

## ***Verbascum matevskii* (Scrophulariaceae), a new species from North Macedonia**

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*Abstract:* *Verbascum matevskii* is described, and illustrated as species new to science from the northwestern part of North Macedonia. It is a distinct species, to some extent similar to the Balkan endemics *V. davidoffii*, *V. durmitoreum* and *V. epixanthinum* var. *pindicolum*, differing from each of them in several morphologic characteristics. The new species is endemic to the area south of Gostivar, where it occurs very scattered in various mesic habitats in the zone of beech forests.

*Keywords:* beech forests, holotype, morphological description, new species, *Verbascum matevskii*, North Macedonia.

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### **Introduction**

*Verbascum* L. is a large genus whose native range of distribution includes the largest part of Europe, parts of south, west and central Asia, and north and northeastern Africa (Murbeck 1939, map 1). According to the cited author, of 263 species known at that time, 233 were restricted to a relatively small area, encompassing the Balkan Peninsula, Asia Minor, Caucasus, Syria, Mesopotamia and a part of Persia. Since then, the number of known *Verbascum* species has increased to ca. 360, with most of the new ones being described from Turkey (for references see Zografidis 2016). Their natural infrageneric classification is still problematic and even molecular studies are of limited utility in its resolution (Ghahremaninejad et al. 2014). Hybridization of the species growing together is frequent, however, the hybrids are always sterile, and thus, this phenomenon probably is not a significant evolutionary force in *Verbascum* (Murbeck 1933; Zografidis & al. 2020).

The general greatest diversity and the most pronounced endemism in the genus occur in Turkey - 256 species of which 201 endemics, while in Europe in Greece - 76 species of which 24 endemics (Dimopoulos et al. 2013; Duman et al. 2021). Its taxonomy and chorology in North Macedonia have not been comprehensively treated so far. About 29 *Verbascum* species are quoted in the literature of which five are endemic (*V. chrysanthum* Murb., *V. herzogii* Bornm., *V. lesnovoensis* Micevski, *V. macedonicum* Košanin & Murb., *V. wraberii* Micevski & Matevski) and one subendemic (*V. scardicolum* Bornm.).

On June 6, 2022, during the fieldwork in the beech forests south of Gostivar (NW North Macedonia), a green, glandular, mostly unbranched *Verbascum* attracted the author's attention. In the following few weeks, it was studied and documented in several localities of the mentioned area. The morphological examination of the collected material revealed that it represents a so far undescribed species.

## Material and Methods

Appropriate live plants were photographed and herbarized. Herbarium specimens are deposited in the private herbarium of the author, MKNH and Herbarium of the Natural History Museum of the Republic of North Macedonia. The following taxonomic treatments of the genus *Verbascum* were taken into consideration during the identification of the collected material: Murbeck (1933, 1939), Ferguson (1972), Raus (1991), Huber-Morath (1978), and Stefanova-Gateva (1995). In addition, high-quality scans of herbarium specimens from the type collections of the following taxa were used for comparison of some characteristics:

- *Verbascum davidoffii* Murb. [Bulgaria, "Bunderitza Tal (Pirin), trockene Kifer walder (*Pinus leucodermis* Ant.), 8.7.1928, leg. B. Stefanoff": 1314962 (LD); "In HB Lund colui, e seminibus planta a Stefanoff 8.7.1928, in Bulgaria (Pirin plan. Bunderitza – Tal) lecta. Semin. (10.9.1928), Mess. (21.4-1.10.1929)" det. Sv. Murbeck: 1315022, 1315082, 1315142, 1315202, 1316042, 1362167, 1362227, 1362287, 1362347, 13622407, 1363007, 1364162, 1364222, 1364282, 1364342, 1364402, 1374459, 1374519, 1775267 (LD)];

- *V. durmitoreum* Rohlena [Monte Negro, "Valoviti do in m. Durmitor", 8.1904, leg. & det. Jos. Rochlena: 453023 (PRC); Monte Negro, Durmitor, 1600 m, 7.1901. leg. & det. Jos. Rochlena: 453022 (PRC); Monte Negro, Durmitor, 8.1905, leg. & det. Jos. Rochlena: 453021 (PRC)];

- *V. pindicolum* Freyn & Sint. [Greece, "Chaliki, in subalp. m. Plaka" 4.7.1896, leg. P. Sintenis, det. J. Frein: WU0126567 (WU-Halácsy-Graec.); P052715125 (MNHN); 1056414, 1041373, 1041309, 1002334 (LD); B10-0278346 (B); 447639 (Dudley Herbarium); G00025581, G00025582, G00025583 (G); JE00020748 (JE); S-6-6307 (Mus. Bot. Stockholm)].

