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Research article/Araştırma makalesi

A new monotypic genus (*Diptychocarpus* Trautv.) record from Brassicaceae (Cruciferae) family for the Flora of Turkey

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Abstract

In this study the monotypic genus *Diptychocarpus* Trautv. (Brassicaceae/Cruciferae) is recorded for the first time (B9 Van) from Turkey. The diagnostic characters of *Diptychocarpus strictus* (Fisch. ex M.Bieb.) Trautv. are described and illustrated. Geographical distributions are also mapped, and conservation statuses at the regional scale of this species are discussed.

Key words: *Diptychocarpus*, monotypic genus, new record, taxonomy, Turkey

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Türkiye Florasına Brassicaceae (Cruciferae) familyasından yeni bir monotip cins (*Diptychocarpus* Trautv.) kaydı

Özet

Bu çalışmada, monotipik bir cins olan *Diptychocarpus* Trautv. (Brassicaceae/Cruciferae) Türkiye'den (B9 Van) ilk defa kaydedilmiştir. *Diptychocarpus strictus* (Fisch. ex M.Bieb.) Trautv.'un tanıtıcı özellikleri betimlenmiş ve gösterilmiştir. Coğrafi dağılımı haritalanmış ve bu türün bölgesel ölçekte koruma statüsü tartışılmıştır.

Anahtar kelimeler: *Diptychocarpus*, monotipik cins, yeni kayıt, taksonomi, Türkiye

1. Introduction

The vascular plant family Brassicaceae (Cruciferae) is distributed worldwide and consist of 372 genera, and about 4060 species (Gıdık et al., 2016). This family is the second richest in Turkey with regard to species number (607 species, 39 subspecies, and 18 varieties, of them 226 taxa are endemics) (Al-Shehbaz et al., 2007; Al-Shehbaz, 2010; Güner et al., 2012; Karabacak et al., 2016). *Diptychocarpus* Trautv. is a monotypic genus of Brassicaceae found mainly in the Irano-Turanian region, and also present in middle and South West Asia (Al-Shehbaz, 2012). *Diptychocarpus strictus* (Fisch. ex M.Bieb.) Trautv. is a short-lived species, which is unique in the tribe *Chorisporeae* (Brassicaceae) for producing dimorphic fruits on the same raceme.

In this study, an additional Brassicaceae (Cruciferae) genus, *Diptychocarpus*, and one more species are recorded for Turkey.

2. Materials and methods

Plant materials for the new genus record were collected during floristic investigations by the authors between 2010 and 2015 in Van province, East Anatolia, Turkey. Initial attempts to name this specimen using the Flora of Turkey (Davis,

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1965; Davis et al., 1988; Güner et al., 2000) inferred that it is closely related to genus *Chorispora* R.Br. ex DC. There were some discrepancies (e.g. flower and fruit characters) between the description and the specimens. Eventually, using the family account in the Flora Iranica (Rechinger, 1968) and Flora URSS (Bush, 1970) the specimens were identified as *Diptychocarpus strictus* (Fisch. ex M.Bieb.) Trautv. For confirmation, our plants were compared with type specimens and authenticated material in the herbaria: BM, E, JE, P, and WU (Thiers, 2017).
Descriptions have been prepared based on our newly collected material. Voucher specimens are deposited at the herbarium of Van Yüzüncü Yıl University (VANF) and Siirt University Flora and Fauna Center (SUFAF).

3. Results

Brassicaceae (Cruciferae), tribe **Chorisporeae** C.A.Mey. in Ledeb., Fl. Altaic. 3: 104. 1831.

3.1. *Diptychocarpus* Trautv. Bull. Soc. Imp. Naturalistes Moscou. 33(1): 108. 1860.

3.1.1. *Diptychocarpus strictus* (Fisch. ex M.Bieb.) Trautv., Bull Soc. Imp. Naturatlistes Moscou 33(1) : 108 (1860) (Figs. 1-2).

Syn.: *Raphanus strictus* Fisch. ex M.Bieb., Fl. Taur.-Caucas. 3: 452 (1819); *Chorispora stricta* (Fisch. ex M.Bieb) DC., Syst. Nat. 2: 436 (1821); *Matthiola fischeri* Ledep. in Fl. Ross. 1: 110. 1842, nom. illeg. (cited the earlier published *Raphanus strictus* in synonymy); *Alloceratium strictum* (Fisch. ex M.Bieb.) Hook. f. & Thomson, J. Proc. Linn. Soc., Bot. 5: 135 (1861), *Chorispora stenopetala* Regel & Schmalh., Trudy Imp. S.-Peterburgsk. Bot. Sada. 5: 239 (1877). *Orthorrhiza persica* Stapf, Denkschr. Kaiserl. Akad. Wiss. Wien Math.-Naturwiss. Kl. 51: 306 (1886).

