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THE RESOURCES AND CONDITIONS OF OCCURRENCE OF WILD CHERRY *PRUNUS AVIUM* (ROSACEAE) IN THE WIELKOPOLSKI NATIONAL PARK

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Abstract. An inventory of wild cherry trees in the Wielkopolski National Park was made during 2007-2008. Totally, 1098 specimens of the species, in 86 forest compartments were inventoried. There were 28 monumental trees among them; the biggest one of 30 m height and 197 cm of circumference. The habitat conditions of *Prunus avium* occurrence on its natural sites of the Wielkopolski National Park show a wide range. Wild cherry grows here on soils representing eight types – most often on lessivè and rusty soils. In the typology of forest habitats, the species, occurs most often on habitats of a fresh deciduous forest sites, a fresh mixed deciduous forest sites and a fresh oak-pine forest sites. Also the community context of its sites shows a wide range. Wild cherry trees were recorded in eight forest plant communities – the most frequent in phytocoenoses of oak-hornbeam forests *Galio sylvatici-Carpinetum*, acidophilous oak forests *Calamagrostio arundinaceae-Quercetum* and continental pine-oak forests *Querco roboris-Pinetum*.

Key words: wild cherry, ecology, monumental trees, conservation of genetic resources, Wielkopolski National Park

INTRODUCTION

National parks, protecting remnants of natural plant communities and autochthonous populations of plants and animals, play a significant role in the protection of biodiversity at the level of species and ecosystems. In the late 1990's the Forestry Research Institute developed principles for the selection and qualification of objects for protection in the 22 Polish national parks [Matras 2002]. The protection of gene resources of trees and shrubs constituted an important element of the prepared program. In the first stage of this program the Wielkopolski National Park proposed to include 22 species of trees and shrubs in the protection of gene resources. These included also wild cherry *Prunus avium* L. [Matras 2002].

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Wild cherry is a valuable, forest biocenotic species, adding attraction to the landscape due to its high ornamental value during flowering. Moreover, cherry tree wood is valued and demanded by the furniture industry. The range of wild cherry covers most of Europe, except for its northern and eastern edges [Russell 2003]. In Poland it grows mainly in the south of the country. The biggest concentration of localities is found in the Carpathian Foothills, the Beskidy Mountains, the Bieszczady Mountains, the Sudety Foreland and Foothills as well as the Małopolska Upland, the Roztocze and the Lubelska Upland [Boratyńska 1990, Atlas... 2001]. The locality of *P. avium* in the Wielkopolski National Park is thus situated outside the limits of the compact range of this species.

The aim of the presented study was to determine the resources and conditions of the occurrence of wild cherry in the Wielkopolski National Park. Gaining insight in this respect constitutes the basis for the development of a program for conservation of genetic resources of this species in the analysed area.

MATERIAL AND METHODS

Field investigations were conducted in the years 2007-2008. All identified specimens of wild cherry were inventoried, with their height and diameter at the breast height measured and in case of thick trees – also their circumference (at a height of 130 cm). All specimens were marked on a small-scale map of the Wielkopolski National Park (1:25 000). For forest compartments and subcompartments, in which *P. avium* was recorded, data was collected (from the Protection Plan for the Wielkopolski National Park for the period 1.01.1998-31.12.2017), concerning the type and subtype as well as texture of soils, forest site habitats and forest communities.

RESULTS

In the Wielkopolski National Park a total of 1089 *P. avium* specimens were recorded in 86 forest compartments. The mean height of measured trees was 7.4 m. The most common specimens were 5-10 m tall (almost 50%); 23 trees reached the height of more than 20 m (Table 1). Mean diameter at the breast height of inventoried trees was 10.5 cm. In terms of diameter at the breast height the biggest number of specimens were within the range of 5-10 cm (almost 50%); 120 trees had a diameter of over 20 cm (Table 2). Among wild cherry trees recorded in the Wielkopolski National Park 28 reached the dimensions of monumental trees recommended for this species [Kasprzak 2005] (Table 3). Two biggest trees growing in the vicinity of a hospital at Ludwików on Lake Kociołek have trunk diameters of 63 and 49 cm (circumferences of 197 and 152 cm, respectively) and heights of 30 and 34 m, respectively.

