

***Galatella cana* (Asteraceae) confirmed in Bulgarian flora**

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Dedicated to Dr. Ana Petrova on the occasion of her 80th anniversary.

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Received: November 20, 2023 > Accepted: December 08, 2023

Abstract. In Bulgaria, *Galatella cana* was found only once near Lom town (Montana District) in 1892 and it had remained with an unconfirmed status ever since. A new locality, in the Thracian Lowland floristic region, was discovered in 2023, based on some misidentified specimens in the historical collection of Václav Stříbrný. The aim of the present article is to confirm the occurrence of *G. cana* in Bulgarian flora and to provide data of its only surviving population. An updated dichotomous key to the Bulgarian representatives of the genus *Galatella* is also presented.

Key words: Bulgaria, *Compositae*, *Galatella*, new record

Citation: Stoyanov, S. & Marinov, Y. 2023. *Galatella cana* (Asteraceae) confirmed in Bulgarian flora. – *Phytologia Balcanica*, 29(3): 397-404 – ISSN 1310-7771 (print), 1314-0027 (online).

Introduction

Galatella cana (Waldst. & Kit.) Nees was first reported in Bulgarian flora by Velenovský (1898). However, due to a lack of herbarium records in Bulgarian herbaria, the presence of this species in Bulgaria was considered unreliable. Therefore, in the latest taxonomic account of the genus *Galatella* Cass. in *Flora of the Republic of Bulgaria*, vol. 11, it is an unnumbered taxon and its distribution in Bulgaria needed

confirmation (Kuzmanov & Ančev 2012).

Surprisingly, several specimens of *G. cana*, misidentified as *Linosyris villosa* (L.) DC., *Aster villosus* (L.) Sch.Bip. and *A. amellus* L., were found in the historical collection of Václav Stříbrný (kept in Herbarium SOM). They were collected in the period 1904–1915 and their labels indicated “Manolovo” as a gathering place. A search for that locality and clarification of the correct geographical name of the specified settlement was the main objective of the present study.

Material and methods

Field surveys were carried out in September–October 2023. Plant material was collected from one locality in the floristic region of Thracian Lowland. Morphological characters were studied from the personal gatherings and compared with selected specimens of *Galatella* kept in SOM and PRC (acronyms according to Thiers 2023). The collected specimens have been deposited in SOM. Data for the habitat and population of the species have been based on the authors' observations. Nomenclature of *Galatella* followed Greuter (2006+). Conservation assessment was based on IUCN Categories and Criteria (IUCN 2012).

Results and discussion

In 2023, while checking the genus *Aster* in the historical collection of Václav Stříbrný, we came across six specimens with 3-veined, arachnoid-tomentose leaves and lilac ligules, which undoubtedly belonged to *Galatella cana*. They all were erroneously identified as *Linosyris villosa*, *Aster villosus* and *A. amellus*. In the autumn of the same year, following the herbarium label data, we first visited the surroundings of Manolovo village, Pavel Banya Municipality (Stara Zagora District). No *Galatella* was found in the severely overgrazed, slightly saline pastures southwards of the village. Afterwards, in the area of Manole village (Plovdiv District), a field survey was carried out and a large population of *G. cana* was discovered. Most likely, that was the locality in which Stříbrný had gathered his *Galatella* specimens at the turn of the 20th century. Quite possibly, he referred incorrectly to Manole as Manolovo. Other authors have come across the same confusion and also drawn the conclusion that Stříbrný's specimens labeled as collected from Manolovo were actually from Manole village (Ančev & Goranova 2015). Furthermore, according to the dictionaries of Bulgarian settlement names, at the time of Stříbrný's explorations the village of Manolovo was called Borisovo. The name Manolovo appeared only in 1947 (Michev & Koledarov 1989).

Stříbrný's population of *G. cana* has survived more than a century after its discovery. Our finding confirms the species occurrence in Bulgarian flora. Meanwhile, in the Herbarium of Charles University in Prague (PRC) we have found the earliest specimen of *G. cana* from Bulgaria collected by Hermann Škorpil in 1892. Based on it, the species was reported by Velenovský (1898) in his *Flora Bulgarica*. Škorpil's locality near Lom town (Montana District) needed confirmation.

