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## *Oenothera indecora* (*Onagraceae*) a neophyte new to Italy

### Abstract

Crisafulli, A., Picone R. M. & Soldano A.: *Oenothera indecora* (*Onagraceae*) a neophyte new to Italy. — Fl. Medit. 23: 87-92. 2013. — ISSN: 1120-4052 printed, 2240-4538 online.

*Oenothera indecora* Cambess. (*Onagraceae* sect. *Oenothera*, subsect. *Munzia* ser. *Allochroa*), native species to South America, was found naturalized close to Messina (NE Sicily) and in Massa in Tuscany. These reports represent the first records of this species from Italy.

*Key words*: Alien flora, Mediterranean, biogeography.

### Introduction

*Oenothera* L. (1753) is the second largest genus in the *Onagraceae* and consists of 145 species divided into 18 sections, 5 of which are subdivided into subsections (Wagner & al. 2007); these plants grow in temperate to subtropical areas of America, many of them are widely naturalized in several areas of the Earth.

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).

In Europe a total of 80 species (Rostanski & al. 2010) has been recorded. In Italy the genus is represented by the 23 species; 20 indicated by Conti & al. (2005) and *O. latipetala* by Soldano (2010), *O. tetragona* and *O. speciosa* by Banfi & Galasso (2010).

*Oenothera indecora* is a species belonging to the sect. *Oenothera*, subsect. *Munzia* ser. *Allochroa*, which includes species with cylindrical capsule rarely enlarged in the upper third or somewhat petiolate, not fused with the subtending bract (Dietrich 1977). Actually *Oenothera stricta* Link (*Oenothera stricta* Ledeb. ex Link) is the lonely species included into the ser. *Allochroa*, reported from Italy (Conti & al. 2005).

Dietrich (1977) subdivided *Oenothera indecora* into three subspecies: *O. indecora* CAMB. subsp. *indecora*, *O. indecora* CAMB. subsp. *boliviensis* W. Dietrich and *O. indecora* subsp. *bonariensis* W. Dietrich. New studies suggest that this distinction is based on slight differences in pubescence and flower size and the last two subspecies have been included in *O. indecora* s. str. (Wagner & al. 2007).

