



Typification and nomenclatural notes on twenty-three names of *Buddleja* (Scrophulariaceae)

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Abstract

Twenty-three *Buddleja* names, either accepted species or recognized synonyms, are here lectotypified, or a typification remark is provided. Nomenclatural notes are also included, specifying the legitimacy of names of *Buddleja*.

Introduction

Buddleja Linnaeus (1753: 112) belongs to the predominantly southern hemisphere Scrophulariaceae *s.s.* (Oxelman *et al.* 2005, Tank *et al.* 2006), with a broad distribution in tropical, subtropical and temperate zones of Africa, America and Asia, but with the greatest species diversity in the Americas (Marquand 1930, Norman 2000, Chen *et al.* 2007). With nearly 100 species it is the largest genus of tribe Buddlejeae (Norman 2000).

Plants of *Buddleja* are usually trees, shrubs or subshrubs, rarely herbs, occurring mostly in warm tropical and subtropical regions. Leaves are commonly opposite and often have stellate or glandular trichomes on abaxial leaf surfaces. Flowers are generally tetramerous and mostly actinomorphic, with plants either hermaphroditic or functionally dioecious. Ovaries are superior and bilocular. Fruits are capsules or berries with numerous small seeds, which are often winged.

This group has not been studied thoroughly since Norman's revision in 2000, recently Christenhusz (2009) proposed lectotypification of *B. davidii* Franch. During the revision of *Buddleja* for the *Flora Argentina* project (Zuloaga & Anton., ined.) several names were identified to need typification or nomenclatural clarification.

Materials and methods

Protologues from all analyzed names have been examined, and type specimens have been studied, from the corresponding herbaria or from online access to herbaria websites (G, available at <http://www.ville-ge.ch/musinfo/bd/cjb/chg/>; P, available at <https://science.mnhn.fr/all/search>), from JSTOR Global Plants (<http://plants.jstor.org/>), or from personal communication with herbaria curators. Whenever the specimen has a barcode number, this is indicated following the herbarium acronym (Thiers 2015).

It is important to note the recent statements by McNeill (2014), where the author explained that according to Art. 40, Note 1 of the ICN (McNeill *et al.* 2012), one can only be sure that a certain specimen is a holotype if it is clear that the author did not use any other material, and there is no other duplicate, either in different herbaria or in the same herbarium. This observation explains the need to designate lectotypes in many historical cases.

Nomenclatural checklist

A. Accepted *Buddleja* taxa for the Argentinean flora (following Zuloaga *et al.* 2008) needing typification.

Buddleja diffusa Ruiz & Pavón (1798: 53)

Type (lectotype, designated here):—PERU. 1787, “Huanuco” *L. H. Ruiz & J. Pavón s.n.* (MA barcode 814371! [digital image]).

Notes:—Norman (2000: 122) mentioned that the holotype of *B. diffusa* is a specimen housed at BM (barcode 600434). However this specimen is found not to be suitable, since it has no original reference to the protologue, as does a specimen housed at MA. So, according to Art. 9.19 of the ICN (McNeill *et al.* 2012) Norman’s choice is superseded, and a lectotype is here designated. The collections made by L. H. Ruiz and J. Pavón at the “Virreinato de Perú”, between years 1777–1788, are housed at MA herbarium (Muñoz Garmendía 2004). A specimen with a label “Huanuco 1787”, which agrees with the protologue, is here selected as the lectotype.

Buddleja elegans Chamisso & Schlechtendal (1827: 594) subsp. ***angustata*** (Benth.) Norman (1995: 192)

Basionym:—*Buddleja angustata* Bentham (1846: 443) = *Buddleja vetula* Chamisso (1833: 18) var. *major* Schmidt (1862: 284) = *Buddleja vetula* Cham. var. *angustata* (Benth.) Chodat (1902: 822), *nom. illeg. superfl.*

Type (lectotype, first-step designated by Norman 2000: 77):—BRAZIL. Rio Grande do Sul: Rio Grande & Rio Jaquy Mtns., *J. Tweedie 1097* (K!, two sheets; second-step lectotype, here designated K barcode 573255! [digital image], isolectotype K barcode 573275! [digital image]).

Notes:—Norman (2000) mentions the holotype of *B. angustata* to be housed at K, which is likely since Bentham worked there (Stafleu & Cowan 1976), and the majority of J. Tweedie’s collections are housed there as well. However, there are two duplicate specimens at K (K 573255 and K 573575) so that Norman’s mention can be considered as a first-step typification (Art. 9.17, Ex. 12 of the ICN, McNeill *et al.* 2012). This designation is here narrowed by selecting the most complete specimen as a second-step lectotype (Art. 9.17 of the ICN, McNeill *et al.* 2012, McNeill 2014).