Galatella cana (Waldst. & Kit.) Nees, Gen. Sp. Aster.: 163. 1832 (Fig. 1).

Perennial with a nodose rhizome. Stems 5–30, 30–80 cm, densely foliate, erect, striate, arachnoid-hairy. Leaves sessile, lanceolate to narrowly elliptical, acuminate, subcoriaceous, gland-dotted, arachnoid-tomentose, 20–50 × 3–10 mm, mostly 3-veined, with serrulate margins. Synflorescence corymbose, dense, with numerous heads. Involucre 3–5 mm long, cylindrical to obconical, phyllaries 2–3 mm long, outer triangular, middle and inner lanceolate, acute, ± glabrous, granulose, shining, inconspicuously veined, inner with scarious margins. Capitula radiate, with 5–10 ray florets and 5–15 disc florets. Ray florets 7–12 mm long, usually sterile, seldom pistillate, lilac. Disc florets 5–6 mm long, hermaphrodite, yellow, turning purple at the end of anthesis, surface glabrous, limbs ca. 2 mm long. Achenes 3.5–5 mm long, buff-colored, oblong-obovoid, compressed, with indistinct ribs, strigose, gland-dotted, pappus 4–5 mm long, bristles scabrid, pale straw-colored. Flowering VIII–X, fruiting X–XI.

Taxonomically, *G. cana* is closely related to *G. sedifolia* (L.) Greuter recently recorded in Bulgarian flora in halophytic habitats of the Studena river valley, Svishtov District (Stoyanov & Sidjimova 2023). These two species have 3-veined leaves and lilac ligules but they are clearly distinguishable by their stem and leaf indumentum: arachnoid-hairy in *G. cana* and glabrous in *G. sedifolia*. After confirming the presence of *G. cana* in this study, the number of *Galatella* species found in Bulgaria amounts to four (Fig. 2). A dichotomous key for their identification is given below.

