

NEW FINDINGS OF *Achillea ochroleuca* EHRH. IN REPUBLIC OF MOLDOVA

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Summary. The article presents updated data on distribution of *Achillea ochroleuca* Ehrh. – the threatened species growing in the Ponto-Sarmatic steppes of the Republic of Moldova. Two new locations of *Achillea ochroleuca* within the clearings of the forests of downy oak (*Quercus pubescens* Willd.) – near commune Speia, Anenii Noi district and near commune Baurci-Moldoveni, Cahul district. The morphological description, synonymy, Latin, English, Romanian and Russian names, data on stational characteristics, habitat, quantitative aspect of populations, maps of species distribution in the republic are indicated.

Keywords: *Achillea ochroleuca* Ehrh., Ponto-Sarmatic steppes, rare species.

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 600 species (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 [3, 5, 11]. The rarest taxa are included in the Lists of Species Protected by the State and in the Red Book of the Republic of Moldova. More than a third of rare species (215 taxa) grow in the preserved fragments of steppe biotopes – Ponto-Sarmatic steppes, preserved in the Beltsy (north of the republic) and Budzhak (southern parts) steppes, as well as in the glades and clearings of the forests of downy oak (*Quercus pubescens* Willd.) so called “gynets”.

The paper presents the results of a study of the distribution of *Achillea ochroleuca* Ehrh. – the threatened species growing in the Ponto-Sarmatic steppes of the Republic of Moldova.

Materials and methods

During our investigation concerning rare species of the flora of Republic of Moldova, in order to their inclusion to the 4th edition of the Red Book of the Republic of Moldova, we performed all necessary research concerning the *Achillea ochroleuca* species. Firstly, we reviewed all published information on the presence of species in the territory [1, 12-16, 20-24] 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).

The distribution map of the species on the territory of the Republic of Moldova has been compiled. The following symbols are used to denote the spread of the taxa on the distribution map in the region:  – locality, where the species has been met 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 general range of distribution is determined based on literary data [14, 15, 23].

The rarity of *Achillea ochroleuca* is assessed according to the categories and criteria of IUCN [6-8].

Results and discussions

Achillea ochroleuca Ehrh. 1792, Beitr. Naturk. 7: 166, non Willd. 1804; Афанасьев, 1961, Фл. СССР, 26: 93; Richards. 1976, Fl. Europ. 4: 164; Гейдеман, 1986, Опред. высш. раст.

МССР, изд. 3: 541; Цвелев, 1994, Фл. евр. части СССР, 7: 127; Зиман, 1999, Опред. высш. раст. Укр., изд. 2: 335; Васильева и Коваленко, 2003, Консп. флори Півден. Бессарабії: 42; Ciocârlan, 2009, Fl. ilustr. a României: 797. – *A. pectinata* Willd. 1804, Sp. Pl. 3, 3: 2197, non Lam. 173. – *A. kitaibeliana* Soó, 1941, Acta Geobot. Hung. 4: 193; Кондратюк, 1962, Флора УРСР, 11: 263. – Pale yellow yarrow. – Alunică palid-galbenă. – Тысячелистник бледножёлтый. Perennial, herbaceous plant, up to 50 cm tall, greyish, soft-tomentose (with long, thin, sticky hairs), with thick, woody, multi-headed rhizome and multiple roots. There are 5-30 stems (vegetative and generative) on each plant (Figure 1), from the base ascending and legniscient, finely striate, simple,

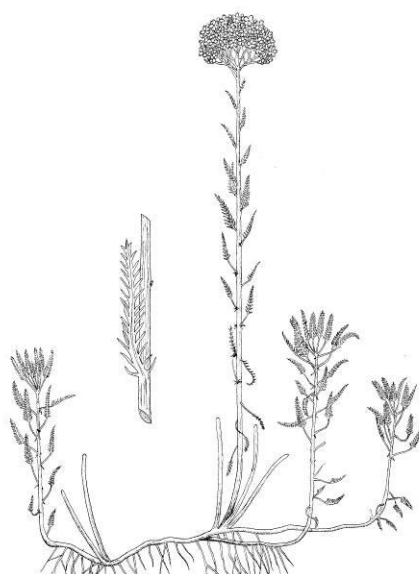


Figure 1. Habitus of *Achillea ochroleuca* Ehrh.

sometimes slightly branched in the upper part, often with leafy branches in the axils of the median stem leaves. Generative stems of 10-50 cm high, with spaced leaves, the lower ones petiolate, the others sessile, auriculate. Vegetative stems of 5-25 cm high, densely leafy, with petiolate leaves. Leaves finely pubescent or almost glabrous, punctate-foveolate, 1-4 linear, pinnately scate, cm long and 2-4.5 mm wide; rachis 1.5-2 mm wide; segments arranged like the teeth of a

comb, linear or subulate-linear, acuminate, 1-4 mm long and 0.4-0.5 mm wide, entire or sometimes 1- or 3-toothed. Median stem leaves sessile, at the base with longer segments, linear-filamentous, slightly amplexicaul. Lower leaves and those from sterile shoots, often upper ones long-petioled, with segments arranged at the base of the rachis and in the top part of the leaf. Anthodia numerous, gathered in compound, dense, convex corymbs. Receptacle flat at flowering, then convex. The involucre is broad-ovoid or ovoid, 3-4 mm long and 2.5-3.5 mm wide, with membranous involucre leaflets, slightly keeled, the outer ones triangular-ovate, the inner ones elongated, obtuse, with a white-membranous margin, at apex sometimes pale-brown. Ligules of marginal flowers pale-yellow, oblong-rounded, two times shorter than the involucre, rounded-3-toothed at the tip. Achene obovoid or almost elipsoid, 1-1.5 mm long and 0.3-0.6 mm wide.

