



<https://doi.org/10.15407/ukrbotj78.04.266>

RESEARCH ARTICLE

Nomenclatural and taxonomic comments on some taxa of *Dysphania* (*Chenopodiaceae* s. str. / *Amaranthaceae* s. l.)

Sergei L. MOSYAKIN* 

M.G. Kholodny Institute of Botany, National Academy of Sciences of Ukraine, Tereshchenkivska Str. 2, Kyiv 01601, Ukraine

Abstract. Following the comprehensive molecular phylogenetic results presented by Uotila et al. (2021), comments are provided on the infrageneric classification system of the genus *Dysphania* in its amended circumscription. Amendments and additions to the five-section scheme of Uotila et al. (2021) are proposed. In particular, the morphologically distinct lineage containing *Dysphania atriplicifolia* (earlier widely recognized in the monospecific genus *Cycloloma* as *C. atriplicifolium*) is recognized as a separate section, *Dysphania* sect. *Cycloloma* (Moq.) Mosyakin, comb. et stat. nov. Extensive synonymy of the section and its species is provided. The subclades revealed in the Australian clade of *Dysphania* sect. *Dysphania* are rather well characterized morphologically and were treated earlier as sections of either *Chenopodium* (sensu lato) or *Dysphania*. These subclades are recognized here as three subsections of sect. *Dysphania*: (1) subsect. *Orthospora* (R.Br.) Mosyakin, comb. et stat. nov.; (2) subsect. *Dysphania*; and (3) subsect. *Tetrasepalae* (Aellen) Mosyakin, comb. et stat. nov. The nomenclature of *Dysphania graveolens* (\equiv *Chenopodium graveolens*) is discussed. It is confirmed that the name *Chenopodium graveolens* was first validated not by Willdenow in 1809 but by Lagasca and Rodríguez in 1802. Original specimens associated with that name in both publications belong taxonomically to the same species currently known as *D. graveolens* (= *Chenopodium incisum* Poir.). In my opinion, Art. 41.8(a) of the ICN (*Shenzhen Code*) is directly applicable here. Consequently, the name *D. graveolens* should be cited with the corrected authorship "(Lag. & Rodr.) Mosyakin & Clemants", and the new combination in *Dysphania* based on *Chenopodium incisum* (provisionally cited in POWO as "*Dysphania incisum* (Poir.) ined.") is unnecessary.

Keywords: *Chenopodium*, *Cycloloma*, *Dysphania*, nomenclature, taxonomy

Article history. Submitted 17 July 2021. Revised 11 August 2021. Published 30 August 2021

Citation. Mosyakin S.L. 2021. Nomenclatural and taxonomic comments on some representatives of *Dysphania* (*Chenopodiaceae* s. str. / *Amaranthaceae* s. l.). *Ukrainian Botanical Journal*, 78(4): 266–273. <https://doi.org/10.15407/ukrbotj78.04.266>

*Corresponding author (e-mail: s_mosyakin@hotmail.com)

Introduction

Since the initial re-circumscription of *Dysphania* R.Br. (*Chenopodiaceae* s. str. / *Amaranthaceae* s. l.; see Hernández-Ledesma et al., 2015; Morales-Briones et al., 2021) to include glandular-pubescent taxa earlier placed in *Chenopodium* L. sensu lato (see e.g., Mosyakin, Clemants, 2002, 2008; Clemants, Mosyakin, 2003, etc.), several new and/or resurrected taxa have been added to the genus and further adjustments of the circumscription of *Dysphania* have been proposed (see Fuentes-Bazan et al., 2012a, b; Uotila, 2013; Uotila

et al., 2021, and references therein). In particular, *Teloxys aristata* (L.) Moq. has been proved to be a member of the phylogenetically distinct genus *Teloxys* Moq. (Moquin-Tandon, 1834: 289), whereas *Cycloloma* Moq. (Moquin-Tandon, 1840: 17), the monospecific genus that contained *C. atriplicifolium* (Spreng.) J.M. Coult. (Coulter in Britton et al., 1894: 143), was revealed as phylogenetically nested in *Dysphania* near the clade corresponding to *Dysphania* sect. *Adenois* (Moq.) Mosyakin & Clemants (2002: 382; see also Simón, 1996, 1997). In contrast, Australasian *Rhagodia* R.Br. and *Einadia* Raf. (Scott, 1978a; Wilson, 1983, 1984) were revealed as members

© 2021 S.L. Mosyakin. Published by the M.G. Kholodny Institute of Botany, NAS of Ukraine. This is an open access article under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits use, distribution, and reproduction in any medium, provided the original work is properly cited

of a re-circumscribed *Chenopodium* (see Fuentes-Bazan et al., 2012a, b; Mosyakin, Iamónico, 2017, and references therein). In general, the infrageneric taxonomy of *Dysphania* is now rather well understood, but several morphologically deviant and geographically restricted taxa, in particular, *D. stellata* (S. Watson) Mosyakin & Clemants from Mexico, the Central American taxon *D. dissecta* (Moq.) Mosyakin & Clemants, and the South American *D. minuata* (Aellen) Mosyakin & Clemants, currently remain unplaced to sections or clades (see Mosyakin, Clemants, 2008: 429; Uotila et al., 2021).

In the present article I provide additional comments on and adjustments to the infrageneric system of *Dysphania*, following the recent treatment of the genus by Uotila et al. (2021) and taking into consideration the earlier infrageneric classifications and taxonomic treatments (Aellen, 1930a, b; Scott, 1978b; Wilson, 1983, 1984; Mosyakin, Clemants, 2002, 2008, etc.), and also consider the nomenclatural case of *Chenopodium graveolens*, which affects the nomenclature of the species that was until recently accepted as *Dysphania graveolens*, with the authorship usually cited as "(Willd.) Mosyakin & Clemants".