Schmidt (1862) considered *B. angustata* Benth. (1846) as a variety of *B. vetula* Cham., and he named it: *Buddleja vetula* var. *major* Schmidt. The author was not obliged to name it var. *angustata*, given that names have no priority outside their rank (Art. 11.2 of the ICN, McNeill *et al.* 2012). Later, Chodat (1902) followed Schmidt’s idea, but he named the variety: *Buddleja vetula* var. *angustata* (Benth.) Chodat, rendering this an illegitimate superfluous name (Art. 52 of the ICN, McNeill *et al.* 2012), because the epithet “*major*” should have been used as it has priority at varietal rank. Norman (1995) considered this taxon as a subspecies of *B. elegans* and correctly used the epithet *angustata*, valid at this rank (Arts. 4.2, 4.3, 11.4, Ex. 16 of the ICN, McNeill *et al.* 2012).

Buddleja misionum Kraenzlin (1916: 294)

Type (lectotype, designated here):—ARGENTINA. Misiones: Santa Ana, Sept. 1901, *A. de Llamas 214* (G barcode 095787! [digital image], isolectotypes BAB barcode 0571! [digital image], WAG barcode 02137! [digital image]).

Notes:—Kraenzlin mentioned three different gatherings in the protologue: *Llamas 24, 214* and *842* (syntypes). Norman (2000: 88) mentioned that the holotype is *Llamas 24*, housed at B and now destroyed (photo neg. 26791!), from which there is a duplicate (isotype) at G herbarium. However, Norman did not select the extant specimen from G as a suitable type. Therefore a lectotype is here designated. The three syntypes are all present at G herbarium. The specimen with a label in Kraenzlin’s hand that reads “*Buddleja misionum* typus, determinavit Kränzlin!” is here designated as the lectotype (Art. 9.5 of the ICN, McNeill *et al.* 2012).

Buddleja stachyoides Chamisso & Schlechtendal (1827: 597)

Type (lectotype, designated by Norman 2000: 84):—BRAZIL. “Brasil meridional”, *F. Sellow s.n.* (F barcode V0360284F! [digital image], isolectotype K barcode 573576! [digital image]).

Notes:—Sellow’s material was housed at B, and the type specimen of this species was probably destroyed (B photo F neg. 3908!). Norman (2000) mentions that the holotype is a fragment of the destroyed type housed at F herbarium. No original material was found at LE, where specimens collected during the Rimanzoff expedition were sent to, nor at HAL. Norman (2000) “clearly indicated the type element” (Art. 7.10 of the ICN, McNeill *et al.* 2012), her use of holotype is an error to be corrected to lectotype (Art. 9.9 of the ICN, McNeill *et al.* 2012), this being allowed since Norman’s work was before 2001.

***Buddleja thyrsoides* Lamarck (1792: 291)**

Type (lectotype, first-step designated by Norman 2000: 79):—URUGUAY. Montevideo, *P. Commerson s.n.* (P!, three sheets; second-step lectotype, here designated P-Lam-No. 357116! [digital image], isolectotypes BAA barcode 0004323! [digital image], F barcode 0062161F! [digital image], P barcode 0641174! [digital image], P barcode 0641175! [digital image]).

Notes:—Norman (2000: 79) mentioned that the holotype of *B. thyrsoides* is conserved in P herbarium, where Lamarck worked (Stafleu & Cowan 1979). In this herbarium three sheets were found which could be considered original material of *B. thyrsoides*. Norman's designation can be considered as a first-step typification (Art. 9.17, Ex. 12 of the ICN, McNeill *et al.* 2012). This designation is here narrowed by selecting the most complete specimen as a second-step lectotype (Art. 9.17 of the ICN, McNeill *et al.* 2012, McNeill 2014). One of these is housed in the Lamarck herbarium (P-Lam), the other two are housed in the general herbarium in P. The one from P-Lam. has a label that reads: "Montevideo Com. [Commerson]". This is the specimen selected as the lectotype given that it is housed in Lamarck's personal herbarium and the label is in agreement with the protologue. The other two specimens housed at P, which have labels that read: "...Montevideo, 1767, Commerson...", and "...Montevideo, 1767..." are both suitable isolectotypes. Both the isolectotypes from herbaria BAA and F are fragments from the selected lectotype.

B. Synonyms of accepted *Buddleja* taxa (Zuloaga *et al.* 2008)

B1. Species described by Robert Elias Fries

R.E. Fries was a Swedish botanist whose type materials are mainly at UPS and S (Stafleu & Cowan 1976).

***Buddleja albotomentosa* Fries (1903: 411)**

Type (lectotype, first-step designated by Norman 2000: 84):—ARGENTINA. Jujuy: Quinta, Laguna de la Brea, 31 May 1901, *R. E. Fries 43* (S!, two sheets; second-step lectotype, here designated S No. S-R-751! [digital image], isolectotype S No. 09-43531! [digital image]).

Notes:—The protologue of this species stated: "...Gegend von Sierra Sta. Barbara (in nördlichen Argentinien)..." [area of Sierra Sta. Barbara (in northern Argentina)]. Norman (2000: 84) designated a collection *Fries 43*, from Laguna La Brea, as lectotype which belongs within Sta. Barbara department, so it is a suitable choice.