Perennial hemicryptophytic plant. It blooms in May-June, bears fruit in July-August. It is propagated by seeds and vegetatively by dividing the rhizomes and rooting the emergent shoots. Steppic, xerophilous, decorative, medicinal, fodder, tanning plant. Endangered species [Endangered (EN)]. B2b(iii, iv, v) [6-8].

In the Republic of Moldova in the years 1930-50 species was found in the south of the country: Crețoaia village, Anenii Noi district; town Taraclia, Dermengi village, Taraclia district; town Vulcănești, Baurci commune, UTA Găgăuzia; town Cahul, Găvănoasa commune, Cahul district; Troițcoe commune, Cimișlia district. It currently grows near Zolonceni commune, Criuleni district; com. Speia, Anenii Noi district; the village of Ciumai, Taraclia town; Bugeac commune, UTA Gagauzia; Andriașevca Noua village, UATSN; Baurci-Moldoveni commune, Cahul district (Figure 2). It is located at the northern limit of the distributional area, which covers the Balkan Peninsula (north), Middle (center and south-east) and Eastern (south-west) Europe.

It is preserved and protected within the Ponto-Sarmatic steppes – natural reserve of medicinal plants "Bugeac" (Figure 3), in the representative sectors with steppe vegetation "Andriașevca Nouă" and "Ciumai", within the Zolonceni protected area. Included in the Red Book of the Republic of Moldova, 3rd edition as a critically endangered species. Included in the Red List of Romania.

The Ponto-Sarmatic steppes – *62C0 is a dry grassland habitat which is belonging to the Steppic Biogeographical Region of the European continent [2, 4] which has only a small foothold in the European Union, but it develops into a vast band of vegetation that stretches out from the eastern parts of Romania and incorporates the entire region known as Dobrogea over southern parts of Republic of Moldova, Ukraine, Russia and western Kazakhstan. It eventually continues all the way across Asia to the foothills to the Altai Mountains on the border of Mongolia. The region itself is characterized by low-lying plains and undulating hills or plateaus with an average



Figure 3. Fragment of Ponto-Sarmatic steppes in Bugeac steppe (near comm. Bugeac, UTAG).

height of 200-300 meters. The Ponto-Sarmatic steppes display special habitat conditions, due to the various climatic effects and unique biogeographical position. They offer many highly-specialized plant species a valuable habitat and are characterized in general by a high biodiversity. Along with Romania and Ukraine, Republic of Moldova bears responsibility for the preservation of the numerous species of the area, because many of them have their most important range of distribution here or because these steppes is their only home [9, 10, 11, 17-19]. For these reasons the European Union placed the Ponto-Sarmatic steppes on the list of "priority habitats" [4].

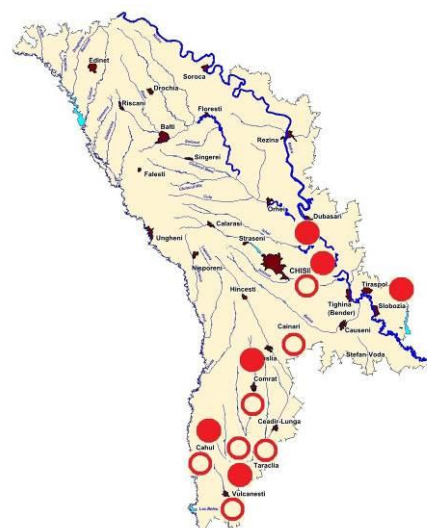


Figure 2. Distribution of *Achillea ochroleuca* Ehrh. in Republic of Moldova

As a result of our research two new locations of *Achillea ochroleuca* within the clearings of the forests of downy oak (*Quercus pubescens* Willd.) – near comm. Speia, Anenii Noi district (Figure 4a) and near comm. Baurci-Moldoveni, Cahul district (Figure 4b).

