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Verbascum haraldi-adnani (Scrophulariaceae), a new chasmophytic species from SW Anatolia, Turkey

Abstract

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Verbascum haraldi-adnani is described as a species new to science and illustrated. The habitat conditions of this local endemic species growing in Yılanlı Dağı (Muğla province) in SW Anatolia, Turkey, and its conservation status are considered. *V. haraldi-adnani* appears to be most closely allied to *V. luciliae.* Its affinities with this and other related or similar species are discussed.

Additional key words: local endemic, rock plants, taxonomy, Muğla province, Yılanlı Dağı.

Introduction

Verbascum L. is a one of the largest genera in Turkey, with c. 238 species and a high species endemism level (c. 80 %). Anatolia represents the centre of diversity and evolution in *Verbascum* (Murbeck 1925; Huber-Morath 1978; Vural & Aydoğdu 1993; Davis & al. 1988; Ekim 2000; Karavelioğulları & al. 2004, 2006; Kaynak & al. 2006; Parolly & Tan 2007). All representatives of this genus in Turkey belong to *V.* sect. *Bothrosperma* Murb. (Huber-Morath 1978). In his "Flora of Turkey" account, Huber-Morath (1978) placed all *Verbascum* species with 4 stamens and a bifid placentation into the informal "group A", where he recognised 29 taxa. This view was largely confirmed by Karavelioğulları & Aytaç (2008), who in their recent revision of this group provide partly amended descriptions of the species. They suggest slight taxonomic adjustments, accepting 25 species, three subspecies and four varieties, to which *V. yurtkuranianum* Kaynak & al. (2006) should be added. The total number of Turkish endemic *Verbascum* species belonging to "group A" is 18.

In July 2007, during bryosociological studies in SW Anatolia, an uncommon *Verbascum* was observed on Yılanlı Dağı in the province of Muğla. In "Flora of Turkey" (Huber-Morath 1978), it keyed out as *Verbascum luciliae* (Boiss.) Kuntze but clearly differed in a number of important

Fig. 1. *Verbascum haraldi-adnani* – habit. – Type material (Turkey, C2 Muğla: Yılanlı Dağı, 1250 m, *Kürschner & al. 07-269*).

features. Comparing the material with related taxa and checking the *Verbascum* accounts in the Floras of the neighbouring countries (Bouloumoy 1930; Rechinger 1943; Thiebaut 1953; Ferguson 1972; Feinbrun-Dothan 1978; Huber-Morath 1980, 1981; Meikle 1985; Raus 1991) and the relevant monographs (Murbeck 1925; Huber-Morath 1971) suggested the novelty of the species from Yılanlı Dağı. One year later, as a response to a critical review of a previous version of the present paper, additional field work yielded further material and observations, which confirmed our earlier conclusions. We thus describe here this plant as a new species, bringing the total number of *Verbascum* species known from Turkey to 239.

Verbascum haraldi-adnani Parolly & Eren, **sp. nov.** – Fig. 1-2
Holotype: Turkey, C2 Muğla, Yılanlı Dağı E of Muğla along the way to Akyer-Göktepe, 37°19'34.2"N, 28°30'30.9"E, 1250 m, siliceous rock in *Pinus nigra* forest, 19.7.2007, *Kürschner 07-269, Erdağ & Eren* (AYDN; isotypes: B, herb. Kürschner, herb. Parolly).

Habitu *Verbasco luciliae* similis et huic speciei proxima, sed imprimis differt indumento virescente dominante glanduloso-tomentoso (non canescente eglanduloso et glanduloso), floribus minoribus (10-11[-12] non 13-20 mm longis) et filamentis brevioribus (2.5-3 non 6-7 mm longis).