On *Cycloloma* and its infrageneric placement in a re-circumscribed *Dysphania*

The nomenclature and taxonomy of a morphologically very peculiar species until recently known mainly under the name *Cycloloma atriplicifolium* (Spreng.) J.M. Coult. (see Coulter in Britton et al., 1894; Standley, 1916; Mosyakin, 2003, and references therein) was haunted by many problems. When Moquin-Tandon decided to segregate that North American species in a genus of its own, he first considered the generic name *Amoreuxia* Moq. (a later homonym of *Amoreuxia* DC., now placed in *Bixaceae*, formerly *Cochlospermaceae*) and then, in 1834, described in detail the genus *Cyclolepis* Moq. (not mentioning the name *Amoreuxia*), but that name again turned to be a later homonym, this time of *Cyclolepis* Gillies ex D. Don (*Asteraceae*). Finally, the name *Cycloloma* Moq. was proposed in 1840 as the replacement name for the illegitimate generic name *Cyclolepis* Moq. (see Moquin-Tandon, 1834, 1840, 1849). Reichenbach (1841:153, 236) also noticed the homonymy of *Cyclolepis* and proposed the replacement name *Petermannia* Rehb., but that name was published later than *Cycloloma*. The generic name *Amorea* was attributed by Delile (1844: 1) to Moquin-Tandon;

however, Moquin-Tandon (1849) did not recognize his authorship of that name and instead attributed it to Delile only. Delile (1844) did not provide any description of the genus *Amorea* but his citation of "*Amorea platyphylla* Moquin" can be interpreted as indirect reference (Art. 38.14 and 41.3 of the ICN: Turland et al., 2018) to the name *Cyclolepis platyphylla* (Michx.) Moq. and Moquin-Tandon's description of *Cyclolepis*.

The only species of *Cycloloma* was placed by earlier authors in *Salsola* L. (Sprengel, 1801, etc.), *Kochia* Roth, or *Chenopodium* (see the nomenclatural citations below), in addition to the generic names mentioned above, and in synonymy below. Its placement in *Salsola* sensu lato or *Kochia* sensu lato was, undoubtedly, due to the presence of a transverse horizontal wing encircling the perianth. That wing is, however, only superficially similar to wing-like appendages present on perianth segments in many taxa of *Salsoloideae* and *Camphorosmoideae* (see Kühn et al., 1993; Cabrera et al., 2009, 2011; Kadereit, Freitag, 2011, etc.) and its development is different. Because of that the placement of *Cycloloma* in *Camphorosmeae* (Scott, 1978c; Kühn et al., 1993) was not justified and, as I noted earlier (Mosyakin, 2003: 265), "*Cycloloma* is more closely related to *Chenopodium* in the broad sense; the problem of its proper placement requires additional study".

Recent molecular phylogenetic results (Uotila et al., 2021) demonstrated that *Cycloloma* is nested within the re-circumscribed genus *Dysphania* and is most probably sister to the large clade of American taxa recognized as *Dysphania* sect. *Adenois* (Moq.) Mosyakin & Clemants (incl. *Dysphania* sect. *Roubieva* (Moq.) Mosyakin & Clemants). The new nomenclatural combination *Dysphania atriplicifolia* (Spreng.) G. Kadereit, Sukhor. & Uotila (in Uotila et al., 2021: 542) has been properly validated, based on these phylogenetic findings.

When providing my open review of the manuscript by Uotila et al. in 2020, I recommended the authors to recognize the *Cycloloma* lineage at the sectional or at least subsectional level, considering its phylogenetic position and the morphological distinctiveness¹.

¹ "I think that a separate section or at least subsection should be recognized for the former *Cycloloma* (one of possible new combinations: *Dysphania* sect. *Cycloloma* (Moq.) AUTHORS or *Dysphania* sect. *Adenois* (Moq.) Mosyakin & Clemants subsect. *Cycloloma* (Moq.) AUTHORS). Its unique morphological characters (well described in the manuscript) and phylogenetic position as probably sister to the rest of taxa of that group are sufficient reasons for that. Also, recognition of subsections in *Dysphania* sect. *Dysphania* can be considered as well" (from my review of the manuscript; also, my email message of 22 July 2020 to Pertti Uotila).

However, they preferred to place *Dysphania atriplicifolia* in sect. *Adenois*, thus stretching considerably the diagnostic morphological characters of the section to accommodate that morphologically deviant species. They, however, admitted that "it [*D. atriplicifolia*] has unique morphological characters within the genus, which might allow to recognize a subsection for it. However, there are several American species, three of them morphologically distinctive, that were not included in our analysis, and due to lack of this information, no further division of *D. sect. Adenois* was adopted" (Uotila et al., 2021: 542). In my opinion, morphological characters of the former *Cycloloma* are too distant and dramatically different from those peculiar to *Dysphania sect. Adenois*: for example, (1) the connate perianth segments with a horizontal, membranous, circular wing, a unique feature of *Cycloloma*; (2) lax, almost leafless inflorescences with remote flowers/fruits in the *Cycloloma* lineage versus usually compact and dense linear inflorescences, or sometimes axillary clusters, in most of members of sect. *Adenois* (sensu stricto), (3) fruits in *Cycloloma* are larger than those in all members of sect. *Adenois*; (4) the tumbleweed life form in *Cycloloma* is not similar to the general plant architecture in most of taxa of sect. *Adenois*. Several other arguments can be added as well.

Dysphania* R.Br. sect. *Cycloloma (Moq.) Mosyakin, comb. et stat. nov.

