

## THREE NEW SPECIES OF THE GENUS ACANTHOLIMON (PLUMBAGINACEAE) FROM IRAN

M. Assadi & S. M. Mirtadzadini

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*Acantholimon albocalycinum* is described from SE Iran. It is from the sect. *Glumaria* and is characterized by having a white calyx. The new species is related to *A. subulatum*, that it is compared with. *A. kermanense* is described from Kerman province, Iran. It is from the sect. *Acantholimon* and seems to be related to *A. chrysostegium*, *A. hyalinum* and *A. mirtadzadinii* and is compared with them. *A. sirchense* is described from SE Iran. The new species is from the sect. *Glumaria* and seems to be again related to *A. subulatum*.

Mostafa Assadi, Research Institute of Forests and Rangelands, P. O. Box 13185-116, Tehran, Iran. –Seied Mansour Mirtadzadini ICST, Shahid-Bahonar University, Kerman, Iran.

Key words. *Acantholimon*, Plumbaginaceae, new species, Tehran. Kerman province.

گونه های جدید جنس *Acantholimon* از تیره Plumbaginaceae در ایران  
مصطفی اسدی و سید منصور میرتاج الدینی

گونه *Acantholimon albocalycinum* از جنوب شرق ایران شرح داده می شود. این گونه متعلق به بخش *Glumaria* است و با داشتن کاسه سفید متمایز می گردد. گونه جدید با گونه *Acantholimon subulatum* قرابت دارد و با آن مقایسه می شود. گونه *Acantholimon kermanense* از استان کرمان شرح داده می شود. این گونه از بخش *Acantholimon* است و با گونه های *A. chrysostegium* و *A. mirtadzadinii* و *A. hyalinum* قرابت دارد و با آنها مقایسه می شود. گونه *A. sirchense* از بخش *Glumaria* است و از جنوب شرق ایران شرح داده می شود. این گونه با *A. subulatum* نزدیکی دارد و با آن مقایسه می شود.

### Introduction

The first author has been revising the plant family *Plumbaginaceae* for the Flora of Iran (Assadi 1989). In this study several new findings came to light. Some were already published before (Assadi 2003; Assadi 2004). The second author is especially interested in the genus *Acantholimon*. He has collected rather many interesting plants from Kerman province. In this paper, we publish three new species of the genus *Acantholimon*.

### *Acantholimon albocalycinum* Assadi & Mirtadzadini, **sp. nov.**

(Sect. *Glumaria* Boiss.)

Planta caespitosa, caespitosa ca. 35 cm lato, tubus calycis excepto glabra. Folia heteromorpha; folia vernalia 10-15 mm longa, ca. 1 mm lata, plana, mox languescentia, tandem decidua; folia aestivalia usque ad 30 mm longa, acicularia, transverse triangularia, ad basin plana. Caules ca. 10 cm longi (inflorescentia excepto). Folia caulina 2.6 mm longa, subulata, ad basin marginem late membranacea. Inflorescentia spiciforma, 2-4 cm longa, a caespite bene excedens, spiculis 2-6. Spiculae 10 mm longae, 1-2 florum. Bractea 6 mm longa, ovato-lanceolata, acuminata, viridis, margines membranacea. Bracteolae 3.6 mm longae, a tubis calyces aequantes vel breviores, obovatae, ad apices rotundatae, nervis medianis excepto membranaceae. Calyx 10 mm longus, infundibularis; tubus extus pilosus, intus glabrous; limbus albus, 4 mm longus; veni marginem attingentes. Petala 8 mm longa, spathulata, albida. Stamina 8 mm longa; antherae 1 mm longae; filamenta plana. Gynoecium 8 mm longum; stigma oblique capitatum.

*Typus.* Kerman, between Kerman and Sirch (EU4), 16.8.2002, 3050 m, Mirtadzadini 85786 (holotypus TARI).

