

First record of *Psylliostachys spicata* (Plumbaginaceae), confirmation of *Salvia pratensis* (Lamiaceae) from Turkey, and taxonomic status of *Salvia ertekinii*

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Abstract: *Psylliostachys spicata* (Plumbaginaceae) is reported as a new genus record for Turkey; an amended species description is given. Bossier's record of *Salvia pratensis* (Lamiaceae) in *Flora Orientalis* is confirmed from Turkey. Additionally, the endemic *Salvia ertekinii* is reduced to a synonym of *Salvia pinnata*.

Key words: Halophytes, Lamiaceae, Plumbaginaceae, *Psylliostachys*, *Salvia*, taxonomy

1. Introduction

The family Plumbaginaceae is distributed throughout the world, particularly in the Irano-Turanian and Mediterranean regions. Most of the members of this family are halophytes, cold weather adapted species, or psammophytes and can survive in extreme environments. Plumbaginaceae consists of 28 genera and about 650 species in the world (Kubitzki, 1993; Lledó et al., 2005). In 2013, while conducting field work in Siirt (Southeast Anatolia, Turkey), one author (OK) collected some interesting halophytic plants. One of the collected specimens was identified as a member of Plumbaginaceae; however, its genus and species were not identified using *Flora of Turkey* and its supplements (Bokhari and Edmondson, 1982; Davis et al., 1988; Güner et al., 2000). The specimen was then identified as *Psylliostachys spicata* (Willd.) Nevski, a new genus record for Turkey by one author (MM) while she was visiting Turkish herbaria in 2013 (Rechinger et al., 1974) (Figures 1 and 2). With this new generic record, the family is represented in Turkey by seven genera: *Plumbago* Linn. (1 sp.), *Armeria* Wild. (4 spp.), *Goniolimon* Boiss. (1 sp.), *Limoniopsis* Lincz. (2 spp.), (Bokhari and Edmondson, 1982; Davis et al., 1988), *Acantholimon* Boiss. (52 spp.) (Doğan and Akaydın, 2007), *Limonium* Mill. (22 spp.) (Bokhari and Edmondson, 1982; Davis et al., 1988, Akaydın, 2007; Doğan et al., 2008), and *Psylliostachys* (Jaubert and Spach) Nevski (1 sp.).

Turkey is a major center of diversity for *Salvia* L. in the Old World (Celep et al., 2014). Boissier (1879) reported 75 species of *Salvia* from Turkey; Hedge (1982) recognized 86 species in the *Flora of Turkey* account. Since then eight new species and two new varieties have been described, and two species re-evaluated as valid species from Turkey (Celep et al., 2014, related literature therein). In addition, one variety was recognized at subspecies rank (Celep et al., 2014, related literature therein). With the previous three new records and this new record, the country is now home to 99 *Salvia* species, 52 (52.5%) of which are endemic.

In 2010, an unidentified *Salvia* specimen was examined by the author (FC) in the Geneva herbarium (G) (Switzerland). The specimen was collected by Aucher-Eloy (no: 1557) from "Bithynian Olympo" (Uludağ in northwest Turkey) (Figure 3); there was no name on the specimen and only "Olymp. Byth. Aucher Eloy herbier d'Orient. Nr 1557" on the label. The specimen—not ideal—was subsequently cited in *Flora Orientalis* (1879) as *S. pratensis* L. The species was not dealt with in the *Salvia* account in *Flora of Turkey and the East Aegean Islands* (Hedge, 1982), possibly because of the inadequacies of the Aucher specimen.