Basionym: *Cycloloma* Moq., *Chenop. Monogr. Enum.*: 17 (1840).

Type: *Cycloloma platyphyllum* (Michx.) Moq., *Chenop. Monogr. Enum.*: 18 (1840).

= *Amoreuxia* Moq., *Mem. Soc. Hist. Nat. Monsp.* (1826) [non vidi], nom. illeg. (later homonym, Art. 53.1 of the ICN: Turland et al., 2018), non *Amoreuxia* DC., *Prodr.* 2: 638. 1825 (*Bixaceae*, formerly *Cochlospermaceae*).

≡ *Cyclolepis* Moq., *Ann. Sci. Nat., Bot. sér. 2, 1*: 203 (1834), nom. illeg. (later homonym, Art. 53.1 of the ICN: Turland et al., 2018), non *Cyclolepis* Gillies ex D. Don, *Philos. Mag. Ann. Chem.* 11: 392 (1832) (*Asteraceae*).

≡ *Petermannia* Rchb., *Deut. Bot. Herb.-Buch*: 153 (1841).

≡ *Amorea* Delile, *Index Seminum [Montpellier]* [issue of 1844]: 1 (1844).

The section contains only one species:

Dysphania atriplicifolia (Spreng.) G.Kadereit, Sukhor. & Uotila, *Taxon* 70(3): 542 (2021). ≡ *Salsola atriplicifolia* Spreng., *Erster Nachtr. Bot. Gart. Halle*: 35, adnot. 46 (1801). ≡ *Kochia atriplicifolia* (Spreng.) Roth, *Neue Beytr. Bot.* 1: 177 (1802). ≡ *Cycloloma*

atriplicifolium (Spreng.) J.M.Coult., *Mem. Torrey Bot. Club* 5: 143 (1894). ≡ *Chenopodium atriplicifolium* (Spreng.) A.Ludw. ex Graebn., *Syn. Mitteleur. Fl.* 5(1, Lief. 79 & 80): 18 (1913).

= *Salsola platyphylla* Michx., *Fl. Bor.-Amer.* 1: 174 (1803). ≡ *Amoreuxia platyphylla* (Michx.) Moq., *Mem. Soc. Hist. Nat. Monsp.* (1826) [non vidi]. ≡ *Cyclolepis platyphylla* (Michx.) Moq., *Ann. Sci. Nat., Bot. sér. 2, 1*: 203 (1834). ≡ *Cycloloma platyphyllum* (Michx.) Moq., *Chenop. Monogr. Enum.*: 18 (1840). ≡ *Amorea platyphylla* (Michx.) Delile, *Index Seminum [Montpellier]* [issue of 1844]: 1 (1844).

= *Kochia dentata* Willd., *Hort. Berol.* 1(3): tab. 28 (1804). ≡ *Salsola dentata* (Willd.) Germann, *Verz. Pfl. Bot. Gart. Kais. Univ. Dorpat* [vol. of 1807]: 116 (1807).

= *Chenopodium radiatum* Schrad., *Neues J. Bot.* 3(3): 85 (1809).

Invalid names under which the species was occasionally cultivated or mentioned in the 19th century:

= *Salsola latifolia* hort. ex Poir. in Lam., *Encycl.* 7: 298 (1806), nom. inval. (pro syn., Art. 36.1(b) of the ICN: Turland et al., 2018).

= *Salsola chenopodioides* hort. ex Dum.Cours., *Bot. Cult.*, ed. 2, 2: 463 (1811), nom. inval. (pro syn.).

= *Salsola corymbosa* hort. ex Moq. in DC., *Prodr.* 13(2): 60 (1849), nom. inval. (pro syn.).

= *Salsola paniculata* hort. ex Moq. in DC., *Prodr.* 13(2): 60 (1849), nom. inval. (pro syn.).

= *Salsola stellata* hort. ex Moq. in DC., *Prodr.* 13(2): 60 (1849), nom. inval. (pro syn.).

On Australian groups of *Dysphania* sect. *Dysphania* (as outlined in Uotila et al., 2021)

The phylogenetic analysis of Uotila et al. (2021) revealed three main clades in the Australian group that they recognized as *Dysphania* sect. *Dysphania*. It is noteworthy that these clades quite well correspond to the main morphology-based groups, usually recognized earlier as infrageneric taxa (sections) of either *Chenopodium* or *Dysphania*.

In particular, (1) the clade containing *Dysphania carinata* (R.Br.) Mosyakin & Clemants, *D. cristata* (R.Br.) Mosyakin & Clemants, *D. melanocarpa* (J.M.Black) Mosyakin & Clemants, *D. pumilio* (R.Br.) Mosyakin & Clemants, and *D. truncata* (Paul G.Wilson) Mosyakin & Clemants corresponds to *Dysphania* sect. *Orthospora* (R.Br.) Mosyakin & Clemants (≡ *Chenopodium* sect.

Orthosporum R.Br.: see Brown, 1810: 407; Scott, 1978b; Wilson, 1983, 1984; Mosyakin, Clemants, 2002, 2008, and references therein); (2) the clade of *D. glandulosa* Paul G.Wilson, *D. glomulifera* (Nees) Paul G.Wilson, *D. littoralis* R.Br., *D. platycarpa* Paul G.Wilson, and *D. valida* Paul G.Wilson corresponds to *Dysphania* sect. *Dysphania* (see Scott, 1978b; Mosyakin, Clemants, 2002; Clemants, Mosyakin, 2003); and (3) the clade of *D. congestiflora* S.J.Dillon & A.S.Markey, *D. plantaginella* F.Muell., *D. simulans* F.Muell. & Tate ex Tate, and *D. sphaerosperma* Paul G.Wilson contains taxa placed earlier in *Dysphania* sect. *Tetrasepalae* (Aellen) A.J.Scott (= *Chenopodium* sect. *Tetrasepala* Aellen) (see Aellen, 1930b: 490; Scott, 1978b: 218; Mosyakin, Clemants, 2002; Dillon, Markey, 2017), while its subclade containing *D. rhadinostachya* (F.Muell.) A.J.Scott and *D. kalpari* Paul G.Wilson includes taxa earlier placed in *Dysphania* sect. *Caudatae* A.J.Scott (Scott, 1978b: 218). We propose to recognize these three well-outlined groups (clades) as subsections of *Dysphania* sect. *Dysphania*.

