

Short communication

## The orchid *Ophrys speculum* Link (Orchidaceae) in Croatia

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**Abstract** – The orchid *Ophrys speculum* Link is widely distributed in the Mediterranean. Since its inclusion in the checklist of Croatian flora, the species has not been confirmed in the field, but has recently been found on Cape (rt) Kamenjak, southern Istria. A few plants were growing within garrigue vegetation of *Cisto-Ericetalia*.

**Keywords:** *Ophrys speculum*, orchid, Rt Kamenjak, Istria, Croatia

### Introduction

In Croatian flora the genus *Ophrys* is present with 67 taxa, the largest genus in terms of number of taxa from the *Orchidaceae* family (HRŠAK 2000, BOGDANOVIĆ 2004, NIKOLIĆ 2012). The genus is distributed throughout the whole of Croatia, but more taxa can be found in the Mediterranean part, as the genus is principally Mediterranean (DELFORGE 2006).

The *Ophrys speculum* group consists of three closely related species: *O. speculum* Link, *O. vernixia* Brotero and *O. regis-ferdinandii* (Achtaroff et Kellerer ex Renz) Buttler (GREUTER 2004, DELFORGE 2006). *Ophrys speculum* is a widespread Mediterranean species commonly found (sometimes even abundantly) in many Mediterranean countries (e.g. Spain, Greece, North Africa), but rare in the centre of the range (SOÓ 1980, PIGNATTI 1982, DELFORGE 2006). For example, the species is noted for France and Corsica, but it appears to be extremely rare on the mainland (LEPAGE and WILCOX 2003, DELFORGE 2006). Similarly, *O. speculum* is found only sporadically on the Italian mainland, but is common on Sicily and Sardinia (PIGNATTI 1982, ROMOLINI and BIAGIOLI 2002, DELFORGE 2006). Two variants can be distinguished across the distributional range of the species; the western variant *O. speculum* Link ssp. *speculum* and the eastern variant with darker flowers, *O. speculum* Link

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ssp. *orientalis* (Paulus) Paulus et Salkowski (BAUMANN et al. 2006, DELFORGE 2006, PAULUS and SALKOWSKI 2007).

It flowers in the period of (February–) March–April (–May) and inhabits open habitats with full sunlight to mid shade, such as poor grassland and garrigue, appearing mostly in coastal areas up to 1200 m asl. (DELFORGE 2006). The species is pollinated by the wasp *Dasyscolia ciliata* (Scoliidae, Hymenoptera) and this relationship is highly species-specific (POUYANNE 1917, AYASSE et al. 2003, BAUMANN et al. 2006, PAULUS 2007). It has been found that the western variant is pollinated by *D. ciliata* ssp. *ciliata*, while the eastern variant is pollinated by *D. ciliata* ssp. *araratensis* (DELFORGE 2006, PAULUS and SALKOWSKI 2007).

Although *O. speculum* is listed in the checklist of the Croatian flora (HRŠAK 2000, NIKOLIĆ 2012) no specific locality is given, and furthermore, the origin of the data is unknown. Relevant determination keys do not mention the eastern Adriatic coast as a part of the species range (SOÓ 1980, BAUMANN et al. 2006, DELFORGE 2006).

The cape of the Istrian peninsula (Rt Kamenjak, north Adriatic) has been protected since 1996, nowadays as a part of the Significant Landscape »Lower Kamenjak and Medulin archipelago«. More than 500 plant taxa have been recorded in previous floristic studies (TOMMASINI 1873; FREYN 1877; PERKO 1998; STARMÜHLER 1998, 2004, 2010; TOPIĆ and ŠEGULJA 2000; HRŠAK et al. 2011), some of them rare, endangered and/or endemic; therefore Rt Kamenjak has recently been estimated as an Important Plant Area (VUKOVIĆ 2010). A former study of orchids of the same area (VUKOVIĆ et al. 2011) did not provide any note on *O. speculum*.