Salvia ertekinii Yıld. was reported from a single location in the Siirt region (Southeast Anatolia, Turkey). Subsequently, it has not been refound. During our field studies (the author FC with Dr A Kahraman, and several

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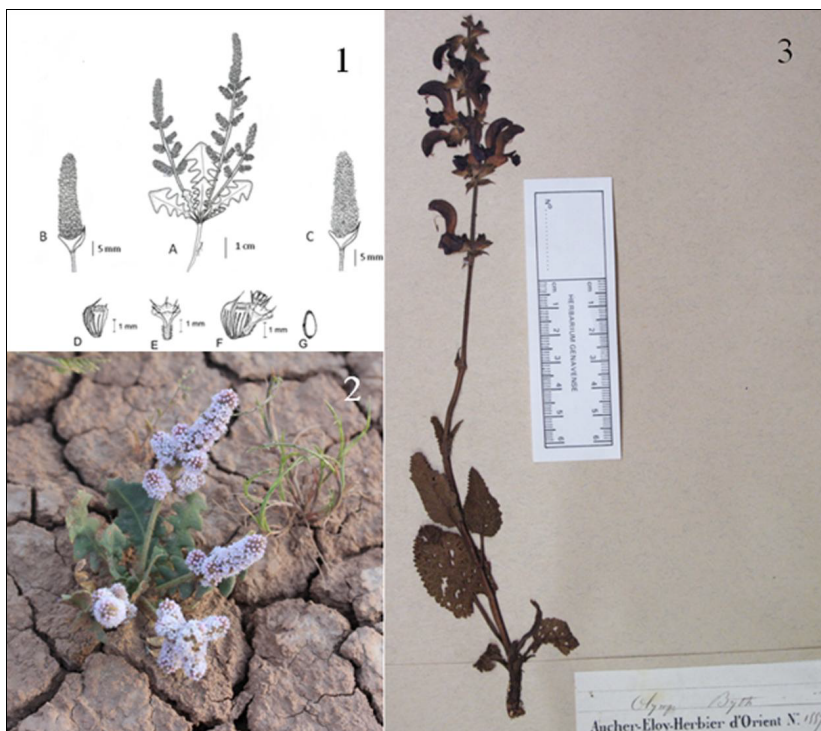


Figure 1. *Psylliostachys spicata*. A, habit. B, flowering inflorescence. C, fruiting inflorescence. D, outer and inner bracts. E, flower. F, spikelet. G, nutlet.

Figure 2. *Psylliostachys spicata* at flowering time.

Figure 3. *Salvia pratensis*, herbarium sheet from G (Geneva, Switzerland) herbarium.

visits by the author OK) in the type locality of *S. ertekinii* and close locations, only *S. pinnata* L., among other *Salvia* species, was found.

2. Materials and methods

Psylliostachys spicata specimens were collected in dried and saline soils during the flowering period from natural populations in TURKEY, B9 Siirt: Akdoğmuş köyü, tuzcul alan, 03.05.2013, 37°51'618"N, 042°03'119"E, 617 m, O.Karabacak 8834 (GAZI!, ANK!); *ibid*, 01.07.2013, O.Karabacak 8849 (GAZI!); Eruh, Gölgekonak köyü, tuzcul alan, 31.05.2014, 37°46'348"N, 042°06'883"E, 763 m, M. Fidan 1874 (GAZI!); Eruh, Üzümlük köyü, tuzcul alan, 31.05.2014, 37°46'699"N, 042°45'743"E, 730 m, M. Fidan 1880 (GAZI!). Collected plants were studied morphologically and compared with *Psylliostachys* specimens by the author (MM) deposited in different herbaria including B, NHM, IRAN, TARI, Shiraz University (abbreviations following *Index Herbariorum*, Holmgren and Holmgren (1998), internet access 20 Feb 2015), and the private herbarium of Dr Hossein Akhane (Hb. Akh.), currently housed in the Halophytes and C₄ Plants Research Laboratory, School of Biology, University of Tehran. A morphological description is provided,

supported by a line drawing and distribution map in Turkey (Figures 1 and 3). A *Salvia pratensis* specimen was seen in the Geneva herbarium (G) (Switzerland) and related literature checked (Boissier, 1879; Hedge, 1972). *Salvia ertekinii* and *S. pinnata* specimens were seen in the GAZI, ANK, and HUB herbaria and the literature checked (Yıldırım and Ertekin, 2008).

3. Results and discussion

Psylliostachys spicata (Willd.) Nevski in Trudy Bot. Inst. Akad. Nauk SSSR, Ser. 1, IV: 314 (1937) (Figures 1 and 2)

Syn.: *Statice spicata* Willd., Sp. Pl. 1 (2): 1532 (1797); *S. sisymbriifolia* Jaub. & Spach, Ill. Pl. Or. 1: 158 (1844); *Limonium spicatum* Kuntze, Rev. gen. 2: 396 (1891).