In S herbarium two duplicate specimens exist with the number *Fries 43* (S-R-751 and S 09-43531), so that Norman's designation can be considered as a first-step typification (Art. 9.17, Ex. 12 of the ICN, McNeill *et al.* 2012). One of them has a label by Norman that reads: "holotype", and the other has a label that reads "isotype". Other things being equal (e.g. the quality of the specimens), even if Norman's annotations on the specimens have no binding effect (see Art. 7.9 of the ICN, McNeill *et al.* 2012), the specimen annotated as "holotype" by Norman is here designated in a second-step-typification, and the one that reads isotype becomes an isolectotype.

Current status:—heterotypic synonym of *Buddleja stachyoides* Chamisso & Schlechtendal (1827: 597).

***Buddleja pendula* Fries (1907: 26)**

Type (lectotype, first-step designated by Norman 2000: 118):—ARGENTINA. Jujuy: Piquete at rio Francisco, 20 Aug. 1901, *R. E. Fries 353a* (S!, two sheets; second-step lectotype, here designated S No. 09-43617! [digital image], isolectotype S-R- No. 767! [digital image]).

Notes:—Norman (2000) "clearly indicated the type element" (Art. 7.10, before 2001) as to be the collection in S as the "holotype", but it is an error to be corrected to lectotype (Art. 9.9 of the ICN, McNeill *et al.* 2012). In S herbarium, actually, two duplicate specimens exist (S 09-43617 and S-R-767), so that Norman's mention can be considered as a first-step typification (Art. 9.17, Ex. 12 of the ICN, McNeill *et al.* 2012). This designation is here narrowed by selecting the most complete specimen as a second-step lectotype (Art. 9.17 of the ICN, McNeill *et al.* 2012, McNeill 2014).

Current status:—heterotypic synonym of *Buddleja iresinoides* (Grisebach 1879: 278) Hosseus (1926: 45).

Buddleja similis Fries (1907: 27)

Type (lectotype, first-step designated by Norman 2000: 118):—ARGENTINA. Jujuy: Arroyo del Medio, loco aprico, *R. E. Fries* 353 (S!, two sheets; second-step lectotype, here designated S No. 09-43643! [digital image], isolectotypes P barcode 0641157! [digital image], S-R- No. 771! [digital image]).

Notes:—Norman (2000) “clearly indicated the type element” (Art. 7.10, before 2001) as to be the collection in S as the “holotype”, but it is an error to be corrected to lectotype (Art. 9.9 of the ICN, McNeill *et al.* 2012). In S herbarium, actually, two duplicate specimens exist (S09-43643 and S-R-771), so that Norman’s mention can be considered as a first-step typification (Art. 9.17, Ex. 12 of the ICN, McNeill *et al.* 2012). This designation is here narrowed by selecting the most complete specimen as a second-step lectotype (Art. 9.17 of the ICN, McNeill *et al.* 2012, McNeill 2014).

Current status:—heterotypic synonym of *Buddleja iresinoides* (Grisebach 1879: 278) Hosseus (1926: 45).

B2. Species described by Friedrich Kraenzlin

Kraenzlin’s type material was mostly housed at B (Stafleu & Cowan 1979), and therefore the holotypes of the following taxa were all probably destroyed during WWII, except for the collections of Malme, which are housed at S. In most of the following cases Norman (2000) mentions the “holotype” to be a fragment, housed at F, removed from the destroyed type from B. According to Art. 9.9 of the ICN (McNeill *et al.* 2012) Norman’s use of holotype is an error to be corrected to lectotype.

Buddleja fiebrigiana Kraenzlin (1908: 311)

Type (lectotype designated by Norman 2000: 76 as “holotype”, corrected here):—PARAGUAY. San Pedro: Loma, N of C de Altos, *K. Fiebrig* 396 (F barcode V0360287F! [digital image], fragment ex B photo neg. 3879!, isolectotypes E barcode 259315! [digital image], G barcode 95759! [digital image]).

Current status:—heterotypic synonym of *Buddleja elegans* Chamisso & Schlechtendal (1827: 594) subsp. *angustata* (Benth.) Norman (1995: 192).

Buddleja grisea Kraenzlin (1908: 311)

Type (lectotype designated by Norman 2000: 76 as “holotype”, corrected here):—PARAGUAY. Guairá: “Prope Villarica in paludosis”, January 1905, *E. Hassler* 8831 (F barcode V0360288F! [digital image], fragment ex B photo neg. 3883!, isolectotypes BM barcode 89830! [digital image], G barcode 095782! [digital image], G barcode 095783! [digital image], G barcode 095784! [digital image], GH barcode 75700! [digital image], NY barcode 297534! [digital image], S barcode 10-26130! [digital image]).

Current status:—heterotypic synonym of *Buddleja elegans* Cham. & Schltdl. subsp. *angustata* (Benth.) E.M. Norman.

Buddleja hypoleuca Kraenzlin (1913: 39)

Type (lectotype designated by Norman 2000: 108 as “holotype”, corrected here):—BOLIVIA. Santa Cruz: Comarapa, *T. C. J. Herzog* 1888 (F barcode 0062100F! [digital image], fragment ex B photo neg. 3884!, isolectotypes L barcode 04920! [digital image], S-R- No. 757! [digital image]).

Current status:—heterotypic synonym of *Buddleja tucumanensis* Grisebach (1874: 213).

