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# Typification of Three Names in the Genus *Periploca* (Apocynaceae)

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**ABSTRACT.** Three names in the genus *Periploca* L. are discussed and typified. A specimen preserved at BM and collected by Francis Masson in Tenerife (Canary Islands, Spain) is designated as the neotype of the name *P. laevigata* Aiton. A Cavanilles illustration is designated as the lectotype of *P. puniceifolia* Cav., a synonym of *P. laevigata*. Furthermore, a “second-step” lectotypification is published for the name *P. angustifolia* Labill.

**Key words:** Lectotype, neotype, nomenclature, Periplocoideae, “second-step” lectotypification, taxonomy.

The genus *Periploca* L. (Apocynaceae: Periplocoideae) includes 14 species that occur in Africa, Asia, and Europe, which inhabit humid forest, drier savanna, or desert scrub. The majority of *Periploca* species are shrubby scramblers; a few are lianas or erect shrubs (Schumann, 1895; Browicz, 1965, 1966; Verhoeven & Venter, 1994; Venter, 1997). Morphologically, their always-pubescent stamens are most significant (Venter, 1997; Endress et al., 2018). Plants of the genus *Periploca* have been used in Chinese traditional medicine for the treatment of rheumatoid arthritis. A recent study attributed this effect to their pregnane glycoside contents, which have a potent immunosuppressive effect (Feng et al., 2008). Some species are also used as ornamentals (Browicz, 1966).

*Periploca laevigata* Aiton s.l. (sect. *Periploca* ser. *Laevigata* Browicz) inhabits dry, often rocky places and is distributed in North Africa from the Sahara to Egypt, Syria, the Canary Islands, the southeastern Iberian Peninsula, and small islands of the central and eastern Mediterranean (Browicz, 1966; Markgraf, 1972; Venter, 1997; Arista & Ortiz, 2012). *Periploca laevigata* is very variable in morphology. The European, Asian, and North African representatives have often been treated as *P. laevigata* subsp. *angustifolia* (Labill.) Markgr. (see Markgraf, 1971, 1972). It differs from *P. laevigata* s. str., which was described from material from the Canary Islands, only in its leaf length to width ratio (López González, 2001). However, this distinction is rather arbitrary especially since *P. laevigata* is considered a very variable species with regard to leaf size and shape (Browicz, 1966: 50–52). Therefore, some authors

consider *P. angustifolia* Labill. to be simply a (heterotypic) synonym of *P. laevigata* (see e.g., Arista & Ortiz, 2012). However, the most widely used and accepted treatment is to consider this taxon as a subspecies of *P. laevigata* (Browicz, 1966; Markgraf, 1971, 1972; Bolòs & Vigo, 1996; Venter, 1997; Charco, 2001; López González, 2001; Ruiz de la Torre, 2006; Blanca, 2009), or occasionally as a distinct species, *P. angustifolia* (Raynaud, 2007).

The name *Periploca laevigata* lacks a type designation and its typification is therefore investigated here to contribute to the stability of the nomenclature. Further, a lectotype is designated for *P. puniceifolia* Cav., another heterotypic synonym of *P. laevigata* (see Browicz, 1966; Venter, 1997), and a “second-step” lectotypification for *P. angustifolia* is proposed.

## BACKGROUND AND TYPIFICATION OF THE NAMES

***Periploca laevigata*** Aiton, Hort. Kew. 1: 301. 1789.

TYPE: Spain. Canary Islands, Tenerife, 1778, *F. Masson s.n.* (neotype, designated here, BM barcode [bc] BM000829233!). Figure 1.

*Periploca puniceifolia* Cav., Icon. 3: 9, tab. 217. 1795, as “*punicaefolia*.” TYPE [icon]: “*Periploca punicaefolia*” in Cavanilles (1795: tab. 217) (lectotype, designated here). Figure 2.

