EXTINCT, THREATENED AND RARE VASCULAR PLANTS OF THE POLISH CARPATHIANS

by

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Introduction

The Carpathian Mountains cover not more than 7% of the territory of Poland. In this limited area however, there is a comparatively rich flora comprising more than 1600 vascular plant species (native taxa and established aliens), which is 70% of the total flora of the country (2300 vascular plant species). A relatively high degree of anthropogenic transformations in the environment of the Polish Carpathians, has become a serious threat to many biotopes especially in recent decades. This threat, increasing from year to year, is the reason for preparing the regional "Red list of extinct and endangered plant species in the Polish Carpathians"

Results

Special attention has been devoted to the native mountain, endemic and relic species, as well as to those attaining regional or general limits of their distribution in the area under consideration. Old segetal and ruderal species (archeophytes) have also been taken into account. The threat to particular species has been estimated according to inter- nationally accepted IUCN "categories of the Red Book", (Lucas, Synge 1978, How to use). In category "R" (rare species) the species having not more than 10 (usually not more than 5) localities and represented by very small populations in the Polish Carpathians have been included (with a few exceptions).

Consequently, 407 species are to be found in the "Red list". Their contribution to the categories distinguished is presented below:

Ex – 19 species	R – 151 species
E – 60 species	I – 65 species
V – 120 species	Σ – 415 species

The following very rare, endemic and relic species have become extinct in the Polish Carpathians since the beginning of the century: *Anacamptis pyramidalis* (L.) Richard, *Betula humilis* Schrank, *Botrychium lanceolatum* (S. G. Gmel,) Angstr., *Cerasus fruticosa* Pallas, *Dianthus nitidus* Waldst. et Kit., *Gladiolus felicis* Mirek, *Ligularia sibirica* (L.) Cass., *Orobanche picridis Schultz, Pedicularis sceptrum-carolinum* L., *Polemonium coeruleum* L., *Primula halleri* J. F. Gmel., *Saxifraga hirculus* L., *Taraxacum pieninicum* (Pawł) Pawł. Another group of extinct species consists of highly specialized speirochorous flax-weeds: *Camelina alyssum* (Mill.) Thell. *Cuscuta epilinum* Weihe, *Lolium remotum* Schrk. and *Spergula maxima* Weihe.

Extinct are also following eight weed species representing allion *Caucalidion*: *Bupleurum rotundifolium* L., *Caucalis daucoides* L., *Conringia orientalis* (L.) Andrz., *Gagea villosa* (MB.) Duby, *Galium tricorne* Stok., *Linaria arvensis (L.) Desf., Lygia passerina* (L.) Fasano, and *Vaccaria pyramidata* Med. Moreover

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from the Pogórze Śląskie (westernmost part of the Carpathian Foothills): *Chamaecytisus supinus* (L.) Link, *Iris graminea* L., *Iris sibirica* L., *Lathyrus nissolia* L., *Montia rivularis* Gmel., *Nymphaea candida* Presl (also at Myślenice), *Oenanthe fistulosa* L., *Orchis tridentata* Scop., *Spergula pentandra* L.

Arrangement of the extinct (Ex), endangered (E), and vulnerable (V) species according to the habitats they occupy, allows us to distinguish the main factors responsible for extinction. Especially threatened are species connected to water and swampy habitats (lakes, rivers, peat-bogs, wet and humid meadows, carrs and the like.), i. e. species representing the phytosociological classes: *Potametea, Litorelletea, Isoeto-Nanojuncetea, Phragmitetea, Utricularietea, Scheuchzerio-Caricetea fuscae, Oxycocco-Sphagnetea, Alnetea glutinosae* and *Molinio-Arrhenatheretea*. The drainage of the peatlands, exploitation of peat-bogs, great changes of water regime in river valleys, water polution, and intensification of meadow culture, have been responsible for the threat to species connected with the habitats mentioned. Extinction of segetal weeds, especially speirochorous archaeophytes representing *Secalinion* and *Linion*, has been observed throughout the Polish Carpathians. Improved agricultural practices (intensive mineral fertilization, more efficient methods of cleaning the seed material of crop plants, and chemical control of weeds with herbicides), are the main factors responsible for the changes observed. In many other cases, especially when extinction of coniferous and mycorrhizous species is considered, a very important role seems to be played by air pollution (acid rains, heavy metal contamination) acting not only directly but also in an indirect way. This short analysis clearly suggests that the extinction of vascular plant species in the Polish Carpathians is, in general, caused by the same factors as in other regions of Poland and Central Europe; however some regional peculiarities do exist.