Some scans of the following other collections of *V. durmitoreum* were also on the author's disposal: Monte Negro, "Sinjavina planina, in monte Jablan vrh", 7.1903, leg. & det. Jos. Rochlena, 453027 (PRC); Monte Negro, "in m. Maglič", 8.1905, leg. & det. Jos. Rochlena, 453025, 453026 (PRC).

A morphological description, illustrations and a map of the distribution of the new species are presented.

## Results and Discussion

### *Verbascum matevskii* Teofilovski, sp. nov. (Fig. 1-4)

**Description:** Biennial, rarely perennial, (70)90-140(170) cm tall, herbaceous, plant, with indumentum of brownish, branched, eglandular hairs (mostly intermixed in easily falling away tomentum) and shortly stalked, pale (in inflorescence sometimes darkish), not viscose glands. Stem strictly erect, together with inflorescence axis obtuse-subangular, green or greenish, sparsely floccose-tomentose,  $\pm$  glabrescent, densely glandular. Basal leaves yellowish-green or green, 9-25x3-10 cm, elliptic or elliptic-oblong, acute to subobtuse, abruptly, or gradually attenuate in 1-6 cm long, narrowly winged petiole, crenate or crenate-dentate; above sparsely to densely, below densely to subpannosely,  $\pm$  persistently tomentose. Cauline leaves gradually decreasing in size upwards, not decurrent, denticulate or crenulate; lower surface grayish-green or green, sparsely floccose-tomentose or -pubescent,  $\pm$  glabrescent; upper surface green,  $\pm$  densely glandular, without or with sparse, floccose eglandular indumentum when mature; lower similar but smaller than basal ones, shortly petiolate; middle ovoid, ovoid-oblong or elliptic, cuneate or truncate at base, shortly petiolate or sessile, acute; upper ovate-lanceolate, truncate to subcordate at base, sessile, often slightly acuminate, acute. Inflorescence slightly shorter than stem, simple raceme or with 1-3 short branches at base (rarely more branched). Fascicles mostly with 4-10(12) flowers, arranged in narrowly-cylindric, moderately dense (rarely loose), interrupted at base raceme. Bracts green; lower foliaceous or lanceolate; the rest narrowly linear, about equaling fascicles, lower surface sparsely floccose-tomentose,  $\pm$  glabrescent, glandular. Peduncles green, sparsely floccose-tomentose,  $\pm$  glabrescent, densely glandular; those of primary flowers 6-10 mm (8-15 mm in fruit), longer than others, with two linear-filiform, 4-7 mm long bracteoles at base; fruiting stiff,  $\pm$  thickened toward apex, erect with arcuate base to almost patent. Calix green, 2-4 mm long (up to 6 mm in fruit), almost to base divided into five lanceolate to linear, acute lobes; indumentum as in peduncles. Corolla yellow, 20-30 mm in diameter, with pellucid glands; outer side  $\pm$  puberulent, inner ciliate-villous at base of two upper lobes; throat with brownish stripes and spots; lobes five, obovate to suborbicular. Stamens five; filaments of two inferior 6.5-9.0 mm long, longer than those of three uppers, unilaterally ciliate-villous in lower c. 2/3; filaments of three uppers densely villous throughout; hairs of all filaments white or sometimes partially pale violet,  $\pm$  clavate. Anthers of two inferior stamens 1.5-1.8 mm long, reniform, perpendicularly or sometimes  $\pm$  obliquely inserted. Style 7-11 mm long,  $\pm$  tomentose at base, stigma spatulate or obovate, decurrent. Capsule narrowly to broadly ovoid or subelliptic, truncate, 5.5-8.0 mm long, 1.5-2.3 times longer than calyx, stellate-floccose-tomentose,  $\pm$  glabrescent. Seeds, abundant, obconical-

prismatic, 0.7-0.8x0.5-0.6 mm, rugose-foveolate, blackish. Flowering time: end of May - June.

