

SILENE CAPITELLATA AND SILENE RETINERVIS (CARYOPHYLLACEAE), NEW RECORDS FOR IRAN

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During field works in Qazvin and West Azarbaijan provinces, some interesting specimens of the genus *Silene* were found. *Silene capitellata* (sect. *Capitellatae*) which is mostly growing in Turkey has been collected in Qazvin, Alamout Mountains. *S. retinervis* (sect. *Auriculatae*) was described from Ghandil Mountain of Iraq by Ghazanfar, were collected in three localities from Pyranshahr and Ziveh of West Azarbaijan province. In this article, these two perennial species are reported as new records in Iran. The taxonomical description, geographical distribution and the ecology of the new records are provided and their photographs and illustrations are presented.

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Key words: *Silene* sect. *capitellatae*; *Silene* sect. *Auriculatae*; *Silene capitellata*; new records; Iran

گزارش‌های جدید برای ایران (Caryophyllaceae) *S. retinervis* و *Silene capitellata*

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طی کاوش‌های انجام شده در استان‌های قزوین و آذربایجان غربی، نمونه‌های جالبی از جنس *Silene* جمع‌آوری شدند. *Silene capitellata* از بخش *Capitellatae* که بیشتر در ترکیه پراکنش دارد، از کوه‌های منطقه الموت در استان قزوین جمع‌آوری شده است. همچنین *S. retinervis* از بخش *Auriculatae* که توسط غضنفر از کوه قندیل عراق معرفی شده بود، از سه رویشگاه در پیرانشهر و زیوه از استان آذربایجان غربی جمع‌آوری شدند. این دو گونه گیاهی چندساله به عنوان گزارشی جدید برای فلور ایران معرفی می‌شوند. شرح گیاه‌شناسی، توزیع جغرافیایی، اکولوژی و تصاویر هر یک از گونه‌ها ارائه شده‌اند.

INTRODUCTION

When a plant taxonomist has an exploration trip in different phytogeographical regions of Iran, will encounter with remarkable plant diversity not only in each region but also in each habitat. Therefore, in spite of about three centuries botanical exploration, there are some unexplored areas in Iran that need to be studied.

In our intensive field works and studies on the genus *Silene* (Caryophyllaceae) in Iran, we observed two distribution types of *Silene* species. Some species

such as *Silene aucheriana* Boiss. and *S. swertiifolia* Boiss. have wide distribution, while a number of species such as *S. nizvana* Melzh. and *S. daenesis* Melzh. are confined into a small area in unique locality. Therefore, for new insight about distribution patterns of *Silene* species, the comprehensive field works in all parts of Iran is necessary. During such explorations, some new taxa of the genus *Silene* were described or reported in Iran in recent years (Melzheimer 1985; Gholipour & Sheidai 2009; Gholipour & al. 2010; Nejadi Edalatian & al. 2011;

Gholipour & Parsa Khanghah 2015; Gholipour & Golshahi 2016; Hoseini & Assadi 2016; Gholipour 2017).

During our field works in the mountainous areas of west Azarbaijan and Qazvin provinces in 2011-17, some interesting specimens were collected by the authors. Our efforts to determine the specimens by using Flora Iranica (Melzheimer 1988) and checking materials in some Iranian herbaria were unsuccessful. One specimen was determined as *Silene capitellata* Pers. by using Flora of Turkey (Coode & Cullen 1966) and Flora of the USSR (Shishkin 1936), along with consulting with Kemal Yildiz and Bengt Oxelman, and checking the specimens in herbarium of Conservatoire et Jardin botaniques de la Ville de Genève (G) and Berlin Botanical Garden and Botanical Museum herbarium (B). Another specimen was determined as *S. retinervis* Ghazanfar; a species was described from Iraq, after consulting with Shahinia A. Ghazanfar and checking type photo and description (Ghazanfar 1982). In this paper, these species are recorded for Flora of Iran.

MATERIALS AND METHODS

In this research the plant materials were collected from natural habitats of the species during the years 2011 - 2017. Additionally, herbarium specimens of Conservatoire et Jardin botaniques de la Ville de Genève (G), and Berlin Botanical Garden and Botanical Museum herbarium (B) were observed and digital photo of type specimen of *S. retinervis* was studied in Royal Botanical garden Kew virtual herbarium (K). The specimens were determined by using; Flora Iranica (Melzheimer 1988), Flora of Turkey (Coode & Cullen 1966) and Flora of the USSR (Shishkin 1936) and consulting with Kemal Yildiz, Bengt Oxelman and Shahinia A. Ghazanfar, the genus *Silene* specialists in the world. The specimens are preserved in IRAN and Sari Payame Noor University (SPNH) herbaria.

