A new species of *Acantholimon* Boiss. (Plumbaginaceae) from Ankara, Turkey

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*Acantholimon anatolicum* Dogan & Akaydın sp. nov. (Plumbaginaceae) is described and illustrated. The species grows on deep gypsum-rich sandy soil on eroded mountain slopes between Çayırhan and Nallıhan in Ankara. Diagnostic morphological characters that discern it from closely related species are discussed and its conservation status is indicated. A revised key to *Acantholimon* species with ± dense terminal spikes and excurrent scapes is given for the species found in Turkey. (c)The Linnean Society of London, Botanical Journal of the Linnean Society, 2002, 140, 443–448.

ADDITIONAL KEYWORDS: Central Anatolia – conservation – distribution.

INTRODUCTION

The genus *Acantholimon* Boiss. comprises about 200 species throughout the world but mainly distributed in Euro-Asia and crossing into South America. Its centre of diversity lies in the east Mediterranean and Irano-Turanian phytogeographic regions. *Acantholimon* species are all perennial, densely or laxly pulvinate subshrubs forming thorn cushions. The genus has ecological and economic importance. Its ornamental importance with coloured long-lasting flowers is remarkable. A Turkish dessert is also made by means of boiling the roots (Baytop, 1994).

Boissier (1879) recognized 74 species of *Acantholimon* in his *Flora Orientalis*; some of these species were described from Turkey. Bokhari (1970, 1972a) carried out taxonomic studies on *Plumbaginaceae* in Turkey where he recognized six genera (*Acantholimon* Boiss., *Limoniopsis* Linz., *Limonium* Miller, *Armeria* Willd., *Goniolimon* Boiss. and *Plumbago* L.) in this family, and described six new species (*A. confertiflorum*, *A. halophilum* Bokhari, *A. acerosum* (Willd.) Boiss., *A. kotschyi* (Jaub. & Spach) Boiss., *A. confertiflorum* Bokhari, *A. glumaceum* (Jaub. & Spach) Boiss., *A. caesareum* Boiss. & Bal., *A. puberulum* Boiss. & Bal. and *A. ulicinum* (Willd. et Schultes) Boiss). In a recent numeric taxonomic study, a new infrageneric grouping in the genus was made on the basis of the species found in Ankara Province, and three subsections, namely Caryophyllacea Bunge (including *A. venustum* and *A. kotschyi*), Halophiliacea Muvaffak & Dogan (including *A. halophilum*, *A. acerosum*, *A. caesareum* and *A. confertiflorum*) and Androsacea Bunge (including *A. glumaceum*, *A. puberulum* and *A. ulicinum*) were recognized (Muvaffak, Doğan & Bilgin, 2001).

A recent study conducted by Muvaffak (1997) concluded that there were nine species of *Acantholimon* in Ankara Province, viz: *A. venustum* Boiss., *A. halophilum* Bokhari, *A. acerosum* (Willd.) Boiss., *A. kotschyi* (Jaub. & Spach) Boiss., *A. confertiflorum* Bokhari, *A. glumaceum* (Jaub. & Spach) Boiss., *A. caesareum* Boiss. & Bal., *A. puberulum* Boiss. & Bal. and *A. ulicinum* (Willd. et Schultes) Boiss. In a recent numeric taxonomic study, a new infrageneric grouping in the genus was made on the basis of the species found in Ankara Province, and three subsections, namely Caryophyllacea Bunge (including *A. venustum* and *A. kotschyi*), Halophiliacea Muvaffak & Dogan (including *A. halophilum*, *A. acerosum*, *A. caesareum* and *A. confertiflorum*) and Androsacea Bunge (including *A. glumaceum*, *A. puberulum* and *A. ulicinum*) were recognized (Muvaffak, Doğan & Bilgin, 2001).

