

# *Gundelia purpurascens* (Compositae) is a synonym of *G. rosea*

Ernst VITEK<sup>1</sup> & Metin ARMAĞAN<sup>2</sup>

with 1 figure and 1 table

Key words: *Compositae* (Asteraceae), *Gundelia*, *G. rosea*, *G. purpurascens*, *G. tehranica*; taxonomy, distribution area.

## Summary

VITEK E. & ARMAĞAN M. 2023. *Gundelia purpurascens* (Compositae) is a synonym of *G. rosea*. – *Phyton* (Horn, Austria) 62–63: 35–39, with 1 figure and 1 table.

The recently published *Gundelia purpurascens* (BORN.) FIRAT is shown to be a synonym of *G. rosea*. *Gundelia tournefortii* as understood by AL-TAEY & HOSSAIN (1984) can be assigned to *G. tehranica* VITEK & NOROOZI. For the two species a preliminary distribution map is given.

## 1. Introduction

For a long time *Gundelia* was regarded as a monotypic genus with *G. tournefortii* L. as the single species (e.g., GROSSHEIM 1934, KUPICHA 1975, FEINBRUN-DOTHAN 1978, RECHINGER 1989, etc.). For a recent assessment of *G. tournefortii* sensu stricto see VITEK & al. (2017), for a complete overview of the genus see VITEK (2019). Several earlier authors recognized various infraspecific units (e.g., TRAUTVETTER 1876, BORNMÜLLER 1906). One of these is *Gundelia tournefortii* f. *purpurascens* described by BORNMÜLLER (1939) noting “... capitulo necnon bracteis flosculas purpureas subduplo superantibus intense purpureo-tinctis” (... flower head [flower aggregate] and the bracts intensely purple, bracts nearly double as long as the purple flowers). Based on this f. *purpurascens*, AL-TAEY & HOSSAIN (1984) described *Gundelia rosea*. Recently FIRAT (2018) changed the rank of f. *purpurascens* to species level. In this publication he provided a rich documentation on yellow-flowering specimens of *Gundelia*. However, although the diagnosis by BORNMÜLLER (1939) is very short, it seems obvious that the specimens examined by FIRAT cannot be conspecific, and a re-evaluation of all connected names is necessary.

## 2. Materials and methods

The original descriptions have been checked, compared, and the type specimens revised. Herbar-

ium specimens examined for the present study are cited with ‘!’, digital images retrieved from the web with ‘scan!’.

For the preliminary distribution map all available sources have been used: the publications of AL-TAEY & HOSSAIN (1984), VITEK & NOROOZI (2017a, b), FIRAT (2018), specimens seen in the herbaria E, G, HSBU, JE, IRAN, K, KUFS, TARI and W (abbreviations following THIERS 2021), photos sent to the authors for determination, and photos available in the web, especially at iNaturalist (2021). The abbreviation ICN refers to the ‘International Code of Nomenclature for algae, fungi, and plants’ (TURLAND & al. 2018).

Selected specimens mentioned in the section on the distribution (chapter 5):

*Gundelia tehranica*: [Turkmenistan:] Regio transcaspiaca, Kisil-Arwat, Karakala, in declivibus lapidosis vallis fluvii Sumbar, 24. 6. 1901, P. SINTENIS 1953 [G!, K!]. – Afghanistan: 10 m. [miles] E. of Herat on Obeh (central) road, fine dry clay soil, Flat ground, Fls. yellow and brown, lvs. green, the largest having a central purple vein, 24. 4. 1971, R. B. & L. GIBBONS 88 [K!]. – Prov. Herat, Kotal-i-Buguchar, ca. 40 km N von Herat an der Straße nach Toraghundi [Towrgondi], 62/06-34/41 [62°06'E, 34°41'N], 1300 msn, 28. 4. 1977, D. PODLECH & K. JARMAL 29440 [KUFS (scan!)]. – Prov. Badghis, Sini, 4 km N von

<sup>1</sup> Naturhistorisches Museum Wien, Abteilung Botanik, Burgring 7, 1010 Vienna, Austria; corresponding author (e-mail: ernst.vitek@nhm-wien.ac.at)

<sup>2</sup> Yuzuncu Yil University, Education Faculty, Department of Mathematics and Science, 65090 Van, Turkey (e-mail: metinarmagan@yyu.edu.tr)

Laman an der Straße nach Qala-i-Naw, 63/06-34/46 [63°06'E, 34°46'N], 1320 msm, 3. 5. 1977, D. PODLECH & K. JARMAL 29765 [KUF'S (scan!)]].

