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Distribution of *Ophrys apifera* Huds. (*Orchidaceae*) in Bulgaria

Abstract

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Ophrys apifera Huds. is a rare species of high conservational value in Bulgaria. Discussion on the distribution of the species and the state of 11 established populations were given. Six new localities were found in the region of Western Stara Planina and the respective habitats were identified. A hypochrome variety (*Ophrys apifera* f. *flavescens* Rosb.) is reported for the first time in Bulgaria. In the populations studied, *O. apifera* occurs together with other *Orchidaceae* species, which are also of conservational value - *Himantoglossum caprinum* (M. Bieb.) Spreng., *Anacamptis pyramidalis* (L.) L.C. Rich., *Orchis purpurea* Huds., and *O. coriophora* L.

Introduction

Ophrys apifera Huds. is a species of high conservational value for the Bulgarian flora. This species is included in the Biodiversity Act of Bulgaria (2002), and in the new edition of the Red Data Book of Bulgaria (Peev in press) with an "endangered" (EN) status, as well in the Convention on International Trade in and in the new edition of the Red Data Book of R Bulgaria Peev (in press) with the same status, as well as in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 1973: http://www.ukcites.gov.uk).

The species is a Euro-Mediterranean geoelement. It is comparatively widely distributed in Europe, reaching northwards to N.Ireland, eastward to Kavkaz Mt., and southward to North Africa (Soó 1980; Delforge 1994). *O. apifera* inhabits from light to shady and from dry to moist meadows or light forests, up to 1800 m of altitude (Bancheva & al. 2002).

The species distribution in Bulgaria has been described by Velenovsky (1898), Davidov (1904) and Urumov (1906, 1913). Davidov (1904) reports that he had discovered the species in the outskirts of Shumen. Because no herbarium materials were available, Stoianov & Stefanov (1924) do not include *O. apifera* in "Flora of Bulgaria". The species is not included also in "Flora of PR Bulgaria" (Stoianov 1964), "Flora of Bulgaria" (Stoianov & al. 1966) and in the Guide to Higher Plants in Bulgaria (Kozhuharov 1992). Its first inclusions are in the Conspectus of Higher Plants in Bulgaria by Dimitrov (2002) and the Guide to Higher

Plants in Bulgaria (Cheshmedzhiev 2003). In Flora Europea v.5 on the Balkan Peninsula the species is listed for Greece, Turkey, Yugoslavia, and Romania (Soó 1980).

In 1997 an *O. apifera* population with six flowering individuals an area of about 500 sq. m., 180 m a.s.l. was reported in the Eastern Rhodopes, Licana Cheshma locality between villages of Svirachi and Mandritsa - Ivajlovgrad region (SOM 153457) (Gerasimova & al. 1998). Later *O. apifera* was found in Strandja Mountain, Ouzounbodzhak Reserve (SOM 155152) (Bancheva & al. 2002) but herbarium specimen could not be founded. This population is formed by 18 individuals and occupies an area of 18 sq. m. In 1998 *O. apifera* was reported in the outskirts of Podgumer, a village near Sofia, but the only individual observed could not be located later (Petrova & al. 2001). A new locality of this species was found in the region of Sunny Beach, Black sea coast (southern) (Nyagolov & al. 2001). In the population of Ophrys cornuta Steven three individuals of O. apifera were observed. One herbarium specimens (SO 103477) was found from Balkan foothill region - Tzarevetz village (Vratca district) collected by Z.Tsekova in May 2001. The discovery of the species in Shume region - in the outskirts of Shumen reported in the beginning of the XX-th century (Davidov 1904) is of great interest. In 1999 E. Radoslavova (personal communication) discovered a *O. apifera* population on the Shumen plateau.

Material & Methods

As a part of our field studies of habitat diversity for the Natura 2000 project, we visited the region of Western Stara Planina in the period June-August 2005, and discovered populations of *O. apifera* there. Material identification followed Soó (1980) and Delforge (1995). Specimens were deposited in the herbarium collection of the Institute of Botany - (SOM). We reviewed the herbarium materials of official Bulgarian herbariums - SOM, SO, and SOA, as well as the relevant literature. The results are presented according to Kozuharov & al. (1983), with UTM-map of distribution of the species. The areas and census numbers of the *O. apifera* populations were determined during field studies. Habitats were classified following the Interpretation Manual of European Union Habitats 15/2. (2002), and their codes are listed following Natura 2000 (HD Code) and Palearctic Habitat Classification (PAL. CLASS), version 1996 (Kavrakova & al. 2005).

