

A new alien species of *Euphorbia* (*Euphorbiaceae*) to the Bulgarian flora

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Abstract. A new species of *Euphorbia* – *E. davidii* – from the *E. dentata* group has been recorded in Bulgaria. The species is native to North America and was found in the ferry complex at lake Beloslav and Razdelna shunting-yard railway station, near the city of Varna, the Black Sea Coast floristic region. The morphology of the species is described and illustrated on the basis of material from Bulgaria.

Key words: alien species, Bulgaria, *Euphorbia davidii*, *Euphorbia dentata* group, *Euphorbiaceae*

Introduction

Euphorbia is one of the larger genera in the Bulgarian flora. So far it has been represented with 31 species of which three are alien: *E. lathyris* L., *E. maculata* L. and *E. nutans* Lag. (Kuzmanov 1979; Assyov & Petrova 2006). Recently, a new alien species has been recorded along the railways, westwards of Beloslav town. The plants were remarkable with their annual habit, oppositely branched stems and opposite, petiolate, unlobed dentate leaves, and certainly belonged to the *E. dentata* group.

Euphorbia dentata group comprises seven species, of which two are South American and five are North American (Mayfield 1997).

Material and methods

Morphological characters were recorded from the material of Bulgarian accessions and compared with the relevant literature data (Mayfield 1997). Herbarium material is deposited in the Herbarium (SOM) of the

Institute of Botany, BAS. Data about populations and habitats are based on visual observations.

Results and discussion

Euphorbia davidii Subils, Kurtziana 17 (1984) 125 (Fig. 1).

Syn.: *Euphorbia dentata* var. *gracillima* Millsp., Pittonia 2 (1890) 90; *Euphorbia dentata* var. *lancifolia* Farwell, Amer. Midl. Nat. 8 (1923) 273.

Annual, 10–50(70) cm tall. Stems solitary, erect, up to 4 mm thick at base, with opposite, arcuately ascending branches and two layers of hairs – upper of sparse, ±patent longer hairs and lower of denser, shorter, downwards directed hairs. Leaves opposite, with 7–15(25) mm long petioles, blades 1–10 × 0.5–3.5 cm, lanceolate to broadly elliptic, widest in the middle, attenuate at base, bluntly acute to acuminate at apex, with a crenate-dentate margin, dense, shortly strigose on both surfaces. Synflorescence umbellate, flat-topped to slightly rounded, with numerous cyathia. Ray-leaves narrowly elliptic to lanceolate, shortly petiolate, paler



Fig. 1. *Euphorbia davidii*: a – plant habit; b – synflorescence (photos A.S. Petrova).

at the base. Cyathia involucre cylindric, glabrous, green, 2.5–3 × 1.3–1.8 mm; involucre lobes subequally divided to 5–7 linear lobes with swollen apical cells. Glands 0.9 × 1.3 mm, solitary, cupped with oblong mouth, pale-yellow. Staminate flowers 5–8 in a fascicle. Pistillate flower pedicel elongating to ca. 3 mm, exceeding cyathia, ovaries usually glabrous, seldom sparingly strigose. Stigma lobes bifurcate to $\frac{3}{4}$ of their length, spreading. Capsules broadly ovoid, glabrous, 3-locular, ca. 4.5–5 mm wide. Seeds ovoid to triangular-ovoid, angulate, ca. 2.4–3 mm in diameter; surface grey to nearly black, irregularly tuberculate; caruncle reniform-triangular, peltiform, ca. 0.9–1.1 mm.

The species belongs to the American *Euphorbia* subgenus *Poinsettia*. According to Mayfield (1997), *E. davidii* differs from the closely related *E. dentata*, with which it occasionally grows sympatrically, mainly by the following characters: trichomes of the lower leaf surface strongly tapered with a broad basal cell (trichomes weak, lacking broad basal cell in *E. dentata*), seeds angu-

lar in transection, unevenly tuberculate (seeds rounded in transection, evenly tuberculate in *E. dentata*).

Euphorbia davidii is easily recognized from all other Bulgarian *Euphorbia* species by a combination of the following characters: annual with oppositely branched stems; leaves opposite, clearly petiolate, attenuate at base, leaf-blade lanceolate to broadly elliptic, widest in the middle, on the margin serrate-dentate.

Phenology. Flowering in August–September, fruiting in September–October.

Distribution in Bulgaria. Black Sea Coast (*Northern*):

1. Along the rail tracks at the Razdelna shunting-yard station, Varna district, 43.16437° N, 27.63208° E, 10–15 m, 27.08.2009, coll. V. Vladimirov & A.S. Petrova (SOM 165357, 165358) & 02.10.2009, coll. V. Vladimirov & A.S. Petrova (SOM 165479, 165473, 165474);

2. Along the rail tracks at the ferry harbour complex, W of the town of Beloslav, Varna district, 43.18137° N, 27.66762° E, ca. 10 m, 02.10.2009, coll. V. Vladimirov, A.S. Petrova & I. Yankov (SOM 165475, 165476, 165477, 165478).

About a hundred fruiting individuals were observed in the first locality and a few thousands in the second, where in some places the species is very abundant (Fig. 2). The distance between the endmost observed plants is about 2 km. *Euphorbia davidii* usually grows between the railroad tracks and on the embankment. The substrate is mostly limestone gravel, in places with sandy-clayey soil, which is found in the area. Other ruderal and alien species grew in close proximity: *Amaranthus albus*, *Ambrosia artemisiifolia*, *Cephalaria transsylvanica*, *Chondrilla juncea*, *Crepis foetida*, *Digitaria* spp., *Erigeron canadensis*, *Grindelia* sp., *Gyp-*



Fig. 2. A stand of *Euphorbia davidii* (photo V. Vladimirov).

sophilla trichotoma (an endangered species in the Bulgarian flora), *Lactuca saligna*, *Mercurialis annua*, *Portulaca oleracea*, etc.

Search for more localities of the species in the other railway stations in Varna district has been unsuccessful.

Worldwide distribution. *Euphorbia davidii* is native to North America, Central USA to NW Mexico, from where it spread further on the continent along railroad tracks. It was introduced and became established in South America (Argentina) and Australia (Mayfield 1997). In Europe a species of *E. dentata* group was first recorded in the area of Pyatigorsk town (a spa resort) in the North Caucasus (Russian Federation) in 1968 (Mikheev 1971). First records from the Ukraine are from the area of Odessa Port on the Black Sea (Kovalenko & al. 1993), and subsequently the species spread to many localities in the country, usually along the railways (Huzik & al. 1997).

Euphorbia dentata s.l. is listed as a weedy or invasive species in some parts of the world (<http://plants.usda.gov/index.html>, accessed on 24.10.2009) and is included in the list of quarantine weeds in Russia and the Ukraine. According to Mayfield (1997), *E. davidii* is the most widespread and weediest of the species in the *E. dentata* alliance. Very likely, the records of *E. dentata* in Europe should be referred to *E. davidii*. Thus, *E. davidii* may have been introduced to Bulgaria together with the ferried crop-seeds from the Ukraine.

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