

Notes on *Verbascum* (*Scrophulariaceae*) from Greece

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Abstract. The authors report the rediscovery of *Verbascum hypoleucum* and *V. foetidum*, two Greek endemics from Peloponnesos and Sterea Ellas, respectively. These very rare species have been previously known only from one or two 19th century collections. Furthermore, *V. ×naxense*, *V. ×patrense*, *V. ×pseudomaurum*, *V. ×thermiense*, and *V. ×zakynthicum*, five new nothospecies from mainland and insular Greece, are also described.

Key words: endemics, Greece, rediscovery

Introduction

Verbascum L. is on the top-ten list of the species-rich genera of vascular plants in Greece and represents also one of the endemics-richest and range-restricted-richest angiosperm genera in the country (Dimopoulos & al., 2013). Over 27 mullein species are both Greek endemics and range-restricted; most of them (23) are local to a single floristic region and some of them, in turn, are further restricted to a single mountain or island. However rare these species may be, most are not difficult to detect. Their non-negligible size and usual gregariousness makes these plants quite apparent in the field. Thus, even though *Verbascum* is considered a difficult genus and misidentifications are not uncommon, several corroborative records exist for most range-restricted endemics. However, there are three notable exceptions among its species, exceedingly underrepresented in the records: *Verbascum hypoleucum* and *V. foetidum* rediscovered after more than century and a half (addressed in this study) and *V. orphanideum*, a taxon collected once from Mt Parnon in the Peloponnesos by Orphanides in 1850 and never reported again.

Natural hybrids are frequently observed in the genus as they are readily produced when two species co-exist. Importantly, they are invariably found to be sterile (e.g. Murbeck 1933, Rechinger & Huber-Morath 1960, pers. obs.), which could indicate that hybridization probably is not a significant evolutionary force in *Verbascum*. The best known nothospecies from Greece have been described by Rechinger & Huber-Morath (1960), whereas to the authors' knowledge no further discoveries were made so far. Botanical outings in 2019 have led to discovery of five new hybrids described here.

Material and methods

Field studies were undertaken in the spring/summer season of 2019 in the floristic regions of Kiklades, Peloponnesos, Sterea Ellas, and Ionian Islands. Voucher specimens were collected and examined under a Zeiss Stemi SV6 stereo microscope. For pollen examination of dry specimens, anthers of mature flower buds (that would have opened on the next day of the collection date) were smashed with a needle in a

drop of water on a slide and a cover slip was placed over the suspension. The preparations were examined with a Zeiss Axioskop 2 light microscope and images of pollen grains were captured with a ProgRes 3 digital camera.

Taxonomy

Verbascum hypoleucum Boiss. & Heldr. (Fig. 1)

Gr Nomos & Eparchia Korinthias: Mt Killini, Flabouritsa Gorge, along a rocky footpath from Manna to Markou Lakka, 1200 m, 37°57'N, 22°26'E, 16.06.2012,

G. Zarkos & V. Christodoulou obs. (several photos); loc. ibid., 10.07.2018, A. Zografidis 441 (herb. Zograf.); Mougosto Aesthetic Oak Forest, 860 m, 38°00'N, 22°36'E, 19.07.2019, K. Polymenakos & G. Kofinas 895 (ATH); loc. ibid., 17.08.2019, A. Zografidis (obs.).

Notes. This distinctive species was known only from the type collected by Heldreich from Mt Killini in Peloponnesos, labeled in his hand "In faucibus umbrosis reg. abietinae inter Kyllenes et Gymnouvouno montes versus Phlampuritzta 4000', 10 Jul 1848, no 2039". There seems to be only two duplicates: one was kept in B and probably destroyed during World War II (a photo taken by A. & Sv. Murbeck