Buddleja ignea Kraenzlin (1908: 309)

Type (lectotype designated by Norman 2000: 108 as “holotype”, corrected here):—BOLIVIA. Tarija: Paicho, *K. Fiebrig* 3046 (F barcode V0062101F! [digital image], fragment ex B photo neg. 3888!, isolectotypes A barcode 075703! [digital image], BM barcode 0600627! [digital image], E barcode 0259278! [digital image], G barcode 00236168! [digital image], GH barcode 075705! [digital image], GOET barcode 0475! [digital image], K barcode 0573225! [digital image], L barcode 04921! [digital image], S-R-No. 758! [digital image], U barcode 03704! [digital image], US barcode 0113038! [digital image]).

Current status:—heterotypic synonym of *Buddleja tucumanensis* Grisebach (1874: 213).

Buddleja inconspicua Kraenzlin (1908: 309)

Type (lectotype designated by Norman 2000: 108 as “holotype”, corrected here):—BOLIVIA. Tarija: Camataqui, *K. Fiebrig 3061* (F barcode V0062106F! [digital image], fragment ex B photo neg. 3885!, isoelectotypes G barcode 0236167! [digital image], K barcode 0573224! [digital image], L barcode 04922! [digital image]).

Current status:—heterotypic synonym of *Buddleja tucumanensis* Grisebach (1874: 213).

Buddleja misera Kraenzlin (1908: 308)

Type (lectotype designated by Norman 2000: 120 as “holotype”, corrected here):—BOLIVIA. Cornaca bei Tupiza, *K. Fiebrig 3107* (F barcode V0062109F! [digital image], fragment ex B photo neg. 3893!, isoelectotypes A barcode 00075714! [digital image], BM barcode 0600432! [digital image], E barcode 0259277! [digital image], G barcode 0236221! [digital image], GH barcode 075719! [digital image], GOET barcode 0473! [digital image], GOET barcode 0474! [digital image], K barcode 0573333! [digital image], L barcode 04916! [digital image], M barcode 0183817! [digital image], P barcode 0641153! [digital image], P barcode 0641152! [digital image], S-R-No. 764! [digital image], U barcode 061927! [digital image], US barcode 0113049! [digital image]).

Notes:—Kraenzlin mentioned in the protologue two different gatherings: *Fiebrig 3107*, and *3342* (syntypes). Norman (2000: 120) selected the collection *Fiebrig 3107* in F herbarium as holotype, but to be corrected as a lectotype (done here).

Current status:—heterotypic synonym of *Buddleja hieronymi* Fries (1905: 117).

Buddleja sancti-leopoldi Kraenzlin (1913[1914]: 43)

Type (lectotype, designated here): BRAZIL. Rio Grande do Sul: Cachoerira, *G. O. Malme 1031* (S No. 768! [digital image], isoelectotype S No. 09-43638! [digital image]).

Notes:—Kraenzlin mentioned three different gatherings: *Malme 888*, *Malme 906*, and *Malme 1031* (syntypes). Norman (2000: 88) did not select a lectotype. Malme’s collections are housed at S (Stafleu & Cowan 1981), and a lectotype is here selected according to Art. 9.5 of the ICN (McNeill *et al.* 2012). The specimen *Malme 1031* is here designated as the lectotype as it bears a label that reads: “*Buddleja sancti leopoldo* Typus! Kränzlin!”, and it is thus likely that it was studied by the author of the name.

Current status:—heterotypic synonym of *Buddleja grandiflora* Chamisso & Schlechtendal (1827: 596).

B3. Species described by Henry Rusby

H. Rusby was an American botanist whose collections are housed at NY, except his collection pre-1890, which are kept at MICH (Stafleu & Cowan 1983).

Buddleja andina Britton ex Rusby (1895: 222)

Type (lectotype, designated here): BOLIVIA. La Paz: La Paz, 1889 (1885), *H. H. Rusby 2050* (NY barcode 297524! [digital image], isoelectotypes BM barcode 600440! [digital image], MO barcode 391963! [digital image], NY barcode 297525! [digital image], WIS barcode v0256009WIS! [digital image]).

Notes:—In the protologue of *B. andina* Rusby mentioned “Vic, La Paz, 10000 ft., 1889 (85) Rusby’s 2050”. In general this would be enough to point to a holotype specimen in NY, where N. Britton worked, were it not that there are two specimens (sheets) of *Rusby 2050* in NY. One of these is here selected as the lectotype (Art. 9.17 of the ICN, McNeill *et al.* 2012, McNeill 2014).

Miguel Bang was a Danish botanist who collected mainly in Bolivia (Stafleu & Cowan 1976) and whose plants are mostly at NY and US. There are several specimens collected by Bang number 85, from the same place and date as *Rusby 2050*, distributed to several herbaria (BR, E, GH, K, NDG, NY, US). In 1889 Rusby and Bang agreed to collaborate to continue floristic studies in Bolivia (Ochoa 1990). Although most probably Bang’s collection is a

duplicate from Rusby's, both have different collector and number, so to avoid ambiguity the *Rusby 2050* is selected here as lectotype, in agreement with the protologue.

