



***Oenothera parodiana* (Onagraceae): a new alien species record for the flora of Turkey**

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Abstract

Oenothera parodiana Munz (Onagraceae) collected from Thrace (European part of Turkey), is reported as a new alien species for the flora of Turkey. Morphological description including detailed photos of the species are given.

Key words: *Oenothera parodiana*, Turkey, Thrace, alien species, new record

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***Oenothera parodiana* (Onagraceae): Türkiye florası için yeni bir yabancı tür kaydı**

Özet

Trakya'dan toplanan *Oenothera parodiana* Munz (Onagraceae), Türkiye florası için yeni bir yabancı tür olarak kaydedildi. Türün betimi ve detaylı fotoğrafları verildi.

Anahtar kelimeler: *Oenothera parodiana*, Türkiye, Trakya, yabancı tür, yeni kayıt

1. Introduction

The plant family *Onagraceae* (Evening-primroses) comprises ca. 655 species across 17 genera (Levin et al., 2003). *Onagraceae* have a world-wide distribution, with the majority of species concentrated in the New World, especially western North America (Levin et al., 2004).

Oenothera L. (güneşdamlası) is the second largest genus of the family *Onagraceae* and consists of 145 species (188 taxa). The genus is widely distributed in temperate to subtropical areas of North and South America with a few species in Central America. The centre of diversity for the genus is in south-western North America (Wagner et al., 2007), with a number of species now naturalized worldwide (Dietrich et al., 1997) and approximately 70 reported from Europe (Mihulka and Pysek, 2001; Rostanski, 2010). The genus comprises annual, biennial or perennial herbs, many of which occurring in primarily or secondarily open habitats including old fields and roadsides, stream sides or dunes (Dietrich, 1977).

Oenothera parodiana Munz is a species belonging to the sect. *Oenothera*, subsect. *Munzia*, ser. *Allochroa* according to Dietrich (1977). Species in this group characterized by: cylindrical capsule rarely enlarged in the upper third or somewhat petiolate, not fused with the subtending bract. In Turkey *Oenothera* is represented by 2 naturalized alien species (*O. biennis* L., *O. glazioviana* Micheli) in the sect. *Oenothera*, subsect. *Oenothera* (Güzel, 2012; Chamberlain, 1972). In this paper *O. parodiana* is recorded for the first time for the Turkish flora. Thus, the total number of *Oenothera* species known from Turkey has now increased to three. After the Flora of Turkey and supplements, also a lot of new records and new taxa belonging to different genera have been published (Korkmaz et al., 2011; Köstekci and Arabacı, 2013; İlçim and Özçelik, 2013; Yaprak and Başköse, 2012).

Dietrich (1977) subdivided *Oenothera parodiana* into three subspecies: *O. parodiana* subsp. *parodiana*, *O. parodiana* subsp. *brasiliensis* Dietrich, *O. parodiana* subsp. *strigulosa* Dietrich. This distinction is based on in pubescence and flower size. But according to Wagner et al. (2007), last two subspecies have been included in *O. parodiana* s.str.

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2. Materials and methods

In 2013, during an excursion to collect *Berteroa* DC. specimens, the author collected material of *Oenothera* from the Çatalca district of İstanbul province and was identified according to several literatures: *Flora Europea* (Raven, 1968), The genus *Oenothera* L. in Eastern Europe (Rostanski, 2004), *Oenothera* Occuring in Europe (Rostanski et al., 2010), The species of *Oenothera* L. in Britain (Rostanski, 1982), The South American Species of *Oenothera* Sect. *Oenothera* (Dietrich, 1977). Identification was checked by Dr. Warren Wagner who is an expert on the *Oenothera* genus from the Smithsonian Institute, USA. The species was described according to my observations of the collected specimens and the above-mentioned literature. Specimens were deposited at ISTE.



Figure 1. *Oenothera parodiana*. A, habit; B, sepal tips on flower bud; C, teeth at the apex of the capsule; D, seeds [S. Yüzbaşıoğlu 3873 (ISTE 101195)]

3. Results

Oenothera parodiana Munz, Physis 11: 283 (1933). (Figs 1-2)

Syn.: *O. parodiana* subsp. *brasiliensis* W. Dietr., *O. parodiana* subsp. *strigulosa* W. Dietr.

Typus: Argentina, Prov. Buenos Aires, meadows of El Socorro, Pergamino, 8 Dec. 1926, L. R. Parodi 7395 (GH, holotype; W, isotype).

Description

Erect or somewhat decumbent annual or biennial herb, forming a rosette; with a simple or branched main stem, the obliquely ascending or arching side branches arising from the rosette, up to 50 cm tall, densely short and long appressed hairs. Rosette leaves narrowly elliptic or oblanceolate, acute, sessile or short petiolate, 3-5 cm long, 3-4.7 mm wide; cauline leaves narrowly oblong to lanceolate or oblanceolate, acute, rounded to truncate at the base, sessile, 1.5-7

cm long, 3.5-7 mm wide; bracts lanceolate to ovate, acute, truncate to subcordate at the base, sessile, 1-2 cm long, 0.5-1 cm wide, shorter than the capsules they subtend; leaves plane or evidently undulate at the margins, irregularly or regularly serrate. Inflorescence usually branched. Hypanthial tube 11-13 mm. Sepals green turning reddish with age, flecked with reddish brown, 8-11 mm (inc. 3-3.5 mm tips). Petals broadly obovate, 6-11 mm long, 11-14 mm wide, yellow turning reddish with age. Anthers c. 5 mm long. Filaments c. 6 mm long. Stigma with 4 linear lobes, lobes c. 5 mm long. Ovary 10-13 mm long. Capsule cylindrical, (22-) 24-27 mm long, 2.5 mm wide, broader in the upper half, with emarginate teeth. Seeds light brown, elliptic in outline, 1.3-1.7 mm long.