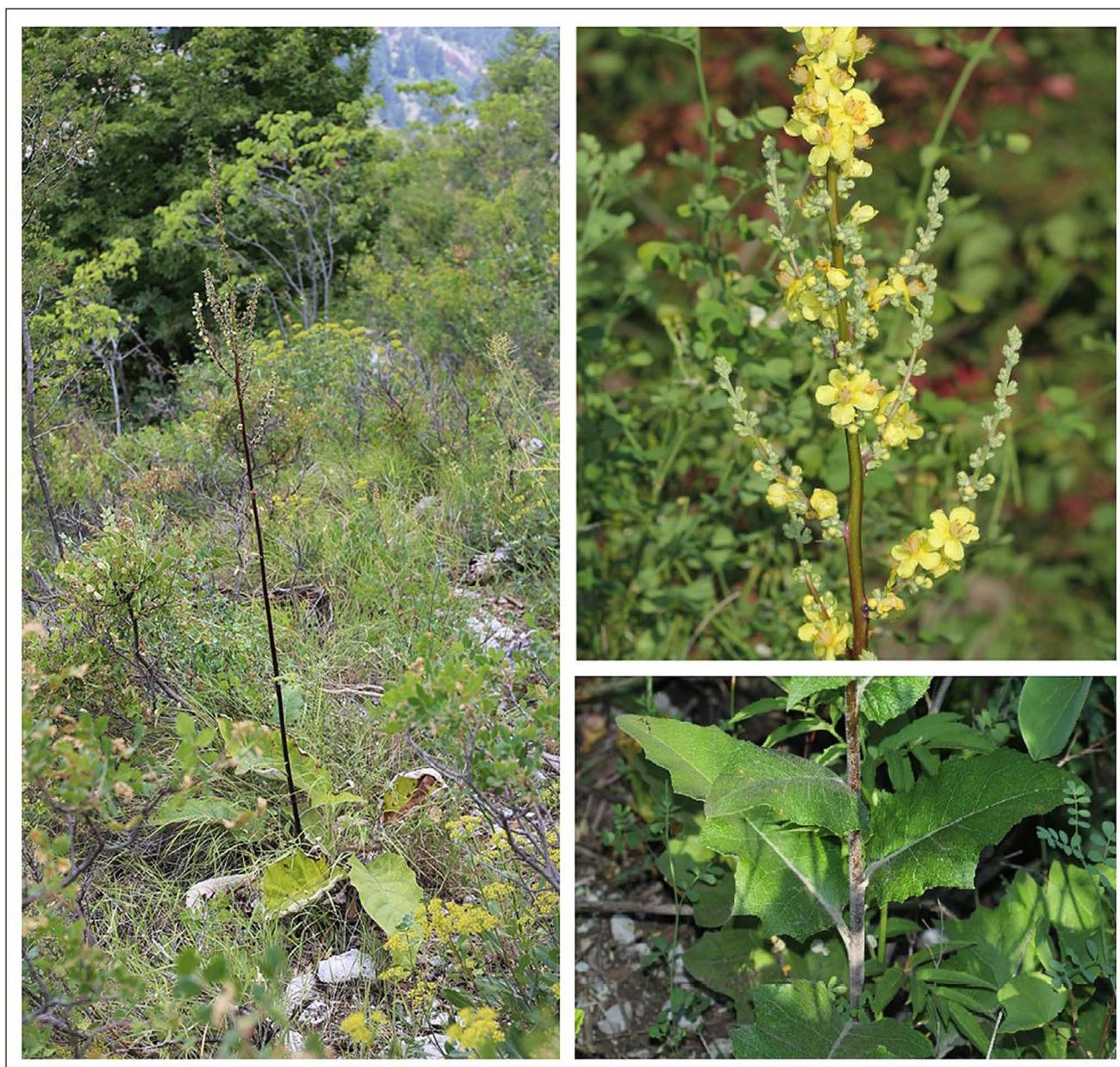


Fig. 1. *Verbascum hypoleucum* in habitat in Flabouritsa Gorge, Mt Killini.