Current status:—heterotypic synonym of *Buddleja aromatica* Rémy (1847: 226).

Buddleja coroicense Rusby (1907: 412)

Type (lectotype, first-step designated by Norman 2000: 122):—BOLIVIA. La Paz: Coroico, Jul. 1894, *A. M. Bang 2327* (NY!, three sheets; second-step lectotype, here designated NY barcode 0297530! [digital image], isolectotypes BM barcode 600449! [digital image], CORD barcode 3655! [digital image], CORD barcode 3656! [digital image], E barcode 259276! [digital image], F barcode 062093F! [digital image], G barcode 00236345! [digital image], GH barcode 75691! [digital image], K barcode 573226! [digital image], LIL barcode 1099! [digital image], M barcode 183825! [digital image], MICH barcode 1115853! [digital image], PH barcode 010895! [digital image], NY barcode 0297531! [digital image], NY barcode 0297532! [digital image], PUL barcode 314! [digital image], US barcode 113029! [digital image], US barcode 930972! [digital image], WIS barcode 256011WIS! [digital image]).

Notes:—Rusby mentioned three gatherings in the protologue: *Bang 2327*, *Pearce* and *Mandon 347*. Although he states that the *Pearce* collection was “less tomentose” and the *Mandon* collection “might be the same”, the author did not specify which of the three specimens should be regarded as the type. Therefore these are considered syntypes and a lectotype is to be selected according to Art. 9.5 of the ICN (McNeill *et al.* 2012). Norman (2000: 122) indicated *Bang 2327* collection in NY as the holotype, but it is an error to be corrected to lectotype (Art. 9.9 of the ICN, McNeill *et al.* 2012). In NY herbarium, actually, three duplicate specimens exist (NY 0297530, NY 0297531, NY 0297532), so that Norman's mention can be considered as a first-step typification (Art. 9.17, Ex. 12 of the ICN, McNeill *et al.* 2012). This designation is here narrowed by selecting the specimen annotated by Norman as “holotype” as a second-step lectotype (Art. 9.17 of the ICN, McNeill *et al.* 2012, McNeill 2014).

Current status:—heterotypic synonym of *Buddleja diffusa* Ruiz & Pavón (1798: 53).

B4. Taxa described by other botanists

Buddleja australis Vellozo (1825[1829]: 41)

Type (lectotype, designated here): Illustration in Vellozo, 1827 [1831]. Icon. 1, tab. 104.

Note:—The location of Vellozo's type material is unknown (Stafleu & Cowan 1986). Consequently, given no suitable original material is available the illustration from Flora Fluminensis, which is also original material is here designated as lectotype (Art. 9.12 of the ICN, McNeill *et al.* 2012).

Current status:—heterotypic synonym of *Buddleja stachyoides* Cham. & Schltldl.

Buddleja brasiliensis Jacquin ex Sprengel (1825: 430). *nom. illeg. superfl.* ≡ *B. perfoliata* Kunth (1818: 346).

Note:—*Buddleja brasiliensis* is an illegitimate name because of the inclusion of “*B. perfoliata* Humb.” in its synonymy. *Buddleja perfoliata* Kunth (1818: 346) has priority. It is automatically typified, under art. 7.5 (McNeill *et al.* 2012) with the type of *B. perfoliata* Kunth (cited as “*Crescit inter lacum Chalcensem et urbem Mexici*, alt. 1170 hex.”), a Mexican species. It is not likely that this was intended, considering Sprengel's choice of epithet, and therefore it is important to note that Sprengel's protologue of *B. brasiliensis* also included other elements, e.g. J. Jacquin's illustration in *Eclog. Pl. Rar. Vol. 2, pag. 10, tab. 158*, which represents *B. stachyoides*, a species that does occur in Brazil. Sprengel probably studied Jacquin's plate pre-publication (plates were executed between 1811 and 1816 and published in 1844). Even if *Buddleja brasiliensis* is not a name available for use (illegitimate), the plant intended to be published by Sprengel is a different species that its autotype suggests, but a synonym of *B. stachyoides* (Bravo 1983, Norman & Ariza Espinar 1995, Norman 2000, Zuloaga *et al.* 2008), although Bravo (1983) was the first author to synonymize both taxa. However this author employed the name *B. brasiliensis* as the correct one for this taxon, following principles of date priority, because he probably did not realize it was an illegitimate name.

Buddleja brasiliensis Jacq. ex Spreng. subsp. *stachyoides* (Cham. & Schltldl.) Norman (1976: 20) is an invalid combination since *Buddleja brasiliensis* is an illegitimate superfluous name. However, this does not affect the legitimacy of any name of an infraspecific taxon included within it (Art. 55.2 of the ICN, McNeill *et al.* 2012) so, *B. brasiliensis* subsp. *stachyoides* (Cham. & Schltldl.) E.M.Norman is legitimate, and the epithet “*stachyoides*” has priority at subspecific rank.

Current status:—heterotypic synonym of *Buddleja stachyoides* Cham. & Schltdl.