Plant caespitose, ca. 35 cm broad, except the calyx tube glabrous. Leaves heteromorphous; spring leaves 10-15 mm long, deciduous; summer leaves up to 30 mm long, spiny, triangular at cross section, broadened at base. Stems ca. 10 cm long (inflorescence included). Stem leaves 2.6 mm long, subulate, broadly membranous at the base margin. Inflorescence spike-like, 2-4 cm long, well exceeding the cushion, with 2-4 spikelets. Spikelets 10 mm long, 1-2 flowered. Bract 6 mm long, ovate-lanceolate, acuminate, green, membranous at the margin. Bracteoles 3.6 mm long, equaling or shorter than the calyx tube, obovate, rounded at the apex, except the middle nerve membranous. Calyx 10 mm long, funnel-shaped above, tube hairy outside, glabrous inside; limb white, 4 mm long; nerves purple reaching to the margin of calyx limb. Petals 8 mm long, spathulate, whitish. Stamens 8 mm long, anthers 1 mm long; filaments flat. Gynoecium 8 mm long; stigmas obliquely capitate.

The new species differs from *A. subulatum* in following characters: bracteoles obovate, rounded at the apex (not oblong-elliptic, mucronate at the apex), nerves of the calyx limb up to the margin of the limb (not disappearing near the apex), bract acuminate (not mucronate) (see Rechinger & Schiman-Czeika 1974). It also differs from *A. sirchense* (another new species in this paper) in the following characters: calyx limb white (not purple), plant except the calyx tube glabrous (not densely hairy), spikelets greenish (not purple).

### *Acantholimon kermanense* Assadi & Mirtadzadini, **sp. nov.**

(Sect. *Acantholimon*)

Planta caespitosa, caespitosa usque ad 50 cm lato, glabra vel griseo-flava, calcareo-punctata, tubus calyces, bractea et bracteola excepto glabra. Folia homomorpha, usque ad 20 mm