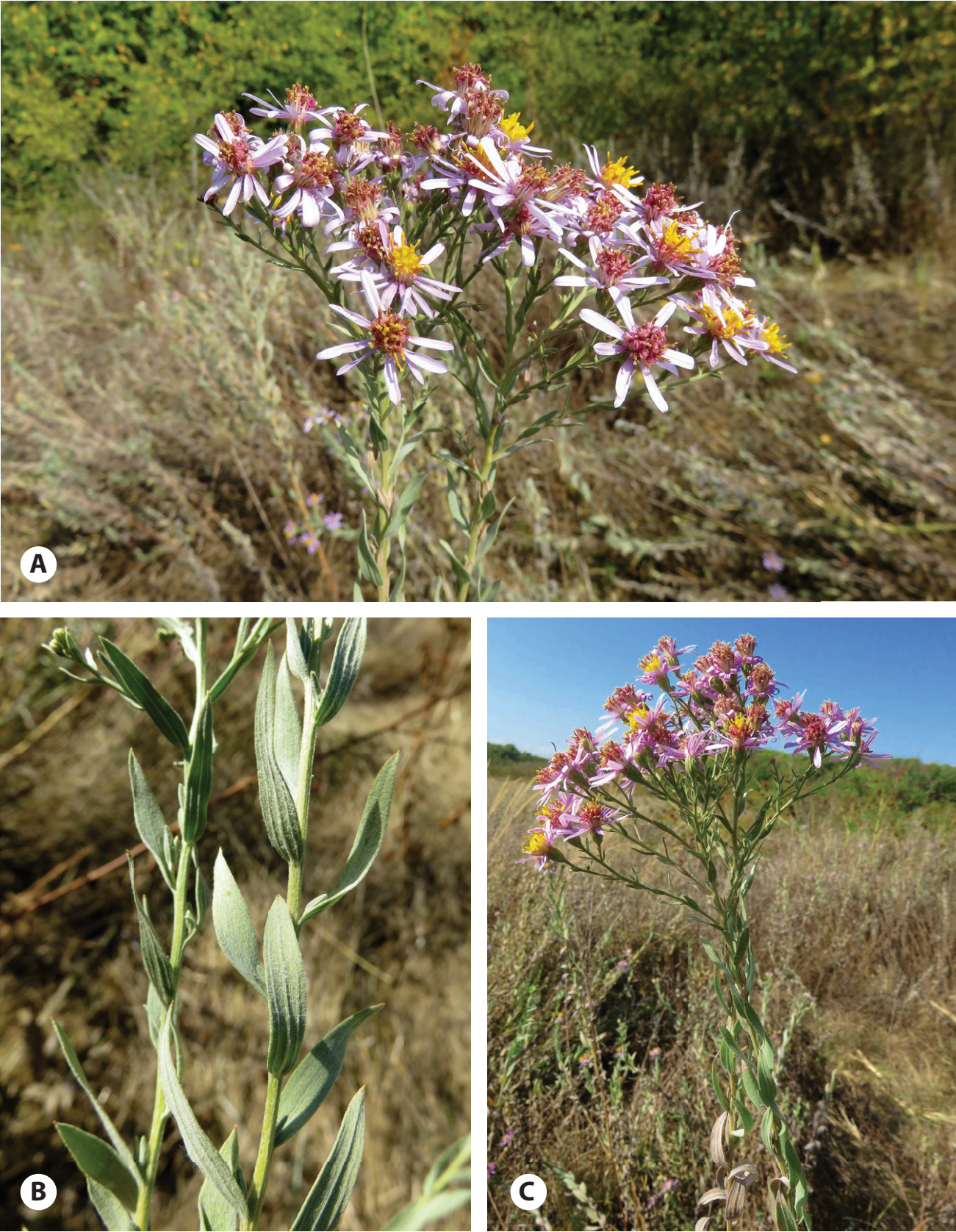


Fig. 1. *Galatella cana*: A, inflorescence; B, leaves; C, whole plant.

