

THE CURRENT CONDITION OF THE ORCHIDACEAE POPULATIONS IN POLISH NATIONAL PARKS

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Abstract - The priority task of national parks is to protect valuable species, including Orchidaceae. This article presents data on the occurrence of Orchidaceae taxa in Polish national parks, and is an attempt to evaluate their number within the orchid family included in this type of protected area.

Key words: National park, Orchidaceae, occurrence, species protection, Poland, *Epipactis*, *Dactylorhiza*

INTRODUCTION

Within the territory of Poland there are 23 national parks which cover about 1% of the total area of the country. They often contain unique mosaics of habitats with high species diversity on areas of not less than 1000 ha. Pursuant to the provisions of the Act, the area covered by this type of protection should not only be characterized by social, cultural and educational values, but most of all by the natural beauty, landscape and scientific ones (Act of 16 April 2004). Protection conducted in the parks was established on the basis of a special conservation plan which should favor the preserving of valuable items, especially rare species of plants and animals under the legal protection of the species (Department of Forestry and Nature Conservation, 2010, Grzegorzczak, 2007, Act of 16 April 2004). The orchid family (Orchidaceae) is one of the largest and most diverse botanical families

(Arditti, 1967, Brzosko et al. 2008). Both the number and status of the taxonomic species within the family are a contentious issue and still controversial, mainly because of the wide range of taxa phenotypic plasticity and difficulties with defining the boundaries between species (Faltyn, Jakubská-Busse, 2008, Jakubská-Busse, Gola, 2010, Jakubská-Busse et al., 2012). It is estimated that in the world today there are from 20 to 35 thousand species of orchids (Arditti, 1967, Butler, 2000, Baumman et al., 2010, Delforge, 2006). Representatives of this family can be found in almost all continents, from the Arctic to the Antarctic, in all kinds of habitats, including meadows and bogs, deserts and semi-deserts, mountainous areas, and even underground (Arditti, 1967, Szlachetko, Skakuj, 1996, Szlachetko, 2001, Jakubská et al., 2005, Nicole et al., 2005, Jakubská, 2006, Baumman et al., 2010, Stefaniak et al., 2011). Despite the large number of described species and extreme specializa-

tion, orchids are dying out. The main threats to this group, regardless of the area of distribution, are the loss of habitat, predatory exploitation and trafficking (Bernacki et al., 2008). Abiotic environmental pollution, land-use changes and urbanization also affect the decrease in the number of natural populations (Nowicka-Falkowska, Falkowski, 2005).

Thanks to their *in situ* protection, national parks are also a refuge for the protection of gene species including the orchid (Silska, Praczyk, 2009).

Regardless of the form of protection carried out in national parks, all species belonging to the Orchidaceae family in Poland are under strict protection (Regulation of 05.01.2012), seventeen of them are entered into the Polish Red Book of Plants (Zarzycki et al., 2001), and two of them (*Cypripedium calceolus* and *Liparis loeselii*) are covered by the protection program of the European ecological network, Natura 2000. The high degree of risk of extinction is also confirmed by including orchids into the group of plants with special needs according to Zarzycki (1992). Keeping orchid populations in national parks offers a large field for research (for example on demographic trends) to research units, and provides specific facilities for maintaining the

genetic diversity of Polish flora, including the use of *in vitro* techniques to reintroduce taxa.

The aim of this study was to determine the current list of orchid species in the national parks in Poland, including the determination of the level of their uniqueness.

MATERIALS AND METHODS

Data used for analysis was obtained directly from the materials received from the management of national parks, from the official websites and oral information from both the researchers and individuals. The graph and description in the text includes only species of orchid confirmed by the study. Extinct species and unconfirmed ones were placed in tables and are highlighted. Expanded abbreviations of national parks are under Tables 1 and 2.

RESULTS

Orchids in national parks in Poland

Within the area of national forests in Poland, there were recorded 49 species of orchids belonging to 24 genera, one hybrid (*Dactylorhiza × braunii* (Halacsy)