**Holotype:** North Macedonia, Gostivar, 1.60 km NW of Straža, beech forest clearing, limestone, 1523 m, 41.678975°N, 20.837378°E, 16.6.2022, leg. & det. A. Teofilovski (MKNH).

**Isotypes:** herb. A. Teofilovski; Herbarium of the Natural History Museum of the Republic of North Macedonia.

**Other collections:** North Macedonia, Gostivar, 0.97 km NW of Straža, beech forest margins and clearings, limestone, 1375 m, 41.675341°N, 20.843715°E, 7.6.2022, leg. & det. A. Teofilovski (herb. A. Teofilovski); North Macedonia, Gostivar, 2.05 km NW-W of Sretkovo village, sparse beech forest, forest openings and margins, 1330 m, 41.709062°N, 20.821845°E, 28.6.2022, leg. & det. A. Teofilovski (herb. A. Teofilovski); North Macedonia, Gostivar, c. 3.0 km NE-E of Železna Reka village, beech forest, forest openings, burned places, roadsides, silicate, 1300-1560 m, 41.703923°N, 21.033522°E, 15.7.2022, leg. & det. A. Teofilovski (herb. A. Teofilovski).

**Distribution:** According to the present data, *V. matevskii* is endemic to the northwestern part of North Macedonia, with restricted distribution south of Gostivar. Its known distributional range spreads over eight square kilometers near the locality Straža and Sretkovo village and one square kilometer near Železna Reka village. The distance between the two areas is ca. 15 km.

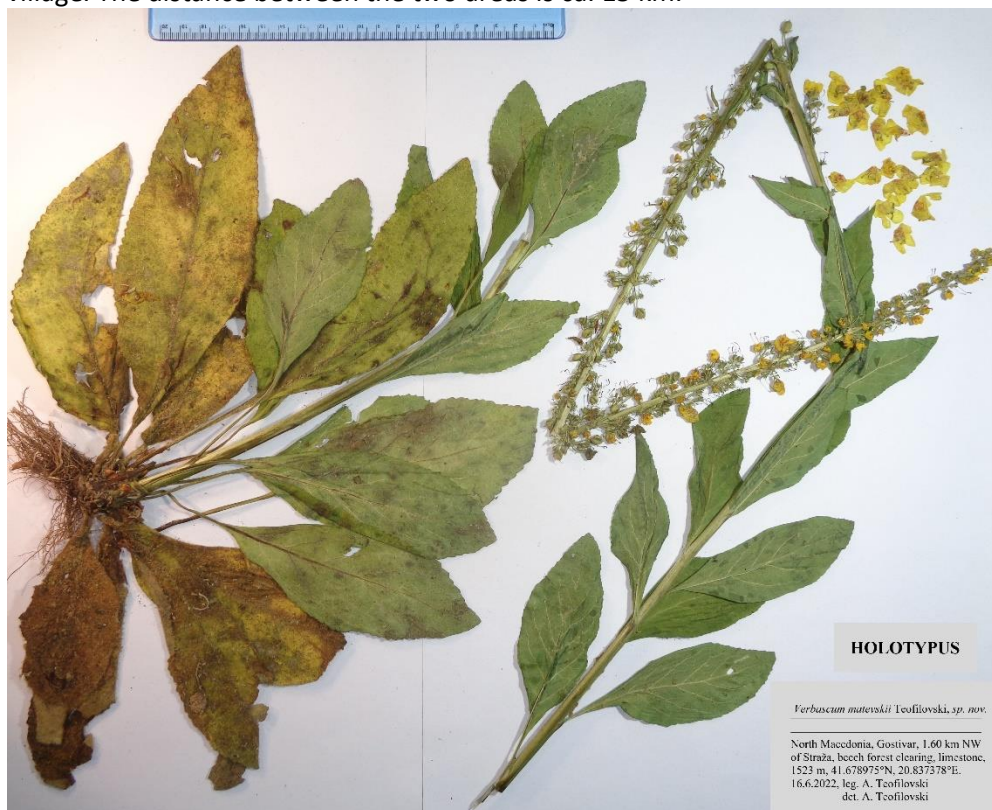


Fig. 1 Holotype of *Verbascum matevskii* (stored in MKNH).