Habitat conditions for the occurrence of *P. avium* in natural sites in the Wielkopolski National Park vary considerably. Wild cherry trees grow in forests of this Park on soils representing the following eight types: brown soils, acid brown soils, soils lessivès, rusty soils, podzol soils, river alluvial soils, deluvial soils and anthropogenic soils with an unformed profile, and belonging to three divisions – autogenic soils, alluvial and deluvial soils and anthropogenic soils. *Prunus avium* trees grow most commonly on soils

Table 1. An account of *Prunus avium* trees in the classes of height
Tabela 1. Zestawienie drzew *Prunus avium* w klasach wysokości

Height, m Wysokość, m	< 5	5-10	10.5-15	15.5-20	> 20
Number of trees Liczba drzew	333	529	164	40	23

Table 2. An account of *Prunus avium* trees in the classes of diameter at the breast height (Dbh)
Tabela 2. Zestawienie drzew *Prunus avium* w klasach pierśnicy

Dbh, cm Pierśnica, cm	< 5	5-10	10.5-15	15.5-20	> 20
Number of trees Liczba drzew	171	521	195	82	120

Table 3. An account of *Prunus avium* monumental trees
Tabela 3. Zestawienie drzew pomnikowych *Prunus avium*

Location Lokalizacja	Height, m Wysokość, m	Dbh, cm Pierśnica, cm	Circumference, cm Obwód, cm
1	2	3	4
10 d	12	30	95
12 a	25	30	94
12 b	15	34	107
	17	32	102
44 f	13	36	112
48 i	12	44	140
51 c	24	36	114
61 f	12	32	100
	16	34	106
64 a	22	31	98
68 b	14	30	96
68 d	18	34	108
68 d	15	36	112
74 c	25	42	131
91 d	32	41	130
91 d	34	49	152
Hospital area in Ludwikowo – forest Teren szpitala w Ludwikowie – las	19	37	118
	25	41	130
	30	63	197
	26	34	105

Table 3 – cont. / Tabela 3 – cd.

1	2	3	4
93 a	13	35	110
	19	34	105
94 c	14	30	93
133 a	18	33	104
133 Aa	16	34	107
188 g	16	34	108
	14	37	119
202 a	20	28	87

lessivès (46 compartments) and rusty soils (35 compartments). As far as soil textural groups are concerned, sandy soils definitely predominate on sites with wild cherry – loose sands, slightly loamy sands, loamy sands and compact soils. Light alluvial soils or heavy loams are much less common.

In the typology of forest habitats the sites in which *P. avium* is found, located in the Wielkopolski National Park, fall within a wide range – from fresh coniferous forest and fresh mixed coniferous forest sites, through fresh mixed deciduous forest and fresh deciduous forest sites, to moist deciduous forest and flood plain forest sites. It results from the conducted survey that a vast majority of wild cherry trees grow on fresh deciduous forest sites (54 compartments), fresh mixed deciduous forest (35 compartments) and fresh mixed coniferous forest sites (21 compartments).

Wild cherry in the Wielkopolski National Park is found within a wide phytocenotic scale and it may be observed in forest phytocenoses with diverse site conditions. The occurrence of *P. avium* was reported in the eight forest communities: *Leucobryo-Pinetum* (suboceanic fresh coniferous forest), *Querco roboris-Pinetum* (continental pine-oak forest), *Calamagrostio arundinaceae-Quercetum* (acidophilous oak forest), *Galio sylvatici-Carpinetum* (oak-hornbeam forest), *Luzulo pilosae-Fagetum* (acidophilous lowland beech forest), *Circaeo-Alnetum* (ash-alder riparian forest), *Ficario-Ulmetum* (ash-elm riparian forest) and *Salici-Populetum* (willow-poplar riparian forest), representing four classes and six associations. In a vast majority of cases in the analysed area wild cherry is found in phytocenoses of oak-hornbeam forests *Galio sylvatici-Carpinetum* (57 compartments), acidophilous oak forests *Calamagrostio arundinaceae-Quercetum* (31 compartments) and continental pine-oak forests *Querco roboris-Pinetum* (18 compartments).