**Notes.** William Aiton set to work in the 1780s to catalogue every plant being grown at Kew. The result, published in 1789, was called *Hortus kewensis* and included information on the country of origin of every plant and who first cultivated it in Britain. The botanical descriptions in the *Hortus kewensis* were not written by the Aitons (William Aiton [1731–1793] and William Townsend Aiton [1766–1849]), but by Daniel Carl Solander, Jonas Carlsson Dryander, and Robert Brown (see Britten, 1912, and Krok, 1925). However, the International Code of Nomenclature (ICN, Art. 46.8, Ex. 43; Turland et al., 2018) specifies that names of new taxa published in *Hortus kewensis* (1789) are to be “attributed to Aiton, the stated author of the work, except where a name and description were both ascribed in that work to somebody else.”

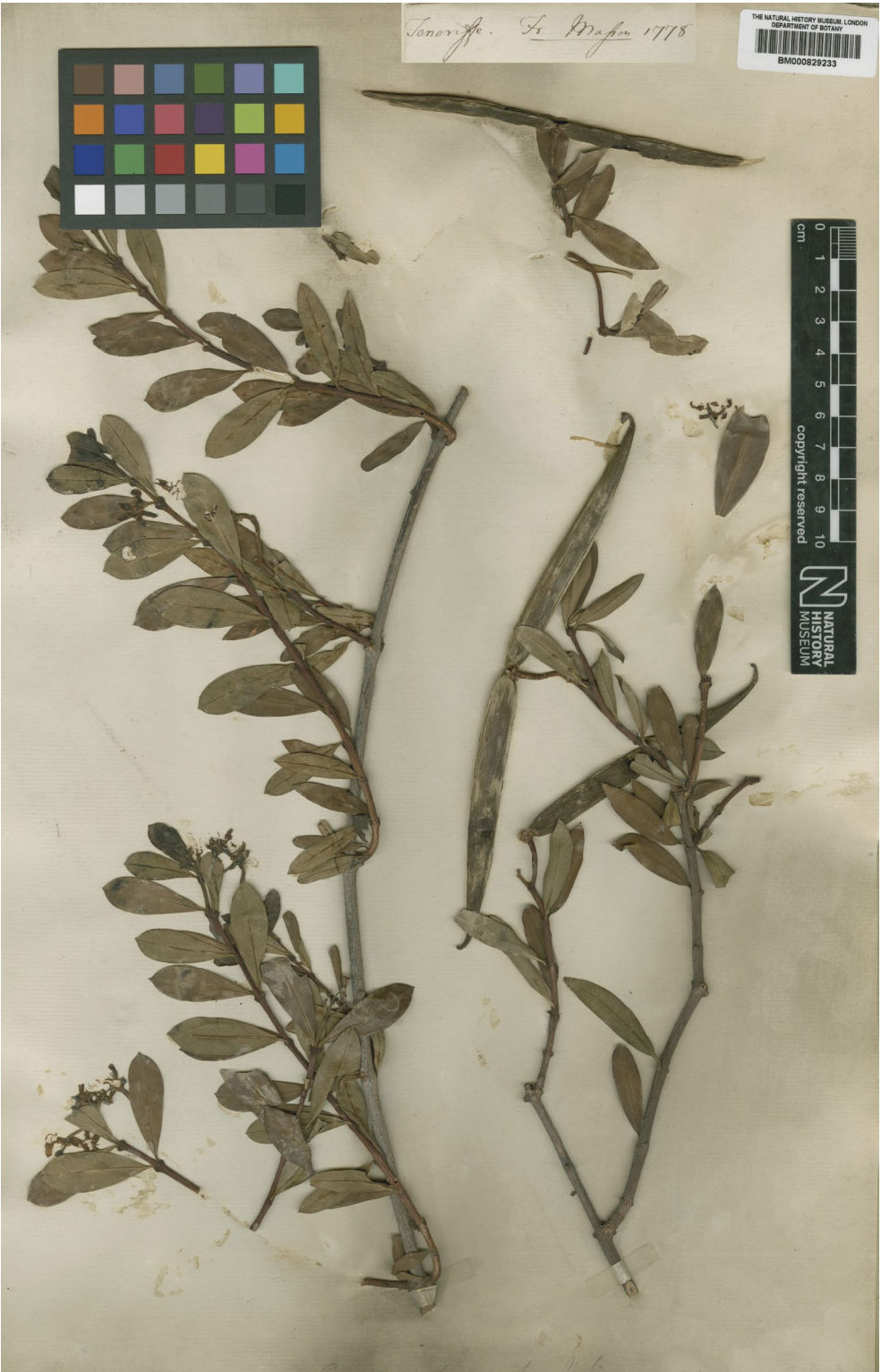


Figure 1. Neotype of *Periploca laevigata* Aiton (BM, BM000829233). Photograph by and courtesy of Herbarium BM; reproduced with permission.