Dysphania* sect. *Dysphania* subsection. *Dysphania (autonym, Arts. 22.3 and 32.3 of the ICN: Turland et al., 2018).

Type: *Dysphania littoralis* R.Br., Prodr. Fl. Nov. Holland.: 407 (1810), the only species originally included in *Dysphania* by Brown (1810: 407).

Dysphania* sect. *Dysphania* subsection. *Orthospora (R.Br.) Mosyakin, comb. et stat. nov.

Basionym: *Chenopodium* L. sect. *Orthosporum* R.Br., Prodr. Fl. Nov. Holland.: 407 (1810). = *Dysphania* R.Br. sect. *Orthospora* (R.Br.) Mosyakin & Clemants, Ukrayins'k. Bot. Zhurn. 59(4): 382 (2002).

Type: *Chenopodium cristatum* R.Br. (see Wilson, 1983: 169; Uotila et al., 2021: 543).

Dysphania* sect. *Dysphania* subsection. *Tetrasepalae (Aellen) Mosyakin, comb. et stat. nov.

Basionym: *Chenopodium* L. sect. *Tetrasepala* Aellen, Bot. Jahrb. Syst. 63: 490 (1930). = *Dysphania* R.Br. sect. *Tetrasepalae* (Aellen) A.J.Scott, Bot. Jahrb. Syst. 100(2): 218 (1978).

Type: *Dysphania inflata* (Aellen) A.J.Scott = *D. rhadinostachya* (F.Muell.) A.J.Scott subsp. *inflata* (Aellen) Paul G.Wilson (Scott, 1978b: 218; Uotila et al., 2021: 543).

= *Dysphania* R.Br. sect. *Caudatae* A.J.Scott, Bot. Jahrb. Syst. 100(2): 218 (1978).

Type: *Dysphania plantaginella* F.Muell. (see Scott, 1978b: 218).

These subsections (clades as outlined in Uotila et al., 2021) of *Dysphania* sect. *Dysphania* can be distinguished using the following key:

1. Perianth segments (tepals) normally 5 subject. *Orthospora*
 - Perianth segments (tepals) normally 4–1 2
2. Perianth segments (tepals) 4–3. Inflorescences dense, spike-like, leafless or almost leafless subject. *Tetrasepala*
 - Perianth segments (tepals) 2–1. Inflorescences interrupted, consisting mostly of axillary clusters subject. *Dysphania*

On *Chenopodium graveolens*

It was usually assumed that the name *Chenopodium graveolens* was first published by Willdenow (1809: 290; IPNI, 2021–onward: <https://www.ipni.org/n/56134-2>). However, that name is a later homonym (or an isonym?) of the earlier name *Chenopodium graveolens* that has been published earlier by Lagasca and Rodríguez (1802: 70) (see IPNI, 2021–onward: <https://www.ipni.org/n/164958-1>). In the Plants Of the World Online online database (POWO, 2021–onward, accessed 9 June and 5 July 2021) the name *Chenopodium graveolens* Lag. & Rodr. (<http://www.plantsoftheworldonline.org/taxon/urn:lsid:ipni.org:names:164958-1>) was listed on 9 June 2021 as a synonym of *D. schraderiana* (Schult.) Mosyakin & Clemants, but later (accessed 5 July 2021) it was listed as a synonym of "*Dysphania incisa* (Poir.) ined."

The name *Chenopodium graveolens* Willd. (<http://www.plantsoftheworldonline.org/taxon/urn:lsid:ipni.org:names:56134-2>) was listed on 9 June and 5 July 2021 as a synonym of the same provisional combination, "*Dysphania incisa* (Poir.) ined."

Digital images of and associated data on at least two original (or presumably original) specimens of *Chenopodium graveolens* Lag. & Rodr. are available online from JSTOR Global Plants (<https://plants.jstor.org/>). Images of specimens of *C. graveolens* associated with Willdenow are available from both the Willdenow Herbarium at B (Virtual Herbarium Berlinense; <http://www2.bgbm.org/herbarium/default.cfm>) and JSTOR Global Plants.

The specimen MA214007 (image and data are available from: <https://plants.jstor.org/stable/10.5555/al.ap.specimen.ma214007>) contains five large branches plus small fragments in an envelope, and has the presumably

original handwritten label ("Chenopodium graveolens | Lagasca et Rodríguez | Anal. Scient. Natur. Vol. 9. pag. 70 | culta in hoc regio horto anno 1801. Floruit Septembri") and the curatorial label [printed and typewritten (name) text: "Ex antiquo herbario generali | HERBARIUM HORTI BOTANICI MATRITENSIS | Chenopodium graveolens Lag. & Rodr."]. It is listed in JSTOR Global Plants as "Type of *Chenopodium graveolens* Lag. et Rodr. ... (stored under name)". This specimen, which morphologically matches the original description by Lagasca and Rodríguez (1802: 70), is formally **designated here as the lectotype** of *Chenopodium graveolens* Lag. & Rodr. (following the recommendations of McNeill, 2014).

