

Oenothera paradoxa (Onagraceae) in Belgium

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ABSTRACT. – *Oenothera paradoxa* was described in 1968 from the former German Democratic Republic (East Germany). For quite a long time it was only known from scattered localities. In Belgium it was poorly known and only recorded from a single locality; for this reason *O. paradoxa* was not included in a recently published identification key for *Oenothera* in Belgium. However, in the past years this species was observed in several new localities, in Belgium as well as in other parts of Europe. It is in fact a very characteristic and easily recognized species. In this short note distinguishing features of *O. paradoxa* are discussed and the species is copiously illustrated.

SAMENVATTING. – *Oenothera paradoxa* (Onagraceae) in België. *Oenothera paradoxa* werd in 1968 beschreven van de voormalige Duitse Democratische Republiek (Oost-Duitsland). Gedurende lange tijd was ze bekend van slechts enkele groeiplaatsen. In België was ze lang bekend van één groeiplaats en bovendien slecht begrepen; om die reden ontbrak *O. paradoxa* in een recent gepubliceerde identificatiesleutel voor *Oenothera* in België. In de voorbije jaren kende de soort echter een opvallende uitbreiding, zowel in België als elders in Europa. Het is een zeer karakteristieke en gemakkelijk te herkennen soort. In deze korte nota bespreken we de onderscheidende kenmerken van *O. paradoxa* en wordt de soort uitvoerig geïllustreerd.

Introduction

Oenothera paradoxa Hudziok was described by Hudziok (1968) from a single locality in Zossen (Wünsdorf) in the Brandenburg State (former German Democratic Republic; current-day Germany). It was distinguished from all other evening-primroses in the Brandenburg area by its buds and floral bracts that are blotched with red in the upper half. For this unique character Hudziok thought a hybrid origin for this species to be rather unlikely, although it certainly had some features typical of *O. depressa* Greene. Later, it was generally admitted that *O. paradoxa* is indeed a hybridogenous species (i.e., a stable hybrid, occurring also in the absence of its putative parent species) that arose in Europe in the 20th century. *Oenothera depressa* (from series *Devriesia* Rostański) was thought to be one parent whereas the other was believed to be from series *Rugglesia* Rostański, either *O. parviflora* L. or *O. subterminalis* R.R. Gates (e.g. Rostański & Latowski 2010, Rostański & Verloove 2015, Henker & Kiesewetter 2018).

This species long remained a rare and very local species. From Belgium it was identified by the late K. Rostański from a single locality (coal mining spoil heaps in Beringen-Mijn) where it had been collected by the first author in 2001 and 2007 (Rostański & Verloove 2015).

Since it was thought to be poorly characterized (as an alleged hybrid between two species that belong to two different, quite dissimilar series) and extremely rare, it was not included in an identification key, nor was it illustrated in an account for the genus in Belgium (Rostański & Verloove 2015).

Since the publication of this account, *Oenothera paradoxa* was recorded in several new localities, in Belgium as well as in other parts of Europe. In the Ghent port area, for instance, its abundance was noticed lately, especially in railway sidings on sandy substrate. Locally, it has become one of the most frequent species. Moreover, *O. paradoxa* turned out to be a very characteristic and easily identified species, as already pointed out by Hudziok (1968).

Since it was lacking in Rostański & Verloove (2015) it is here shortly described and typical features are illustrated.

***Oenothera paradoxa* Hudziok**, Verh. Bot. Vereins Prov. Brandenburg 105: 93. 1968.

Biennial. Stem 50-160 cm, coarse and erect, unbranched or rarely slightly branched below, flushed with or intensely deep red, especially in lower 2/3, red-pustulate hairs absent or sparse. Stem leaves broadly lanceolate, dentate,

densely and softly hairy from short, appressed hairs, crinkled from wavy margins, dark green; midrib red turning deep red at the base. Inflorescence a narrowly pyramidal or more or less compact, bracteate, apical spike. Rachis green. Flowers chasmogamous (or partly cleistogamous). Hypanthium 28-35(-40) mm, yellowish-green, sometimes slightly reddish, hairy from long, \pm patent hairs and with glandular hairs. Buds green but distinctly red-blotched in upper third, densely hairy and glandular; sepal-tips 3-6 mm, pressed together at base, with V-shaped sinus at apex. Petals yellow, obovate with slightly emarginated or (less frequently) rounded apex, (10-)14-21 \times (10-)13-18(-21) mm, slightly wider as long. Anthers 6-8 mm. Stigma surrounded by or below the anthers. Capsule narrowly lanceolate in outline, 25-35 \times 8-9 mm, green, densely covered with hairs. Young (upper) capsules slightly red-punctate, with bristle and glandular hairs, older (lower) ones predominantly with bristle hairs; capsule teeth 2 mm, clearly emarginate.