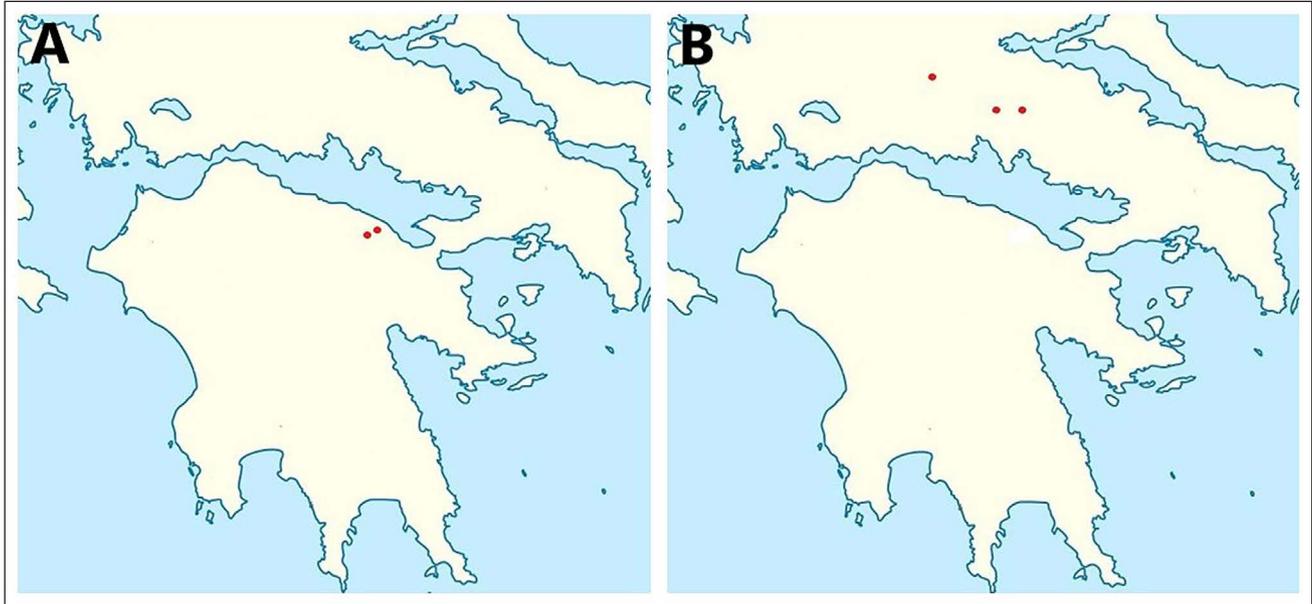


Fig. 2. Known distribution of *Verbascum hypoleucum* (A) and *V. foetidum* (B).

is kept in LD), and a second one, with an additional note “rarissime ad rupes, specimina 2!”, deposited in G (images of the surviving duplicate are available at <https://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=87604&base=img&lang=en>). *Verbascum hypoleucum* has characteristic, uniquely lobed leaves that somewhat resemble the leaves of henbane (Fig. 1). It was rediscovered first in the Flabouritsa Gorge (Mt Killini, locus classicus) already in 2012, but was then misidentified as *V. banaticum* Schrad. (Zarkos & al. 2012). Currently, two very small populations of this very rare plant were reported. They consisted collectively of no more than 10 mature individuals (in the summer of 2019) (Fig. 2A). The second population was found at the NE foothills of Mt Killini, in the Mougosto Oak Forest where only a single mature plant and a few immature basal-leaf rosettes were observed. According to the available living material, the stamen hairs are whitish (not pale-violet), whereas the species is morphologically related to *V. delphicum* Boiss. & Heldr., a variable taxon endemic to the mountains of Dirfi/Xirovouni and Ochi in Is Evvia (subsp. *delphicum*) and Mt Parnitha in Attica (subsp. *cervi*) (Zografidis 2016).

***Verbascum foetidum* Boiss. & Heldr. (Fig. 3)**

Gr Nomos Viotias, Eparchia Levadias: Mt Parnassos, near Eptastomos Cave, in a fir forest, 1200 m, 38°33'N, 22°29'E, 12.08.2019, A. Zografidis & K. Polymenakos 613 (herb. Zograf., UPA), Kalania site, in an open fir forest, 1380 m, 38°32'N, 22°29'E, 14.07.2019,



Fig. 3. *Verbascum foetidum* in habitat (Mt Vardousia) next to the second author K. Polymenakos.

K. Polymenakos & G. Kofinas 891 ATH, loc. *ibid.*, 12.08.2019, A. Zografidis & K. Polymenakos 614 (herb. Zograf.); Nomos Fokidos, Eparchia Parnassidos: Mt Vardousia, at the roadsides and in an open fir forest c. 3 km N of Athanasios Diakos, 1200 m, 38°43'N, 22°10'E, 13.08.2019, A. Zografidis & K. Polymenakos 621 (herb. Zograf.).