Another presumably original specimen is available from the Herbario Universidad de Sevilla (SEV), SEV-H4090 (<https://plants.jstor.org/stable/10.5555/al.ap.specimen.sev-h4090>); it has a JSTOR Global Plants note "m. Rodríguez. Posible duplicado del pliego nº HHUS 4089" and is listed as "Type of *Chenopodium graveolens* Lag. et Rodr. ... (stored under name)". The original status of that specimen is doubtful because no date of collection is available from the two labels on the sheet. However, the two plant fragments (branches) on that sheet clearly belong to the same species as *Chenopodium graveolens* sensu Willdenow (see comments on specimens from the Willdenow Herbarium below).

The specimen K000898413 (<https://plants.jstor.org/stable/10.5555/al.ap.specimen.k000898413>) contains small plant fragments in an envelope; the sheet has also a typewritten excerpt from the protologue of *Chenopodium graveolens* Lag. & Rodr. and the explanatory curatorial label "HERB. HORT. BOT. REG. KEW. | *Chenopodium Botrys* L. (*C. graveolens* | Lag. et Rodr.) | Specimen in Herb. Lagasca at Madrid, presumably | cultivated in the Botanic Garden there, Oct. 1822. | Specimen received on loan from the Jardín Botánico, Madrid, | 1949". It also has identification labels by Aellen ("*Chenop. Botrys* L.! | Det. Aellen 1961") and Uotila ("REVISIÓN PARA *FLORA IBERICA*" | *Chenopodium botrys* L. | Det.-rev. Pertti Uotila XII 1984"), both indicating that the specimen belongs to *C. botrys* L. (now *Dysphania botrys* (L.) Mosyakin & Clemants). Judging from the curatorial label and the date on it, that specimen does not belong to original material of *C. graveolens* Lag. & Rodr. but in fact represents some plant cultivated under that name long after the actual date of publication of the name and description of *C. graveolens* Lag. & Rodr. It should be noted that the name *C. graveolens* is not mentioned in the treatment of *Chenopodium* sensu lato in *Flora Iberica* (Uotila, 1990).

There are two specimens of *Chenopodium graveolens* in the Willdenow Herbarium at B. The specimen B-W05350-010 (<https://plants.jstor.org/stable/10.5555/al.ap.specimen.b%20-w%2005350%20-01%200>) has Willdenow's inscription (top-right corner of the sheet) "*Ch. graveolens*. 1" and the annotation/identification label by Aellen: "*Chenopodium graveolens* Willd. | (*Chenopodium incisum* Poir. var. *mexicanum* Aellen). | det. P. Aellen | 10.03.1930". Another specimen, B-W05350-020 (<https://plants.jstor.org/stable/10.5555/al.ap.specimen.b%20-w%2005350%20-02%200>), bears Willdenow's annotation (top-right corner of the sheet) "*Ch. graveolens*. 2".

Both these specimens from the Willdenow Herbarium belong to the same species as the specimen MA214007 (see above).

The specimen P00606423 (image and data available from <https://plants.jstor.org/stable/10.5555/al.ap.specimen.p00606423>) with the label "*Chenopodium incisum* | [illegible] | herb. Poiret. h. par. [hortus parisiensis]" seems to be the only original specimen of *Chenopodium incisum* Poir. directly associated with Poiret, and thus it is listed in JSTOR Global Plants as the "Holotype of *Chenopodium incisum* Poir.". It is conspecific with herbarium specimens of *C. graveolens* of Lagasca and Rodríguez and *C. graveolens* of Willdenow.

In my opinion, Art. 41.8(a) of the ICN (Turland et al., 2018) is directly applicable here. According to that article, "On or after 1 January 1953, in any of the following cases, a full and direct reference to a work other than that in which the basionym or replaced synonym was validly published is treated as an error to be corrected, not affecting the valid publication of a new combination, name at new rank, or replacement name: (a) when the actual basionym or replaced synonym was validly published earlier than the name or later isonym cited as such, but in the cited publication, in which all conditions for valid publication of the name as cited are fulfilled, there is no reference, in association with that name, to the place of valid publication of the actual basionym or replaced synonym <...>".

We may assume that the plant species cultivated in Berlin under the name *Chenopodium graveolens* was received under that name either directly from Madrid or through some other botanical garden, and thus Willdenow used the name actually provided by Lagasca and Rodríguez but for some reason did not mention that reference. Thus, Mosyakin and Clemants (2002: 383) provided the full and direct reference to the description of *C. graveolens* in the book by Willdenow (1809), a work

other than that in which the actual basionym was validly published (which was in fact the article by Lagasca and Rodríguez of 1802), but that should be treated as an error to be corrected because the actual basionym (in our case, *C. graveolens* Lag. & Rodr.) was validly published earlier than the name or later isonym cited as such (*C. graveolens* attributed to Willdenow) but in the cited publication (Willdenow, 1809) all conditions for valid publication of the name as cited were fulfilled, and there was no reference to the place of valid publication of the actual basionym (Lagasca, Rodríguez, 1802). Consequently, a new combination in *Dysphania* based on *Chenopodium incisum* (provisionally cited in POWO as "*Dysphania incisum* (Poir.) ined.") is not needed. It should be also noted that Zhang and Zhu (2016; see also Zhu, Sanderson, 2017), when making a new nomenclatural combination *Neobotrydium graveolens* (Lag. & Rodr.) M.L.Zhang & G.L.Chu, cited the name by Lagasca and Rodríguez as the basionym.