Figure 2. *Oenothera parodiana*. A, old (red one) and young (yellow one) flower; B, flower and flower bud; C, fruited branch; D, stem leaves [*S. Yüzbaşıoğlu* 3873 (ISTE 101195)].

Collected specimens: Turkey: A2(E) İstanbul, Çatalca, Karacaköy-Karamandere, along river, sandy soil, 30 m, 29.06.2013, *S. Yüzbaşıoğlu* 3862 (ISTE 101184); *ibid.*, 13.07.2013, *S. Yüzbaşıoğlu* 3873 (ISTE 101195).

Chromosome number. $2n=14$ (studied from *S. Yüzbaşıoğlu* 3873)

Habitat. Samples were collected from the edge of the river on sandy soil. Within this area, the species is associated with plants such as *Berteroa obliqua* (Sm.) DC., *Malva sylvestris* L., *Echium plantagineum* L., *E. italicum* L., *Clinopodium nepeta* (L.) Kuntze, *Sambucus ebulus* L. and *Verbascum* sp.

Phenology. Flowering in June-July, fruiting July-August.

General distribution. South America, South Africa, Rhodesia, Netherlands, Germany, France, Albania and NW Turkey (Fig. 3).

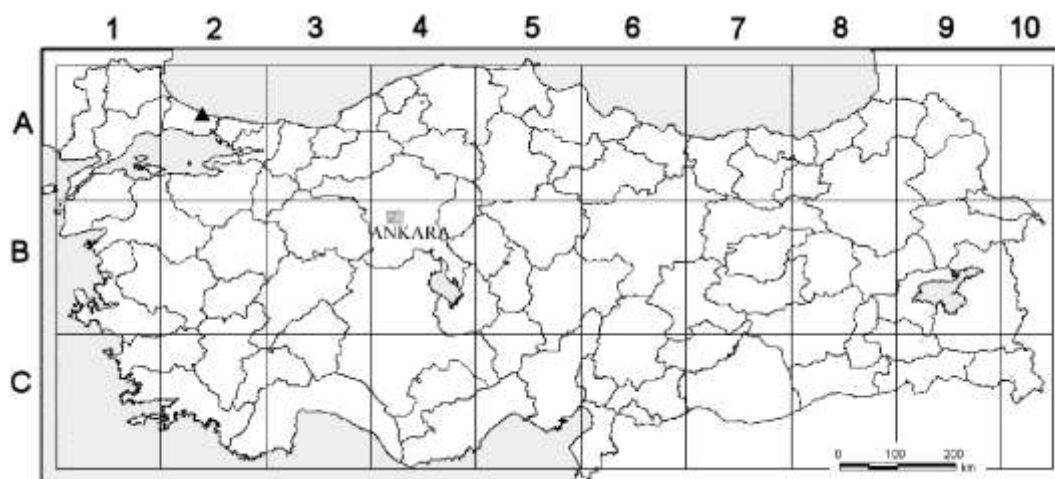


Figure 3. Distribution map of *Oenothera parodiana* (▲) in Turkey

A key for *Oenothera* taxa in Turkey is developed based on Rostanski (2004, 2010) as follows:

1. Stem, rachis and ovaries with red bulbous-based hairs; petals 30-50 mm long; cultivated plant sometimes escaping from cultivation.....*O. glazioviana*
1. Red bulbous-based hairs absent
2. Petals 20-30 mm long; hypanthial tube 25-35 mm long; cultivated plant sometimes escaping from cultivation.....*O. biennis*
2. Petals 6-15 mm long; hypanthial tube 11-13 mm long.....*O. parodiana*

4. Conclusions

The first specimen of *O. parodiana* was collected by L.R. Parodi in 1926 from Argentina, after this collection, in 1933, it was described by Munz as a new species. The species, which is native to several countries of South America like Brazil, Uruguay and Argentina (Dietrich, 1977). Outside its native range, *O. parodiana* also recorded from many countries as an alien species in South Africa, Rhodesia, Netherlands, Germany, France (Dietrich, 1977) and Albania (Rakaj 2006). Because of the distribution of *O. parodiana* in the Europe as an alien, the distribution in Thrace (European part of Turkey) is not surprising. Author has estimated that it is a newly naturalized taxon in Turkey. The flora of Thrace has been studied by many researchers (Webb, 1965; Yarıcı, 1997; Yarıcı, 1999; Kavgacı, 2007; Genç and Özen, 2008; Akalın-Uruşak et al., 2013). However, this species was not found in its first place of collection falling into the above-mentioned study area.

O. parodiana is closely allied to *O. indecora* Cambess. Following to system of classification into section, subsection and series published in “The South American Species of *Oenothera* Sect. *Oenothera*” (Dietrich, 1977), these two species falls into the following position: Section *Oenothera*, Subsection *Munzia*, Series *Allochora*. *O. indecora* is native to several countries of South America. In Europe, it is known as an alien species in Netherland, Hungary, France, Germany, Portugal, Greece, Belgium and Spain. Recently, it has been recorded in Italy (Crisafulli et al., 2013). Considering the distribution area of the *O. indecora* in Europe, it will not surprising record as an alien species in Turkey in the near future. Main differences between the species are given in the Table 1.

Table 1. A comparison between the diagnostic characters of *O. parodiana* and *O. indecora*

Characters	<i>O. parodiana</i>	<i>O. indecora</i>
Bracts	only half as long as the capsule they subtend or shorter	subequal or longer than the capsule they subtend
Indumentum	glandular hair absent	glandular hair present

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