

DELPHINIUM В ГЕРБАРНЫХ СБОРАХ ИЗ НИЖНЕГО ПОВОЛЖЬЯ

ON SPECIES IDENTIFICATION  
OF *DELPHINIUM* (RANUNCULACEAE) HERBARIUM  
SPECIMENS GATHERED IN THE LOWER VOLGA REGION  
AND THE ADJACENT TERRITORIES

I. V. Shilova, A. V. Bogoslov, T. A. Kritskaya, A. S. Kashin

*N. G. Chernyshevsky Saratov State University*  
83 Astrakhanskaya Str., Saratov 410012, Russia  
E-mail: kashinas2@yandex.ru

Received May 20, 2019; Revised June 10, 2019; Accepted June 14, 2019

The article is concerned with the difficulties of species identification of the *Delphinium* (Ranunculaceae) herbarium specimens gathered in the Lower Volga region (Astrakhan, Volgograd and Saratov oblasts) and the adjacent regions (Penza, Samara, Tambov and Ulyanovsk oblasts and the Republic of Mordovia). The specimens from a number of herbaria (MW, LE, SARAT, SARBG, GMU, PVB) are subject to the research. It is revealed that their classification is problematic due to the absence of clear-cut classifying morphological parameters. The situation is further complicated by the occasional presence of taxonomically relevant traits of different taxa in one specimen as well as the disagreements concerning the genus's taxonomic structure. The article also states that the *Delphinium* populations grown in the studied territory have been decreasing dramatically in the last twenty years. The fact that many populations, previously recorded in scientific literature or herbaria, were not detected is most likely indicative of their elimination. The tendency towards extinction is especially prominent on the southern border of the studied genus range. In this view, the article emphasizes the importance of further extensive research into morphological variability of the *Delphinium* populations, grown in the Lower Volga region and the adjacent territories.

**Key words:** *Delphinium* L., Ranunculaceae, species, populations, taxonomic structure, herbarium specimens, species identification.

DOI: 10.18500/1682-1637-2019-2-3-73-89

ACKNOWLEDGEMENTS

The study was carried out with the financial support of the Russian Foundation for Basic Research (Project No. 18-34-00061).

The authors thank A. P. Seryogin, P. G. Efimov, T. B. Silayeva, V. M. Vasyukov, E. V. Pismarkina, E. A. Arkhipova for the opportunity to work with herbariums or information about herbarium collections in the MW, LE, GMU, PVB, SARAT funds.

REFERENCES

Agafonov V. A. *Steppe, calcophilic, psammophilic and halophilic eco-floristic complexes of the Middle Don basin: their origin and protection*. Voronezh: Izdatel'stvo Voronezhskogo Universiteta, 2006. 250 p. (In Russian).

Davydov D. A. Nomenclature problems concerning certain types of plants included in «Red book of Ukraine». In: *The flora in the Red Book of Ukraine: the realization of the Global Strategy for Plant Conservation: Materials of the 3rd International Congress Conference*. Lviv: Institute of Ecology of the Carpathians; M. G. Kholodny Botanical Institute, 2014. pp. 27 – 28. (In Ukrainian).

Didukh Ya. P., Zyman S. M., Burda R. I., Chetvernykh I. S. *Delphinium cuneatum* Stev. ex DC. – Dolphin wedge-shaped. In: *Ecoflora of the Ukraine*. Vol. 2. Kiev: Phytosociocenter Press, 2004. pp. 115 – 116. (in Ukrainian).

Elenevsky A. G., Bulaniy Yu. I., Radygina V. I. *Handbook of vascular plants of the Saratov region*. Saratov: IP Bazhenov, 2009. 248 p. (In Russian).

Elenevsky A. G., Bulaniy Yu. I., Radygina V. I. *Summary of the flora of the Saratov region*. Saratov: Press Centre “Nauka”, 2008. 232 p. (In Russian).

Fedorov N. I. *Genus Delphinium L. in Southern Ural: ecology, population structure and biochemical peculiarities*. Ufa: Gilem Press, 2003. 149 p. (In Russian).

