

TRAGOPOGON TALEGHANENSIS (ASTERACEAE), A NEW SPECIES FROM IRAN

M. Mahmoodi & S.R. Safavi

Received 2023.12.27; accepted for publication 2024.04.08

Mahmoodi, M. & Safavi, S.R. 2024.06.30: *Tragopogon taleghanensis* (Asteraceae), a new species from Iran.- *Iran. J. Bot.* 30(1): 11-16. Tehran.

A new species of *Tragopogon* is described. As of now, the total number of species within the genus in Iran stands at 27, with 11 of them being endemic to Iran. The specimens of *Tragopogon taleghanensis* Safavi & Mahmoodi have been collected from Takhte-e-Valian Mountain in Central Alborz. It is related to the *Tragopogon jerdianus* Boiss. & Buhse., of which it can be distinguished by the plant habit and size, leaf size and arrangement, peduncle length and diameter, involucre bracts size, ligules color, and achene size.

Mohammad Mahmoodi & Sayed Reza Safavi (correspondence <rezasafavii@gmail.com>), Research Institute of Forests and Rangelands, Agricultural Research, Education and Extension Organization (AREEO), Tehran, Iran.

Keywords: Asteraceae; Cichorieae; new species; subalpine flora; *Tragopogon*; Iran

Tragopogon taleghanensis, گونه جدیدی از جنس *Tragopogon* (Asteraceae) از ایران

محمد محمودی: استادیار، موسسه تحقیقات جنگلها و مراتع کشور، سازمان تحقیقات، آموزش و ترویج کشاورزی، تهران، ایران
سیدرضا صفوی: استادیار، موسسه تحقیقات جنگلها و مراتع کشور، سازمان تحقیقات، آموزش و ترویج کشاورزی، تهران، ایران
در این مقاله گونه جدیدی از جنس *Tragopogon* شرح داده می‌شود. بنابراین هم‌اکنون تعداد کل گونه‌های این جنس در ایران ۲۷ گونه است که ۱۱ گونه آن انحصاری ایران هستند. نمونه‌های گونه *Tragopogon taleghanensis* Safavi & Mahmoodi از کوه تخته ولیان در البرز مرکزی جمع‌آوری شده است. این گونه از نظر ریخت‌شناسی نزدیک به *T. jerdianus* Boiss. & Buhse. است و با توجه به شکل و اندازه ساقه، اندازه و آرایش برگ‌ها روی ساقه، طول و قطر دمگل‌آذین، اندازه برگ‌های گریبانی و همچنین اندازه فندقه‌ها از آن متمایز می‌شود.

INTRODUCTION

Tragopogon, also known as goatsbeard or salsify, is a genus of flowering plants in the family Asteraceae, tribe Cichorieae. Rechinger (1977) in the Flora Iranica area reported 37 species, 26 of which were from Iran. Safavi & al. Maroofi (2006) have been added to the flora of Iran. So by now, the total number of species of the genus in Iran is 27, of which 11 are endemic to Iran. The new species was discovered during a botanical expedition conducted by authors in late June 2021 to the subalpine zone of Mt. Takhte-e-

(2013) reported 26 species in the Flora of Iran, 10 of which were endemics of the flora of Iran. Since the genus *Tragopogon* was revised by Rechinger (1977) for the Flora Iranica, a new species (Safavi & Maroofi 2014; Mahmoodi & al. 2016) and one new variety (Safavi & Valian (highest summit 3150 m) in central Alborz. After a detailed examination of the collected samples and the materials in the TARI Herbarium, we concluded that our samples represent a new species to science.