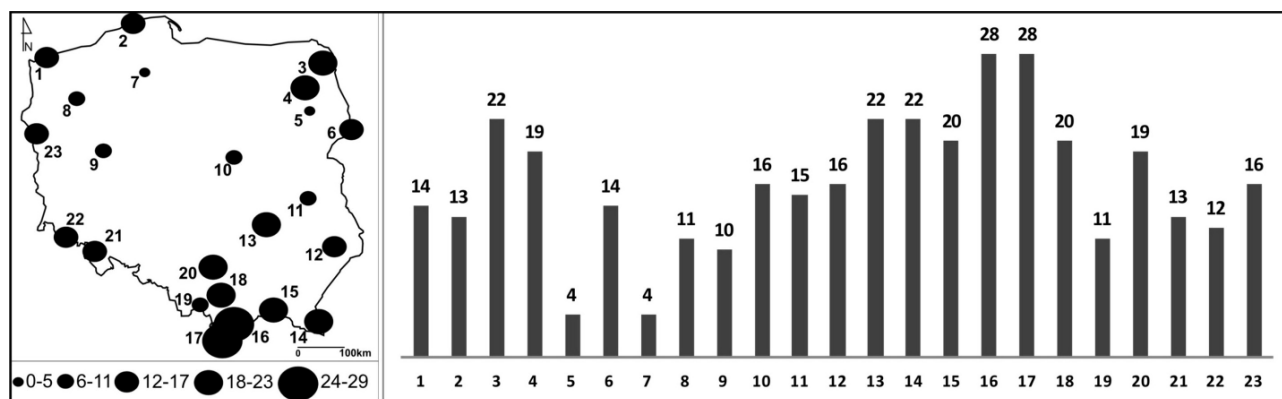


Figure 1. First The number of species of the family Orchidaceae found in the Polish national parks

Explanation: 1 – Woliński NP, 2 – Słowiński NP, 3 – Wigierski NP, 4 – Biebrzański NP, 5 – Narwiański NP, 6 – Białowiecki NP, 7 – NP Bory Tucholskie, 8 – Drawieński NP, 9 – Wielkopolski NP, 10 – Kampinoski NP, 11 – Poleski NP, 12 – Roztoczański NP, 13 – Świętokrzyski NP, 14 – Bieszczadzki NP, 15 – Magurski NP, 16 – Pieniński NP, 17 – Tatrzański NP, 18 – Gorczański NP, 19 – Babiogórski NP, 20 – Ojcowski NP, 21 – NP Gór Stołowych, 22 – Karkonoski NP, 23 – NP Ujście Warty

* (NP) National Park

Table 1. Orchid species found in the northern Polish national parks

Explanation: B. – Białowiecki NP (Karczeńska 2011), Bi. – Biebrzański NP, BT – NP Bory Tucholskie, D. – Drawieński NP, K. – Kampinoski NP, N. – Narwiański NP, S. – Słowiński NP, Wi. – Wigierski NP, Wo. – Woliński NP, Wie. – Wielkopolski NP, UW – NP Ujście Warty

Species confirmed

Species have become extinct or acknowledged in recent years

Species	National Park										
	B.	Bi.	BT	D.	K.	N.	S.	Wi.	Wie.	Wo.	UW.
<i>Cephalanthera damasonium</i> (Mill.) Druce										■	
<i>Cephalanthera rubra</i> (L.) Rich.	■	■							■	■	■
<i>Coeloglossum viride</i> (L.) Hartman	■	■									
<i>Corallorhiza trifida</i> Chatelain					■		■			■	
<i>Cypripedium calceolus</i> L.	■	■			■			■			
<i>Dactylorhiza baltica</i> (Klinge) Nevski								■			
<i>Dactylorhiza ×braunii</i> (Halacsy) Borsos & Soó				■							
<i>Dactylorhiza fuchsii</i> (Druce) Soó	■	■		■	■		■	■			
<i>Dactylorhiza incarnata</i> (L.) Soó	■	■	■	■	■	■	■	■	■	■	■
<i>Dactylorhiza incarnata</i> ssp. <i>ochroleuca</i> (Wustnei) O. Schwartz		■				■		■			
<i>Dactylorhiza incarnata</i> (L.) Soó var. <i>macrophylla</i>								■			
<i>Dactylorhiza maculata</i> (L.) Soó	■	■		■	■	■	■	■	■	■	■
<i>Dactylorhiza majalis</i> (Rchb.) P. F. Hunt & Summerh.	■	■		■	■	■	■	■	■	■	■
<i>Dactylorhiza russowi</i> (Klinge) Holub					■						
<i>Dactylorhiza ruthei</i> (R. Ruthe et M. Schulze in R. Ruthe) Soó								■			
<i>Dactylorhiza sambucina</i> (L.) Soó											■
<i>Dactylorhiza traunsteinerii</i> (Saut.) Soó					■		■	■	■	■	
<i>Epipactis atrorubens</i> (Hoffm.) Besser	■	■		■	■		■	■	■	■	■
<i>Epipactis helleborine</i> (L.) Crantz	■	■	■	■	■		■	■	■	■	■
<i>Epipactis palustris</i> (L.) Crantz	■	■		■	■		■	■	■	■	■
<i>Epipactis purpurata</i> Sm.					■						
<i>Epipogium aphyllum</i> Sw.	■										
<i>Goodyera repens</i> (L.) R. Br.	■	■	■	■	■			■	■	■	■
<i>Gymnadenia conopsea</i> (L.) R. Br.		■							■		■