Annual, 5–30 cm tall, caudex (0.1–) 0.7 cm in diameter; scape 1–2 mm in diameter, pubescent throughout, denser on upper half; mostly with 2–7 scapes branched from base. Leaves in basal rosettes, oblanceolate, pinnately veined, glaucescent–green, attenuate at base, 2–13 × 0.7–3.5 cm, lamina sparsely hairy at margin, deeply sinuately lobed, mucronate or acute at apex. Inflorescence a simple or branched spike, 2–13 cm long, lateral branches of inflorescence 1–6 cm, apical branches (2–) 2.5–13 cm, spikelets two-bracteolate, 1–4 flowered; outer bracts

linear-spathulate, 1.5–5 × 0.5–2 mm, at margin 0.2–0.5 mm, membranous, margin entire, with short hairs on herbaceous part, apex acute-caudate; inner bracts oblong-ovate, pale green, 2–3 × 2–3 mm, membranous at margin, with short hairs on herbaceous part, apex truncate. Calyx funnel-shaped, 3–5 mm long, with 10 narrow pale green unequal nerves, tubular part 2–3 mm long, densely covered with glandular hairs, apical part papery and showy, whitish, 1–2.5 mm long, calyx at apex with five lobes at apex, lobes 1 mm long, triangular, intercalary lobes absent. Corolla glabrous, pink to whitish, 3.5–5 mm long, gamopetalous; tube 2.5–4.5 mm long, corolla with 5 apical limbs up to 0.5 mm long and each limb with 0.5–0.8 mm broad, oblong-ovate, entire margins, rounded at apex. Filaments attached at lower half of the corolla, 3.5–5 mm long. Anthers 1–1.5 mm, pale yellow. Styles filiform, free from base, 3–4.5 mm long. Stigma 1–1.5 mm. Ovary

obovoid or elliptic-oblong. Fruits fusiform or elliptic-oblong, 3–4.5 mm long, with 1 seed. Achenes fusiform, 3–3.7 mm long. Funicle 3–4 mm long. Fl. & Fr. May–July

Habitat and National Conservation Status: *Psylliostachys spicata* grows in a very limited saline area (in Turkey), where it is under high grazing pressure and erosion (Figure 2). It is here evaluated as Vulnerable under Criterion D2 of IUCN (2010, 2012) for Turkey. At its locality, the following other taxa exist abundantly: *Alhagi pseudalhagi* (M. Bieb.) Desv., *Kali tragus* (L.) Scop., *Carlina lanata* L., *Spergularia rubra* (L.) J. & C. Presl., *Plantago coronopus* L., *Lepidium perfoliatum* L., *Crypsis schoenoides* (L.) Lam.

Psylliostachys (Jaub. & Spach) Nevski is distributed throughout Central Asia, Pakistan, the Caucasus, Iran and westward to Iraq, Syria, and Palestine (Nevski, 1937; Rechinger and Schiman-Czeika, 1974; Feinbrun, 1978) (Figure 4).