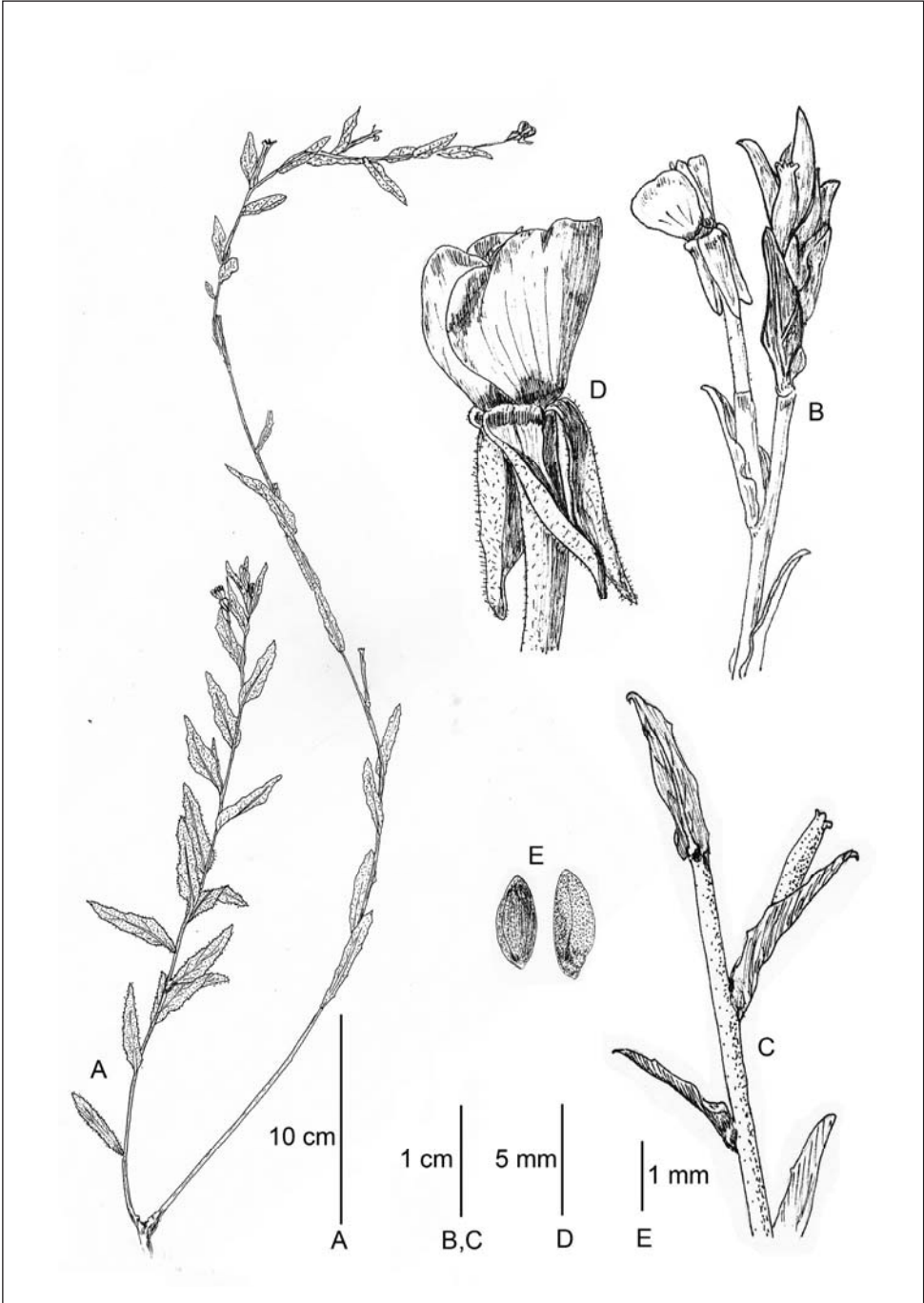


Fig. 1. *Oenothera indecora*. A, habit; B, flowering branch; C, fruited branch; D, flower; E, seeds (drawing by Salvatore Casella).

*Oenothera indecora* Cambess. [syn. *O. polymorpha* H. Lév. var. *indecora* (Cambess.) H. Lév.; *O. polymorpha* var. *indecora* H. Lév., *Raimannia indecora* (Cambess.) Sprague & Riley; *Oenothera argentiniae* var. *longipila* Kloos & Thell.] is a monoecious herbaceous annual or biennial plant, with a basal rosette; stems up to 80 cm tall, densely short-villous and glandular pubescent (Fig. 1). Basal leaves narrow-oblongate, sessile, 5-7 cm long, 10-15 mm wide; cauline leaves narrow-elliptic to lanceolate, 5-7 cm long, 10 mm wide, sessile; bracts 1.5-3 cm long, 0.5-1 cm wide, margins irregularly toothed and undulate. Ephemeral flowers opening near sunset. Sepals densely flecked with reddish brown, to 7-10 mm long, with slender free tips c. 1 mm long, at the anthesis banded close to the stalk (Fig. 2). Obovate petals, 5-9 mm long, yellow turning reddish with age. Stamens 8 yellow subequal to petals, with anthers 2-3 mm long, filaments 3-6 mm long. Style surrounded by the anthers at anthesis; stigma with linear lobes 2-3 mm long. Fruit  $\pm$  cylindrical, subsessile, broader in the upper half, slightly curved, to 20-30 mm long, ca. 2 mm wide, slightly pubescent with 4 apical acute teeth (Fig. 3). Seeds light brown, obovoid, indistinctly and shallowly pitted elliptic in outline, 1-1.2 mm long.

Chromosome number  $n = 7$  (Dietrich 1977)

Flowering time: September-July in Brazil; September-May in Uruguay, Paraguay and Argentina (Dietrich 1977).



Fig. 2-3. Flowering and fruited branch of *Oenothera indecora*.

The specimens we collected show phenotypic characteristics typical of *O. indecora* subsp. *indecora* (Dietrich 1977), such as densely glandular pubescence which make plants appear pubescent to the naked eye.

