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Occurrence of *Rosa blanda* Ait. (Rosaceae) in Poland

Introduction

Rosa blanda Ait. (sect. Cinnamomeae) is a North American species of rose, growing in Canada and the United States. Its natural range extends from Quebec to Ontario, south to Kansas, and east to Missouri and Ohio (Stephens, 1973; Gleason, Cronquist, 1991; Lewis et al., 2014). However, it has been cultivated and grown wild in Poland, Finland, Austria, Germany, and France (Tutin et al., 1968; Zieliński, 1987; Czarna, 2016; *Rosa blanda* Ait...). Mirek et al. (2002) granted *R. blanda* the status of an anthropophyte permanently established in Polish flora.



Fig. 2. Flower of *Rosa blanda* Ait. (Photo. 2013, W. Gruszka, Dendrological Garden in Przelewice)

R. blanda is morphologically similar to the native species *R. majalis* Herrm., for which it is a vicarious species (Zieliński, 1987). Characteristic features of this rose are needle-like thorns at the base of long shoots; flowering stems usually without thorns; leaflets blade elliptic or ovate, sometimes obovate; margins 1-serrate; teeth 10–26 per side; acute; and inflorescences corymbs, 1–5(–10)-flowered (Stephens, 1973; Zieliński, 1987; Lewis et al., 2014; *Minnesota Wildflowers a field...*; Fig. 1 – Appendix 1, Fig. 2).

There is almost no information on the distribution of this species in the Polish botanical literature, probably due to the fact that, outside of cultivation in botanical gardens or arboreta, few specimens are seen. In 2017, during field research carried out in the vicinity of Gorzów Wielkopolski, the authors came across a site where *R. blanda* was growing in 17 different-sized clusters. This finding provided the impetus to undertake this research study aimed at presenting all the *R. blanda* sites in Poland so far identified and determining its ability to establish and spread.

Materials and methods

In order to establish the distribution of spontaneous sites of this species in the country, the authors, in addition to their own observations, consulted collections in the largest national herbariums via e-mail. Information was obtained from the following herbariums: the Herbarium of the Białowieża Geobotanical Station at the University of Warsaw (BSG), the Herbarium of the Institute of Dendrology of the Polish Academy of Sciences in Kórnik (KOR), the Scientific Herbarium of the University of Silesia (KTU), the Herbarium of the Institute of Botany at the Jagiellonian University in Cracow (KRA), the Herbarium of Vascular Plants at the Institute of Botany of the Polish Academy of Sciences (KRAM), the Herbarium of the Maria Curie-Skłodowska University (LBL), the Herbarium of the Faculty of Biology at the University of Warsaw (WA), and the Herbarium of the Department of Taxonomy and Plant Geography at the Nicolaus Copernicus University in Toruń (TRN). Data published in papers by Zieliński (1977, 1987) and Czarna (2009, 2011, 2016) and unpublished information made available by researchers, Prof. Błażej Gierczyk from the Adam Mickiewicz University in Poznań and Lucjan Rutkowski, PhD from the Nicolaus Copernicus University in Toruń, were also included.

All the collected data are shown on the map (Fig. 3). The list of sites and the distribution map includes only sites that have been created spontaneously or those that are remnants of an old local cultivation (feral). Sites of specimens in private collections, botanical gardens, arboreta, etc. have not been recorded. The sites are located in relation to ATPOL (ATlas of POLand) squares, 10 × 10 km, (Zajęc, Zajęc, 2001) and the nearest village. Abbreviations used: obs. – observation, com. – compartment.

