RARE ASPERULA L. (*RUBIACEAE*) SPECIES IN THE SPONTANEOUS FLORA OF REPUBLIC OF MOLDOVA

SPECIE RARĂ ASPERULA L. (*RUBIACEAE*) ÎN FLORA SPONTANĂ A REPUBLICII MOLDOVA

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Summary. *The article presents new data on distribution in the spontaneous flora of the Republic of Moldova and the study results on Asperula species: Asperula rumelica Boiss. and Asperula tenella Heuff. ex Degen. – two rare species (Rubiaceae Juss. family) proposed for inclusion in the national Ecological legislation and to the Red Book of the Republic of Moldova, 4th edition. The following data for these taxa are indicated: Latin, Romanian and Russian names, synonymy, category and criteria of rarity, local distribution, habitat, limiting factors, biological and ecological characteristics, status and conservation measures protection in the republic.*
Keywords: *Asperula rumelica, Asperula tenella, flora, rare species, Republic of Moldova.*

Rezumat. *Articolul prezintă date noi de răspândire în flora spontană a Republicii Moldova și rezultatele studiului asupra speciilor din genul Asperula: Asperula rumelica Boiss. Asperula tenella Heuff. ex Degen. – două specii rare (din familia Rubiaceae Juss.) propuse spre includere în legislația ecologică națională și în Cartea Roșie a Republicii Moldova, ediția a IV-a. Pentru acești taxoni sunt indicate următoarele date: denumirea în limba latină, română și rusă, sinonimia, categoria și criteriile de raritate, răspândirea locală, habitatul, factorii limitativi, caracteristicile biologice și ecologice, starea și măsurile de conservare în republică.*
Cuvinte-cheie: *Asperula rumelica, Asperula tenella, floră, specii rare, Republica Moldova.*

INTRODUCTION

One of the features of the spontaneous flora of Republic of Moldova is the presence in it of a high number of rare and endangered species. Rare species of vascular plants now account for about 30% of the total composition of the flora of different categories of rarity. In accordance with the rarity categories, all these species are threatened with

extinction due to the small number of populations and limited distribution across the territory [1-3].

The rarest taxa are included in the Lists of Species Protected by the State and in the Red Book of the Republic of Moldova. The Red Book is an official document that includes a list of critically endangered, endangered, vulnerable plant and animal species of the Republic of Moldova, as well as general information about their status, condition, range, methods of their protection, conservation and dissemination, published at least once every 10 years.

MATERIAL AND METHODS

During our investigation concerning rare species of the *Asperula* genus in the flora of the Republic of Moldova, in order of their inclusion to the 4th edition of the Red Book of the Republic of Moldova, we performed all necessary research. Firstly, we reviewed all published information on the presence of species in the territory [1, 3-10] and consulted specimen materials in several scientific herbaria (Herbarium of the National Botanical Garden (Institute) from Republic of Moldova, Herbarium of the State University of Moldova).

Rare species are identified on the basis of their local distribution in the Republic of Moldova. The following symbols are used to denote the spread of the species on the distribution map of the Republic of Moldova: ○ – locality, where the species has grown in the past (before 1971 i.e. 50 years ago) and ● – locality, where the species grows in the present time (from 1971 to 2024).

The taxonomy of *Asperula* species followed by the recent taxonomical literature [11, 12]. The rarity of species is assessed according to the categories and criteria of IUCN [13].

RESULTS AND DISCUSSIONS

Within the framework of scientific study of the Laboratory of Spontaneous Flora and Herbarium of the National Botanical Garden (Institute) of the Republic of Moldova, it was established that the *Asperula* genus in the flora of the Republic of Moldova includes 3 species – *A. cynanchica* L., *A. rumelica* Boiss. and *A. tenella* Heuff. ex Degen. According to the IUCN criteria two of them are assessed as rare: *A. rumelica* (Critically Endangered species [CR]) and *A. tenella* (Vulnerable species [VU]). They differ in the number and vitality of populations, local distribution and, along with the types of relatively low risk of extinction, are extremely rare.