Results & Discussion

5770.23455. ***Ophrys apifera*** **Huds.**

FN-56; SC (AT AV) SOM 162514; Stara Planina (Western): above Stanyanci mine in lowland hay meadows (6510; PAL.CLASS.: 38.252); 660 m a.s.l.; N 43°02’44.5”; E 22°54’47.7”; in flower; 18.06.2005. On an area of 300 sq. m., 16 individuals of *Ophrys apifera* and 5 individuals of *Orchis coriophora* were observed.

FN-56; SC (AT AV) SOM 162516; Stara Planina (Western): northwest of Chepurlinci village in semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia,* 6210; PAL.CLASS.: 34.316); 690 m a.s.l.; N 43°02’19.8”; E 22°54’31.8”; in flower; 18.06.2005. On an area of 250 sq. m., 5 indi-

viduals of *Ophrys apifera,* 4 individuals of *Anacamptis pyramidalis*, and 2 individuals of *Orchis purpurea* were observed.

FN-67; SC (AV AT) SOM 162517; Stara Planina (Western): southeast of Smolcha village), in semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*, 6210; PAL.CLASS.: 34.316); 990 m a.s.l.; N 43°03'49.9"; E 22°58'53.3"; in flower; 22.06.2005. On an area of 100 sq. m., 44 individuals of *Ophrys apifera* and 50 individuals of *Orchis coriophora* were observed.

FN-67; SC (AV AT) SOM 162518; Stara Planina (Western): southeast of Smolcha village, in semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*, 6210; PAL.CLASS.: 34.316); 990 m a.s.l.; N 43°03'54.0"; E 22°58'55.5"; in flower; 22.06.2005. On an area of 500 sq. m., 9 individuals of *Ophrys apifera*, 76 individuals of *Ocrhis coriophora*, and 11 individuals of *Himantoglossum caprinum* were observed (SOM 162521).

These two localities are located close to each other, and the region in which they occur is used extensively as a grazing land.

FN-67; SC (AV AT) SOM 162519; Stara Planina (Western): near Burlia village , in semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia,* 6210; PAL.CLASS.: 34.316); 960 m a.s.l.; N 43°06'09.3"; E 22°59'10.1"; in flower; 22.06.2005. On an area of 150 sq. m., 10 individuals of *Ophrys apifera* and more than 9 individuals of *Ocrhis coriophora* were observed .

FN-67; SC (AV AT) SOM 162615; Stara Planina (Western): south of Komshtica village, in semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia,* 6210; PAL.CLASS.: 34.316); 1130 m a.s.l.; N 43°06'04.1"; E 23°00'31.4"; in flower; 22.06.2005. On an area of 100 sq. m., 19 individuals of *Ophrys apifera* were observed.

The distribution of the species in Bulgaria is shown in Fig.1. The new discovered populations occupied areas from 50 to 500 sq. m at altitudes from 660 to 1130 m. The species had not been previously reported to occur in Bulgaria at altitudes above 1000 m (Dimitrov 2002; Cheshmedzhiev 2003). The *O. apifera* populations occur in semi-natural grass and shrub communities. These are xerotermic to mesotermic grass communities on calcareous soils from the *Festucetalia valesiacae* order. Both continental and subcontinental pastures and meadows, as well as perennial sub-Mediterranean grasslands are represented in these communities. Many of these communities are secondary, replacing logged forests. The species diversity is exceptionally high. The usual dominant species are *Chrysopogon gryllus, Dichanthium ischaemum, Stipa* spp*., Festuca valesiaca,* and *Bromus* spp. Other common species include *Poa angustifolia, Anthyllis vulneraria, Coronilla varia, Carex caryophyllea, Carlina vulgaris, Centaurea scabiosa, Eryngium campestre, Filipendula vulgaris, Convolvulus cantabrica, Salvia nemorosa, Leontodon crispus, Anacamptis pyramidalis, Orchys morio, O. purpurea, O. coriophora, Origanum vulgare, Sanguisorba minor*, *Helianthemum nummularium, Adonis vernalis, Thymus* spp., etc.

