

## *Epipactis exilis* and *E. greuteri* (Orchidaceae) in the Bulgarian flora

Antoaneta S. Petrova & Diana Y. Venkova

Botanical Garden, Bulgarian Academy of Sciences, P.O. Box 664, 1000 Sofia, Bulgaria, e-mail: petrovabotgar1@abv.bg

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**Abstract.** *Epipactis exilis* and *E. greuteri* are reported for the Bulgarian flora on the basis of the authors' collections and a revision of the specimens of genus *Epipactis* in the herbaria SOM, SO and SOA. A description of the habitats and data about the size and the spatial structure of the populations is given. According to an evaluation of the species according to the *IUCN Red List of Categories and Criteria* applied at regional level, *E. exilis* is classified as Endangered and *E. greuteri* as Critically Endangered.

**Key words:** Bulgarian flora, *Epipactis* (Orchidaceae)

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### Introduction

Genus *Epipactis* is among the taxonomically most difficult European orchid genera (Delforge 2006). Studies in the last decades have provided description of numerous new species, many from Central Europe and the southern part of the Balkan Peninsula. Another result of the attention attached to this genus recently is the enlarging of the distribution areas of some species, known initially as local or regional endemics.

Until recently, there were no special investigations of *Epipactis* in Bulgaria. The contemporary general accounts of the Bulgarian flora (Andreev 1992; Delipavlov & Cheshmedzhiev 2003) list only five species: *E. atrorubens* (Hoffm.) Besser, *E. helleborine* (L.) Crantz, *E. microphylla* (Ehrh.) Sw., *E. palustris* (L.) Crantz, and *E. purpurata* Sm. The report of *E. persica* (Soó) Nannf. (Siering & Henning 1990) was considered in Dimitrov (2002) and Assyov & Petrova (2006). The latter source includes also some of the recently found taxa.

Our studies carried out since 1997 (although quite limited) have shown a considerable diversity of the

genus in the country. *Epipactis leptochila* (Godfery) Godfery (Petrova & Venkova 2006a) and *E. pontica* Taubenhein (Petrova & Venkova 2006b) are recent new additions to the Bulgarian flora. In this paper we report data about *E. exilis* P. Delforge and *E. greuteri* H. Baumann & Künkele. Both species are described from Greece but latter are also reported from Italy, some countries on the Balkan Peninsula (Delforge 1995, 2006; Jogan 2001; *Flora Croatica Database* 2005), and Slovakia (Mereda 2000).

### Materials and methods

The field data about the distribution, population size and habitats were collected during the authors' investigations in different parts of the country. Furthermore, we revised the samples of genus *Epipactis* in the herbaria of the Institute of Botany, BAS (SOM), Sofia University (SO), and the Agrarian University, Plovdiv (SOA), thus obtaining some additional information.

## Results and discussion

### *Epipactis exilis* P. Delforge, *Naturalistes Belges*, 85 (Orchid. 17): 246 (2004)

[Syn. *E. gracilis* B. & H. Baumann, Mitt. Arbeitskr. Heim. Orch., Baden-Württemberg, 20(1): 26 (1988)].

Rhizomatous perennial herb; stems 1(–4), 15–35(40) cm high, green, glabrous; cauline leaves 4–6, dark-green, spirally arranged, clasping, the middle ones oval-acuminate, 2.5–5 × 1–2 cm, shorter than the internodes, the upper leaves almost reaching the base of the inflorescence; lower bracts 2.8–3.5 cm, longer than the flowers; inflorescence subunilateral, lax, with 3–10 (15) flowers (Fig. 1), flowers small, pale-green, open, pendant, petals and sepals pale (whitish)-green, 7.5–10 × 3.5–4.5 mm; labellum 7–8.5 mm long, greenish-white, hypochile cupped, slightly nectariferous, shining; epichile cordate, small (3.5–4 × 3.9–5 mm), whitish, with 2 greenish or pale-pink calluses, with a deep longitudinal groove; clinandrium ± developed, rostellum elongated, without a gland, non-functional; pollinia powdery; ovary green, fusiform, elongated, glabrescent. An autogamous species, perianth withering after self-pollination.

**Distribution in Bulgaria** (Fig. 3). Our personal field studies have established *E. exilis* for four floristic regions. There are herbarium specimens from one more region. Data about the localities and corresponding vouchers are listed below.

**Balkan Range (Central):** northern slope of the Shipka pass (Gabrovo district), in a beech forest with *Laurocerassus officinalis*, at about 1100 m, LH-63, 02.08.1999, coll. A.S. Petrova (SOM 155566).

**Mt Vitosha:** near the second lift station on the Simeonovo – Aleko line, in a beech forest along river Yanchevska, at about 1200 m, FN-82, 17.08.1997, with flowers, coll. A.S. Petrova (SOM 155293).

**Rila Mts:** about 3 km off Rila Monastery, along the road to Kirilova Polyana locality, at the edge of a spruce forest, at about 1250 m, GM-06, 05.08.1999, coll. A.S. Petrova, D. Venkova & Y. Stoyanov (SOM 155294).

