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FIRST RECORD OF THE RARE MYCO-HETEROTROPHIC ORCHID *EPIPOGIUM APHYLLUM* SWARTZ ON MT VELEBIT (CROATIA)

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The rare myco-heterotrophic orchid *Epipogium aphyllum* Swartz was recorded on Mt Velebit for the first time. It was found in beech and fir dominated primeval forest (ass. *Omphalodo-Fagetum*) in Klepina duliba. After Mt Medvednica, Plitvička jezera and Samoborsko gorje, this is the fourth record of that species in Croatia in the last eighty years.

Key words: *Epipogium aphyllum*, myco-heterotrophic orchid, Velebit, Croatia

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Rijetka mikoheterotrofna orhideja bezlisni nadbradac *Epipogium aphyllum* Swartz pronađena je po prvi put na Velebitu. Zabilježena je u bukovo-jelovoj prašumi (as. *Omphalodo-Fagetum*) u Klepinoj dulibi. Uz Medvednicu, Plitvička jezera i Samoborsko gorje ovo je četvrto nalazište vrste u Hrvatskoj u posljednjih osamdeset godina.

Ključne riječi: *Epipogium aphyllum*, mikoheterotrofna orhideja, Velebit, Hrvatska

INTRODUCTION

Most European orchids are autotrophic, however few are myco-heterotrophic, feeding on decomposing organic substances acquired from fungi. This feature is known in the genera *Epipogium* R. Br. and *Neottia* Ludwig, which are completely devoid of chlorophyll, and *Limodorum* Boehmer and *Corallorhiza* Châtel., which retain a little of it (DELFORGE, 2006). However, certain autotrophic species occasionally

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lack chlorophyll, subsisting on decomposed material by using mycorrhyza. This way of functioning, termed hemi-saprophytism, is sometimes found in the genera *Cephalanthera* L.C.M. Richard and *Epipactis* Zinn, where albinism has only been reported exceptionally (DELFORGE, 2006). Furthermore, several other orchid species, such as *Goodyera repens* (L.) R. Br. and *Listera cordata* (L.) R. Br. are sometimes deemed hemi-saprophytic (STEVANOVIĆ & JANKOVIĆ, 2001).

In Croatian flora, four mycoheterotropic, i.e. saprophytic orchid species are known. While *Limodorum abortivum* (L.) Swartz, *Neottia nidus-avis* (L.) L.C.M. Richard and *Corallorhiza trifida* Châtel. are rather common species, *Epipogium aphyllum* Swartz is one of the rarest orchid species in Croatia.

The genus *Epipogium* is composed of few species, of which only *E. aphyllum* has Eurosibirian distribution (LAUBER & WAGNER, 1998, LANDOLT, 2010). *E. aphyllum* (syn. *Satyrium epipogium* L., *Epipogium gmelinii* L.C.M. Richard) is a temperate-boreal species (BAUMANN *et al*., 2006) growing in Northern (Scandinavia, Russia) and Central Europe, extending southwards in the mountains to the Pyrenees, Central Apennines, North-Western Greece and Crimea (MOORE, 1980). It is common in montane and subalpine beech (*Fagus sylvatica*), fir (*Abies alba*) and spruce (*Picea abies*) dominated forests with high air humidity and organic and base rich substrates, reaching up to 1900 m a.s.l. (BAUMANN *et al*., 2006).

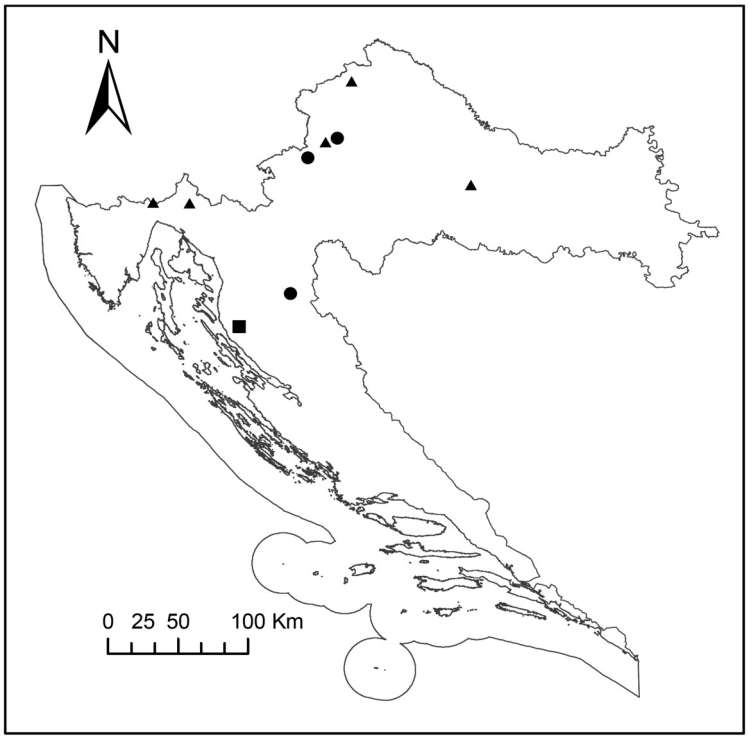

Fig. 1. Distribution of *Epipogium aphyllum* Swartz in Croatia. ▲ – findings from 1861 to 1930; ● – findings from 1930 to 2011; ■ – finding site Mt Velebit