*Gundelia* cf. *rosea*: Iran, Mazandaran, Sang-Deh, Poole sefid [Pol Sefid], 1400 m, 25. 5. 1972, DOUMANCHICK [TARI 31488!].

### 3. Results and discussion

BORNMÜLLER was the first who used the epithet when he distributed specimens as “*Gundelia purpurascens*”. The label is printed, but the species name is hand-written, therefore not validly published. In IPNI the name is listed as species with the remark “in obs., pro syn.”, based on the publication of BORNMÜLLER (1939), where he described this entity as *Gundelia tournefortii* forma *purpurascens*, listing “*G. purpurascens*” as synonym (not validly published, see ICN Art. 36.1).

AL-RAWI (1964) in his list of ‘Wild Plants of Irak’ enumerated this taxon as “*Gundelia purpurascens* BORNMÜLLER”, obviously intending to change the rank to species, as he gave it in the same font as *G. tournefortii*. But he provided no reference to the basionym and therefore this name is not validly published (ICN Art. 41.5).

*Gundelia rosea* was described by AL-TAEY & HOSSAIN (1984) and clearly based on *G. tournefortii* f. *purpurascens*. Probably they did not use the epi-

thet ‘*purpurascens*’ for this entity, being aware that the name listed in AL-RAWI (1964) could be regarded as an earlier homonym, which, however, is not the case. AL-TAEY & HOSSEIN (1984) gave a detailed description. To separate *G. rosea* from the yellow-flowering *G. tournefortii*, they repeated the flower color given by BORNMÜLLER (1939) and added the form and size of the fruits as the second important character: “... sed corolla extus intense purpurea intus rosea haud flava, fructibus majoribus obovovoid-eis nec obconicis differt” [(*G. rosea*) is different with the corolla on the outside intensely purple and on the inside pink, not yellow, and with bigger fruits, which are ovoid, not conical]. Without doubt *G. rosea* and *G. tournefortii* f. *purpurascens* pertain to the same unit within *Gundelia* and therefore have to be treated as synonyms.

Recently FIRAT (2018) published the combination *Gundelia purpurascens* (BORNM.) FIRAT. He also gave a rich documentation of what he interpreted as *G. purpurascens* – a yellow-flowering *Gundelia*. His plants are more or less glabrous with a high number of synflorescences, with some arachnoid hairs in the young synflorescences, bracts with strong spines, flower aggregates (partial synflorescences) with (6–) 7 externally reddish-brown to purplish or maroon, internally yellow flowers. These characters are not in agreement with the description of *Gundelia rosea* (Table 1) but perfectly fit to another recently de-

Table 1: Distinctive characters of *Gundelia tournefortii* (s. str.), *G. tehranica* and *G. rosea*.

Characters	<i>Gundelia tournefortii</i>	<i>G. tehranica</i>	<i>G. rosea</i>
indumentum on leaves	densely covered with thin hairs appressed to the leaves and sometimes forming a dense tomentum	slightly hairy to glabrous	more or less densely hairy
indumentum in synflorescence	densely felty hairy and arachnoid hairs	arachnoid hairs, at least when young	densely arachnoid-hairy
bracts of flower aggregate	variable	normally stiff, projecting from the synflorescence	more or less stiff, sometimes projecting from the synflorescence
flower color	bright to dark yellow inside, sometimes rusty brown outside	bright to dark yellow inside, sometimes brownish outside	bright to light pink inside, deep purple outside
fruit	obconical, sometimes longitudinally furrowed	obconical, sometimes longitudinally furrowed	obovoid, distinctly more rounded in longitudinal section and round in transversal section
flowers in flower aggregate (partial synflorescence)	5–7	7–8	7–10 (–12)
habitat	broad variety of habitats, from mountain slopes to sand dunes	dry stony slopes, even in semi-desert	mountain meadows and stony slopes

