PROPOSALS TO CONSERVE OR REJECT NAMES

Edited by John McNeill, Scott A. Redhead & John H. Wiersema

(2815) Proposal to conserve the name *Bosea yervamora* (*Amaranthaceae*) with a conserved type

Javier Francisco-Ortega,[1,2] Kanchi N. Gandhi,[3] Arnoldo Santos-Guerra,[4] Alan Tye,[5] Alan R. Franck,[6] José A. Mejías,[7] Jonathan A. Flickinger[6,2] & Brett Jestrow[2]

1 *Institute of Environment, Department of Biological Sciences, Kimberly Green Latin American and Caribbean Center, Cuban Research Institute, Florida International University, Miami, Florida 33199, U.S.A.*
2 *The Herbarium, Fairchild Tropical Botanic Garden, Coral Gables, Florida 33156, U.S.A.*
3 *Harvard University Herbaria, Cambridge, Massachusetts 02138, U.S.A.*
4 *Calle Guaidil 16, 38280 Tegueste, Tenerife, Spain*
5 *Charles Darwin Foundation, Puerto Ayora, Galápagos, Ecuador*
6 *Institute of Environment, Department of Biological Sciences, Florida International University, Miami, Florida 33199, U.S.A.*
7 *Departamento de Biología Vegetal y Ecología, Universidad de Sevilla, 41012, Sevilla, Spain*
Addresses for correspondence: *Javier Francisco-Ortega, ortegaj@fiu.edu; Kanchi N. Gandhi*, *gandhi@oeb.harvard.edu*

DOI https://doi.org/10.1002/tax.12512

First published as part of this issue. See online for details.

(2815) ***Bosea yervamora*** L., Sp. Pl.: 225. 1 Mai 1753 [Angiosp.: *Amaranth*.], nom. cons. prop.
Typus: Spain, Canary Islands, Tenerife, Carretera de Tegueste a Bajamar, 28.548055 N, 16.354722 W, 18 Oct 2019, *Santos-Guerra* (ORT No. 47659; isotypi: BM barcode BM013848261, FTG barcode 00174597, GH barcode 00459189, LPA No. 39183, MA No. MA-01-00944610, ORT No. 47660, TFC No. 53475), typ. cons. prop.

Linnaeus (Crit. Bot.: 77. 1737) coined the genus name "*Bosea*" to honor Caspar Bose (1645–1700), who owned a famous garden in Leipzig ("Bose Senator Lipsiensis"). Later Linnaeus (Hort. Cliff.: 84. 1738) spelled the name as "*Bosia*", provided a description and referenced earlier works, viz., Plukenet (Almagestum: 42. 1696), Sloane (Cat. Pl. Jamaica: 135 [sub *Tilia*]. 1696, Voy. Jamaica 2: 19 [sub *Tilia*], t. 158, fig. 3. 1725), Ray (Hist. Pl. 3 (24: Dendrologiæ): 88 [sub *Tilia*]. 1704), Walther (Design. Pl.: 24 [sub *Frutex*], t. 10. 1735), and Thran (Index Pl. Horti Carolsruh.: 44. 1733). Subsequently, Linnaeus (Gen. Pl., ed. 2: 102. 1742, Sp. Pl.: 225. 1753; Gen. Pl., ed. 5: 105. 1754) reverted to the original spelling, and it was validated as *Bosea*, monotypic when published in 1753 with *B. yervamora* L. as generitype. The epithet is a noun in apposition. The name *B. yervamora* L. is still in use to refer to the only species of *Amaranthaceae* endemic in the Canary Islands, where it is common in thermophilous woodland.

Bosea yervamora was one of the untypified names in the Linnaean Plant Name Typification Project (Jarvis, Order Out of Chaos: 357. 2007), but its subsequent typification (Iamonico in Anales Jard. Bot. Madrid 70: 187–188. 2013) has been problematic. As the genus was monotypic, there was no diagnosis (*nomen specificum legitimum*) in his *Species plantarum* account (Linnaeus, l.c. 1753), but there was reference to his 1738 work, along with Sloane (l.c. 1696, 1725), Ray (l.c.), Walther (l.c.), and Royen (Fl. Leyd. Prodr.: 223 [sub *Bosia*]. 1740).

