

Distribution of species of the genus *Oenothera* L. (Myrtales, Oenotheraceae) in Serbia

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ABSTRACT: By employing the UTM system (100×100 square meters expressed alphabetically and 10×10 square meters numerically), the distribution of the genus *Oenothera* L. in Serbia is presented on the basis of our own studies and both herbarium and literature data. *Oe. biennis* L. is the most frequent, then *Oe. salicifolia* DESF., whereas *Oe. glazioviana* MICHELI and *Oe. oakesiana* (A. GRAY) ROBBINS ex S. WATS et COULT are still rare species. *Oe. glazioviana* is recorded from two, while *Oe. oakesiana* from a one locality only.

Key words: adventive species, *Oenothera*, Serbia, distribution

Introduction

Species of the genus *Oenothera* L. are frequent and widespread in Europe. Their gene and areal centre from which they spread out in various directions is American continent. They may be found in various habitats like roads, railroads, embankments, sandy terrains, river banks or ruderal places of the urban regions. All the Serbian species belong to the subgenus *Oenothera*.

A great variation of anatomical and morphological characters, as well as a differential approach to the species definition cause frequently some misunderstandings in the systematics within this genus. There are two ways of defining the species concept in the genus *Oenothera*. One is the American

concept being founded mostly upon the cytogenetical investigations while the European concept uses stable phenotypic characteristics (ROSTAŃSKI 1982). In Europe, a total of 70 species and hybrids has been recorded (ROSTAŃSKI 1995). The *Oenothera* taxa and their distribution are well established in certain European regions. In other words, 6 species has been reported from Hungaria so far (ROSTAŃSKI 1965; SOÓ 1966), 15 in the Britain flora (ROSTAŃSKI 1982), 24 in Austria (ROSTAŃSKI 1982), 12 in Portugal (ROSTAŃSKI 1991), 16 in Italy (SOLDANO 1993), while 34 taxa were recorded from Poland, Czech Republic, and Slovak Republic (ROSTAŃSKI, 1995).

Viewed in this way, only insufficient data are available on the number and distribution of the *Oenothera* species in Serbia. The first data on the *Oenothera* species in Serbia were presented by PANČIĆ (PANČIĆ 1874). Almost a hundred years later new records on new species and their distribution were published (IVKOVIĆ 1975; OBRADOVIĆ & PANJKOVIĆ 1986; BOŽA & KNEŽEVIĆ 1988).

Subgen. *Oenothera*

Sect. *Oenothera*

Series *Oenothera* ROSTAŃSKI Feddes Repert. 96: 1-2, 7, 1985

1. *Oe. biennis* L. Sp. Pl. 1: 346, 1753.

2. *Oe. glazioviana* MICHELI in MARTIUS Fl. Brasil 13/2: 178, 1882.

Series *Devriesia* ROSTAŃSKI Feddes Repert. 96: 1-2, 5, 1985

3. *Oe. salicifolia* DESF. Tabl. Ecole Bot., ed. 2: 271, 1815

Series *Ruglesia* ROSTAŃSKI, Feddes Repert. 96: 1-2, 11, 1985

4. *Oe. oakesiana* (A. GRAY) ROBBINS ex S. WATS. et COULT. in A. GRAY Man. ed. 6: 190, 1890.

Distribution of species*

1. *Oenothera biennis* L. Sp. Pl. 1: 346, 1753.

Syn.: *Onagra biennis* (L.) SCOP. Fl. Carn. ed. 2, 1: 628, 1771; *Onagra europaea* SPACH Hist. Veg. (Phan.) 4: 359, 1835; *Oenothera biennis* subsp. *biennis* sensu MUNZ North Amer. Fl. ser. 2/5: 132, 1965.

Widespread and frequent European species (RAVEN 1968), also recorded from eastern Asia (ROSTAŃSKI 1982). First data from Serbia appeared in the second half of the nineteenth century (PANČIĆ 1874).