Shortly glandular-tomentose perennial herb, 20-40 cm tall. *Rootstock* branched, woody, stout, up to 1 cm in diameter, with a blackish brown bark easily peeling off, supporting 1-2 flowering stems per branch and year. *Stems* arcuate-ascending, slender, 1.5-2 mm in diameter at base, equally leafy throughout, at base with a dense indumentum of many short, glandular and much fewer longer, white eglandular hairs, otherwise glandular-pubescent. *Leaves* bright green, becoming increasingly simpler and smaller upwards; with the exception of a few longer eglandular hairs along the leaf margins and on the petioles, uniformly with short, glandular hairs on both surfaces, but weaker so on the upper surface; *basal leaves* often weathered at anthesis, petiolar remains present; *lower stem leaves* narrowly ovate to lanceolate, 40-50 × 14-24 mm (including the 8-12 mm long petiole), acute, pinnatisectly divided into a large, dentate, coarsely serrate to irregularly incised terminal lobe and 1-2(-3) pairs of distant lateral lobes with dentate margins, each tooth mucronulate to sharply pointed; *middle stem leaves* with shorter petioles, upper subsessile, smaller and less divided; *uppermost stem leaves* merging into bracts, lanceolate, sessile, almost entire. *Inflorescence* a 10-30-flowered, 10-15 cm long and densely short-glandular hairy raceme, bracteate throughout. *Pedicels* patent, delicate, (10-)12-15 mm long. *Flowers* hermaphrodite, 10-11(-12) mm across, slightly zygomorphic. *Bracts* (from base to top) ranging from lanceolate to almost subulate, lowermost up to 8 × 2 mm. *Bracteoles* absent. *Calyx* divided almost to base, equally 5-lobed; lobes narrowly ovate, c. 3 × 1.2-1.5 mm, acute, green and glandular-pubescent on both surfaces. *Corolla* rotate, 5-lobed; tube short, yellow; lobes rounded, slightly unequal, c. 4 × 3.5 mm, bright yellow, sparsely glandular-pubescent outside. *Stamens* 4, all fertile, isandric; filaments free, 2.5-3 mm long, purplish, with dense, yellowish white wool right up to anthers; anthers introrse, reniform, c. 1 mm, yellow. *Ovary* 2-locular; style terminal, filiform, 5-7(-8) mm long, long exerted, papillose at margin; stigma clavate. *Capsule* globose, 3-4 × 3-4 mm, glandular-pilose, glabrescent, pale brown. *Seeds* c. 0.7-1 mm long, blackish.

Eponymy. – We are glad to name the new *Verbascum* after our friends and colleagues Prof. Dr Harald Kürschner, Systematische Botanik & Pflanzengeographie, Freie Universität Berlin, and Assoc. Prof. Dr Adnan Erdağ, Botany section, Adnan Menderes University Aydın, who were attracted by this saxatile beauty while searching for bryophytes.

Distribution, site ecology and IUCN threat category. – The eye-catching *Verbascum haraldi-adnani* seems to be a very local endemic, which is only known from a single locality. It grows, in various exposures, on a few large boulders in a rock-strewn black pine forest (*Pinus nigra* var. *caramanica* (Loudon) Rehder) at an altitude of c. 1250-1300 m. As a true chasmophyte, *V. haraldi-adnani* grows in the clefts of siliceous rocks (orthogneiss), both in the deep shade of

Fig. 2. *Verbascum haraldi-adnani* – A: the species in its natural habitat; B: inflorescence, note the long style of the flower. – Photographs from the type locality (Turkey, Yılanlı Dağı) by Özkan Eren on 5 July 2008.

boulders and at sunny places (Fig. 2A). Besides two habitat-vague vascular plants (*Poa bulbosa* L. and a sterile *Festuca* species), associated species include mostly silicolous mosses such as *Grimmia lisae* De Not., *G. trichophylla* Grev., *Hedwigia stellata* Hedenäs, *Homalothecium sericeum* (Hedw.) H. Rob., *Hypnum cupressiforme* Hedw. and *Pterogonium gracile* (Hedw.) Sm.

We do not have much information about the population size of *Verbascum haraldi-adnani,* but during the 2008 field survey c. 35 flowering and fruiting individuals were observed on a limited number of rocks scattered in the forests. Further populations could not be traced. Hence, we strongly recommend placing *V. haraldi-adnani* in the IUCN category "Critically Endangered (CR)", because the estimated whole range is less than 10 km² (Criterion B2) and the population size of the species is estimated to be lower than 50 mature individuals (Criterion D; IUCN 2001).

On 5 July 2008, the population was in late flower, so that it was possible to collect both flowering and fruiting material. In July 2007, the few plants recorded were still mostly in bud.

Additional material seen (paratypes). – TURKEY: C2 Muğla: Yılanlı Dağı, along the way to Akyer-Göktepe, İkizhasan Mevkii, 37°19'32.3"N, 28°30'33.1"E, 1290 m, siliceous rock in *Pinus nigra* forest, 5.7.2008, *Eren 164/08 & Ağcagil* (AYDN, B, herb. Parolly).