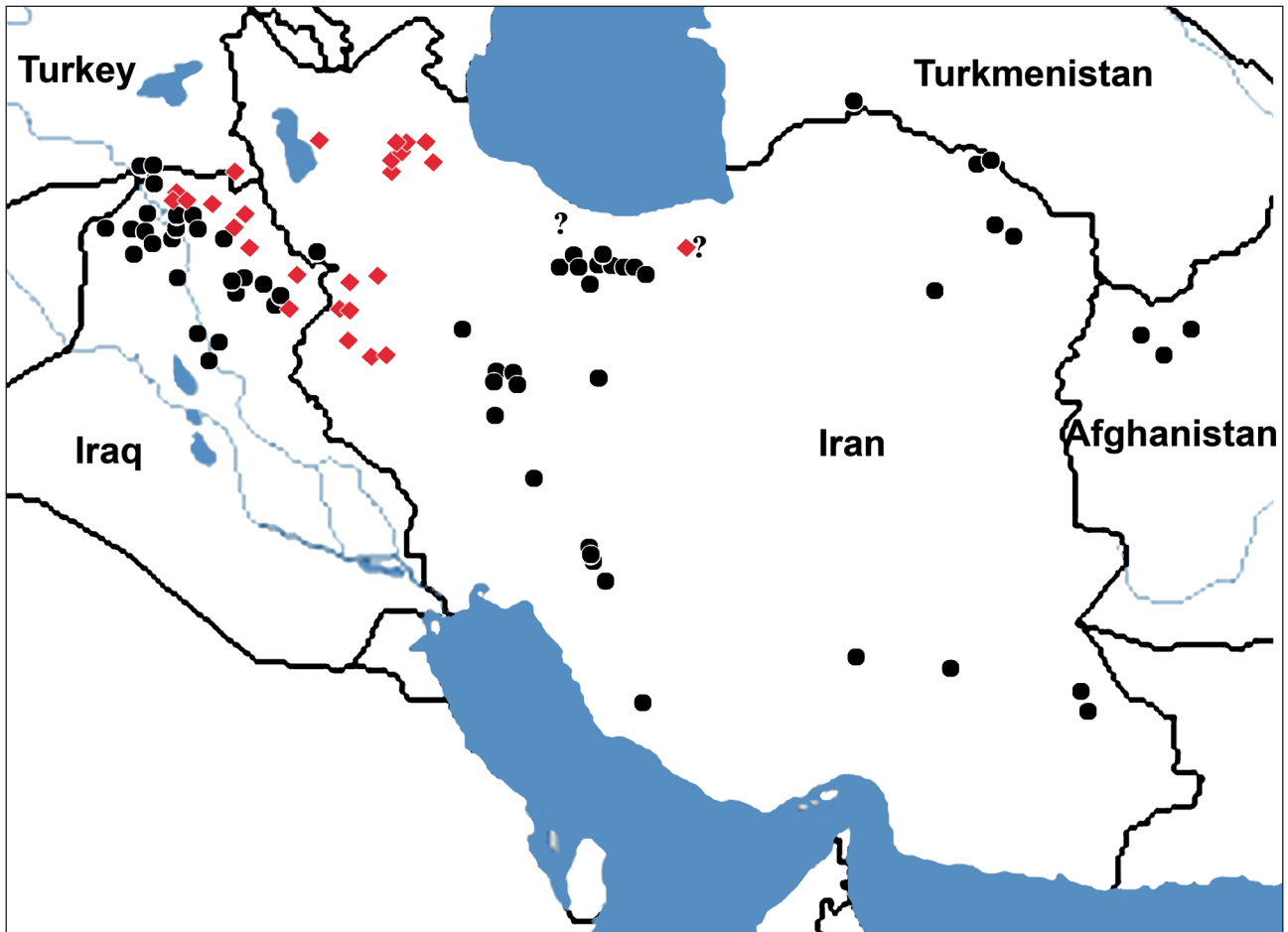


Fig. 1: Preliminary distribution of *Gundelia rosea* (red diamonds) and *G. tehranica* (black dots). The left question mark refers to unconfirmed findings of *Gundelia*, possibly both *G. rosea* and *G. tehranica*.

scribed species, *Gundelia tehranica* (VITEK & NOROOZI 2017a). The characters of this species are also in accordance with what AL-TAEY & HOSSAIN (1984) understood as *G. tournefortii* and with photos of *Gundelia* from this area (e.g., iNaturalist 2021).

Therefore it can be concluded that *G. tehranica* is widespread in Iraq, and based on the documentation of FIRAT (2018) the species reaches Turkey in the province Şirnak.

#### 4. Taxonomy

***Gundelia rosea*** HOSSAIN & AL-TAEY, Notes Roy. Bot. Gard. Edinburgh 42(1): 41 (1984).

Holotype: Iraq, [north of Atrush,] c. 60 km N. E. of Mosul, 10. 5. 1978, HOSSAIN s.n. (MSUH; isotypes BAG, E00385310!, K000797235 scan!).

= *Gundelia tournefortii* f. *purpurascens* BORN.M., Beih. Bot. Centralbl., B, 60: 197 (1939).