Table 1. Continued

Species	National Park										
	B.	Bi.	BT	D.	K.	N.	S.	Wi.	Wie.	Wo.	UW.
<i>Herminium monorchis</i> (L.) R. Br.								■			
<i>Liparis loeselii</i> (L.) Rich.		■		■			■	■			■
<i>Listera ovata</i> (L.) R. Br.	■	■		■	■		■	■	■	■	■
<i>Malaxis monophyllos</i> (L.) Sw.							■	■			
<i>Neotianthe cucullata</i> (L.) Schltr.							■	■			
<i>Neottia nidus-avis</i> (L.) Rich.	■	■			■		■	■	■	■	■
<i>Orchis coriophora</i> L.		■									
<i>Orchis mascula</i> L.											■
<i>Orchis militaris</i> L.					■						■
<i>Orchis morio</i> L.					■						
<i>Orchis palustris</i> Jacq.		■			■						■
<i>Platanthera bifolia</i> (L.) Rich.	■	■		■	■		■	■	■	■	■
<i>Platanthera chlorantha</i> (Custer) Rchb.		■			■		■	■	■	■	■
<i>Traustainera globosa</i> (L.) Rchb.											■

Borsos & Soó), 3 subspecies (*Dactylorhiza incarnata* ssp. *ochroleuca* (Wustnei) O. Schwartz, *Gymnadenia conopsea* (L.) R. Br. ssp. *conopsea*, *Gymnadenia conopsea* ssp. *densiflora*) and 1 variant (*Dactylorhiza incarnata* (L.) Soó var. *macrophylla*). Most species were recorded within the genera *Dactylorhiza* Neck. ex Nevski (13), *Orchis* Tourn. ex L. (7) and *Epipactis* Zinn (6). The largest number of species is listed in the Tatrzanski National Park and Pieniński National Forest (28), and the smallest number is recorded in Tucholski National Forest and Narewski National Park (4 species) (Fig. 1).

The most common species in national forests are *Dactylorhiza majalis* (Rchb.) P. F. Hunt & Summerh (21 NP), *Epipactis helleborine* (L.) Crantz (21), *Listera ovata* (L.) R. Br. (21), *Platanthera bifolia* (L.) Rich. (20), *Epipactis palustris* (L.) Crantz (19), and

Dactylorhiza maculata (L.) Soó (17). Ten species of orchid were found only once in the analyzed national forests: (*Chamorchis alpina* (L.) Rich. TNP, *Dactylorhiza baltica* (Klinge) Nevski WiNP, *Dactylorhiza incarnata* (L.) Soó var. *macrophylla* WiNP, *Dactylorhiza ×psychrophila* (Schltr.) Aver. KaNP, *Dactylorhiza ruthei* (R. Ruthe et M. Schulze in R. Ruthe) Soó WiNP, *Herminium monorchis* (L.) R. Br. WiNP, *Leucorchis albida* (L.) A. et D. Löve BaNP, *Epipactis microphylla* (Ehrh.) Sw. PiNP, *Neotianthe cucullata* (L.) Schltr. WiNP, and *Spiranthes spiralis* (L.) Chev.-all. ONP) (Table 1, 2).

As many as 26 species are considered extinct or at least they have not been recorded recently, two of which could not be confirmed three times in a row, such as *Epipogium aphyllum* Sw. in Karkonoski National Park, Roztoczański National Forest and