In the article rare plants of the *Asperula* genus are given in alphabetical order, each with the indication of the following characteristics: Latin, Romanian and Russian names, synonymy, category and criteria of rarity, local distribution (with map of distribution in the Republic of Moldova), habitat, limiting factors, biological and ecological characteristics (including the plant habitus), status and protection measures in the republic.

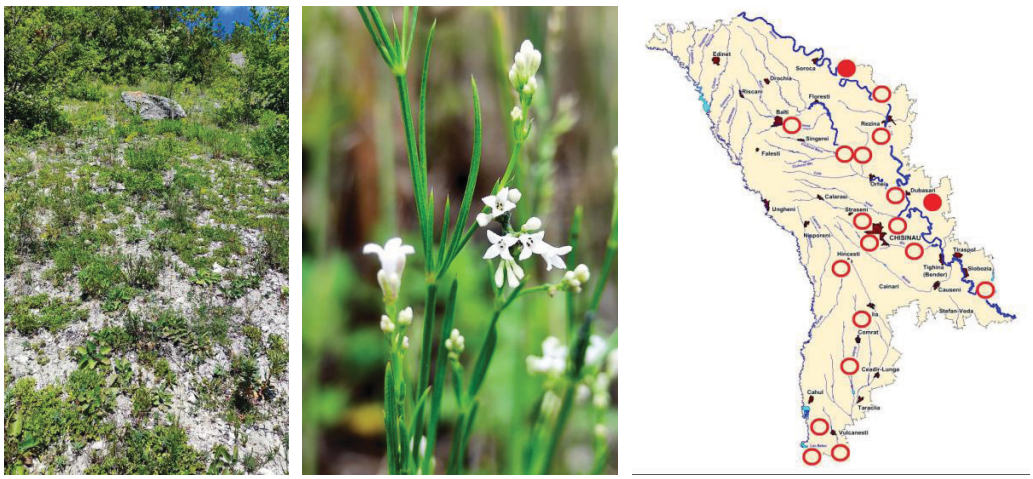
Asperula rumelica Boiss. (=*Asperula montana* Waldst. et Kit., *A. cynanchica* L. var. *graveolens* (M.Bieb. ex Schult. et Schult. fil.) Stojan. et Stef., *A. cynanchica* L. sub-

sp. *rumelica* (Boiss.) Pjatunina, *A. graniticola* Klokov, *A. hypanica* Klokov). – Lipitoare rumelică. – Ясменник румелийский.

Status. Critically Endangered species [CR]. A2ce+4ce; B2ab(i,ii,iii,iv); D2.

Distribution. In the Republic of Moldova it was distributed in the past almost all over the country (whether collected or literature data): in the northern part: Sîngerei, Rezina and Rîbnița districts (Transdniestrian region); central districts: Orhei, Criuleni, Anenii Noi, Hâncești, Grigoriopol (Transdniestrian region), in the vicinity of Chișinău, and in the south part: Cahul, Comrat, Vulcănești (Gagauzia region), Slobozia (Transdniestrian region). At present it is known for certainty from two localities: com. Hîrtop (Grigoriopol distr., Transdniestrian region) and Ocnița (Camenca, Transdniestrian region) (Fig. 1c). Outside the borders of the republic it grows in Balkan peninsula (România, Bulgaria), Eastern (southern) Europe, Asia Minor (Turkey) [4, 11, 14-16].

Habitat. Steppe grasslands, eroded and steep; sunny limestone slopes (Fig. 1a).



a b c

Figure 1. *Asperula rumelica* Boiss.:
a – habitat, b – habitus, c – distribution in the Republic of Moldova.

Quantitative aspect. Species grows in small groups of 2-3 (10) individuals and is scattered throughout the slope. The largest population occupies an area of about 1,5 ha, with an abundance of 1(2). The population is stable, represented by individuals of different ages, most of which are mature flowering plants. Plant density reaching up to 2-3 mature plants per 1 m^2.