Grant V. *Plant speciation*. New York: Columbia Univ. Press., 1981. 563 p.

Grant V. The plant species in theory and practice. In: *The Species Problem*. Washington: Amer. Assoc. Adv. Sci., 1957. pp. 39 – 80.

Handbook of vascular plants of the Tambov region. Tula: Grif & K Press, 2010. 350 p. (In Russian).

Ilina V. N. Flora of the Domashky Vershiny (Kinel and Neftegorsk Districts of the Samara Region). *Phytodiversity of Eastern Europe*, 2013, vol. 7, iss. 2, pp. 41 – 49. (In Russian).

Ivanova A. V., Elkina E. M. Representation of the flora of the Soksky landscape region in the herbarium of the Regional Local History Museum. P. V. Alabina. *Phytodiversity of Eastern Europe*, 2008, vol. 6, pp. 3 – 45. (In Russian).

Kamelin R. W. The peculiarities of flowering plants speciation. *Proceedings of the Zoological Institute of the Russian Academy of Sciences*, 2009, vol. 313, iss. S1, pp. 141 – 149. (In Russian).

Kharitonov A. N., Berezutsky M. A. About the discovery of the delphinium of the fluffy flowering (*Delphinium pubiflorum* (DC.) Turcz. Ex Huth) in the territory of the Saratov region. In: *Principles and methods of biodiversity conservation: Proceedings of the III all-Russian scientific conference*. Yoshkar-Ola; Pushchino: Mari State University, 2008. pp. 216–217. (In Russian).

Malyutin N. I. *Delphiniums*. Moscow: Agropromizdat, 1984. 80 p. (In Russian).

Malyutin N. I. Phylogeny and taxonomy of the genus *Delphinium* L. *Botanicheskii zhurnal*, 1973, vol. 58, iss. 12, pp. 1710 – 1722. (In Russian).

## DELPHINIUM В ГЕРБАРНЫХ СБОРАХ ИЗ НИЖНЕГО ПОВОЛЖЬЯ

Mayevsky P. F. *Flora of middle zone of the European part of the USSR*. Moscow: KMK Scientific Press Ltd., 2014. 635 p. (In Russian).

Pis'markina E. V. Materials to the flora of protected areas of penza region: vascular plants of natural monument «Urochishhe Cherdak». *Phytodiversity of Eastern Europe*, 2016, vol. 10, iss. 3, pp. 39 – 45. (In Russian).

Rakov N. S., Saksonov S. V., Senator S. A., Vasyukov V. M. *Flora of the Volga river basin. Vol. 2: Vascular plants of the Ulyanovsk region*. Togliatti: Cassandra Press, 2014. 295 p. (In Russian).

*Red book of the Penza region. Vol. 1: Mushrooms, lichens, mosses, vascular plants*. 2<sup>nd</sup> edn. Penza, 2013. 299 p. (In Russian).

*Red book of the Republic of Mordovia. Vol. 1: Rare species of plants and fungi*. 2<sup>nd</sup> edn. Saransk: Izdatel'stvo Mordovskogo Universiteta, 2017. 409 p. (In Russian).

*Red book of the Samara region. Vol. 1: Rare species of plants and fungi*. Samara: Samara State Regional Academy, 2017. 284 p. (In Russian).

*Red book of the Tambov region: Plants, lichens, fungi*. Tambov: Natural Resources Committee for the Tambov region, 2002. 348 p. (In Russian).

*Red book of the Voronezh region. Vol. 1: Plants. Lichens. Mushrooms*. Voronezh: Modek, 2011. 472 p. (In Russian).

*Red book of Volgograd region. Vol. 2: Plants and mushrooms*. Volgograd: Committee for Nature Protection of the Administration of the Volgograd Region, 2006. 236 p. (In Russian).

*Red book of Volgograd region. Vol. 2: Plants and other organisms*. Voronezh: Izdat-Print, 2017. 268 p. (In Russian).

Saksonov S. V., Senator S. A. *Flora of the Volga river basin. Vol. 1: Guide the Samara flora (1851–2011)*. Togliatti: Cassandra Press, 2012. 511 p. (In Russian).

