

Lectotype designation of the Macaronesian endemic *Gymnosporia cassinoides* (Celastraceae)

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Abstract. The typification of the name *Celastrus cassinoides*, currently accepted as *Gymnosporia cassinoides* (Celastraceae), is discussed. This species is a plant endemic to the Canary Islands, traditionally known as *Maytenus canariensis*. A lectotype is designated for this name using a specimen preserved in the herbarium BM, collected by Francis Masson in the Canary Islands in 1778.

Keywords. Canary Islands, lectotype, Masson, nomenclature, typification.

Resumen. Se discute la tipificación del nombre *Celastrus cassinoides*, actualmente *Gymnosporia cassinoides* (Celastraceae). Esta especie es una planta endémica de las Islas Canarias, tradicionalmente conocida como *Maytenus canariensis*. Se designa un lectotipo para este nombre utilizando un espécimen conservado en el herbario BM, recolectado por Francis Masson en las Islas Canarias en 1778.

Palabras clave. Islas Canarias, lectotipo, Masson, nomenclatura, tipificación.

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INTRODUCTION

Celastraceae R.Br. contains approximately 98 genera and 1264 species distributed worldwide. They are found in the tropics and subtropics, with some rare representatives in temperate regions (Loesener 1942; Simmons & al. 2001a, 2001b; Simmons 2004). The delimitation of genus *Maytenus* Molina has been long debated particularly regarding the merger/segregation of species from *Gymnosporia* (Wight & Arn.) Hook.f. (Loesener 1942; Brenan 1953; Exell 1953; Hou 1955, 1962; Demissew 1985; Jordaan & van Wyk 1999, 2003; McKenna & al. 2011). Molecular data support that *Gymnosporia* (Wight & Arn.) Hook.f. is a natural group distinct from *Maytenus* (Simmons & al. 2001a, 2001b, 2008) and it has recently been reinstated to include all its thorny members, previously placed under *Maytenus* Molina. *Gymnosporia* is an Old World genus, comprising about 118 species and infraspecific taxa of dioecious trees, shrubs or dwarf shrubs, occurring in Africa, Madagascar and adjacent islands, southern Spain, the near Middle East, Afghanistan, Pakistan, India, Sri Lanka, Thailand, Vietnam, China, Taiwan, Ryukyu Islands (Japan), Malesia, Australia (Queensland), and the

Polynesian Islands (Jordaan & van Wyk 1999, 2003, 2006; Simmons 2004).

Gymnosporia cassinoides (L'Hér.) Masf. (based on *Celastrus cassinoides* L'Hér.), popularly known as “peralillo”, “peralito”, “acebuche” or “árbol negro” (the leaves resemble those of a pear tree, genus *Pyrus*, “peral” in Spanish) (Kunkel 1971, 1986; Pérez de Paz & Hernández Padrón 1999), is a hermaphrodite and small tree, with leathery leaves, alternate, oval, irregularly toothed edges (serrated), dichasiale inflorescences, well-developed petals and obconic fruits, trigonous and dehiscent (capsules), pale greenish to brown, and seeds having a white aril at the base. The specific epithet “*cassinoides*” alludes to the resemblance to a species of *Ilex* (*I. cassinoides* Link) from India, whose vernacular name is “cassine” (Kunke 1986).

Gymnosporia cassinoides is a Canarian endemic plant, recorded from all the islands of the archipelago except Lanzarote (i.e., El Hierro, La Palma, La Gomera, Gran Canaria, Tenerife, and Fuerteventura) (Masferrer 1881; Pitard & Proust 1908; Ceballos & Ortuño 1951;

Lems 1960; Sunding 1971; Reyes-Betancort & Guerra 2010). It is a medicinal plant (Pérez de Paz & Hernández Padrón 1999) due to its antibacterial effect, among others (e.g., dermatics, cystostatic, emollient, antirheumatic) (González & al. 1989, 1992, 1996; Huang & al. 2021). In the Eastern most islands (Lanzarote and Fuerteventura) (Kunkel 1973, 1974, 1975, 1976, 1977; Santos & Fernández 1984) a second species of the genus has been described, i.e., *G. cryptopetala* Reyes-Bet. & A.Santos belonging to sect. *Tenuispinae*, which shows a close relationship with geographically distant species such as *G. tenuispina* (Sond.) Szyszyl. and *G. emarginata* (Willd.) Thwaites (Reyes-Betancort & Guerra 2010).

Gymnosporia cassinoides was traditionally known as *Maytenus canariensis* (Loes.) G.Kunkel & Sunding (Sunding 1971), a new combination at new rank for *M. dryandri* var. *canariensis* Loes.; the name “*Maytenus cassinoides*” (based on the L’Héritier’s name *Celastrus cassinoides*) could not be used because to the older homonym *M. cassinoides* (Poir.) Urb. used to name a plant of the West Indies. The name *M. dryandri* var. *canariensis* Loes. is a replacement name for *Celastrus cassinoides*; Loesener (1942) published “*M. dryandri* (Lowe) Loes. (*Catha dryandri* Lowe, Fl. Madeira [1868] 109), typische Form auf Madeira, var. *canariensis* Loes. auf den Canaren (*Celastrus cassinoides* L’Hér. 1786; *Catha cassinoides* Webb et Berth. (Webb & Berthelot 1842); *G. cassinoides* Masf.; non *M. cassinoides* Urban 1904)”, and therefore *M. dryandri* var. *canariensis* can be treated as a new name (nomen novum) published as an explicit substitute (avowed substitute) for a legitimate previously published name (*Celastrus cassinoides*), which is its replaced synonym.

