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GUNDELIA ARMENIACA (ASTERACEAE); A SPECIES NEW TO THE FLORA OF TURKEY, WITH CONTRIBUTIONS TO ITS TAXONOMY

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ABSTRACT. *Gundelia armeniaca* Nersesian is recorded for the first time for the flora of Turkey. The specimens were collected from Patnos (Ağrı) province, eastern Anatolia. The species description, photographs and distribution map of the new record are presented.

1. INTRODUCTION

Gundelia L. belongs to the tribe Lactuceae according to the chloroplast *ndhF* gene [1]. In the different Flora accounts [2–8] *Gundelia tournefortii* L. is the only known species of the genus *Gundelia* and all other names were recorded as synonyms. Recently, several new species have been described and new status proposed by different authors including *Gundelia aragatsi* Vitek, Fayvush, Tamanyan & Gemeinholzer, *Gundelia armeniaca* Nersesian from Armenia, and *Gundelia dersim* Vitek, Yüce & Ergin, *Gundelia munzuriensis* Vitek, Yüce & Ergin, *Gundelia vitekii* Armağan, *Gundelia komagenensis* Fırat,*Gundelia colemerikensis* Fırat, *Gundelia mesopotamica* Fırat and *Gundelia asperrima* (Trautv.) Fırat from Turkey, and *Gundelia tehranica* Vitek & Noroozi and *Gundelia microcephala* (Bornm.) Vitek from Iran.

Some important morphologic characters including plant size, number of flowers forming one cephaloid (=flower complex, heads of second order, pseudocephalia) in the synflorescence [11], size and shape of the fruit complex (disseminule), color of the flowers, indumentum in the synflorescence, indumentum of leaves, and habitats were used by Vitek et al. [9, 10] and Fırat [13] for separating species in the genus *Gundelia*. Besides, Nersesian [12] used the shape of the involucels of the central and lateral flowers as diagnostic characters. In addition, [13–18] found some additional morphologic characters to help for distinguishing species in the genus as closure of flowers at ± noon and opening in ± late afternoon, the different/same colors of basal and cauline leaves and squamulose disseminule (beside glabrous disseminule).

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During floristic surveys in Patnos (Ağrı) (Figure 1), from June to August 2015, 2016 and 2017, some interesting *Gundelia* specimens were collected. To determine those specimens, a wide range of literatures [e.g. 1–28] were used and finally, they were identified as *Gundelia armeniaca* which was firstly described from Yerevan (Armenia).

2. Material and Methods

Photos of the living material were taken with a Sony DSCR1 digital camera. Accessions were georeferenced using a Magellan eXplorist 710 GPS. A total of 10 herbarium specimens of the species were collected from one adjacent localities and deposited in the herbaria VANF [25], and in the personal herbarium of the author (private Herbarium of Mehmet Fırat).

3. Results And Discusson

Taxonomy

Gundelia armeniaca Nersesian (Figures 2–7)

Type specimens: Абовянский район, окр. с. Гехадир, 10.06.1988, А. Нерсесян, [Abovian region, surroundings of Geghadir village, 10.06.1988, A. Nersesyan] [holotype ERE 137773, isotypes ERE 137772, ERE 149115, ERE 149116, ERE 149117, W 2006- 0005938, W 2006-0005939].



FIGURE 1. Distribution map of *Gundelia armeniaca* in Armenia and Turkey.

Description: Perennial lactiferous herb with branched stem 30–80 cm, glabrous or more or less hairy. Leaves coriaceous, rigid, pinnatilobate, pinnatipartite or pinnatisected, spiny. Both side sparsely short or long ±arachnoid hairs, especially on or besides the veins. Synflorescences normally 3–15, globose or ovoid, 35–80 mm long and 30–50 mm in diameter (excluding bractes), consisting of 20–50 cephaloids. Synflorescence glabrous or less arachnoid hairy (when young more arachnoid hairs). Bracts spiny, normaly less exceeding cephaloids, with a strong terminal spine and 2–5 lateral spines, green, purple or maroon, Cephaloid (in the middle of the synflorescence) compound of (5-)6–7 flowers. Flowers campanulate to widely spreading, corolla externally reddish to dark pink or purple, dark purple (almost violet), ±with gland; internally various pink or reddish violet, 7–9 mm long (usually central sorter than lateral). Cephaloids glabrous or rarely squamulose ±hairy. Fruit complex (disseminule) normally obconical, greyish-brown, 10–13 mm long (without spines), in upper part 6–9 mm in diameter (when ripe); central and lateral flowers surrounded by spines originated from the involucels, spines of the central flowers 4–6 mm, of the lateral flowers 1–5 mm, obtained from 25 fruit of average weight 0.2061 g (when ripe).

