Botanica SERBICA 36 (2): (2012) 85-89

Original Scientific Paper

Liparis loeselii (L.) Rich. – a plant rediscovered in the Balkan peninsula

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ABSTRACT: The species *Liparis loeselii* (L.) Rich. is a very rare declining species throughout its distribution. In the Balkan Peninsula it has the status of a regionally extinct species, with its latest record in Tundzha Hilly Country in Bulgaria from 1995. During our latest investigations in Livanjsko polje (Bosnia and Herzegovina) this orchid was rediscovered in a numerous population in a small surface area. The nearest certain localities are located in Slovenia, ca. 255 km to the northwest of the new locality. The new status of this endangered species in Bosnia and Herzegovina as Critically Endangered species (CR) is proposed.

Key words: *Liparis loeselii*, new record, endangered species, Balkan Peninsula, Bosnia and Herzegovina, Livanjsko polje

Received 12 July 2012 Revision accepted 27 July 2012

UDK

INTRODUCTION

The genus *Liparis* has a cosmopolitan distribution with 426 recognized taxons at the species rank (WCSP 2012). It belongs to the family *Orchidaceae*, subfamily *Epidendrodidae* and Tribus *Malaxidae* (Pridgeon *et al.* 2005). Only one species grows in Europe: *Liparis loeselii* (L.) Rich, the fen orchid, generally restricted to mainly warm temperate zones and mountain regions southwards (Hulten & Fries 1986). It is a small glabrous orchid, with two elliptic pseudobulbs joined by a short horizontal stolon. It has a stem 6-20 cm, with two subopposite, acute, oblong-elliptical leaves. Flowers are small, yellowish-green, 3-8(-18) in a lax spike on the top. A spur is absent, with a labellum equalling the outer perianth segments. 2n=32 (Moore 1980).

General distribution: The plant is distributed in North America and Eurasia, from south Wales to central Asian Russia (Meusel *et al.* 1965). In the USA it is rare in the west (Washington, Montana) and more common in central and east parts (North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Wisconsin, Iowa, Michigan, Illinois, Indiana, Missouri, Arkansas, Ohio, West Virginia, New York, Pennsylvania, Maine, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island, New Jersey, Delaware, Maryland, Virginia, North Carolina, Kentucky, Tennessee, Alabama and Washington D.C.). In Canada it is recorded from: British Columbia, Northwest Territories, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Nova Scotia, PEI and Newfoundland & Labrador. In Europe it has been registered in: Austria, Belgium, Great Britain, Bulgaria (extinct), Czech Republic, Slovakia, Denmark, France, Germany, Switzerland, Netherlands, Hungary, Italy, Bosnia and Herzegovina (extinct), Slovenia, Norway, Finland, Poland, Romania, Russia and Sweden. In Asia it has been registered only from several localities in Siberia (map 1).

Habitat: This species mainly occupies two types of habitat: dunes slacks on the coast of North America and north Europe and neutral to alkaline fens in plains and mountains (Pillon *et al.* 2007). According to the EUNIS classification, *Liparis loeseli* occurs also in other habitat types: periodically inundated shores with pioneer and ephemeral vegetation, water-fringing reed-beds and

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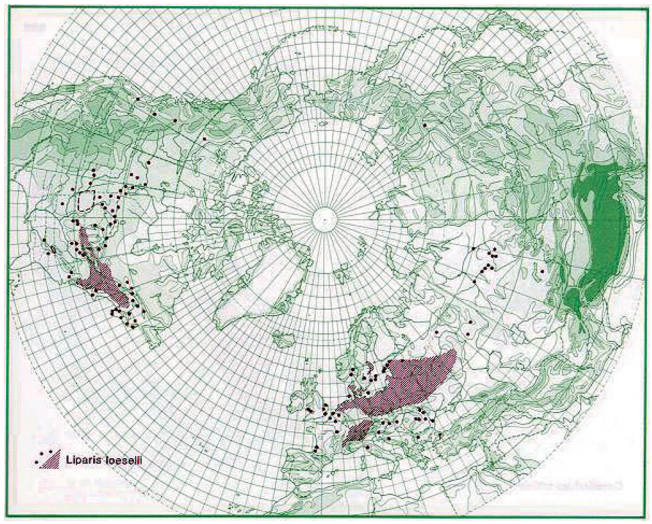