Buddleja connata Ruiz & Pavón (1798: 52)

Type (lectotype designated by Norman 2000: 101, corrected here):—PERU. Sine loc., *L. H. Ruiz & J. Pavón* s.n. (MA barcode 814368! [digital image]).

Note:—Norman (2000: 101) designated a lectotype for *B. connata* and indicated it was housed at M. However, Munich has almost no collections of Ruiz & Pavón, no such specimen is known to exist at M (Andreas Fleischmann com. pers.). Therefore this must have been a typographical error in Norman (2000), and the herbarium should read “MA”, as this herbarium houses many types of Ruiz and Pavón (Art. 9 Ex. 2, McNeill *et al.* 2012).

Current status:—heterotypic synonym of *Buddleja globosa* Hope (1782: 417).

Buddleja grandiflora Cham. & Schltdl. var. ***foliosa*** Chodat & Hassler (1903: 918)

Type (lectotype, first-step designated by Norman 2000: 91):—PARAGUAY. Cordillera de los Altos, *E. Hassler 3706* (G!, four sheets; second-step lectotype, here designated G barcode 95798! [digital image], isolectotypes G barcode 95796! [digital image], G barcode 95797! [digital image], G barcode 95795! [digital image], K barcode 573260! [digital image], K barcode 573262! [digital image], MPU barcode 011090! [digital image], P barcode 641150! [digital image], S No. 10-26144[digital image], UC barcode 944164! [digital image]).

Notes:—Norman (2000: 91) mentioned the holotype to be housed at G, which is probable since both R. Chodat and E. Hassler worked at G and the majority of Hassler’s collection is kept at G (Stafleu & Cowan 1979). But in G there are four sheets belonging to the collection *Hassler 3706*, so Norman’s choice can be considered as a first-step typification (Art. 9.17, Ex. 12 of the ICN, McNeill *et al.* 2012). This designation is here narrowed by selecting the most complete specimen as a second-step lectotype (Art. 9.17 of the ICN, McNeill *et al.* 2012, McNeill 2014).

Current status:—heterotypic synonym of *Buddleja tubiflora* Benthams (1846: 443).

Buddleja paraguariensis Chodat (1901: 407)

Type (lectotype, first-step designated by Norman 2000: 91):—PARAGUAY. Near Paraná, *E. Hassler 319* (G!, three sheets; second-step lectotype, here designated G barcode 95799! [digital image], isolectotypes G barcode 95800! [digital image], G barcode 95801! [digital image], K barcode 0573261! [digital image], NY barcode 297542! [digital image]).

Notes:—Norman (2000: 91) mentioned the holotype to be housed at G. In G herbarium, actually, three duplicates of *Hassler 319* exist (G 95799, G 95800 and G 95801), so Norman’s mention can be considered as a first-step typification (Art. 9.17, Ex. 12 of the ICN, McNeill *et al.* 2012). This designation is here narrowed by selecting the most complete specimen at G as a second-step lectotype (Art. 9.17 of the ICN, McNeill *et al.* 2012, McNeill 2014).

Current status:—heterotypic synonym of *Buddleja tubiflora* Benthams (1846: 443).

Buddleja tenuifolia Grisebach (1874: 213)

Type (lectotype designated by Norman 2000: 91):—ARGENTINA. Córdoba: “in collibus calcareis”, *P. G. Lorentz 419* (F barcode V0360285F! fragment [digital image], isolectotypes CORD barcode 6035! [digital image], GOET barcode 5442! [digital image]).

Notes:—Norman (2000) designated as lectotype of *B. tenuifolia* a fragment housed at F. However, as clearly explained by Planchuelo & Ariza Espinar (2015), Dr. A. Grisebach was Professor at the University of Goettingen from 1837, and was appointed Director of the Botanical Garden there in 1875. P. G. Lorentz’s collections from Argentina were kept at CORD and another set was sent to GOET where Grisebach had the opportunity to study the Argentinian material (Hunziker 1960). So Grisebach’s new species are certainly based on the study of material housed at GOET. Nevertheless, according to Art 9.3 of the ICN original material comprises also” the isotypes or isosyntypes of the name irrespective of whether such specimens were seen by either the author of the validating description or diagnosis or the author of the name”. Following Art. 7.9 and 7.10 the author who first designates a lectotype in conformity with Art. 9.11–13 must be followed, even if it is not certain the fragment material from F was seen by the author.

Current status:—heterotypic synonym of *Buddleja mendozensis* Bentham (1846: 443).