Limitation factors. Habitat reduction and ruderalization of steppic and calcareous areas; afforestation of steppe sectors; grazing, tourist and recreational activity.

Biological and ecological characteristics. Perennial, chamaephytic plant (Fig. 1b). Blooms in April-September. It is a steppic, xerophilic plant, multiplies by seeds.

Cultivation. No information.

Protection status. No action is taken. Species is indicated for the several protected areas: Scientific reserve "Lower Prut", National Parc "Orhei", Landscape Reserve "Saharna", Forest nature reserve "Sărata Galbenă".

Protection measures. The species out to be included into the list of species protected by law and to the 4th edition of the Red Book of the Republic of Moldova as Critically Endangered (category CR); monitoring the condition of known populations; highlighting new places of growth; the introduction in the *ex situ* collections of the National Botanical Garden (Institute).

Asperula tenella Heuff. ex Degen (=*Asperula cynanchica* L. var. *elongata* Stev., *A. longiflora* C.Koch, *A. stevenii* V.Krecz., *A. maeotica* M.Pop. et Chrshan., *A. bidentata* Klokov, *A. hypanica* Klokov, *A. attenuata* Klokov). – Lipitoare delicată. – Ясменник нежный.

Status. Vulnerable species [**VU**]. A2ce+4ce; B2ab(i,ii,iii,iv); D2.

Distribution. In the Republic of Moldova it was met in the past in the north-eastern part: Rezina district; central districts: Nisporeni, Grigoriopol (Transdniestrian region), Hînceşti, Cimişlia and in the vicinity of the city of Chisinau, and southern districts: Leova, Cahul, Taraclia, Comrat and Vulcăneşti (Gagauzia region). At present it is known for certainty from 7 localities: comm. Hârtop (Grigoriopol district, Transdniestrian region), Sărata Galbenă (Hânceşti), Cazaclia (Comrat, Gagauzia region), Slobozia Mare, Văleni, Câşliţa-Prut (Cahul) and Ciumai (Taraclia district) (Fig. 2c). Outside the borders of the republic it grows in Central (Hungary, doubtfully present in Romania) and Eastern (southern) Europe, Crimea, Balkan peninsula, Asia Minor [4, 11, 14-16].

Habitat. Limestone slopes, steppe hills (Fig. 2a).



a b c

Figure 2. *Asperula tenella* Heuff. ex Degen:
a – habitat, b – habitus, c – distribution in the Republic of Moldova.

Quantitative aspect. The total number of plants has not been determined. In the growing places there are solitary individuals or groups of 2-3 (5) specimens in each.

Limitation factors. Habitat reduction and ruderalization through plowing steppic areas; afforestation of steppe sectors; grazing, tourist and recreational activity.

Biological and ecological characteristics. Perennial, chamaephytic plant (Fig. 2b). Blooms in April-August. It is a steppic, xerophilic plant, multiplies by seeds.

Cultivation. No information.

Protection status. No action is taken. Territorially the species is indicated for the several protected areas, within the: Scientific reserve “Lower Prut”, Landscape Reserve “Saharna”, National Parc “Orhei”, steppe sector in the south of Bugeac “Ciumai” and the Forest nature reserve “Sărata Galbenă”.

Protection measures. The species out to be included into the list of species protected by law and to the 4th edition of the Red Book of the Republic of Moldova as Vulnerable (category VU); monitoring the condition of known populations; highlighting new places of growth; the introduction in the *ex situ* collections of the National Botanical Garden (Institute).

CONCLUSIONS AND RECOMMENDATIONS

In conclusion, we propose to include in the State Protected Species List and in the 4th edition of the Red Book of Republic of Moldova both species from Asperula genus: *A. rumelica* Boiss. (as Critically Endangered (category CR) and *A. tenella* Heuff. ex Degen. (as Vulnerable (category VU).

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