## Materials and methods

The area of Rt Kamenjak was surveyed during May 2010 when a few plants were found in the field. We used the relevant determination key for European orchids (DELFORGE 2006) for determination of the species. The same area was surveyed again in April 2012, with one fieldtrip in the first, and other in the second half of the month. On the second fieldtrip, the exact position of the locality was determined using GPS Garmin eTrex Vista, and the checklist of the adjacent flora was prepared. The obtained coordinates of the field observation were incorporated into the Flora Croatica Database (NIKOLIĆ 2012) and a distribution map was prepared using ESRI GIS ArcMap 9.3 software. The nomenclature of taxa is given according to BAUMANN et al. (2006), PAULUS and SALKOWSKI (2007) and Flora Croatica Database (NIKOLIĆ 2012).

In addition to fieldwork, two herbarium collections (ZA and ZAHO) were examined for specimens and some old literature was searched for localities of *O. speculum* (VISIANI 1842, 1847, 1852; SCHLOSSER and VUKOTINOVIĆ 1869; POSPICHAL 1897; MANNAGETTA 1901; ADAMOVIĆ 1909; ROSSI 1924, 1930; HAYEK 1933).

Furthermore, *O. speculum* was evaluated under the IUCN criteria (GÄRDENFORS et al. 2001, ANONYMOUS 2010) to obtain the threat status of the species on the national level.

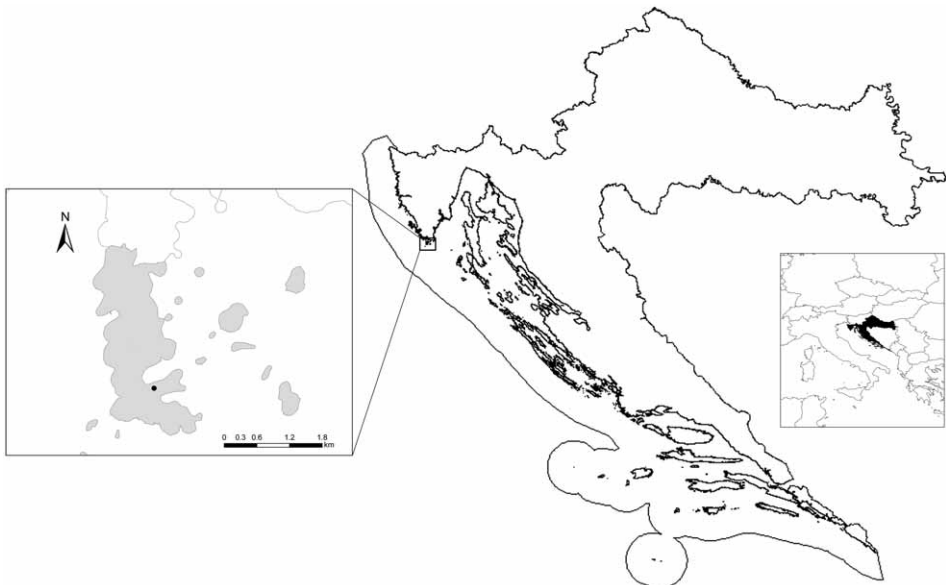
## Results

Three individuals of *Ophrys speculum* ssp. *speculum* (Fig. 1) were found growing along the macadam road on the way to Cape Škara on south-eastern Kamenjak (13°54'55" N,



**Fig. 1.** *Ophrys speculum* Link ssp. *speculum*. a – habitus, b – flower (Photo by Nina Vuković).

44°46'20" E) (Fig. 2). The road passes through garrigue vegetation of the order *Cisto-Ericetalia* H-ić. 1958. In the first half of April only the sprouts were observed, while in the second half the plants were fully flowering. The plants were up to 10 cm high but generally in a good condition. However, the evaluation of the threat status on the national level has resulted in proposing the species as CR D (critically endangered according to criteria D). Accompanying plant species typical of the area were recorded in the close vicinity, given alphabetically in the following list: *Cerastium pumilum* Curtis ssp. *glutinosum* (Fries) Jalas,



**Fig. 2.** Locality of *Ophrys speculum* Link ssp. *speculum* on Rt Kamenjak. Gray area – »Lower Kamenjak and Medulin archipelago«.

