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***Lathyrus palustris* – a newly discovered species in Slovenia**

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Running title: *LATHYRUS PALUSTRIS* IN SLOVENIA

Abstract – A conspicuous wetland species, *Lathyrus palustris* L. with Holarctic distribution has been discovered as new for the flora of Slovenia, although the wetland flora and vegetation of the country is relatively well studied. We recorded the species in the area of the intermittent Lake Cerknica, growing in different herbaceous wetland plant communities. The ecology fits the data from the surrounding regions. Our finding fills an important gap in the distribution area between Southeastern and Central Europe, where the species' rarity has resulted in it being declared endangered and accordingly protected.

Keywords: flora, Lake Cerknica, new records, wetlands

Introduction

The species *Lathyrus palustris* L. is included in the *Orobanchaceae* section of the genus *Lathyrus* (Kenicer et al. 2005). It is widespread with a Holarctic distribution (Kenicer et al. 2005) and was reported from every country neighboring Slovenia (Fischer et al. 2008, Barthä et al. 2015, Bartolucci et al. 2018, Nikolić 2020). The species is not mentioned in any of the identification keys for the Slovenian flora (Piskernik 1951, Martinčič et al. 2007 and previous versions of Mala flora Slovenije) but it was, however, included in the list of vascular plants of the Slovenian ethnic territory (which is larger than defined by the current political borders) in Mayer (1952). The only mention of the species for Slovenia was in a local vegetation paper by Gaži and Dubravec (1978), which seems to have been overlooked subsequently. The species was reported from Vojnik near Celje without a specific location, occurring in one vegetation relevé in a community dominated by *Scirpus sylvaticus* L. No further information or evidence is available to confirm the record.

The species is characterized by a narrowly winged stem, leaves with usually (two to) three pairs of leaflets, a tendril, and 2–6 pink flowers in the inflorescence (Fig. 1, On-line Suppl. Fig. 1, On-line Suppl. Fig. 2) (Fischer et al. 2008, Nikolić 2020). These characters distinguish it from other similar pink-flowered species.



Fig. 1. A specimen of *Lathyrus palustris* from Lake Cerknica collected on 7th June, 2023, stored in the LJS herbarium collection (ID 13137).

L. palustris L. is a wetland species. According to Mucina et al. (2016), it is characteristic of three phytosociological classes: *Alnetea glutinosae* Br.-Bl. et Tx. ex Westhoff et al. 1946 (European mesotrophic regularly flooded alder carr and birch wooded mires), *Phragmito-Magnocaricetea* Klika in Klika et Novák 1941 (Reed swamp, sedge bed and herbland vegetation of freshwater or brackish water bodies and streams of Eurasia), and *Molinio-Arrhenatheretea* Tx. 1937 (Anthropogenic managed pastures, meadows and tall-herb meadow fringes on fertile deep soils at low and mid-altitudes (rarely also high altitudes) of Europe).

In the paper, we report on the first documented findings of the species for the territory of Slovenia, report on its ecology, and discuss its distribution and conservation status in the wider region.

Material and methods

Lake Cerknica (SW Slovenia) is one of the largest intermittent lakes in Europe, occurring on a typical karst polje (plain), 26 km² of the area being inundated at high flooding levels. Different parts of the plain experience different depths and periods of flooding, resulting in a variety of wetland plant communities.

The study is a result of i) intensive field vegetation recording (over 150 relevés in 2022–2023) for the purpose of a monitoring survey of donor and recipient plots for the LIFE for Seeds project (LIFE20 NAT/SI/000253), and ii) *Allium suaveolens* Jacq. population monitoring (2024) in the Lake Cerknica area. The vegetation relevés were made according to the Braun-Blanquet approach using the modified abundance scale (+ – 5) (Westhoff and van der Maarel 1978), in plot sizes of 5 × 5 m. All occurrences of the species were found by chance.

We identified the unknown species as *L. palustris* using the identification manuals Fischer et al. (2008) and Nikolić (2020). To ascertain whether it has been reported for Slovenia, we checked Google Scholar, Hladnikia journal, and the basic floristic publications for the territory of Slovenia (Mayer 1952, Trpin and Vreš 1995, Jogan et al. 2001, Bakan 2006, Martinčič et al. 2007, Anderle 2023). We also checked herbarium specimens in the Herbarium of the University of Ljubljana (LJU) and the Herbarium of the Jovan Hadži Institute of Biology ZRC SAZU (LJS) herbaria (Thiers 2025) for any misidentifications, stored under the following names: *L. hirsutus* L., *L. latifolius* L., *L. linifolius* (Reichard) Bässler, *L. membranaceus* C. Presl., *L. sylvestris* L., and *L. tuberosus* L.

We compared the specimens we collected in the field with photos of herbarium specimens from Virtual herbaria (JACQ Consortium) and with two specimens from the Herbarium of the University of Zagreb (ZA).

Results and discussion

We found the individuals of *Lathyrus palustris* in eight sites in the area of the intermittent Lake Cerknica, that can be spatially grouped into three clusters (On-line Suppl. Fig. 3, On-line Suppl. Tab. 2). The habitats are different wetland communities, i.e. tall sedge-dominated beds, *Molinia caerulea* meadows, and *Schoenus ferrugineus*-dominated fens. We made two vegetation relevés with present *L. palustris* (On-line Suppl. Tab. 1).

No specimens examined in the herbaria LJU and LJS corresponded to *L. palustris*. Specimens collected at the two sites where the two vegetation relevés were made are stored in the LJS herbarium under IDs 12621 and 13137 (Fig. 1, On-line Suppl. Tab. 2).

The vegetation and flora of wetland habitats in Slovenia have been relatively well studied, including the area of the intermittent Lake Cerknica; however, the species *L. palustris* is not mentioned or listed in the publications. In the Balkans and the wider neighborhood, the species is rare, corresponding to the edge of its area of distribution. It has recently been (re)discovered for Bulgaria (Hájek et al. 2006), and confirmed for North Macedonia (Teofilovski 2018) in a basophilic fen and a sedge bed. In accordance with its rarity, it is often assessed as threatened: in Austria as Endangered with decline (Schratt-Ehrendorfer et al. 2022), in Croatia as Data Deficient (Nikolić and Topić 2005), in Italy as Endangered (Orsenigo et al. 2021), and in Hungary it is Near Threatened (Barina et al. 2007). Globally, the species is considered Least Concern (Rowe and Kavak 2019).

The species is protected in the following countries: Croatia (strictly protected) (Anonymous 2016), Hungary (Anonymous 2012), Austrian Carinthia (Anonymous 2007a) but not in Austrian Styria (Anonymous 2007b) or Italy (Anonymous 2013). As the species has not been recorded in Slovenian territory, it is not protected. Still, due to several locations found in a span of only a couple of years since the discovery, we can expect the species to be present in even more localities in the area of Lake Cerknica, possibly also in other regions. Nevertheless, it is unlikely to be widespread and common in the country, and additional attention to this conspicuous species in the future years will enable us to assess its conservation status.

Here, we also propose that the species be named “močvirski grahor” in Slovenian, following the established Slovenian name for the majority of species in the genus *Lathyrus* “grahor” with the adjective “močvirski” being the translation from Latin “palustris” and from

names in other languages (Croatian “močvarna” graholika (Nikolić 2020), and English “Marsh” Pea (Rowe and Kavak 2019)).

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Author contribution statement

F.K. conceived and wrote the manuscript; all authors recorded and identified the species in the field; all authors critically revised and approved the manuscript.

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