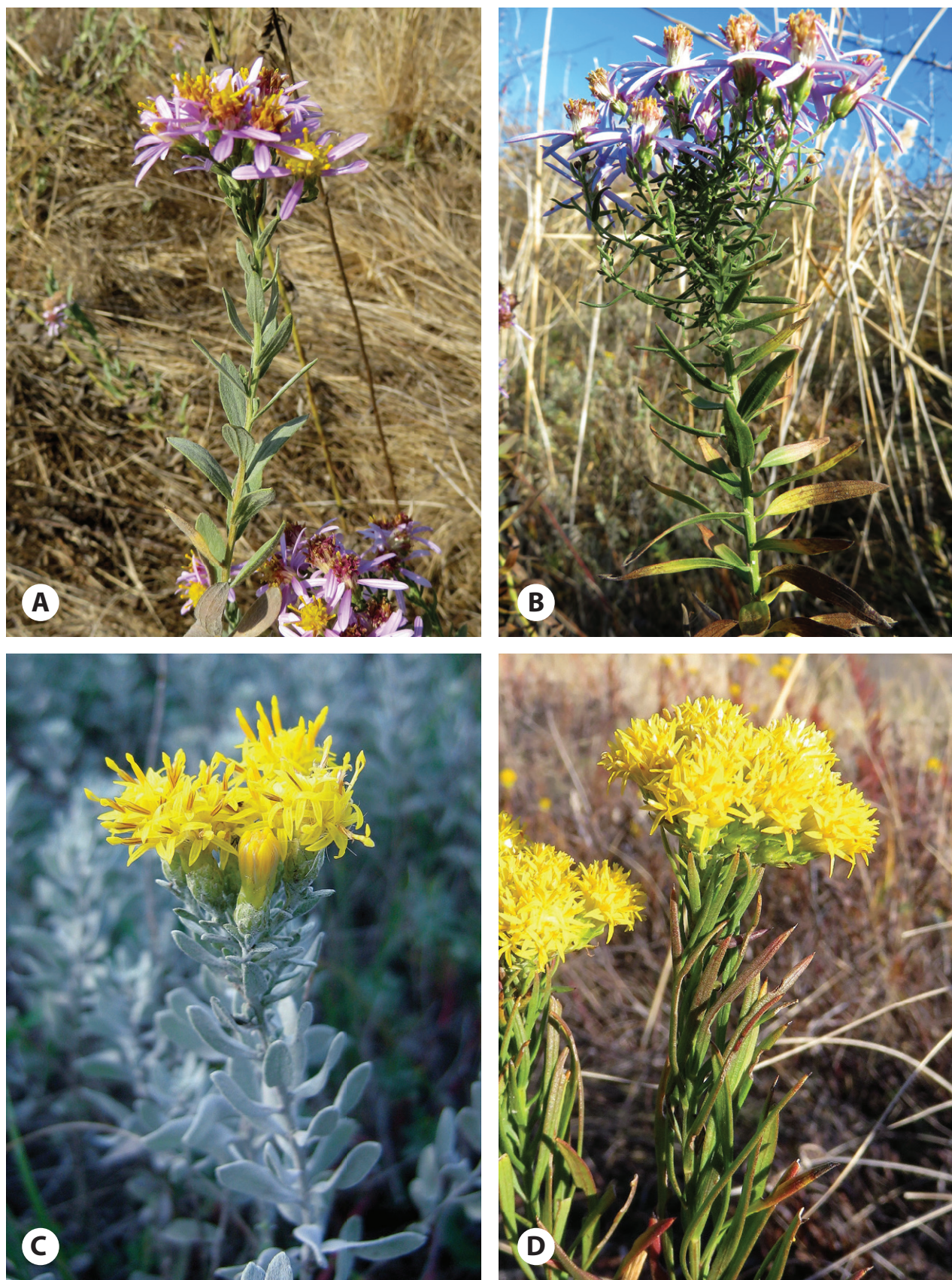


Fig. 2. Comparison of the Bulgarian species of *Galatella*: A, *G. cana*; B, *G. sedifolia*; C, *G. villosa*; D, *G. linosyris*.

Key to the Bulgarian species of *Galatella*

1. Capitula with ray and disc florets, leaves 3-veined2.
- 1*. Capitula only with disc florets, leaves 1-veined3.
2. Leaves arachnoid-tomentose.....*G. cana* (Waldst. & Kit.) Nees
- 2*. Leaves glabrous.....*G. sedifolia* (L.) Greuter
3. Leaves arachnoid-tomentose, ± obtuse.....*G. villosa* (L.) Rchb.f.
- 3*. Leaves glabrous, acuminate.....*G. linosyris* (L.) Rchb.f.

Habitat and population. *Galatella cana* is a salt-tolerant species and, in the Pannonian Basin countries, it occurs mainly in halophytic vegetation (Morariu & Nyárády 1964; Gajić 1975; Danihelka & al. 2022). Regarding the categories of salt tolerance, there are certain dissimilarities. According to the summary classification of the halophytic plants of Romania (Grigore 2012), it is classified in I category, including mainly species considered as obligate halophytes (euhalophytes), while in the classification of Dítě & al. (2023) *G. cana* is put in II category, as a facultative halophyte. Due to a lack of typical halophytic species in the habitat of *G. cana* in Bulgaria (near Manole village, Plovdiv District), there was no explicit indication for soil salinity. Thus, presence of any salinization can only be assumed. There, the species takes mainly part in seasonally dry grasslands dominated by *Bothriochloa ischaemum*, alongside *Achillea millefolium*, *Agri-monia eupatoria*, *Agrostis stolonifera*, *Carduus acanthoides*, *Cirsium arvense*, *Crepis pulchra*, *Cynodon dactylon*, *Dipsacus laciniatus*, *Dorycnium herbaceum*, *Echium italicum*, *Eryngium campestre*, *Festuca valesiaca*, *Fragaria moschata*, *Galium verum*, *Glycyrrhiza echinata*, *Hypericum perforatum*, *Limonium asterotrichum*, *Marrubium peregrinum*, *Odontites vulgaris*, *Phleum phleoides*, *Picris hieracioides*, *Prunella laciniata*, *Sanguisorba minor*, *Taeniatherum caput-medusae*, *Xeranthemum cylindraceum*, etc. Some tree and shrub species occur sporadically in these grassland communities as *Acer tataricum*, *Crataegus monogyna*, *Gleditsia triacanthos*, *Paliurus spina-christi*, *Prunus spinosa*, *Pyrus pyraeaster*, *Rosa canina*, *Ulmus minor*, etc.