*Convolvulus arvensis* L., *Dittrichia viscosa* (L.) Greuter, *Dorycnium hirsutum* (L.) Ser., *Helichrysum italicum* (Roth.) G. Don, *Hypericum perforatum* L., *Juniperus oxycedrus* L., *Orchis morio* L., *Plantago coronopus* L., *Plantago lanceolata* L., *Sanguisorba minor* Scop. ssp. *muricata* Briq., *Sherardia arvensis* L. and *Spartium junceum* L.

The search within the ZA and ZAHO herbaria did not reveal any specimens of *O. speculum*. None of the reviewed literature references provided any note on *O. speculum* in Croatia.

## Discussion

The species *Ophrys speculum* was found within its usual Mediterranean range, growing in a typical habitat and our finding is in accordance with the steno-Mediterranean distribution of this species. Therefore an even wider occurrence of this species in Croatia could be expected. However, it is evident that *O. speculum* is extremely rare in Croatia. Possible confusion with other Croatian orchids due to morphological similarity is excluded because of the rather specific morphology of its flowers, such as large, shiny lip with dense, brown hairs (Fig. 1), which makes it easily identifiable. The only similar plants are two related species from the same group that are rarer than *O. speculum* and locally distributed (*O. vernixia* in Portugal and Spain, *O. regis-ferdinandii* in Greece and Anatolia). What is more, they can be distinguished from *O. speculum* by the shape of the labellum and its lobes (BAUMANN et al. 2006, DELFORGE 2006). The rather early flowering period of the species and the fact that it can flower sporadically (DELFORGE 2006) could be a part of the explanation.

The scarce presence of this species in Croatia, as well as in Italy and France, is most probably connected with the distribution of a specific pollinator wasp *Dasyscolia ciliata*. Recent data (FALLAHZADEH and SAGHAEI 2010, OSTEN 2012) show that the wasp is absent from France, Italy and eastern-Adriatic coast, with a confirmed presence in the Portuguese mainland, Spanish mainland, Balearic Islands, Greek mainland, Dodecanese Islands, Malta, North Africa and the Near East. In addition, existing data show the presence of *D. ciliata* on Corsica, Sicily and Sardinia (COCQUEMPOT and HARMON 1995, OSTEN 2000, PAGLIANO 2012).

In the key for *Scoliidae* from OSTEN (2000) there is an indication that the wasp can be found in Croatia and/or nearby countries, stating that the wasp is present on the eastern Adriatic coast, but this probably refers to the record of MAIDL (1922), who mentions *D. ciliata* (as *Scolia ciliata*) for 'Durazzo' (Durrës, Albania). To date there has been no record of the presence of this wasp in Croatia.

From the available distributional data for *O. speculum* and *D. ciliata* it can be concluded that the range of the orchid, where it is widespread and common, mainly corresponds to areas with the confirmed presence of the wasp. Since the plant-pollinator relationship is highly species-specific in the case of *Ophrys* orchids (PAULUS 2007), the absence or scarce presence of the wasp in the range of *Ophrys speculum* could prevent or seriously reduce the ability of the orchid to reproduce and therefore close its life-cycle. Consequently, its occurrence in Croatia is unusual and it is likely to be found only accidentally and no stable occurrence is to be expected.

The localized distribution of this orchid in Croatia (only one confirmed population of three individuals), the vicinity of the road (potential threat from passengers and/or vehicles) and exposure to natural succession certainly amplify the risk of disappearance from the

area. Given all these facts, we conclude that there is an extremely high risk of extinction of *O. speculum* from the Croatian flora, and as a result recommend the species to be classified as Critically Endangered.

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