MATERIALS & METHODS

During fieldwork in central Alborz, we encountered unknown specimens of *Tragopogon* with unique characteristic features. Specimens of *Tragopogon* were collected from the subalpine zones of central Alborz Mountains and they were examined in detail and cross-checked with various *Tragopogon* accounts in the relevant taxonomic literature (Boissier, 1846; Borisova 1964; Rechinger 1977; Matthews 1975; Richardson 1976, and Safavi & al. 2013). The type specimens in virtual herbaria (e.g. B, E, G, K, M, P, and W) were examined (acronyms according to Thiers 2021). The specimens of new species were eventually examined and compared with the description of *T. jezdianus* as an endemic species in the flora Iranica area and then the description of the new species was prepared (Rechinger 1977; Safavi & al. 2013). The specimens are preserved in the TARI herbarium. Diagnostic morphological characters from closely similar taxa are discussed and arranged in Table 1. Morphological investigations in this research have been done by using a Nikon stereoscope, and magnification up to 5 times was used. The author of the plant names was checked with Brummitt and Powell (1992).

RESULTS & DISCUSSION

New species

Tragopogon taleghanensis Safavi & Mahmoodi, **sp. nov.** (Figs. 1-3)

Suffrutescent, acaulescent, with arachnoid hairs at the junction of the capitulum and peduncle. Roots spindle-shaped, thick, and vertical. Rootstock \pm indurate and branched. Peduncle elongated, 6-8 cm long and 0.1 cm diameter. Collar covered with remnants of dried petioles. All leaves are mainly in the basal part of the plant, gramineous, flaccid, dark green, with a curved tip, 6-8 cm long and 4-5 mm wide. Involucre with 5 phyllaries, few-flowered, 23-25 mm at flowering time and 30-32 mm long at the time of fruit maturity; phyllaries dark-green, 3-4 mm wide at the base, with longitudinal pale lines and arachnoid hairs on the lower half. Ligule yellow in the natural state and violet-purple in the dried state, almost as long as the involucre. Achene 15-16 mm long, straw-colored, sulcate-striated with narrow lines, beaked; beak 4-5 mm long. Pappus pale brown, 16-18 mm long, with plumose hairs.

