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## ***ECLIPTA PROSTRATA* (L.) L. (ASTERACEAE) – NEW SPECIES FOR THE FLORA OF REPUBLIC OF MOLDOVA**

**Polina CASSIR**

*Scientific reserve „Lower Prut”, Slobozia Mare, Republic of Moldova*

**Tatiana IZVERSCAIA, Veaceslav GHENDOV**

*National Botanical Garden (Institute), Moldova State University, Republic of Moldova*

The article presents data on the new vascular plant species *Eclipta prostrata* (L.) L. (= *Eclipta alba* (L.) Hassk.), belonging to the Asteraceae family, in the spontaneous flora of the Republic of Moldova. Populations of this new species were recorded in the south of the republic, on the territory of the Ramsar site „Lower Prut Lakes”. Synonymy, chorology, stationary characteristics, photographic images, black and white diagnostic illustrations are presented, as well as some useful plant properties.

**Keywords:** *vascular flora, Eclipta prostrata, Ramsar site „Lower Prut Lakes”, Republic of Moldova.*

### **ECLIPTA PROSTRATA (L.) L. (ASTERACEAE) – SPECIE NOUĂ PENTRU FLORA REPUBLICII MOLDOVA**

În articol sunt prezentate date despre noua specie de plante vasculare *Eclipta prostrata* (L.) L. (= *Eclipta alba* (L.) Hassk.), aparținând familiei Asteraceae, în flora spontană a Republicii Moldova. Populațiile acestei specii noi au fost înregistrate în sudul republicii, pe teritoriul sitului Ramsar „Lacurile Prutului de Jos”. Sunt prezentate sinonimia, corologia, caracteristicile staționale, imaginile foto, ilustrațiile diagnostice alb-negru, precum și câteva proprietăți utile ale plantei.

**Cuvinte-cheie:** *flora vasculară, Eclipta prostrata, Situl Ramsar, Lacurile Prutului de Jos”, Republica Moldova.*

#### **Introduction**

The genus *Eclipta* L. is a quite well studied in the most regions of the natural area of its distribution as well as on the territories of where the species of the genus are introduced. It is a genus, whose representatives are distributed mainly in the Northern (generally in central and southern parts) and South America, Africa, as well as Australia. In total, the genus includes (based on the opinions of different authors) from 7 to 11 species: *Eclipta alatocarpa* Melville (native to Australia), *Eclipta elliptica* DC. (South America – Argentina Northeast, Brazil South, Uruguay), *Eclipta leiocarpa* Cuatrec. (South America – Colombia), *Eclipta megapotamica* (Spreng.) Sch.Bip. ex S.F.Blake (South America – Argentina Northeast, Brazil South, Uruguay), *Eclipta paludicola* Steud. (South America – Colombia), *Eclipta platyglossa* F.Muell. (Australia), *Eclipta prostrata* (L.) L. (North and South Americas), *Eclipta procumbens* Michx., *Eclipta punctata* Jacq., *Eclipta pusilla* M.E.Jones and *Eclipta thermalis* Bunge [1]. Some botanists consider the last four species as synonyms of *Eclipta prostrata* (L.) L. [2].

The plants of *Eclipta prostrata* registered and collected in 2022 on the territory of the „Lower Prut Lakes” Ramsar site indicate the first findings of the species for the vascular flora of the Republic of Moldova (Fig. 1).

#### **Material and methods**

The samples of the collected herbaria from the territory of Ramsar site (the voucher specimen has been maintained in the Herbarium of the National Botanical Garden (Institute) of the Moldova State University), were critically processed in laboratory conditions using specific regional floras [3-7]. The nomenclature of the species is given in accordance with the modern nomenclature [7, 8].

The general distribution map is cited from the Royal Botanic Gardens, Kew [2]. Confinement to biotopes in the territories of natural growth and in regions where the plant is introduced is given on the basis of literature data [3-7, 11]. The descriptions of plant communities on the site were made according to the



Fig. 1. *Eclipta prostrata* (L.) L. – herbarium sample.



