of ***Byttneria sidifolia*** and an isotype at Paris, but she failed to distinguish which was which and thus did not effectively select a lectotype (Turland et al. 2018; Art. 9.17), which is resolved here.

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