



## A new Turkish species of *Salvia* L. (Lamiaceae)

ALI A. DÖNMEZ

Biology Department, Faculty of Science, Hacettepe University, 06532/Beytepe-Ankara, Turkey

Received April 2001; accepted for publication June 2001

A new species, *Salvia hedgeana* Dönmez, is described from Turkey. Diagnostic characters, description, detailed illustration and taxonomic comments on the species are given. Its relationships with *S. huberi* and *S. rosifolia* are discussed. A map including the distribution of the species and other related species is given. IUCN threatened category and observations on the population are noted. © 2001 The Linnean Society of London

ADDITIONAL KEY WORDS: endemic – *Salvia huberi* – *Salvia rosifolia* – systematics – taxonomy – Turkey.

### INTRODUCTION

*Salvia* had 86 species in Turkey (Hedge, 1982). Since the most recent revision of the genus, two new species (Davis & Tan, 1988; Vural & Adıgüzel, 1996) have been described; the total has now reached 88.

During a field trip to the Divriği (Sivas) region, an unusual population was encountered. The flowers were exuberant in comparison to other *Salvia* species known to the author.

Later studies showed that the plants were close to *S. huberi* Hedge and *S. rosifolia* Sm., although there are some differences. These and other specimens belonging to *S. huberi* and *S. rosifolia* were examined at Edinburgh and herbaria in Turkey. Morphological examination and pollen studies by light microscope were carried out. Pollen slides were prepared following Wodehouse (1935).

#### *Salvia hedgeana* Dönmez sp. nov.

(Figs 1, 2)

Affinis *S. huberi* Hedge, sed caulibus procumbentibus, foliis trifoliatis marginis integris, pedicellis longioribus, calycibus maioribus differt.

Perennial suffruticose herb. STEMS procumbent, ascending, 5–10(–15) cm, branched at base, with sterile shoots, retrorsely pilose hairy, sessile glandular hairs on stem and inflorescence. LEAVES trifoliate, lanceolate in outline, with one pair of lateral segments, terminal leaf segment lanceolate, 20–30(–40) × 3–5 mm, margin entire, slightly involute, lateral segments

(4–)6–9(–11) × 1–2 mm, petiole 10–20 mm, winged, ciliate. INFLORESCENCE racemose, (3–)5–8 × 2–3 cm, slightly exceeding the leaf level with (3–)4–5(–6) verticillasters, each verticillaster with 2–4(–6) flowers in each node, internodes (8–)10–12(–15) mm, and flowers exceeding them. Floral leaves similar to stem leaves. BRACTS lanceolate widened at base, 8–15 × 2–3 mm, lower bracts up to 40 mm. BRACTEOLAS lanceolate up to (4–)6–10(–13) × 1–2(–4) mm. PEDICELS 5–9 mm. CALYX campanulate 10–15 mm, up to 17 mm in fruit, (13–)14(–15) veined, retrorsely pilose, with sessile glands, violet mainly on upper half, bilabiate, lobes divided to nearly mid length, lower lobe with two teeth, broadly lanceolate, 6–8 mm, upper lobe with small three teeth, triangular 1–2 mm. COROLLA 15–20 mm, blue, with a white spot on lower lip, sparsely villous outside, tube 8–14 mm, not squamulate, with an annulus in throat, upper lip falcate. UPPER THECAE 3.5 mm length, lower 1–1.2 mm, adnate to each other basally; filaments c. 5 mm, longer than connectives. STYLE 30–35 mm, exerted from corolla lips. NUTLETS oblong to ovoid 2.5–4 × 2–2.5 mm, dull green, entire to slightly papillate.

*Type.* (Turkey) B7 Sivas: Divriği, Dumlucadağ, Karasar pass, above Kayaburun village, 1600 m, steppe, 15.6.1995, AAD 4579, slide no: AD 1390, AD 1391 (holo HUB, iso. E).

*Distribution.* Endemic. Irano–Turanian element. IUCN category; CR.

*Pollen description.* Pollen grains hexacolpate-operculate, prolate to spheroidal (polar axis 43 µm and



Figure 1. *Salvia hedgeana* sp. nov. A, habit. B, leaf. C, flower. D, calyx. E, corolla. F, stamen. G, nutlet.

equatorial axis  $40\ \mu\text{m}$ ), mesocolpia unequal in size, four smaller and two larger. Exine about  $1.75\ \mu\text{m}$  thick, eureticate with many free-standing bacula and scattered perforations in the tectum of each lumen, muri simplibaculate. Intine  $0.75\text{--}1\ \mu\text{m}$  thick.