* Abbreviation of herbaria: BEO = Herbarium of Natural History Museum, Belgrade; BEOU = The Botanical Garden Herbarium, Belgrade; HIB = Herbarium of the Institute of Biology, Novi Sad; HMD = Herbarium Moesiacum Doljevac (vicinity of Niš).

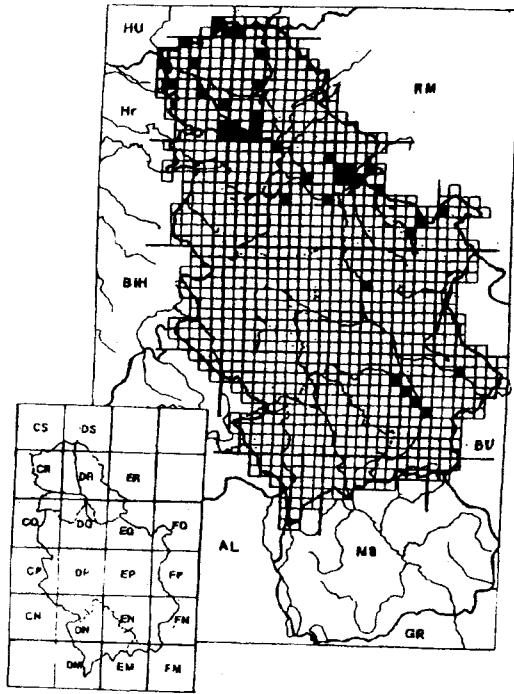


Fig. 1. Distribution of *Oenothera biennis* L. in Serbien.

Novi Sad, Ratno Island (ZORKÓZY 1896): DR01;
 Sremska Kamenica (ZORKÓZY 1896): DR00;
 Deliblato Sands, Kajtasovo (WAGNER 1914): EQ07;
 Rumenka, along railroad (KUPCSOK 1915): CR91;
 Apatin, embankment (PRODÁN 1916): CR45;
 Riđica, embankment (PRODÁN 1916): CR59;
 Šajkaš, ditches along railroad (PRODÁN 1916): DR21;
 Čortanovci, long the Danube (OBRADOVIĆ 1966): DR20;
 Slankamen (OBRADOVIĆ 1966): DQ49;
 Stepanovićevo, along road, 04.07.1971 (Lučić 1973): CR93;
 Deliblato Sánds, Konstantin pool, uncultivated soil long road (PANJKOVIĆ 1976): EQ16;
 Subotica, Radanovac, uncultivated soil (ŠABIĆ 1976): CS90;
 Grdelica (STAMENKOVIĆ 1977): EN85;
 Predejane (STAMENKOVIĆ 1977): EN94;
 Novi Sad, sand salinas (BUDAK 1978): DR01;
 Senta 18.07.1978. (MARIĆ 1979): DR28;
 Bečej, the Tisa bank, 01.06.1978. (PETROVIĆ 1979): DR25;
 Sremski Karlovci, alluvium along the Danube (BUTORAC 1981): DR10;
 Majdanpek, along the Great Pek river (GAJIĆ 1985): EQ71;