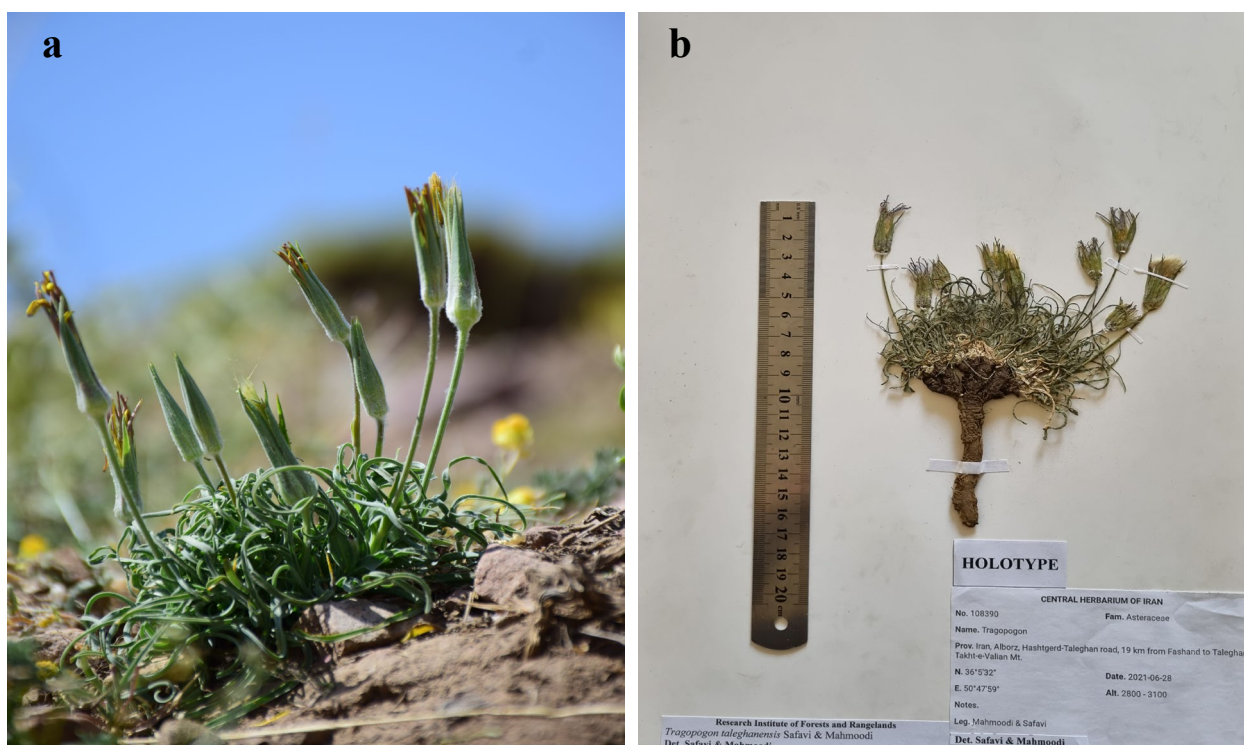


Fig. 1. *Tragopogon taleghanensis* Safavi & Mahmoodi a, Genral view in Takhte-e-Valian Mt.; b, 108390- Holotype-TARI.

Type: Iran, Alborz, Hashtgerd-Taleghan road, 19 km from Fashand to Taleghan, Takhte-e-Valian Mt. (36° 05' 32" N 50° 47' 59" E), 2800-3100 m, Safavi & Mahmoodi 108390 Iran (Holotype TARI).

Etymology: The epithet "taleghanensis" refers to the Taleqan County, where the type specimen of the new species were collected.

Phenology: flowering in June and mature achenes appear in July.

Distribution and habitat: *Tragopogon taleghanensis* is known from the type locality in Central Alborz Mountains in N. Iran. It was found in the subalpine zone of Takhte-e-Valian Mountain with a rocky bed at 2800-3100 m a.s.l (Fig. 4). The new species is a narrow endemic (Fig. 5). In the habitat of this species, two endemics including *Astragalus ochrochlorus* Boiss. & Hohen. and *Echinops elbursensis* Rech.f. are dominant. Other companion species, a considerable number of which are endemic and rare, include *Acantholimon erinaceum* (Jaub. & Spach) Lincz.; *Achillea millefolium* L. subsp. *elbursensis* Hub-Mor.; *Achillea vermicularis* Trin.; *Aethionema stenopterum* Boiss.; *Allium capitellatum* Boiss.; *Arenaria*

gypsophiloides L.; *Arenaria insignis* Litw.; *Astragalus aegobromus* Boiss. & Hohen.; *Astragalus jodotropis* Boiss.; *Astragalus mesoleios* Boiss. & Hohen.; *Astragalus sciureus* Boiss. & Hohen.; *Bupleurum falcatum* L.; *Cousinia chamaepauce* Boiss.; *Cousinia pterocaulos* (C.A.Mey.) Rech. f.; *Delphinium aquilegifolium* (Boiss.) Bornm.; *Dracocephalum kotschyi* Boiss.; *Euphorbia cheiradenia* Boiss. & Hohen.; *Euphorbia microsciadia* Boiss.; *Euphorbia myrsinites* L.; *Galium hyrcanicum* C.A.Mey.; *Helichrysum oligocephalum* DC.; *Helichrysum psychrophilum* Boiss.; *Leonurus cardiaca* subsp. *persicus* (Boiss.) Rech. f.; *Leutea petiolaris* (DC.) M. Pimen.; *Mesostemma kotschyanum* (Fenzl ex Boiss.) Vved; *Minuartia lineata* Bornm.; *Nepeta racemosa* Lam.; *Pimpinella tragium* Vill.; *Salvia atropatana* Bunge; *Salvia hypoleuca* Benth.; *Scutellaria pinnatifida* A. Hamilt. subsp. *viridis* (Bornm.) Rech. f.; *Stenotaenia nudicaulis* Boiss.; *Tanacetum polycephalum* Sch.-Bip. subsp. *duderanum* (Boiss.) Podlech; *Thesium kotschyanum* Boiss.; *Thymus kotschyanus* Boiss. & Hohen. var. *kotschyanus*.