The extensive field surveys and the laboratory studies conducted on *Acantholimon* in Turkey by the authors revealed four additional new species, namely *A. avanosicum* Doğan & Akaydın (Doğan & Akaydın, 2001).
METHODS

Since 2000, as a part of a revisional study on the genus Acantholimon in Turkey, the authors have carried out extensive field studies and collected a large number of specimens. These specimens were pressed carefully and dried using the standard techniques for laboratory analysis (Davis & Heywood, 1973). A local population of Acantholimon, which looked close to A. strigillosum Bokhari at first glance in the field, was collected from Kuşênetê between Çayrhan in Ankara (A3). The specimens were cross-checked with the keys provided by Bokhari & Edmondson (1982), and the Acantholimon accounts given in various floras, such as Flora Orientalis (Boissier, 1879), Flora
NEW SPECIES OF ACANTHOLIMON FROM TURKEY

Iranica (Rechinger & Schiman-Czeika, 1974), Flora Europaea (Moore, 1972), Flora of USSR (Komarov, 1967), and Flora of Syria, Palestine and Sinai (Post, 1933).

The specimens were then compared with the duplicates of Davis’ specimens obtained from Edinburgh (E) as a gift, cited in the Flora of Turkey and the East Aegean Islands. The Supplement (Davis et al., 1988) was also consulted. Acantholimon material either collected from the field in the past two years or kept at three Turkish herbaria in Ankara (ANK, GAZI· and HUB) was examined. Some specimens of A. strigillosum were also collected from the area around Hekimhan in Malatya (B6) in July and August 2001. The type specimens of E. Boissier cited in his Flora Orientalis were studied at the Boissier Herbarium in Jardine Botanic Garden, Geneva (G). The authorities are cited in accordance with Authors of Plant Names (Brummitt & Powell, 1992).

RESULTS

ACANTHOLIMON ANATOLICUM DOGAN & AKAYDIN SP. NOV. (FIGS 1, 2)


Diagnosis: Affinis A. strigillosum sed foliis brevioribus, 5-12 mm longis, margine minute ciliatis; caules et folia exserta; scapo 5-8 cm longo; spicae 15-20 mm longae, 6-12 spiculis composita; bractea florali externa breviore (4-5 mm lango), ovato-acuminati vel mucronati; bracteolis internis aquilongibus, 7-7.5 mm longitudine, oblongo-lanceolati, cuspidati, hyalino marginati, dorso ciliato; calycibus 10-11 mm, infundibularibus; limbo 10-lobati, nervis limbi marginem attingentibus.

Description: Densely pulvinate glaucous shrublet. Leaves 5–12 × 0.5–1 mm, linear-triquetrous, glabrous, ciliate on margins. Scapes 5–8 cm excurrent, puberulent, with 2–3 spikes. Scales 4–5, shorter than internodes, puberulent. Spikes 15–20 mm, imbricate to terminal. Spikelets 6–12, 1-flowered, lower ones undeveloped. Bracts unequal, green; outer bracts 4–5 mm, ovate, pointed at apex, densely puberulent, narrowly hyaline on margins; inner bracts 7–7.5 mm (including aristate point c. 1 mm), oblong-lanceolate, obtuse, cuspidate, with narrowly hyaline on margins especially in upper half. Calyx infundibular, 10–11 mm, tube pilose; limb white, 10-lobed; veins expanded towards margins, not excurrent. Petals pink.


Ecology: This new species grows on deep gypsum-rich sandy soil on open mountain slopes around Kuş Cenneti between Çayırhan and Nallıhan in Ankara (A3) with Gypsophila venusta Fenzl, Gypsophila pilosa Huds., Astragalus microcephalus Willd., various grasses of the Central Anatolian steppe.


Status: This new species is known only from the type locality between Çayırhan and Nallıhan, where it grows on dry mountain slopes on the left side of the
spikelets. Branched terminal spikes with densely congested monomorphic leaves, infundibular calyx, and having 8 cm) scapes with 4–5 scales and covered with puberulous hairs. They are longer (14–18 mm) and covered by strigillose hairs.

