ONTOGENETIC STRUCTURE OF COENOPOPULATIONS OF *ORCHIS MILITARIS* L. AND *DACTYLORHIZA INCARNATA* (L.) SOO (ORCHIDACEAE, LILIOPSIDA) IN ROMANOVSKY DISTRICT, SARATOV REGION

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The results of studies conducted in Romanovsky district of the Saratov region during the period of mass flowering of *Orchis militaris* L. and *Dactylorhiza incarnate* (L.) Soo from June 2 till 16, 2017, are presented. Descriptions of habitats of the species (a hollow and a pasture), which differ in the projective cover and dominants, are given. E.g., the dominants in the hollow were *Elytrigia repens* (L.) Nevski, *Carex vulpina* L., and *Potentilla anserina* L, those in the pasture were *Elytrigia repens* (L.) Nevski, *Festuca pratensis* Huds., and *Festuca valesiaca* Gaudin. The ontogenetic structure of populations of these species is shown. E.g., in the hollow, juvenile individuals of *O. militaris* were absent, immature (23.1%), verginyl (34.0%) and generative individuals (42.9%) were found. In the pasture, juvenile and immature individuals of *O. militaris* were 6.8 and 9.3%, respectively, and verginyl (36.8%) and generative individuals (47.1%) prevailed. The age spectra of both populations are of right-sided type. In the age spectrum of the *D. incarnata* coenopopulation, the proportion of age groups of the pregenerative and generative periods was 52.9%. The high recovery and efficiency indices indicate a steady status of the *O. militaris* and *D. incarnata* coenopopulationss. To assess the status of these coenopopulations and further forecast of their development, annual monitoring is necessary.

Key words: *Orchis militaris*, *Dactylorhiza incarnata*, coenopopulations, ontogenetic structure, Saratov region.

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REFERENCES

Averyanov L. V. Yatryshnik shlemonosniy – *Orchis militaris* L. [*Orchis militaris* L.]. In: *Krasnaya kniga Rossiyskoy Federatsii* (*rasteniya i griby*) [Red Data Book of Russian Federation (Plants and Fungi)]. Moscow, KMK Scientific Press Ltd., 2008, pp. 399–400 (in Russian).

Vahrameeva M. G. Rod palchatokorennik [The Genus of *Dactylorhiza*]. In: *Biological Flora of the Moscow Region*. Moscow, Izdatelstvo ”Grif i Ko“ 2000, iss. 14, pp. 55–86 (in Russian).

Gubanov I. A., Kiseleva K. V., Novikov V. S., Tikhomirov V. N. *Illyustrirovannyy opredelitel rasteniy Sredney Rossii*. *T. 1. Paporotniki*, *khvoshchi*, *plauny*, *golosemennyye*, *pokrytosemennyye* (*odnodolnyye*) [Illustrated determinant of plants in Central Russia. Vol. 1. Ferns, Horsetails, Placentas, Gymnosperms, Angiosperms (Monocots)]. Moscow, KMK Scientific Press Ltd., 2002. 498 p. (in Russian).

Yelenevsky A. G., Bulany Yu. I., Radygina V. I. *Konspekt flory Saratovskoy oblasti* [Synopsis of the Flora of the Saratov Region]. Saratov, Izdatelskiy tsentr “Nauka”, 2008. 232 p. (in Russian).

Zheleznaya E. A. Ontogenesis of *Dactylorhiza incarnata* (L.) Soo. In: *Ontogenetic Atlas of Plants*. Yoshkar Ola, Mari State University, 2007, vol. 5, pp. 286–291 (in Russian).

Zhivotovsky LA. Ontogenetic states, effective density, and classification of plant populations. *Russian J. of Ecology*, 2001, vol. 32, no. 1, pp. 1–5.

Zaugolnova L. B., Zhukova L. A., Komarov A.S., Smirnova O. V. *Tsenopopulyatsii rasteniy* (*ocherki populyatsionnoy biologii*) [Cenopopulation of Plants (Essays of Population Biology)]. Moscow, Nauka Publ., 1988. 181 p. (in Russian).