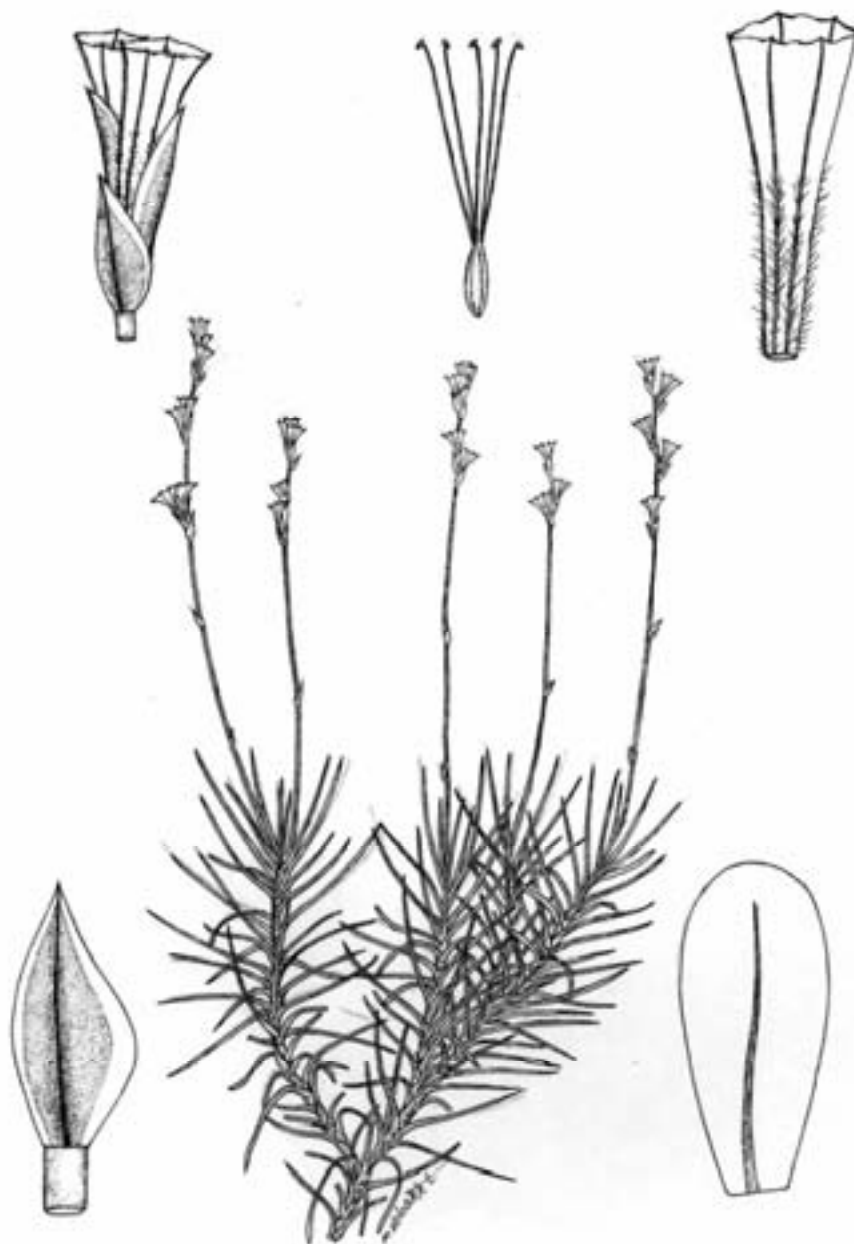


Fig. 1. *Acantholimon albocalycinum* (x 0.7); spikelet, bract and petal (x 4.2); gynoecium (x 5.6); calyx (x 7).

longa, 1 mm lata, acicularia, transverse triangularia, ad basin margines membranacea et partim scabra, persistentia. Folia caulina 0-2, 2-3 mm longa, ovata, vel subulata. Caules 1.6-10 cm longa (inflorescentia incluso). Inflorescentia capitata vel dense spicata, 1-3 cm longa, caespitem aequans vel superans. Spiculae 1-4, 10 mm longae, 2-4 florum. Bractea 4-5 mm longa, late ovata, acuta vel oblonga mucronata, marginem late membranacea. Bracteolae 6-8, 7-8.5 mm longae, obovatae vel oblongo-obovatae, apices rotundatae, margines membranaceae, interdum pilosae. Calyx 10 mm longus, infundibularis; tubus extus pilosus, intus glaber vel raro cum pilis paucis; limbus purpureus vel alborpurpureo-suffusus, apicem undulatus; veni purpurei, apices attingentes. Petala 8-10 mm longa, spathulata, rosea, apices rotundata. Antherae 1-1.5 mm longae; filamentum versus basin appanati. Gynoecium 8 mm longum; ovarium fusiformum, longitudine sulcatum. Stigmata antheris aequantes.

*Typus.* Kerman: Sarduih (EU2), 3370 m, 25.07.2002, S. M. Mirtadzadini 85795 (holotypus TARI); the same locality and collector, 85791, 85794 (TARI); Sarduih to Orzuih, 3100 m, 21.06.2004, S. M. Mirtadzadini 85358.

Plant caespitose, up to 50 cm broad, glaucous or grayish-yellow, covered with calcareous dots, except tube of the calyx homomorphous, up to 20 mm long, 1 mm broad, spiny, triangular at cross section, membranous and partly scabrous toward the base at the margin, persistent. Stem leaves 0-2, 2-3 mm long, ovate or subulate. Stems 1.6-10 cm long (inflorescence included). Inflorescence head-like or densely spicate, 1-3 cm long, equaling or well exceeding the cushion. Spikelets 1-4, 10 mm long, 2-4 flowered. Bract 4-5 mm long, broadly ovate, acute or longly mucronate, broadly membranous at the margin. Bracteoles

6-8, 7-8.5 mm long, obovate or oblong-obovate, rounded at the apex, broadly membranous at the margin, sometimes hairy at the back. Calyx 10 mm long, funnel-shaped above; tube hairy outside, glabrous or rarely with hairs inside; limb purple or white tinged purple, undulate at the apex; nerves purple, reaching to the apex of limb. Petals 8-10 mm long, spathulate, pink, rounded at the apex. Stamens 6-8 mm long; anthers 1-1.5 mm long; filaments flattened toward the base. Gynoecium 8 mm long; ovary fusiform, longitudinally sulcate. Stigmata equaling the anthers.