In the vicinity of the Speia comm. (N 47°00'37.69"; E 29°18'56.90", 33 metres above sea level) it forms numerous groups with an abundance (1-2) of several generative and vegetative specimens on the flat top of the slope. The overall surface of the population is approximately 200 m². It grows as part of the steppe grassland, which is dominated by species of the genus *Stipa* L. (*Stipa lessingiana* Trin., *Stipa pennata* L., *Stipa pulcherrima* K.Koch and *Stipa ucrainica* P.A.Smirn.), *Festuca valesiaca* Gaudin and a significant number of species of steppe vascular plants (*Astragalus varius* S.G.Gmel., *Melica transsilvanica* Schur, *Pleconax conica* (L.) Šourková, *Salvia nutans* L., etc.). Seldom can be met *Bothriochloa ischaemum* (L.) Keng in small spots. In the grassland, together with *Achillea ochroleuca*, grow rare species protected at the national, regional

(included in the Red Books of Romania and Ukraine) and European levels: *Asparagus officinalis* L., *Bellevalia sarmatica* (Pall. ex Georgi) Woronow, *Crambe tataria* Sebeók, *Digitalis lanata* Ehrh., *Goniolimon bessarianum* (Schult.) Kusn, *Hyacinthella leucophaea* (C. Koch) Schur, *Pontechium maculatum* (L.) Böhle et Hilger, *Stipa lessingiana* Trin. et Rupr., *Stipa pennata* L., *Stipa pulcherrima* K.Koch, *Stipa ucrainica* P.A.Smirn., *Veronica euxina* Turrill.

In the glades of the gârnets forest stands in the vicinity of the Baurci-Moldoveni comm. (N 46°02'41.41"; E 28°15'48.53", 182 metres above sea level) species of *Achillea ochroleuca* grows in grater groups than in previous locality, with an abundance of (2-3). The overall surface of the population is approximately 300 m².

The community is dominated by *Festuca valesiaca* Gaudin and species of steppe grasses, characteristic of the primary communities of the Budzhak steppes. In the glades, together with *Achillea ochroleuca*, local populations of rare species protected at the national, regional (included in the Red Books of Romania and Ukraine) and European levels are preserved: *Adonis vernalis* L., *Asparagus officinalis* L., *Dictamnus albus* L., *Doronicum hungaricum* (Sadl.) Rchb.f., *Hyacinthella leucophaea* (C. Koch) Schur, *Iris aphylla* L., *Ornithogalum boucheanum* (Kunth) Asch., *Ornithogalum fimbriatum* Willd., *Ornithogalum refractum* Schlecht., *Pontechium maculatum* (L.) Böhle et Hilger, *Scorzonera mollis* M.Bieb., *Stipa dasyphylla* (Lindem.) Trautv., *Stipa lessingiana* Trin. et Rupr., *Stipa pennata* L., *Stipa pulcherrima* K.Koch, *Stipa ucrainica* P.A.Smirn., *Veronica euxina* Turrill.

In *ex situ* conditions Pale yellow yarrow grows in the Collection of rare vascular plants and in the Collection of medicinal plants of the National Botanical Garden (Institute). The purpose of growing *Achillea ochroleuca* in *ex situ* conditions is the reproduction of plants and obtaining seeds and rhizomes for its subsequent reintroduction in the localities of their origin in the past (where the presence in the present has not been confirmed during field surveys) and in new analogous biotopes, mainly in protected territories.

Conclusions

Pale yellow yarrow assessed as an endangered species in the Republic of Moldova (according to IUCN criteria), grows in Ponto-Sarmatic steppes communities in the central and southern parts of the region in the Republic of Moldova. Two new locations of species occurrence represent valuable areas of habitats valuable from biodiversity point of view. Therefore, we propose to continue further research of these habitats in order to their inclusion into the List of protected areas by law.

Acknowledgments. The research was supported by the subprogram 010101 “Research and *ex situ*, *in situ* conservation of the plant diversity of the Republic of Moldova”.

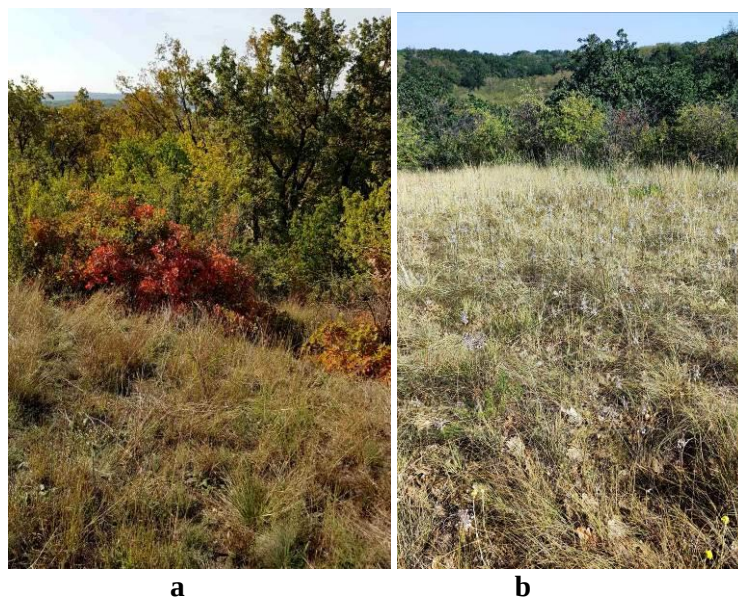


Figure 4. Fragments of Ponto-Sarmatic steppes on the glade of the forests of downy oak: a – near comm. Speia, Anenii Noi district), b – near comm. Baurci-Moldoveni, Cahul district

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