#### DISCUSSION

The pollen morphological characters of this new species are similar to those of the *Salvia*-type recorded by Henderson, Prentice & Hedge (1968) including that of *S. rosifolia*.

This new species is clearly different from *S. huberi* in that it has shorter and procumbent stems, trifoliate leaves, narrower and entire leaf segments, approximate verticillasters and smaller calyx.

*S. rosifolia* differs from *S. hedgeana* in its ascending

habit and 50 cm height. In addition the leaf segments are larger and their margins are mainly serrate. While the colour of corolla is pink to crimson in *S. rosifolia*, it is blue with white spotted lower lip in *S. hedgeana*. Corolla length of a specimen (12–14 mm) collected from Erzurum (Demirkuş 1361) and identified as *S. huberi* is shorter than that of the specimen given in the original description (16–20 mm).

This new species can be placed between *S. rosifolia* and *S. huberi*. Although *S. rosifolia* has the widest distribution, these three species have a similar distribution pattern (Fig. 2). While the first species is mainly distributed in eastern Anatolia, *S. huberi* is localized to north-eastern Anatolia. *S. hedgeana* is found in the western parts of eastern Anatolia. With respect to morphological relationships between these three species and their distribution pattern it is a

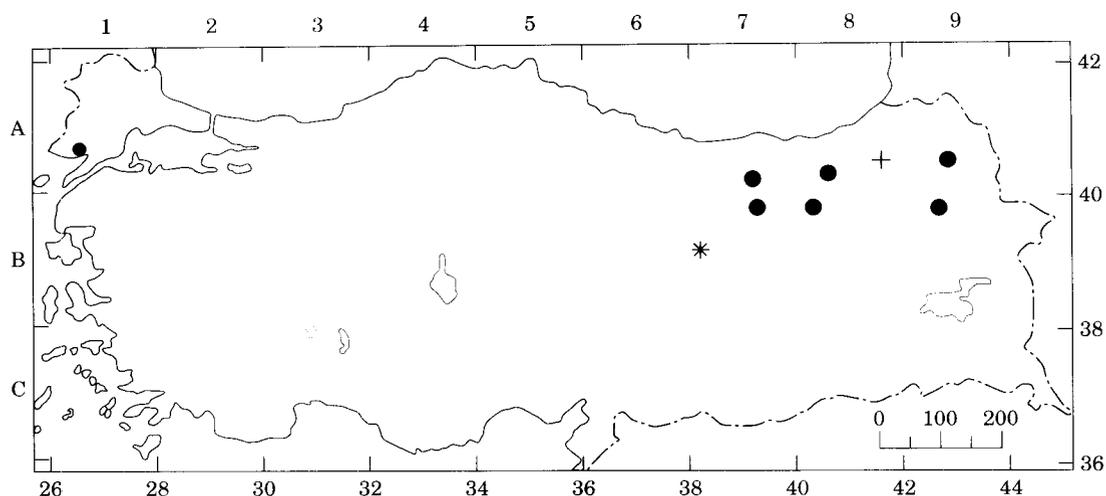


Figure 2. Distribution of (\*) *Salvia hedgeana* sp. nov., (+) *S. huberi* and (●) *S. rosifolia* in Turkey.

Table 1. Comparison of *Salvia hedgeana* and related species

Characters	<i>S. rosifolia</i>	<i>S. hedgeana</i> sp. nov.	<i>S. huberi</i>
Habit	Ascending, up to 50 cm	Procumbent, 5–10(–15) cm. with sterile shoots	Ascending/procumbent
Villous hair	±	Present only on corolla	±
Terminal leaflet	20–40 × 4–6 mm (oblong elliptic)	20–30(–40) × 3–5 mm, linear lanceolate	15–20 × 6–9 mm, narrower than <i>S. rosifolia</i>
Basal leaflet	Two pairs (ovate-oblong)	One pair (linear-lanceolate)	Two pairs
Margin of leaflet	Entire to serrate	Entire	Finely serrate
Bracts	Ovate-acuminate, 7–12 × 3–5 mm	Lanceolate, 8–15 × 2–3 mm, lower up to 40 mm	Lanceolate, 10–15 mm, lower up to 30 mm
Calyx	10–15 mm	13–15 mm, up to 17 mm in fruit	7–11 mm
Pedicel length	4–7 mm	5–8 mm	2–5(–7) mm
Indument. of calyx	Pilose to pubescent	Pilose	Pilose
Corolla length	20–24 mm	15–20 mm	12–14 mm
Corolla tube	c. 14 mm	c. 10 mm	c. 8 mm
Colour of corolla	Lilac-pink to violet	Blue, white dotted on lower lip	Lilac-pink to violet (blue?)