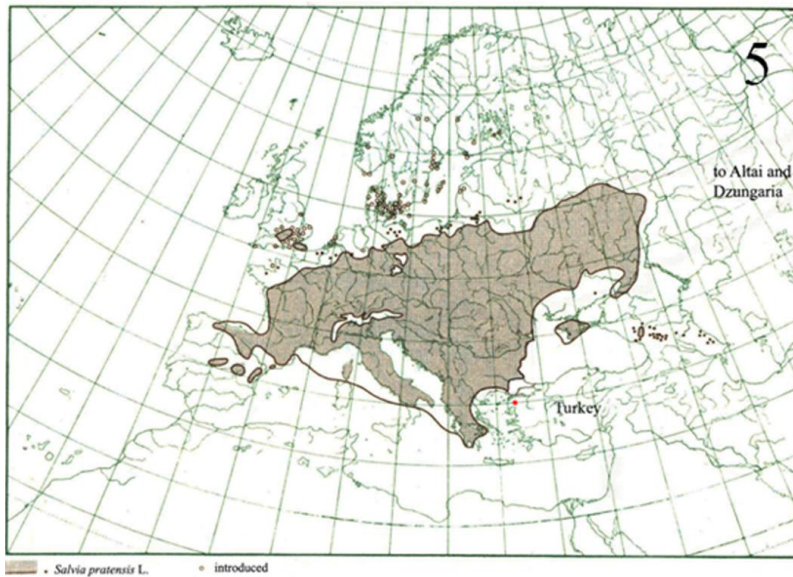
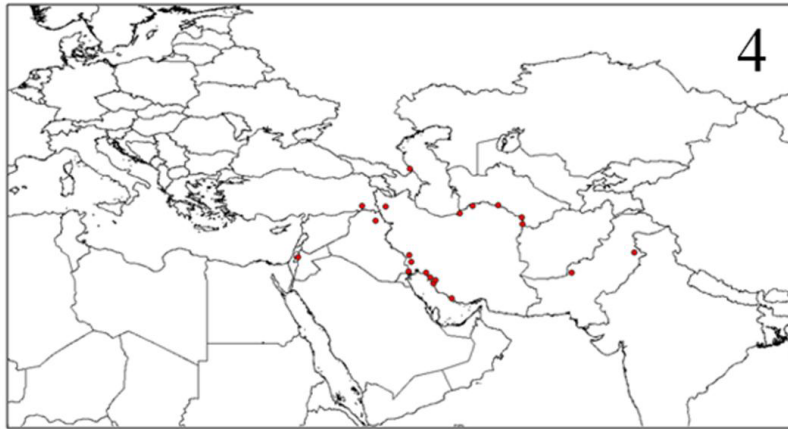


Figure 4. Updated distribution area of *Psylliostachys spicata* (●).

Figure 5. Updated and modified (from Meusel et al., 1978) distribution map of *Salvia pratensis* (●).

Salvia pratensis

During the literature surveys, it was realized that probable presence of *S. pratensis* was indicated in *Flora Europaea* (Hedge, 1972) from the European part of Turkey. In addition, the distribution map of the species in Meusel et al. (1978) clearly includes NW Anatolia and the European part of Turkey (Figure 5). However, this information was subsequently corrected in the book review of Meusel et al. (1978) as follows: “*Salvia pratensis* does not grow in European Turkey” (Notes from Royal Botanic Garden Edinburgh, 37(2): 236, 1979, Book review). Since 2005, we have not found *S. pratensis* in Turkey or in the Turkish herbaria. Our studies and consultation of various Floras of areas where this very variable species occurs led us to confirm the correctness of the record in *Flora Orientalis* (Boissier, 1979) as *S. pratensis*. However, verification of the identification awaits a new gathering of the species. Many collections have subsequently been conducted on Uludağ but, surprisingly, no specimens of *S. pratensis* from there or anywhere else in Turkey have been gathered since Aucher collected it.

Salvia ertekinii

According to Yıldırım and Ertekin (2008), *S. ertekinii* differed from the widely distributed *S. pinnata* by its longer (20 mm, not 12–15 mm) calyx and large mericarps (3 × 3 mm, not 2.5 × 2.25). Our studies in the field and herbarium, micromorphological studies, and literature surveys since 2005 showed that *S. ertekinii* is only a late-stage specimen of *S. pinnata*. In fruit, the size of the calyx

can reach over 20 mm in *S. pinnata*. In addition, our mericarp micromorphological studies showed that the mericarp size of *S. pinnata* is 2.8–3.1 × 2.5–2.8 mm (Celep et al., 2014) and therefore the mericarp size of *S. ertekinii* does not significantly differ from that of *S. pinnata*.

Salvia pinnata L. Sp. Pl. (1753: 27) Syn.: *Salvia ertekinii* Yıld. in Ot Sistemik Botanik Dergisi (The Herb Journal of Systematic Botany), 2008, 15(1): 5 (Figs. 3–4) **syn. nov.**

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