Novi Sad (BUDAK 1986): DR01;
 Žabalj (BUDAK 1986): DR22;
 Bačka Topola (IGIĆ 1991): CR97;
 The Palić Lake (IGIĆ 1991): DS01;
 Svetozar Miletić (IGIĆ 1991): CR67;
 Beograd (JOVANOVIĆ 1994): DQ66;
 Lalić (GRDINIĆ 1996): CR74;
 Ruski Krstur (GRDINIĆ 1996): CR74;
 Hajdukovo (PARABUĆSKI ined.): DS00;
 Čavolj (PARABUĆSKI ined.): CS81;
 Smederevo, Provalija, a field above Smederevo 1859., J.PANČIĆ, BEOU: DQ94;
 Gradište, on sandy terrain, avgust 1868., J.PANČIĆ, BEOU: EQ45;
 Ram, on sands, J.PANČIĆ, BEOU: EQ26;
 Čuprija, along the Great Morava river, J.PANČIĆ, BEOU: EP36;
 Banat region, Nera river, 10.06.1932., BEO :EQ37;
 Rušanj, 1940., T. SOŠKA, BEO: DQ54;
 Beograd, Pančevo Marsh, sand, 03.07.1942., GREBEŠČIKOV, BEO: DQ76;
 Fruška Gora, Bukovac, 09.1952., HIB: DR00;
 Pančevo Marsh, Borča surroundings, along the canal, 08.1953., BEO: DQ66;
 Fruška Gora, Venac, HIB: CR90;
 Fruška Gora, Brankovac, along road, HIB:CR90; N.DIKLIĆ, BEO: DQ76;
 Deliblato Sands, 29.05.1965., HIB: EQ06;
 Deliblato Sands, sandy habitats 26.08.1965., HIB: DQ98;
 Đerdap Gorge, D.Milanovac, river island Poreč (Greben), crest cultivated field, stubble,
 15.09.1965., N.DIKLIĆ, V.NIKOLIĆ, M.RAKIN, BEO: EQ82;
 Đerdap Gorge, Veliki Štrbac, Pecka pool, 25.06.1967., V.NIKOLIĆ, N.DIKLIĆ, BEO: FQ03;
 Novi Sad, 28.06.1972., HIB: DR01;
 Kovilj, 20.07.1972., HIB: DR20;
 Bogojevo, along the Danube, 17.09.1972., HIB: CR54;
 Veliko Gradište, 15.07.1973., HIB: EQ45;
 Piroć, nearby sandy terrain, 07.1992., HMD: FN28;
 Beograd, Pančevo Marsh, *Phragmition*, 16.06.1996., BEOU: DQ66;
 Bački Monoštor, along roads, 07.1996., HIB: CR37;
 Doljevac, Čečina, along the river, HMD: EN68;
 Leskovac, nearby ruderal habitats, HMD: EN76.

2. *Oenothera glazioviana* MICHELI in MARTIUS Fl. Brasil. 13/2: 178, 1882.

Syn.: *Oe. lamarckiana* auct. genet. sec. DE VRIES non SERINGE in DC. Prodr. 3: 46, 1828; *Oe. erythrosepala* BORBÁS Magy. Bot. Lapok 2: 24, 1903; *Oe. vrieseana* LEVEILLE Monogr. Oenoth.: 368, 1909; *Oe. grandiflora* subsp. *erythrosepala* (BORBÁS) LOVE Op. Bot. 5: 258, 1961.

Originates from North America, introduced as ornamental in Europe in the middle of the nineteenth century (SOĆ 1966). Today it is frequent in gardens or in numerous populations as withdrawn from culture. The first record from Serbia was made in 1991 in the surroundings of Subotica (leg. BOŽA et al. 1991).

Ludoško Lake, Subotica surroundings, sandy terrain, 07.1991., (SAVIĆ et. al. 1995): DS10;
 Zlatibor, Partizanske Vode, road leading to a touristic centre, 1996, HIB:CP93.

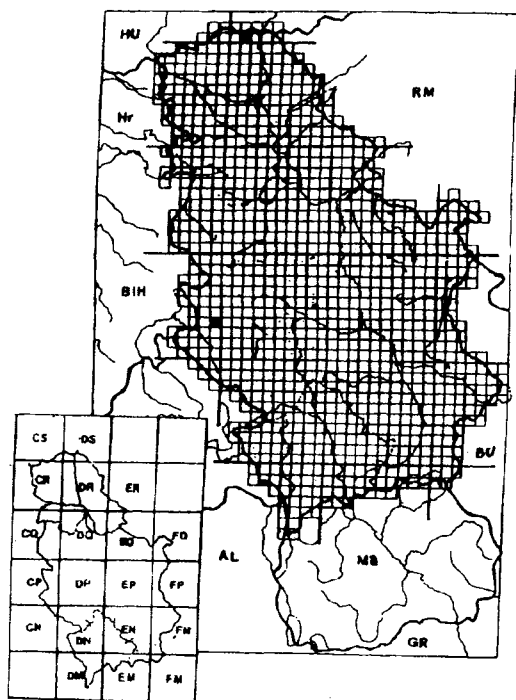


Fig. 2. Distribution of *Oenothera glazioviana* MICHELI in Serbia.