RESULTS AND DISCUSSION

Silene capitellata, which belongs to the section *Capitellatae* Schischk. and *S. retinervis* from the section *Auriculatae* Boiss, are recorded to the flora of Iran for the first time.

Silene capitellata Boiss. Diagn. ser. 1 (1): 25 (1843), (Sect. *Capitellatae* Schischk.), (figs. 1 & 2).

Perennial herb, caespitose; stems erect or ascending, 10 - 40 cm long, densely puberulent in lower part, glabrous and viscid at above. Basal leaves oblanceolate, petiolate, puberulent, 45 - 60 × 4 - 6 mm; acute; ciliate. Cauline leaves oblanceolate to linear, the lower pairs petiolate, other sessile, 17 - 60

× 1 - 4.5 mm, 4 - 6 pairs. Inflorescence capitate, the heads up to 15 mm in diameter; bracts lanceolate, glabrous, scarious; Pedicels lower than 1 mm. Calyx 4 - 5.5 mm long, campanulate, glabrous, membranous below; with 10 parallel greenish veins; teeth triangular, broadly membranous in the margin. Petals whitish; claw 3.5 - 4 mm long, ciliate; limb 2 - 3 mm long, entire; coronal scales absent. Stamens 10; Alternate stamens 6 - 6.5 mm long, epipetalous stamens 5.5 - 6 mm long, inserted 0.2 - 0.5 mm from the base of petals. Anthophore shorter than 0.5 mm, glabrous. Capsule ovoid, 4.5 - 5 × 3 - 3.5 mm, distinctly exceeding from calyx. Seed asymmetrical reniform, blackish-brown, 1 - 1.2 × 0.5 - 0.6 mm; papillate, concave in lateral and dorsal face.

Taxonomy, geographical distribution and ecology

Silene capitellata was classified under section *Lasiostemones* Boiss. in Flora of Turkey (Coode & Cullen 1966), while Chowdhuri considered it as a member of sect. *Orites* (Adans.) Oth (Chowdhuri 1957) based on entire petals and glabrous claws. Shishkin (1936) introduced sect. *Capitellatae* Schischk. as a new taxon with following diagnostics features; flowers in a capitate inflorescence enveloped by large ovate bracts; petals white, entire; coronal scales none; capsule subsessile, and placed the species in this section. According to the morphological features; plants hermaphrodite not usually dioecious, inflorescence capitate not compound panicles or thyrsoidal or congested into pseudo-verticels, flowers bisexual not often unisexual, petals entire not usually ± entire and petal claw ciliate not glabrous or ciliate, we believe *S. capitellata* should be classified under sect. *Capitellatae*.

Silene capitellata is an Irano - Turanian element mainly distributes in Turkey. According to available information, it is known only in a unique locality in c. 100 m² in Qazvin province in Iran (map. 1). This species grows on Mountain grasslands and rocky outcrops in elevation from 800 to 2700 m (fig. 1 A). The flowering time of the species is from June to July and fruiting time is in August.

Specimens examined: Iran: Qazvin, Alamout road, 22 km from Koraneh to Rajaidasht, 36° 23' N 50° 12' E, 2280 m, 8 May 2017, Gholipour- SPNH-5617! 6 June 2017, Amini Rad & Gholipour- SPNH-5705! IRAN-74436! Armenia: Aucher-Eloy- G- 433! & B-4271! Turkey, K. Moras, Ayrandaghi, evresi, 1600 m, H. Dumman-Gazi- 3908!

Silene retinervis Ghaz. Kew Bull. 37 (3): 458, 1982, (Sect. *Auriculatae* Boiss.), (fig. 3)

Perennial herb, caespitose, gynodioecious; stems

prostrate, decumbent or ascending, 8.5 – 28 cm long, with villose hairs in the lower parts and dense glandular hairs in the upper parts. Basal leaves oblanceolate, 15 – 50 × 1.5 – 3 mm, pubescent; acute. Cauline leaves 2 pairs, linear - lanceolate, 7 - 40 × 1 - 1.5 mm, pubescence with sparsely glandular hairs; acute. Inflorescence solitary rarely simple dichasia, alar pedicels 12 - 28 (- 42) mm long, lateral pedicels 1 - 2 mm, covered with glandular hairs. Bract lanceolate or linear - lanceolate. Calyx 21 - 25 mm long, cylindrical - clavate and inflated, with reticulate nerves; teeth triangular or ovate - triangular, or lanceolate, 2 - 3.5 mm long; membranous and ciliate at margin. Petals yellow; claw 11 - 12 mm long with distinct auricles; limb 6 - 7 mm long up to 2 - 3 mm divided; coronal scale 1 - 1.5 mm long, oblong. Alternate stamens 15 - 17 mm long, epipetalous stamens 9 - 10 mm long, inserted 4 - 5 mm from the base of petals. Capsule ovoid, 9 - 11 × 3.5 - 4.5 mm. Anthophore 10 - 15 mm long, pubescent on the base.

