

A new natural hybrid of *Verbascum* (*Scrophulariaceae*) from European Turkey

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Abstract. *Verbascum edirnense*, a natural hybrid between *V. densiflorum* and *V. sinuatum* from European Turkey, is described as new to science and illustrated. The morphological characteristics of *V. edirnense* are compared with those of its parents.

Key words: hybrid, *Scrophulariaceae*, taxonomy, *Verbascum*

Introduction

The genus *Verbascum*, which belongs to tribe *Verbasceae* (*Scrophulariaceae*), is represented worldwide by 360 species (Judd & al. 1999) and is the largest genus of the family in Turkey. It comprises 228 species and 114 hybrids in the *Flora of Turkey* (Huber-Morath 1978) and 188 taxa are endemic to the country (Karavelioğulları & al. 2006).

After the publication of the *Flora* nine new species have been described from Anatolia (Davis & al. 1988; Vural & Aydoğdu 1991; Karavelioğulları & al. 2004; Kaynak & al. 2006; Parolly & Tan 2007; Parolly & Eren 2008). During our studies, *V. samniticum* Ten. attracted our attention as a new record for European Turkey (Yılmaz & Dane 2008).

The hybrid number and hybridization rate in *Verbascum* are higher than in the other Turkish genera of the *Scrophulariaceae* (Davis & al. 1988). Twenty-eight natural hybrids were recognized in the *Flora of Turkey* (Huber-Morath 1978), and seven new hybrids have been added ever since (Davis & al. 1988; Ekim 2000; Sutory 2004).

Our study is based on some *Verbascum* specimens collected in the wild, in the fields around Edirne in European Turkey, between 2003–2007. During spec-

imen collection for our studies, some plants seemed to have intermediate characteristics of *V. densiflorum* and *V. sinuatum*. After some morphological studies and reviewing and checking of the respective literature (Ferguson 1972; Huber-Morath 1978), and after examination of many other specimens we have come to the conclusion that those intermediate specimens represented a hitherto undescribed natural hybrid in *Verbascum*. Voucher specimens were deposited in the Herbarium of Trakya University (EDTU).

Results and discussion

***Verbascum* × *edirnense* F. Dane & G. Yılmaz, hybr. nov.** (*V. densiflorum* Bertol. × *sinuatum* L., nothosp. nova) (Figs 1, 2 & 3)

Herba biennis eglandulosa. Caulis ramosus erectus 80–120 cm altus tomentum pilorum adpressorum candelabriformium cinereum usque flavescens ferens. Folia basalia 15–30 × 5.5–8.5 cm oblongo-elliptica spatulata crenata tomentum densum pilorum candelabriformium superne inferneque (ut in *V. densifloro*) ferentia minus sinuata leviter undulata breviter petiolata (ut in *V. sinuato*). Folia caulina 11–15 × 3–5 cm ovata usque ovato-lanceolata acuta vel acuminata (ut in *V.*