DISCUSSION

Results of the conducted survey of wild cherry in the Wielkopolski National Park showed that this species is much more numerous and more common that it had been supposed before. In a survey of vascular flora of the Wielkopolski National Park [Żukowski et al. 1995] wild cherry was described as a scattered species found in 14 localities, in oak-hornbeam forests, open oak forests and mesophilous thickets. In con-

trast, a detailed survey showed the occurrence of 1089 *P. avium* specimens in as many as 86 compartments. We need to mention here particularly trees of monumental dimensions, with a total number of almost 30. The biggest wild cherry in the Wielkopolski National Park grows in Ludwików, it is 30 m tall, of 197 cm in circumference. According to Pacyniak [1992], the biggest wild cherries in Poland have a circumference of a little more than 300 cm and their age is estimated at approximately 100-125 years. The thickest trees are as a rule found in open areas, while in those growing in forest stands the circumference usually does not exceed 200 cm.

According to Zarzycki et al. [2002], wild cherry is found in Poland most frequently on fresh, mineral humus soils, from moderately poor soils to rich soils. Site conditions for the occurrence of *P. avium* in the Wielkopolski National Park correspond fully to the indicator figures for this species.

The phytocenotic scale of this species is relatively wide. According to Balcerkiewicz [1990], in Poland *P. avium* is found in phytocenoses of at least 20 forest associations; however, this species is found relatively regularly only in six of them (*Tilio-Carpinetum*, *Potentillo albae-Quercetum petraeae*, *Dentario glandulosae-Fagetum*, *Galio sylvatici-Carpinetum*, *Molinio arundinaceae-Quercetum* and *Alnetum incanae*). Wild cherry is associated most with oak-hornbeam forest of the *Carpinion betuli* association, for which it is considered a characteristic species. Also in the Wielkopolski National Park *P. avium* shows a wide phytocenotic scale, being found in forest communities representing eight associations. Also here wild cherry is found most frequently in oak--hornbeam forests.

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ZASOBY I WARUNKI WYSTĘPOWANIA CZEREŚNI PTASIEJ *PRUNUS AVIUM* (ROSACEAE) W WIELKOPOLSKIM PARKU NARODOWYM

Streszczenie. W latach 2007-2008 przeprowadzono inwentaryzację czereśni ptasiej na terenie Wielkopolskiego Parku Narodowego. Zinwentaryzowano ogółem 1089 osobników tego gatunku, w 86 oddziałach leśnych. Wśród nich znalazło się 28 drzew pomnikowych; największe osiągnęło wysokość 30 m i obwód 197 cm. Warunki siedliskowe występowania *Prunus avium* na naturalnych stanowiskach w Wielkopolskim Parku Narodowym mają szeroki zakres. Czereśnia ptasia rośnie na glebach reprezentujących osiem typów – najczęściej na glebach płowych oraz rdzawych. Uwzględniając typologię siedlisk leśnych, stwierdzono, że najczęściej występuje na siedliskach lasu świeżego, lasu mieszanego świeżego oraz boru mieszanego świeżego. Czereśnia ptasia na terenie Wielkopolskiego Parku Narodowego ma również szeroką skalę fitocenotyczną. Ogółem odnotowano występowanie *P. avium* w płatach ośmiu zespołów leśnych – najczęściej w fitocenozach lasów dębowo-grabowych *Galio sylvatici-Carpinetum*, acidofilnych dąbrów *Calamagrostio arundinaceae-Quercetum* oraz borów mieszanych *Querco roboris-Pinetum*.

Słowa kluczowe: czereśnia ptasia, ekologia, drzewa pomnikowe, ochrona zasobów genowych, Wielkopolski Park Narodowy

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