

DOI 10.51582/interconf.19-20.02.2022.076

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CURRENT STATE OF POPULATIONS OF *DAPHNE ALTAICA* (THYMELACEAE) IN KAZAKH ALTAI

Abstract. The article presents data on the distribution of the rare endemic species *Daphne altaica* Pall in the Kazakh Altai. Three isolated populations were found forming the main ecological optimum of the species.

Keywords: endemic plant, relict, population.

Daphne altaica Pall – is a xeromesophilic shrub up to a height of 1.5m. A relict of the Tertiary Turgai flora. Listed in the Red Book of the Republic of Kazakhstan [1]. An endemic plant to the Asian range. The species is ornamental (Fig. 1), used as a medicine for malignant tumors in folk medicine of Altai [2]. It is part of the shrub communities in Kazakh Altai. The species is located in small clonal areas, spatially isolated over the area of the region.

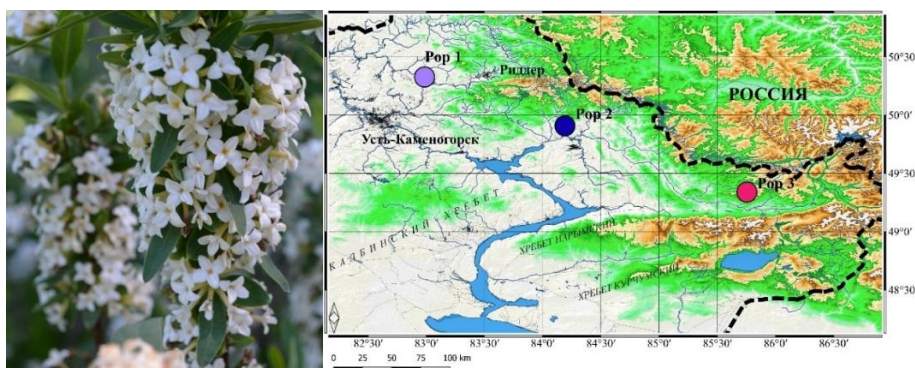


Fig. 1. *D.altaica*. Fig. 2. The surveyed populations of *D. altaica*

It is found in limited extent in the South-Western Altai. Three populations have been identified and surveyed (Fig. 2): the first (edge of the village Sekissovka), the second (edge of the village Oktyabrskoye), the third (edge of the village Barlyk). The habitats are characterized by low competitiveness in phytocenotic composition. Seed production is observed rarely, only in climatically favorable years (the absence of return ground frosts during the period of mass flowering). Below are the results of population surveys.

The first population occupies an area of about 1000 m² in the northwestern foothills of Ubinskiy Ridge, southwest of the village Sekissovka, at an altitude of 448 m above sea level. Coordinates: 50° 21' 28" N, 82° 37' 03" E. Included in the shrub formation. The edificators are *Lonicera tatarica* L. – cop, *Rosa pimpinellifolia* L. – cop, *D. altaica* – cop₃ - sp, from herbaceous plants *Fragaria viridis* Duch. – cop, *Carex macroura* Meinsh. - cop₂. *D. altaica* does not form solid thickets, areally located in local groups. The shrub layer, 150-200 cm tall, is dominated by *R. pimpinellifolia* – cop, *D. altaica* - cop₂, *L. tatarica* – cop, *Rosa acicularis* is common among subordinate species – sp-sol, *Crataegus chlorocarpa* Lenné et C. Koch. – sol, *Padus avium* Mill. – s, *Rhamnus cathartica* L. – s, *Salix caprea* L. – s, are all sporadically found. The density of the shrub layer is high – 05-08, with the cover area to 60-70%. *R. pimpinellifolia* acts as an active indicator species in phytocenosis. *D. altaica* prefers to settle at the edges of thickets, fringes of forests and in sparse shrubs with a density of 03-05. Self-maintenance of the population is active, however only vegetatively, due to the complexity of seed reproduction. The population is of right-sided spectrum, normal type.

The second population occupies an area of about 1500 m², 1 km northwest of the village Barlyk, at an altitude of 697 m. Coordinates: 49° 20' 12" N, 85° 10' 39" E. Included in the shrub formation (*Padus avium* Mill., *Crataegus sanguinea* Pall., *C. chlorocarpa* Lenné et C. Koch., *R. pimpinellifolia* and others). From the northwest and southwest, the area is surrounded by *C. sanguinea* – cop₂, *P. avium* – sp-cop, *R. pimpinellifolia* – sp, often densely entwined by *Humulus lupulus* L., *Calystegia sepium* (L.) R. Br. Habitat conditions for the species are optimal: protection from wind action and return spring ground frosts, abundance of snow

cover up to 1.5-2 m, constant moderate soil moisture). The ground cover is formed by litter, 98-130 g/m², the total projective cover is 100%. Soils are loose: mountain chernozems. *D. altaica* is located in small isolated clonal groups, where it occupies sparse thickets of shrubs with a density of 03-05 or fringes of forests. Fruiting is very weak. With abundant flowering, the formation of drupes does not exceed 0.7% per generative shoot. Juvenile and immature individuals were not registered in coenopopulation. Reproduction and expansion of the population occurs by clonal reproduction. *D. altaica* disseminates by seeds, which are dispersed by wind, meltwater and birds. Despite the scarcity, small number and fierce competition, *D. altaica* is able to hold its territory and to maintain itself. The population is young, right-sided, normal type.

The third population is part of the shrub formation. Located on the northeastern slope, 8 km northwest of the village Oktyabrskoye. Coordinates: 49° 45' 08" N, 83° 42' 37" E. Occupies an area about 1.5 ha at an altitude of 627 m above sea level. The shrub community is developed, characterized by short stature and dominance of *R. pimpinellifolia*, rarer *L. tatarica*, in this place *D. altaica* acts as a subordinate species with an abundance of sol. The vegetation cover is relatively rich in terms of species, it includes about 57 species with the dominance of *R. pimpinellifolia*. *Chamaenerion angustifolium* (L.) Scop. and *Carex macroura* Meinsh can act as dominants and subdominants. The ground cover consists of litter. The habitat of the species is characterized by severe ecological and climatic conditions (high insolation, limited snow cover, early release from snow cover, strong wind action, absence or its weak development, soil moisture deficiency, high density of shrubs and herbage). Soils: well drained mountain chernozems. The ground cover is poor, 1.5-3 cm, 25-31 g/m².

All surveyed populations are right-sided by the structure. The species belongs to moderately shade-enduring plants in relation to illumination. The optimum of the species can be attributed to low-grass glades, fringes of forests, in the altitudinal limit of 500-800 m above sea level.

The survey of the current state of the *D. altaica* population has indicated that within the first and second populations the species grows well, but not abundantly, successfully passes all stages of development, blossoms and bears fruits. The

individuals of the third population bear fruit sporadically due to ground frosts. It has been identified that the species should be preserved using the *ex situ* preservation method.

Source of financing

The article was prepared with the financial support of Science Technical Program "Development of scientific and practical foundations and innovative approaches to plant introduction in natural zones of Western and Eastern Kazakhstan for rational and effective use in landscaping, gardening and environmental protection" of the Ministry of Education and Science of the Republic of Kazakhstan for 2021-2022.

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