

(2402) Proposal to conserve the name *Chenopodium* (*Chenopodiaceae* s.str.; *Amaranthaceae* sensu APG) with a conserved type

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(2402) *Chenopodium* L., Sp. Pl.: 218. 1 Mai 1753 [*Chenopod. / Amaranth.*], nom. cons. prop.
Typus: *C. album* L., typ. cons. prop.

The generic name *Chenopodium* was formally established by Linnaeus (Sp. Pl.: 218. 1753) and the description of the genus (Gen. Pl., ed. 5: 103. 1754) is associated with the *Species Plantarum* under Art. 13.4 of the *ICN* (McNeill & al. in *Regnum Veg.* 154. 2012). In the same publication he also established *Blitum* L. (l.c. 1753: 4) (initially with two species, *B. capitatum* and *B. virgatum*) as a genus separate from *Chenopodium*. Linnaeus (l.c. 1753: 218–222) initially included in *Chenopodium* 22 species: *C. bonus-henricus*, *C. urbicum*, *C. rubrum*, *C. murale*, *C. album*, *C. viride*, *C. hybridum*, *C. botrys*, *C. ambrosioides*, *C. multifidum*, *C. anthelminticum*, *C. glaucum*, *C. vulvaria*, *C. polyspermum*, *C. scoparia* (it should be noted that Linnaeus used the species epithet as a noun, and thus the correction of this name to “*C. scoparium*” is incorrect), *C. maritimum*, *C. fruticosum*, *C. altissimum*, *C. salsum*, *C. hirsutum*, *C. aristatum*, and *C. virginicum* (most probably conspecific with *C. aristatum*). Following recent taxonomic rearrangement and molecular phylogenetic data (see overview in: Fuentes-Bazan & al. in *Willdenowia* 42: 5–24. 2012a), these species are currently placed in at least 10 genera (listed alphabetically, except *Chenopodium* s.str.): *Bassia* All. (*Bassia scoparia* (L.) A.J. Scott = *Kochia scoparia* (L.) Roth), *Blitum* L. (*B. bonus-henricus* (L.) C.A. Mey.), *Chenopodiastrum* S. Fuentes & al. (*C. murale* (L.)

S. Fuentes & al., *C. hybridum* (L.) S. Fuentes & al.), *Dysphania* R. Br. (*D. botrys* (L.) Mosyakin & Clemants, *D. ambrosioides* (L.) Mosyakin & Clemants, *D. multifida* (L.) Mosyakin & Clemants, *D. anthelmintica* (L.) Mosyakin & Clemants), *Lipandra* Moq. (*L. polysperma* (L.) S. Fuentes & al.), *Oxybasis* Kar. & Kir. (*O. urbica* (L.) S. Fuentes & al., *O. rubra* (L.) S. Fuentes & al., *O. glauca* (L.) S. Fuentes & al.), *Spirobassia* Freitag & G. Kadereit (*S. hirsuta* (L.) Freitag & G. Kadereit), *Suaeda* Forssk. ex J.F. Gmel. (*S. maritima* (L.) Dumort., *S. vera* Forssk. ex J.F. Gmel. = *S. fruticosa* (L.) Delile, nom. illeg., *S. altissima* (L.) Pall., *S. salsa* (L.) Pall.), *Teloxys* Moq. (*T. aristata* (L.) Moq.), and *Chenopodium* s.str. (remaining species). These genera are now placed in three different tribes of subfam. *Chenopodioideae* and two more tribes, *Suaedeae* and *Camphorosmeae*, belonging to other subfamilies.

The genus *Chenopodium* was first typified under the *American Code* by Britton & Brown (Ill. Fl. N. U.S., ed. 2, 2: 9. 1913), who selected *C. rubrum* L. as the type. This choice is supersedable under Art. 10.5 (and its voted Ex. 7) of the *ICN*, since it was made following the “largely mechanical method of selection” of the *American Code of Botanical Nomenclature*.

Hitchcock (Hitchcock & Green in Sprague & al., *Nom. Prop. Brit. Bot.*: 137. 1929) proposed another type, *Chenopodium album* L. Hitchcock also noted that “[t]here are 22 original species, about six of which are now referred to other genera. *C. rubrum* is a common Swedish species and is the one referred to in the *Genera Plantarum*

(*Chenopodium* Tournef. 288), but it has been referred to *Blitum*, which is sometimes regarded as an independent genus, and it would therefore not be suitable as a standard-species. *C. album* is chosen as being a common and widely dispersed species belonging to the subgenus *Euchenopodium*.”