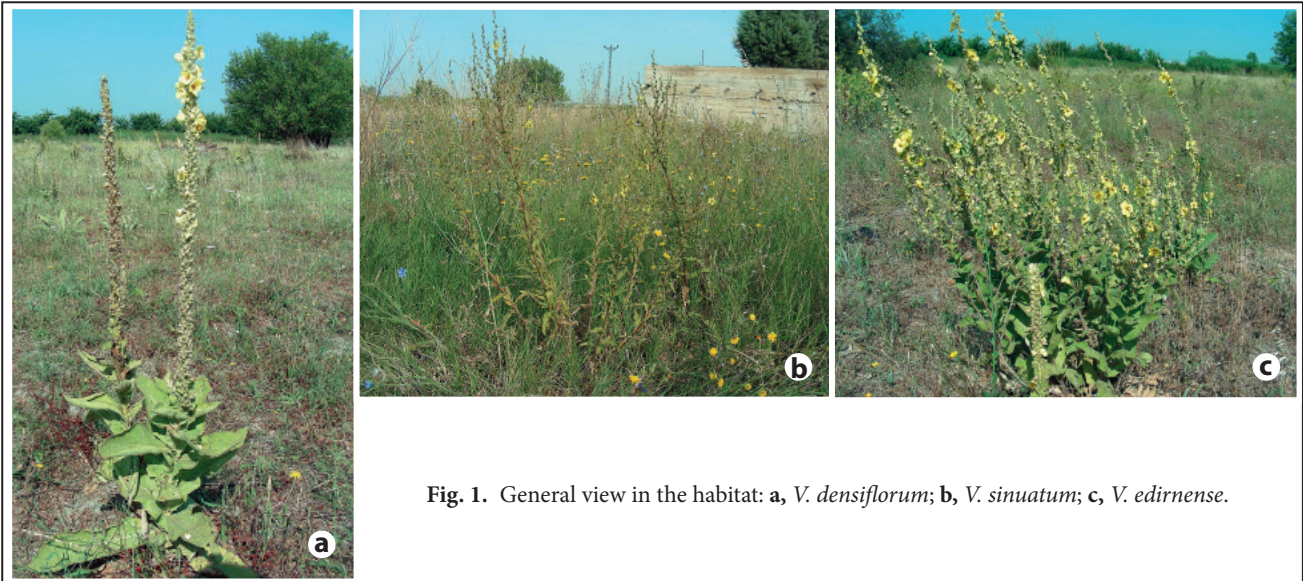


Fig. 1. General view in the habitat: a, *V. densiflorum*; b, *V. sinuatum*; c, *V. edirnense*.



Fig. 2. Basal leaves forming a rosette: a, *V. densiflorum*; b, *V. sinuatum*; c, *V. edirnense*.

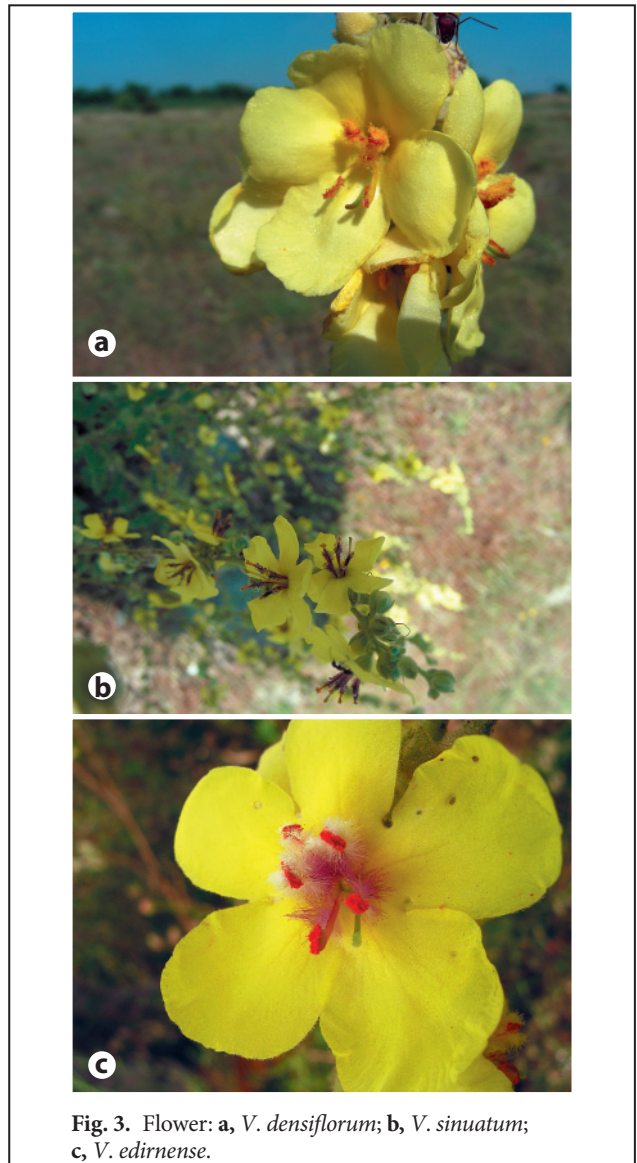


Fig. 3. Flower: a, *V. densiflorum*; b, *V. sinuatum*; c, *V. edirnense*.