Related and similar species. – The unique combination of characters (a glandular pubescent indumentum with the occurrence of scattered eglandular hairs confined to the lower portion of stem and the margins of lower leaves; narrow bracts; very small flowers with short filaments and comparatively long styles, see Fig. 2B) makes *Verbascum haraldi-adnani* a distinct and easy-to-identify species. In technical respects, it approaches a group of *Celsia* type *Verbascum* species with lyrate to pinnatisect leaves and capsules without keels, which key out in lead 9 of the informal *Verbascum* "group A" in "Flora of Turkey" (Huber-Morath 1978). Omitting those species

Table 1. Comparison of *Verbascum haraldi-adnani* with allied and similar species based on Huber-Morath (1978), Karavelioğulları & Aytaç (2008), Murbeck (1925) and the specimens cited below.

	V. haraldi-adnani	*V. luciliae*	*V. rupicola*	*V. agrimoniifolium*	*V. levanticum*
Habit	perennial	perennial	perennial	biennial	annual, biennial or perennial
Indumentum	numerous glandular and very few longer eglandular hairs below, glandular-pubescent above	numerous eglandular and less numerous shorter glandular hairs throughout	numerous eglandular and less numerous shorter glandular hairs throughout	glandular pubescent below, glabrous above	numerous eglandular and less numerous shorter glandular hairs throughout
Pairs of lateral leaf lobes of basal leaves	1-2(-3)	(2-)3-5	1-2	4-10	2-4
Cauline leaves	alternate	alternate	alternate	alternate	opposite
Lower bracts	lanceolate, long-acuminate to caudate, almost entire	broadly lanceolate, acuminate, entire, rarely dentate	broadly ovate, acuminate, serrate-dentate	cordate to ovate, acuminate or caudate, dentate or entire	leaf-like, broadly triangular-ovate, acute or shortly acuminate, dentate
Indumentum of bracts	densely glandular-pubescent	with eglandular and glandular hairs	with glandular hairs	glabrous	eglandular- and glandular-pubescent
Indumentum of calyx	densely glandular-pubescent	densely glandular-pubescent	densely glandular-pubescent	glabrous	densely glandular-pubescent
Corolla diam. [mm] and indumentum	10-11(-12), sparsely glandular pubescent outside	13-18(-20), glabrous or sparsely glandular outside	12-16, glabrous or sparsely glandular outside	10-12, glabrous outside	(10-)25-30(-35), glabrous or sparsely glandular outside
Filaments [mm]	2.5-3	6-7	3-4	4-5(-6)	3-6
Filament wool	whitish yellow	whitish yellow	purple-violet	whitish yellow	whitish yellow and purple-violet
Anterior anthers	transversely medifixed	transversely medifixed	transversely medifixed	transversely medifixed	decurrent on to filament
Style [mm]	(5-)6-7(-8)	4-5	6-7	6-7	8-9
Capsule	glandular	glandular	glandular	glabrous	glabrous, rarely sparsely glandular
Habitat	rocks	rocks & rocky slopes	rocks	wet places	diverse
Range	local endemic	W & SW Anatolia	SW & C Anatolia	Turkey, Transcaucasia, Iraq, Afghanistan, Syria	Cyprus, Lebanon, Palestine, Turkey

with an exclusively eglandular indumentum on the basal leaves, brings four species into the focus: *V. agrimoniifolium* (K. Koch) Hub.-Mor. (including subsp. *agrimoniifolium* and subsp. *syriacum* (Murb.) Hub.-Mor.), *V. levanticum* I. K. Ferguson, *V. luciliae* (Boiss.) Kuntze and *V. rupicola* (Hayek & Siehe) Hub.-Mor. The diagnostic characters of these four species are compared in Table 1.

Verbascum agrimoniifolium, although similarly small-flowered, is readily distinguished from *V. haraldi-adnani* by its often annual or biennial, non-chasmophytic habit, much more strongly divided leaves, the glabrous portions of the inflorescence and, in ecological respects, its preference for damp, eutrophic habitats. Depending on the sites, the E Mediterranean, facultative rock plant *V. levanticum* can develop a habit matching that of *V. haraldi-adnani*. However, the opposite stem leaves, the much larger flowers (the largest in this group), the deviating anther insertion type and the purple-violet filament wool of the anterior stamens indicate superficial affinities rather than a closer relationship.

