

Tragopogon floccosus (Asteraceae: Cichorioideae), a recently discovered species in the Bulgarian flora

Vladimir Vladimirov & Sonya Tsoneva

Institute of Botany, Bulgarian Academy of Sciences, Acad. Georgi Bonchev St., bl. 23,
1113 Sofia, Bulgaria, e-mail: vdvlad@bio.bas.bg; sonya@bio.bas.bg

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Abstract. *Tragopogon floccosus* is reported as new to the Bulgarian flora. It was discovered in sandy places in two localities near the Danube River, in the Danubian Plain floristic region. The species is diploid, $2n=12$. Identification key for all Bulgarian species of *Tragopogon* is provided in the article.

Key words: Bulgarian flora, chromosome number, identification key, *Tragopogon*

Introduction

So far genus *Tragopogon* has been represented by eight species in the Bulgarian flora – *T. balcanicus* Velen., *T. crocifolius* subsp. *samaritani* (Heldr. & Sart. ex Boiss.) I. Richardson, *T. dubius* Scop., *T. orientalis* L., *T. porrifolius* L., *T. pratensis* L., *T. pterodes* Pančić, and *T. stribrnyi* Hayek – despite the fact that some taxa have been accepted with a different taxonomic rank (Peev 1992; Delipavlov 2003). *T. floccosus* Waldst. & Kit. has been reported for several countries in the Eastern Central Europe: the Czech Republic, Hungary, Serbia and Montenegro, Romania, extending as far as to the Baltic region of Russia (Richardson 1976). It was recently discovered in open sandy grassland near the Danube River in Northwest Bulgaria. The species was conspicuous with its up to 1.5 m high and strongly branched upper stem, with arachnoid indumentum at base and beneath the capitula, not observed in the other Bulgarian species of *Tragopogon*.

Material and methods

Morphological characters were noted from the material collected in the field by the authors.

Achenes were collected and germinated in Petri dishes to obtain chromosome counts. Root tips were cut and treated following the staining method of Feulgen densitometry (Greilhuber & Tensch 2001), involving hydrolysis in 5N HCl for 90 min at 20 °C, staining with Schiff's reagent for 1 h at room temperature, washing in SO₂-water for 45 min at room temperature, rinsing in distilled water, and finally squashing in 45% acetic acid.

Taxonomy of all species mentioned in the present publication, with the exception of *T. floccosus*, follows Kozhuharov (1992).

Results and discussion

Key to the Bulgarian species of *Tragopogon*:

1. Flowers pinkish, pink, purple or brownish 2
- 1*. Flowers yellow 4
2. Body, at least of the outer achenes, with five rows of scales (longer than 1 mm) forming distinct wings; flowers pink or white-pinkish, ligules about 1.5-2 times longer than the involucre bracts *T. pterodes*
- 2*. Body of all achenes unwinged (only with scales less than 1 mm long, arranged in five rows); flowers purple, brownish or dirty-whitish; ligules shorter, to slightly exceeding the involucre bracts 3

3. Peduncles inflated; leaves narrowly linear without undulate margin; stem base usually arachnoid; ligules about as long as the involucre bracts ***T. balcanicus***
- 3*. Peduncles not inflated; leaves broadly linear-lanceolate, often with undulate margin; stem base usually glabrous; ligules distinctly shorter than the involucre bracts ***T. porrifolius***
4. Peduncles distinctly inflated; ligules pale yellow, shorter than involucre bracts ***T. dubius***
- 4*. Peduncles not distinctly inflated; ligules lemon- or golden-yellow, equal or longer than the involucre bracts 5
5. Beak of most achenes by over 1/2 as long as the body 6
- 5*. Beak of most achenes by under 1/2 as long as the body 8
6. Involucre bracts 5-7; leaves not or scarcely widened at base ***T. crocifolius***
- 6*. Involucre bracts 8 (-12); leaves usually widened at base 7
7. Ligules lemon-yellow; beak about as long as the body of achene ***T. pratensis***
- 7*. Ligules golden-yellow; beak usually shorter than the body of achene ***T. orientalis***
8. Leaves broadly lanceolate, often with undulate margin, moderately to densely hairy, especially beneath, lower leaves broadest near the middle of the lamina ***T. stribrnyi***
- 8*. Leaves linear, without undulate margin, somewhat arachnoid when young, to glabrous, lower leaves broadest near the base ***T. floccosus***

***Tragopogon floccosus* Waldst. & Kit. (Fig. 1)**

Biennial to perennial plant; stem up to 150 cm high, strongly branched in the upper half, lanate when young; leaves linear, widened at base; peduncles not inflated, lanate; involucre bracts *ca.* 8; ligules yellow, equalling or slightly exceeding the bracts; achenes 1.7-2.5 cm, nearly smooth, with a short (up to 0.3 cm) beak.