Map 1. Distribution of *Liparis loeselii* in the World, according to Meusel et al. 1965

tall helophytes other than canes and different types of wet grasslands (http://eunis.eea.eu.int). This helophytic species has a pioneer character in overgrowing open swamp habitats. According to this, the main reason for its disappearance in non-human impacted habitats is natural succession of vegetation, which causes a higher density of cover and more shade.

HISTORY OF INVESTIGATIONS IN THE BALKANS

Bosnia and Herzegovina: In B&H territory this species was discovered by Austrian botanist Wetchky G. M. in 1905. during an excursion in Bosnia within the Botanical Congress in Wien. As guests of the former curator of the State Museum in Bosnia and Herzegovina, ornithologist Otto Reiser, botanists spent 04.06.1905 around an unknown lake near the locality of Jezero near Jajce. Whilst there, Wetchky found the rare species *Liparis loeselii* (Maly 1905). This botanist donated a herbarium specimen to the State Museum one year later and that specimen was included in the biggest Herbarium in B&H (Anonymous 1906). This record is, until now, the only known location of this orchid in Bosnia and Herzegovina.

During the 70s and 80s of the last century, under the guidance of the curator of the State Museum, Čedomil Šilić, there were several botanical excursions to Jezero with the main goal to find this plant species. However, due to habitat degradation caused by raising the water level for a newly-constructed reservoir on the Pliva lake, it was concluded that this orchid doesn't grow any more at this locality (personal statement by Čedomil Šilić). As a result of those investigations, *Liparis loeselii* was given the status of a regionally extinct species in B&H (Šilić 1992-1995).

Croatia: In Croatia *Liparis loeselii* has the status of an insufficiently known species (Data deficient - DD) (Nikolić & Topić 2005). Namely, this species is included in the survey of flora Croatica (Nikolić 2000) based on only one specimen in the Herbarium Croaticum, collected from Slovenia (montis Rožnik, Labacensis, Carniolia).

Bulgaria: In Bulgaria the species was first recorded in the 19th century somewhere in the Sofia region, but without the exact locality. After that, the species was confirmed in the Valley of the Struma river (Southern – Kodzha Orman locality at Belasitsa Mt foothills) (Stojanov & Achtarov1951) and Tundzha Hilly Country (Gabarevo village, Stara Zagora district, Elaka locality) in 1994 and 1995 (Trifonov 2009). At the first locality this orchid was destroyed because of development of agricultural land in the area and construction of drainage channels (Petrova & Vladimirov 2009). It was recorded by Trifonov at the latter locality as only three specimens (one on 23.05.1994 and two specimens at the end of May 1995). The same population was the object of numerous subsequent excursions, but the researcher did not find it any more (Trifonov 2009).

Romania: *Liparis loeselii* is an endangered plant in Romania. It is distributed in the Carpathian Massif in Central Romania (Witkowski 2003; Dihoru & Negrean 2009) and Dobrodgea in the Delta Danube region (Hayek 1931), which belongs to the Balkan Peninsula area. The first time the species was registered in the Danube Delta was by A. Kanitz in 1881 (Kanitz 1879-1881) somewhere in the Tulcea region, but without an exact locality. Later, the species was recorded by Rudescu in 1965 near Sf. Gheorghe (Rudescu *et al.* 1965). During the last 57 years the species has not been confirmed in the Danube Delta region and has the status of a regionally extinct species (Extinct?) (Romulus 2010; Sarbu *et al.* 2006).

All these data are shown in the UTM 10x10 km revised map of the Balkan Peninsula (map 2). The boundaries of the Balkans are given according to Turrill's boundaries (Turrill 1929). Data outside the Balkan boundaries are given according to Seliškar (2004) for Slovenia and Dihoru & Negrean (2009) for Romania.