Fig. 2. *Eclipta prostrata* (L.) L.: a – flowering branch, b – stem leaf, c – inflorescence, d – palea, e – bisexual floret, f – ray floret, g – achene.

generally accepted method [9]. The rarity of species in the Republic of Moldova is assessed by the IUCN categories and criteria [10]. The drawings were made by Leca Petru.

### Results and Discussions

During the floristic survey (in 2022) of the „Lower Prut Lakes” Ramsar site territory (carried out within the framework of the project „Research and conservation of vascular flora and macromycobiota of the Republic of Moldova”), in order to investigate the state of rare species of vascular plants, the herbarium samples of the genus *Eclipta* L. were collected. These samples were identified as *Eclipta prostrata* (L.) L. (Fig. 2).

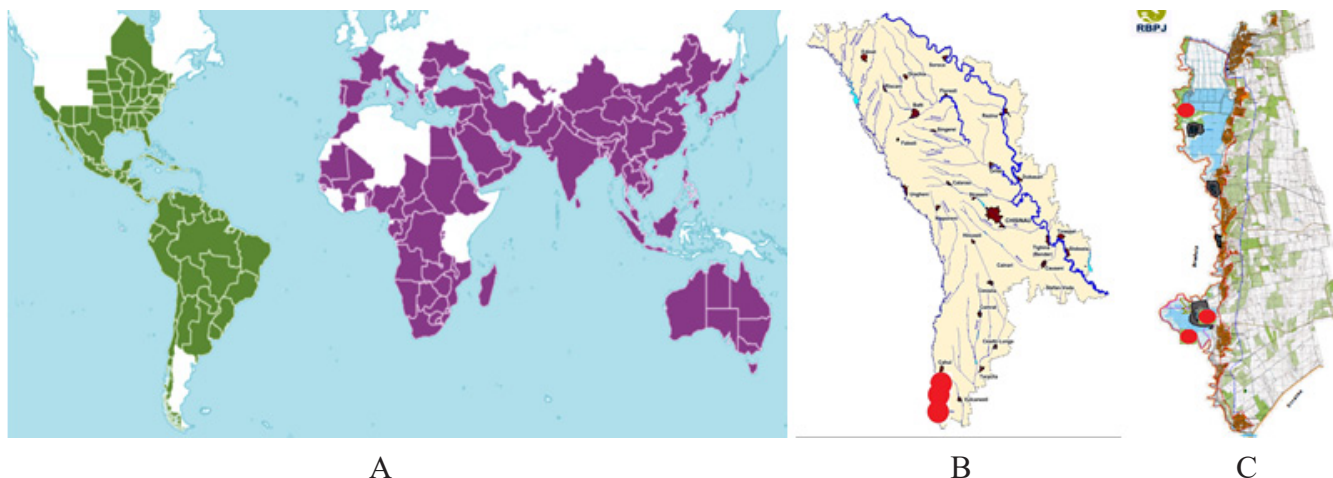
*Eclipta prostrata* (L.) L. 1771, Mantissa Alt.: 286. (synonyms: *Verbesina prostrata* L. 1753, Sp. Pl. 2: 902; *Cotula prostrata* (L.) L. 1767, in Syst. Nat., ed. 12, 2: 564; *Eleutheranthera prostrata* (L.) Sch.Bip. 1866, Bot. Zeitung (Berlin), 24: 239; *Eclipta alba* f. *prostrata* (L.) Hassk. 1848, Pl. Jav. Rar.: 530). – Ecliptă prostrată – Eclipta (false daisy, ink plant, tattoo plant) – Эклипта распростёртая.