Table 2. Continued

Species	National Park											
	Ba.	Bie.	G.	GS.	Ka.	M.	O.	Pi.	P.	R.	Ś.	T.
<i>Lisreta ovata</i> (L.) R. Br.	■	■	■	■	■	■	■	■	■	■	■	■
<i>Listera cordata</i> (L.) R. Br.	■	■	■	■	■	■	■	■	■	■	■	■
<i>Malaxis monophyllos</i> (L.) Sw.	■	■	■	■	■	■	■	■	■	■	■	■
<i>Neottia nidus-avis</i> (L.) Rich.	■	■	■	■	■	■	■	■	■	■	■	■
<i>Ophrys muscifera</i> L.	■	■	■	■	■	■	■	■	■	■	■	■
<i>Orchis coriophora</i> L.	■	■	■	■	■	■	■	■	■	■	■	■
<i>Orchis mascula</i> L.	■	■	■	■	■	■	■	■	■	■	■	■
<i>Orchis militaris</i> L.	■	■	■	■	■	■	■	■	■	■	■	■
<i>Orchis morio</i> L.	■	■	■	■	■	■	■	■	■	■	■	■
<i>Orchis pallens</i> L.	■	■	■	■	■	■	■	■	■	■	■	■
<i>Orchis palustris</i> Jacq.	■	■	■	■	■	■	■	■	■	■	■	■
<i>Orchis ustulata</i> L.	■	■	■	■	■	■	■	■	■	■	■	■
<i>Platanthera biforia</i> (L.) Rich.	■	■	■	■	■	■	■	■	■	■	■	■
<i>Platanthera chlorantha</i> (Custer) Rchb.	■	■	■	■	■	■	■	■	■	■	■	■
<i>Pseudorchis albida</i> (L.) Á. Löve & D. Löve	■	■	■	■	■	■	■	■	■	■	■	■
<i>Spiranthes spiralis</i> (L.) Chevall.	■	■	■	■	■	■	■	■	■	■	■	■
<i>Traustainera globosa</i> (L.) Rchb.	■	■	■	■	■	■	■	■	■	■	■	■

Białowiecki National Park, Roztoczański National Park, and *Orchis palustris* Jacq. in the Bieszczadzki National Park, Karkonoski National Park and Biebrzański National Park.

Most species of orchids were found in parks located in the southern part of the country, the number of species ranging from 11 to 28. In the northern part, the Polish number of species ranged from 4 to 22. These numbers is a result of the geographical and climatic diversity of the habitats, but they also involve a high level of anthropopression.

DISCUSSION

The most common types of orchids in the areas of national forests are *Dactylorhiza* and *Epipactis*, due to their wide ecological amplitude and geographical range (Dickson, 1990, Świercz, 2006, Stefaniak et

al., 2011). National parks located on the mountainous areas are home to rare species such as *Spiranthes spiralis* or *Pseudorchis albida*. The very few records of species such as *Herminium monorchis* or *Epipogium aphyllum* may be linked to a specific biology of the species and the loss of their potential habitat (Sokolowski, 1988).

Especially valuable is the orchid flora of Biebrzański National Park, where we have populations of six species that were not listed in the other national forests, including *Dactylorhiza incarnata* ssp *ochroleuca* or *Orchis coriophora* (Werpachowski, 2005).

The worst, in terms of long-term records of existence, is the current state of Karkonoski National Park, whose territory has failed to confirm the presence of as many as 13 species. Probably the loss of

orchids is associated with the strong level of anthropoppression of the foothill zone, where these species were reported.

It is undisputed that the national parks are real refuges for orchid populations in Poland and their permanent monitoring and protection ensures the maintenance of their resources in the country.

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- Bieszczadzki NP http://www.bdpn.pl/index.php?option=com_content&task=blogcategory&id=51&Itemid=137 (data wejścia 09.09.2012)
- Magurski NP <http://www.magurskipn.pl/index.php?d=artykul&kat=3&art=697> (data wejścia 09.09.2012)
- Ojcowski NP http://www.ojcowskiparknarodowy.pl/main/swiat_roslin.html (data wejścia 09.09.2012)
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- Białowiecki NP http://www.bpn.com.pl/index.php?option=com_content&task=view&id=25&Itemid=46 (data wejścia 09.09.2012)
- Bebrzański NP <http://www.biebrza.org.pl/index.php?strona=49> (data wejścia 09.09.2012)
- Drawieński NP <http://www.dpn.pl/rosliny-zielne> (data wejścia 09.09.2012)
- Woliński NP <http://www.wolinpn.pl/index.php?page=28&artykul=33> (data wejścia 09.09.2012)
- Wigierski NP <http://www.wigry.win.pl/glowne/rosliny.htm> (data wejścia 09.09.2012)
- Słowiński NP <http://www.slowinskipn.pl/pl/przyroda> (data wejścia 09.09.2012)
- <http://www.npn.pl/rosliny> (data wejścia 09.09.2012)