densifloro). Inflorescentia ad basin plerumque ramosa, laxa, cum fasciculis florum 2–9-floris (ut in *V. sinuato*). Bractee 4–8 mm longae acutae (eis *V. densiflori* magis similes), breviter cuspidatae (ut in *V. sinuato*). Bracteolae duae, ovatae usque lanceolatae, 2–4 mm, tomentum densum albescens vel flavescens pilorum candelabriformium ferentes. Pedicelli longiores 2 mm longi. Lobi calycis 5–7(–8) mm (longitudine *V. sinuato* magis propinqui) ovato-lanceolati vel lanceolati acuti usque acuminati extus tomentum densum albescens vel flavescens pilorum candelabriformium ferens intus pilis candelabriformibus paucioribus (ut in *V. densifloro*) instructi. Corolla 15–35 mm diametro (magnitudine inter parentes), extus tomentosa. Stamina 5, inferiora antheris decurrentis obliquis; filamenta superiora usque ad antheras albo-flavescenti-violaceo lanosa, ea decurrentia prope medium filamentum pilis albo-flavescenti-violaceis instructa (characteres inter parentes). Stylus 10 mm longus stigmatem spatulato decurrenti instructus ut in *V. densifloro*.

Holotype: Turkey: A1(E) Edirne: Center – around the Faculty of Medicine, pasture, 41°40'28"N, 26°33'39"E, 26 m, 11.07.2007, coll. F. Dane & G. Yilmaz (EDTU 9611); **Isotype** (EDTU 9612).

Biennial, eglandular herb. Stem branched, erect, 80–120 cm, with grey to yellowish tomentum of adpressed, candelabriform hairs. Basal leaves 15–30 × 5.5–8.5 cm, oblong elliptical, spatulate, crenate, with a dense tomentum of candelabriform hairs adaxially and abaxially (as in *V. densiflorum*), less sinuate, somewhat undulate, shortly petiolate (as in *V. sinuatum*). Cauline leaves 11–15 × 3–5 cm, ovate to ovate-lanceolate, acute to acuminate (as in *V. densiflorum*). Bracts 4–8 mm, acuminate (closer to *V. densiflorum*), shortly cuspidate (as in *V. sinuatum*). Bracteoles 2, ovate to lanceolate, 2–4 mm, with a dense whitish to yellowish tomentum of candelabriform hairs. Longer pedicels 2 mm. Calyx lobes 5–7(–8) mm (closer to *V. sinuatum*), ovate-lanceolate or lanceolate, acute to acuminate, with a dense whitish to yellowish tomentum of candelabriform hairs; inside the calyx less candelabriform hairs (as in *V. densiflorum*). Corolla 15–35 mm in diameter (between the parental species), tomentose outside. Stamens 5, 2 anterior with decurrent oblique anthers; 3 posterior with wool up to anthers, with yellowish-white hairs above and violet hairs below; the 2 anterior with violet hairs near the filament (between the parental species). Style 10 mm with spatulate stigma (as in *V. densiflorum*).

Distribution. *Verbascum edirnense* is located in Edirne, where is distributed locally one of the parent species: *V. densiflorum*. However, *V. sinuatum* is widely distributed in Anatolia and European Turkey especially in the Mediterranean area.

Verbascum is divided by Huber-Morath into artificial groups A to M (Huber-Morath 1971, 1978). In this study one of the parent species of the hybrid (*V. densiflorum*) belongs to Group E, while the other (*V. sinuatum*) belongs to Group H. *V. sinuatum* created 27 hybrids with nearly all groups in Turkey. *Verbascum sinuatum* in particular created hybrids with Group K. The number of these hybrids is six. There are five hybrids of *Verbascum* in European Turkey. *V. phlomoides* L., which belongs to Group E, similarly to *V. densiflorum* has created a hybrid with *V. sinuatum* (Huber-Morath 1978). The hybrid plants grow together with the parental species and their occurrence is limited by the distribution of *V. densiflorum* in A1(E) squares. Although the hybrid is mentioned in Murbeck's monograph (1933) without description, it is not mentioned in Huber-Morath's works (1971, 1978).

Verbascum sinuatum is widely spread, while *V. densiflorum* is locally distributed in European Turkey. However in the field the number of *V. sinuatum* individuals is lower than the number of these of *V. densiflorum*. There were 45 *V. densiflorum* and 10 *V. sinuatum* individuals in the observed area.