Tab. 1 Comparison of the main differential characteristics of *Verbascum matevskii* vs. *V. davidoffii*, *V. durmitoreum* and *V. epixanthinum* var. *pindicolum*.

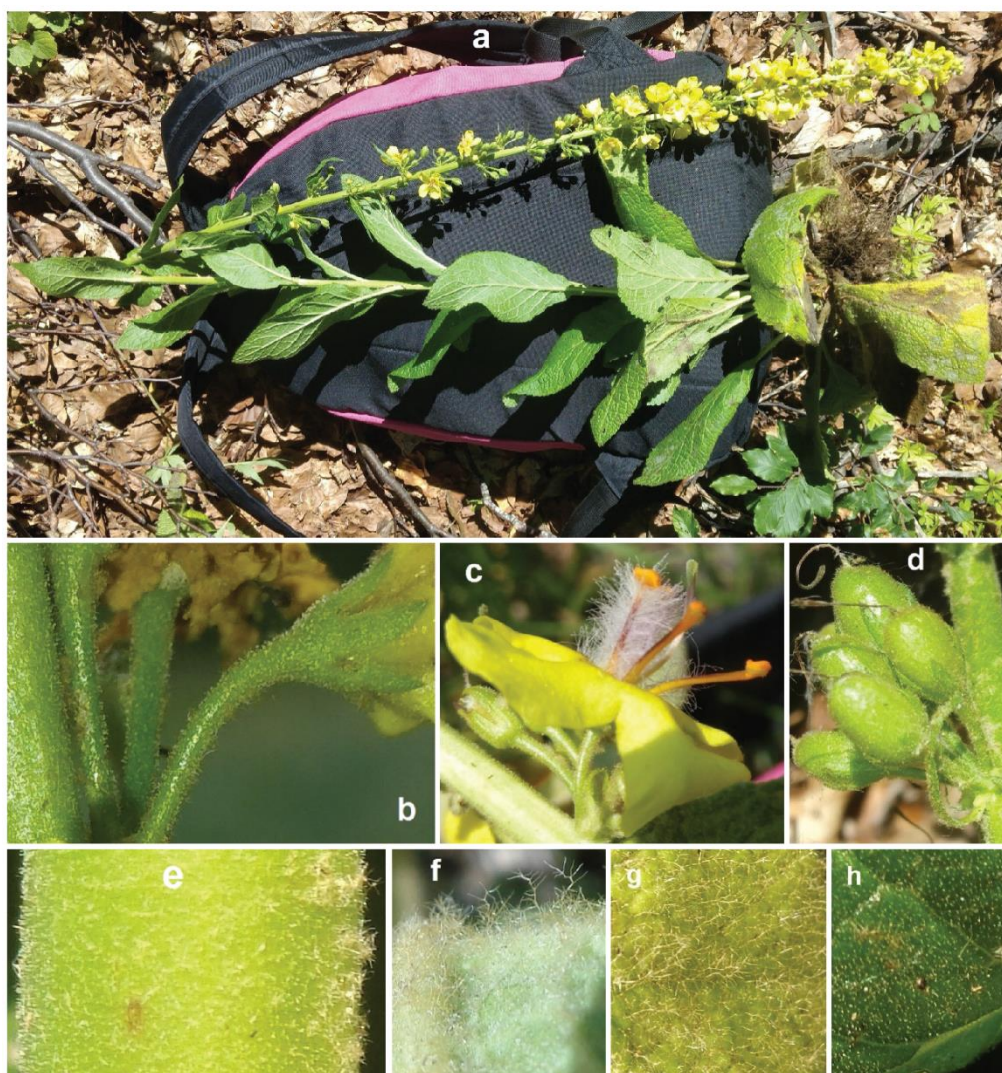
	<i>V. matevskii</i> (Fig. 1-4)	<i>V. davidoffii</i> (Fig. 5)	<i>V. durmitoreum</i> (Fig. 6)	<i>V. epixanthinum</i> var. <i>pindicolum</i> (Fig. 7, sub <i>V. pindicolum</i> )
height	(70)90- 140(170) cm	50-80 cm	30-50 cm	40-70 cm
glandular hairs	short, glands usually pale	short, glands <b>black</b>	short	<b>long</b>
stem	subangular	<b>terete</b>	<b>terete</b>	<b>terete</b>
basal leaves	crenate or crenate- dentate, base attenuate	<b>subentire or</b> <b>crenate</b> , base attenuate	<b>coarsely</b> <b>crenate</b> , base <b>rounded to</b> <b>subcordate</b>	<b>entire or minutely</b> <b>crenate</b> , base attenuate
peduncle of primary flower length	6-10 mm	5-10 mm	5-10 mm	<b>up to 6 mm</b>
calyx length	2-4 mm	<b>5-8 mm</b>	<b>5-9 mm</b>	<b>4-6 mm</b>
pellucid glands on corolla	present	<b>absent</b>	<b>absent</b>	<b>absent</b>
filaments hairs	usually white	<b>yellowish- white</b>	<b>violet</b>	<b>violet</b>
filaments of two inferior stamens	unilaterally hairy	<b>hairy on all sides</b>	<b>hairy on all sides</b>	unilaterally hairy
capsule/calyx length ratio	1.5-2.3 times longer	<b>scarcely or</b> <b>slightly longer</b>	<b>subequal or</b> <b>slightly longer</b>	<b>1.5 times longer</b>
distribution	NW North Macedonia	<b>SW Bulgaria</b> <b>(Pirin Mt.)</b>	<b>Monte Negro,</b> <b>Hercegovina</b>	<b>Greece</b>

