

A New Alien Species for the Flora of Turkey: *Bidens frondosa* L. (Asteraceae)

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Abstract: The North American species *Bidens frondosa* L. (Asteraceae) has been recorded as a new alien species for the flora of Turkey. The description of the species together with its drawing and distribution map is provided here.

Key Words: Adventive species, *Bidens frondosa*, Compositae, NE Anatolia

Türkiye Florası İçin Doğallaşmış Yeni bir Kayıt: *Bidens frondosa* (Asteraceae)

Özet: Bir Kuzey Amerika türü olan *Bidens frondosa* L. (Asteraceae) Türkiye florası için doğallaşmış olarak kaydedilmektedir. Türün tanımıyla beraber çizimi ve yayılış haritası verilmektedir.

Anahtar Sözcükler: Doğallaşmış tür, *Bidens frondosa*, Compositae, Kuzey Doğu Anadolu

Introduction

During field studies within an ongoing project supported by TÜBİTAK and the Bulgarian Academy of Sciences (BAS), *Bidens frondosa* L. (Asteraceae) was collected in 2006 in a different part of NE Anatolia. This species is native to North America, but is currently expanding into Europe. According to Tutin (1976), it occurs in most countries in West, South, and Central Europe. The species has also been recently recorded from Bulgaria (Šumberová et al., 2004).

Results

This study is based on specimens collected from North-East Anatolia between July and September 2006. The description was written with the aid of *Flora Europaea* (Tutin, 1976) and Šumberová et al. (2004). Specimens were deposited at the herbaria of the Karadeniz Technical University, Department of Biology (KTUB) and Department of Forest Botany (KATO), as well

as of the Bulgarian Academy of Sciences, Institute of Botany, BAS (SOM).

Bidens frondosa L., Sp. Pl. 832 (1753) (Figures 1, 2).

Annual herbs. Stem 100-200 (-280) cm, branching, 4-angled, almost glabrous, with few hairs in the upper part, erect, often reddish above. Leaves opposite, petiolate, pinnate, with 1(-2) pairs of leaflets. Terminal leaflet with a petiole up to 30 mm, longer than lateral leaflets. The petioles of the lateral leaflets up to 3-5 mm long. Leaflets lanceolate to oblong-lanceolate, acute or acuminate, coarsely serrate, light green below dull green above. Capitula 8-15 mm in diameter, erect, wider than long. Outer involucral bracts spreading, 6-8, herbaceous, light green, up to 30 mm long, occasionally leaf-like with a few hairs below; inner 5-9 mm, ovate-oblong, with dark brown mucronate tips, yellowish green to dirty dark yellow, glabrous. Corolla 3 mm long, whitish at base, yellowish at apex. Receptacular scales as long as achenes, lanceolate, scarious at margins. Anthers 1 mm long,

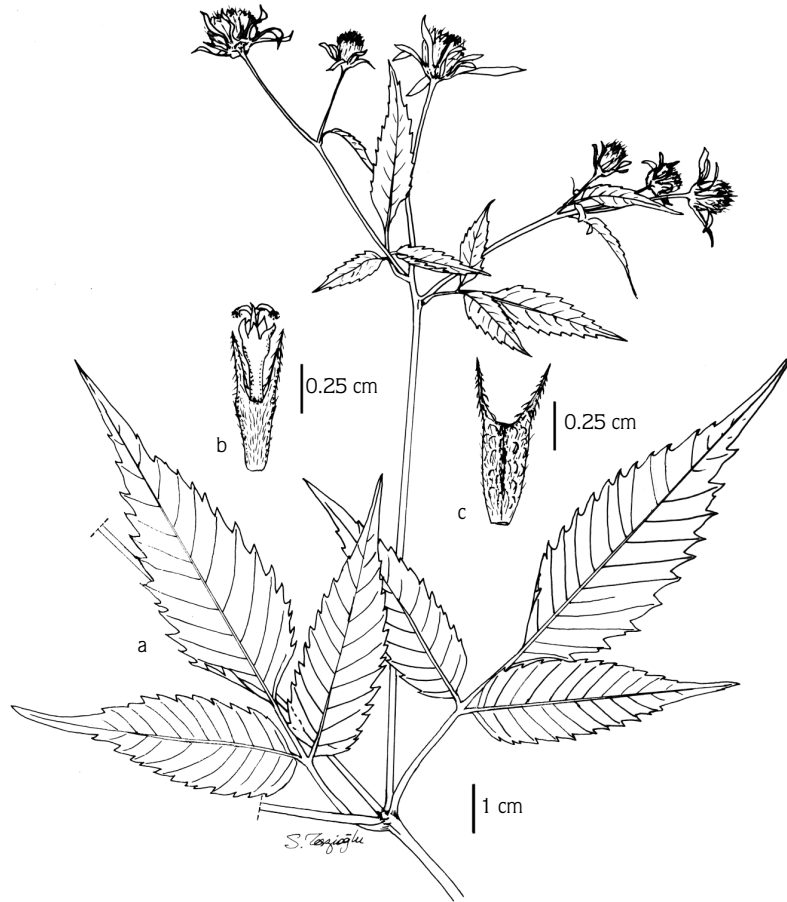


Figure 1. *Bidens frondosa* L. a-Stem with leaves and capitula; b-Disc flower; c-Achene.