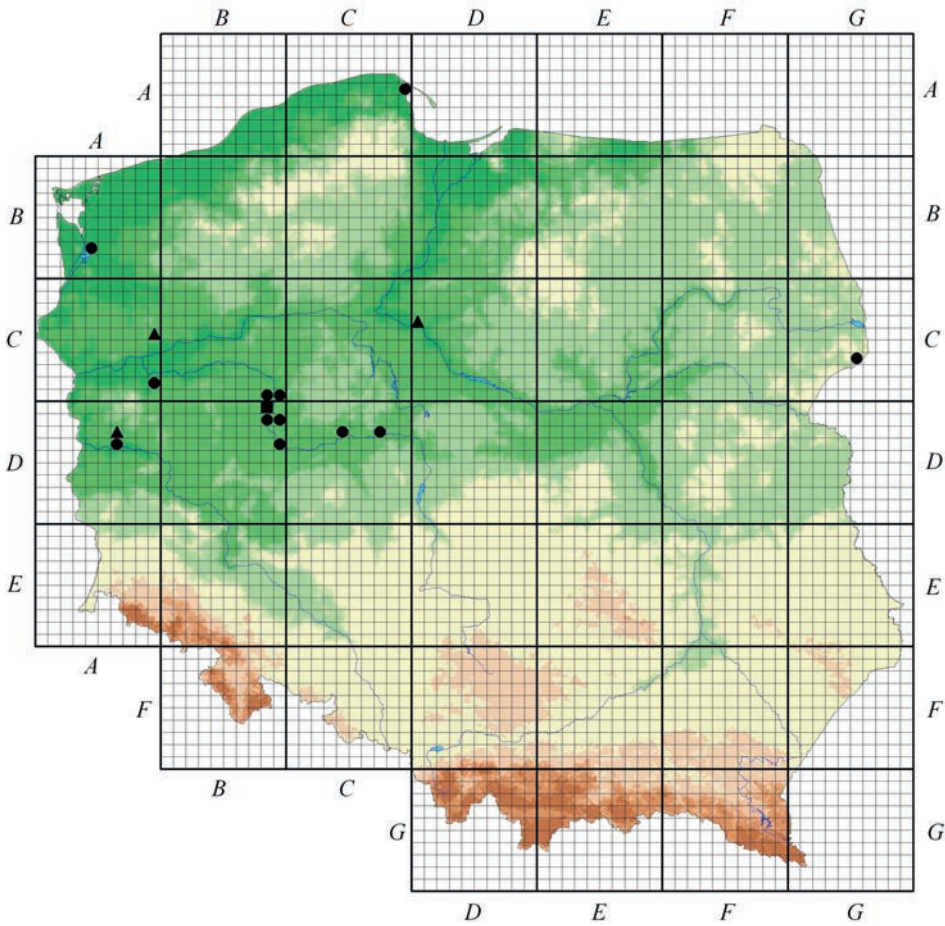


Fig. 3. Current distribution of *Rosa blanda* Ait. in Poland based on the ATPOL grid square system; ● – squares in which single sites were recorded for the species, ▲ – squares in which two sites were recorded for the species, ■ – squares in which four sites were recorded for the species

Glossary of geographical names in article

The list includes geographical coordinates for the villages in article:

Białowieża 52°42'04,9"N; 23°52'10,2"E (GC65)

Budachów 52°9'14,88"N; 15°5'3,56"E (AD26)

Dobrosułów 52°11'37"N; 15°07'28,99"E (AD26)

Konin 52°13'39"N; 18°15'41"E (CD27)

Poznań 52°24'52"N; 16°55'16"E (BC98, BC99, BD08, BD18, BD19)

Puck 54°42'59,93"N; 18°24'27,21"E (CA49)

Pyzdry 52°10'13"N; 17°41'24"E (CD24)

Skwierzyna 52°35'46,58"N; 15°30'10,38"E (AC89)

Strzelce Krajeńskie 52°52'43,22"N; 15°31'58,16"E (AC49)

Szczecin 53°26'N; 14°34'E (AB74)
 Śrem 52°05'N; 17°01'E (BD39)
 Toruń 53°02'N; 18°37'E (DC30)
 Wielisławice 52°53'51,28"N; 15°27'58,91"E (AC49)
 Zemsko 52°16'20,0"N; 16°34'45,4"E (AC89)