*Acantholimon kermanense* is rather a variable species even in a single locality. Stem length greatly but gradually changes from nearly absent to 8 cm long (inflorescence excluded), bracts acute to shortly or longly mucronate, bracteoles obovate to oblong-obovate, limb of the calyx purple to whitish tinged purple.

The new species seems to be related to *A. chrysostegium* Rech. f. & Schiman-Czeika and *A. hyalinum* Rech. f. & Schiman-Czeika. The former species is endemic to Afghanistan, Herat and is similar to long stemmed specimens of *A. kermanense*. However, *A. kermanense* differs from *A. chrysostegium* by having 2-4 flowers in spikelets (not 2), rounded bracteoles at the apex (not emarginate), narrower leaves less than 1 mm broad (not  $\pm 1.5$  mm), glabrous leaves (not papillose-glandulose), 0-2 stem leaves (not always 4), 6-8 bracteoles in each spikelets (not 3). *A. hyalinum* is again an endemic of Herat and is similar to short stemmed specimens of the new species. The differences are as follows: in the new species bracts shorter up to 5 mm long (not 6-8 mm), flowers 2-4 (not 1-2), leaves shorter up to 15 mm long (not 20-30 mm) and bracteoles up to 8 mm long (not 11-12 mm long).

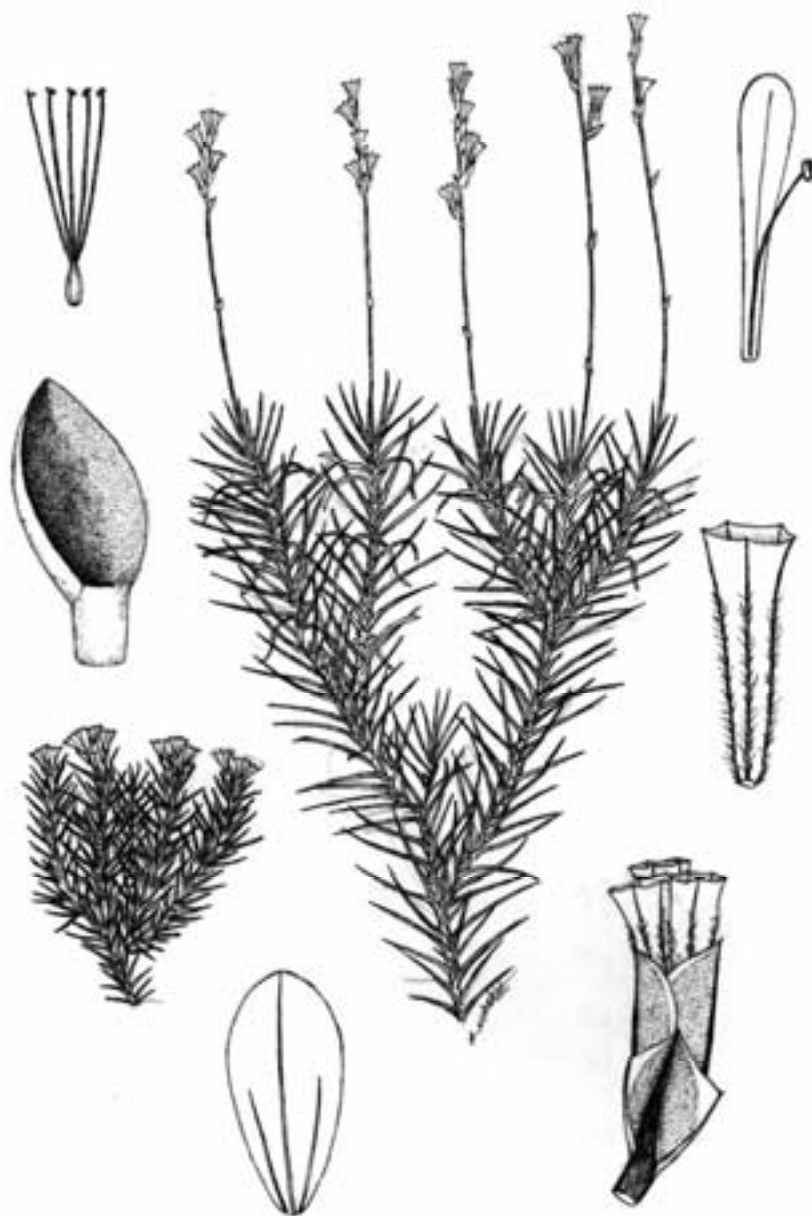


Fig. 2. *Acantholimon kermanense* (x 0.7); spikelet, calyx, bract and petal (x 4.2); bracteole and gynoecium (x 5.6).