Herbs, annual or perennial, highly variable species (Fig. 2). Stems succulent, erect, ascending or prostrate, up to 60 (-100) cm tall, strigose-pilose, branched at base, slightly swollen below nodes and rooting at the nodes. Leaves opposite, lanceolate, sessile or shortly petiolate, 3-10 cm long and 0,5-2,5 cm wide, papery, densely strigose-pubescent on both surfaces, with narrowed base, margin serrulate, apex gradually acuminate. Capitulate inflorescence terminal or axillary. Capitula circa 5 mm long and 6 mm wide, enlarging to 11 mm wide in fruit; peduncle slender, of 2-4,5 cm long; involucre globose-campanulate; phyllaries 5 or 6, 2-seriate, oblong, acute, outer longer than the inner. Ray florets 2-seriate, white, with lamina 2,5-3 mm long and circa 0,4 mm wide, bifid or entire. Disk florets many, tubular; corolla circa 1,5 mm long, 4-lobed. Achenes bilateral compressed, circa 2,8 mm long and 1,5 mm wide, with ribbed margin. Flowers in June-September.

The native distributional range covers the North, Central and South America. The species has been introduced to Europe, where is considered naturalized (Mediterranean region, central (Romania) and southeastern (Republic of Moldova, Ukraine) parts), Asia (widely distributed throughout India, China, Taiwan, Thailand), Africa, Australia and Pacific islands (Fig. 3a). *Eclipta* generally occurs from spring to fall. It germinates over a wide range of pH, salt, and temperature conditions and preferentially germinates when the seed is on or near the soil or media surface. *Eclipta* germination is greater in warm, moist soils and as a result it typically occurs in poorly drained fields, irrigated areas, or during periods of heavy rainfall.

Plants can flower in as little as five weeks after germination and produce seeds with no dormancy within 6 to 7 weeks that germinate quickly. *Eclipta* can also reproduce vegetatively through adventitious rooting of nodes or from stem fragments left on the soil [7].

**Fig. 3. *Eclipta prostrata* (L.) L. distribution: a – worldwide, b – in the Republic of Moldova, c – in „Lower Prut Lakes” Ramsar site.**



The populations of *Eclipta prostrata* in the Ramsar site area are known from 3 localities – the border between the Crihana Veche commune and the Manta commune, the Manolescu canal in plot 4, in the commune of Slobozia Mare and the shore of Lake Belevu in the water (plot 7) (Fig. 3b, 3c). At the same time, in 2022, the species was reported from the territory of a neighboring state, in Romania – Ialomița county to the east of the commune Vlașca (detection date of the species 16<sup>th</sup> September 2022, where it grows on the banks of the Danube (Borcea branch) [11].

Throughout its general range it occurs in wet meadows, in shallow waters, often a weed on roadsides. The species habit is greatly influenced by the habitats in which the plants grow. In the Republic of Moldova, it grows in the floodplain of the Prut River along damp banks as part of periodically flooded meadows and in the shallow waters of Lake Belevu, as well as canals Gârloiu and Manolescu. The habitat represents damp biotopes on the banks, among shrubs of species of the genus *Salix* L., forms small thickets of 2 x 2 m<sup>2</sup>, among meadow grassland, represented by hygrophytes and mesohygrophytes: *Alisma plantago-aquatica* L., *Alopecurus aequalis* Sobol., *Bidens cernua* L., *Bolboschoenus maritimus* (L.) Palla, *Catabrosa aquatica* (L.) P.Beauv, *Eleocharis palustris* (L.) Roem. et Schult., *Glyceria arundinacea* Kunth, *Lythrum salicaria* L., *Oenanthe aquatica* (L.) Poir., *Persicaria amphibia* (L.) Delarbre, *Persicaria hydropiper* (L.) Delarbre, *Phalaroides arundinacea* (L.) Rauschert, *Phragmites australis* (Cav.) Trin. ex Steud., *Ranunculus sceleratus* L., *Rorippa amphibia* (L.) Besser, *Scirpus tabernaemontani* C.C.Gmel., *Stachys palustris* L., *Typha latifolia* L., *Veronica anagallis-aquatica* L., *Veronica anagalloides* Guss. etc. The plant was registered in patches, in the vegetal association dominates with abundance 3-4. Solitary specimens grow scattered in water nearby (Fig. 4).