Phenology: Flowering time from May to June and fruiting from July to August.

Distribution: *Gundelia armeniaca* is new record from Patnos (Ağrı) province of Turkey. According to the grid system (Davis 1965) the new species, falls specifically within the B9 square. It is growing type locality Yerevan (Armenia) and Ağrı (Turkey).

Habitat and ecology: *Gundelia armeniaca* grows in *Astragalus* sp. steppe, and near lowland at c. 1600–1900 m. It is associate with other plants such as; *Cirsium* sp., *Eryngium* sp. *Astragalus* sp., *Bromus* sp., *Poa* sp. and *Vicia* sp.

Ethnobotanical usage: *Gundelia armeniaca* is known to be the tastiest and one of the most consumed species. It is cooked as stew or egg-vegetable, obtained gum is chewed.

Vernacular name: *Gundelia armeniaca* is called as “Kereng” by the local people of the Ağrı province. The other *Gundelia* species are known by the local people under many names in Kurdish; e.g. "Kênger", "Qorav", "Kereng", "Kerenk", "Keven", "Kengel", and in Turkish; e.g. "Has kanger", "Acı kenger", "Eşek dikeni", "Kenger" [27].

Red list assessment: The distribution area of: *Gundelia armeniaca* is less than 500,000 km^2. The species was collected from two localities, and where it occurred, ca. 10,000 individuals were counted. It is consumed by the local people and under pressure because of the some anthropogenic activities e.g. grazing. Based on the above data and observations, the IUCN [28] red list category of *Gundelia armeniaca* is suggested as "Vulnerable", VU.

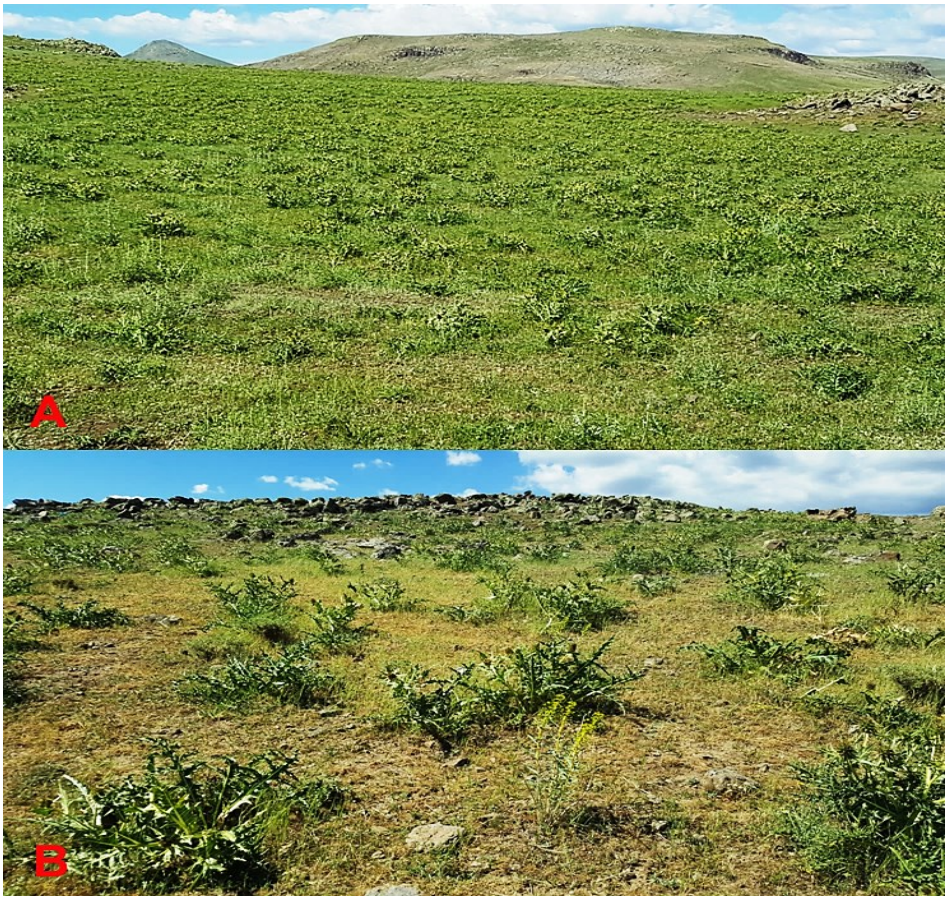


FIGURE 2. Gundelia armeniaca. A, B– Habitat.

