

**ENVIRONMENTAL AND PHYTOCOENOTICAL CHARACTERISTICS, STRUCTURE OF COENOPOPULATIONS
AND ONTOGENY OF *LAGOCHILUS ILICIFOLIUS* (LAMIACEAE) IN TUVA**

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SUMMARY

Lagochilus ilicifolius Bunge is the widespread species in Central Asia. Iridoid glycosides, aliphatic alcohol, diterpene and phenylpropanoids were isolated and identified in the above-ground parts of the individuals plants (Jing-Shi et al., 2012; Li G. et al., 2015). Population-developmental approach allows us to evaluate the state species coenopopulations and enables to predict their existence on the edge of the area.

The goal of the paper is to evaluate the current state of coenopopulations of *L. ilicifolius* on the border of species distribution area (region – Tuva) and study the ontogeny of individual plants.

The studies were carried out in 2009 in Tuva. Development of individual plants and the ontogenetic structure of the coenopopulations (CP) was studied by common methods (Rabotnov, 1950; Uranov, 1975; Tsenopopulyatsii rasteniy ..., 1976, 1988). The classification of «delta-omega» by L. A. Zhivotovsky (2001) was applied for characteristic of the CP. Odum's index (I_{od}) (1986) was used for the evaluation of spatial structure of CP. The level of index significance was assessed by comparison to the calculated index with the table-valued *F*-test of Fisher–Snedecor. For morphometric assessment at least 25 mature generative individuals were sampled. All values were statistically processed at 95 % significance level ($P < 0.05$) with the package «Statistica 6.0».

The *L. ilicifolius* main ecological distribution area is the deserted steppes of the Central Asia. *L. ilicifolius* is the species with the fairly wide ecological amplitude in terms of moisture. According to I. A. Tsatsenkin et al. (Methodological..., 1974), the ecological area covers 26 stages (14–40) on L. G. Ramensky scale. The analysis of our geobotanical descriptions from Tuva allowed to expand it up to 34 stages (14–48). Ordination of geobotanical descriptions of Tuva communities with *L. ilicifolius* by the moistening factor revealed the diversity of its habitats: from typical deserted steppes to the true bunchgrass steppes and their wetter variants with *Carex pediformis* (C. A. Mey.).

L. ilicifolius is caudex taproot herbaceous plant with sympodial long-shoot forthputting model characterized by long growing period. The ontogeny of individuals is simple, complete with follow morphogenesis phases: primary shoot → main axis → primary bush. Often, the final phase of the ontogenesis is completed with uniaxial shoot.

Ontogenetic spectra of two CP are complete, centered, dominated by mature generative individual plants (37.7 and 28.4 %, respectively). The distribution of ontogenetic groups reflects the

specific in development of the species: hindered seed germination – reproduction index is low (0.19–0.16), gradual increase of life duration in pregenerative period, its' decrease in postgenerative period and maximum duration in mature generative period. Comparison of CP by the age and effectiveness data showed that both coenopopulations are mature and stable.

Density of *L. ilicifolius* individuals in both populations widely varies from 1 to 24 individuals per 1 m², whereas absolute density and ecological density on the average is 5.2–6.9 individuals/1 m² (CP 1) and 5.8–7.2 individuals/1 m² (CP 2).

Distribution of individuals in both of CP is irregular and clustered: $I_{od} = 4.34$ for CP 1, $I_{od} = 3.01$ for CP 2.

Thus, *L. ilicifolius* at the northern border of its' distribution is growing on soils with different moisture content. The *L. ilicifolius* coenopopulations has typical structure, reflecting its stable position in Tuva.

Key words: *Lagochilus ilicifolius*, morphology, ontogenesis, ontogenetic structure of coenopopulations.