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References

- Bentham, G. (1846) Scrophulariaceae. In: Candolle, A.L.P.P. de (Ed.) *Prodromus systematis naturalis regni vegetabilis* 10. Masson, Paris, pp. 186–586.
- Bravo, L.D. (1983) Loganiaceae. Fl. Prov. Jujuy. *Colección Científica del Instituto Nacional de Tecnología Agropecuaria* 13 (8): 39–54.
- Chamisso, L.K.A. & Schlechtendal, D.F. (1827) Scrophularineae. De plantis in expeditione speculatoria Romanzoffiana observatis disserere pergunt Ad. de Chamisso et D. de Schlechtendal. *Linnaea* 2: 555–609.
- Chamisso, L.K.A. (1833) Scrophularineae. Spicilegium Plantarum e families jam prius recensitis, praesertim brasiliensium serius a Sellowii. *Linnaea* 8: 7–332.
- Chen, G., Sun, W. & Sun, H. (2007) Ploidy variation in *Buddleja* L. (Buddlejaceae) in the Sino-Himalayan region and its biogeographical implications. *Botanical Journal of the Linnean Society* 154: 305–312.
<http://dx.doi.org/10.1111/j.1095-8339.2007.00650.x>
- Chodat, R.H. & Hassler, E. (1903) Plantae Hasslerianae. *Bulletin de l'Herbier Boissier sér. 2* 3: 906–941.
- Chodat, R.H. (1901) Plantae Hasslerianae. *Bulletin de l'Herbier Boissier sér. 2* 1: 395–441.
- Chodat, R.H. (1902) Plantae Hasslerianae. *Bulletin de l'Herbier Boissier sér. 2* 2: 811–824.
- Christenhusz, M.J.M. (2009) Typification of ornamental plants: *Buddleja davidii* (Scrophulariaceae). *Phytotaxa* 2: 55–55.
<http://dx.doi.org/10.11646/phytotaxa.2.1.11>
- Fries, R.E. (1903) Beiträge zur Kenntnis der Ornithophilie in der südamerikanischen Flora. *Arkiv för Botanik* 1: 389–439.
- Fries, R.E. (1905) Novae Symbolae Mycologicae in peregrinis terris a botanicis danicis collectae. *Nova Acta Regiae Societatis Scientiarum Upsaliensis. Uppsala* 1: 17–136.
- Fries, R.E. (1907) Zur Kenntnis der Phanerogamenflora der Grenz-gebiete zwischen Bolivia und Argentinien. *Arkiv för Botanik* 6 (11): 1–32.
- Grisebach, A. (1874) Plantae Lorentzianae. *Abhandlungen der Königlichen Gesellschaft der Wissenschaften zu Göttingen* 19: 49–279.
- Grisebach, A. (1879) Symbolae ad Floram Argentinam. *Abhandlungen der Königlichen Gesellschaft der Wissenschaften zu Göttingen* 24: 1–346.
- Hieronimus, G.H.E. (1882) Plantae diaphoricae flora Argentinae. *Boletín de la Academia Nacional de Ciencias (Córdoba)* 4: 199–537.
- Hope, J. (1782) Beschryving Van Eene *Budleja globosa*. *Verhandeligen uitgegeeven door de hollandse maatschappy der weetenschappen, te Haarlem* 20 (2): 417–418.
- Hosseus, K.C. (1926) Loganiáceas. *Revista del Centro Estudiantes de Farmacia, Córdoba* 2 (5): 1–60.
- Hunziker, A.T. (1960) Catálogo de los tipos “Grisebachianos” conservados en Córdoba. *Boletín de la Academia Nacional de Ciencias (Córdoba)* 41: 283–421.
- Kraenzlin, F.W.L. (1908) Loganiaceae austro-americanae. *Botanische Jahrbücher für Systematik Pflanzengeschichte und Pflanzengeographie* 40: 306–312.
- Kraenzlin, F.W.L. (1913) Buddleiae americanae nonnullis gerontogaeis adjectis. *Botanische Jahrbücher für Systematik Pflanzengeschichte und Pflanzengeographie* 50 (Beibl. 111): 33–47.
- Kraenzlin, F.W.L. (1916) Loganiaceae. In: Hassler, E., ex herbario Hassleriano: novitates paraguarienses. *XXL. Repertorium Specierum Novarum Regni Vegetabilis* 14: 292–295.
- Kunth, C.S. (1818) Scrophularinae. *Nova Genera et Species Plantarum (quarto ed.)* 2: 345–360.
- Lamarck, J.B. (1792) *Tableau encyclopedique et methodique des trois règnes de la nature: Botanique 1*. Panckoucke, Paris, 496 pp.
- Linnaeus, C. (1753) *Species plantarum* 1. Stockholm, Salvius.
- Marquand, C.V.B. (1930) Revision of the old world species of *Buddleja*. *Bulletin of Miscellaneous Information Royal Botanic Gardens*,