Other specimens examined: *Gundelia armeniaca* Turkey. B9 Ağrı, Patnos district, 25 km from Ercis (Van) to Patnos, area of *Astragalus* sp. steppe, , 1881 m, 39°09′17″ N, 43°05′74″ E, coll. 11.06.2015, *M. Fırat 32566* [(VANF, Herb. M. Fırat), (in flower)]; ibid. 15.08.2015, *Fırat 32673* [(VANF, Herb. M. Fırat), (in fruit)].



FIGURE 3. *Gundelia armeniaca*. A– haabit, B– synflorescence in flower stage.

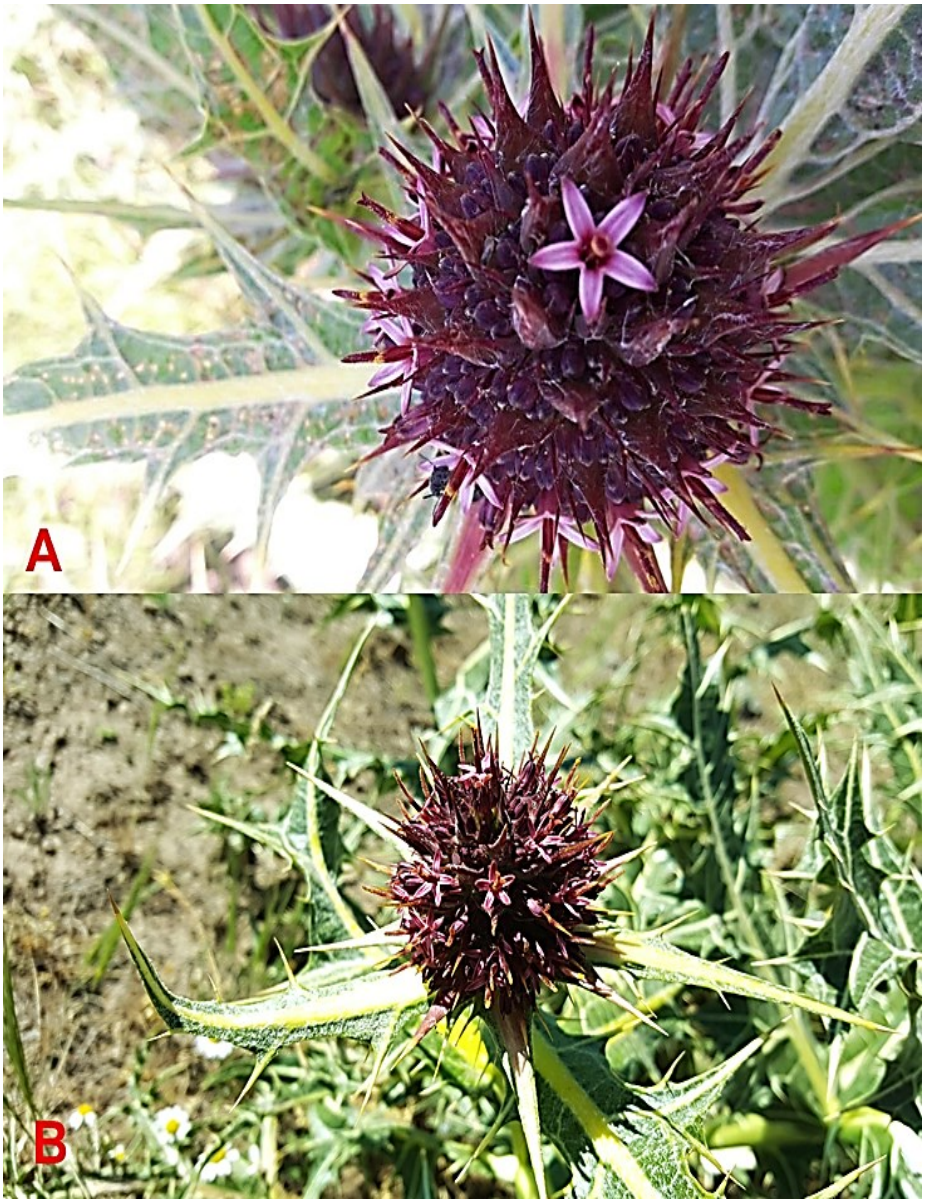


FIGURE 4. *Gundelia armeniaca*. A, B– Synflorescence in early flowers stage.



FIGURE 5. *Gundelia armeniaca*. A– synflorescence in flowers stage, B– synflorescence in early fruiting stage.



FIGURE 6. *Gundelia armeniaca.* A- synflorescence seven fruiting early stage, B– synflorescence six fruiting early stage.