A large number of *O. apifera* varieties have been described based on the flower color (Summerhayes 1951; Buttler 1991; Delforge 1995; Potùček & Cačko 1996). In 1998 at the Licana site, Ivajlovgrad region - eastern Rhodope, a plant with a specific flower color (known as f. *bicolor*) was found (Gerasimova & al. 1998). In our study, near Stanyanci mine (FN-56), we found 10 individuals of *Ophrys apifera* f. *flavescens* (Fig.2), a rare hypochrome variety. Hypochromic individuals are extremely rare in the *Ophrys* genus. In

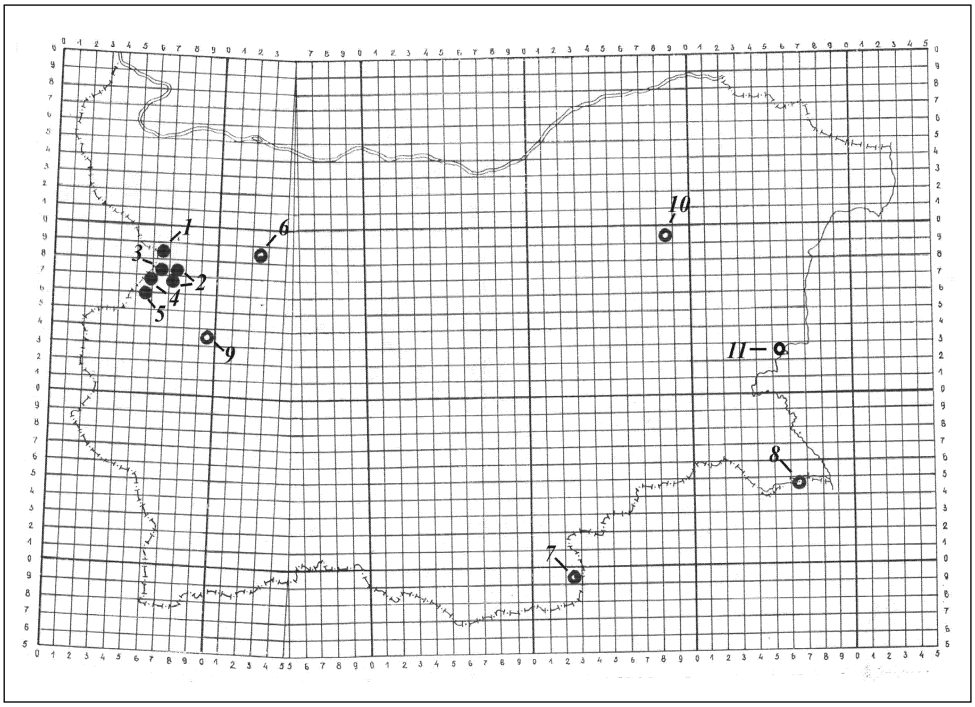

Fig. 1. UTM-map of the distribution of *Ophrys apifera* Huds. in Bulgaria.
● – new localites: 1 – Burlia, 2 – Smolcha, 3 – Komshtica, 4 – Stanyanci, 5 – Chepurlinci; ○ – according to literary data: 8 – Ouzounbodzhak Reserve, 9 – Podgumer, 10 – Shumen plateau; 11 – Sunny Beach; ◑ – according to herbarium materials and literary data: 7 – Licana Cheshma; ◒ – according to herbarium materials: 6 – Tzarevetz. Square side 10 km.

O. apifera, however, they may outnumber normal individuals in a population, probably because of the extensive self-pollination in this species (Delforge 1995).

Conclusions

The data on the distribution of *Ophrys apifera* suggest that well-preserved populations exist in western Stara Planina, a region in which the species had not been reported previously. All of these populations occur in semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (6210 PAL.CLASS.: 34.316), and one in lowland hay meadows (6510; PAL.CLASS.: 38.252), which are habitats of European significance. Other *Orchidaceae* species of conservational value have also been reported in the same habitats (*Himantoglossum caprinum*, a species protected by the Convention on the Conservation of European Wildlife and Natural Habitats (1979: http://www.lkp.org.pl/pravo_html/konv_bernenska_zl.html) and the Biodiversity Act of Bulgaria (2002), similarly to *Anacamptis pyramidalis*).

Fig. 2. *Ophrys apifera* f. *flavescens* Rosb. of the population near Stanyanci.

We think that the two populations near Smolcha village warrant the declaration of a "Protected Area" for the preservation of *Ophrys apifera* and an important orchid habitat, which is a priority type according to European Community Directive 92/43/EEC, 1992 (http://www.jncc.gov.uk).

The individuals from the rare hypochrome variety *Ophrys apifera* f. *flavescens*, which had not been reported previously for Bulgaria, as well as all other populations, will be monitored to analyze their dynamics.

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