***Lectotype*:** "*Raphanus strictus* m. ad lac. Inderiensem [manus Fischeri] *Chorispermum aitonianum* spectat. Remitte!" [*Tauscher*] [manus Biebersteinii]. Designated by German, 2011: 52 [lectotype: LE; isolectotypes: LE, KW, P (photo)!].

Annual herb, multicellular glands present, sometimes mixed with simple trichomes to 2–3 mm. Stems 10–45 cm, erect, branched above. Petiole 2–16 mm; basal leaf lanceolate to linear-lanceolate, 20–50 × 2.5–11 mm, densely glandular, sparsely pilose to glabrous, base cuneate to attenuate, margin sinuate-dentate to dentate or rarely pinnatifid, apex acute; cauline leaves similar to basal ones, gradually narrower upward, becoming linear to filiform, subsessile, entire. Raceme elongated in fruit; fruiting pedicel 2.5–7 mm. Sepals 4.5–5.5 mm; petals purple to whitish, 6–11 × 0.6–1.3 mm; oblanceolate; claw 3–5.5 mm; filaments 2–7 mm; anthers ovate. Fruit linear, dimorphic, 1.8–3.6 mm wide; lowermost fruit terete, 3–8 cm, rigid, indehiscent; the distal ones flattened, 4–10 cm, coriaceous, dehiscent; style 2–7 mm, stout, cylindric to subconical, persistent, glabrous; stigma capitate, 2-lobed, lobes connivent. Seeds uniseriate, broadly winged, brownish, oblong to suborbicular, 2–4.5 × 2–3 mm; wing 0.2–1.2 mm.

Phenology: Flowering from March to June.

Habitat: Steppes, hillsides, wastelands.

Distribution: Afghanistan, Armenia, Azerbaijan, China (Gansu, Nei Mongol, Xinjiang), Iran, Kazakhstan, Kyrgyzstan, Pakistan, Russia, Syria, Tajikistan, Turkmenistan, Uzbekistan; new to Turkey (Fig. 2).

Material: Turkey, B9 Van: Edremit, Kadembas district, behind of the green valley picnic area, slopes, 28 iii 2010, 38° 24.48′ N, 43° 13.58′ E, 1683 m, *M.Fidan* 412 (VANF); 11 iv 2010, *M. Fidan* 551; 18 iv 2014, *M. Pınar* 4063 & *H. Eroğlu* (in fruit).

Conservation status in Turkey: Classified by us as 'Vulnerable' VU (D1; E), based on IUCN criteria (IUCN, 2016). In Turkey, the species population is very small and restricted (the approximate area of occupancy is c. 0.50 km2) (criterion D), and mature individuals number less than 1000 (criterion D1). Also, Its population placed under high grazing pressure, anthropogenic disturbance, and erosion effect. We consider probability of extinction in the wild to be more than 10 % within the next 100 years (criterion E).

Identification key to *Diptychocarpus* and related genus

1. Siliques of two kinds (fruit dimorphic), lowermost indehiscent, corky, and terete, uppermost dehiscent and flattened; seeds winged…….***Diptychocarpus***
1. All siliques similar (fruit of one kind), indehiscent, flattened or terete; seeds wingless ……..…..…….**2**
2. Stigma capitate, entire or slightly lobed; fruit clearly 2-partite…….……***Raphanus***
2. Stigma with decurrent carpidial lobes; fruit not 2-partite……...……***Chorispora***