3. *Oenothera salicifolia* DESF. ex G. Don, Gen. Syst. 2: 685, 1832.

Syn.: *Onagra salicifolia* (DESF. ex G. DON) SPACH, Hist. Natur. Vég. Phanér. 4: 361, 1835; *Oenothera depressa* GREENE Pittonia 2: 261 1891; *Onagra depressa* (GREENE) SMALL, Bull. Torrey Bot. Club 23: 170, 1896; *Oenothera hungarica* BORBÁS, Magy. Bot. Lapok 2: 243, 1903; *Oe. bauri* BOEDIJN Z. Abstammungs- u. Vererbungsl. 32: 360, 1924; *Oe. biennis* subsp. *bauri* (BOEDIJN) TISCHLER Chromos. Gafasspfel. Mitteleur.: 57, 1950; *Oenothera strigosa* (RYDB.) MACK. et BUSH var. *depressa* (GREENE) GATES Tax. Genet. Oenothera: 34, 1958; *Oenothera strigosa* subsp. *hungarica* (BORBÁS) LÖVE et LÖVE. Op. Bot. 5: 257, 1961; *Oenothera villosa* THUNB. subsp. *villosa* sensu RAVEN et DIETRICH. Ann. Missouri Bot. Gard., 63: 382 (1976).

Introduced from North America in the first half of the nineteenth century therefore being adventive in Europe (SOÓ 1966). It inhabits the regions from France to the countries of former USSR (ROSTANSKI 1966). KOVÁCS recorded it as cultivated species in gardens of Stari Becej (KOVÁCS 1929). As subspontaneous Voivodina species (nearby Novi Sad) it was recorded for the first time on sandy soils by IVKOVIĆ (IVKOVIĆ, 1975).

Bečej, garden cultivated (Kovács 1929): DR25;
 Novi Sad, on sandy terrain(Ivković 1975): DR01;
 Đala (Boža et. al. 1980): DS31;
 Banovci (OBRADOVIĆ 1981): DQ48;
 Bačka Palanka (OBRADOVIĆ 1981): CR71;
 Beočin (OBRADOVIĆ 1981): DR00;
 Kneževac (OBRADOVIĆ 1981): DR39;
 Knićanin (OBRADOVIĆ 1981): DR40;
 Krčedin (OBRADOVIĆ 1981): DQ39;
 Novi Sad (OBRADOVIĆ 1981): DR01;
 Senta (OBRADOVIĆ 1981): DR28;
 Slankamen (OBRADOVIĆ 1981): DQ49;
 Žabalj (OBRADOVIĆ 1981): DR22;
 Horgoš (BUDAK 1986): DS11;
 Novi sad, on sandy terrain (BUDAK 1986): DR01;
 Bačka loess plateau (Igić 1991): DR07;
 Kovilj Mrsh, prominent, sunny edges of marsh and ruderal habitats (BUDAK et. al. 1992):
 DR20;
 Opovo, 05.06.1967., HIB: DQ58;
 Sremska Kamenica, 20.06.1971., HIB: DR00.

