5. Заугольнова Л. Б. Пространственная структура и взаимоотношения ценопопуляций некоторых степных злаков / Л. Б. Заугольнова // Бюл. МОИП. Отд. биол. – 1982. – Т. 87, вып. 2. – С. 68–81.
6. Заугольнова Л. Б. Пространственная структура ценопопуляций / Заугольнова Л. Б. // Ценопопуляции растений (очерки популяционной биологии). – М.: Наука, 1988. – С. 75–90.
7. Злобин Ю. А. Принципы и методы изучения ценотических популяций / Ю. А. Злобин. – Казань: Изд- во Казанского ун-та, 1989. – 146 с.
8. Злобин Ю. А. Популяционная экология растений: современное состояние, точки роста / Ю. А. Злобин – Сумы: Университетская книга, 2009. – 263 с.
9. Красная книга СССР: Редкие и находящиеся под угрозой исчезновения виды животных и растений. Т. 2. –М.: Лесная промышленность, 1985. – 480 с.
10. Красная книга Республики Крым: Растения, водоросли и грибы. / Отв. ред. д. б. н., проф. А. В. Ена, к. б. н. А. В. Фатерыга. – Симферополь: ООО «ИТ “АРИАЛ”», 2015. – 144 с.
11. Красная книга Российской Федерации (растения и грибы) / Р. В. Камелин и др. – М.: Товарищество научных изданий КМК, 2008. – 885 с.
12. Kershaw K. Patterm in vegetation and its casuality / K. Kershaw // Ecology. – 1964. – V. 44, № 2. – P. 377–388.
13. Левина Т. З. Фенология цветения *Ophrys oestrifera* M. Bieb. на северном и южном макросклонах Крымских гор в 2015–2016 годах / Т. З. Левина, Л. П. Вахрушева // Материалы II научной конференции профессорско-преподавательского состава, аспирантов, студентов и молодых ученых «Дни науки КФУ им. В. И. Вернадского». – Симферополь, 2016. – С. 477–478.
14. Никитина С. В. К характеристике рябчика шахматного на северной границе его ареала / С. В. Никитина, Л. В. Денисова, М. Г. Вахрамеева. Охрана редких растений и фитоценозов: Сб. науч. трудов. М.: РУ ВНИЭТРУСХ, 1980. – С. 54–65.
15. Одум Ю. Основы экологии. [Пер. с 3-го англ. издания под ред. и с предисл. д-ра биол. наук Н. П. Наумова]. – М.: Мир, 1975. – 744 с.
16. Смирнова О. В. Основные черты популяционной биологии растений (эдификаторов и ассектаторов) современного лесного пояса. Общие представления популяционной биологии и экологии растений // Восточноевропейские леса: история в голоцене и современность. / О. В. Смирнова, Н. А. Торопова. – М.: Наука, 2004. – Кн. 1. – С. 154–164.
17. Смирнова О. В. Типы стратегий у растений. // Ценопопуляции растений (очерки популяционной биологии). – М.: Наука, 1988. – С. 130–137
18. Червона книга України. Рослинний світ / Под ред. Я. П. Дідух. – К.: Глобалконсалтинг, 2009. – 900 с.

SPATIAL STRUCTURE OF *OPHRYS OESTRIFERA* M. BIEB. POPULATIONS IN THE COMMUNITIES OF THE CRIMEAN MOUNTAINS ON NORTHERN AND SOUTHERN MACROSLOPES

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The article notes that the object of study of *Ophrys oestrifera* M. Bieb. – Crimean Orchid first category of rarity [9, 18] are not well investigation, especially at the population and chorological levels. Two new *Ophrys oestrifera* M. Bieb populations, discovered in the vegetation period of 2014, were included in the comprehensive study [1, 13]. However, according to the authors, to obtain an integral evaluation of the current state of *Ophrys oestrifera* M. Bieb. populations it is necessary to study the spatial distribution of species populations in natural conditions of growth. This information is a further contribution to the knowledge of the overall structure *Ophrys oestrifera* M. Bieb. populations, because

spatial structure of populations shows its adaptive capabilities to the ecological-coenotic conditions, characterizes the relationship with the other components of phytocoenosis, the relationship with pollinators is an indicator of its vitality, the direction of intraspecific and interspecific competition. The spatial arrangement of individuals *Ophrys oestrifera* M. Bieb. populations established by the method of "nearest neighbor" [2, 15].

Population № 1 grows on the southern slopes Mountains of the Crimean, in the outskirts of the village of Luchistoye, microclone southern exposure, in association *Dorycnieto-echietum-poteriosum* in conditions of strong anthropogenic and zoogenic impacts. The spatial structure of population № 1 is diffuse-contagious pattern: adaptive strategy of individuals of this population, spatial arrangement, primarily, anthropogenic impact, and then depends on the interaction with other components of the phytocoenosis it was established. The uneven distribution *Ophrys oestrifera* M. Bieb. populations in association *Dorycnieto-echietum-poteriosum* can be explained, primarily, by high anthropogenic pressure, adapting to which individuals of *Ophrys oestrifera* M. Bieb. move to shrub groupings, where they find protection from the effects of grazing animals here.