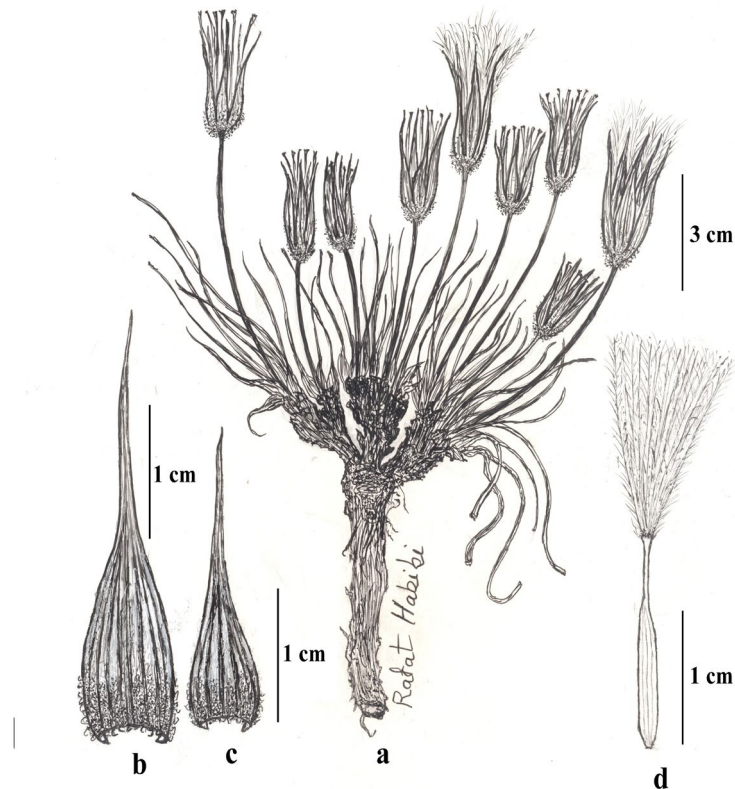


Fig. 2. *Tragopogon taleghanensis* Safavi & Mahmoodi (108390-TARI): a, general view; b, phyllary at time of fruit maturity; c, phyllary at flowering time; d, achene.



Fig. 3. *Tragopogon taleghanensis* Safavi & Mahmoodi (108390-TARI): A, involucre at the time of fruit maturity; B, involucre at flowering time; D, central striated achene; E, marginal achene with antrorse scabrid projections; C, achene. *Tragopogon jezdianus* Boiss. & Buhse (94436-TARI).

Conservation status: *Tragopogon taleghanensis* is a local endemic species known so far only from the type locality. The AOO is measured at about 0.01 km² and the EOO was estimated at 0.03 km². There are no protection plans in the habitat of the new species and also extensive human impacts, especially overgrazing, are observed in the area, which has led to the destruction of the habitat. According to our observations, extensive road construction operations are in progress in the region, which led to a significant destruction of the habitat of the newly discovered species. As a consequence, and following the IUCN Red List criteria (IUCN 2019), *T. taleghanensis* is here defined as Critically Endangered: CR [criteria, B1b (iii) +B2 b (iii)].

Relationships: *Tragopogon taleghanensis* is similar to *T. jezdianus* Boiss. & Buhse (1860) distributed in N, C, NE & S of Iran, Mazandaran (1900-2800 m), Esfahan (2100 m), Yazd (2700-3400 m), Hormozgan (1900-2100), Khorasan (1750-2600 m), Semnan (1250-2700) and Tehran (1200-1600) provinces. It differs from *T. jezdianus* in the following characteristics: Plant surface with arachnoid hairs at

the junction of the capitulum and peduncle (vs. glabrous); Acaulescent (vs. with a stem 7-40 cm long). Leaves mainly in the basal part of the plant (vs. located along the entire length of the stem); Basal leaves 3-6 × 0.1-0.2 cm (vs. 10-20 × 0.1-0.5 cm). Peduncle 6-8 cm long (vs. 2-6 cm), 0.2 cm in diameter (vs. 0.1 cm). Involucre at flowering time 23-25 mm long (vs. 18-25 mm), at the time of fruit maturity 30-32 mm long (vs. 25-35 mm), width at the time of fruit maturity 3-4 mm (vs. 3-6 mm). Involucral bracts with arachnoid hairs on the lower half (vs. glabrous). Ligules almost as long as the involucre (vs. protruding slightly from the involucre), color in a natural state yellow (vs. dark yellow), in dried state violet-purple (vs. dark yellow with dark veins in abaxial surface). Achene 15-16 mm long (vs. 12-13 mm), all of them with sulcate-striated and narrow lines on the surface (vs. the central achenes striated but the marginal ones with antrorse scabrid projections), straw-colored (vs. pale brown); beak 4-5 mm long (vs. beakless or with a very short beak up to 1 mm long); Pappus 16-18 mm long (vs. 15-17 mm), pale brown (vs. brown). The diagnostic characters are summarized in Table 1.