Results

Unpublished sites in ATPOL grid squares

AC4944, AC4955: between Strzelce Krajeńskie and Wielisławice, roadside trench, 2017, W. Gruszka,
 AD2615: Dobrosułów near Torzym, 2010, A. Czarna, (KOR 52896),
 BC9897: Poznań, 100 m from the intersection of Solidarności Avenue and Dojazd Street, roadside, obs. 2019, B. Gierczyk (e-mail information),
 BC9961: Poznań, Bożywoja Street, hedges, 2010, J. Zieliński, (KOR 48896),
 BD0814: Poznań, near Żwirki and Wigury II Family Allotment Gardens, 800 m from Bukowska Street, obs. 2019, B. Gierczyk (e-mail information),
 BD0831: Poznań, at Owczej Street, near Marcelesiński Forest, com. 85lx, obs. 2019, B. Gierczyk (e-mail information),
 BD1883: Poznań, Greater Poland National Park, com. 76c, woodland, 2004, A. Purcel, 2004 (KOR 47092),
 CD27: Konin, roadside slope, 1975, K. Balcerzak, 1975 (KOR 8975),
 DC3021: Toruń, Pawia Street, remnant of former local cultivation, obs. 2019, L. Rutkowski (e-mail information), and
 DC3061: Toruń, Sienkiewicza Street, remnant of former local cultivation, obs. 2019, L. Rutkowski (e-mail information).

Published sites in ATPOL grid squares

AB74: Szczecin area, (Zieliński, 1987),
 AC89: between Skwierzyna and Zemsko, remnant of former local cultivation (Zieliński, 1977),
 AD2662: Budachów, on the road from Osiecznica (Zieliński, 1977),
 AD3624: Lubuskie Lakeland, before Dobrosułów from Budachowo, remnant of an old hedge, 1974, J. Zieliński (KOR 6633, Zieliński, 1977),
 BD0845: Poznań, old Górczyński cemetery, remnant of former local cultivation (Czar-
 na et al., 2011; Czarna 2016),
 BD0853: Poznań, near Junikowska Street, side of fence of plot no. 54, B. Gierczyk
 11.06.2006 (*Rosa blanda* Aiton...),
 BD19: Poznań area, (Zieliński, 1987),

BD39: Śrem, hedges at the “Śrem” Iron Foundry (Czarna, 2009),
 CA49: Puck area, (Zieliński, 1987),
 CD2400: Pyzdry, old cemetery, remnant of former local cultivation (Czarna, 2016),
 and
 GC6508: Białowieża, Białowiecki National Park, Polana Białowiecka, 1991, Ł. Łuczaj,
 Herbarium BSG Vascular Plants (catalogue number A20192) published in: Global
 Biodiversity Information Facility database (*Rosa blanda* Ait....).
 Species were previously generally reported in the Białowiecka Forest (Zieliński, 1987).

Discussion

Rosa blanda Ait. has the status of an established, non-invasive kenophyte in Poland. Its introduction into Poland is estimated to be 1817 (Tokarska-Guzik et al., 2012). Since the second half of the 20th century, information about its sporadic spread beyond cultivation in gardens, arboreta, or botanical gardens has appeared in the literature (Zieliński, 1977, 1987).

R. blanda, as a foreign escapee species, is a rare species in Poland. A total of 22 sites, created spontaneously or as a remnant of old local cultivations, were identified. Its current range is mainly restricted to central and north-western Poland, with isolated sites in the north and east of the country (Fig. 3). However, it can be assumed that the distribution of the species in Poland is probably influenced by insufficient field research, particularly in the central and eastern part of the country. Therefore, it may be expected that the list of published sites will be supplemented with additional records in the future.

The spread of this species within the country may be facilitated by its wide tolerance, both in terms of climate and habitat conditions. *R. blanda* Ait. is a frost-resistant species; it tolerates temperatures to -42.8°C (USDA zones 2 to 6; United States Department of Agriculture). It is also shade resistant. In Polish climatic conditions it blooms abundantly and bears fruit; it also propagates very effectively by stolons (authors' observation).