The corrected nomenclatural citation of *Dysphania graveolens* is provided below:

Dysphania graveolens (Lag. & Rodr.) Mosyakin & Clemants, Ukrayins'k. Bot. Zhurn. [Ukr. Bot. J.] 59(4): 383 (2002) (cited with the authorship "(Willd.) Mosyakin & Clemants"). ≡ *Chenopodium graveolens* Lag. & Rodr., Anales Ci. Nat. 5: 70 (1802). ≡ *Teloxys graveolens* (Lag. & Rodr.) W.A.Weber, Phytologia 58: 478 (1985), with the authorship "(Willd.) W.A.Weber" (see Weber, 1985: 478). ≡ *Neobotrydium graveolens* (Lag. & Rodr.) M.L.Zhang & G.L.Chu, Pl. Diversity 38: 327 (2016) (see also Zhu, Sanderson, 2017: 73).

= *Chenopodium graveolens* Willd., Enum. Pl. Berol. 1: 290 (1809) (isonym?).

= *Chenopodium incisum* Poir., Encycl., Suppl. 1: 392 (1810).

Acknowledgments

I am grateful to colleagues who provided their assistance and expertise during the preparation of the present nomenclatural note, or provided PDF copies of some publications, especially to Rafaël H.A. Govaerts (Royal Botanical Gardens, Kew, U.K.), Pertti Uotila (Finnish Museum of Natural History, Botany Unit, University of Helsinki, Helsinki, Finland), and Filip Verloove (Meise Botanic Garden, Meise, Belgium). Ganna V. Boiko and Vera P. Hayova (M.G. Kholodny Institute of Botany, National Academy of Sciences of Ukraine,

Kyiv, Ukraine) guided the present submission through the editorial process and made several improvements in the text, and their assistance is gratefully acknowledged. Useful comments of two anonymous reviewers were gratefully accepted in the final version and are greatly appreciated.

References

- Aellen P. 1930a. Die systematische Stellung und Gliederung der R. Brownischen Gattung *Dysphania*. *Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie*, 63: 482–490.
- Aellen P. 1930b. Eine neue Sektion der Gattung *Chenopodium* (Sect. *Tetrasepala*). *Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie*, 63: 490–492.
- Britton N.L., Coulter J.M., Rusby H.H., Kellerman W.A., Coville F.V., Underwood L.M., Ward L.F. 1894. List of *Pteridophyta* and *Spermatophyta* growing without cultivation in Northeastern North America. *Memoirs of the Torrey Botanical Club*, 5: 5–377.
- Brown R. 1810. *Prodromus florae Novae Hollandiae et Insulae Van-Diemen*. Londini [London]: Typis Richardi Taylor & socii, viii+ pp. 145–590. <https://doi.org/10.5962/bhl.title.52309>
- Cabrera J.F., Jacobs S.W.L., Kadereit G. 2009. Phylogeny of the Australian *Camphorosmeae* (*Chenopodiaceae*) and the taxonomic significance of the fruiting perianth. *International Journal of Plant Sciences*, 170(4): 505–521. <https://doi.org/10.1086/597267>
- Cabrera J., Jacobs S.W.L., Kadereit G. 2011. Biogeography of *Camphorosmeae* (*Chenopodiaceae*): tracking the Tertiary history of Australian aridification. *Telopea*, 13(1–2): 313–326. <https://doi.org/10.7751/telopea20116023>
- Clemants S.E., Mosyakin S.L. 2003. *Dysphania*. In: Flora of North America Editorial Committee (eds.). *Flora of North America North of Mexico*, vol. 4. New York; Oxford: Oxford University Press, pp. 275–300.
- Delile [Raffeneau-Delile] A. 1844. *Index Seminum Horti Regii Botanici Monspelienensis, anni 1844*. Monspelii [Montpellier], 4 pp.
- Dillon S.J., Markey A.S. 2017. *Dysphania congestiflora* (*Chenopodiaceae*), a new species from Western Australia. *Nuytsia*, 27: 133–138. Available at: <https://florabase.dpaw.wa.gov.au/nuytsia/article/793>
- Fuentes-Bazan S., Mansion G., Borsch T. 2012a. Towards a species level tree of the globally diverse genus *Chenopodium* (*Chenopodiaceae*). *Molecular Phylogenetics and Evolution*, 62: 359–374. <https://doi.org/10.1016/j.ympev.2011.10.006>
- Fuentes-Bazan S., Uotila P., Borsch T. 2012b. A novel phylogeny-based generic classification for *Chenopodium* sensu lato, and a tribal rearrangement of *Chenopodioidae* (*Chenopodiaceae*). *Willdenowia*, 42(1): 5–24. <https://doi.org/10.3372/wi.42.42101>