Such a relationship may be given with the remaining two taxa, both endemics of the western half of Anatolia, which are also predominantly small- to medium-sized chasmophytes with branched, woody root-stocks and basal leaves with 1-5 lateral leaf lobes. Besides the initially mentioned diagnostic indumentum characters and quantitative characters of the flowers, *V. rupicola* differs clearly by its purple-violet filament wool and the much wider bracts.

Verbascum luciliae appears to be the closest ally of our species, however, having leaves with on average 3-5 lateral leaflets (the vast majority of all *V. haraldi-adnani* individuals studied in the field have only 1-2 pairs), significantly larger flowers in combination with relatively short styles, and filaments twice as long as in *V. haraldi-adnani* (this holds also for the smallest individual *V. luciliae* flowers from the top of the inflorescence, which are occasionally only 13-15 mm in diameter). The flowers of *V. haraldi-adnani* appear to be constantly small within the population and to have long styles (Fig. 2B, see also the colour photographs of the electronic supplement at www.bgbm.org/willdenowia/willd38/parolly+eren.htm): the largest flower measured (fresh material) had a corolla diameter of 12 mm, but 10-11 mm is the normal range. The characters “corolla diameter”, “filament length” and “style length” seem at least in this group of *Verbascum* (Table 1) to be disconnected and justify together with the leaf and indumentum characters the species rank of *V. haraldi-adnani*. The distribution of the glandular and eglandular hairs on specimens of the two species is remarkably, and to our knowledge, also constantly different. *V. haraldi-adnani* shows an almost completely glandular-pubescent indumentum, with only a few scattered eglandular hairs confined to its basal parts. By contrast, in *V. luciliae* such long eglandular hairs clearly dominate the lower portions (stems, basal and lower cauline leaves), and they are also prominent in the upper parts. This dense indumentum gives *V. luciliae* a ± greyish overall appearance, while *V. haraldi-adnani* is clearly green (see the electronic supplement). The distribution ranges of both taxa are c. 100 km apart.

Specimens of related and similar species seen

Verbascum agrimoniifolium subsp. *agrimoniifolium.* – TURKEY: A8 Erzurum: Zwischen Bayburt und İspir, 20 km westlich İspir, 1520 m, Schuttstelle, mit *Verbascum oreodoxum*, 15.6.1984, *Nydegger 19235* (B). – AFGHANISTAN: Prov. Kabul, Istalif 34°51'N, 69°06'E, 22.6.1965, *Rechinger 31195* (B); Prov. Ghorat, in alveo glareosa rivi c. 5 km E Parjuman (Partcheman), 1850 m, 2.8.1962, *Rechinger 19121* (B). – IRAQ: Ditionis Erbil, in montis Kuh-Sefin reg. infer. ad pagum Schaklava, 900 m, 27.5.1893, *Bornmüller 1639* (B); distr. Mosul, ad confines Turciae prov. Hakkari, in ditione oppidi Zakho, in faucibus 5 km a Zakho meridiem versus, 4.7.1957, *Rechinger 10706* (B). – IRAN: Prov. Kermanshah, inter Kermanshah et Senandaj, 73 km NNW Taq-i Butsan, ad fontem, 29.8.1957, *Rechinger 14646* (B); Montes Elburs centr., in montibus Kuh-e Dasht prope Keredj, in valle Darreh Wardi, c. 1600 m, 7.6.1937, *Rechinger 746* (B); prope Sultanabad, 7.1897, *Strauss s.n.* (B); Kohrud, 20.7.1904, *Strauss s.n.* (B); Kuh-i-Parrau, Nudschuheran-Schlucht, 15.6.1906, *Strauss s.n.* (B); Kermanschah, in valle Dscham-Tueh ditionis fluvii Saimerre, 14.5.1904, *Strauss s.n.* (B).

Verbascum agrimoniifolium subsp. *syriacum*. – SYRIA: Libani ad rivolos subalpinos jugi Sannin, 1600-1700 m, 21.7.1897, *Bornmüller 1192* (holotype B); Antilibani in humidis ad Rascheya, 1200 m, 27.6.1897, *Bornmüller 1193* (B).

Verbascum levanticum. – TURKEY: C2 Muğla: Kumluca-Muğla arası, Alakır Barajı, 180 m, yol kenarı, 18.5.1999, *FAK 2698* (GAZI). C4 Antalya: Alanya, Derince Dere çevresi, 800 m, *Pinus nigra* açıklığı, *31.8.1993, Duman 5467 & Aytaç* (GAZI). C4 İçel: Steiler felsiger Hang, 1020 m, Exp. N, nördlich Gülnar, 30.4.2000, *Ulrich 0/130* (herb. Parolly).