≡ *Gundelia purpurascens* AL-RAWI, Technical Bulletin (Baghdad) 14: 116 (1964), nom. inval. (ICN Art. 41.5).

≡ *Gundelia purpurascens* (BORN.M.) FIRAT, Ot Sist. Bot. Derg. 25: 14–15 (2018).

Lectotype designated here: [Iraq,] Kurdistania (Assyria orient.), in montis Kuh-Sefin reg. infer. ad pagum Schaklawa [Shaqlawa, 36°23'N, 44°20'E] (ditionis Erbil [Arbil]), 900 m, 16. 5. 1893, BORNMÜLLER 1407 (JE 00015294!; isolectotypes: W 1895-0001550!, K 000797233!).

Epitype: [Iraq: Arbil:] Mountain top near Shaqlawa, N.E. Iraq, alt. c. 900 m, 13 April 1979, MOSHARRAF & HOSSAIN (E00480275!) (paratype of *G. rosea*).

The specimen in JE is chosen as lectotype because BORNMÜLLER's first series is kept in JE, and the specimen shows at least one very young ovoid fruit. The epitype is chosen with ripe fruits.

≠ *Gundelia tournefortii* (var.) – [unnamed] LINNÉ, Sp. Plant. (1753). – AL-TAEY & HOSSAIN (1984) give the unnamed variety of LINNÉ (1753) as a synonym. The characters given by LINNÉ (1753), “floribus intense purpureis, capite araneosa lanugine obsito”, would more or less fit for *G. rosea*, but the Linnéan

unit is based on the information of TOURNEFORT (1703) who did not pass any areas where *G. rosea* occurs. Some other complications with this Linnéan taxon are discussed in VITEK & JARVIS (2007).

***Gundelia tehranica*** VITEK & NOROOZI, Ann. Naturhist. Mus. Wien, B, 119: 246 (2017).

Holotype: Iran, Tehran, Tuchal Mt., above Velenjak, 2200–2300 m, 35°49'26"N, 51°23'30"E, 6. 5. 2016, J. NOROOZI (W 2016-0011195!, isotypes E!, G!, IRAN!, NY!, TARI!, W 2016-0011196!).

= *Gundelia tournefortii* sensu HOSSEIN & AL-TAEY, Notes Roy. Bot. Gard. Edinburgh 42(1): 40–41 (1984).

= *Gundelia purpurascens* sensu FIRAT, Ot Sist. Bot. Derg. 25: 14–21 (2018).

### 5. Preliminary distribution of *Gundelia rosea* and *G. tehranica*

So far it is impossible to provide a detailed and precise distribution map of the two species. Most of the herbarium specimens give no information on flower color and do not show ripe fruits, therefore they often cannot be determined with absolute certainty. However, based on (1) references, i.e., AL-TAEY & HOSSAIN (1984, taking their "*G. tournefortii*" as *G. tehranica*), VITEK & NOROOZI (2017a, b for Iran), and FIRAT (2017, 2018 for Turkey), (2) specimens studied in the herbaria, (3) photos sent to the author for determination, and (4) photos in the web with precise topographical data (iNaturalist 2021), a preliminary distribution can be presented (Fig. 1). In a few places, both species were found close to each other, e.g., near Shaqlawa (BORNMÜLLER 1939, FIRAT 2018) and Aqra [Aqrah, Akre] and Atrush [Atrish] (AL-TAEY & HOSSAIN 1984), but in general *G. tehranica* seems to prefer dryer habitats and areas, being widespread in the semi-deserts of Iraq and Iran, reaching Turkey and possibly Syria in the West, Turkmenistan and Afghanistan in the East (specimens listed above), while *G. rosea* is found on more or less humid mountain areas in the northern parts of Iraq and Iran, also extending to Turkey.

The easternmost record of *G. rosea* (Iran, Mazandaran province, Pol Sefid, [TARI 31488]) appears to be rather isolated from the others. The determination was not unambiguous but with high probability – the locality is situated on the northern, humid side of the Zagros Mountains where the occurrence of *G. rosea* seems at least possible. Also further to the West in Kelardasht (north of Alam Kuh), during a meeting for poetry organized by the Austrian Culture Forum Tehran, the participants reported *Gundelia* but could not agree on the flower color – probably they even reported two different

flower colors in this area, pointing towards *G. rosea* and *G. tehranica*. Therefore it is possible that *G. rosea* may occur more frequently along the northern side of the Zagros Mountains, waiting for documentation.