From the nomenclatural point of view, the name *Gymnosporia cassinoides* has not yet been typified. For this reason, the purpose of this paper is to propose its typification to ensure nomenclatural stability. This contribution is a further step in our work on the nomenclature of the genus *Gymnosporia* (e.g., Ferrer-Gallego & Laguna 2020).

MATERIALS AND METHODS

The protologue of *Celastrus cassinoides* was analyzed to identify original material 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 (2024 [continuously updated]). The typification of the name is in accordance with the rules and recommendations of the Shenzhen Code (Turland & al. 2018).

RESULTS AND DISCUSSION

L’Héritier’s protologue (1789: 4) of *Celastrus cassinoides* consisted of a short diagnosis: “*C. [Celastrus] inermis, foliis ovatis utrinque acutis laxe dentatis perennantibus, floribus axillaribus*”, followed by the provenance “*Habitat in Maderâ, Nivariâ. Masson.*” In the protologue was cited an illustration, as “2. CELASTRUS *cassinoides*. Tab. 10.” (see L’Héritier, 1790 [May]: Tab. 10) that can be considered original material for typification purposes.

The illustration of this species mentioned by the author in the protologue was published by L’Héritier in May 1790 (Tab. 10). It is an excellent drawing of a stem with leaves, flowers and fruits, with several details of the flowers, fruits, and seeds (Fig. 1). L’Héritier published his work *Sertum anglicum* in various fascicles in different years. According to Stafleu & Cowan (1981: 3, no. 4492) in 4 fascicles between 1789 and 1792 (Fasc. 1, p. [i–iv], 1–36, tab. 1–2 (princ. I.1789), Fasc. 2, tab. 3–12 (V.1790) Fasc. 3, tab. 13–24, 15bis (IV.1792) Fasc. 4, tab. 25–34 (fin. 1792)). According to ICN Art. 9.4 (Shenzhen Code, Turland & al. 2018), original material comprises: (a) those specimens and illustrations (both unpublished and published prior to publication of the protologue) that the author associated with the taxon, and that were available to the author prior to, or at the time of, preparation of the description, diagnosis, or illustration with analysis validating the name; (b) any illustration published as part of the protologue.

The description of this plant was published in 1789 (fascicle 1) and the illustration “Tab. 10” of *Celastrus cassinoides* in 1790 (fascicle 2). However, in the protologue was mentioned “2. CELASTRUS *cassinoides*. Tab. 10.” and therefore L’Héritier associated this illustration (unpublished at the time that was published the protologue) with the taxon and it was therefore available to the author at the time of preparation of the description of the species. Therefore, this illustration is original material of *C. cassinoides* and eligible for lectotypification. However, according to Lowe (1862), this illustration represents heterogeneous material.

On the other hand, L’Héritier (1789) mentioned in the protologue at least two concrete gatherings collected by Francis Masson, from Madeira, and also from “Nivariâ”. Nivaria or Ninguaria were the names by which the Romans knew the island of Tenerife, in reference to the snow perched on the Teide Volcano.

Francis Masson (1741–1805) was a Scottish botanist and gardener, in the 1760s he went to work at Kew Gardens. As an under-gardener he was the first official plant collector from the Royal Botanic Gardens of Kew,

appointed by Sir Joseph Banks. Between 1776 and 1779 he collected extensively on the Macaronesian archipelagos of Madeira, the Azores and the Canaries (Francisco-Ortega & al. 2008). Whereas Masson's living plants were destined to Kew, the herbarium specimens were mainly sent to Sir Joseph Banks and are now preserved at BM. Duplicates of Masson's collections are in several herbaria, e.g., AWH, BR, CGE, DBN, HAL, LD, LINN, MO, OXF, P, PH, UPS (incl. Thunberg herbarium) (e.g., Stafleu & Cowan 1981; Rodrigues de Moraes 2013). The Royal Botanic Gardens, Kew, had no herbarium in the 18th century and as noted by Stafleu & Cowan (1976), I have not been able to locate any specimen of *Celastrus cassinoides* from the Canary Island or Madeira collected by Masson in the K herbarium (David Goyder, pers. comm.).