**Ecology:** *V. matevskii* grows in mesic habitats of the beech forests zone, between 1160 and 1600 m a.s.l. It inhabits sparse beech forests, cutting and burned areas, forest clearings and roadsides, on siliceous and carbonate bedrock. The only other *Verbascum* species observed to grow together, though only in rare cases, is *V. nigrum* s.l.

**Size of the population and threats:** The number of observed individuals of the new species is ca. 120, occurring very scattered, in small groups or singly. Having into consideration the small number of individuals, its scattered occurrence, and the strong adverse anthropogenic impacts in the area (tree-cutting, construction and reconstruction of forest roads, frequent forest fire), *V. matevskii* is obviously a highly endangered species. Further field study in the distribution and neighboring areas is needed to assess its threat status according to IUCN criteria and the need for protection.

**Taxonomy:** *V. matevskii* is a morphologically distinct species with no closely related known taxa. In the sense of the infrageneric classification proposed by

Murbeck (1933), it belongs to *Verbascum* sect. *Bathrosperma*, subsect. *Fasciculata*. Due to its dense glandular cover, unbranched or almost so inflorescence and linear bracts, to some extent, it is similar to the following three representatives of this subsection: Bulgarian endemic *V. davidoffii* Murb. (Fig. 5), Montenegro-Herzegovinian endemic *V. durmitoreum* Rohlena (Fig. 6) and Greek endemic *V. epixanthinum* var. *pindicolum* (Freyn & Sint.) Murb. (syn. *V. pindicolum* Freyn & Sint.) (Fig. 7, sub *V. pindicolum*). It differs from all of them in its about twice height [(70)90-135(170) vs. 50-80 / 30-50 / 40-70 cm, respectively], subangular stem (vs. terete), the presence of pellucid glands on the corolla (vs. absence), (usually) shorter calyces (2-4 vs. 5-8,



**Fig. 2** *Verbascum matevskii*, a specimen and details of specimens from the type locality, a) specimen, b) part of inflorescence (axis, peduncles, calyx), c) flower, d) fruiting fascicle with bract and bracteoles, e) stem, f) lower surface of basal leaf, g) upper surface of basal leaf, h) upper surface of upper cauline leaf (Photo A. Teofilovski, 16.6.2022).



Fig. 3 *Verbascum matevskii* on the type locality (Photo A. Teofilovski, 16.6.2022).