**Fig. 4. Habitat (water edge) and plants of *Eclipta prostrata* (L.) L. from the Ramsar site „Lower Prut Lakes”.**





According to the IUCN criteria, the *Eclipta* in the local flora is categorized as a critically endangered species (category Critically Endangered – CR, A4ce; B2ab (ii, iii); C2a; D), based on the fact that the species occurs in very few localities in the country and forms a small local population, although the ability of its area of expansion in the foreseeable future is high.

Usage: The plant has a folk reputation in Taiwan as a remedy for the treatment of bleeding, hemoptysis and itching, hepatitis, diphtheria and diarrhea. Stigmasterol, caffeic acid and wedelolactone have been determined as markers of *E. prostrata*. Methanol extracts from *E. prostrata* have been used to treat jaundice, leishmaniasis [12], mouse osteoblast differentiation [13] and hepatic stellate cell proliferation [14]. Water extract of *E. prostrata* showed a significant reduction in total cholesterol, triglyceride, total protein, and elevation in high-density lipoprotein cholesterol concentrations [15-16]. The extract is reported to suppress maternal aggression [17]. The whole plant is used for: diarrhea, jaundice, rice-fields dermatitis, eczema, ulcers, wound bleeding; plant juice with ginger given in indigestion; plant juice applied over wounds and cuts; plant infusion given as wash in ulcers of venereal diseases, also ash of dry plants is applied; aerial parts have antibiotic, tonic, emetic, hemostatic, aphrodisiac, anthelmintic, antimyotoxic and antihemorrhagic properties. The aqueous extract mixed with black pepper and sugar taken in body inflammation. Roots – purgative, antiseptic and emetic; pounded roots applied on septic wounds. Leaves of *Eclipta prostrata* used for liver problems, jaundice and gastrointestinal disorders; leaves paste with mustard oil applied to forehead for headache; leaves crushed and applied on foot cracks, wounds and sores between toes; fresh leaves juice antiinflammatory, hepatic stimulant, used in eczema, skin diseases, ulcers, wounds, sores, scorpion stings. Seeds tonic for promoting sexual desire and improving semen quality. In veterinary medicine – leaf juice used in swelling of ears of cattle; antiseptic pounded roots applied on septic wounds and ulcers [18].

### Conclusions

For the first time for the territory of the Republic of Moldova, *Eclipta prostrata* (L.) L. is reported, found during field surveys of meadow communities on the territory of the „Lower Prutul Lakes” Ramsar site in 2022. In the only growing place known in the region, it forms an extremely small populations, represented by several adult fruit-bearing specimens. The species, at present, is rare although the ability of its area of expansion in the foreseeable future is high. A „zero” level of long-term monitoring has been laid.

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**Date about author:**

**Polina CASSIR**, botanist, Scientific reserve „Lower Prut”, Slobozia Mare, Republic of Moldova.

**E-mail:** [cassirpolina@gmail.com](mailto:cassirpolina@gmail.com)

**ORCID:** 0000-0003-1434-080X

**Tatiana IZVERSCAIA**, PhD in Biology, leading scientific researcher, National Botanical Garden (Institute) „Al. Ciubotaru”.

**E-mail:** [t\\_izverskaya@mail.ru](mailto:t_izverskaya@mail.ru)

**ORCID:** 0009-0003-8530-0140

**Veaceslav GHENDOV**, PhD in Biology, leading scientific researcher, National Botanical Garden (Institute) „Al. Ciubotaru”.

**E-mail:** [v\\_ghendov@mail.ru](mailto:v_ghendov@mail.ru)

**ORCID:** 0000-0001-6405-3935

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