According to Francisco-Ortega & al. (2008), there is only record of Masson's stay in Tenerife in the first half of 1778 (from February to August), with shipments of plant material (with accompanying letter) on 19 March 1778 and 4 May of the same year, in both cases addressed to Banks. And according to the list consulted by Francisco-Ortega &

al. (2008), he sends Canarian material (from Tenerife) of "*Celastrus rotundifolia*" (which they assimilate to *Maytenus canariensis*, the only species of this genus growing in Tenerife) on 23 November 1778 (but sent from Madeira). The Spanish material (BM000829286 and BM000829287) was collected at "Barranca Honda" [Barranco Hondo], a gorge located in the 'Acentejo' region, in northern Tenerife, where the species is locally common (Francisco-Ortega & al. 2008).

The British Museum (BM) holds three relevant specimens for the name *Celastrus cassinoides* collected by Masson (BM000829286, BM000829287, and BM000838914). The sheet BM000829286 bears a specimen with leaves and four fruits, and a handwritten label: "Teneriffe. Fr. Masson" (Fig. 2). The sheet BM000829287 bears a specimen with leaves, fruits, and seeds, and is annotated (on the back of the sheet) "Teneriffe. Fr. Masson" (Fig. 3). The geographical locality "Teneriffe" and the author "Fr. Masson" agree with the locality and author given in the protologue "Nivariâ" and "Masson".

On the other hand, the sheet BM000838914 bears a specimen with leaves and fruits, and a handwritten label: "Madera. Fr. Masson" (Fig. 4). This specimen is part of the original material, but is not suitable for designation as the lectotype, as it currently belongs to another species, and therefore a lectotypification using this specimen would be nomenclaturally disruptive. This specimen was selected as the lectotype of *Maytenus umbellata* (R.Br.) Mabb. (Mabberley 1981: 486).

These three specimens can be treated as syntypes mentioned by L'Héritier in the protologue, because the information match between the original annotations on the labels of the herbarium sheets and the protologue ("*Habitat in Maderâ, Nivariâ. Masson*"), (i.e., "Nivariâ" [Tenerife]. Fr. Masson" and the specimens BM000829286 and BM000829287, and "Madera. Fr. Masson" and the specimen BM000838914). I have not been able to locate other *Celastrus cassinoides* material from Masson's collection in other herbaria (e.g., AWH, BR, CGE, DBN, HAL, LD, LINN, MO, OXF, P, PH, UPS).

In conclusion, among the original elements, the illustration cited in the protologue and the specimens at BM, I designate as the lectotype of the name *Celastrus cassinoides* the specimen BM000829287 (Fig. 3). This specimen shows the diagnostic characters of *Gymnosporia cassinoides*: with leathery leaves, alternate, oval, irregularly toothed edges (serrated), bark grayish brown, young twigs not grooved; unarmed (the plant may rarely have axillary thorns); inflorescence equal to or shorter than leaves (3–7-flowered); capsule obconical-trigona.



Fig. 1. Original material of *Gymnosporia cassinoides* (L'Hér.) Masf. (*Celastrus cassinoides* L'Hér.; basionym), illustration published by L'Héritier (1790 [May]: Tab. 10).



Fig. 2. Original material and isoelectotype of *Gymnosporia cassinoides* (L'Hér.) Masf. (BM000829286). Image courtesy of the herbarium BM, reproduced with permission.



Fig. 3. Lectotype of *Gymnosporia cassinoides* (L'Hér.) Masf. (BM000829287): **a**, front side of the sheet; **b**, back side of sheet with the annotation "Teneriffe. Fr. Masson" [Images courtesy of the herbarium BM, reproduced with permission].



Fig. 4. Original material of *Gymnosporia cassinioides* (L'Hér.) Masf. (BM000838914) collected by Fr. Masson from Madera. This specimen is the lectotype of *Maytenus umbellata* (R.Br.) Mabb. Image courtesy of the herbarium BM, reproduced with permission.

Gymnosporia cassinoides (L'Hér.) Masf., *Anales Soc. Esp. Hist. Nat.* 10: 176. 1881. $\equiv$ *Celastrus cassinoides* L'Hér. in *Sert. Angl.*: 4. 1789 [basionym] $\equiv$ *Catha cassinoides* (L'Hér.) Webb & Berthel., *Hist. Nat. Iles Canaries* 3(pt. 2, sect. 2, livr. 67): 142. 1842. $\equiv$ *Maytenus dryandri* var. *canariensis* Loes. in Engler, *Nat. Pflanzenfar.*, ed. 2, Aufl. 20b: 140. 1942 [nom. nov.] $\equiv$ *Maytenus canariensis* (Loes.) G. Kunkel & Sunding in Kunkel, *Cuad. Bot. Canar.* 13: 9. 1971; in Kunkel, *Cuad. Bot. Canar.*, Supl. 2: 62. 1971. Type (lectotype designated here):—[Spain] Canary Islands “Nivariâ” [Tenerife], [Barranco Hondo, 1778, see Francisco-Ortega & al. 2008], F. Masson s.n. (BM000829287 [photo!]; image of the lectotype, see Fig. 3). Isolectotype: BM000829286 (Fig. 2).

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AUTHORSHIP CONTRIBUTION STATEMENT

P. Pablo FERRER-GALLEGO: Conceptualization, Data curation, Investigation, Writing—original draft, Writing—review & editing.

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