Usually occurring in sunny, dry to moist sites (*Minnesota Wildflowers a field...*), it tolerates dry, sandy habitats that are poor in nutrients, such as roadsides (Stephen, 1973) and heavy clay soils. In terms of pH, it grows on acidic, alkaline, and neutral soils (*Plants for a future...*). Most often, it occurs in anthropogenic, partially transformed habitats (Tokarska et al., 2012).

Although rose has been included in the alien species list for Poland (*Gatunki obce w Polsce...*) its negative impact on native species of flora or other elements of the habitats in which it grows has not yet been described. Nevertheless, the possibility that such impacts exist cannot be excluded. For many alien species a so-called delay phase,

also known in the literature as a lag phase, has been observed between the appearance of the species and the discovery of its invasive behaviour (Hobbs, Humphries, 1995; Richardson, Pyšek, 2006). Therefore, it is important to know the current distribution of the plant's spontaneous sites and, in the long term, to undertake research aimed at determining its impact on the native flora. Furthermore, it has been proven that the species has a tendency to spontaneously cross with other species, for example *R. acicularis* Lindl., *R. carolina* L., and *R. virginiana* Mill. (Lewis, 2016; Lewis, Elvin-Lewis, 2017). A dangerous phenomenon may have been described by Mercure and Bruneau (2008) when they confirmed spontaneous crossing between *R. blanda* and *R. rugosa* Thunb. These are two species with great potential for range expansion that could pose a serious threat to the native flora. Although *R. rugosa* is widespread throughout Poland (and its abundance is increasing), as mentioned earlier, *R. blanda* occurs in few sites outside of cultivation. However, it should be noted that the hybrid form between *R. rugosa* and most probably *R. blanda* was observed by Zieliński (2014) in Poland in 1988; not as an F1 hybrid but as a next-generation segregant. In this context, it should be mentioned that *R. blanda* occurs in two places together with *R. rugosa* in the site between Strzelce Krajeńskie and Wielisławice, so the emergence of a hybrid between these species seems possible.

Acknowledgements

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Conflict of interest

The authors declare no conflict of interest related to this article.

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Abstract

The article presents the Smooth rose, *Rosa blanda* Ait. distribution in Poland based on literature data, available herbarium materials, and shared unpublished data. *R. blanda* is a North American species that is cultivated and has become wild throughout Poland, where it has the status of a domestic, non-invasive kenophyte. This species is rare in Poland. Only 22 sites have been identified (mainly in the central and northwestern part of the country), as created spontaneously or as remaining from old, local cultivations. However, it cannot be excluded that this species will become invasive in the future and will negatively affect native flora species, especially through its ability to cross with other rose species (including invasive *R. rugosa* Thunb.).

Key words: Rosaceae, distribution of stands, invasive potential, kenophytes

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Występowanie róży labradorskiej, *Rosa blanda* Ait. (Rosaceae) w Polsce**Streszczenie**

W artykule przedstawiono rozmieszczenie w Polsce róży labradorskiej *Rosa blanda* Ait. na podstawie danych z literatury, dostępnych materiałów zielnikowych, a także udostępnionych danych niepublikowanych. *R. blanda* jest gatunkiem północnoamerykańskim, który jest uprawiany i zdziczał na terytorium całej Polski, gdzie posiada status zadomowionego, nieinwazyjnego kenofita. Gatunek ten jest rzadki w Polsce. Zidentyfikowano tylko 22 stanowiska (głównie w środkowej i północno-zachodniej części kraju), powstałe prawdopodobnie spontanicznie lub będące pozostałością starych, lokalnych upraw. Nie można jednak wykluczyć w przyszłości zachowania inwazyjnego i negatywnego wpływu na rodzime gatunki flory, zwłaszcza że gatunek ten ma tendencję do krzyżowania się z innymi gatunkami (w tym inwazyjną *R. rugosa* Thunb.).