PERIPLOCA PUNICÆFOLIA.

Tab. 217.



A.J. Cavanilles del.

V. Lopez Engueta sculp.

Figure 2. Lectotype of *Periploca puniceifolia* Cav., icon "*Periploca puniceifolia*" in Cavanilles (1795: tab. 217).

Aiton's protologue (1789: 301) of *Periploca laevigata* consisted of a short diagnosis ("3. P. [Periploca] corollis glabris, cymis trichotomis, foliis oblong-lanceolatis laevibus, caule glabro") followed by six annotations: (1) "Smooth Periploca"; (2) "Nat. of the Canary Islands. Mr. Francis Masson"; (3) "Introd. 1779"; (4) "Fl."; (5) "G. H." (indicating that this species is cultivated in the Green House at Kew); and (6) "B" (indicating that this species is shrubby [see Aiton, 1789: xxx (preface), for abbreviations]).

Browicz (1966: 34) indicated the "type" of *Periploca laevigata* as "Type: Cult. in H. Kevenis, misit Fr. Masson ex Ins. Canariis, 1779." However, he also noted: "So far as I know there is no herbarium specimen by Aiton which could be taken as type of *P. laevigata*" (Browicz, 1966: 7). Some years later, Venter (1997: 126) indicated as type of *P. laevigata* a specimen preserved at K, as "Type: Canary Islands, Masson s.a. (K!, holo)." However, in the K herbarium no specimen of this species collected by Francis Masson can be located (David Goyder, pers. comm.).

Francis Masson (1741–1805) was a British plant collector and gardener at Kew. In 1772, he was appointed the first Kew plant collector and gained his passage to Cape Town, South Africa, with Captain Cook; he would spend much of his field career working there (see Masson, 1796). In 1776–1778, he made collections in Madeira, the Canary Isles, the Azores, and the West Indies.

Masson's living plants went to Kew; his herbarium specimens went (mainly) to Banks and are now preserved at BM. Duplicates of Masson's collections are in several herbaria, e.g., BR, CGE, DBN, HAL, LD, LINN, MO, PH, UPS (incl. Thunberg herbarium) (Staffeu & Cowan, 1981). The Royal Botanic Gardens of Kew had no herbarium in the 18th century, and, as indicated by Staffeu and Cowan (1976), almost all types of both editions of the *Hortus kewensis* are housed in the Banksian herbarium at BM.

As noted, we have not been able to locate any specimen at K of *Periploca laevigata* collected by Masson in the Canary Islands (David Goyder, pers. comm.). However, BM holds a relevant specimen of *P. laevigata* collected by Masson, barcoded BM000829233. The sheet bears a well-preserved specimen, with leaves, flowers and fruits, and a handwritten label: "Teneriffe. Fr. Masson 1778." The geographical locality "Teneriffe" and the author "Fr. Masson" agree with the locality and author given in the protologue, "Canary Islands" and "Francis Masson." I have not been able to locate any further material derived from Masson's collection in other herbaria (e.g., BM, BR, CGE, DBN, G, HAL, LD, LINN, MO, PH, UPS).

Following Art. 9.11 of the ICN (Turland et al., 2013), as the previously designated lectotype has been lost, a

new type may be designated. The *Masson s.n.* specimen barcoded BM000829233 is well preserved and complete and represents the traditional concept and current use of the name (e.g., Jahandiez & Maire, 1932; Maire, 1961; Browicz, 1966; Markgraf, 1972; Bolòs & Vigo, 1996; Venter, 1997; Charco, 2001; López González, 2001; Ruiz de la Torre, 2006; Arista & Ortiz, 2012; Charco et al., 2014). It cannot be treated as original material because the *Hortus kewensis* description was based on cultivated living material received in 1779, and the protologue gives no evidence that the preserved specimen was seen. However, because the specimen was evidently associated with the living material collected by Masson, it is a very appropriate neotype and is here designated as such.

