

**COMPARATIVE ANALYSIS OF POPULATION STRUCTURE
OF HEDYSARUM GRANDIFLORUM (FABACEAE)
IN SAMARA REGION AND BASHKORTOSTAN REPUBLIC**

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SUMMARY

Hedysarum grandiflorum Pall. is a perennial polycarpic with tap root 25—40 cm high. It is included in the Red Book of the Russian Federation and is protected in 11 regions of Russia. In Bashkortostan Republic it is assigned to category 3 (rare species), in Samara region to 4/F (a rare species with a stable population). Species area includes the Volga-Kama and the Volga-Don interfluve, Trans-Volga region, the Urals, part of Ukraine and of Kazakhstan. In Bashkirian Cis-Urals the species grows on the north-eastern border of the area and is often found in the mountain remnants of erosional origin, and represent refugia of steppe flora and steppe plant communities in co-agrolandscape. In Samara region species grows in petrophyte steppes of the Zhiguli Mountains on the plateau and the watershed flanks of the rivers in the Predvolzhon and Trans-Volga, on Mountain Reefs on Syrtovaya hill. The aim of the work was to determine the characteristics of the ontogenetic structure of *H. grandiflorum* coenopopulations on the border of area in petrophyte steppes of Ural region in Bashkortostan Republic and in the central part of the area in Samara region (Trans-Volga and Samara Bend). In 2011—2013 years 13 *H. grandiflorum* coenopopulations were examined in the Urals region of Bashkortostan and 10 coenopopulations were in the Samara region. The main population characteristics as density and age structure were identified. The age structure of coenopopulations was studied according to standard methods. The ontogenetic spectra were constructed based on these data. Some demographic indicators as recovery index, the index aging were applied. Coenopopulation status was estimated according to «delta–omega» classification of L. A. Zhivotovsky. Data analysis was carried out in MS Excel 2010 using standard indicators.

In Samara region *H. grandiflorum* grows on steep flanks in *Stipa pennata* and forbs, *Stipa pennata* and *Festuca valesiaca*, *Stipa pennata* and *Galatella* sp. communities with sparse herbage on rubbly substrate (petrophyte variants) with the dominance of *Stipa pennata*, significant role *Artemisia austriaca*, *Festuca valesiaca*, *Galatella villosa*, and often with prevalence of *H. grandiflorum*, as well as on the flat areas in communities with domination of steppe cereals and forbs; and in the Bashkortostan Republic (Bashkirian Cis-Urals) — in petrophytes steppes with *Stipa pulcherrima*, *S. korshinskyi*, and derived grasslands with *Stipa capillata*, *Artemisia austriaca*.

The density of the most of *H. grandiflorum* coenopopulations in Samara region was medium (2.6—8.3 individuals per 1m²), in Bashkortostan Republic it was 4.8—20.6 individuals per 1 m². All populations were normal, the most of the coenopopulations were incomplete, two populations in Samara region were complete. The average spectrum of studied coenopopulations in Samara region was centered with a maximum on the middle-aged individuals (36.3—69.2 %); plants of all age states were presented in it. In Bashkortostan Republic the average ontogenetic spectrum was left-sided with a maximum in the virginal individuals (9.1—45.6 %), plants of all age states were presented in it. Ontogenetic structure of *H. grandiflorum* populations in Bashkortostan had two types of spectrum, left-sided and centered. The

estimation of age (D) and efficiency (w) showed that 9 coenopopulations in Samara region were mature (D = 0.41—0.55; w = 0.72—0.85), one population was aging (D = 0.55; w = 0.83). In Bashkortostan Republic 12 coenopopulations were young (D = 0.15—0.35; w = 0.40—0.59), one population was transitional (D = 0.36; w = 0.77). Indices of recovery (0.06—0.44) and aging (0.0—0.05) in Samara region were low. The populations in Bashkortostan Republic had high recovery index (1.05—2.19), with the exception of two coenopopulations, where the recovery index was less than one. The index of aging in all coenopopulations was equal to or close to zero. The Bashkortostan coenopopulations of *H. grandiflorum* were younger than in the Samara region and had greater density. In general, the state of the investigated coenopopulations of *H. grandiflorum* was rather stable despite the anthropogenic impact.

Key words: *Hedysarum grandiflorum*, Samara region, Bashkortostan Republic, a rare species, coenopopulation, ontogenetic structure.