- Hernández-Ledesma P., Berendsohn W.G., Borsch T., von Mering S., Akhani H., Arias S., Castañeda-Noa I., Eggli U., Eriksson R., Flores-Olvera H., Fuentes-Bazán S., Kadereit G., Klak C., Korotkova N., Nyffeler R., Ocampo G., Ochoterena H., Oxelman B., Rabeler R.K., Sanchez A., Schlumberger B.O., Uotila P. 2015. A taxonomic backbone for the global synthesis of species diversity in the angiosperm order *Caryophyllales*. *Willdenowia*, 45(3): 281–383. <https://doi.org/10.3372/wi.45.45301>
- IPNI. 2021–onward. *International Plant Names Index*. The Royal Botanic Gardens, Kew, Harvard University Herbaria & Libraries and Australian National Botanic Gardens. Available at: <https://www.ipni.org/> (Accessed 9 June 2021 and 5 July 2021).
- Kadereit G., Freitag H. 2011. Molecular phylogeny of *Camphorosmeae* (*Camphorosmoideae*, *Chenopodiaceae*): Implications for biogeography, evolution of C₄-photosynthesis and taxonomy. *Taxon*, 60(1): 51–78. <https://doi.org/10.1002/tax.601006>
- Kühn U. (with additions by Bittrich V., Carolin R., Freitag H., Hedge I.C., Uotila P., Wilson P.G.) 1993. *Chenopodiaceae*. In: Kubitzki K., Rohwer J.G., Bittrich V. (eds.). *The families and genera of vascular plants*, vol. 2. Berlin; Heidelberg; New York: Springer; pp. 253–281.
- Lagasca M., Rodriguez J. 1802. Descripciones de algunas plantas nuevas que han florecido en el Real establecimiento botánico en el año 1801. *Anales de Ciencias Naturales (Madrid)*, 5: 65–76. Available at: <https://www.biodiversitylibrary.org/bibliography/14767>
- McNeill J. 2014. Holotype specimens and type citations: general issues. *Taxon*, 63(5): 1112–1113. <https://doi.org/10.12705/635.7>
- Moquin-Tandon A. 1834. Descriptions de plusieurs nouveaux genres de Chénopodées (Nova Chenopodearum genera). *Annales des Sciences Naturelles (Paris)*, Sér. 2, 1: 203–211, 289–294 + pl. 9, 10.
- Moquin-Tandon A. 1840. *Chenopodearum monographica enumeratio*. Parisiis [Paris]: P.-J. Loss, xi + 182 pp. <https://doi.org/10.5962/bhl.title.15484>
- Moquin-Tandon A. 1849. *Ordo Salsolaceae*. In: Candolle A.P. (ed.), *Prodromus systematis naturalis regni vegetabilis*, vol. 13(2). Parisiis [Paris]: Sumptibus Victoris Masson, pp. 41–219. <https://doi.org/10.5962/bhl.title.286>
- Morales-Briones D.F., Kadereit G., Tefarikis D.T., Moore M.J., Smith S.A., Brockington S.F., Timoneda A., Yim W.C., Cushman J.C., Yang Y. 2021 (online before print: 2020). Disentangling sources of gene tree discordance in phylogenomic datasets: Testing ancient hybridizations in *Amaranthaceae* s.l. *Systematic Biology*, 70(2): 219–235. <https://doi.org/10.1093/sysbio/syaa066>
- Mosyakin S.L. 2003. *Cycloloma*. In: Flora of North America Editorial Committee (eds.). *Flora of North America North of Mexico*, vol. 4. New York; Oxford: Oxford University Press, pp. 264–265.
- Mosyakin S.L., Clemants S.E. 2002. New nomenclatural combinations in *Dysphania* R.Br. (*Chenopodiaceae*): Taxa occurring in North America. *Ukrainian Botanical Journal*, 59(4): 380–385. Available at: <https://www.researchgate.net/publication/272417640>
- Mosyakin S.L., Clemants S.E. 2008. Further transfers of glandular-pubescent species from *Chenopodium* subgen. *Ambrosia* to *Dysphania* (*Chenopodiaceae*). *Journal of the Botanical Research Institute of Texas*, 2(1): 425–431. Available at: <https://biostor.org/reference/157645> and <https://www.biodiversitylibrary.org/part/161523>
- Mosyakin S.L., Iamónico D. 2017. Nomenclatural changes in *Chenopodium* (incl. *Rhagodia*) (*Chenopodiaceae*), with considerations on relationships of some Australian taxa and their possible Eurasian relatives. *Nuytsia*, 28: 255–271. Available at: <https://florabase.dpaw.wa.gov.au/science/nuytsia/843.pdf>
- POWO. 2021–onward. *Plants of the World Online*. Facilitated by the Royal Botanic Gardens, Kew. Available at: <http://www.plantsoftheworldonline.org/> (Accessed 9 June 2021 and 5 July 2021).
- Reichenbach H.G.L. 1841. *Das Herbarienbuch: Erklärung des natürlichen Pflanzensystems, systematische Aufzählung, Synonymik und Register der bis jetzt bekannten Pflanzengattungen...* (Der deutsche Botaniker, Bd. 1). Dresden; Leipzig: In der Arnoldischen Buchhandlung, xcv + 240 pp. <https://doi.org/10.5962/bhl.title.7694>
- Scott A.J. 1978a. *Rhagodiinae*: a new subtribe in the *Chenopodiaceae*. *Feddes Repertorium* 89(1): 1–11. <https://doi.org/10.1002/fedr.19780890102>
- Scott A.J. 1978b. A review of the classification of *Chenopodium* L. and related genera (*Chenopodiaceae*). *Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie*, 100(2): 205–220.
- Scott A.J. 1978c. A revision of the *Camphorosmoideae* (*Chenopodiaceae*). *Feddes Repertorium* 89(2–3): 101–119. <https://doi.org/10.1002/fedr.19780890202>
- Simón L.E. 1996. Notas sobre *Chenopodium* L. subgen. *Ambrosia* A.J.Scott (*Chenopodiaceae*). 1. Taxonomía. 2. Fitogeografía: Áreas disyuntas. *Anales del Jardín Botánico de Madrid*, 54: 137–148.
- Simón L.E. 1997. Variations des caractères foliaires chez *Chenopodium* subg. *Ambrosia* sect. *Adenois* (*Chenopodiaceae*) en Amérique du Sud: Valeur taxonomique & évolutive. *Adansonia*, sér. 3, 19(2): 293–320.
- Sprengel K.[P.J.]. 1801. *Erster Nachtrag zu der Beschreibung des botanischen Gartens der Universität zu Halle*. Halle: Karl August Kümmel, viii + [9-] 44 pp.
- Standley P.C. 1916. *Chenopodiaceae*. In: *North American Flora*, vol. 21(1). New York: The New York Botanical Garden, 93 pp. Available at: <https://www.biodiversitylibrary.org/item/15434>
- Turland N.J., Wiersma J.H., Barrie F.R., Greuter W., Hawksworth D.L., Herendeen P.S., Knapp S., Kusber W.-H., Li D.-Z., Marhold K., May T.W., McNeill J., Monro A.M., Prado J., Price M.J., Smith G.F. 2018. *International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code)* adopted by the Nineteenth International Botanical Congress, Shenzhen, China, July 2017 [*Regnum Vegetabile*, vol. 159]. Glashütten: Koeltz