Verbascum luciliae. – TURKEY: B2 Uşak: Eşme, Karapınar güney sırtları, küçük çömlek tepesi, 950-1130 m, volkanik kaya üzeri, 27.5.2000, *Duman 7208* (EGE). B2 Kütahya: Simav, Akdağ, 1900 m, kaya çatlağı, 3.8.1993, *Gemici 8179* (EGE); von Kiçir nach Hisarköy, 3 km südlich Kiçir, 1090 m, 22.6.1993, *Nydegger 47522 (B).* B3 Uşak: Eşme, Kişlak D., Gümüşkol batisi, 920-1000 m, *kaya üzeri,* 1.6.2002, *Duman 8717* (GAZI).

Verbascum rupicola. – TURKEY: B1 İzmir: Gümüldür, Tahtalı baraj bendi yakını, 180-200 m, silisli kayalar, 20.5.2003, *Şenol 3025* (AYDN, EGE).

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References

Bouloumoy, L. 1930: Flore du Liban et de la Syrie. – Paris.

Davis, P. H., Mill, R. R. & Tan, K. (ed.) 1988: Flora of Turkey and the East Aegean Islands **10** [Suppl. 1]. – Edinburgh.

Ekim, T. 2000: *Verbascum* L. – Pp. 193 in: Güner, A., Özhatay, N., Ekim, T. & Başer, K. H. C. (ed.), Flora of Turkey and the East Aegean Islands **11** [Suppl. 2]. – Edinburgh.

Feinbrun-Dothan, N. 1978: Flora palaestina **3.** – Jerusalem.

Ferguson, I. K. 1972: *Verbascum* L. – Pp. 205-216 in: Tutin, T. G., Heywood, V. H., Burges, N. A., Moore, D. M., Valentine, D. H., Walters, S. M. & Webb, D. A. (ed.), Flora europaea **3.** – Cambridge, etc.

Huber-Morath, A. 1971: Die türkischen Verbasceen. – Denkschr. Schweiz. Naturf. Ges. **87:** 1-166.

— 1978: *Verbascum* L. – Pp. 461-603 in: Davis, P. H. (ed.), Flora of Turkey and the East Aegean Islands **6.** – Edinburgh.

— 1980: *Verbascum* L. – Pp. 204-222 in: Mouterde, P. (ed.), Nouvelle flore du Liban et de la Syrie **3.** – Beyrouth.

— 1981: *Verbascum* L. – Pp. 5-51 in: Rechinger, K. H. (ed.), Flora iranica **147.** – Graz.

IUCN 2001: IUCN Red List categories and criteria, version 3.1. – Gland & Cambridge.

Karavelioğulları, F. A. & Aytaç, Z. 2008: Revision of the genus *Verbascum* L. (Group A) in Turkey. – Bot. Res. J. **1(1):** 9-32.

— , Duran, A. & Hamzaoğlu, E. 2004: *Verbascum tuna-ekimii (Scrophulariaceae),* a new species from Turkey. – Ann. Bot. Fenn. **41:** 227-231.

— , Vural, M. & Polat, H. 2006: Two new taxa from Central Anatolia, Turkey. – Israel J. Pl. Sci. **54:** 105-111. [CrossRef]

Kaynak, G., Daşkın, R., Yılmaz, Ö. & Erdoğan, E. 2006: *Verbascum yurtkuranianum (Scrophulariaceae),* a new species from northwest Anatolia, Turkey. – Ann. Bot. Fenn. **43:** 456-459.

Meikle, R. D. 1985: Flora of Cyprus **2.** – Kew.

Murbeck, S. V. 1925: Monographie der Gattung *Celsia*. – Lund.
Parolly, G. & Tan, K. 2007: *Verbascum lindae (Scrophulariaceae),* a new species from SW Anatolia, Turkey. – Willdenowia **37:** 277-282. [CrossRef]
Raus, T. 1991: *Verbascum* L. – Pp. 170-188 in: Strid, H. & Tan, K. (ed.), Mountain flora of Greece **2.** – Edinburgh.
Rechinger, K. H. 1943: Flora aegaea. – Wien.
Thiebaut, J. 1953: Flora libano-syrienne. – Paris.
Vural, M & Aydoğdu, M. 1993: A new species from Central Anatolia – *Verbascum gypsicola (Scrophulariaceae)*. – Karaca Arbor. Mag. **2:** 75-78.

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