*Acantholimon mirtadzadini* Assadi which was described from a place close to the locality of the new species is another relative and is similar to the short stemmed specimens of *A. kermanense* (Assadi 2003). In this case it differs from the new species by having mucronate bracteoles, darker petals and calyx limbs and less than 3 cm. stems.

***Acantholimon sirchense* Assadi & Mirtadzadini, sp. nov.**

(sect. *Glumaria* Boiss.)

Planta caespitosa, caespitosa ca. 45 cm lato, cinerascens, dense et breviter hirsuta. Folia heteromorpha; folia vernalia ca. 10 mm longa, 1 mm lata, flaccida, mox languescentia, plana, reflexa, tandem decidua; folia aestivalia 20–40 mm longa, acicularia, transverse triangularia, basin dilatata vel membranacea. Caulis 10-25 cm longa (inflorescentia incluso). Folia caulina 2-3, ca. 6.5 mm longa, subulata, basin dilatata et amplexicaulia. Inflorescentia spiciforma, 3-15 cm longa, spiculis 2-7. Spiculae 10 mm longae, floribus 3. Bractea 6-6.5 mm longa, lanceolata, mucronata, marginem membranacea. Bracteolae 5, 8.5 mm longae, tubo calycis longiore, obovatae, mucronatae, nervo mediano excepto membranaceae. Calyx 5 mm longus, infundibularis; tubus extus pilosus, intus glaber; limbus purpureus vel brunneus, 3-4 mm longus, apicem breviter excedentes. Petala ca. 12 mm longa, spathulata, alba. Stamina 4 mm longa; antherae 1 mm longae; filamenta dilatata. Gynoecium 10 mm longum; stigmata oblique capitata.

*Typus.* Kerman: N. of Kerman, Kuhpayeh, 3200 m, 24.06.2004. Mirtadzadini 86983 (holotypus TARI); between Kerman and Sirch (EU4), 16.08.2002, Mirtadzadini 85788.

Plant caespitose, ca. 45 cm broad, grayish, densely covered with short hairs. Leaves

heteromorphous; spring leaves ca. 10 mm long, 1 mm broad, flaccid, soon wilting, flat, reflex, finally deciduous; summer leaves 20-40 mm long, spiny, triangular at cross section, at the base broadened and membranous. Stems 10-25 cm long (inflorescence included). Stem leaves 2-3, ca. 6.5 mm long, subulate, broadened and amplexicaule at the base. Inflorescence spike-like, 3-15 cm long, well exceeding the cushion, with 2-7 spikelets. Spikelets 10 mm long, 3 flowered, partly purple. Bract 6-6.5 mm long, lanceolate, mucronate, membranous at the margin. Bracteoles 5, 8.5 mm long, longer than the calyx tube, obovate, mucronate, except the middle nerve membranous. Calyx 9 mm long, funnel-shaped above; tube hairy outside, glabrous inside; limb purple to brownish, 3-4 mm long, shortly 10 lobed at the apex, with broadened purple nerves shortly exceeding the limb margin. Petals ca. 12 mm long, spathulate, whitish. Stamens 4 mm long; anthers 1 mm long; filaments broadened. Gynoecium 10 mm long; stigmas obliquely capitate.

The new species differs from a relative *Acantholimon subulatum* Boiss. in the following characters: plant distinctly and densely covered by short hairs (not glabrous or puberulent), bracts lanceolate (not ovate-lanceolate), tube of the calyx hairy (not glabrous), nerves of the calyx broadened above and shortly exceeding the calyx limb (not narrowed and/or disappearing near the margin of calyx limb).