The species is characteristic for river sands in the middle and lower stretches of the Danube. The habitat belongs to the Pannonic inland dunes type (Tzonev 2005: 35). *Allium rotundum* L., *Bromus tectorum* L., *Centaurea arenaria* M. Bieb. ex Willd., *Crepis setosa* Haller f., *Chamaecytisus* aff. *danubialis* (Velen.)

Rothm., *Chondrilla juncea* L., *Erodium cicutarium* (L.) L'Hér., *Gypsophila paniculata* L., *Holoschoenus vulgaris* Link, *Linaria genistifolia* (L.) Mill., *Marrubium peregrinum* L., *Medicago minima* (L.) Bartal., *Plantago scabra* Moench, *Plantago lanceolata* L., *Polycnemum arvense* L., *Scabiosa argentea* L., *Secale sylvestre* Host, *Seseli tortuosum* L., *Teucrium scordium* subsp. *scordioides* (Schreb.) Maire & Petitm., *Tragopogon dubius* Scop., *Xeranthemum annuum* L. were found to grow in close proximity to *T. floccosus*.

Distribution in Bulgaria (Fig. 2)

Danubian Plain: **1.** Sandy places near the Danube to the north of Slivata village, Montana district, 43° 46' 33" N, 23° 01' 56" E, *ca.* 20 m, FP-65, 23.07.2003, coll. S. Tsoneva & V. Vladimirov (SOM); **2.** NW of Orsoya village, Montana district, 43° 47' 00" N, 23° 04' 25" E, *ca.* 20 m, FP-65, 22.07.2003, coll. S. Tsoneva & V. Vladimirov (SOM); 15.08.2004, coll. V. Vladimirov (SOM).

Conservation status

T. floccosus is a rare plant in the Bulgarian flora. It is restricted to the sandy places in the two above-mentioned localities, which occupy a total area under 10 km². The habitat itself, Pannonic inland dunes, is a priority habitat for the European Union (Directive 92/43/EEC). In Bulgaria most similar places along the Danube were drained and converted into arable land in the past. Rating according to the IUCN criteria (IUCN 2001) resulted in the following national IUCN category: **Critically Endangered [CR B1ab(ii,iii)+2ab(ii,iii)]**. Further efforts for monitoring the population are required.

Chromosome number

The chromosome number was counted in roots from 5 achenes from the locality near Orsoya village. All individuals were diploid, $2n = 2x = 12$ (Fig. 3). No earlier counts for the species have been found.

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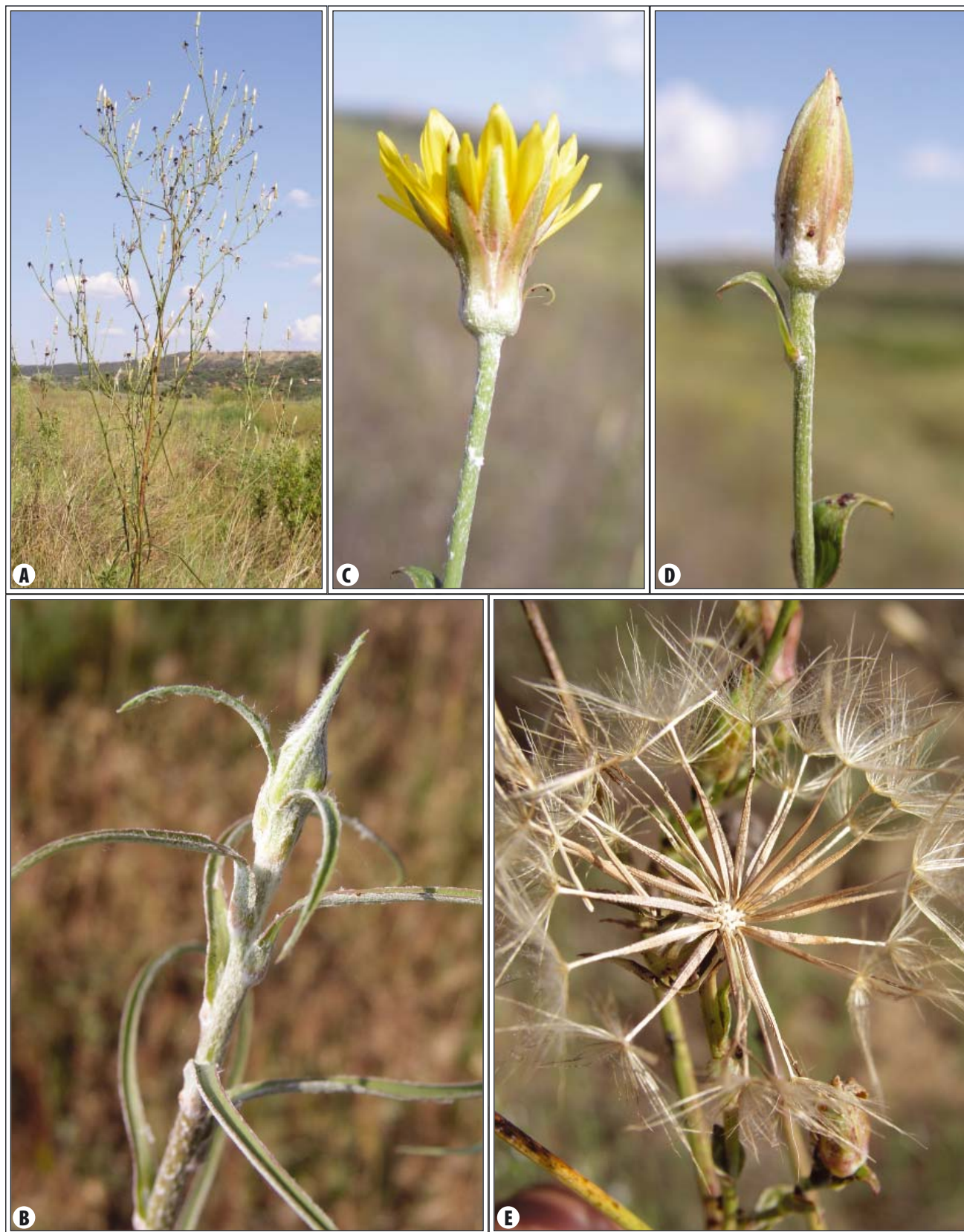


