

P 12: Conservation of medicinal and aromatic plants

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Abstract

The conservation of medicinal and aromatic plants includes *ex situ* and *in situ* methods. The genetic resources of medicinal and aromatic plants are stored, studied and constantly maintained in the field collections of the Institute of Botany of Nature Research Centre, Kaunas Botanical Garden of Vytautas Magnus University and Aleksandras Stulginskis University of Agriculture. Presently seeds of 214 accessions representing 38 species of medicinal and aromatic plants are stored in a long-term storage in the Plant Gene Bank. The data about national genetic resources are collected and stored in the Central Database of the Plant Gene Bank.

Keywords: medicinal plants, aromatic plants, *ex situ*, *in situ*, conservation

Introduction

The gathering and utilization of medicinal plants is an age-old tradition in Lithuania, especially in forested areas of the country. Investigations into medicinal plants in Lithuania were commenced in the 18th century. The Botanical Garden of Vilnius University played a major role in medical practice of those days; medicinal plants were planted, distributed and studied. The first factory of processing medicinal plants was opened in Švenčionys in 1883 (BUDRIŪNAS, R., 1999). The researches of medicinal plants were commenced when the Department of Medicinal Plants at the University of Vytautas Magnus in Kaunas had been established by prof. K. Grybauskas in 1924 (RAGAŽINSKIENĖ, O. 2004). The investigations of medicinal plants at the Institute of Botany were started in 1959.

Within the framework of the National Plant Genetic Resources programme, the MAP working group was one of the crop-specific working groups, which consolidated researches of different institutions possessing collections. In 1995 Lithuania joined the European Plant Genetic Resources (PGR) conservation network.

Genetic biodiversity of medicinal and aromatic plants is under the threat of extinction as a result of urbanization of natural and agricultural areas, habitat loss due to harvesting of raw material and changes in land use and agricultural practice.

The aim of this paper is to give a brief review of the current status of the conservation of the medicinal and aromatic plants genetic resources in Lithuania.

Materials and Methods

The existing system of conservation of medicinal and aromatic plants includes *ex situ* and *in situ* methods. Preliminary assessment of genetic diversity has been carried out according to the morphometric variation of phenotype in wild populations. On the second stage the evaluation and selection of accessions has been made according to their morphological characters and chemical composition as well susceptibility to diseases. In the selection process of *in situ* conservation areas the following criteria were considered: ecological heterogeneity of the site, phenotypic diversity and concentration of the target species, economic value of the target species, the possibility of the site control, the location of the site with regard to protected areas.

The seeds of medicinal and aromatic plants are stored in a long-term storage in the Plant Gene Bank. Seed samples are cleaned of weed seeds, pests and diseases. A dehumidified drying chamber is used for seed drying. Seeds are dried for two–three months at temperature 15–20 °C and relative air humidity of 10 – 15 %. Seeds moisture content after drying reduces to 3 – 5 %, they are

packed in airtight aluminium foil bags and stored at -18 °C. Long-term storage conditions guarantee the seed survival for decades as only very limited metabolism can occur there.

Results

The Lithuanian flora contains 1334 plant species. There are more than 460 species, which are used in folk and traditional medicine in Lithuania (RADUŠIENĖ and JANULIS, 2004). The majority of medicinal and aromatic plants are still collected from the wild; the lack of advanced local varieties limits their cultivation. There are species which are difficult to cultivate and therefore vulnerable to harmful harvesting of wild populations. 33 species of medicinal plants are included in the Red Data Book of Lithuania. Generally, the conservation of wild plants species and their resources is regulated by the the Law on Wild Vegetation (1999), the Law on Protected Areas (1993, 2001), Law on National Plant Genetic Resources (2001) and supplementary legal acts. The protected areas account for 14.8 % of the total area of the country.

The existing system of conservation of medicinal and aromatic plants includes *ex situ* and *in situ* methods.

Ex situ conservation of medicinal and aromatic plants

The recourses of medicinal and aromatic plants are stored, studied and constantly maintained in the field collections of the Institute of Botany of Nature Research Centre, Kaunas Botanical Garden of Vytautas Magnus University and the Aleksandras Stulginskis University.

Today the field collection of the Institute of Botany of the Nature Research Centre includes over 140 species of medicinal and aromatic plants and berry plants. About 90 % of the accessions are plants of wild origin native to Lithuania and neighbouring countries, collected mainly for the purposes of research and conservation. There are over 600 accessions of medicinal and small fruit plants. In Kaunas Botanical Garden the plants are classified by the pharmacognostic principle in respect to the biologically active compounds. The collection of medicinal plants consists of 400 species, the indigenous species comprise one fifth of the collection. The field collection of caraway, which vary in time of flowering, colour of inflorescence and the amount of essential oils are stored in Aleksandras Stulginskis University.

Long-term seed storage

The long-term seed storage was established in 1997 in the National Plant Genetic Resources Coordinating Centre. The Nordic Gene Bank provided all necessary facilities.

At the present time seeds of 214 accessions representing 38 species of medicinal and aromatic plants are put in long-term storage in the Plant Gene Bank. The majority of the accessions are of Lithuanian origin with rare exceptions of some foreign accessions of special value to Lithuanian growing conditions. The long-term seed storage is annually supplemented with new accessions.

In situ conservation

Long-time observations have revealed that protection and certain management of natural populations *in situ* are required to ensure their survival and sustainable utilization (LABOKAS, 1999). In the selection process of *in situ* conservation areas the following criteria were considered: ecological heterogeneity of the site, phenotypic diversity and concentration of the target species, economic value of the target species, the possibility of the site control, the location of the site with regard to protected areas. Target species selected on the basis of socio-economic and scientific values are the following: *Acorus calamus* L., *Arnica montana* L., *Allium* spp., *Crataegus* L., *Origanum vulgare* L., *Thymus* spp., *Hypericum* spp., *Helichrysum arenarium* (L.) Moench., *Salvia* L., *Vaccinium* spp., and others. Among the most endangered are plant populations in the forest ecosystems because they are greatly subject to forestry activities. In most cases *in situ* conservation of medicinal and small fruits is more reliable within the already existing network of protected areas than outside them

(Labokas, 1999). Today the 21 areas for *in situ* conservation of medicinal plants and small fruits as well crop wild relatives in Lithuania are selected.

Status of national medicinal and aromatic genetic resources

Today the status of national genetic resources has been granted to 4 collections, 21 areas *in situ* and 207 accessions of medicinal and aromatic plants. The data about these national genetic resources are collected and stored in the Central Database of Plant Gene Bank.

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