The only existing Bulgarian population of *G. cana* occupies about 0.4 ha and includes ca. 10 000 individuals (Fig. 3A). It has a very high density (3–4 individuals per m²) and its total cover in some places is up to 70%. Its densest patch covers an area of about 0.3 ha and holds about 9000 individuals. The high total cover is due to the fact that each individual forms numerous stems. Part of the population is found among the tall and powerful stems of *Glycyrrhiza echinata*, with a density of less than one individual per m² and with no more than a few hundred individuals. *Glycyrrhiza echinata* can be regarded as a competitive species and a further increase of its cover would degrade the habitat quality and is a potential threat to *G. cana* (Fig. 3B).

Distribution. *Galatella cana* is a Pannonian geoelement. Its range includes mainly the western and southern margins of the Pannonian Lowland: South Moravia, East Austria, Hungary, North Serbia, and Southwest Romania (Danihelka & al. 2022). According to Morariu & Nyárády (1964), it also occurs outside the Pannonian Basin, in the southern and eastern parts of Romania. Across its entire range, the species has been severely affected by destruction of the wet meadows and saline habitats – in the Czech Republic, it is regionally extinct (Grulich & Chobot 2017), and in Slovakia, it has recently been rediscovered (Eliáš & al. 2020).

In Bulgaria, *G. cana* occurs with certainty in one locality (Manole village, Plovdiv District), which represents the southernmost limit of the species' range. Coincidentally, the species population falls into the Trakiiski Ravnets Protected Site for conservation of the Bulgarian endemic plant *Achillea thracica* Velen. Nevertheless, the circumstances call urgently for putting *G. cana* under the protection of the Bulgarian Biodiversity Act. Due to its extremely limited distribution in Bulgaria (only the currently found locality), the reduction of the area of occupancy (the locality near Lom town is unconfirmed) and the extent and quality of the habitat, *G. cana* would meet the criteria for a Critically Endangered species [CR B1ab(ii, iii, iv)+2ab(ii, iii, iv); C2a(ii)] at regional level.

Studied specimens. Bulgaria. Ad Lom Palanka [Lom town, Montana District], 1892, coll. Škorpil, det.

