

TRIFOLIUM LONGIDENTATUM (FABACEAE), A NEW RECORD FOR THE FLORA OF IRAN

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Trifolium longidentatum Nabelek is reported as a new record from the Kurdistan province, West of Iran. It belongs to the section *Trifolium*, subsect. *Ochroleuca*. This species, is characterized by long calyx teeth, oblong-lanceolate stipules that adnate to petiole in four-fifths of their lengths, pale pink flowers and bent beak pods. It is taxonomically an isolated species and there is no very close species to it in the Flora Iranica area. Morphological characteristics, habitats and geographical distribution of *T. longidentatum* are presented. An identification key to the Iranian members of *Trifolium* sect. *Trifolium* subsect. *Ochroleuca* is also provided.

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Key words: *Trifolium longidentatum*; Sect. *Trifolium*; Subsect. *Ochroleuca*; new record; flora of Iran

گونه ***Trifolium longidentatum***، گزارش جدیدی برای فلور ایران

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گونه *Trifolium longidentatum* به عنوان یک گزارش جدید از استان کردستان در غرب ایران معرفی می شود. این گونه متعلق به بخشه *Trifolium* زیر بخشه *Ochroleuca* است و از نظر تاکسونومی با داشتن دندانه های کاسه بلند، گوشوارک های مستطیلی - نیزه ای که چهار پنجم طول آن به دمبرگ متصل شده، گل های صورتی کم رنگ و غلاف منقار مانند خمیده از سایر گونه ها قابل تشخیص می باشد و در محدوده فلور ایرانیکا گونه ای نزدیک به آن وجود ندارد. ویژگی های ریخت شناسی، زیستگاه و پراکنش جغرافیایی این گونه در ایران و همچنین یک کلید شناسایی برای این گونه ارائه شده است.

INTRODUCTION

The genus *Trifolium* L. with about 255 species worldwide, is among the largest genera of the Fabaceae (Ellison & al. 2006). It is widely distributed in the temperate and subtropical regions with the highest species diversity in the Mediterranean basin and Western North America (Zohary 1972; Zohary & Heller 1984; Gillett & Taylor 2001). This genus includes many forage species, widely cultivated in

most parts of the world (Gillett & Taylor 2001).

According to Heller (1984), 52 species of *Trifolium* grow in Flora Iranica area, from which, 48 species occur in Iran, 24 out of them belong to the sect. *Trifolium*. New records after the publication of Flora Iranica (Moussavi 2001; Nemati 2005; Tabad & al. 2015), have increased the number of Iranian species of the sect. *Trifolium* to 27.

The section has been divided into 17 subsections;

of these, 15 subsections including *Ochroleuca* Gib & Belli have been reported for the flora of Iran. The members of this subsection represented in the world by eight species and in the Flora Iranica area by four species (Zohary & Heller 1984). Another species of this subsection is *T. kurdistanicum* which is recently described as a new species by Yousefi & al. (2017) that increased the number of *Ochroleuca* species to nine. The members of this subsection are characterized by: perennial habit; calyx tube 10-nerved, unequal, linear-subulate teeth with 1-3 nerves, triangular at base, usually spreading in fruit; throat closed by callosity; corolla large, often yellowish-white (Zohary & Heller 1984).

MATERIALS AND METHODS

The first author has been working on the genus *Trifolium* sect. *Trifolium* to prepare her doctoral dissertation. During identification of *Trifolium* specimens in the Herbarium of Kurdistan Agricultural and Natural Resources Research and Education Center in Sanandaj (HKS), two unknown specimens from Kurdistan province were examined and identified as *T. longidentatum* according to the relevant literatures (Zohary 1970; Zohary & Heller 1984; <http://elmer.rbge.org.uk/bgbase/vherb/bgbasevherb.php>)

RESULTS

Morphological characters of the specimens were completely identical to the description of *Trifolium longidentatum* Nabelek, which previously was considered as an endemic species to Van province in the south east of Turkey. Therefore, this species that was formerly not recognized in the Flora Iranica region, is reported here as a new record for the flora of Iran.

New record

Trifolium longidentatum Nabelek, Publ. Fac. Sci. Univ. Masaryk Brno 35: 69 (1923). -fig. 1.

Examined specimens: Kurdistan: ca. 30 Km from Saghez to Baneh, Piromaran village, Nacarouz Mountain, 2400 m. 21.06.2005, Maroofi & Moradi 7236. Kurdistan: Saghez to Baneh, Piromaran village, Nacarouz Mountain, 2500 m. 28.06.2006, Maroofi 7828.

Perennial, appressed villose, erect or ascending, 20-40 cm high. Stems mostly simple. Leaves varying in length of petioles, at lower part long-petioled, those of the uppermost, short-petioled; stipules foliaceous, membranous between green nerves, adnate at base to the petiole for more than four-fifths of their length, free portion triangular to lanceolate, obtuse, glabrous,

hairy at margin; leaflets entire, oblong to elliptical, 1.5-4 × 0.7-2 cm, obtuse, the lower ones slightly emarginate, softly hairy on lower surfaces. Inflorescence solitary, 2-4.5 × 1.5-2.5 cm, many-flowered, ovoid in flowering, later elongating, long pedunculate, up to 14 cm long. Flowers up to 2.5 cm long, dense. Calyx partly villous, with 10 prominent nerves; tube cylindrical; teeth of calyx erect, subulate, plumose, acute at tip, 3-nerved, markedly unequal, all longer than tube; throat of fruiting calyx closed by bilabiate callosity. Corolla yellowish to pale pink, to 25 mm long, much exceeding the calyx, standard oblong, emarginated at the apex, 6-7 mm longer than wings and keel. Pod membranous, with rather large beak. Seed 1, oblong, brown, 2mm long.