Saksonov S. V., Senator S. A., Vasyukov V. M., Rakov N. S., Silayeva T. B., Koneva N. V., Ivanova A. V., Bobkina E. M. New locations of the species included in the Red Book of the Samara Region (according to the results of monitoring 2007 – 2008). *Samarskaya Luka*, 2008, vol. 17, iss. 4, pp. 846 – 871. (In Russian).

Senator S. A., Saksonov S. V., Rakov N. S., Vasyukov V. M., Ivanova A. V., Sidiyagina L. V. Vascular plants of Togliatti and its surrounding (Samara region). *Phytodiversity of Eastern Europe*, 2015, vol. 9, iss. 1, pp. 32 – 101. (In Russian).

Senator S. A., Saksonov S. V., Vasyukov V. M., Rakov N. S., Dronin G. V., Ivanova A. V., Novikova L. A. XIVth expedition-conference of the Institute of Ecology of the Volga river basin of Russian Academy of Sciences dedicated to 100th anniversary of the Russian Botanical Society. Part 1. Samara Region. *Samarskaya Luka: problems of regional and global ecology*, 2016, vol. 25, iss. 3, pp. 53 – 93. (In Russian).

Senator S. A., Vasyukov V. M., Ivanova A. V., Novikova L. A., Saksonov S. V., Silayeva T. B., Rakov N. Flora and vegetation of the central part

## DELPHINIUM В ГЕРБАРНЫХ СБОРАХ ИЗ НИЖНЕГО ПОВОЛЖЬЯ

of the Privolzhskaja upland (based on XIII expedition-conference of Institute of Ecology of Volga basin of the RAS). *Phytodiversity of Eastern Europe*, 2014, vol. 8, iss. 4, pp. 14 – 85. (In Russian).

Shilova I. V., Petrova N. A., Ermolaeva N. N., Kashin A. S., Arkhipova E. A. Distribution of *Delphinium* species (Ranunculaceae) in Saratov region. *Botanicheskii zhurnal*, 2016, vol. 101, iss. 7, pp. 842 – 849. (In Russian).

Solyanov A. A. *Flora of the Penza region*. Penza, 2001. 310 p. (In Russian).

Tkachenko M. A. Some additional information about the representatives of the buttercup family (Ranunculaceae) in the Red book of the Volgograd region. In: *Maintaining regional Red books: achievements, problems and prospects: Proceedings of the III All-Russian scientific-practical conference with international participation*. Volgograd: Kruton Press, 2017. pp. 131 – 135. (In Russian).

Tutin T. G., Burges N. A., Chater A. O., Edmondson J. R., Heywood V. H., Moore D. M., Valentine D. H., Walters S. M., Webb D. A. *Flora Europaea. Vol. 1: Psilotaceae to Platanaceae*. 2<sup>nd</sup> edn. New York: Cambridge Univ. Press, 1993. 629 p.

Tzvelev N. N. About some genera of the family of buttercups (Ranunculaceae) in Eastern Europe. *Botanicheskii zhurnal*, 1996, vol. 81, iss. 12, pp. 112 – 122. (In Russian).

Tzvelev N. N. Rod 10. Genus 10. *Delphinium*. In: *Flora of Eastern Europe*. St. Petersburg, 2001. pp. 66 – 74. (In Russian).

Vasyukov V. M. *Plants of the Penza Region (flora summary): the monograph*. Penza: Izdatel'stvo Penzenskogo Universiteta, 2004. 184 p. (In Russian).

---

### Cite this article as:

Shilova I. V., Bogoslov A. V., Kritskaya T. A., Kashin A. S. On species identification of *Delphinium* (Ranunculaceae) herbarium specimens gathered in the Lower Volga region and the adjacent territories. *Bulletin of Botanic Garden of Saratov State University*, 2019, vol. 17, iss. 2 – 3, pp. 73 – 89. (in Russian).  
DOI: 10.18500/1682-1637-2019-2-3-73-89.