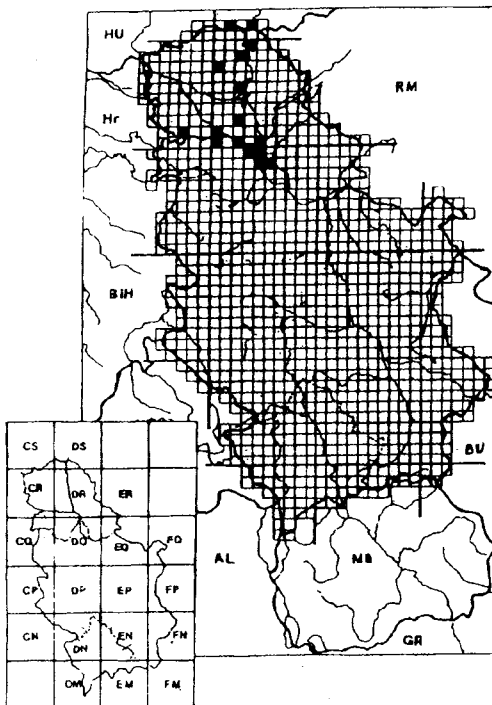


Fig. 3. Distribution of *Oenothera salicifolia* DESF. ex G. DON in Serbien.

4. *Oenothera oakesiana* (A. GRAY) ROBBINS ex S. WATS. et COULT. in A. GRAY Man. Bot. North. U. S., ed. 6: 190, 1890.

Syn.: *Oe. syrticola* BARTLETT Cybele Columb. 1: 28, 1914; *Oe. muricata* auct., Apud. Gates. Ident.: Gates PRL, VIII. und 6/35 (k), 1934.

Oenothera oakesiana is one of the first American species of the genus *Oenothera* introduced in Europe (ROSTAŃSKI 1982). This adventive plant has been recorded from Italy, Austria, Germany, Holland, Poland, Slovakia, Czech Republic, Hungary, and Romania so far (ROSTAŃSKI 1982). The first record for the surroundings of Novi Sad included ruderal habitats (BOŽA & KNEŽEVIĆ 1988). This species occurs in Serbia together with *Oe. biennis* and *Oe. salicifolia* and it predict possible creation of hybrid taxa.

Novi Sad, ruderal habitats on sandy substratum (BOŽA et.al. 1988): DR01.

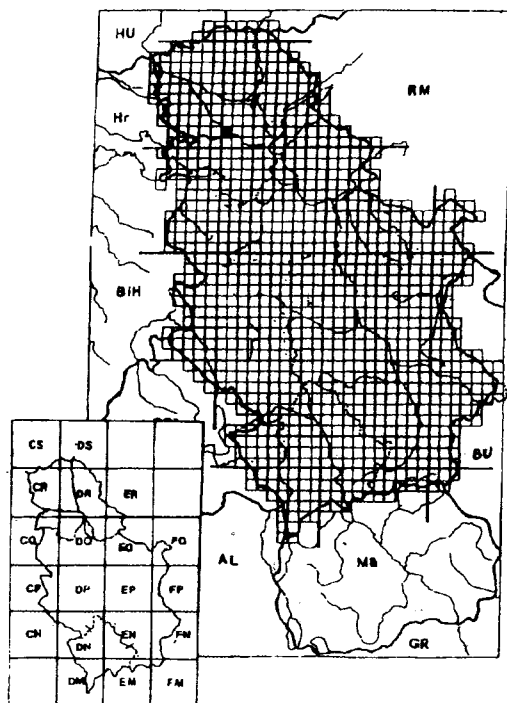


Fig. 4. Distribution of *Oenothera oakesiana* (A.GRAY) ROBBINS EX S. WATS. ET COULT. in Serbien.

Conclusion

Oe. biennis represents the most frequent *Oenothera* species (Fig. 1.), *Oe. salicifolia* is widening its distribution area (Fig. 3.), whereas *Oe. glazioviana* (Fig. 2.) and *Oe. oakesiana* (Fig. 4.) are still rare. It may be explained by favourable ecological conditions including plains, sandy, pebbly, and sunny open habitats, as well as favourable connections between this region and Central Europe.

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