Notes. This taxon was known earlier only from two gatherings by Heldreich (collected in 1852, type) and Orphanides (collected in 1856), both from the same Dipotama locality on Mt Parnassos, in the floristic region of Sterea Ellas (images of the type material are available at <https://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=9174&base=img&lang=en>). A first attempt to rediscover the species at the *locus classicus* was undertaken in the summer of 2018. However, it proved unsuccessful and only one interesting basal leaf rosette was observed. Next summer, on Mt Parnassos, the taxon was finally found in the Kalania site and the neighboring Eptastomos Cave location, c. 15 km W of the type locality. A second population was reported on Mt Vardousia, near the settlement of Athanasios Diakos. The known distribution of the species, including the *locus classicus*, is shown in Fig. 2B. *Verbascum foetidum* is an intermediate taxon between the Balkan endemic *V. eriophorum* Godr. and the variable Greek endemic *V. epixanthinum* Boiss. & Heldr. and it might be difficult to distinguish it from some forms of the latter. However, it is clearly distinct from the sympatric populations of *V. epixanthinum* that grow at higher altitudes on Mt Parnassos (var. *parnassicum* (Halácsy) Murb.) by its elliptic-oblong and ± crenate basal leaves (vs. ovate-lanceolate, subentire), broader, elliptic calyx segments (vs. lanceolate) and its obtuse, ± thin-walled capsule, with a weak rostrum (vs. acute, with a thick pericarpium and a persistent rostrum). The shape of the calyx segments, which are close to those of *V. eriophorum*, is perhaps the most reliable character for distinguishing *V. foetidum* from all varieties of *V. epixanthinum*. The authors regard this taxon as a distinct species for the time being, as further studies are needed to be conclusive regarding its taxonomic position: i.e. whether it is a distinct species, or a subspecies of either *V. epixanthinum* or *V. eriophorum*.

Verbascum xnaxense* Zograf. *nothosp. nov.

[*V. adeliae* Heldr. ex Boiss. × *V. sinuatum* L.] (Fig. 4)

Gr Nomos Kikladon, Eparchia Naxou: Is. Naxos, c. 3 km SW of Apirathos; at the roadside, 560 m,

37°02'N, 25°30'E, 31.05.2019, A. Zografidis 549 (holotype UPA; isotype ATH).

Description. This is a sterile biennial herb producing a basal leaf-rosette in the first year of growth, and an erect, terete, leafy flowering stem, 0.5–1.5 m high, in the second year. Indumentum whitish /yellowish, eglandular, persistent, covers the aerial part of the plant; eglandular hairs dendritic. Rosette and lower cauline leaves oblong-elliptic, attenuate to a short, winged petiole or sessile, lamina up to 40×15 cm, sinuate and slightly crenate, obtuse at apex; middle and upper cauline leaves progressively smaller, sessile, decurrent, crenate-crenulate, subacute to acute, the upper ones approx. 3×1.5 cm. Inflorescence freely branched from below, lax; leaves at the base of branches acuminate, decurrent. Glomerules 3–10-flowered; bracts 3–6×1–3 mm, lanceolate, acuminate to caudate; bracteoles present, lanceolate; longer pedicel of glomerule 2–5 mm. Calyx 3–4 mm, segments triangular-lanceolate, acute, divided almost to the base. Corolla yellow, 2–2.5 cm in diameter, with very sparse pellucid glands, outer surface tomentose with dendritic hairs, inner surface with very sparse simple hairs on the proximal part of upper lobes (on the central vein of the lobe); stamens five, all with medifixed anthers; filament hairs reaching the connective, bicolored, proximal part white, distal part violet. Capsules absent.

Notes. The plant is found near the parental species. As mentioned in the introduction, the natural hybrids of *Verbascum* are sterile. In mature flowering stage, sterility is readily checked by inability of the hybrid to fructify. In a very early flowering stage, a suspected hybrid can be assessed by pollen examination; pollen grains of hybrids are stunt/aberrant shaped, unlike normal pollen.

Mention deserves the fact that filament hairs of the Cycladic endemic *V. adeliae* were whitish and not violet as cited in the original description by Boissier. That fact was also noted by Murbeck in his monograph on *Verbascum*.

