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STOCK-TAKING OF *ADONIS VERNALIS* L. IN THE SELECTED LOCALITIES IN POLAND

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SUMMARY

Adonis vernalis L. is a valuable medicinal plant protected in Poland. Research Institute of Medicinal Plants of Poznań (RIMP) is carrying out research into estimation and protection of genetic variability of this species within the National Crop Plant Genetic Recources Conservation Programme. Distribution, numbers of population and the threat of particular localities in Poland have been investigated. Populations of *Adonis vernalis* L. commonly include from several dozen to several hundred specimen. Overgrowing of grasslands with shrubs and trees is the main threat to this species. Active protection consisting in exclusion of shrub and tree development by taking the steps delaying natural succession such as reasonable pasturage and mowing is necessary.

INTRODUCTION

Estimation and protection of genetic variability of medicinal plants are the aims of this research. Investigation and observation in *in situ* and *ex situ* conditions refer to *Adonis vernalis* L. – a valuable medicinal plant protected in Poland. The numbers of this species in Poland have decreased as a result of use of the areas, where it occurs, for agriculture and forest cultivation or crop of raw material from natural localities for therapeutical purpose. Research into distribution and the estimation of the level of threat of particular localities is necessary for carrying out the successful methods of their protection. In the case of usable plants, such as herbal plants, there is a necessity of extension of tasks connected with their protection. It consists in starting cultivation and storing diaspores in conditions ensuring their long-lasting viability.

MATERIALS AND METHODS

Literature and our own field observations were the base for verification of *Adonis vernalis* localities in Poland (Ceynowa-Giełdoń 1971; Towpasz, Trzcińska-Tacik 1997; Łuszczyńska 2000; Zając, Zając 2001). Research was done in the years 1996–2003. In this period 30 localities of *Adonis vernalis* L. were verified. In four localities this species died out. The description of the studied localities contains, first of all, numbers of population, type of community and factors causing threat. Development of plants was also observed in *ex situ* conditions (experimental plots in the garden of the RIMP).

RESULTS AND DISCUSSION

Adonis vernalis L. is a perennial plant from *Ranunculaceae* family. Full-grown specimen create imposing tufts of from several to several dozen shoots (up to 50 cm height). Plants start their blossoming at the beginning of April. Diaspores ripen in June. *Adonis vernalis* reproduces generatively in natural conditions. The plant development is very slow and demands particular composition of soil and proper weather conditions. Plants start blossoming in 3–4 years after sowing (Kozłowski et al. 2001). *Adonis vernalis* is a plant of steppe origin. It occurs in xerothermic associations. It is a characteristic species for grasslands from *Festucetalia valesiacae* order. Xerothermic grasslands need dry and warm habitat rich in calcium carbonate lime or loess soil (Matuszkiewicz 2002). *Adonis vernalis*, a relict of steppe flora, occurs in the xerothermic grasslands in the localities in Małopolska, Lubelszczyzna and on the Lower Vistula (Fijałkowski 1961). The results of observations of 26 localities of *Adonis vernalis* L. are given in Table 1.

Table 1. Verified localities of *Adonis vernalis* L.