It differs from another relative *Acantholimon scirpinum* Bge. in following characters: plant hairy throughout (not glabrous except the calyx), bract lanceolate, acuminate (not broadly ovate, cuspidate), calyx limb purple (not white).

It also differs from *Acantholimon cupreo-ovivascens* Rech. f. & Schiman-Czeika by having whitish petals (not purple), bract

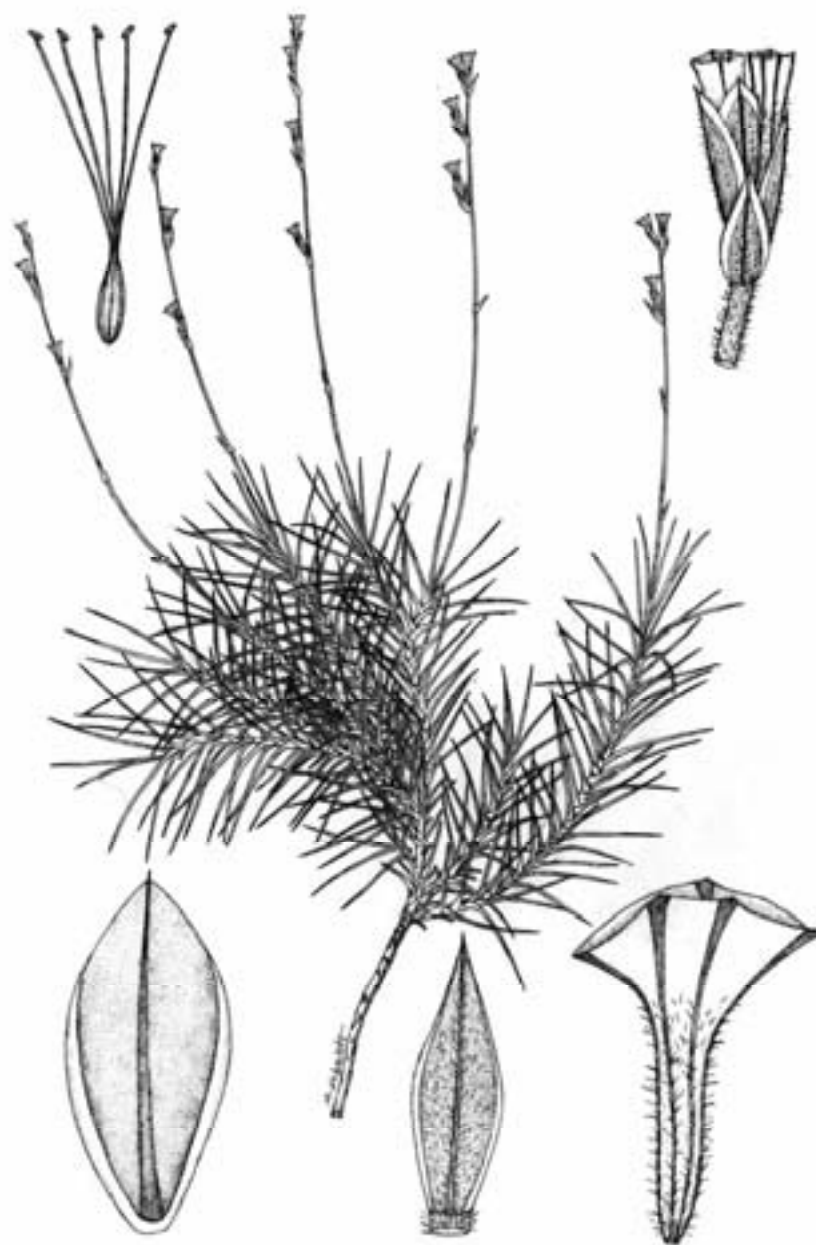


Fig. 3. *Acantholimon sirchense* (x 0.6); spikelet (x 3.6); gynoecium (x 4.8); calyx and bracteole (x 6); bract (x 6.6).

lanceolate, acuminate (not broadly ovate, cuspidate), calyx limb darker, margin of bracteoles narrowly membranous (not broadly membranous), tuft relatively loose, leaves narrower, ca. 1 mm broad (not 1.5-2 mm).

### **Acknowledgment**

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