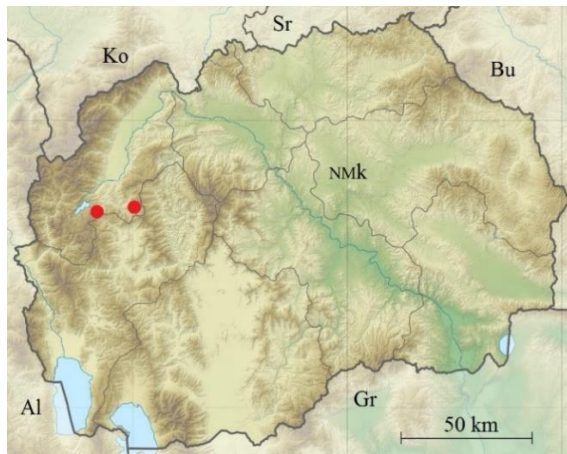


Fig. 4 General distribution of *Verbascum matevskii*.

5-9, 4-6 mm, respectively), and the usually much longer capsule than calyx (1.5-2.3 times vs. up to slightly longer in *V. davidoffii* and *V. durmitoreum* and ca. 1.5 times in *V. epixanthinum* var. *pindicolum*). In addition, the new species differs from each of them also by several other characteristics, the main of which are comparatively presented (together with the ones listed above) in Tab. 1. The presented characteristics of *V. davidoffii*, *V. durmitoreum* and *V. epixanthinum* var. *pindicolum* are based on descriptions given by Murbeck (1933). However, most of them are visible (and measurable) in the scans of the herbarium specimens from the type and other collections listed above (see Material and methods).

**Etymology:** The name of the new species honors Acad. Prof. Dr. Vlado Matevski (Macedonian academy of sciences and arts), a prominent researcher of Macedonian flora and the genus *Verbascum*.

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## References

- Dimopoulos P., Raus Th., Bergmeier E., Constantinidis Th., Iatrou G., Kokkini S., Strid A. & Tzanoudakis D. (2013): Vascular plants of Greece: an annotated checklist. – Botanischer Garten und Botanisches Museum Berlin-Dahlem. pp. 372. – Berlin & Hellenic Botanical Society, Athens.
- Duman H., Uzunhisarcikli M. E. & Ozbek F. (2021): A new natural hybrid of *Verbascum* L. (Scrophulariaceae) from Turkey. – Gazi Univ. J. Sci. 34/4: 937–946. doi.org/10.35378/gujs.787401
- Ferguson I. K. (1972): *Verbascum* L. – In: Tutin T. G., Heywood V. H., Burges N. A., Moore D. M., Valentine D. H., Walters S. M. & Webb D. A. (eds.): Flora Europaea 3, pp. 205–216. – Cambridge University Press, Cambridge.
- Gahremaninejad F., Riahi M., Babaei M., Attar F., Behçet L, Sonboli A. (2014): Monophyly of *Verbascum* (Scrophulariaceae: Scrophulariaceae): evidence from nuclear and plastid phylogenetic analyses. – Aust. J. Bot. 62: 638–646. doi.org/10.1071/BT14159
- Huber-Morath A. (1978): *Verbascum* L. – In: Davis P. (ed.): Flora of Turkey and the East Aegean Islands 6. pp. 461–603. – Edinburgh University Press, Edinburgh.
- Murberck S. (1933): Monographie der Gattung *Verbascum*. – Acta Univ. Lund. 29: 1–630.
- Murbeck S. (1939): Weitere Studien über die Gattungen *Verbascum* und *Celsia*. – Acta Univ. Lund. 35: 1–71.
- Raus T. (1991): *Verbascum* L. – In: Strid H. & Tan K. (ed.): Mountain flora of Greece 2. pp. 170–188. Edinburgh.
- Stefanova-Gateva B. (1995): *Verbascum* L. – In: Kožuharov S. (ed.): Flora Reipublicae Bulgaricae 10. pp. 26–100. – Editio Academica “Profesor Marin Drinov”, Serdicae. [in Bulgarian].
- Zografidis A. (2016): Two new infraspecific taxa of *Verbascum delphicum* (Scrophulariaceae, Scrophulariaceae) from mainland Greece and the island of Evvia. – PhytoKeys 74: 107–122. doi: 10.3897/phytokeys.74.10381



Zografidis A., Polymenakos K., Zarkos G. & Dimopoulos P. (2020): Notes on *Verbascum* (Scrophulariaceae) from Greece. – *Phytol. Balcan.* 26/3: 485–494

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Fig. 5 *Verbascum davidoffii*, herbarium specimen from the type collection (1315022, LD).