The hybrids are easily detectable and recognizable in the field. Their intermediate morphological characters are sufficient to suggest a hybrid origin and to determine the parent species. A more detailed comparison of the hybrid with its parents is given in Table 1 and the geographical distributions of the three taxa are mapped in Fig. 4. *Verbascum edirnense* has intermediate morphological characters between *V. densiflorum* and *V. Sinuatum*, mainly in the shape of basal leaves, inflorescence, anthers of lower stamens, and colour of filament hairs.

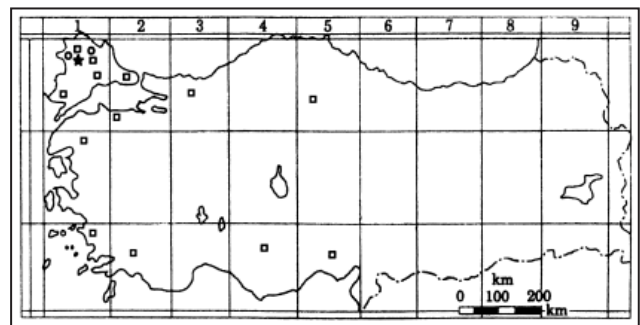


Fig. 4. Distribution in Turkey of: *V. edirnense* (★); *V. densiflorum* (○); *V. sinuatum* (□).

Table 1. Comparison of some diagnostic morphological characters of *V. edirnense* with its parents.

Characters	<i>V. densiflorum</i>	<i>V. edirnense</i>	<i>V. sinuatum</i>
Indumentum	Greyish- or whitish- tomentose, eglandular	Grey to yellow tomentose, usually yellowish tomentose, eglandular	Shortly and densely grey or yellow tomentose,
Stem	50–200 cm, robust, terete or striate-angular, simple.	80–120 cm erect, terete, mostly branched from base	50–100 cm, terete or winged by decurrent hairs, mostly branched from base.
Basal leaves	10–40 × 4–10 cm, ovate- to lanceolate-oblong; coarsely crenate, Petiole 2–5 cm	15–30 × 5.5–8.5 cm, oblong- elliptical, spatulate, (less sinuate), crenate, somewhat undulate, shortly petiolate	4–35 × 2–15cm, spatulate-oblong, incised-lobed or pinnatifid, often undulate, sessile or shortly petiolate
Cauline leaves	Distinctly decurrent, upper ovate to ovate-lanceolate, acuminate, serrate-dentate	11–15 × 3–5 cm ovate to ovate-lanceolate, acuminate	Cauline leaves decurrent or not, petiole seldom up to 4 cm, upper coarsely dentate or subentire, oblong-ovate or cordate-ovate, acute.
Inflorescence	dense, usually simple, with clusters of 2–9 flowers	Usually branched at base, lax (as in <i>V. sinuatum</i>) with clusters of 2–9 flowers.	Usually branched at base, lax with numerous branches forming broad panicle, with clusters of 1–7 flowers.
Bracts	15–40 mm, usually long acuminate-caudate, lower decurrent ovate-lanceolate to linear lanceolate	4–8 mm, long acuminate	Broadly cordate-triangular, mucronate, acute
Pedicels	Indistinct, 6–10 mm, occasionally shortly adnate at base.	Longer pedicels 2 mm	Longer pedicels 2–5 mm.
Calyx	6–12 (–15) mm, lobes ovate-lanceolate or +–lanceolate, acuminate	5–7(–8) mm; lobes ovate-lanceolate or lanceolate, acute or acuminate	2,5–5 mm; lobes ovate-lanceolate, acute.
Corolla	35–50 mm in diameter, yellow, with or without few pellucid glands, pubescent outside	15–35 mm in diameter (between the parental species), yellow, tomentose outside	15–30 mm in diameter. yellow, with pellucid glands, stellate-tomentose outside
Stamens	5, 3 posterior, with whitish-yellow wool up to anthers, 2 anterior glabrous, their anthers decurrent, 3.5–5 mm	5, 2 anterior with decurrent oblique anthers; 3 posterior with wool up to anthers, with white-yellowish hairs above and violet hairs below; and 2 anterior with violet hairs near the filament	5, anthers all reniform, filaments with purple-violet wool, 2 anterior glabrous near apex.
Style	6–15 mm with spatulate stigma	10 mm with spatulate stigma	6–7 mm, with capitate stigma

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