Fig. 1. *Tragopogon floccosus*: A – whole plant; B – indumentum of a young stem; C – flower head before anthesis; D – flower head at anthesis; E – achenes.

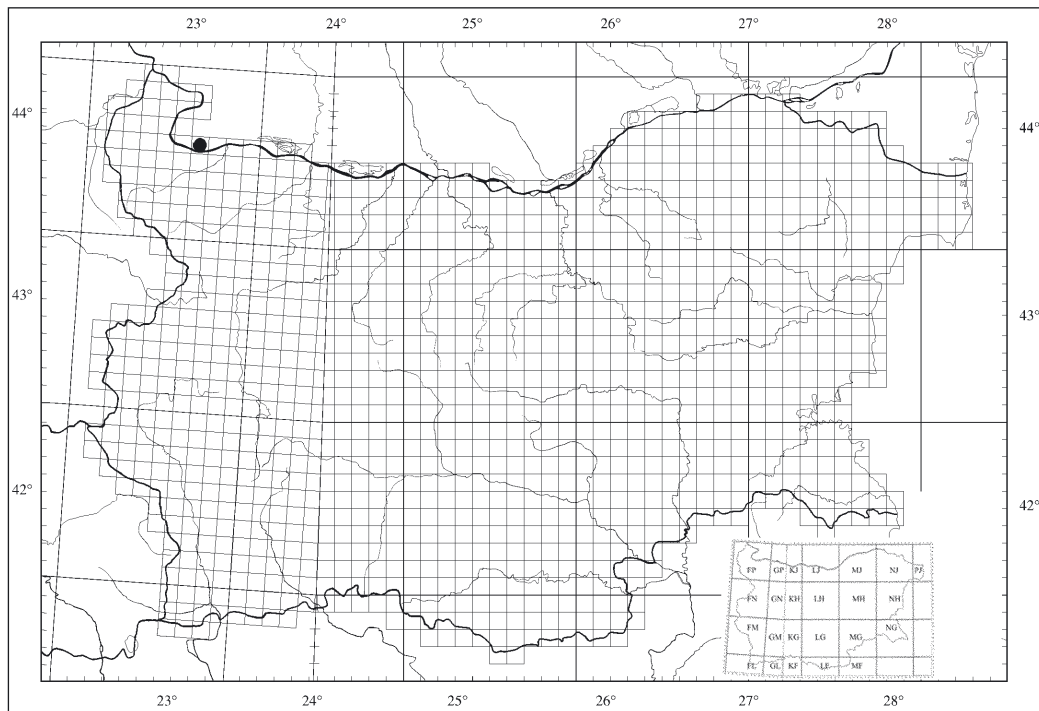


Fig. 2. UTM-distribution map of *Tragopogon floccosus* in Bulgaria.



Fig. 3. Mitotic metaphase plate of *Tragopogon floccosus*.

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