RESULTS AND DISCUSSION

Although known from several localities mentioned in old botanical literature, findings of *Epipogium aphyllum* in Croatia in the last 80 years have been very rare (Fig. 1.). Probably the first finding of this species belongs to KLINGGRÄFF (1861) who recorded it on Mt Medvednica near Zagreb, where he found it rare (»*rara ad St. Jacobum*«). On the same mountain this species was found by SCHLOSSER & VUKOTINOVIĆ (1869), who, moreover, found it further to the East (Daruvar in Slavonija region) and North (Mađarevo in Hrvatsko zagorje region). Their findings from Medvednica are supported by two herbarium specimens, collected in 1854 and deposited in ZA. In addition, the species was recorded again on Medvednica by FORENBACHER (1908). Furthermore, the species was found in the mountains of the western part of the Croatia – on Risnjak (Hirc, 1899; 1905) and Ćićarija (POSPICHAL, 1897; ROSSI, 1930). After 1930 records of *E. aphyllum* in Croatia were scarce. It was confirmed again for Medvednica by KRANJČEV (2005), and newly found in the Plitvička jezera National Park (KRGA, 1992) and Samoborsko gorje (RANDIĆ, 1999).

On July 25 2011, during research into the primeval forest of Klepina duliba (Štirovača Forest, Northern Velebit) the species was noticed within beech and fir dominated forest (ass. *Omphalodo – Fagetum* (Tregubov 1957) Martinček *et al*. 1993) (Fig. 2). The Gaus Krueger coordinates of the finding site are 5548881 and 4972557.

Fig. 2. *Epipogium aphyllum* Swartz; Klepina duliba, Štirovača, Northern Velebit (photo: V. Šegota)

Plants in a large cluster, containing approximately ten erect aerial stems, developing from auxiliary bulbils on the underground stolons, were noticed close to the long-decaying fir bole. Since *Epipogium aphyllum* is rare and strictly protected by law, it was not collected for the herbarium, but only photographed.

The small population of *E. aphyllum* in the Klepina duliba represents the first finding of that species on Velebit (conf. DEGEN, 1936–1938; FORENBACHER, 2001), as well as the extension of its areal in the Croatian Dinarides, including Risnjak. Moreover, this finding is only the fourth in the last eighty years in Croatia. Since the stands in Klepina duliba are not managed by Forestry Services, the natural processes of forest regeneration are ensured. Hence, the optimal habitats for the sustenance of *E. aphyllum* – such as shady sites on decaying logs and twigs, as well as a thick layer of litter are maintained, and new findings of this species could be expected. Nevertheless, the species is generally hard to see and very irregular at its sites, since it becomes visible only during its flowering – moreover, it may not flower for several years or will even flower underground (DELFORGE, 2006). An interesting feature of its flowers, having nectar with the scent of fermented banana (DELFORGE, 2006), could sometimes possibly help botanists in finding the species in the wild.

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SAŽETAK

Prvi nalaz rijetke mikoheterotrofne orhideje *Epipogium aphyllum* Swartz na Velebitu (Hrvatska)

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Bezlisni nadbradac (*Epipogium aphyllum*) jedna je od četiri mikoheterotrofne orhideje u flori Hrvatske, uz šiljorep (*Limodorum abortivum*), kokošku (*Neottia nidus-avis*) i koraljušu (*Corallorhiza trifida*). To je eurosibirska vrsta koja raste u bukovim, jelovim i smrekovim šumama umjerene i borealne zone. Vrstu se rijetko zamjećuje, jer je vidljiva jedino za vrijeme cvatnje, a cvate rijetko i neredovito, ponekad čak i u tlu. U Hrvatskoj je do 1930. zabilježena na nekoliko lokaliteta (Medvednica, Daruvar, Mađarevo u Hrvatskom zagorju, Risnjak i Ćićarija). Do danas, vrsta je potvrđena za Medvednicu te pronađena u NP Plitvička jezera i Samoborskom gorju.

U srpnju 2011. vrsta je po prvi put zabilježena za Velebit. Desetak jedinki pronađeno je na lokalitetu Klepina duliba u Štirovači, u bukovo-jelovoj prašumi (*Omphalodo-Fagetum*), na zasjenjenom staništu pokraj raspadajućih trupaca jele, na tlu bogatom listincem. Pronalazak vrste na Velebitu predstavlja, dakle, četvrto nalazište u Hrvatskoj u posljednjih osamdeset godina.