

## *EPIPACTIS GREUTERI* (ORCHIDACEAE) IN POLAND

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**Abstract.** Between 1997 and 2010, nine localities of *Epipactis greuteri* H. Baumann & Künkele were found in the Polish part of the Western Carpathians. Eight of them were confirmed in subsequent years. The distribution of the new species in Poland is mapped. A morphological description of *E. greuteri* based on specimens from Poland and a key for the Polish *Epipactis* Zinn species are given.

**Key words:** distribution, *Epipactis greuteri*, Poland, Western Carpathians

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In August 1997, during field studies of the flora and vegetation of the Barnowiec Nature Reserve in the Beskid Sądecki Mountains (Western Carpathians), Z. Szelaąg found an abundant population of *Epipactis greuteri* H. Baumann & Künkele. It was the first finding of the species in Poland, which increased the number of *Epipactis* species in the country to seven (see key below).

In later years, further localities of *E. greuteri* were discovered in other parts of the Polish Western Carpathians, in chronological order as follows: (1) Beskid Niski Mts, one locality by L. Bernacki and J. Pawelec in 2000; (2) Pogórze Śląskie foothills, one locality by L. Bernacki in 2001; (3) Beskid Sądecki Mts, three localities by K. Stawowczyk in 2007 and 2008; (4) Beskid Makowski Mts, one locality by L. Bernacki and M. Mazur in 2010; and (5) Pogórze Przemyskie foothills, two localities by M. Wolanin in 2010 (Fig. 1).

All discovered localities of *E. greuteri* in Poland are listed and characterized below.

EG2544 – BESKID SĄDECKI MTS, Barnowiec Nature Reserve, *Dentario glandulosae-Fagetum*, 30 m

from asphalt road, 650 m a.s.l., 7 Aug. 1997, Z. Szelaąg (KRAM).

The Barnowiec Nature Reserve was revisited by ZS in 1998, when three subpopulations of *E. greuteri* were found in the lower part of the Reserve at 610–830 m a.s.l. The total population size of *E. greuteri* in the Barnowiec Nature Reserve in 1998 was estimated to be 40–60 flowering plants, and the estimates were similar in 2000 and 2011. See Table 1 for the phytocoenological characteristics of the *E. greuteri* occurrence in the Barnowiec Nature Reserve.

EG3414 – BESKID SĄDECKI MTS, Roztoka Mała stream valley, *Petasites albus* community along stream in forest with *Abies alba* dominating, 630 m a.s.l., 1 Aug. 2007, K. Stawowczyk, ca 30 flowering plants observed.

EG2441 – BESKID SĄDECKI MTS, Jaworzynka stream valley near Gołkowice Górne, along forest road at 580 m a.s.l. and 710 m a.s.l., 5 Aug. 2008, K. Stawowczyk. In 2011 the locality was visited by KS and LB; 48 flowering plants were observed.

EG2430 – BESKID SĄDECKI MTS, Za Bachnaty stream valley near Gaboń, *Abies alba* forest along stream, 650 m a.s.l., a few flowering plants observed, 25 July 2008, K. Stawowczyk.

DF9112 – POGÓRZE ŚLĄSKIE FOOTHILLS, Wiślicka Skarpa Nature Reserve near Skoczów, on humid margin of *Tilio-Carpinetum* forest, 290 m a.s.l., L. Bernacki 12 Aug. 2001, only two flowering plants observed.

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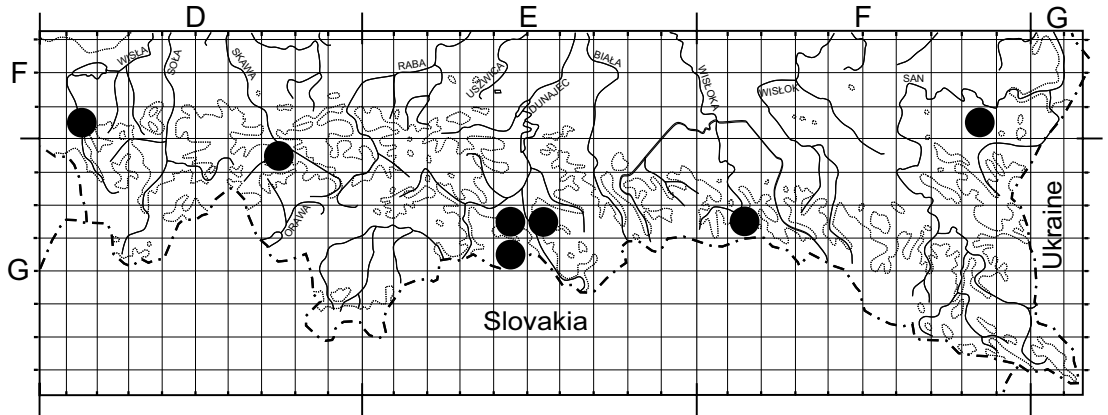


Fig. 1. Distribution of *Epipactis greuteri* H. Baumann & Künkele in Poland in ATPOL grid squares (10×10 km).