The following unique combination of features easily distinguishes *Oenothera paradoxa* from other species of *Oenothera* currently found in Belgium (see also Figures 1-5). Flower buds and bracts are distinctly blotched with red in the upper third. Occasionally, these blotches can be absent early in the flowering season but they will appear during either ripening or in older plants. Note, however, that the red pigmentation soon fades after desiccation which might considerably complicate the identification of herbarium specimens. Also, similar red spots at the top of the buds can appear in *O. villosa* Thunb. (although only exceptionally so) but this is a completely different species with dense villous hairiness and lanceolate leaves. *Oenothera paradoxa* has mid-stem leaves that are (very) broadly lanceolate with a deep red midrib. Its inflores-

cence has densely aggregated bracts at the apex which gives it a fairly characteristic ‘crown-like’ look. Only *O. wratislawiensis* Rostański – a stable hybrid of alleged *O. canovirens* E.S. Steele \times *subterminalis* parentage – may be similar but is not very well known. It is supposed to have narrowly lanceolate leaves. According to the representatives of the so-called American school of taxonomy (Dietrich *et al.* 1997) *Oenothera paradoxa* belongs to the variability of *O. biennis* L.

Some recent new records from Belgium

Until recently, *Oenothera paradoxa* was only known from a single locality in Belgium. In 2001 and 2007 it was found in abundance on a coal mining spoil heap in Beringen-Mijn in the province of Limburg (Rostański & Verloove 2015). In the past two years it was observed in the following additional localities:

- Waregem (province of West Flanders), IFBL E2.15.33, newly constructed industrial zone, ca. 500 individuals, 15 July 2017, D. Derdeyn (observation retrieved from <https://waarnemingen.be>);
- Beveren, Kieldrecht, Sint-Antoniusweg (province of East Flanders), IFBL B4.54.33, worked-up sandy roadsides in Waasland port area, 30 July 2017, F. Verloove 13138 (BR);
- Beveren, Kieldrecht, near Kieldrechtsluis (province of East Flanders), IFBL B4.53.42, sandy area and railway sidings near container terminal in Waasland port area, 15 July 2018, F. Verloove 13281 (BR), M. Hassler *et al.*;
- Gent, Sint-Kruis-Winkel, R4-Kennedylaan (province of East Flanders), IFBL C3.44.12 and 44.13, sandy area along railway tracks in Ghent port area, very common, 15 July 2018, F. Verloove, M. Hassler *et al.*;



Figure 1. *Oenothera paradoxa*, Gent (Sint-Kruis-Winkel), July 2018. Flower buds are distinctly blotched with red in the upper third.



Figure 2. *Oenothera paradoxa*, Baden-Württemberg, Philippsburg, July 2014. The crown-like inflorescence apex with red-blotched bracts and buds is quite characteristic.



Figure 3. *Oenothera paradoxa*, Beveren (Waasland port area), July 2017. Leaves are broadly lanceolate and dentate, the mid-vein is distinctly red (especially towards base) and leaf margins are wavy.



Figure 4. *Oenothera paradoxa*, Beveren (Waasland port area), July 2017. Stems are deep red, especially in the lower 2/3.

- Gent, Sint-Kruis-Winkel, R4-Kennedylaan towards Zelzate (province of East Flanders), IFBL C3.44.12, along railway tracks in Ghent port area, very common, 29 July 2018, F. Verloove 13298 (BR);
- Gent, Desteldonk-Mendonk, R4-Kennedylaan (province of East Flanders), IFBL C3.44.31, sandy area along railway tracks in Ghent port area, very common, 29 July 2018, F. Verloove;

- Gent, Desteldonk-Mendonk (province of East Flanders), IFBL C3.43.44 and C3.53.22, sand raised site W of Hulsdonk in Ghent port area, scattered individuals, 29 July 2018, F. Verloove.

In the Waasland port area and especially in the Ghent port area *Oenothera paradoxa* looks firmly established. By railway tracks adjoining the R4 Kennedylaan, between Ghent and Zelzate, it locally is the dominant evening-primrose these days, often occurring in dense, nearly monospecific stands of many hundreds of individuals.

Distribution in Europe

Oenothera paradoxa was originally described from a single locality in the Brandenburg state in Germany (see above). Subsequently it was recorded in widely scattered localities in other states as well: northwestern part of Baden-Württemberg, Mecklenburg-Vorpommern, Niedersachsen and formerly also in Sachsen (Henker & Kiesewetter 2018). Only relatively recently it was also discovered in other European countries, at first in Poland where it was long considered rare and local (Rostański 1995, Rostański & Tokarska-Guzik 1998, Rostański & Latowski 2010). At present, however, it has become fairly widespread in large parts of the country (Woźniak-Chodacka & Pliszko 2017). This may be due, at least in part, because *O. paradoxa* is commercially grown as an oilseed crop in Poland (Rostański *et al.* 2010). The species may have escaped from such agricultural fields. In the 1990s it was reported from a single locality in France (Rostański *et al.* 1994), although the species probably never naturalized; it is not mentioned in *Flora Gallica* (Tison & de Foucault 2014). In Belgium it was first collected in 2001 (see above).

In addition, unpublished reliable records for *Oenothera paradoxa* are available from the Netherlands where it has been known from several localities since at least 2014 (<https://waarneming.nl>). In 2017 it was observed for the first time in Austria (<http://forum.flora-austria.at/viewtop->



Figure 5. *Oenothera paradoxa*, Gent (Sint-Kruis-Winkel), July 2018. Rosette leaves with distinct red midvein.

ic.php?f=10&t=421). In summary, the species is known to be or have been present in Austria, Belgium, France, Germany, the Netherlands and Poland. In other European countries it may have been overlooked or neglected.

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