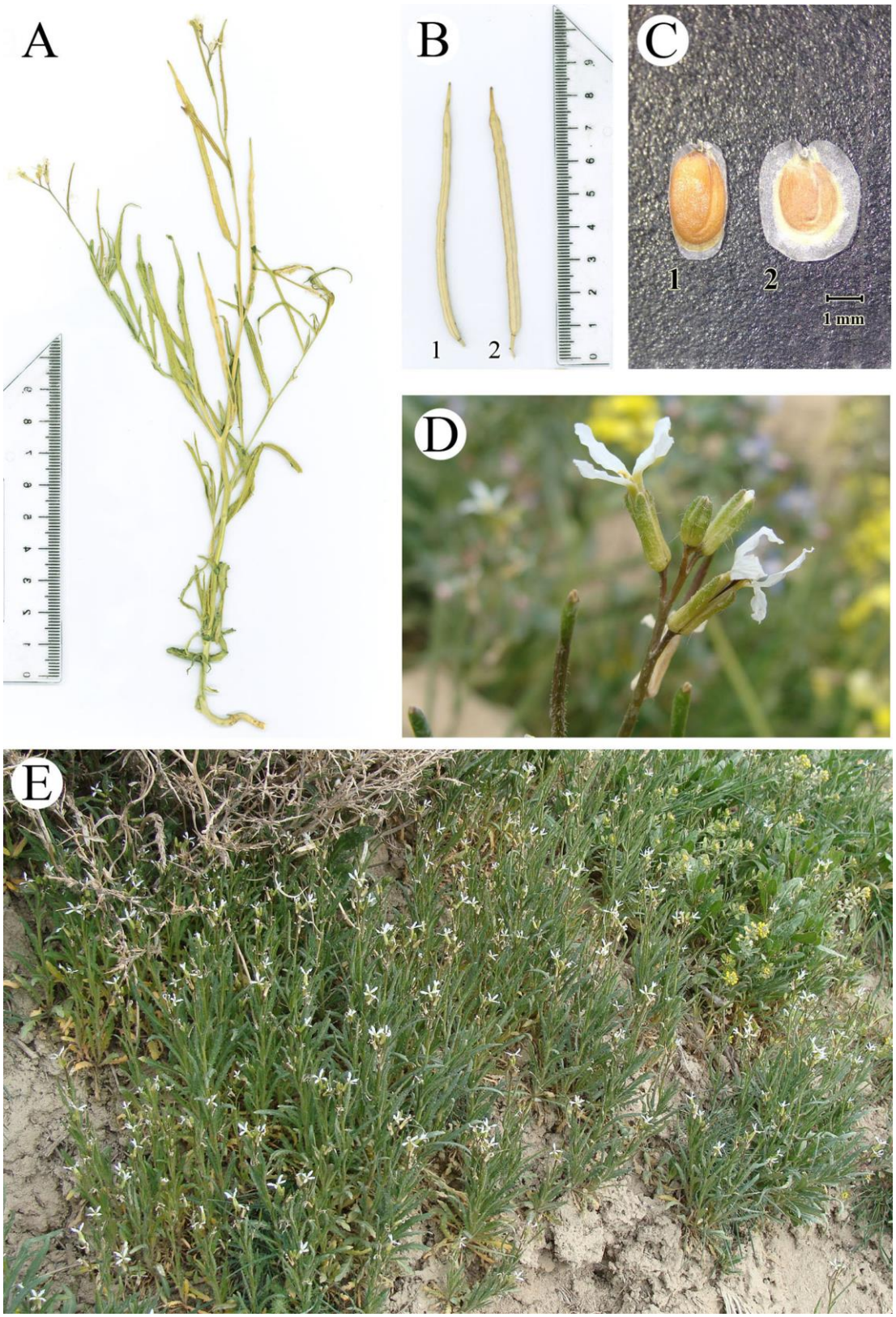

Figure 1. *Diptychocarpus strictus* (Fisch. ex M.Bieb.) Trautv. **A** habit, **B** dimorphic fruits (1-terete silique, 2-compressed silique) **C** seeds (1- from terete silique, 2-from compressed silique), **D** flower, **E** natural population (photographs by M Fidan).

4. Conclusions and discussion

Diptychocarpus is similar to *Chorispora* as described by Cullen (1965) in Flora of Turkey, but differs in its heterocarpic racemes (upper coriaceous, dehiscent; lowermost fruit rigid, indehiscent) and different flower colour (violet and white) (Wu and Tan, 2007; German et al., 2011). Al-Shehbaz et al. (2006), in the most recent paper on the

systematics of the family, place *Diptychocarpus* is in the tribe Chorisporeae. Extension of the range of this species to Turkey is not surprising, because it also grows in nearby Armenia, Azerbaijan, Iran, and Syria. As a result of this study, with the addition of the new genus records here, the number of genera in the Brassicaceae family recorded from Turkey is increased to approximately 99 and number of species has reached 608.

Figure 2. Distribution map of the genus *Diptychocarpus* in the world (□). Blue symbol (□) indicated by the arrows is the first discovered locality of *D. strictus* in Turkey

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