In 2007 and 2011, LB searched without results for *Epipactis greuteri* in the Reserve.

DG0703 – BESKID MAKOWSKI MTS, Drożdżyna near Budzów, *Picea abies-Abies alba* forest along stream, 375–390 m a.s.l., 31 July 2010, L. Bernacki & M. Mazur, ca 25 flowering plants.

FG2101 – BESKID NISKI MTS, Magurski National Park, Mt. Góra Kamień, NE slope, 445–455 m a.s.l., in *Fagus sylvatica* forest, 29 July 2000, J. Pawelec & L. Bernacki, 21 flowering plants. The occurrence of *Epipactis greuteri* at the locality was confirmed by JP in 2003, 2006 and 2008.

FF9822 – POGÓRZE PRZEMYSKIE FOOTHILLS, Góra Frankowa (Maciejówka) hill near Bircza, 440 m a.s.l., in *Fagus sylvatica* – *Abies alba* forest, 20 July 2010 M. Wolanin (herb. of Department of Botany, Rzeszów University). In 2011 ca 20 flowering plants were found. In 2015, due to the partial deforestation and expansion of *Rubus hirtus*, only 3 plants were observed.

FF9823 – POGÓRZE PRZEMYSKIE FOOTHILLS, 1 km S of Chołowice near Krasiczyn, 250 m, *Abies alba* forest, 21 July 2010, M. Wolanin, 3 flowering plants (herb. of Department of Botany, Rzeszów University).

The taxonomic history of *E. greuteri* is relatively brief. The species was described in 1981 from the Pindos Mountains in central Greece (Baumann & Künkele 1981). In the next thirty years *E. greuteri* was found in Croatia and Slovenia (Robatsch 1988, 1989; Nikolić & Topić 2005; Jogan 2007), Italy (Savelli *et al.* 1989; Bongiorno *et al.* 2006), Austria (Mrkvicka 1992), Czech Republic (Batoušek 1993), Germany (Feldmann *et al.* 1996), Slovakia (Mered'a 1999,

Bulgaria (Petrova & Venkova 2008) and Romania (Ardelean 2011).

However, specimens of *E. greuteri* had been collected in Central Europe for many years before it was described from Greece. For example, in



Fig. 2. *Epipactis greuteri* H. Baumann & Künkele in the Baranowiec Nature Reserve, 10 August 2011. Photo Z. Szelağ.



Fig. 3. *Epipactis greuteri* H. Baumann & Künkele in the Magurski National Park, 1 August 2007. Photo J. Pawelec.

Slovakia the species was found in 1936 in the Malá Fatra Mts, in 1946 in the Javorníky Mts, and in 1971 in the Pieniny Mts (cf. Mered'a 2000). In the Czech Republic *E. greuteri* was herbarized in 1884 in the Beskydy Mts and kept in the Silesian Museum in Opava (OP).

***Epipactis greuteri* H. Baumann & Künkele**

Figs 2–4

Mitt. Arbeitskreis Heimische Orchid. Baden-Württemberg 13: 344. 1981.

DISTRIBUTION MAP: Mered'a (2000).

Stem 20–60(–70) cm high, solitary or in few-specimen clusters, green to dark green, in lower part glabrous, in upper part with dense whitish-gray pubescence. Cauline leaves (3–)5–7 green, oval to lanceolate, acute at apex, 4–10 cm long and 1.5–3.5 cm wide; in lower part of stem additional (1–)2–3 brownish, squamous, 1–3 cm long leaves. Inflorescence up to 20 cm long, with (6–)15–30(–35) autogamic flowers. Bracts

2.0–5.5(–7.0) mm long, hanging down. Floral pedicels 5–10(–12) mm long. Sepals pale green to yellow-green, oval, acuminate, 10–12(–13) mm long and 5–6 mm wide. Petals whitish to yellow-greenish, occasionally pinkish, ovate, less acuminate, slightly shorter than sepals. Lip 8–10(–11) mm long, divided into two parts. Hypochile cup-shaped, nectariferous, greenish, inside green to brownish green with pale margin. Epichile triangular to cordate, whitish with greenish central part, 4.5–6.0 mm long and 4.0–5.5 mm wide, slightly curved down at apex, with two smooth calli at base. Clinandrium strongly reduced. Rostellum with non-functional viscidium. Pollinia friable, easily disintegrating. Ovaries green, nodding on elongated pedicels, moderately pubescent. Capsules yellowish-green. Flowering: end of July and August.