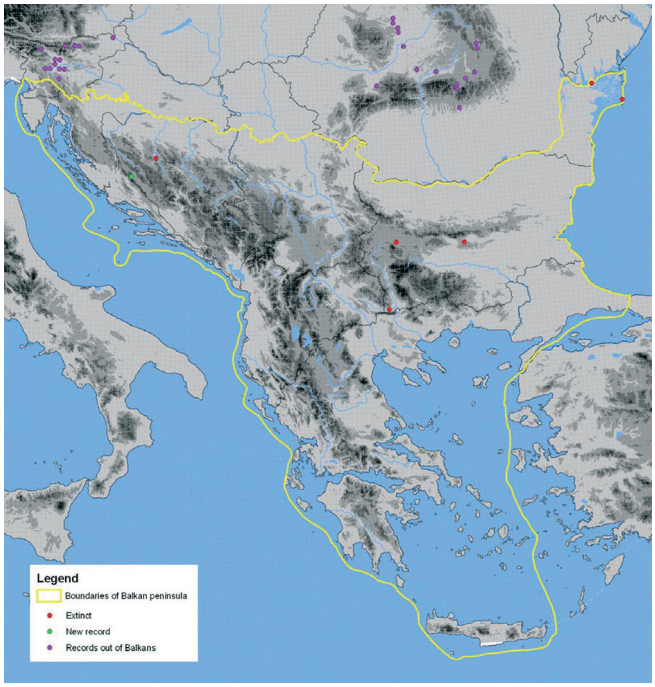
RESULTS AND DISCUSSION

During our latest research in Livanjsko polje in Bosnia, a new locality of *L. loeselii* was discovered. It was growing on the edge of a *Phragmites* bed near the village of Gornji Kazanci in turfs of the moss *Philonotis calcarea*. The geographical location in the Balkans is shown on map 2, and a more precise location on map 3.

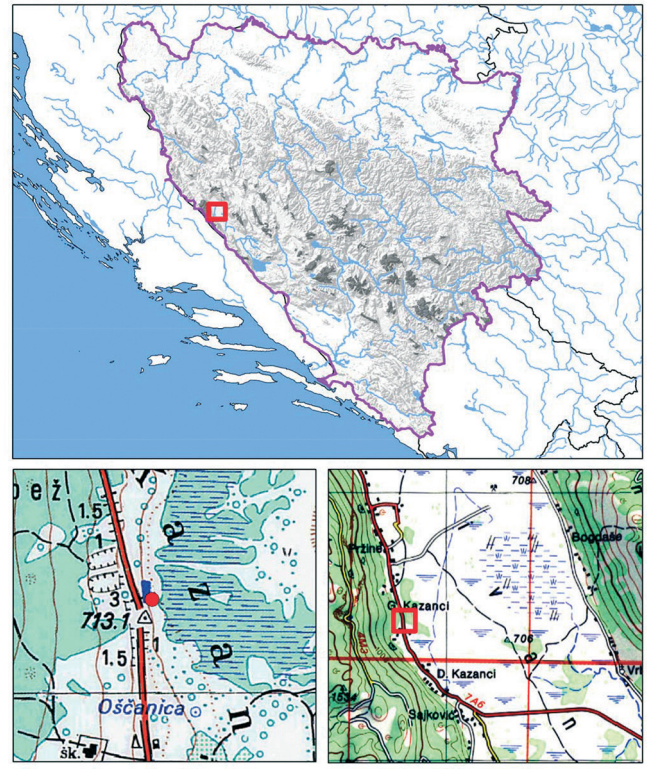
This small orchid (fig. 1) grows here in the community with vascular plants: *Phragmites australis, Carex acutiformis, Equisetum palustre, Epipactis palustris, Juncus articulatus, Eupatorium cannabinum, Eriophorum*

Fig. 1. *Liparis loeselii* in the Livanjsko polje (photo: Đ. Milanović)

Fig 2. Habitat of *Liparis loeselii* near to Kazanci in Livanjsko polje (Photo: Đ. Milanović)



Map. 2. General view of earlier distribution of *Liparis loeselii* in Balkans. New record is indicated by green.