Słowa kluczowe: Rosaceae, rozmieszczenie stanowisk, potencjał inwazyjny, kenofity

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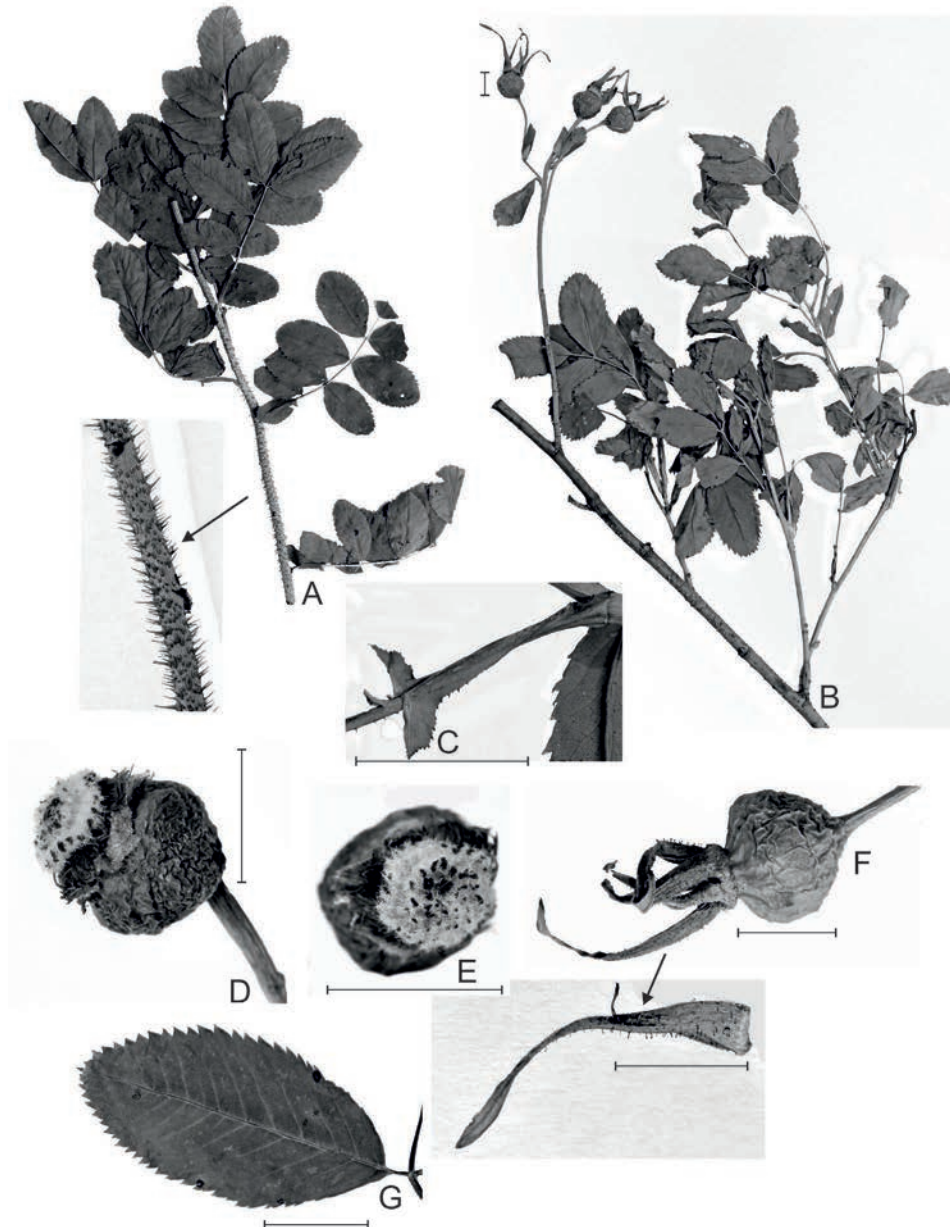


Fig. 1. Smooth Rose, *Rosa blanda* Ait. (Photo. 2018, A. Sołtys-Lelek, specimen from Poland, between Strzelce Krajeńskie and Wielisławice, 2017, W. Gruszka); A – part of long shoot, B – part of fruiting short shoot, C – stipule, D, E – fruit, F – fruit with glandular sepal, G – leaf. Solid bar = 1 cm