Fig. 4. Habitat of *Tragopogon taleghanensis* Safavi & Mahmoodi (Takhte-e-Valian Mt.).

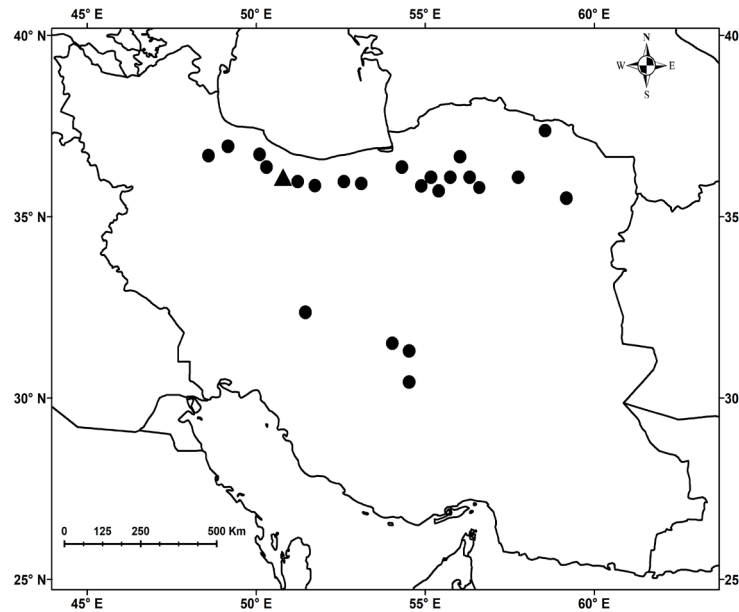


Fig. 5. Distribution map of *Tragopogon taleghanensis* (▲) and *Tragopogon jezdianus* (●) in Iran.

Table 1. A comparison of the diagnostic characters of *Tragopogon taleghanensis* and *T. jezdianus*.

Diagnostic characters	<i>Tragopogon taleghanensis</i>	<i>Tragopogon jezdianus</i>
Plant surface	with arachnoid hairs at the junction of the capitulum and peduncle	glabrous
Stems size	Acaulescent	7-40 cm
Leaves arrangement	Mainly in the basal part of the plant	Throughout the stem
Basal leaves size	3 - 6 × 0.1 - 0.2 cm	10-20 × 0.1-0.5 cm
Peduncle long	6 - 8 cm	2-6 cm
Peduncle diameter	0.2 cm	0.1 cm
Involucral bracts	With arachnoid hairs on the lower half	Glabrous
Involucre long (at flowering time)	23-25 mm	18-25 mm
Involucre long (at time of fruit maturity)	30-32 mm	25-35 mm
Involucre width (at time of fruit maturity)	3-4 mm	3-6 mm
Ligules color (in vivo)	Yellow	dark yellow
Ligules color (in sicco)	Violet-purple	Dark yellow with dark veins on the abaxial surface
Ligules size	Almost as length as the involucre	protruding slightly from the involucre
Achene size	15-16 mm	12-13 mm
Achens surface	Sulcate-striated with narrow lines	The central achenes striated but the marginal ones with antrorse scabrid projections
Achenes color	Straw-colored	Pale brown
Roster size	4-5 mm	Without a roster or with a very short roster up to 1 mm long
Pappus size	16-18 mm	15-17 mm
Pappus color	Pale brown	brown