Geographical distribution and ecology

Silene retinervis is an Irano - Turanian element and distributes in Iraq, near the border of Iran and West Azarbaijan Province. We collected the specimens of the species from three localities; Pyranshahr in very restricted area of Sepiarez Mountain and two localities in Ziveh (Dalamber and Boz-e Sina Mountains) (map. 1). *S. retinervis* grows on mountains meadows on screes and stony substrates in the alpine zone from 2850 to 3050 m. The flowering time of the species is from July to August.

Specimens examined: Iran: W. Azarbaijan, Urmia, Dizaj, Ziveh, Kisian, before Dalamber, Boz-e Sina Mountain, 37° 07' N 44° 51' E, 2970 m., 23 July 2011, Gholipour & Amini Rad- SPNH-5708! Dalamber Mountain, 37° 09' N 44° 48' E, 2850-2971 m, 21 Jul. 2011, Gholipour- SPNH-5707! Pyranshahr to Naghadah, Km 5, Silveh village, Kouh- e Sepiarez, 36° 51' N 44° 58' E, 3008 m, 1 Jul. 2010, Gholipour & Amini Rad- SPNH-5706! Iraq: NE Iraq, top of Qandil range, between top of Perrish and Bardanas (Iraqi-Iranian border), c. 3000 m, 29 Aug. 1957, Ali al-Rawi & I. Serhang- 24304 (holotype K photo!).

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Fig. 1. *Silene capitellata*: A, Plant habit in natural habitat (SPNH-5617); B, basal leaf; C, cauline leaf; D, Inflorescence; E, inflorescence in fruiting time; F, capsule (scale bar 10 mm).