Uotila (in Ann. Bot. Fenn. 30: 189. 1993), citing a personal communication from Jarvis, reported that the case of *Chenopodium* was accidentally omitted during the voting of the Subcommittee 3C on the lectotypification of Linnaean generic names (Jarvis in Taxon 41: 552–583. 1992); however, *C. album* was cited as the type in a list of Linnaean generic names and their types (Jarvis & al. in Regnum Veg. 127: 33. 1993). It is also accepted in the *Index Nominum Genericorum* (Farr & Zijlstra in Ind. Nom. Gen., 2011–, <http://botany.si.edu/ing/>).

Since Britton & Brown’s *Flora* is the binding example of a publication with supersedable type designations mentioned in Art. 10.5, Ex. 7 of *ICN*, the type designation of *C. album* by Hitchcock in 1927 should be followed instead of that of *C. rubrum* made by Britton & Brown in 1913, as the latter was made following the “largely mechanical method of selection” of the *American Code*.

However, Britton & Brown’s typification of *Chenopodium* was soon followed by Standley (in N. Amer. Fl. 21: 9. 1916). It should be noted that Standley (l.c.: 3–93) accepted in his treatment of North American *Chenopodiaceae* almost all generic types proposed for 14 genera of the family by Britton & Brown, with the exception of *Kochia* Roth, which was typified by Britton & Brown contrary to the rules of the *American Code*; thus, Standley just corrected that by citing as the type “*Salsola arenaria* Maerklin” (a synonym of *Kochia laniflora* (S.G. Gmel.) Borbás, at present usually accepted as *Bassia laniflora* (S.G. Gmel.) A.J. Scott), the only species initially included in *Kochia* by Roth. Standley also made some other corrections and additions to Britton & Brown’s typifications. In particular, he properly cited types for three genera (*Cycloloma* Moq., *Roubieva* Moq., *Sarcobatus* Nees), which were treated by Britton & Brown simply as “monotypic”, without direct citation of “type species”: *Salsola platyphylla* Michx. (a synonym of *Cycloloma atriplicifolium* (Spreng.) Coult.), *Chenopodium multifidum* L. (= *Roubieva multifida* (L.) Moq., now recognized as *Dysphania multifida* (L.) Mosyakin & Clemants), and *Sarcobatus maximiliani* Nees (a synonym of *S. vermiculatus* (Hook.) Torr., now in *Sarcobataceae*), respectively; cited *Axyris ceratoides* L. (now *Krascheninnikovia ceratoides* (L.) Gueldenst.) as the type of *Eurotia* Adans. (nom. illeg.), for which Britton & Brown (l.c.: 20) mentioned “[t]wo known species, the following [*Eurotia lanata* (Pursh) Moq. – S.M.] of western North America; the other, of western Asia and eastern Europe is the generic type”, and proposed types for some other genera of *Chenopodiaceae* not mentioned by Britton & Brown.

Recent discussion on typification of *Salsola* L. (Akhani & al. in Taxon 63: 647–650. 2014; Mosyakin & al. in Taxon 63: 1134–1135. 2014, and references therein) raised again the problem of typifications accepted or proposed in 1916 by Standley, who most probably followed the *American Code*. However, as noted by Akhani & al. (l.c.: 648), there is no internal proof in Standley’s *North American Flora* treatments that he in his selection of generic types of *Chenopodiaceae* simply followed Britton & Brown or that his selection was largely mechanical. If we apply to *Chenopodium* the chain of arguments provided by Akhani & al. (l.c.: 647–650) for *Salsola*, we should inevitably conclude that the non-supersedable type of *Chenopodium* is *C. rubrum*.

Fuentes-Bazan & al. (l.c. 2012a: 13) mentioned that the solution of the issue of the proper type of *Chenopodium*, and other cases of problematic typifications made by Standley and some other authors

who followed the *American Code*, will depend on the decision of the Special Committee on Publications Using a Largely Mechanical Method of Selection of Types appointed by the XVIII International Botanical Congress in Melbourne (McNeill & al. in Taxon 60: 1507–1520. 2011); this committee has to examine the question and present proposals to solve it to the next IBC. Fuentes-Bazan & al. (l.c. 2012a: 13) further noted that “[i]n the event that the conclusion were to allow Standley’s designation to stand, it would be imperative to propose the conservation of *Chenopodium* with its currently accepted type”, but refrained from further nomenclatural actions, awaiting the decision of the mentioned committee.

