

A NEW SPECIES AND A NEW RECORD OF ACANTHOPHYLLUM C. A. MEY. (CARYOPHYLLACEAE) FROM NORTHEAST OF IRAN

M. Mahmoudi Shamsabad, J. Vaezi, F. Memariani & M. R. Joharchi

Received 10.12.2011. Accepted for publication 21.02.2012.

Mahmoudi Shamsabad, M., Vaezi, J., Memariani, F. & Joharchi, M. R. 2012. 06. 31: A new species and a new record of *Acanthophyllum* C. A. Mey. (*Caryophyllaceae*) from northeast of Iran. *-Iran. J. Bot. 18(1): 59-63. Tehran.*

Acanthophyllum ejtehadii (sect. *Oligosperma*) is described as a new species to the science from Khorassan, NE Iran, which is closely related to *A. diezianum*. *Acanthophyllum maimanense*, hitherto known only from NW Afghanistan, is a new record for the flora of Iran. These species are compared with the closely related species of sect. *Oligosperma* and their distribution data and pictures are provided.

Masoumeh Mahmoudi Shamsabad (correspondence, ma_ma648@stu-mail.um.ac.ir), Department of Biology, Faculty of Sciences, Ferdowsi University of Mashhad, Mashhad, Iran. -Jamil Vaezi, Department of Biology, Faculty of Sciences, Shahid Chamran University of Ahvaz, Ahvaz, Iran. -Farshid Memariani & Mohammad Reza Joharchi, Research Centre for Plant Sciences, Ferdowsi University of Mashhad, Mashhad, Iran.

Key words: *Acanthophyllum*, sect. *Oligosperma*, new species, new record, endemic, Khorassan, Iran.

گونه‌ای جدید و گزارش جدیدی از جنس *Acanthophyllum* C. A. Mey. از شمال شرق ایران

معصومه محمودی شمس آباد، کارشناسی ارشد علوم گیاهی، گروه زیست شناسی، دانشکده علوم، دانشگاه فردوسی مشهد.

جمیل واعظی، استادیار گروه زیست شناسی، دانشکده علوم، دانشگاه شهید چمران اهواز.

فرشید معماریانی و محمدرضا جوهرچی، اعضای هیأت علمی گروه گیاهشناسی، پژوهشکده علوم گیاهی، دانشگاه فردوسی مشهد.

گونه *Acanthophyllum ejtehadii* از بخش *Oligosperma* به عنوان آرایه جدیدی برای علم گیاهشناسی از خراسان در شمال شرق ایران معرفی می‌شود که خویشاوند نزدیک *A. diezianum* است. گونه دیگری از این بخش با نام *A. maimanense* که تاکنون فقط از شمال غرب افغانستان معرفی شده، برای اولین بار برای فلور ایران گزارش می‌شود. این گونه‌ها با نزدیک ترین گونه‌های خویشاوند خود در بخش Sect. *Oligosperma* مقایسه شده و تصاویر و اطلاعات پراکنندگی جغرافیایی آنها ارائه می‌شود.

INTRODUCTION

Acanthophyllum C. A. Mey. (*Caryophyllaceae*, *Caryophylloideae*, *Caryophylleae*) with about 60 species is distributed in the Irano-Turanian region (Takhtajan 1986, Ghaffari 2004). It comprises 33 species distributed in Iran from which 23 species are endemic to the country. In previous investigation a taxonomic study was carried out by Basiri & al. (2011) to solve the problems in species delimitation of this genus. They suggested seven synonyms and five reductions to the rank of variety for the genus in Iran. *Acanthophyllum* species are adapted to desert, mountain and temperate areas (Heywood 1985). Geographical distribution of this genus is in Iran,

Afghanistan, Pakistan, Kazakhstan, Tajikistan, Uzbekistan, Turkmenistan, Western China, Armenia, Iraq, Turkey and Syria. Khorassan-Kopetdagh floristic province located in the northeast of Iran and adjacent areas in south Turkmenistan and northwest of Afghanistan has been considered as the most important centers of diversity of the genus with 23 recorded species (Schiman-Czeika 1988, Ghaffari 2002).

In Flora Iranica area, the genus has been divided into seven sections; of these, four sections including *Oligosperma* Schischk., *Macrostegia* Boiss., *Acanthophyllum* and *Plesiosperma* Boiss. have been reported for the flora of Iran (Schiman-Czeika 1988).