**Rhodopi Mts (Central):** Dobrostan massive, along the forest trail from Chervenata Stena peak to Besovo chalet, 1300 m, LG-24, 3.08.1997, with flowers coll. A.S. Petrova & Y. Stoyanov, 29.07.1998, coll. A.S. Petrova & D. Venkova (SOM 155292, 155339); along the road from Teshel to Mougla village, about 6 km off Teshel, in a beech forest, KG-91, 02.08.1999, with fruits,



Fig. 1. *E. exilis* – herbarium sheet (Dobrostan).

coll. A. Petrova & D. Venkova (SOM 161910); SW of Kiselchovo village, Smolyan district, in a beech forest, 1300 m, LF-09, 27.07.2002, with flowers, observed by A.S. Petrova; 02.08.2003, with fruits (Fig. 2), coll. by A.S. Petrova & D. Venkova (SOM 162019).

**Mt Strandzha:** in shady places near the small monastery east of Kladara (Slivarovo) village, NG-54, 27.07.1933, coll. D. Yordanov, sub. *E. microphylla* var. *glabrescens* Velen. (SO 14457); in shady forests above Kosti village, NG-65, 10.07.1933, coll. D. Yordanov, sub. *E. microphylla* Sw. (SO 1458).



Fig. 2. *E. exilis* from Kiselchovo area with fruits (photo A.S. Petrova).

**Habitat and population data.** All observed localities were in shady places, usually in beech forests, predominantly on north-facing steep slopes, but *E. exilis* populations prefer places with a small inclination. The locality in the Rila Mts is the only one found on the edges of a spruce forest. The findings were at altitudes between 800–1400 m, but the data from Mt Strandzha were from much lower altitudes, possibly about 350–400 m.

The observed populations were often local and small ones. Such was the case with Mt Vitoshka popu-

lations (only six plants were observed in a century-old beech forest); the population in the Shipka pass (a sparse one, with nine plants on about 1 ha); and the population in the Mouglenska river valley (five individuals in a small beech grove – the beech is rare there, coniferous woods prevail).

The observed populations in the Rila Mts and near Kiselchovo village in the Rhodopi Mts were comparatively larger. In both places 30–40 plants were observed, scattered in appropriate microhabitats.

We have repeated the observations of the species in the Dobrostan area in the Rhodopes. Here, along the Chervenata Stena peak – Besovo chalet – Koroudere trail the species forms four subpopulations, all in beech forests, local. They numbered 15 to 60 (possibly 100) individuals. There were distinct fluctuations observed in the highermost subpopulation. Only 15 plants were counted in 1997, but over 55 in 1998. In 2001 the observed individuals were 24 and in 2004 about 60 (65).

***Epipactis greuteri* H. Baumann & Künkele, Mitt. Arbeitskr. Heim. Orch., Baden-Wurttemberg, 13(3): 344 (1981)**

Rhizomatous perennial herb; stems 1(–4), 20–60 cm high, green, covered with dense whitish pubescence; cauline leaves 4–8, dark-green, ± spiral, almost clasping the stem, arching, the middle ones lanceolate, 5–8 × 2–3.5 cm, 1–2 upper leaves bract-

like; lower bracts large, up to 4.5 cm, longer than the flowers; pendant, inflorescence elongate, ± lax, taking up to 2/3 of the stem, with 5–25 flowers (Fig. 4), flowers green, ± open, campanulate, petals and sepals subequal, green, oval-lanceolate, keeled, 9–12 × 4–5 mm; labelum 7.5–9 mm long, green, hypochile cupped, slightly nectariferous, greenish-