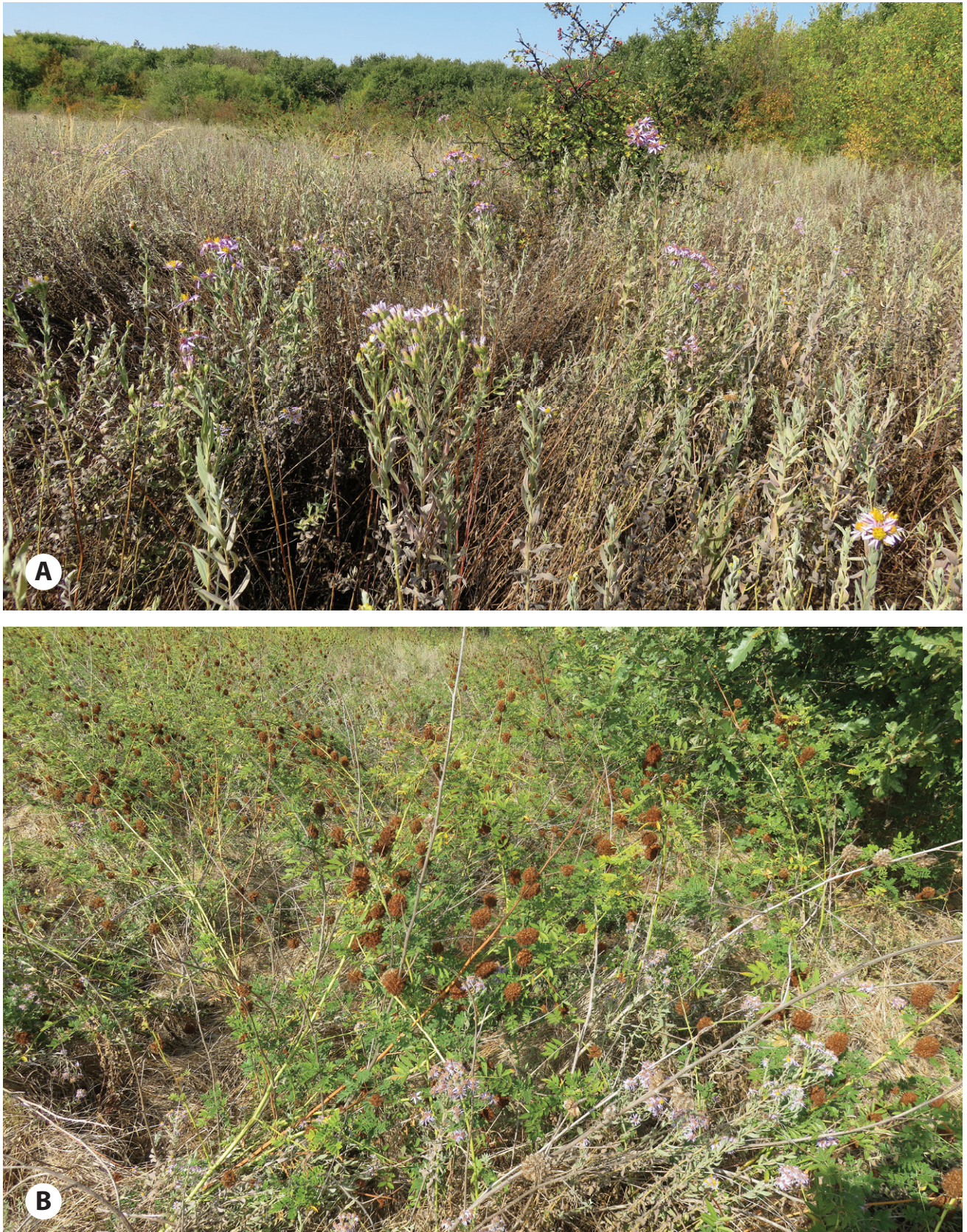


Fig. 3. Habitat and population of *Galatella cana*: **A**, the densest patch of the species population; **B**, habitat area negatively affected by *Glycyrrhiza echinata*.

Velenovský (PRC 473980, JACQ consortium 2004 ff); Manolovo [refers to Manole village, Plovdiv District], 07.1904, *Stříbrný* (Herbarium Stříbrný SOM 3374, sub *Linosyris villosa*); *loc. ibid.*, 07.1906, *Stříbrný* (Herbarium Stříbrný SOM 3377, sub *Aster villosus*); *loc. ibid.*, 07.1909, *Stříbrný* (Herbarium Stříbrný SOM 3378, sub *Aster villosus*); *loc. ibid.*, 07.1910, *Stříbrný* (SOM 76224, sub *Linosyris villosa*); *loc. ibid.*, 08.1910, *Stříbrný* (Herbarium Stříbrný SOM 3371, sub *Aster amellus*); *loc. ibid.*, 08.1915, *Stříbrný* (SOM 76221, sub *Linosyris villosa*); Thracian Lowland, 3 km northwest of Manole village, Plovdiv District, Terfilska Korja area, Trakiiski Ravnets Protected Site, in seasonally dry grasslands, 160 m, 42.20414°N, 24.90093°E, 13.09.2023, *Stoyanov & Marinov* (SOM 178631); *loc. ibid.*, 03.10.2023, *Stoyanov & Marinov* (SOM 178632-178634).

Acknowledgements. This study was carried out under the project “Flora, vegetation and natural habitats of Bulgaria and the Balkan Peninsula” of the Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences. The authors are grateful to Patrik Mráz, the Head Curator of PRC Herbarium, for accessing the Virtual Herbaria JACQ. They also extend their gratitude to Elena Gancheva for improving the English text and to Georgi Stoyanov for preparing the figures.

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