Fig. 1. *Acanthophyllum ejtehadii* Mahmoudi & Vaezi – 44247 (FUMH).

Section *Oligosperma* with 23 species worldwide is the largest section of the genus, of which 16 species occur in Iran. This section was firstly described by Shishkin (1936) in Flora of USSR. The members of the section are identified by dense flowers, spherical terminal heads, (4) 6-12 mm long calyx, 1-2 mm long calyx-teeth and 4-ovuled ovary (Shishkin 1936, Schiman-Czeika 1988). Generally, variation of morphological characters within the family of *Caryophyllaceae* makes the taxa complicated to be delineated and identified (Fior & al. 2006). In *Acanthophyllum* species, like other *Caryophyllaceae* genera, there are specimens with doubtful position.

Therefore, a detailed morphological, palynological and anatomical investigation of *Acanthophyllum* sect. *Oligosperma* has been done by Mahmoudi (2011). In this paper, new additions to the Iranian flora including a new species and a new record are reported.

NEW SPECIES

In September 2010, we observed an imperfect specimen of *Acanthophyllum* without herbarium number in herbarium of Mashhad School of Pharmacy. A visit to the locality of the specimens was made to collect living materials and to investigate their morphological features in the field, in June 2011. This plant was characterized by some features including narrow floral leaves, bracts and bracteoles spread

upright and short, dense branches and short internodes and is described as a new species here.

***Acanthophyllum ejtehadii* Mahmoudi & Vaezi, sp. nov.** (Fig. 1).

Typus: Iran, Khorassan, Chenaran, 5 km from Radkan towards Merichgan, 1237m, 4.5.2011, Basiri & Mahmoudi 44247 (holotypus FUMH; isotypus TARI).

Valde affinis *A. diezianum* sed differt basi prostrati, ramis ascendentibus (nec basi ramosi), pilis brevissimis, glanduliferis, inflorescentia pilis longioribus raro immixtis (nec pilis crispulis, pluricellularibus, simplicibus, ad calyces pilis glanduliferis raro immixtis), foliis floralibus 8×1.5-2 mm (nec 12-15(-20)×1.5-2 mm), bracteis 6×±1 mm (nec 9-13×±1.5 mm). Bracteolis ±4×.5 mm, lineari-subulatis (nec 6-10×1-1.5 mm, triquetro-acuminatis).

Other material studied. Khorassan, Mashhad, Amarghan, Borzesh Abad, Ghorashi Al-Hosseini 1609-G (FUMH); Khorassan, Chenaran, 5 km from Radkan to Merichgan, 1250 m, Mehregan *s.n.* [Herbarium of Mashhad School of Pharmacy].

Etymology. *Acanthophyllum ejtehadii* named in honor of Prof. Dr. Hamid Ejtehad, the Iranian ecologist in Ferdowsi University of Mashhad.

Suffrutex parvus, a basi prostratus ramis ascendentibus, pilis brevibus glanduliferis praeditis raro pilis crispulis pluricellularibus immixtis. Rami floriferi 5-10 cm longi, internodiis 1-6 mm longis. Folia 7-15 × 0.5-1 mm, lineari-triangularia, erecto-patentia. Ramuli in

Table 1. Diagnostic morphological characters of *Acanthophyllum ejtehadii* and the closest relative species.

Character	<i>A. ejtehadii</i>	<i>A. diezianum</i>	<i>A. pachystegium</i>	<i>A. lilacinum</i>	<i>A. pulchrum</i>
Plant state	Prostrate at base, branches ascending	Branched at base	Prostrate at base, branches ascending	Branched at base	Prostrate at base, branches ascending
Indumentum	Short glandular hairs, sometimes covered with sparsely long simple hairs	Long and crisped simple hairs, on calyx rarely covered with glandular hairs	Short glandular hairs, in inflorescence covered with short simple hairs	Simple hairs intermixed with scattered glandular hairs	Short glandular hairs
Floral leaves	8-10×1-1.5 mm, upright.	12-17×±1.5-2 mm, upright	8-11×2.5-3 mm, recurved	9-13×2.5-3 mm, squarrose	(10-)13-16×1-1.5 mm, upright
Bracts	8-9×1 mm, linear-subulate	8-12×1.5 mm, triquita-acuminate	6-8 × 2-2.5 mm, lanceolate-acuminate	8-12 × 2-3 mm, ovate-lanceolate, acuminate	(10-)12-15 mm, linear-triangular
Bracteoles	5-6×0.5 mm	6-8×1-1.5 mm	4-6×1.5-2 mm	4-7×1-2 mm	7-12×±1 mm
Calyx	9 mm	8-10 mm	6-8 mm	7-8 mm	(9-)10-13 mm
Petals	12-14×1.5-2 mm	12-16×1.5-2 mm	11-15×1.5-2 mm	12-15×1.5-2 mm	(16-)22×±2 mm