Regarding the typification of the name *Bosea yervamora*, Linnaeus (l.c. 1753) gave the locality as "*Habitat in* Canariis insulis", but because he referred to Sloane's (l.c. 1696, 1725) accounts on Jamaican plants, Linnaeus must also have assumed that the species was present in the West Indies. Indeed, he had previously (l.c. 1738) cited its occurrence as "*Crescit in insulis* Canariis, *aliisque Americae insulis*" with reference to Plukenet (l.c. 1696). We believe that Linnaeus's confusion on the locality arose because Plukenet (l.c. 1696), who is considered the first to have described the Canarian plant (as *Arbuscula baccifera Canariensis* […] *Yerva-mora Hispanorum*), mentioning only the Canary Islands as the locality, later (Almagesti Bot. Mant.: 21. 1700) placed both this taxon and a Jamaican-occurring species described by Sloane (l.c. 1696, 1725) under the same polynomial. Linnaeus (l.c. 1753) continued to follow Plukenet's second interpretation and treated the two species as a single taxon. Sloane's polynomial has been identified as the West Indian endemic *Phyllanthus nutans* Sw. (*Phyllanthaceae*), a species found in the Cayman Islands, Cuba, and Jamaica, being relatively common in Jamaica (Adams, Fl. Pl. Jamaica: 408. 1972; Proctor, Fl. Cayman Islands: 441–443, t. 37. 2012; Falcón Hidalgo & al. in Int. J. Pl. Sci. 181: 288, 293–294, 298, 302. 2020).

Unfortunately, no material of either of these two species is found in the Hortus Cliffortianus herbarium (Jarvis, Dataset: Clifford Herbarium. 2016, https://doi.org/10.5519/0022031). Furthermore, Plukenet's polynomial does not refer to any of his illustrations to clarify the identity of this taxon; while his morphological description is for a species with "Syringae caeruleae foliis, purpurantibus venis", which does not agree with the leaf morphology of either the Canary Island amaranth or *P. nutans*.

Iamonico's (l.c.) lectotypification mentioned that "No specimens of original material were found in the Linnaean and Linnaean-linked herbaria." He performed a thorough analysis on the material associated with the name and made it clear that none was suitable for typification, being not available to Linnaeus in or prior to 1753. After comparing the Sloane (l.c. 1725) and Walther (l.c.) illustrations mentioned in the protologue, Iamonico remarked that because the Sloane image is more complete "we are designating it as lectotype of this name". The Sloane illustration seems to have been based on a single specimen in

the Sloane Herbarium (BM barcode BM000589120), collected in Jamaica. Since Linnaeus did not study that specimen, it is not part of the original elements and is not eligible for typification of *B. yervamora* (*ICN* Art. 9.4), but, of course, the cited illustration is. Additionally, Iamonico noted the same BM specimen as the "typotype" for the name *B. yervamora* (regarding the term "typotype", see Reveal & Jarvis in Taxon 58: 977. 2009). We find that the designated lectotype is in conflict with Linnaeus's (1754) validating description of *Bosea*.

Although Iamonico's lectotype belongs to a taxon occurring in Jamaica, it is evident from his discussion that he regarded the "typotype" specimen as belonging to a member of *Amaranthaceae* endemic to the Canary Islands and that he did not realize that the specimen was a Greater Antillean member of *Phyllanthaceae*. We therefore conclude that Iamonico's intention was to select for *Bosea yervamora* a lectotype identifiable as the Canarian amaranth, but inadvertently an illustration of *Phyllanthus nutans* was designated as the lectotype. The latter name had previously been typified by Webster (in J. Arnold Arbor. 39: 57. 1958) based on a collection made by Olof Swartz in Jamaica (S No. S-R-4464).

Linnaeus's (l.c. 1754) description of *Bosea* agrees with the morphology of the Canarian endemic and does not apply to *Phyllanthus nutans*. According to Linnaeus (l.c. 1754), *Bosea* has unilocular globose berries with a single seed (vs. 3-locular, usually 6-seeded capsules of *P. nutans*); 5 calyx lobes (vs. 6 in *P. nutans*); 5 stamens (vs. 3 in *P. nutans*); and leaves lanceolate and concave (vs. ovate to elliptic and flat in *P. nutans*). It is not clear how Linnaeus, if he did not have any surviving material, had such an explicit description of *Bosea* that clearly excluded the Caribbean element. Linnaeus's description found in the second edition of *Genera plantarum* (l.c. 1742) is identical to that published in the fifth edition of this work; however, in the second edition he referred to an earlier work by Ludwig (Defin. Pl.: 126. 1737), in which "*Yervamora*" is described. This taxon was reported by Ludwig (l.c.) as growing in Bose's garden. Linnaeus's description is similar to that provided by Ludwig (l.c.), but it has a few differences, as for instance Linnaeus referred to plants with leaves that are "lanceolatis, concavis, erectis, margine tenuioribus" (vs. "oblongis cuspidatis" in "*Yervamora*"). Therefore, it is still not obvious what source was used by Linnaeus for his description of *Bosea*.