Population № 2 grows on the Northern macroslope Mountains of the Crimean, in the outskirts of the village of Perevalnoye in association *Bothriochloetum-dorycniosum*, microclone eastern exposure. The anthropogenic factor is negligible in this area. The spatial structure of population No. 2 looks like as conglomeration of individuals of *Ophrys oestrifera* M. Bieb., the grouping in the form of a figure of irregular shape on the perimeter thickets of *Cornus mas* L., there are 40 individuals (80 %) provide here an independent and well-separated locus. Other individuals removed from each other near 180–470 cm. Therefore, in the population № 2 of the spatial strategy of individuals is largely determined by the relationship with the components of phytocoenosis, so they form the so-called "phytocoenotic" pattern [12]: individuals of *Ophrys oestrifera* M. Bieb. mainly grow where continuous exposure opposed to a phytogenic one field turf grasses weak or almost absent.

Individuals of both populations demonstrate a vital strategy of patients. Plants from populations № 1 in its spatial distribution have to avoid places intensive grazing and other anthropogenic pressures and, therefore, move to the bushes. Individuals of the population № 2 is in a growing niche, where the dogwood weakens the solid effect opposed to a phytogenic one field derznovennyj grains that contributes to the creation of favorable conditions for the growth of *Ophrys oestrifera* around the perimeter of the crown of *Cornus mas* L., that is with vegetation and life strategy of the patient. Both the studied populations of the *Ophrys oestrifera* M. Bieb. has the contagious nature of the spatial structure, form the loci of the 1st, 2nd and 3rd levels, but different sizes of loci and degree of ogranichennosti clusters.

Keywords**:** *Ophrys oestrifera* M. Bieb., Population, spatial structure, distribution of individuals, aggregation, loci.

References

1. Vakhrusheva L. P., Kucher E. N., Levina T. Z. Age structure of *Ophrys oestrifera* M. Bieb. populations in different anthropogenic pressures phytocoenosis, *X Intern. Scientific-practical conference "Protection and cultivation of orchids"*, 54 (Minsk, 2015).
2. Greig-Smith P. *Quantitative plant ecology*, 359 (M.: Mir, 1967).

3. Grigorieva N. M., Zaugolnova L. B., Smirnova O. V. Features of the spatial structure of coenopopulations of certain plant species, *Coenopopulations of plants (development and relationships)*, 20 (M., 1977).
4. Zaugolnova L. B. Heterogeneity of a structure of ocenopopulations in time and space (on the example of *Alyssum lenense* Adams.), *the Botanical magazine*, **61, 2**, 187 (1976)
5. Zaugolnova L. B., the Spatial structure and relationships of coenopopulations of some steppe grasses, *bull. MOIP. Department of biol*., 68 (1982).
6. Zaugolnova L. B. Spatial structure of coenopopulation, *Coenopopulation of plants (sketches of population biology)*, 75 (M.: Science, 1988).
7. Zlobin U. A. *Principles and methods of studying coenopopulation*, 146 (Kazan: prod. – in Kazan un-that, 1989).
8. Zlobin U. A. *Population plant ecology: current state, growth points*, 263 (Sumy: University book, 2009).
9. *Red List USSR:* The rare and being under the threat of disappearance animal species and plants, **2**, 480 (M.: Forest industry, 1985).
10. *Red List of the Crimea Republic*: Plants, water-plants and mushrooms, editor A. B. Yena, A. B. Fateriga, 144 (Simferopol: LTD. of "IT ARIAL", 2015).
11. *Red List of the Russian Federation* (plants and mushrooms), R. V. Kamelin, etc., 885 (M.: Association of scientific publications KMK, 2008).
12. Kershaw K. Patterm in vegetation and its casuality, *Ecology*, **44, 2**, 377 (1964).
13. Levina T. Z., Vakhrusheva L. P. Phenology of blossoming of *Ophrys oestrifera* M. Bieb. On northern and southern macroslopes of the Crimean Mountain 2015–2016, *Materials II of scientific conference of the faculty, graduate students, students and young scientists "Days of science of KFU V. I. Vernadsky"*, 477 (Simferopol, 2016).
14. Nikitina S. V., Denisova L. V., Vakhrameeva M. G. *To the characteristic of a guinea-hen flower, Protection of rare plants and phytocoenosis*, 54 (M.: RU VNIETRUSH, 1980).
15. Odum Y. *Fundamentals of ecology*, 744 (M.: World, 1975).
16. Smirnova O. V., Toropova N. A. The main features of population biology of plants (edificators and assectators) of the modern forest belt. General views of population biology and plant ecology, *Eastern European forests: history in the Holocene and modernity*, Book. 1, 154. (M.: Science, 2004).
17. Smirnova O. V. Types of strategy at plants, *Coenopopulation of plants (sketches of population biology)*, 130 (M.: Science, 1988).
18. *The Red Book of the Ukraine*. Flora, Under edition Y. P. Didukh, 900 (K.: Globalkonsalting, 2009).