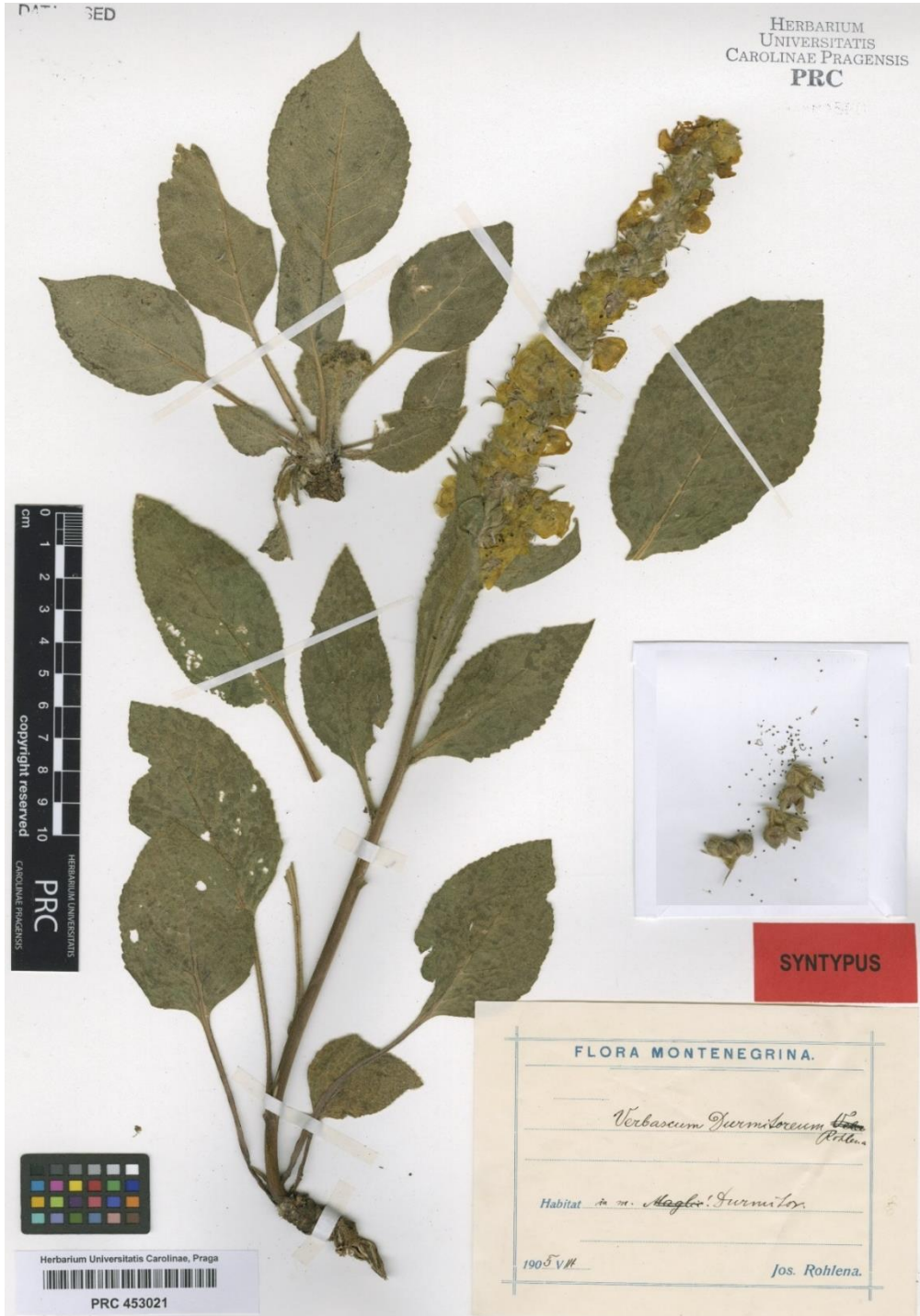


Fig. 6 *Verbascum dumitoreum*, herbarium specimen from the type collection (453021, PRC).



Fig. 7 *Verbascum epixanthinum* var. *pindicolum*, herbarium specimen from the type collection (G00025581, G).