Identification key to *Tragopogon taleghanensis* and its close species

- 1- Leaves 2-2.5 mm wide, three-veined. Involucre 10-15 mm long at flowering time and 18-25 mm long at time of fruit maturity. Achene without rooster .. 2
- Leaves 1-5 mm wide, with many veins. Involucre 18-25 mm long at flowering time and 25-35 mm long at time of fruit maturity. Achene rostrate 3
- 2- Stems 60-70 cm. Peduncle 8-20 cm. Involucres 14-15 mm long at flowering time. Achenes 14-15 mm long and serrulate-scabrid at the top. Pappus 12 mm long *T. maroofi*
- Stems 25-35 cm. Peduncle 4-6 cm. Involucres 9-11 mm long at flowering time. Achenes 9-10 mm and smooth, Pappus 7 mm long *T. erotris*
- 3- Stemless. Peduncle 6-8 cm long. Achene 15-16 mm, sulcate-striated with narrow lines, Roster 4-5 mm *T. taleghanensis*
- Stem 7-40 cm. Peduncle 2-6 cm long. Achene 12-13 mm, the central achenes striated but the marginal ones with antrorse scabrid projections. Without a rooster or with a very short rooster up to 1 mm long ..
..... *T. jezdianus*

REFERENCES

- Boissier, P.E. 1846: *Diagnoses Plantarum Orientalium Novarum*. ser. 1, no. 7. -Lipsiae [Leipzig], B. Herrmann.
- Borisova, A.G. 1964: *Tragopogon* L. In: Bobrov E.G. and Tzvelev, N.N. (eds.), *Flora of the USSR*. vol. 29: 115-197. -Moscow-Leningrad, Akademiya Nauk SSSR Publishers.
- Brummitt, R.K. & Powell, C.E. 1992: *Authors of Plant Names Standard- International Working Group on Taxonomic Databases (TDWG)*. <http://www.tdwg.org/standards/101>.
- IUCN: 2019: *Guidelines for Using the IUCN Red List Categories and Criteria*, Version 14. Prepared by the Standards and Petitions Committee. IUCN, Gland, Switzerland; Cambridge, United Kingdom. <<http://www.iucnredlist.org/documents/RedListGuidelines.pdf>>.
- Mahmoodi, M., Safavi, S.R. & Ghahremaninejad, F. 2016: *Tragopogon maroofi*, a new name for *T. kurdicus* Safavi and Maroofi (Asteraceae). -*Ann. Bot. Fenn.* 53 (1-2): 36-36. Helsinki.
- Matthews, V.A. 1975: *Tragopogon* L. In: Davis P.H. (ed.), *Flora of Turkey and the East Aegean Islands* vol. 5: 632-657. -Edinburgh, Edinburgh University Press.
- Rechinger, K.H. 1977: *Tragopogon* L. In: Rechinger, K.H. (ed.), *Flora Iranica* no. 122: 83-120. -Graz, Akademische Druck-u. Verlagsanstalt.
- Richardson, I.B.K. 1976: *Tragopogon* L. In: Tutin, T.G., Heywood, V.H., Burges, N.A., Valentine, D.H., Walters, S.M. & Webb, D.A. (eds.), *Flora Europea* vol. 4: 322-325. -Cambridge, Cambridge Univ. Press.
- Safavi, S.R. & Maroofi, H. 2006: A new variety of the genus *Tragopogon* L. from Iran. -*Iran. J. Bot.* 12 (1): 99-100.
- Safavi, S.R. & Maroofi, H. 2014: A new species of the genus *Tragopogon* L. (Asteraceae) from Iran. -*Iran. J. Bot.* 20 (1): 5-7.
- Safavi, S.R., Naseh, Y., Jafari, E., Tavakoli, Z. & Heydarnia, N. 2013: *Tragopogon* L. In: *Flora of Iran* (Asteraceae, Tribe Cichorieae) no. 70: 442-485. -Tehran. Research Institute of Forests & Rangelands.
- Thiers, B. 2016 [continuously updated]: *Index herbariorum: A global directory of public herbaria and associated staff*. New York Botanical Garden, Bronx, NY. Available from: <http://sweetgum.nybg.org/ih/> (accessed 18 October 2021).