



Neotypification of the sweet tabaiba, *Euphorbia balsamifera* (Euphorbiaceae)

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Euphorbia balsamifera Aiton (1789: 137) (Euphorbiaceae) is a dioecious succulent dendroid shrub, popularly known as “sweet tabaiba” or “tabaiba [tabaibera or tabaibo] dulce” (the plant is also known in Africa as “ifernane”, “fernán”, “yaro”, “aliyara”, see Marrero Gómez *et al.* 2000). It is distributed along the dry coastal areas of all the Canary Islands where it is a common element of the thermophilous vegetation. The species is less common along the coast of southern Morocco and northern Western Sahara where it is found forming scattered populations (Walker & Thorburn 1987, Marrero Gómez *et al.* 1999, Molero *et al.* 2002, Fennane 2007, Riina 2020, Riina *et al.* 2021).

Euphorbia balsamifera belongs to *E.* sect. *Balsamis* Webb & Berthelot (1846–1847: 253), a small clade in *E.* subg. *Athymalus* Necker ex Reichenbach (1829: 194) (Peirson *et al.* 2013). The species was recently recircumscribed using a taxonomic integrative approach including phylogenomic evidence, morphology, distribution ranges, clade ages, and climatic niches (Riina *et al.* 2021). This work allowed the recognition of three monophyletic groups at the species level within the former *E. balsamifera* s.l., namely *E. adenensis* Deflers (1887: 67) [= *E. balsamifera* subsp. *adenensis* (Deflers) Bally (1965: 31)], *E. balsamifera* s.str., and *E. sepium* N.E.Br. (in Brown *et al.* 1911: 551) [= *E. balsamifera* subsp. *sepium* (N.E.Br.) Maire (1938: 450)]. Updated descriptions of the three species, current distribution data and field images are also available in Riina *et al.* (2021).

Although Riina *et al.* (2021) indicated and designated nomenclatural types for *E. balsamifera* and *E. sepium*, the name *Euphorbia balsamifera* still lacks a formal type designation. Therefore, the purpose of this paper is to propose the typification of *Euphorbia balsamifera* to ensure nomenclatural stability.

The protologue of *Euphorbia balsamifera* was analyzed to identify original material (or lack thereof) pertinent to the typification. The taxonomic identity of the proposed type was verified against the traditional concept and the current usage of the name. In the following account herbarium acronyms follow Thiers (2023 onwards). The typification is in accordance with the rules and recommendations of the Shenzhen Code (Turland *et al.* 2018).

In the 1780s, William Aiton set out to catalogue every plant grown at Kew. The result, published in 1789, was called *Hortus kewensis* (a catalogue of the plants cultivated in the Royal Botanic Garden at Kew) and included information on the country of origin of each 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, Krok 1925). On the other hand, some of the new taxa described in the first edition (1789) of the *Hortus kewensis* came from L’Héritier (so indicated), and the types of these taxa are in the L’Héritier herbarium at G-DC and also at BM. Specifically, the diagnoses in *Hortus kewensis* vols. 1 & 2 were largely written by Dryander, who used a manuscript left by Solander, which is held in the Botany Library at BM (Britten 1912, Krok 1925, Rauschenberg 1968, Bridson *et al.* 1980, Stafleu & Cowan 1985). 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”.

Aiton’s protologue (1789: 137) of *Euphorbia balsamifera* consisted of a short diagnosis (“14. *E.* [Euphorbia] inermis fruticosa stricta, capitulo terminali, foliis lanceolatis laevibus glaucis”) followed by six annotations: 1) “Balsam Spurge”; 2) “*Nat.* of the Canary Islands. Mr. Francis Masson.”; 3) “*Introd.* 1779”; 4) “*FL.*”; 5) “*D. S.*” (indicating that this species is cultivated in the Dry Stove at Kew); and 6) “*B.*” (indicating that this species is shrubby [see Aiton 1789: page xxx [30] for abbreviations]).



FIGURE 1. Neotype of *Euphorbia balsamifera* Aiton (BM000928081). Image courtesy of the herbarium BM, reproduced with permission.

Riina *et al.* (2021: 499) indicated the “holotype” of *E. balsamifera* as: “Type: Canary Islands, Tenerife, 1778, *F. Masson s.n.* (holotype BM000928081!)” (see also Molero *et al.* 2011). However, this specimen cannot be treated as original material used by Aiton to describe his species (see below).

Francis Masson (1741–1805) was a British plant collector and gardener at Kew. In 1772, he was appointed Kew’s first plant collector and gained his passage with Captain Cook to Cape Town, South Africa, where he would spend much of his field career (see Masson 1796). Between 1776 and 1778, Sir Joseph Banks sent Masson on a botanical expedition to Madeira, the Canary Islands, the Azores, and the West Indies.

Masson’s living plants went to Kew, and their introduction into cultivation in 1777 is recorded in the Aiton’s *Hortus kewensis* (1789). His herbarium specimens went (mainly) to Banks and are now kept 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) (Stafleu & Cowan 1981). The Royal Botanic Gardens, Kew, had no herbarium in the 18th century and as noted by Stafleu & Cowan (1976), almost all types cited in both editions of the *Hortus kewensis* are held in the Banksian herbarium at BM.

We have not been able to locate any specimen of *E. balsamifera* from the Canary Island collected by Masson in the K herbarium (David Goyder, pers. comm.). However, the British Museum (BM) holds a relevant specimen of *E. balsamifera* collected by Masson, barcoded BM000928081. The sheet bears a specimen with leaves and cyathia, 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”. The sheet is also annotated at the base of the specimen as “Euphorbia balsamifera Sol. in Hort. Kew. ii. 137”, and a printed label “Type Specimen / of / Euphorbia balsamifera [Soland. in] / Ait., Hort. Kew. ii. 137 (1789)”. This specimen cannot be treated as a syntype mentioned by Aiton in the protologue, because the information does not match between the original annotations on the label of the herbarium sheet (“Teneriffe. Fr. Masson. 1778”) and the protologue (“*Nat. of the Canary Islands. Mr. Francis Masson. / Introd. 1779*”). We have not been able to locate other *E. balsamifera* material from Masson’s collection in other herbaria (e.g., BM, BR, CGE, DBN, G, HAL, LD, LINN, MO, PH, UPS).

The Masson specimen barcoded BM000928081 is well preserved, and represents the traditional concept and current use of the name (e.g., Webb & Berthelot 1846–1847, Børgesen 1924, Rodríguez Delgado & Beltrán Tejera 1990, Marrero Gómez *et al.* 1999, 2000, Fennane 2007, Molero *et al.* 2011, Riina 2020, Riina *et al.* 2021). Unfortunately, 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. In addition, the sheet in BM lacks any original annotation by Aiton explicitly referring to *E. balsamifera*. However, because the specimen was evidently associated with the living material collected by Masson, and shows relevant diagnostic features (e.g., stem leaves lanceolate to linear-lanceolate, 14.1–44.9(–50) × 2.9–10(–12) mm; mucron 0.3–0.6 mm long, when present) it is a very appropriate neotype and is here designated as such.

Euphorbia balsamifera Aiton (1789: 137)

Neotype (designated here):—[Spain] Canary Islands, Tenerife, 1778, *Francis Masson s.n.* (BM barcode BM000928081 [photo!]; Fig. 1).

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