Verbascum xpatrense* Zograf., Fassou & Dimopoulos *nothosp. nov. [*V. macrum* Ten. × *V. guicciardii* Heldr. ex Boiss.] (Fig. 5)

Gr Nomos Achaias, Eparchia Patron: Mt Panachai-ko, at NW foothills, c. 0.7 km NW of Ano Kastritsi, in a semiruderal area near stream, 350 m, 38°16'N, 21°49'E, 22.05.2019, A. Zografidis 519 (hototype UPA; isotype ATH).



Fig. 4. Holotype of *Verbascum xanaxense* kept in UPA.



Fig. 5. Holotype of *Verbascum xpatrense* kept in UPA.

Description. A sterile biennial herb producing a basal-leaf rosette in the first year of growth, and an erect, terete, leafy flowering stem, 1–2 m high, in the second year. Indumentum whitish /yellowish, eglandular, persistent, covers the aerial part of the plant; eglandular hairs dendritic. Rosette and lower cauline leaves oblanceolate-elliptic; lamina up to 45×15 cm, slightly crenate in distal half, crenate-dentate in proximal half, subacute at apex, attenuate into a short, winged petiole, or sessile. Middle and upper cauline leaves ovate-lanceolate, sessile, decurrent, progressively smaller, subacute to acuminate. Inflorescence simple or sparingly branched from below, dense; glomerules 3–10-flowered, subsessile; bracts 7–20×3–10 mm, ovate (the lowermost) to lanceolate, acuminate to caudate; bracteoles present, lanceolate. Calyx 8–13 mm, segments lanceolate, acute, divided almost to the base. Corolla yellow, 3–5 cm in diameter, with pellucid glands, outer surface tomentose, with dendritic hairs, inner surface with simple hairs on the proximal part of upper lobes; stamens five with white/yellowish filament hairs; two lower stamens with decurrent anthers 3–4 mm, filament hairs not reaching the connective. Capsules not formed.

Notes. Found near the parental species. A similar *V. xcephalariense* Hub.-Mor. & Rech. f., representing

the hybrid *V. macrurum* × *V. samniticum*, is reported from Mt. Killini, Nomos Korinthias.

***Verbascum xpseudomaurum* Zograf. nothosp. nov.** [*V. daenzeri* (Fauché & Chaub.) Kuntze × *V. samniticum* Ten.] (Fig. 6)

Gr Nomos Lakonias, Eparchia Lakedemonos: Mt Parnon, c. 3 km NE of the settlement of Vasaras; at the roadside, 870 m, 37°10'N, 22°31'E, 24.05.2019, A. Zografidis 531 (holotype UPA; isotype ATH).

Description. A sterile, biennial(?) herb producing a basal-leaf rosette in the first year of growth, and an erect, terete, leafy flowering stem, c. 1.8 m high, in the second year. Indumentum sparse, consisting of glandular hairs, single eglandular hairs and bifurcated hairs (trifurcated hairs present but rare). Rosette and lower cauline leaves petiolate, ±elliptic in outline; petiole 1–4 cm; lamina up to 25×9 cm, acute, pinnatifid with approx. 15 lobes on each side, basal part of lamina pinnatisect; lobes acute, ±double dentate. Middle and upper cauline leaves progressively smaller, sessile, pinnatifid, and double-dentate (middle) to dentate (upper). Stem branched from below, forming several single lax inflorescences; glomerules 2–4(–5)-flowered; bracts 4–15×1–8 mm, lanceolate, acuminate to



Fig. 6. Holotype of *Verbascum* × *pseudomaurum* kept in UPA.

caudate, the lower and middle ones dentate, the upper ones \pm entire; bracteoles present, lanceolate to narrowly lanceolate-oblong; longer pedicel of glomerule 8–15(–20) mm, the rest \pm subequal. Calyx 3–6 mm, segments narrowly lanceolate-oblong, acute, divided almost to the base. Corolla yellow, 2.5–3.5 cm in diameter, with pellucid glands, outer surface subglabrous with very sparse simple hairs, inner surface with some simple hairs on the proximal part of the upper lobes; stamens five; filament hairs of three upper stamens white, filament hairs of two lower stamens white and violet, not reaching the connective; two lower stamens with decurrent anthers approx. 2 mm long. Capsules not formed.