Despite the discrepancies between Iamonico's lectotype and Linnaeus's description in *Genera plantarum*, this designated lectotype is in accord with the rules on lectotype selection (Art. 9.12 of the *ICN*; Turland & al. in Regnum Veg. 159. 2018) in that the Sloane illustration, cited by Linnaeus (l.c. 1753) is part of the protologue of *Bosea yervamora*, even though it is in serious conflict with the Linnaean generic description. Walther's (l.c.) illustration does not match the morphology of the Canary Island endemic either, as the latter has quite long exserted stamens, which are not depicted in Walther's (l.c.) t. 10, even though exserted stamens (t. 4) and pistils (t. 11 and 18) are depicted in other illustrations in Walther's work.

Apart from resolving these taxonomic confusions involving the accounts of Plukenet, Sloane, Walther, and Linnaeus, additional reasons justify conserving the name *Bosea yervamora* with a conserved type that applies to the Canary Islands endemic. Being a common species, the name is widely used in floristic treatments in the Canaries (Webb & Berthelot, Hist. Nat. Iles Canaries 3: 268–269. 1847; Pitard & Proust, Iles Canaries: 324. 1908; Lid, Contr. Fl. Canary Islands: 61. 1967; Bramwell & Bramwell, Wild Fl. Canary Islands: 121, 1974; Ceballos & Ortuño, Estud. Veg. Fl. For. Canarias Occid.: 320. 1976; Santos, Veg. Fl. La Palma: 150, 152–153. 1983; Arechavaleta & al., Lista Espec. Silvest. Canarias 2009: 124. 2010), ecological works (Rodríguez & Marrero in Anuario Est. Atlánt. 36: 597–598. 1990; Fernández-Palacios & al., Bosques Termófilos Canarias: 30, 85, 89, 140, 160. 2008; Padilla & al. in J. Ecol. 100: 420–422. 2012), and popular articles (Bramwell & Bramwell, Hist. Nat. Islas Canarias: 208. 1987; Rodrigo, Fl. Veg. Archipiél. Canario: 44–45. 1992). It would be desirable for biologists, educators, and nature managers to continue using the name *B. yervamora*, whereas its enforced abandonment would disrupt communication between disciplines.

Assigning the name *Bosea yervamora* to the West Indian taxon would have three undesirable taxonomic results. Firstly, it would require the new combination "*Phyllanthus yervamora*" to replace *P. nutans*, which would affect how biologists and educators in its native range refer to this species. Since *Bosea* and *Phyllanthus* have equal priority, *Bosea*, applying to a genus of only three species, would be logically synonymized under *Phyllanthus*, applying to a much larger and more widespread genus from the Old and New World with over 800 species (Bouman & al. in Taxon 70: 72–98. 2020).

Secondly, if *Phyllanthus* and *Bosea* become congeneric, the Canarian endemic hitherto known as "*Bosea*" would need to be accommodated under another generic name for which *Rodetia* Moq. (in Candolle, Prodr. 13(2): 323. 1849) is available.

Thirdly, names of two additional species would be affected. Our molecular systematic research supports *Bosea* (as currently understood) as a monophyletic group of three species, concordant with the current perspective of *Amaranthaceae* systematists (Townsend in Kubitzki, Fam. Gen. Vasc. Pl. 2: 80. 1993). If the name *B. yervamora* is not conserved, then *B. cypria* Boiss. ex Hook. f., endemic to Cyprus, requires a new combination in *Rodetia* and *B. amherstiana* (Moq.) Hook. f., confined to the Himalayas, would have to adopt the name of its basionym *R. amherstiana* Moq.

The above difficulties follow from conflicting original descriptions, later misinterpretations, and the recent lectotypification, which we propose to set aside. Based on the evidence presented here, we propose to conserve the name *Bosea yervamora* L. with a conserved type, thereby maintaining names in use for over 250 years and currently used by local naturalists and by experts in *Amaranthaceae* (Kadereit & al. in Int. J. Pl. Sci. 164: 959–986. 2003; Müller & Borsch in Ann. Missouri Bot. Gard. 92: 66–102. 2005). The type being proposed for conservation was collected by one of us (AS-G) on Tenerife Island and is housed in ORT with duplicates in BM, FTG, GH, LPA, MA, and TFC. The specimen has mature flowers, as we were unable to find plants bearing flowers and fruits together.

Author information

JF-O, https://orcid.org/0000-0002-5719-7188
AS-G, https://orcid.org/0000-0001-6010-8396
ARF, https://orcid.org/0000-0003-2706-9350
JAM, https://orcid.org/0000-0001-6393-6496
JAF, https://orcid.org/0000-0001-7693-131X
BJ, https://orcid.org/0000-0003-0343-3146

Acknowledgements

Javier Francisco-Ortega thanks the College of Arts, Sciences and Education of FIU, the FIU Kimberly Green Latin American and Caribbean Center, and the FIU International Center for Tropical Botany for sponsoring a research visit to the Harvard University Herbaria where part of the research and bibliographic searches were performed.