Affinity: *T. longidentatum* is taxonomically isolated among other *Trifolium* species of Iran classified in subsection *Ochroleuca*. According to Zohary (1970), taxonomic affinities of this species are uncertain but possibly have relationships with *T. pannonicum*.

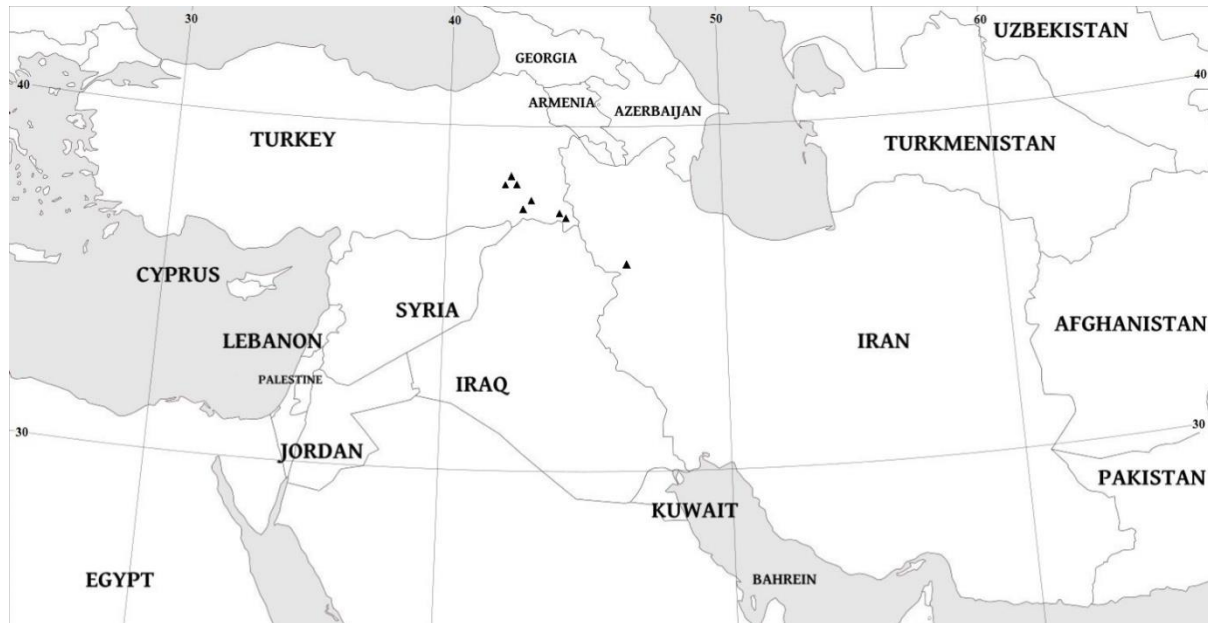
Geographical distribution and habitat: *Trifolium longidentatum* is described from Turkey, Hakkari rather close to western Iranian frontier. The species is known as an endemic Turkish species growing on subalpine meadows (Zohari 1970). Based on this report, this species occurs in the west of Iran as well (map 1). In Iran, it grows on moderately high to high mountains, between 2400 to 2700 m a.s.l., shallow to medium depth soils on steep mountain slopes, accompanied with *Ferula haussknechtii* H. Wolff ex Rech.f., *Campanula involucreta* Aucher ex A.DC., *Prangos uloptera* DC., *Bromus tomentellus* Boiss., *Laserpitium carduchorum* Hedge & Lamond, *Dianthus* L. spp., *Astragalus* L. spp., *Psathyrostachys fragilis* (Boiss.) Nevski and shrubs including *Amygdalus kotschyi* Hohen. ex Spach and rarely *Rhamnus cornifolia* Boiss. & Hohen.

Identification key to the species of Subsection *Ochroleuca* in Iran

1. Stipules adnate to petiole in four-fifths of their lengths; free portion leaf-like, oblong-lanceolate. Pods with bent beak *T. longidentatum*
- Stipules adnate to petiole for less than half of their lengths; free portion subulate. Pods without bent beak 2
2. Flowers up to 18 mm long..... *T. ochroleucum*
- Flowers 20-30 mm 3
3. Lower calyx tooth 2x as long as the upper ones, deflexed. Corolla pink *T. caucasicum*
- Lower calyx tooth 1.5x as long as the upper ones or less. Corolla 2x as long as calyx, yellow or white 4

4. -Head 2-4 × 1.5-3 cm; upper calyx teeth considerably longer than tube *T. canescens*

-Head large 4-6 (-8) × 3-4 cm. upper calyx teeth as long as or slightly longer than tube... *T. trichocephalum*



Map 1. Distribution map of *Trifolium longidentatum*.

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Fig. 1. Image of herbarium specimen of *Trifolium longidentatum*.