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SHORT COMMUNICATION

New nomenclatural combinations in *Cleome* sensu stricto (*Cleomaceae*) from Eastern Europe and the Caucasus

Mykyta M. PEREGRYM^{1,2} , Ihor G. OLSHANSKYI^{3*} 

¹ University of Oulu, P.O. Box 3000, Oulu 90014, Finland

² Taras Shevchenko National University of Luhansk,
90 Gogol' Str., Myrhorod 37600, Poltava Region, Ukraine

³ M.G. Kholodny Institute of Botany, National Academy of Sciences of Ukraine,
2 Tereshchenkivska Str., Kyiv 01601, Ukraine

* Author for correspondence: olshansky1982@ukr.net

Abstract. The genus *Cleome* sensu stricto comprises ca. 22 species naturally distributed across several regions of western Eurasia and Africa, but taxonomic uncertainty persists, particularly in Eastern Europe and the Caucasus. This study addresses conflicting taxonomic viewpoints regarding several *Cleome* taxa, namely *C. canescens*, *C. donetzica*, *C. circassica*, and *C. daghestanica*, which some authors consider distinct species, while others synonymize them under *C. iberica* or *C. ornithopodioides*. Based on morphological distinctions and geographic isolation, the recognition of these taxa as subspecies within *C. iberica* is proposed. The necessary nomenclatural combinations are provided. This study contributes to standardizing the taxonomy of *Cleome* s. str., offering nomenclatural options for future floristic research and plant conservation efforts.

Keywords: *Cleome*, endemics, plant naming, subspecies

Introduction

A recent study indicates that the genus *Cleome* L. sensu stricto comprises ca. 22 species distributed across regions from the western Mediterranean to Central Asia, India, the Arabian Peninsula, and northern and eastern Africa (Roalson, 2021). However, different opinions still exist regarding the number of species and general circumscription of *Cleome* (*sensu lato* or *sensu stricto*). For example, the *Plants of the World Online* database (POWO,

2025–onward) accepts *Cleome* in a wide sense (including *Andinocleome* Iltis & Cochrane, *Areocleome* R.L. Barrett & Roalson, *Arivela* Raf., *Cochranella* E.M. McGinty & Roalson, *Corynandra* Schrad. ex Spreng., *Physostemon* Mart., *Podandrogyne* Ducke, *Pterocleome* Iltis ex E.M. McGinty & Roalson, etc.) and lists in this genus ca. 200 species. Here we accept the genus *Cleome* as circumscribed by Roalson (2021).

Current and previous revisions of *Cleome* s. str., whether at the genus level or lower taxonomic

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ranks (e.g., Tzvelev, 1963, 1979, 2012; Carlström, 1984; Iljinska, 2014), rely predominantly on morphological approaches. This has led to persistent debate over the precise number of species within the genus. Eastern Europe and the adjacent region of the Caucasus exemplify this uncertainty, as many taxa of *Cleome* s. str. were originally described from this region. To date, no unified consensus exists regarding the circumscriptions and reliable diagnostic characters of these taxa. If there have been practically no discussions regarding the acceptance of *C. stevensiana* Schultes, the situation is the opposite with other taxa of *Cleome* series *Ornithopodioides* Tzvelev. For instance, Carlström (1984) and Roalson (2021) synonymized several *Cleome* names under *C. iberica* DC., including *C. canescens* Steven ex DC., *C. ornithopodioides* subsp. *canescens* (Steven ex DC.) Tzvelev, *C. ornithopodioides* var. *sessilis* Boiss., *C. circassica* Tzvelev, *C. ornithopodioides* f. *daghestanica* Rupr., *C. daghestanica* (Rupr.) Tzvelev, *C. donetzica* Tzvelev, and *C. ornithopodioides* subsp. *donetzica* (Tzvelev) Tzvelev. This taxonomic view is currently supported by databases such as the *Plants of the World Online* (<https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:147109-1>, here and below accessed 15 December 2024) and the *Euro+Med Plantbase* (https://europlusmed.org/cdm_dataportal/taxon/26f1f7cd-e27d-4832-ba8d-75fb2326f0ff).

In contrast, other taxonomists argue that *C. canescens*, *C. donetzica*, *C. circassica*, and *C. daghestanica* should be recognized as distinct endemic species (Tzvelev, 2012; Iljinska, 2014; Dzotsenidze, 2024). This ongoing disagreement underscores the need for detailed molecular studies, which could potentially resolve these taxonomic uncertainties. Unfortunately, the ongoing Russian-Ukrainian war and broader political instability in the region hinder prospects for such studies in the near future.

Our study does not aim to provide a comprehensive revision of the genus *Cleome* s. str. in the region concerned. Instead, we focus on standardizing the nomenclature of taxa found within the region. This effort holds particular importance for plant conservation, because *C. ornithopodioides* subsp. *canescens* and *C. ornithopodioides* subsp. *donetzica* are recognized as rare taxa (Dubovik, Tkachenko, 1967; Peregrym, 2006; Didukh, Burda, 2007; Onyshchenko et al., 2022), and they both, as *C. ornithopodioides* L. s.l., are currently listed in the *Red Data Book of Ukraine* (Ostapko et al., 2009).