- Botanical Books, xxxviii + 254 pp. <https://doi.org/10.1186/s43008-019-0019-1>
- Uotila P. 1990. *Chenopodium*. In: Castroviejo S. (ed.). *Flora Iberica*, vol 2. Madrid: Real Jardín Botánico – CSIC, pp. 484–500.
- Uotila P., Sukhorukov A.P., Bobon N., McDonald J., Krinitsina A.A., Kadereit G. 2021. Phylogeny, biogeography and systematics of *Dysphanieae* (*Amaranthaceae*). *Taxon*, 70(3): 526–551. <https://doi.org/10.1002/tax.12458>
- Weber W.A. 1985. The genus *Teloxys* (*Chenopodiaceae*). *Phytologia*, 58(7): 477–478. Available at: <https://www.biodiversitylibrary.org/part/176202>
- Willdenow C.L. 1809. *Enumeratio Plantarum Horti Regii Botanici Berolinensis: continens descriptiones omnium vegetabilium in horto dicto cultorum*. Berolini [Berlin]: In Taberna libraria Scholae Realis, vi + 1099 pp.
- Wilson P.G. 1983. A taxonomic revision of the tribe *Chenopodieae* (*Chenopodiaceae*) in Australia. *Nuytsia*, 4(2): 135–262. Available at: <https://www.biodiversitylibrary.org/page/53204842>
- Wilson P.G. 1984. *Chenopodiaceae*. In: George A.S. (ed.). *Flora of Australia*, vol. 4. Canberra: Australian Government Publishing Service, pp. 81–317.
- Zhang M.L., Zhu G.L. 2016. Resurrection of the genus *Botrydium* Spach (*Chenopodiaceae*), with a description of four new species from China, Peru and Burundi. *Plant Diversity*, 38(6): 322–329. <https://doi.org/10.1016/j.pld.2016.10.005>
- Zhu G.L., Sanderson S.C. 2017. *Genera and a new evolutionary system of World Chenopodiaceae*. Beijing: Science Press, 361 pp.

Recommended for publication by F. Verloove

Мосякін С.Л. 2021. **Номенклатурні та таксономічні коментарі щодо деяких представників роду *Dysphania* (*Chenopodiaceae* s. str. / *Amaranthaceae* s. l.).** *Український ботанічний журнал*, 78(4): 266–273 [In English].

Інститут ботаніки ім. М.Г. Холодного НАН України, вул. Терещенківська 2, Київ 01601, Україна: С.Л. Мосякін

Реферат. Представлені коментарі щодо системи роду *Dysphania* у його уточненому обсязі, зміненому відповідно до результатів недавніх детальних молекулярно-філогенетичних досліджень (Uotila et al., 2021). Запропоновані зміни та доповнення до схеми з п'яти секцій, представленої Uotila et al. (2021). Зокрема, морфологічно чітко окреслена філогенетична лінія, що наразі містить єдиний вид *Dysphania atriplicifolia* (раніше загально визнаний як єдиний вид роду *Cycloloma*, *C. atriplicifolium*), визнана як окрема секція – *Dysphania* sect. *Cycloloma* (Moq.) Mosyakin, comb. et stat. nov. Подана детальна синоніміка секції та її єдиного виду. Філогенетичні лінії, виявлені в австралійській кладі *Dysphania* sect. *Dysphania*, досить добре окреслені морфологічно; раніше вони здебільшого визнавалися як секції *Chenopodium* (sensu lato) або *Dysphania*. Ці групи визнані тут як підсекції в межах *Dysphania* sect. *Dysphania*: (1) subsect. *Orthospora* (R.Br.) Mosyakin, comb. et stat. nov.; (2) subsect. *Dysphania*; та (3) subsect. *Tetrasepalae* (Aellen) Mosyakin, comb. et stat. nov. Обговорена проблема номенклатури *Dysphania graveolens* (= *Chenopodium graveolens*). Підтверджено, що назва *Chenopodium graveolens* була вперше валідно опублікована не Вільденовом (Willdenow) у 1809 р., а Лагаскою (Lagasca) та Родрігесом (Rodríguez) у 1802 р. Оригінальні зразки, асоційовані з цією назвою в обох публікаціях, з таксономічної точки зору належать до виду, який зараз відомий як *Dysphania graveolens* (= *Chenopodium incisum* Poir.). На мою думку, тут слід застосувати Ст. 41.8(a) Міжнародного кодексу номенклатури водоростей, грибів та рослин (*Шеньчженьський Кодекс*). Відповідно, назва *D. graveolens* має цитуватися з уточненим авторством "(Lag. & Rodr.) Mosyakin & Clemants", а потенційна нова комбінація у роді *Dysphania* на основі базіоніму *Chenopodium incisum* (провізорно наведена у базі даних POWO як "*Dysphania incisum* (Poir.) ined.") не потрібна.

Ключові слова: *Chenopodium*, *Cycloloma*, *Dysphania*, номенклатура, систематика