Fig. 2. *Acanthophyllum maimanense* Rech. f. & Schiman-Czeika – 34612 (FUMH).

Table 2. Diagnostic morphological characters of *Acanthophyllum maimanense*, *A. laxiusculum* and *A. heratense*.

Characters	<i>A. maimanense</i>	<i>A. heratense</i>	<i>A. laxiusculum</i>
Leaves	10-17 × 0.5-1 mm, acerose, thin	15-30 × 1-1.5 mm, triangular, rigid	18-40 × 1-1.5 mm, linear-triangular, rigid
Floral leaves	8-10×1 mm	6-9×1.5-2 mm	8-15×1.5-2 mm
Buds length on vegetative branches	well developed, sometimes longer than leaves	shorter than leaves	shorter than leaves
Lateral flowers pedicel	absent	absent	present

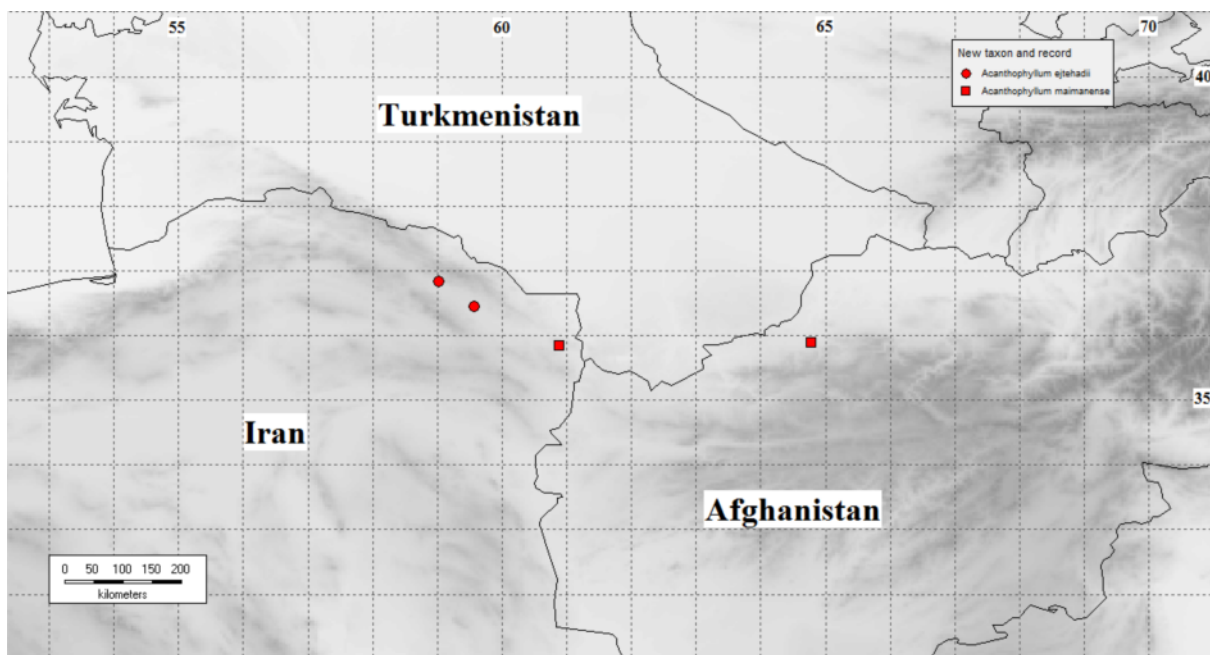


Fig. 3. Distribution map of *Acanthophyllum ejtehadii* and *A. maimanense*.