Nomenclature

In this study, we mainly adopt the viewpoints of Carlström (1984) and Roalson (2021), treating *C. canescens*, *C. donetzica*, *C. circassica*, and *C. daghestanica* within the widely circumscribed taxon *C. iberica*, because of their strong arguments including the differences in seed morphology among *Cleome* series *Ornithopodioides*. However, considering the morphological distinctions previously highlighted (Tzvelev, 1963) and the geographic isolation of these taxa, occurring, respectively, in the Donetsk Upland (*C. donetzica*), the Crimean Mountains (*C. canescens*), and the westernmost (*C. circassica*) and eastern (*C. daghestanica*) parts of the Caucasus, we propose recognizing them at the subspecies level within *C. iberica*. Accordingly, we provide the necessary nomenclatural combinations below:

***Cleome iberica* subsp. *canescens* (Steven ex DC.) Peregrym & Olshanskyi, comb. nov.**

Basionym: *Cleome canescens* Steven ex DC., Prodr. 1: 241 (1824).

Type: UKRAINE, Autonomous Republic of Crimea: In Tauria merid., 1820, *Steven* (lectotype, designated here (or perhaps holotype): G00207233; isolectotypes: H, LE) (Tzvelev, 1963; Roalson, 2021).

In formally designating the lectotype, we follow the advice of McNeill (2014: 1113).

Homotypic synonym: *Cleome ornithopodioides* subsp. *canescens* (Steven ex DC.) Tzvelev, Fl. Evropejskoj Chasti SSSR 4: 30 (1979).

***Cleome iberica* subsp. *donetzica* (Tzvelev) Peregrym & Olshanskyi, comb. nov.**

Basionym: *Cleome donetzica* Tzvelev, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 22: 131 (1963).

Type: RUSSIAN FEDERATION [Rostov Region, near Krasnodonetskaya settlement, formerly Ekaterininskaya]: In declivitate saxosa ad vallem fl. Donetz. bor. prope pag. Ekaterininskaja, 21.VI 1887, *D. Litwinow* (holotype: LE) (Tzvelev, 1963).

Homotypic synonym: *Cleome ornithopodioides* subsp. *donetzica* (Tzvelev) Tzvelev, Fl. Evropejskoj Chasti SSSR 4: 30 (1979).

***Cleome iberica* subsp. *circassica* (Tzvelev) Olshanskyi & Peregrym, comb. et stat. nov.**

Basionym: *Cleome circassica* Tzvelev, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 22: 132 (1963).

Type: RUSSIAN FEDERATION [Krasnodar Krai, near Novorossiysk]: In viciniis urb. Novorossiysk,

07.VII 1892, *V. Lipsky* (holotype: LE; isotype: LE) (Tzvelev, 1963).

***Cleome iberica* subsp. *daghestanica* (Rupr.)
Olshanskyi & Peregrym, comb. et stat. nov.**

Basionym: *Cleome ornithopodioides* f. *daghestanica* Rupr., Mém. Acad. Imp. Sci. Saint Pétersbourg, Sér. 7, 15(2): 137 (1869). [<https://www.biodiversitylibrary.org/item/176551#page/407/mode/1up>]

Type: RUSSIAN FEDERATION, Republic of Dagestan: Caucasus orientalis, supra pag. Tindi, 07.VII 1861, *F. Ruprecht* (lectotype or perhaps holotype: LE [not seen]).

Homotypic synonym: *Cleome daghestanica* (Rupr.) Tzvelev, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 22: 128 (1963).

Conclusion

Thus, the genus *Cleome* s. str. within the flora of Eastern Europe and the Caucasus is represented by five subspecies of *C. iberica* (*C. iberica* subsp. *iberica*, *C. iberica* subsp. *canescens*, *C. iberica* subsp. *donetzica*, *C. iberica* subsp. *circassica*, *C. iberica* subsp. *daghestanica*) and *C. stevensiana* Schultes.

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ETHICS DECLARATION

The author declares no conflict of interest.

ORCID

M.M. Peregrym:  <https://orcid.org/0000-0001-5989-4406>

I.G. Olshanskyi:  <https://orcid.org/0000-0002-8615-7054>

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Нові номенклатурні комбінації в роді *Cleome* sensu stricto (Cleomaceae) зі Східної Європи та Кавказу

М.М. ПЕРЕГРИМ^{1,2}, І.Г. ОЛЬШАНСЬКИЙ³

¹ Університет міста Оулу, а/с 3000, Оулу 90014, Фінляндія

² Луганський національний університет імені Тараса Шевченка, вул. Гоголя 90, Миргород 37600, Полтавська обл., Україна

³ Інститут ботаніки ім. М.Г. Холодного НАН України, вул. Терещенківська 2, Київ 01601, Україна

Реферат. Рід *Cleome* sensu stricto включає 22 види, поширені в різних регіонах Євразії та Африки. Таксономічний ранг багатьох із них є спірним, а особливо таксонів, які описані зі Східної Європи та Кавказу. У цьому дослідженні розглянуто *C. canescens*, *C. donetzica*, *C. circassica* та *C. daghestanica*. Ці таксони деякі автори розглядають як окремі види, а інші відносять до синонімів *C. iberica* або *C. ornithopodioides*. На основі морфологічних відмінностей і географічної ізоляції запропоновано визнання цих таксонів підвидами *C. iberica*. Відповідно, нами запропоновані нові номенклатурні комбінації. Це дослідження сприяє стандартизації таксономії *Cleome* s. str. та вносить необхідну ясність для майбутніх флористичних досліджень і заходів зі збереження рослин.

Ключові слова: *Cleome*, ендеміки, назви рослин, підвиди