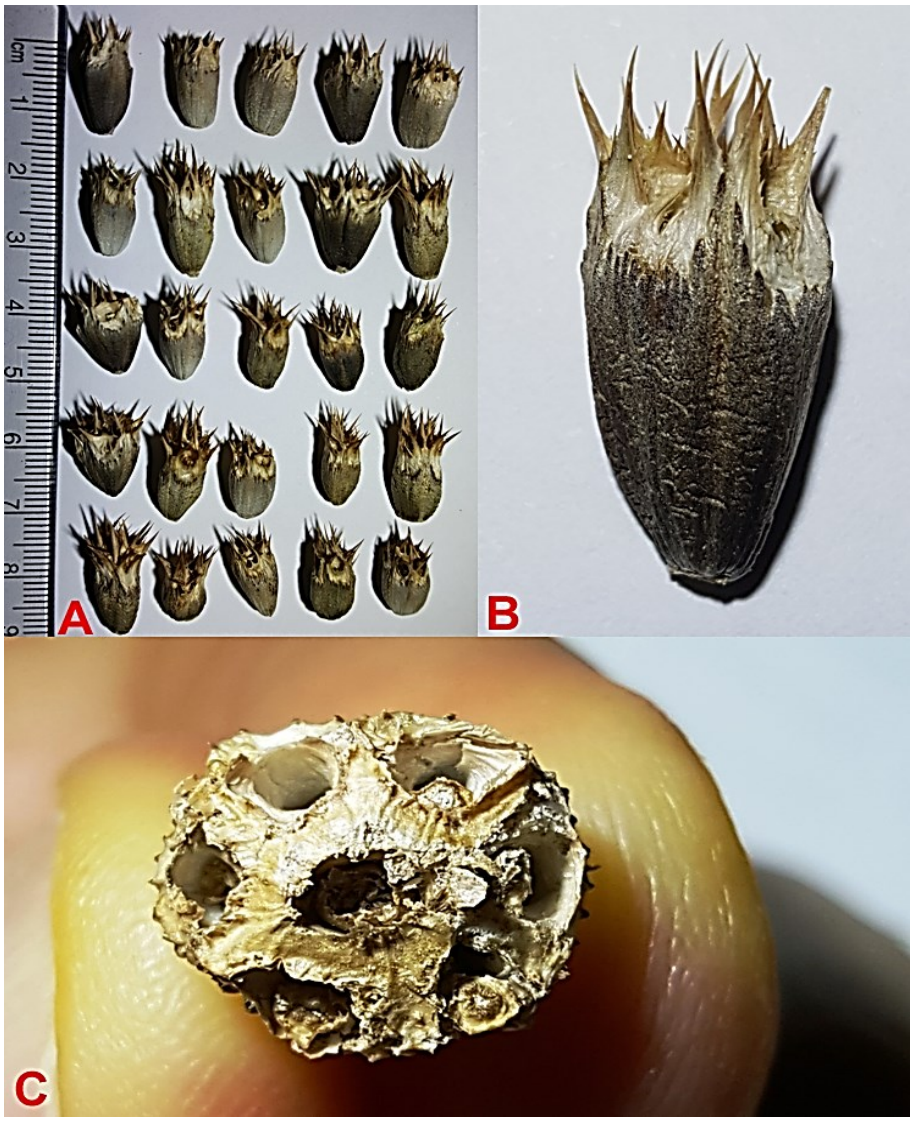


FIGURE 7. *Gundelia armeniaca.* A– variability of ripe disseminules, B– ripe disseminules, C– detail of cephaloid compound seven disseminules.

Comments: Flowers colour, flowers number and hair condition of *Gundelia* sp. should be carefully observed and noted while it is fresh in the field. It is difficult to diagnose from dry material after it turns into a herbarium sample. Yerevan (Armenia) type sample of *Gundelia armeniaca* is taken from is a known place. And, only one species of *Gundelia* sp. grows. After my detailed researches on *Gundelia* species in recent years, taking the colour of corolla and number of cephaloid (in the middle of the synflorescence) compound of 6 flower groups into consideration. With the inclusion of the new record, total number of *Gundelia* species in Turkey increased to thirteen: *Gundelia tournefortii*, *Gundelia armeniaca*, *Gundelia asperrima*, *Gundelia dersim*, *Gundelia munzuriensis, Gundelia vitekii, Gundelia komagenensis, Gundelia colemerikensis, Gundelia cilicica, Gundelia anatolica, Gundelia mesopotamica, Gundelia glabra* and *Gundelia rosea* (Fırat 2016, 2017a, 2017b, 2017c). Based on the former studies and a new descibed species it is possible to claim that the genus deserves much attention on its taxonomy. According to my studies, with very high probability *G. dersim* is a variation of *G. armeniaca*.

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