*Periploca puniceifolia* is a heterotypic synonym of *P. laevigata* s. str. (Browicz, 1966; Venter, 1997; Arista & Ortiz, 2012). The protologue includes a complete description followed by a provenance, "Habitat in Canariis insulis, vernacule ibi dicta *Granadillo*. Vidi floridam in R. horto Matrit. mense Octobri"; a comment, "Fructum non dedit"; and an excellent illustration of this plant and its explanation (Cavanilles, 1795: 9, tab. 217). The drawing illustrates a stem with leaves and flowers, including several details of the flowers, but no fruits (see Fig. 2). This illustration is part of the original material of *P. puniceifolia* (Art. 9.4 of the ICN; Turland et al., 2018).

In the Cavanilles herbarium at MA there are two herbarium sheets of this species. The sheet with barcode MA 476091 bears a fragment with leaves and flowers, but no fruits, and two labels: (1) "*Periploca puniceifolia* Cav. / ex Hort. Reg. Matr. / 1803"; and (2) "*Periploca puniceifolia* Cav. / ic. 3. 217 / *P. laevigata* Ait. / Ex Hort. Matr. 1803." The sheet with barcode MA 476092 bears four fragments, with leaves and flowers, two large, but no fruits; and an envelope that bears a fruit and several seeds. The sheet also contains three labels: (1) "*Periploca delaBillardièrre* / Cornical [handwritten by Broussonet] / *Periploca puniceifolia* / Canarias [handwritten by Cavanilles]"; (2) "*Periploca puniceifolia* / Icon. t. 217. / ex horto R. Matritense mense / novembri 1793" [handwritten by Cavanilles]; and (3) [the envelope] "Fructus *Periploca* / *Puniceifolia* / 12 Sept. 1798."

Among these two herbarium sheets, the specimen with barcode MA 476091 is post-protologue (collected in 1803) and therefore cannot be treated as original material. The sheet barcoded MA 476092 contains material of three collections. The fragment(s) collected in the Canary Islands and in the Royal Botanic Garden of Madrid are presumably original material, although the fruits are not. The fragments are not clearly linked with the two labels. Fortunately (for this reason), these specimens do not need to be treated as syntypes because

the protologue only mentions the provenance of the material (see ICN Art. 9.6 and Art. 40 Note 2; Turland et al., 2018) without identifying details; a date was given for the botanical garden collection but does not match the specimen label. Therefore, the specimens and illustration have the same priority (see ICN Art. 9.12; Turland et al., 2018).

Garilleti (1993: 174) stated that the specimen MA 476092 was “Material tipo” [type material], which might be taken as a designation of type. However, Garilleti (1993) stated in the introduction to his work that his aim was to study the Cavanilles Herbarium and not to designate types. He wrote: “Nuestro objetivo ha sido estudiar el herbario de A. J. Cavanilles, en ningún caso se ha concretado una lectotipificación de sus táxones” [Our aim was to study the herbarium of A. J. Cavanilles, in no case has a lectotypification of his taxa materialized] (Garilleti, 1993: 5; Garilleti, pers. comm.). Inadvertent lectotypifications were permitted and common before 2001, usually when a specimen mistakenly believed to be a holotype was by that statement accidentally designated as a lectotype (ICN Art. 9, Ex. 11). However, Garilleti’s work is unusual in bearing an explicit statement that the work was to contain no lectotypifications. Further, “type material,” as opposed to “type specimen,” could refer to one or multiple syntypes or original material, so does not indicate that a single specimen mentioned was considered to be *the* type. Therefore, subsequent authorities have interpreted his mentions of “type material” as not constituting effective typifications (e.g., Knapp, 2007; Buira et al., 2015; Iamónico & Valdés, 2017; Ferrer-Gallego, 2021). Because similar mentions were made for over 1000 taxa, if those were to be interpreted as unintended typifications, it would be very disruptive to nomenclature. Therefore, we follow established practice in considering that no effective designation of type has been made.