- Kew* 5: 177–208.
<http://dx.doi.org/10.2307/4107720>
- McNeill, J. (2014) Holotype specimens and type citations: general issues. *Taxon* 63: 1112–1113.
<http://dx.doi.org/10.12705/635.7>
- McNeill, J., Barrie, F.R., Buck, W.R., Demoulin, V., Greuter, W., Hawksworth, D.L., Herendeen, P.S., Knapp, S., Marhold, K., Prado, J., Prud'homme van Reine, W.F., Smith, G.F., Wiersema, J.H. & Turland, N.J. (2012) International Code of Nomenclature for algae, fungi, and plants (Melbourne Code). *Regnum Vegetabile* 154: 1–248.
- Muñoz Garmendía, F. (2004) *La botánica al servicio de la Corona. La expedición de Ruiz, Pavón y Dombey al virreinato del Perú (1777-1831)*. Barcelona, Lunwerg, 220 pp.
- Norman, E.M. (1976) Loganiaceae. In: Raulino, R. (Ed.) *Flora Illustrada Catarinense* (Loganiac.): 20. Santa Catarina, Itajaí, 76 pp.
- Norman, E.M. (1995) Novedades en *Buddleja* (Buddlejaceae). *Kurtziana* 24: 192.
- Norman, E.M. & Ariza Espinar, L. (1995) Buddlejaceae. In: Programa PROFLOA (Org.) *Flora Fanerogámica Argentina* fasc. 10., 13 pp.
- Norman, E.M. (2000) Buddlejaceae. In: Norman, E. (Aut.) *Flora Neotropica Monograph* 81. New York Botanical Garden, New York, pp. 1–225.
- Ochoa, C.M. (1990) *The potatoes of South America: Bolivia*. Cambridge University Press, Cambridge, 512 pp.
- Oxelman, B., Kornhall, P., Olmstead, R.G. & Bremer, B. (2005) Further disintegration of Scrophulariaceae. *Taxon* 54: 411–425.
<http://dx.doi.org/10.2307/25065369>
- Planchuelo, A.M. & Ariza Espinar, L. (2015) New lectotypification of *Crotalaria incana* var. *australis* (Crotalarieae, Fabaceae): an example of procedure to determine the correct types from the Lorentz & Hieronymus collection. *Phytotaxa* 195 (3): 243–247.
<http://dx.doi.org/10.11646/phytotaxa.195.3.4>
- Rémy, E.J. (1847) Analecta Boliviana. *Annales des Sciences Naturelles; Botanique sér.* 3 8: 224–240.
- Ruiz, L.H. & Pavón, J.A. (1798) *Flora Peruviana et Chilensis* 1. Gabrielis de Sancha, Madrid.
- Rusby, H.H. (1895) On the collections of Mr. Miguel Bang in Bolivia—part 2. *Memoirs of the Torrey Botanical Club* 4: 203–274.
- Rusby, H.H. (1907) An enumeration of the plants collected in Bolivia by Miguel Bang. Part 4. With descriptions of new genera and species. *Bulletin of the New York Botanical Garden* 4: 309–470.
- Schmidt, J.A. (1862) Scrophularinae. In: Martius, K.F., Eichler, A. & Urban, I. (Eds.) *Flora Brasiliensis* 8. R. Oldenbourg, Monachii et Lipsiae, pp. 229–330.
- Sprengel, C. (1825) *Systema vegetabilium, edition decima sexta*. Vol. 1. Dieterich, Göttingen, 939 pp.
- Stafleu, F.A. & Cowan, R.S. (1976) *Taxonomic literature*. Ed. 2. Vol. 1. Bohn, Scheltema & Holkema, Utrecht, 1136 pp.
<http://dx.doi.org/10.5962/bhl.title.48631>
- Stafleu, F.A. & Cowan, R.S. (1979) *Taxonomic literature*. Ed. 2. Vol. 2. Bohn, Scheltema & Holkema, Utrecht, 991 pp.
<http://dx.doi.org/10.5962/bhl.title.48631>
- Stafleu, F.A. & Cowan, R.S. (1981) *Taxonomic literature*. Ed. 2. Vol. 3. Bohn, Scheltema & Holkema, Utrecht, 980 pp.
<http://dx.doi.org/10.5962/bhl.title.48631>
- Stafleu, F.A. & Cowan, R.S. (1983) *Taxonomic literature*. Ed. 2. Vol. 4. Bohn, Scheltema & Holkema, Utrecht, 1214 pp.
<http://dx.doi.org/10.5962/bhl.title.48631>
- Stafleu, F.A. & Cowan, R.S. (1986) *Taxonomic literature*. Ed. 2. Vol. 6. Bohn, Scheltema & Holkema, Utrecht, 926 pp.
<http://dx.doi.org/10.5962/bhl.title.48631>
- Sutherland, C.N. (1997) Material tipo de la colección de Sessé y Mociño en el Real Jardín Botánico de Madrid. *Anales Jardín Botánico de Madrid* 55: 375–418.
- Tank, D.C., Beardsley, P.M., Kelchner, S.A. & Olmstead, R.G. (2006) Review of the systematics of Scrophulariaceae s.l. and their current disposition. *Australian Systematic Botany* 19: 290–307.
<http://dx.doi.org/10.1071/SB05009>
- Thiers, B. (2015) *Index herbariorum: a global directory of public herbaria and associated staff*. New York: New York Botanical Garden's Virtual Herbarium. Available form: <http://sweetgum.nybg.org/ih> (accessed 20 April 2015)
- Vellozo, J.M. da C. (1825–1829) *Florae fluminensis*. Nacional, Rio de Janeiro, 352 pp.
- Zuloaga, F.O., Morrone, O. & Belgrano, M.J. (2008) Catálogo de las plantas vasculares del Cono Sur: (Argentina, Sur de Brasil, Chile, Paraguay y Uruguay) Vol. 3. *Monographs in systematic botany from the Missouri Botanical Garden* 107: 1–3348.