The type of inflorescence is a spike in both species, but they are densely branched and terminal, 15–20 mm long, having 6–12 spikelets and spikelets are imbricate, 12–13 mm long in A. anatolicum. In A. strigillosum the spikes are laxly branched, 15–30 mm long, having 2–6 spikelets which are widely spaced and 13–15 mm long. Acantholimon anatolicum appears to have a shorter outer bract (4–5 mm long) and inner bracts (7–7.5 mm long) than A. strigillosum, in which the outer bract is 6–6.5 mm and the inner bracts are 7–8 mm. In A. anatolicum the inner bracts (excluding aristate point) are as long as the calyx tube, which is shorter than the inner bracts of A. strigillosum.

Acantholimon anatolicum appears to be quite a distinct local endemic species growing on gypsum-rich sandy soils on dry mountain slopes in Central Anatolia. This new species was probably formed by means of sympatric speciation from a common ancestor, from which A. strigillosum also evolved.

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Table 1. A comparison of Acantholimon anatolicum and A. strigillosum

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<tr>
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<th>A. anatolicum</th>
<th>A. strigillosum</th>
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<tbody>
<tr>
<td>Habit</td>
<td>Densely pulvinate, glaucous shrublet</td>
<td>Laxly pulvinate, strongly glaucous shrublet</td>
</tr>
<tr>
<td>Leaves</td>
<td>Linear-triquetrous, 5–12 × 0.5–1 mm, glabrous, ciliate on margins</td>
<td>Linear-triquetrous, 14–18 × 1–1.2 mm, margins scabrid, strigillose</td>
</tr>
<tr>
<td>Scapes</td>
<td>5–8 cm long, puberulent all over, densely branched, 2–3 spiked</td>
<td>7–12 cm long, strigillose, laxly branched, 2–3 spiked</td>
</tr>
<tr>
<td>Scale</td>
<td>4–5, shorter than internodes, puberulent all over</td>
<td>5–8, shorter than internodes, strigillose all over</td>
</tr>
<tr>
<td>Spike</td>
<td>2–3, 15–20 mm long, imbricate or terminal</td>
<td>2–3, 15–30 mm long, laxly distichous</td>
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<tr>
<td>Spikelets</td>
<td>6–12 in each spike, 1-flowered, 12–13 mm</td>
<td>2–6 in each spike, 1-flowered, 13–15 mm</td>
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<tr>
<td>Bracts</td>
<td>Unequal, puberulent all over</td>
<td>Unequal, strigillose all over</td>
</tr>
<tr>
<td>Outer bract</td>
<td>4–5 mm (including aristate point), ovate, narrowly hyaline on margin</td>
<td>6–6.5 mm, broadly triangular, acute, margins narrowly hyaline</td>
</tr>
<tr>
<td>Inner bracts</td>
<td>7–7.5 mm (including aristate point. 1 mm), oblong-lanceolate, obtuse, cuspidate with narrowly hyaline margin</td>
<td>7–8 mm oblong-lanceolate, acute, long cuspidate, hyaline except for the dark brown vein</td>
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<tr>
<td>Calyx</td>
<td>10–11 mm, tube densely pilose; limb 10-lobed, white; veins 5-brownish, pilose, expanded towards margins, not excurrent</td>
<td>11–12 mm, tube densely pilose in middle region; tube equal to limb; limb obscurely 5-lobed; veins purple, narrowing towards margin, excurrent</td>
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<tr>
<td>Petals</td>
<td>Pink</td>
<td>Pink</td>
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<td>Flowering time</td>
<td>8</td>
<td>8–9</td>
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<tr>
<td>Habitat</td>
<td>Deep sandy gypsum-rich soil</td>
<td>Eroded hills</td>
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<td>Altitude</td>
<td>500 m</td>
<td>1100–1250 m</td>
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<td>Phytogeography</td>
<td>Irano-Turanian element</td>
<td>Irano-Turanian element</td>
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due to the herbaria ANK, GAZİ and HUB for making their material available.

REFERENCES