In conclusion, the original material of *Periploca puniceifolia* includes most of the herbarium sheet with barcode MA 476092 and the illustration included in the protologue, which have equal priority for purposes of typification. The illustration is designated here as the lectotype of the name *P. puniceifolia* since the sheet contains material of three different gatherings, including two that are original material but cannot be linked to any of two labels providing locality data (see Garilleti, 1993: 174). Cavanilles’s excellent illustration matches with the traditional concept of the name *P. puniceifolia*, which is currently treated as a heterotypic synonym of *P. laevigata*.

***Periploca laevigata* subsp. *angustifolia*** (Labill.) Markgr., Bot. J. Linn. Soc. 64: 375. 1971. *Periploca angustifolia* Labill., Icon. Pl. Syr. 2: 13, tab. 7.

1791. TYPE: Oriente, s.d., *Labillardière s.n.* (lectotype, designated by Browicz [1966: 44] and designated here, FI [bc] FI055611!; isolectotypes, BM [bc] BM001014113!, FI [bc] FI055612!, G [bc] G00177315!). Figure 3.

*Notes.* The protologue of *Periploca angustifolia* includes a complete description followed by the geographical provenance of this plant: “*Habitat juxtà Ladicceam ad mare et in insula Lampedosâ. Observata in monte Atlas à D. Desfontaines*” (Labillardière, 1791: 13–14). The protologue also includes an excellent illustration of the plant (Labillardière, 1791: t. 7).

Browicz (1966: 44) indicated as type of *Periploca angustifolia* a specimen preserved in the Herbarium Universitatis Florentinae: “Type: ad Latakieh Syriae maritimae c. fl. et fr., Labillardière (F. – probably holotypus + BM. G. K.)” This author referred to the Herbarium Universitatis Florentinae, Istituto Botanico, Firenze, Italy, with the nonstandard abbreviation “F” instead of FI (see Thiers, 2020 [continuously updated]). This constituted an effective lectotypification. Venter (1997: 126) indicated as type of *P. angustifolia* a poorly preserved, fragmentary duplicate preserved at G, as “Type: Syria, Latakieh, *Labillardière s.n.* (G!, holo; BM).” However, Venter’s indication was ineffective and superfluous as a designation of type.

In the herbarium at FI there are two sheets of Labillardière that contain material of *Periploca angustifolia*. The sheet barcoded FI055611 bears three fragments with leaves, flowers and a fruit, and a label: “Herb. Webbiana / *Periploca laevigata* Vahl. / Ex Herb. Labillardière. / Orient” (Fig. 3). The sheet barcoded FI055612 bears four plant fragments with leaves, flowers and two fruits, and a label: “*Periploca / angustifolia / Sp. nov.*” These two specimens are undoubtedly original material of *P. angustifolia*. Conserved in a separate sheet with the barcode FI055611-a, there is a copy of the drawing published by Labillardière (1791) in the protologue. The specimen FI055611 was certainly the specimen used in preparation of Labillardière’s illustration.

The typification proposed by Browicz (1966) does not distinguish between these two sheets; it can and should be further narrowed to a single specimen by a “second-step” lectotypification according to Art. 9.17 of the ICN (Turland et al., 2018). Thus, of the two specimens at FI, the sheet barcoded FI055611, which was associated with the illustration in the protologue, is here designated to serve as the second-step lectotype of the name *Periploca angustifolia*. It represents the traditional concept and current use of the name (e.g., Browicz, 1966; Markgraf, 1971, 1972; Bolòs & Vigo, 1996; Venter, 1997; Charco, 2001; López González, 2001; Ruiz de la Torre, 2006; Blanca, 2009). It is



Figure 3. Lectotype of *Periploca angustifolia* Labill. (Labillardière s.n., FI055611). Photograph by and courtesy of Herbarium FI; reproduced with permission.

worth noting that the isolectotype at BM has the most complete labeling, including a handwritten label from Labillardière: “Syria, juxta Laodiceam ad mare, et in insula Lampedosa. J.J. La Billardière, m.d.” and a second label reading “*Periploca angustifolia* Labill. / Labillardière.”

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