Notes. The description rested on a single plant that was found near the parental species. This hybrid bears some superficial resemblance (including the type of eglandular hairs) to *V. maurum* Maire & Murb., a distinct endemic species to Western Algeria and Morocco. However, in addition to lack of fruiting, the nothospecies is easily distinguished by the more lobed basal leaves, the existence of 3–4-flowered glomerules (vs. 1–2-flowered), the presence of bracteoles, and by the decurrent front anthers (vs. obliquely inserted or medifixed).

***Verbascum xthermiense* Zograf. nothosp.**

nov. [*V. undulatum* var. *integrifolium* Griseb. \times *V. guicciardii* Heldr. ex Boiss.] (Fig. 7)

Gr Nomos Etolias-Akarnanias, Eparchia Trichonidos: c. 2.5 km NW of Thermo, on the way to Taxiarchis; at the roadsides, 500 m, 38°36'N, 21°39'E, 18.05.2019, A. Zografidis 509 (holotype UPA; isotype ATH).

Description. A sterile biennial herb producing a basal-leaf rosette in the first year of growth, and an erect, terete, leafy flowering stem, 1–2 m high, in the second year. Indumentum whitish/yellowish, eglandular, covers the aerial part of the plant; eglandular hairs dendritic. Rosette and lower cauline leaves petiolate, oblanceolate-elliptic; petiole 1–15 cm; lamina up to 40 \times 13 cm, sinuate-undulate, attenuate at the base, obtuse or subacute at apex. Middle and upper cauline leaves sessile, progressively smaller, subacute to acuminate, the upper ones approx. 5 \times 3 cm, ovate with a \pm cordate base. Stem and axil of inflorescence \pm glabrescent, turning reddish-black. Inflorescence simple or sparingly branched from below, lax; glomerules 3–7-flowered; bracts 7–15 \times 4–9 mm, ovate (the lowermost) to lanceolate, acuminate to caudate; bracteoles present, lanceolate; longer pedicel of glomerules 4–9 mm, the rest distinctly shorter. Calyx 7–11 mm, segments lanceolate, acute,



Fig. 7. Holotype of *Verbascum xthermiense* kept in UPA.

almost divided to the base. Corolla yellow, 3–5 cm in diameter, with pellucid glands, outer surface tomentose with dendritic hairs, inner surface with simple hairs on the proximal part of upper lobes; stamens five with white/yellowish filament hairs; two lower stamens with obliquely inserted anthers, filament hairs reaching the adaxial surface of the connective. Capsules not formed.

Notes. Found near the parental species.

***Verbascum xzakynthicum* Zograf. nothosp. nov.**

[*V. pulverulentum* Vill. × *V. macrurum* Ten.] (Fig. 8)

Gr Nomos Zakynthou, Eparchia Zakyntho: Is. Zakynthos, c. 0.3 km SE of Korithi; in olive groves, at roadsides, 115 m, 37°54'N, 20°42'E, 07.06.2019, A. Zografidis 559 (holotype UPA; isotype ATH).

Description. A sterile biennial herb producing a basal-leaf rosette in the first year of growth, and an



Fig. 8. Holotype of *Verbascum xzakynthicum* kept in UPA.

erect, terete, leafy flowering stem, 1.5 m high, in the second year. Indumentum whitish/yellowish, eglandular, covers the aerial part of the plant; eglandular hairs dendritic. Rosette and lower cauline leaves elliptic-ob-lanceolate, attenuate to petiole 3–7 cm, lamina up to 25×10 cm, subentire, obtuse at apex; middle and upper cauline-leaves progressively smaller, sessile, decurrent, subacute to acuminate. Stem and axil of inflorescence ±glabrescent. Inflorescence sparingly branched from below, dense; glomerules 3–20-flowered; bracts (ex-cl. lowermost) 6–13×1–2.5 mm, narrowly lanceolate; bracteoles present, narrowly lanceolate to linear; longer pedicel of glomerule 2–4 mm. Calyx 4–6 mm, segments narrowly lanceolate, divided almost to the base. Corolla yellow, 2.5–3 cm in diameter, with pellucid glands, outer surface tomentose with dendritic hairs, inner surface with simple hairs on the proximal part of upper lobes; stamens five, filament hairs white/light-brownish; two lower stamens with obliquely inserted anthers, filament hairs not reaching the connective. Capsules not formed.

Notes. The description is based on a single plant that was found near the parental species.

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