If Standley’s treatments of *Chenopodiaceae* and *Amaranthaceae* in the *North American Flora* (and probably other treatments in that serial flora) are listed by the aforementioned Special Committee among the works using a largely mechanical method, then not only his problematic types of *Chenopodium*, *Salsola*, etc. will be supersedable under Art. 10.5 of *ICN*, but also his typifications of other genera. However, many of Standley’s proposed types for other genera of *Chenopodiaceae* and *Amaranthaceae* are not in conflict with their current generic circumscriptions or infrageneric taxonomy.

On the other hand, if Standley’s treatments in the *North American Flora* are not included in the list of publications using a largely mechanical method of selection of types, then his designation of *C. rubrum* as the type of *Chenopodium* should probably stand. Acceptance of that type will result in a dramatic disruption in nomenclature of *Chenopodium* and related genera. In that case, the name *Chenopodium* should be applied to the genus currently known as *Oxybasis* Kar. & Kir., which, to our present knowledge, houses ca. 10 species morphologically more similar to *Blitum* than to *Chenopodium* (Fuentes-Bazan & al., l.c. 2012a: 5–24; Sukhorukov & al. in Phytotaxa 144: 1–12. 2013; Mosyakin in Phytoneuron 2013-56: 1–8. 2013), while *Chenopodium* in its present circumscription (with at least 150 species) will require another generic name, most probably the earliest available one being *Rhagodia* R. Br. (Prodr.: 408. 1810), the genus that until recently housed only Australian taxa, but now, however, is merged with *Chenopodium* (Fuentes-Bazan & al., l.c. 2012a: 5–24; in Molec. Phylogen. Evol. 62: 359–374. 2012b).

The typification of *Chenopodium* with *C. album* was followed, either directly (with indication of the type) or indirectly, by many recent authors (e.g., Aellen in Hegi, Ill. Fl. Mitteleur., ed. 2, 3(2): 577. 1960–1961; Mosyakin in Tzvelev, Fl. Europ. Orient. 9: 27. 1996; Uotila in Rechinger, Fl. Iranica 172: 25. 1997; Uotila in Ali & Qaiser, Fl. Pakistan 204: 13. 2001; Clemants & Mosyakin in Fl. N. Amer. 4: 275–299. 2003; Fuentes-Bazan & al., l.c. 2012a: 5–24; Mosyakin in Tzvelev, Consp. Fl. Europ. Orient. 1: 280. 2012; Sukhorukov & al. in Phytotaxa 144: 1–12. 2013; Mosyakin, l.c. 2013; Sukhorukov & Zhang in PLoS ONE 8(4): e61906. 2013; Sukhorukov & Akopyan in Konspekt Semeistva Chenopodiaceae Kavkaza: 17–22. 2013; Sukhorukov, Karpologiya Chenopodiaceae: 225. 2014).

Fewer authors have recently accepted *C. rubrum* as the type of *Chenopodium* (e.g., Scott in Bot. Jahrb. Syst. 100: 205–220. 1978; Wilson in George, Fl. Australia 4: 132–133. 1983).

The genus *Oxybasis* and its species *O. rubra* (and thus, by implication, the typification of *Chenopodium* by *C. album*) are also already accepted in some major online biodiversity databases (all accessed 26 Aug 2015), such as the Global Biodiversity Information Facility – GBIF (<http://www.gbif.org/species>); Euro+Med Plantbase (fide Uotila, 2011–: <http://www.emplantbase.org/home.html>), and <http://ww2.bgbm.org/EuroPlusMed>), and Species 2000 and ITIS Catalogue of Life (<http://www.catalogueoflife.org>).

Additional arguments and discussion on conflicting typifications of *Chenopodium* are available from Uotila (l.c. 1993: 189), Mosyakin (in *Ukrayins'k. Bot. Zhurn.* 50(5): 71–77. 1993); Mosyakin & Clemants (in *Novon* 6: 398. 1996), Fuentes-Bazan & al. (l.c. 2012a: 5–24), and Mosyakin & al. (l.c.).

I strongly believe that the typification of *Chenopodium* should not depend solely on the decision (which will be nomenclaturally validated only in 2017 at the XIX International Botanical Congress in Shenzhen, China) of the Special Committee on Publications Using a Largely Mechanical Method of Selection of Types, or on any other

possible alternative pre-1929 lectotypification (even made inadvertently) that might come to light in the future. Because of that I propose here to conserve the name *Chenopodium* with the conserved type, *C. album* L., which will preserve the current understanding and circumscription of *Chenopodium* and its relatives and segregates, and will promote nomenclatural stability in this group of taxa.

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