The description is based on plants from the Beskid Sądecki Mountains.



Fig. 4. *Epipactis greuteri* H. Baumann & Künkele in the Jaworzynka stream valley, 31 July 2010. Photo M. Fiedor.

**Table 1.** Phytocoenological spectrum of the *Epipactis greuteri* subpopulations in the Barnowiec Nature Reserve, 10 August 2011.

Relevé number	1	2	3
Relevé area [m <sup>2</sup> ]	400	400	400
Slope	N	NE	NE
Aspect [°]	10	15	10
Tree cover [%]	90	100	100
Shrub cover [%]	30	40	40
Herb cover [%]	60	80	60
<i>A. Abies alba</i>	.	1	+
<i>Fagus sylvatica</i>	1	3	4
<i>Picea abies</i>	3	+	+
<i>B. Abies alba</i>	+	2	+
<i>Picea abies</i>	+	+	+
<i>Fagus sylvatica</i>	1	1	3
<b>C. <i>Epipactis greuteri</i></b>	+	+	+
<i>Athyrium filix-mas</i>	+	1	+
<i>Bromus benekenii</i>	1	.	.
<i>Circaea intermedia</i>	.	1	.
<i>Corallorhiza trifida</i>	.	.	+
<i>Dentaria bulbifera</i>	1	+	+
<i>Dentaria glandulosa</i>	1	2	2
<i>Dryopteris dilatata</i>	1	+	+
<i>Dryopteris spinulosa</i>	1	.	1
<i>Festuca sylvatica</i>	.	+	.
<i>Galeobdolon montanum</i>	+	1	1
<i>Galium odoratum</i>	.	1	1
<i>Hordelymus europaeus</i>	+	+	.
<i>Impatiens noli-tangere</i>	1	.	.
<i>Mercurialis perennis</i>	1	1	+
<i>Neottia nidus-avis</i>	.	.	+
<i>Oxalis acetosella</i>	1	.	.
<i>Petasites albus</i>	2	.	.
<i>Polystichum aculeatum</i>	.	+	1
<i>Viola reichenbachiana</i>	+	+	+

#### KEY TO THE POLISH *EPIPACTIS* SPECIES

1. Hypochile with two lobes at base .....  
..... *E. palustris* (L.) Crantz
- 1\* Hypochile unlobed ..... 2
  2. Cauline leaves 1–3 cm long, shorter than internodes ..... *E. microphylla* (Ehrh.) Sw.
  - 2\* Cauline leaves >4 cm long, longer than internodes ..... 3
3. Epichile with verrucose calli at base .....  
..... *E. atrorubens* (Hoffm.) Besser
- 3\* Epichile with smooth calli at base ..... 4

4. Flowers allogamic. Viscidium functional . . . . . 5
- 4\* Flowers autogamic. Viscidium non-functional or absent ..... 6
5. Cauline leaves up to 6(–8) cm long, 1–2 times longer than internodes, green-purplish .....  
..... *E. purpurata* Sm.
- 5\* Cauline leaves up to 10(–15) cm long, 2–4 times longer than internodes, green .....  
..... *E. helleborine* (L.) Crantz
6. Bracts spreading. Floral pedicels up to 4–5 mm long, sepals up to 9(–11) mm long .....  
..... *E. albensis* Nováková & Rydlo
- 6\* Bracts hanging down. Floral pedicels 5–10(–12) mm long, sepals 10–12(–13) mm long .....  
..... *E. greuteri* H. Baumann & Künkele

ACKNOWLEDGEMENTS. We thank Dr. Pavol Mered'a jr. (Bratislava) and Dr. Petr Batoušek (Zlín) for confirming the identification of the *Epipactis greuteri* from Poland and for valuable discussions, and the three anonymous reviewers for helpful remarks and valuable suggestions on the manuscript. LB thanks Marek Mazur (Jachówka near Sucha Beskidzka) for information on the *E. greuteri* locality and for helping in fieldwork.

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