### Acknowledgements and funding

The investigation was supported by TUBITAK, project number 119Z882. Mustafa BAQAL sent photos of *Gundelia rosea* from Shaqlawa, which confirmed the assignment.

### References

- AL-RAWI A. 1964. Wild plants of Iraq with their distribution. – Technical Bulletin - Institute for Land and Water Management Research 14, 232 pp. – Government Press; Baghdad.
- AL-TAEY R. A. & HOSSAIN M. 1984. Studies in *Gundelia*: 1 – A new species from Iraq. – Notes of the Royal Botanic Garden Edinburgh 42: 39–44.
- BORNMÜLLER J. 1906. Plantae Straussianae sive enumeratio plantarum a Th. STRAUSS annis 1889–1899 in Persia occidentali collectarum (Fortsetzung). – Beihefte zum Botanischen Centralblatt, Abt. 2, 20: 151–196.
- BORNMÜLLER J. 1939. Iter Persico-turcicum 1892–1893. Beiträge zur Flora von Persien, Babylonien, Assyrien, Arabien (Fortsetzung III). – Beihefte zum Botanischen Centralblatt, Abt. 2, 60: 181–228.
- FEINBRUN-DOTHAN N. 1978. Flora Palaestina, 3. – The Israel Academy of Sciences and Humanities; Jerusalem. 481 pp.
- FIRAT M. 2017. *Gundelia rosea* (Asteraceae), a new record for the Flora of Turkey with contributions to its systematics. – Acta Biologica Turcica 30 (2): 31–35.
- FIRAT M. 2018. New status of *Gundelia tournefortii* L. forma *purpurascens* BORNM. (Asteraceae) and new record for the flora of Turkey. – Ot Sistematiği Botanik Dergisi 25: 11–24.
- GROSSHEIM A. A. 1934. Flora Kavkaza, 4. – AzFAN; Baku. 344 pp.
- iNATURALIST [n.d.]. A joint initiative of the California Academy of Sciences and the National Geographic Society. <https://www.inaturalist.org/> [accessed April 2021].
- KUPICHA F. K. 1975. *Gundelia*. – In: DAVIS P. H. (ed.), Flora of Turkey 5, p. 325–326. – Edinburgh University Press.
- LINNÉ C. 1753. Species plantarum exhibentes plantas rite cognitatas ad genera relatas cum differentiis specificis, nominibus trivialibus, synonymis selectis, locis natalibus, secundum systema sexuale digestas. Tom. 1, 2. – Salvius; Holmiae.
- RECHINGER K. H. 1989. Tribus *Arctotidae* "*Arctoteae*" CASS. – In: DITTRICH M., NORDENSTAM B. & RECHINGER K. H., Flora Iranica 164: 107–109. – Akademische Druck- und Verlagsanstalt; Graz.
- THIERS B. M. (updated continuously). Index Herbariorum. – NYBG, Steere Herbarium; New York. <https://sweetgum.nybg.org/science/ih/> [accessed Jan 2021].
- TOURNEFORT J. P. DE 1703. Corollarium institutionem rei herbarii. – Paris.
- TRAUTVETTER E. R. 1876. Plantarum messes anno 1874 in Armenia a Dre. G. RADDE et in Daghestania ab A. BECKER

- factas commentatus est. – Trudy Imperatorskago S.-Peterburgskago botanicheskago sada 4: 97–192.
- TURLAND N. J. [& 15 co-editors] 2018. International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code) adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017. – Regnum Vegetabile 159. – Koeltz Botanical Books; Glashütten, Germany.
- VITEK E. 2019. *Gundelia* (Compositae), from one to many species – an ignored diversity. – *Bocconea* 28: 307–313.
- VITEK E. & JARVIS C. E. 2007. The typification of *Gundelia tournefortii* L. (Compositae). – *Annalen des Naturhistorischen Museums in Wien, Serie B*, 108: 267–272.
- VITEK E. & NOROOZI J. 2017a. *Gundelia tehranica* (Compositae), a new species from Iran. – *Annalen des Naturhistorischen Museums in Wien, Serie B*, 119: 243–248.
- VITEK E. & NOROOZI J. 2017b. *Gundelia rosea* (Compositae), a new record from Iran. – *Annalen des Naturhistorischen Museums in Wien, Serie B*, 119: 249–256.
- VITEK E., LESCHNER H. & ARMAĞAN M. 2017. *Gundelia tournefortii* L. (Compositae) – an approach. – *Annalen des Naturhistorischen Museums in Wien, Serie B*, 119: 227–233.

(Received 6 Dec 2022, accepted 9 Jan 2023)