axillis rami abbreviati interdum evoluti. Folia vernalia ad basin caules presistantia. Inflorescentia 20-30 mm diametro, e dichasio terminali et e verticillastris 1-3 inter se 0-2 mm remotis composita; inflorescentia partialis paulo inaequalia, inferiora pedunculo 1-4 mm longo; cymae partiales multiflorae; flores sessiles. Folia floralia 8-10×1-1.5 mm, lineari-subulata, bracteis similia. Bracteae 8-9×±1 mm, rectae. Bracteolae 5-6×0.5 mm, plerumque calyce breviores. Calyx 9 mm longus, quinquecostatus; dentes ± aequilongi, 0.75-1 mm longi, anguste triangulares, in mucronem 0.5 mm longum attenuati. Petalorum laminae ±5 mm e calyce exsertae, ±1.5 mm latae, lineari-obovatae, acutae, in sicco roseae, basi interdum pallide purpureae.

Acanthophyllum ejtehadii is similar to *A. diezianum* and *A. pulchrum* for the shape and state of bract and

floral leaves and for the indumentum are similar to *A. pachystegium* and *A. lilacinum* (Table 1). The collected material of this species deposited in the Ferdowsi University of Mashhad Herbarium (FUMH).

NEW RECORD

Acanthophyllum maimanense Rech. f. & Schiman-Czeika, Fl. Iranica, 163: 306 (1988).

Material studied: Iran, Khorassan, Torbat-e Jam, Salehabad, N Kal-Karab, 800 m, Joharchi & Zangoeei 34612 (FUMH).

During the identification process and review of the specimens of *Acanthophyllum* species in the Ferdowsi University of Mashhad Herbarium (FUMH), a specimen collected along the eastern boundaries of Khorassan was distinguished with certain characters

such as narrow, needlelike and delicate leaves, expanded buds and horizontal floral leaves. According to Flora Iranica (Schiman-Czeika, 1988), this specimen was identified as *A. maimanense* Rech.f. & Schiman-Czeika. This species (Fig. 2) was firstly collected in 1962 by Hedge & Wendelbo from Maimana as an endemic species to Afghanistan. The most distinguishing features of the species compared to the closely related species *A. heratense* and *A. laxiusculum* are shown in Table 2. The distribution range of this species is here extended westward to NE Iran (Fig. 3).

ACKNOWLEDGEMENT

We wish to thank Mr. Ali Asghar Basiri, the co-collector of the type materials in Ferdowsi University of Mashhad, for his field assistance.

REFERENCES

- Basiri, Sh., Bidi, B., Assadi, M., & Rahimi Nejad, M. 2011: A taxonomic study of *Acanthophyllum* C. A. Mey. (Caryophyllaceae) in Iran. -Iran. Journ. Bot. 17 (1): 24-39.
- Fior, S., Karis, P., Gabriele, C., Minuto, L., & Sala, F. 2006: Molecular phylogeny of the Caryophyllaceae (Caryophyllales) inferred from chloroplast matk and nuclear rDNA ITS sequences. -American Journal of Botany 3: 399-411.
- Ghaffari, M., 2002: Biosystematic study of some *Acanthophyllum* species. -PhD thesis, University of Tehran.
- Ghaffari, M. 2004: Cytotaxonomy of some species of *Acanthophyllum* (Caryophyllaceae) from Iran. - Biologia, Bratislava 59 (1): 53-60.
- Heywood, V. H. 1985: Flowering plants of the World. Croop Helm. London, pp. 63-70.
- Mahmoudi, M. 2011: Biosystematic study of *Acanthophyllum* C. A. Mey. sect. *Oligosperma* in Khorassan provinces. -MSc thesis, Ferdowsi University of Mashhad.
- Schiman-Czeika, H., 1988: *Acanthophyllum* in Rechinger, K. H. (ed.) Flora Iranica, no. 163: 253-330. -Akademische Druck- u. Verlagsantalt, Graz. Pp..
- Shishkin, B. K. 1936: *Acanthophyllum* in Komarov, V. L. (ed.) Flora of USSR, vol. 6: 781-802. -Moskva & Leningrad.
- Takhtajan, A. L., 1986. Floristic Regions of the World. -University of California Press, Berkley.