Zlobin Yu. A., Sklyar V. G., Klimenko A. A. *Populyatsii redkikh vidov rasteniy: teoreticheskiye osnovy i metody izucheniya* [Populations of Rare Plant Species: Theoretical Principles and Study Method]. Sumy, Universitetskaya Kniga Publ., 2013. 439 p. (in Russian).

Kireev E. A. Vidy Orchidaceae Juss. vo flore Priyeruslanskikh peskov Saratovskoy oblasti [The Types Of Orchidaceae Juss. Yeruslan Sands in the flora of Saratov region]. In: *Floristicheskiye i geobotanicheskiye issledovaniya v Evropeyskoy Rossii: materialy Vserossiyskoy nauchnoy konferentsii. posvyashchannaya 100-letiyu so dnya rozhdeniya A. D. Fursayeva* [Floristic and geobotanical researches in the European Russia: materials of the All-Russian scientific conference, devoted to the 100 anniversary since the birth of A. D. Fursayev]. Saratov, Izdatelstvo Saratovskogo gosudarstvennogo pedagogicheskogo instituta, 2000, pp. 21–23 (in Russian).

Kireev E. A. Materialy k flore Saratovskoy oblasti [Materials to the Flora of the Saratov Region]. *Voprosy Botaniki Nizhnego Povolzhia*. Saratov, Izdatelstvo Saratovskogo universiteta, 1993, iss. 7, pp. 66–71 (in Russian).

Rabotnov T. A. Opredeleniye vozrastnykh sostoyaniy populyatsiy vidov v soobshchestve [Definition of age structure of populations of types in community]. *Polevaya geobotanika* [Field Geobotany]. Leningrad, Nauka Publ., 1974, vol. 3, pp. 132–208 (in Russian).

Reshetnikova T. B. Yatryshnik shlemovidniy – *Orchis militaris* L. [Military orchid – *Orchis militaris* L.]. In: *Krasnaya kniga Saratovskoy oblasti*: *Griby*. *Lishayniki*. *Rasteniya* [Red Book of the Saratov region: Mushrooms. Lichens. Plants. Animals]. Saratov, Izdatelstvo Torgovo-promyshlennoy palaty Saratovskoy oblasti, 2006, pp. 106–107 (in Russian).

Semenova N. Y., Nevzorov A. V., Shatakhanov B. D. Status and Ontogenetic Structure of Coenopopulations of *Iris pseudocorus* L. in the Conditions of Saratov Province. *Tambov University Reports*, *Ser. Natural and Technical Science*, 2017, vol. 22, iss. 5, pp. 989–992 (in Russian).

Uranov A. A. The age spectrum of phytocenopopulations as a function of time and wave energy processes. *Scientific Report of Higher School*, *Biology Science*, 1975, no. 2, pp. 7–34 (in Russian).

Fardeeva M. B. *Orkhidnyye respubliki Tatarstan*: *biologiya. ekologiya. voprosy okhrany* [Orchids of the Republic Tatarstan: Biology, Ecology, Protection]. Thesis Diss. Cand. Sci. (Biol.). Kazan, 1997. 24 p. (in Russian).

Fardeeva M. B. Ontogenesis of *Orchis militaris* L. *Ontogenetic Atlas of Plants*. Yoshkar Ola, Mari State University, 2002, vol. 3, pp. 238–241 (in Russian).

Khudyakova L. P. Palchatokorennik myasokrasniy – *Dactylorhiza incarnate* (L.) Soo [Early Marsh-orchid – *Dactylorhiza incarnate* (L.) Soo]. In: *Krasnaya kniga Saratovskoy oblasti*: *Griby*.

Lishayniki. *Rasteniya* [Red Book of the Saratov region: Mushrooms. Lichens. Plants. Animals]. Saratov, Izdatelstvo Torgovo-promyshlennoy palaty Saratovskoy oblasti, 2006, pp. 101–102 (in Russian).

Shatakhanov B. D., Nevzorov A. V., Smirnova E. B. Resources and Status of Cenopopulation of Some Species of Medicinal Plants in the West Areas of Saratov Region. *Actual Problems of Ecology and Environmental Management*: *Proceedings of the International Scientific-Practical Conference*. Moscow, Izdatelstvo RUDN, 2017, pp. 133–138 (in Russian).