*O. indecora* was described for the first time in Brazil by Cambessedes (De Saint Hilaire & al. 1830). The species, which is native to several countries of South America like Uruguay, Paraguay, Brazil, Argentina (Dietrich 1977), occurs outside its native range and it is now established as a neophyte in several tropical and subtropical areas.

In Africa it is reported in: Botswana, Rhodesia, South Africa, Isle of Tristan da Cunha (Dietrich 1977); Namibia, Zimbabwe (Wagner & al. 2007; Hyde & al. 2013); Morocco, Canary Island, Madeira and Lesotho (African Plants Database version 3.4.0; Hansen & Sunding 1993).

It's also recorded in Australia (Dietrich 1977), New Zealand and Japan (Wagner & al. 2007).

In Europe, it is known as an alien species in: Netherland, Hungary, France, Germany (Dietrich 1977); Portugal (Dietrich 1977; Rostanski, 1991; Dietrich, 2000; Greece (Greuter 1989; Greuter & al. 1989; Raus 2006) where is established (DAISIE 2008); Belgium and Azores (DAISIE 2008). Recently, it is been detected in Spain (Verloove & Sánchez Gullón 2008). In Raus (2006) this species is cited also for Italy apparently by mistake. In fact *O. indecora* is not recorded in any Italian flora (Fiori 1925-1929; Zangheri 1976; Pignatti 1982) or recent floristic updating (Conti & al. 2005; Celesti-Grapow & al. 2009; Celesti-Grapow & al. 2010a, 2010b); therefore, our records in Sicily and Tuscany are first records from Italy.

In Sicily, this species has been observed in a locality close to Messina: in 2002, the first specimens were found on a sandy soil within an open area adjacent to the university campus, where a green leisure area for students was about to be realised. Afterwards, it was found along small paths where continuous passing and bustle prevented the natural process of dynamic evolution of the vegetation. Also, since 2010, it was found along the roadsides between the draining interlocking pavers, not so far from the spot of the first observation, where it still grows.

Its stability over time and its weak ability to spread noticed in Sicily, are in accord with Kowarik (1995), who stated that in Europe the majority of alien species of *Oenothera* only remain scattered and rare.

Moreover, its presence along Italian coastal areas matches what has been stated about others species of the series *Allochroa*, native to South America, which tend to spread into warmer regions with mediterranean climate (Pyšek & Mihaluk 2001).

In Sicily *O. indecora* is a synanthropic perennial species in flower from May to July with a secondary flowering period starting with first autumnal rains (September – mid-November). Very probably, some collections from Tuscany (collected at Marina di Massa beaches, between 1959 and 1982), that were provisionally attributed to *O. cfr. parodiana* (Soldano 1984) for having shorter bracts, are to be attributed to the same species. While Dr. W. Dietrich (in letters) suggested for a 1978 strain the hybrid *O. indecora* × *O. stricta*, that in any case involves the presence of *O. indecora* in the territory and effectively the floral characters of the collections showed (Soldano 1984) a strong similarity with that species. A 1980 collection had long bracts and can be attributed to *O. indecora* with greater confidence.

The occurrence of this species in the area around Messina in more than 10 years confirms that *O. indecora* must be considered a naturalized species (Pyšek & al. 2004), while the little population of Marina di Massa disappeared after 1982.

*Exsiccata* are deposited in *Herbaria* of Messina (MS), Palermo (PAL), Turin (MRSN) and Florence (FI).

#### Records:

loc. Papardo – Sperone (Me), (UTM: 33S 552.4235), ruderal place on sandy surfaces, 70 m, May. 25, 2002, *Picone & Crisafulli*; *ibid*, ruderal place on sandy surfaces, 70 m, July 10, 2006, *Lanzetta*; *ibid*. Roadsides on draining interlocking pavers, 80 m, November 23, 2012, *Crisafulli & Picone*; Marina di Massa (Ms), (UTM: 32T 590.4872), beach at S. Giuseppe Vecchio, 2 m, June 22, 1980, *Soldano* 2973.

#### Acknowledgements

Thanks are due to Dr. Salvatore Casella for drawing iconography of *Oenothera indecora*.

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