possibility that *S. rosifolia* is the ancestral species of the *S. huberi* and *S. hedgeana*. Although they show close relationships, the two derivative species have rather distinctive characters (see Table 1). This distinctiveness could be attributed to their habitats and main substrates. *S. huberi* grows in northern parts of Turkey where more humid conditions are present than in the locality of *S. hedgeana*.

The plants are mat-forming, their roots reaching to 20–30 cm and each mat covers 50–60 cm<sup>2</sup> on the soil surface. So far about 6–7 widely spaced *S. hedgeana* mats have been counted. The plants flourish in the area and there is no harmful insect predation or other hazards. The area is heavily grazed by animals, but the *Salvia* mats were not eaten. Nevertheless, it is

suggested that this new species should be placed under the IUCN threat category 'Critically Endangered (CR)' (IUCN, 1994), because the estimated area of occupancy is less than 10 km<sup>2</sup> and it is only known from the type locality.

The area, which is one of the floristically interesting areas of Turkey (Davis, 1971) is rich in endemic species. Some of these collected by the author from the same type locality include *Arenaria acutisepala* Hausskn. ex Williams, *Hypericum uniglandulosum* Hausskn. & Bornm., *Hypericum thymbrifolium* Boiss. & Noë, *Hypericum thymopsis* Boiss., *Ebenus macrophylla* Jaub. & Spach, *Cerasus hippophaeoides* (Bornm.) Bornm., *Crataegus tanacetifolia* Bornm., *Pimpinella flabellifolia* (Boiss.) Benth. & Hook. ex Drude, *Senecio hypo-*

*chionaeus* Boiss var. *argaeus* (Boiss. & Bal.) Mathews, *Scrophularia lepidota* Boiss., *Verbascum reeseanum* Hub.-Mor. and *Eremurus cappadocicus* J. Ray ex Baker.

#### ACKNOWLEDGEMENTS

It is a pleasure to name this species in honour of I. C. Hedge. The specimens were collected during a field trip to collect seeds of endemic plants of Turkey. The project was supported by TUBITAK (TUBITAK -DPT Ç. SEK 4A). Thanks are due to the Royal Botanic Garden (Sibbald) Trust and TUBITAK for financial support; to Mr R. R. Mill for improving the English and Latin diagnosis; to Professor Dr T. Ekim for his support during the project and preparation of this paper, and to Nurtaç Özler and Gülnur Eksi for the illustration.

#### REFERENCES

**Davis PH. 1971.** Distribution pattern in Anatolia with particular reference to endemism. In: Davis PH, Harper PC,

Hedge IC, eds. *Plant life of south-west Asia*. Edinburgh: Botanical Society of Edinburgh, 15–28

**Davis PH, Mill RR, Tan K, ed. 1988.** *Flora of Turkey and the East Aegean Islands*. Vol. 10. Edinburgh: Edinburgh University Press, 210.

**Hedge IC. 1982.** *Salvia*. In: Davis, PH, ed. *Flora of Turkey and the East Aegean Islands*. Vol. 7. Edinburgh: Edinburgh University Press, 400–461.

**Henderson DM, Prentice H, Hedge IC. 1968.** Pollen morphology of *Salvia* and some related genera. *Grana Palynologica* 8: 70–85.

**IUCN Species Survival Commission. 1994.** Red List Categories, approved by the 40th meeting of the IUCN Council Gland, IUCN.

**Vural M, Adigüzel N. 1996.** A new species from Central Anatolia: *Salvia aytaçii* M. Vural N. Adigüzel (Labiatae). *Turkish Journal of Botany* 20: 531–534.

**Wodehouse RP. 1935.** *Pollen grains*. New York, McGraw-Hill.