Region	Locality	Size of population (number of specimen)	Type of community	Threat
Lower Vistula	Zbocza Płutowskie reserve	thousands	*Adonido-Brachypodietum pinnati*	overgrowing with shrubs and trees, burning of grasslands
	Skarpy Ślesińskie reserve	several hundred	*Adonido-Brachypodietum pinnati*	overgrowing of grassland
	Rzadka Wola	several dozen	*Adonido-Brachypodietum pinnati*	locality exposed to mechanical damages (ploughing, digging, etc.)
Miechowsko-Sandomierska Uplands	Krzyżanowice reserve	several hundred	*Thalictro-Salvietum pratensis*	overgrowing of grassland
	Stawiany	several hundred	*Thalictro-Salvietum pratensis*	excessive pasturage
	Skowronno reserve	several hundred	*Thalictro-Salvietum pratensis*	burning of grasslands
	Skorocice reserve	several hundred	*Thalictro-Salvietum pratensis*	overgrowing with shrubs and trees, treading
	Winiary Zagojskie reserve	thousands	*Thalictro-Salvietum pratensis*	–
	Przęślin reserve	several dozen	*Thalictro-Salvietum pratensis*	treading
	Góry Wschodnie reserve	several hundred	*Thalictro-Salvietum pratensis*	treading, picking flowers
	Ostra Góra	several hundred	*Inuletum ensifoliae*	setting trees
	Gnatowice	several dozen	*Inuletum ensifoliae*	overgrowing with shrubs and trees
	Muniaczkowice	several dozen	*Thalictro-Salvietum pratensis*	overgrowing of grassland
	Wały reserve	several hundred	*Inuletum ensifoliae*	overgrowing with shrubs and trees
	Dąbie reserve	several dozen	*Inuletum ensifoliae*	overgrowing with shrubs and trees
	Janowiczki	several dozen	*Thalictro-Salvietum pratensis*	overgrowing with shrubs and trees, treading
	Przemęczanki	several dozen	*Thalictro-Salvietum pratensis*	overgrowing of grassland
	Dwikozy	several hundred	*Thalictro-Salvietum pratensis*	overgrowing with shrubs and trees, treading
Lublin Uplands	Kąty II	several dozen	*Inuletum ensifoliae*	overgrowing of grassland
	Łabunie reserve	several hundred	*Peucedano cervariae-Coryletum*	overgrowing with shrubs and trees
	Dobre	several dozen	*Thalictro-Salvietum pratensis*	overgrowing of grassland
	Ciechanki	several hundred	*Festuco-Brometea*	overgrowing of grassland
	Mięćmierz	several dozen	*Inuletum ensifoliea*	overgrowing with shrubs and trees
	Lublin-Jakubowice	several hundred	*Thalictro-Salvietum pratensis*	overgrowing with shrubs and trees
	Stawska Góra reserve	several hundred	*Cariceto-Inuletum*	overgrowing with shrubs and trees, treading
	Rogów reserve	several	*Inuletum ensifoliae*	overgrowing with shrubs and trees

In the investigated localities of Małopolska and Lublin Uplands *Adonis vernalis* L. was the most often found in the phytocoenoses of *Thalictro-Salvietum pratensis* and *Inuletum ensifoliae* xerothermic grasslands and occassionally in *Peucedano cervariae – Coryletum* community.

In Kujawy Region *Adonis vernalis* L. occurs in *Adonido-Brachypodietum pinnati* community.

It was found that *Adonis vernalis* populations commonly include from several dozen to several hundred specimen. Only individual populations include several plants or over thousand plants.

Despite the fact that the majority of investigated localities of *Adonis vernalis* occur in the nature reserves, some of them are threatened. The increase in growth of other plants in the grasslands, which are not in use, and overgrowing with shrubs and trees are responsible for this situation. These both processes cause the shadow of *Adonis vernalis* plants, their weaker development, decrease in sprouting and development of seedlings (Jankowska-Błaszczuk 1995). During field investigation and observations of plants in experimental cultivation it was found that the number of flowers decreases significantly when the shadow of plants increases and when the period of vegetation is characterized by low insolation.

The occurrence of steppe plants in the investigated localities is often conditioned anthropogenically (Sawicki, Kwiatkowski 2000; Jankowska-Błaszczuk 1995; Cwener, Michalewska 2002).

The pasturage of cattle in the grasslands has a great role. The limitation of an agricultural usage in the strict reserves and enclosure of the area with a fence cause the growth of shrubs, as it happened, for example in the reserve of Stawska Góra.

Burning of grasslands in early spring, noticed in the localities in Skowronno and Płutowskie Zbocza, is not a direct threat for *Adonis vernalis*. Older specimen are resistant to fire and renovate their overground shoots (Jankowska-Błaszczuk 1995). However, the burning of grass in May destroys the young specimen.

Adonis vernalis localities are mainly in the sections of communities on the slopes or scarps with no agricultural management. These localities are often situated near the field cultivation and are exposed to such mechanical damages as ploughing and digging, for example Rzadka Wola locality.

In some localities the attempt to remove of the results of succession by felling trees and shrubs was noticed. However, it is not the same as the usage of grassland for pasturage and mowing, which do not let trees and shrubs develop.

CONCLUSIONS

1. The main threat for *Adonis vernalis* localities is the overgrowing of grasslands with shrubs and trees.
2. Passive protection of grasslands with *Adonis vernalis* in the strict steppe reserves is not successful.
3. Active protection is necessary to maintain the localities of *Adonis vernalis* in reserves by carrying out the activities decreasing the natural succession such as felling trees and shrubs, reasonable pasturage and mowing.

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