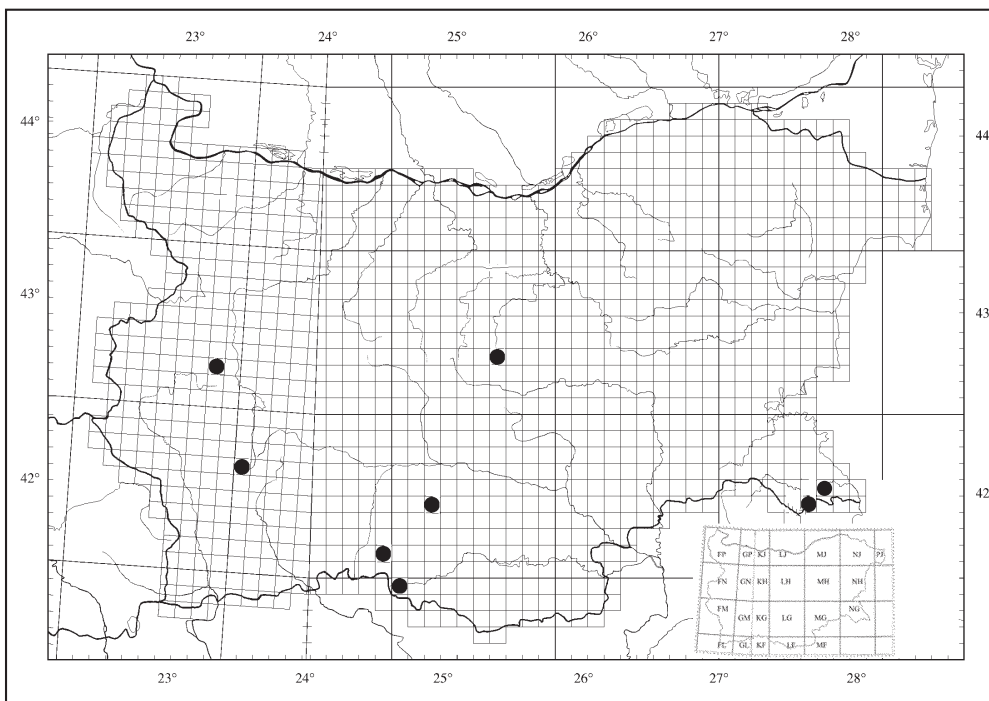


Fig. 3. Map of the distribution of *E. exilis* in Bulgaria.

yellow to pale-brown inside, shining; epichile cordate, white-green, 4–5 × 3–4 mm, the base with 2 long swellings, anther sessile, exceeding rostellum, clinandre only slightly developed, rostellum elongated, tip not sticky, non functional; pollinia rather crumbly than powdery, disintegrated on the stigma; ovary green, pyriform, elongated, with a long pedicel. A self-pollinating species.



**Distribution in Bulgaria** (Fig. 5). We found *E. greuteri* in one floristic region:

**Rhodopi Mts (Central)**: along the road from Teshel to Mougla village, at about 10 km off Teshel, in a beech forest, KG-91, 24.07.1998, with fruits, coll. A.S. Petrova, D. Venkova & I. Gerasimova (SOM 155338).

The observed population was a small one: five plants were found on an area of about 0.05 ha.

## Conclusion

These are the first reports of localities of *E. exilis* and *E. greuteri* for Bulgaria but they are based on eight years of investigations into the *Epipactis* species in Bulgaria. Our opinion is that *E. exilis* is possibly more widely distributed all over the country but, as a rule, it is local, with small populations. The distribution of *E. greuteri* is possibly much more limited, probably to the Rhodopi Mts, or the mountains in Southwest Bulgaria. That is why they deserve to be included in the List of Protected Plants in the country and to be evaluated for the Red Data List of Bulgaria. Our evaluation according to the currently available data, by the IUCN Criteria (IUCN 2001) resulted in the following categories:

- *E. exilis* – **EN B2ab(iii)c(iv)** on the basis of the limited extent of its area of occupancy, very fragmented distribution, strong decline of the beech forests in Bulgaria, and fluctuations of the number of mature individuals;
- *E. greuteri* – **CR D**, a population, which numbers under 50 mature individuals.

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Fig. 4. *E. greuteri* – herbarium sheet.



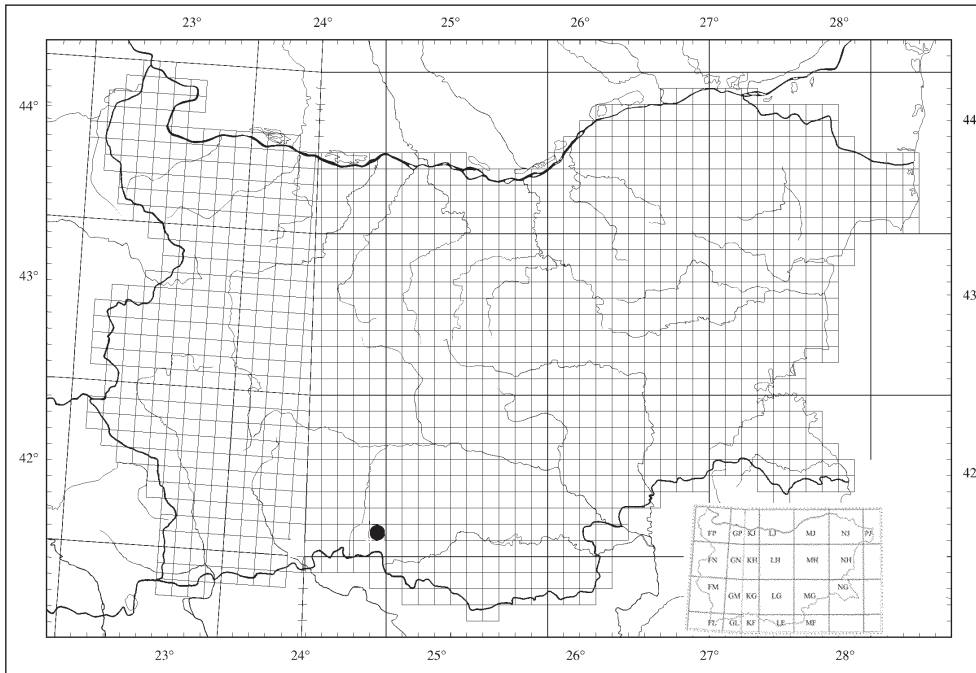


Fig. 5. Map of the distribution of *E. greuteri* in Bulgaria.

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