Map 3. Geographical location of the new record in Bosnia and Herzegovina

latifolium, Mentha aquatica and *Pinguicula vulgaris* (fig. 2). In the transition of surrounding limestone slopes to swamp planes of the Polje there is a short penetration of dolomite substrate. At the contact surface of limestone and dolomite substrates there are many small springs from which water trickles down the slope and makes the edge of the reed constantly wet. In those conditions the moss *Philonotis calcarea* makes permanently wet turfs where the fen orchid has optimal conditions for its development. In this zone, tall plants such as reed and sedge don't make a dense cover, which is what *L. loeselii* favours. It was registered as more than 150 fertile specimens and ca. 50 vegetative plants.

On this site there has been a strong influence of man. There are visible traces of vegetation burning and cleaning, especially near to the sources, but not in high intensity. Such fire intensity and constant influx of water causes only burning of the vegetation surface, while dense turfs of moss are still extremely wet and prevent further fire progress deep into the root zone of fen orchid. In that way, according to its pioneer character, man has accidentally created the conditions for survival of *L. loeselii*.

The fen orchid, *L. loeselii*, is a declining species throughout its distribution. It has disappeared from many natural habitats in the world. The species is protected in most European countries where it occurs and is listed

in Annex II of the European directive 92/43/EEC for conservation of natural habitats and of wild fauna and flora. There are many action plans for its protection in many countries of the world: USA, Canada, Great Britain, Switzerland, Poland etc. It is registered as an endangered species in European countries: Austria (EN), Bosnia and Herzegovina (RE), Bulgaria (RE), Croatia (DD), Denmark (CR), Finland (EN), Great Britain (EN), Germany (??), Italy (EN), Lithuania (EN), Slovakia (CR), Slovenia (EN), Sweden (CR), Poland (VU), France (VU), Russia (категория 3), Belarus (??), Switzerland (VU), Czech Republic (CR), Hungary (CR), Ukraine (EN) and Romania (CR). Monitoring has been established in only three European countries: Poland, Great Britain and Switzerland (Kull *et al.* 2008).

In Bosnia and Herzegovina it has the status of a regionally extinct species (RE=Ex) (Šilić 1992-1995). According to this new record its status is changing. Because of the very small area of occupancy, less than 300 m^2 at only a single location, and extreme fluctuations in the number of mature individuals, which is a characteristic phenomenon for orchids, the new conservation status Critically Endangered (CR) is proposed in Bosnia and Herzegovina.

CONCLUSION

The fen orchid, *L. loeselii*, is recorded in one new locality in Livanjsko polje in Bosnia and Herzegovina. In this country it had been registered from only a single site near Jajce in 1905. As the plant is considered as regionally extinct from the Balkan Peninsula, this record is important for knowledge of its distribution in Europe. This new locality lies ca. 255 km southeast of the nearest known locality in Slovenia and is the southernmost point of its distribution in Europe.

In this paper we propose changing its conservation status in Bosnia and Herzegovina. According to the IUCN categorization (IUCN, 2001) it has the status of Critically Endangered species (CR) in this country.

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Botanica SERBICA

REZIME

Liparis loeselii (L.) Rich. - ponovo otkrivena vrsta na Balkanskom poluostrvu

Đorđije Milanović

Liparis loeselii (L.) Rich. je retka vrsta u svetu, čija brojnost opada duž njenog cijelog areala. Na Balkanskom poluostrvu ima status regionalno iščezle vrste, sa posljednjim potvrđenim lokalitetom iz Bugarske, 1995. godine. Tokom posljednjih istraživanja u Livanjskom polju (Bosna i Hercegovina) ustanovljena je brojna populacija ove vrste na vrlo ograničenom lokalitetu. Najbliža poznata nalazišta iz Slovenije udaljena su oko 255 km sjeverozapadno. U radu je predložen novi status vrste: kritično ugrožena (CR) na teritoriji Bosne i Hercegovine.

Ključne reči: *Liparis loeselii*, novi nalaz, ugrožene vrste, Balkansko poluostrvo, Bosna i Hercegovina, Livanjsko polje