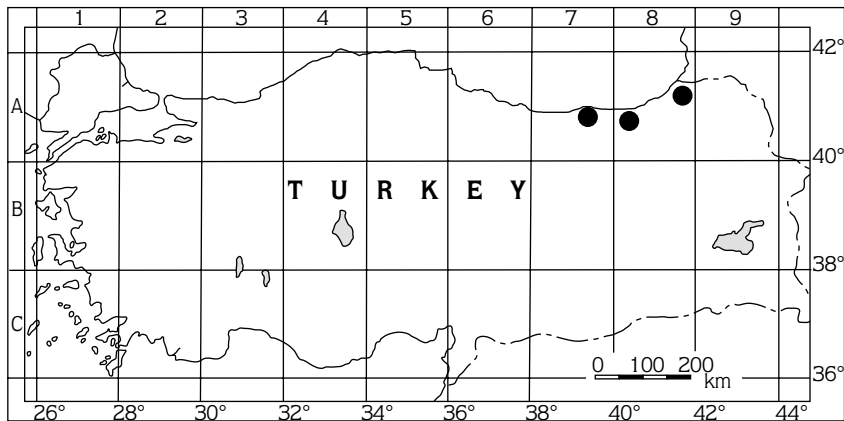


Figure 2. Distribution of *Bidens frondosa* in Turkey.

purplish. Achenes compressed, up to 4-7 mm long (without bristles), rugose, blackish to dark brown. Bristles of achenes 2, about 3 mm long.

Collected Specimens: A8 Rize: İyidere, İyidere merkez kavşak, roadsides, 19 vii 2006, 5-10 m, *Coşkunçelebi* 627 (KTUB); A8 Artvin: On the roadsides to Artvin city centre, 24 viii 2006, 200-300 m, *Coşkunçelebi* 628 (KTUB); A7 Trabzon: Kanuni Kampusü, ditches, 12 vii 2006, 50-100 m, *Coşkunçelebi* & *Vladimirov* (SOM), 28 viii 2006, 50-100 m, *Coşkunçelebi* 629 (KTUB).

Discussion

A remarkable number of adventive species have easily naturalised in NE Anatolia due to the high rainfall throughout the year (Terzioğlu & Anşin, 2001). Many new aliens have been reported previously from the Black Sea region of Turkey (Tan & Baytop, 1995; Duman & Güner, 1996; Byfield & Baytop, 1998; Terzioğlu & Anşin, 2003). *B. frondosa* quickly and efficiently disperses seeds by physical means especially in wet ground, ditches, stream banks, waste ground, and roadsides. It was collected from several localities adjacent to roadsides in the Black Sea region. Each individual of *B. frondosa*

produces thousands of seeds, which can be easily carried by human activities. That is why its distribution has reached NE Anatolia. *B. frondosa* occurs as viable populations of more than a hundred plants and compete well with the native species sharing the same habitats. The following species were represented in the same habitat together with *B. frondosa*: *Ulmus minor* Mill., *Eupatorium cannabinum* L., *Tussilago farfara* L., *Plantago lanceolata* L., *Polygonum hydropiper* L., *P. persicaria* L., *Parietaria judaica* L., *Foeniculum vulgare* Mill., *Ficus carica* L., *Alnus glutinosa* L., *Commelina communis* L., *Mentha longifolia* (L.) Huds., *Artemisia vulgaris* L., and *Sambucus ebulus* L.

So far 3 taxa of *Bidens* have been reported from Turkey: *B. cernua* L. var. *cernua* and var. *radiata* DC, and *B. tripartita* L. (Kupicha, 1975; Güner, 2000). The main phenetic differences among these species are given in Table 1.

Acknowledgements

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Table 1. Main differences among the *Bidens* species in Turkey.

Characters	<i>B. frondosa</i>	<i>B. tripartita</i>	<i>B. cernua</i>
Leaf	pinnate	pinnate	simple
Leaflet petiole	with petiole	without petiole	-
Outer involucre bracts	present	rarely present	absent
Achenes	compressed, with 2 bristles	compressed, with small teeth curved down and rarely 2 or usually 3 bristles	4-angled, with long teeth at the angles and 3-4 bristles

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