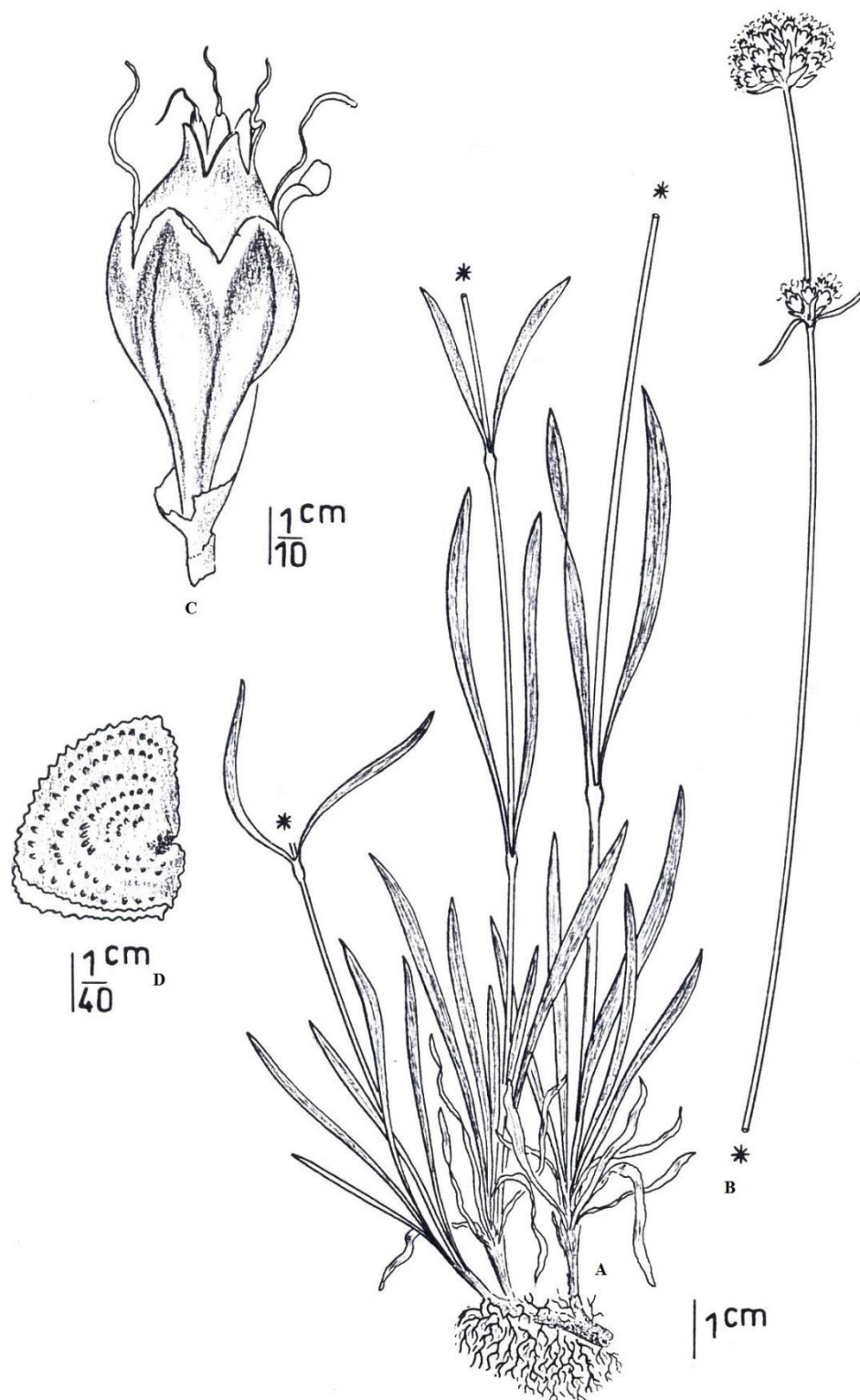
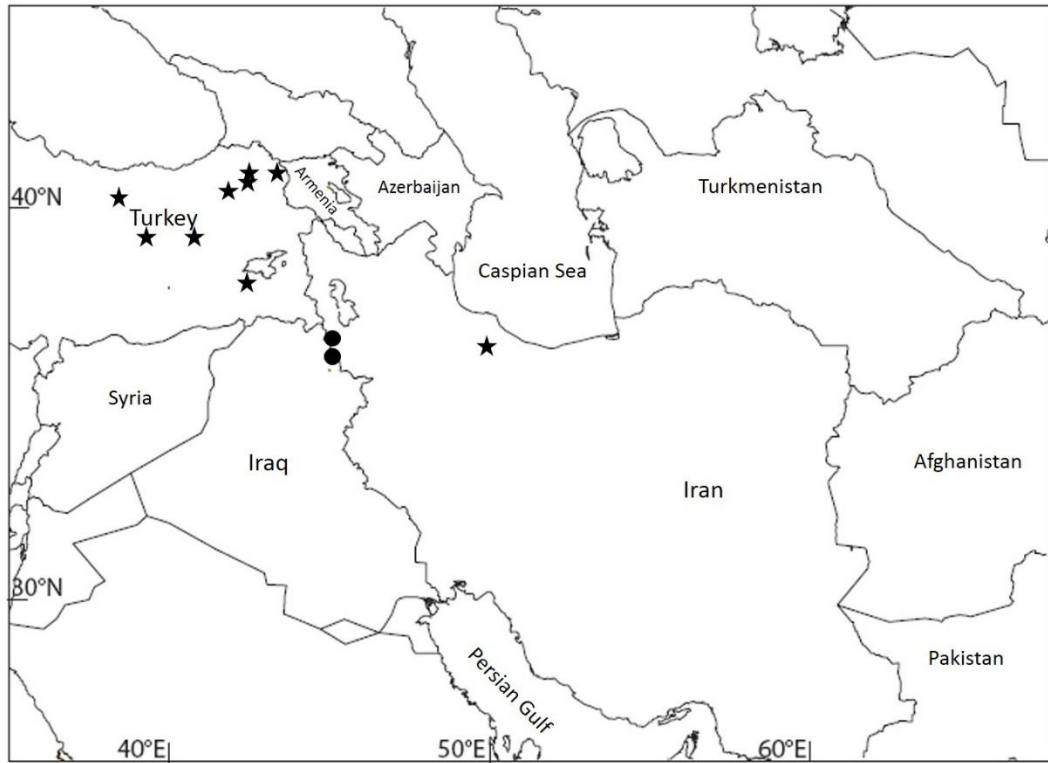


Fig. 2. *Silene capitellata*: A, Plant habit (SPNH-5705); B, inflorescence; C, a flower in fruiting time; D, seed.



Fig. 3. *Silene retinervis*: A, Plant habit (SPNH-5707); B, basal leaf; C, cauline leaf; D, inflorescence; E, flower; f. unripe capsule and Antophore (scale bar 10 mm).



Map. 1. Distribution map of *Silene retinervis* (●) and *S. capitellata* (★).

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