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BIODIVERSITY AND PROTECTION OF THE MEDICINAL AND AROMATIC PLANTS IN BULGARIA

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INTRODUCTION

Current status of the Bulgaria's biodiversity

At the beginning of 21th century the Bulgarian botanists have faced at some challenges as:

- Globalization of the science and the contribution of the regional sciences
- Innovation of new methods and technologies
- Development of interdisciplinary and applied investigations
- Application and implementation of an ecological approach

Globalization of the science gives us a possibility to exchange scientific information and to apply the new criteria for an assessment of the research results. Bulgarian scientists would give a significant contribution to the European botanical science with further investigations of the Bulgarian flora (Palamarev, 2002).

The Bulgarian vascular flora includes 3 900 species, belonging to 916 genera and 159 families. The current data shows that 186 species are Bulgarian and 312 species- Balkan endemic plants (Petrova et al., 2005).

Medicinal and aromatic plants (MAP) present a significant part of the Bulgaria,s biodiversity and they play very important role in the everyday life of men- phytomedicines, herbal teas and other natural products.

Bulgaria is a traditional producer and supplier of high quality medicinal herbs, essential oils, etc. According to the Law on Medicinal plants (2000) 739 vascular plants are used for medical purposes, as spices, for cosmetic products or as food. 29 rare and valuable species are included in this list also (2004). The major part of this biodiversity presents *Magnoliophyta*-658 species. There were remarked some families with big species richness: *Asteraceae*- 76, *Lamiaceae*- 68, *Rosaceae*- 68, *Fabaceae*- 42, *Apiaceae*- 40, etc. *Polypodiophyta* includes 14, *Equisetophyta*-5 and *Lycopodiophyta*-3 species. One species from *Algae* (*Cystoseira barbata* (Good et Vood) Ag) and one species from *Lychenes* (*Cetraria islandica* (L.)Ach.) have been included in this list also (Gussev, 2005).

The MAP,s resources have been strongly influenced by the climatic changes, erosion, fires, agriculture and by the over-exploitation. The problem of these resources and their long-term development was one of the main aspect of the National Strategy for biodiversity protection (Hardalova et al., 1994).

Legislative activity of the Bulgarian government

The Law on Medicinal plants (2000) has determined the MAP they may be collected, the rules for sustainable use and protection, as well as the cultivation of some valuable plants.

The amounts of medicinal herbs for personal and for economic usage and licence taxes are regulated also. The Ministry of Environment and waters (MEW) is responsible for the law implementation and it,s Regional Inspectorates of Environmental Protection control this process. The sustainable use of MAP,s resources is regulated also by the Law on Protected Areas (1998). The system of protected areas in Bulgaria is comparatively well developed. At present, there are 3 National Parks, 8 Nature Parks, 16 Biosphere Reserves under law protection (Peev et al., 1998). The protected areas should be developed for the purposes of nature protection according to the National and European legislation (Kathe et al., 2003).

However, it depends on their category. Few years ago Management Plans for two Bulgarian National Parks have been elaborated. The state of the populations of some rare and threatened plants, as well as the resources of some valuable MAP, have been carried out (Vitkova, Evstatieva, 2000, Evstatieva, Vitkova, 2000).

Bulgaria is the only country in Europe, which has a National System of quotas with aim of management the collection of wild MAP (Lange, 1998). The MEW annually issues quotas for some economically valuable plants as: *Paeonia peregrina* Mill., *Frangula alnus* Mill., *Primula veris* L., *Berberis vulgaris* L., *Galium odoratum* (L.) Scop., *Atropa bella donna* L., *Betonica officinalis* L., *Carlina acanthifolia* All., *Sedum acre* L., *Alchemilla vulgaris* complex. For 26 other species the collection of raw material from the natural habitats has been strongly forbidden.

The National System for Environmental Monitoring, which has developed since 1994, has a great significance. The data about MAP,s collection

includes the species-specific quantities collected in some regions with rich stock of valuable medicinal herbs.

In relation with the implementation of national and international legislative norms, concerning the biodiversity conservation, the MEW initiated an establishment of a National Biodiversity Monitoring System (Stanimirova, Ivanova, 2005). At present, this system is at state of development and the monitoring of the MAP resources should be considered successfully in future.

MAP with conservation significance are of a great interest for the Bulgarian botanists.

According to the Law on Biodiversity (2002) 61 species are protected and their collection from the Nature is forbidden. 43 species are included in the list of CITES (Gussev, 2005). 76 rare and endangered MAP are presented in the Red Data Book of Bulgaria (1984). May be this number will be changed in future, because of the new edition of this book, supported by the MEW. The species have been evaluated according to IUCN Red List Categories and Criteria.Version 3.1 (2001).

The habitat conservation plays an important role for the protection of Map's resources.

Bulgaria is an actively participant in the "Natura 2000" system of protected areas and it is in the process of adopting the EU "Habitats, Fauna and Flora" Directive. Bulgaria has ratified most of the important international conventions related to nature conservation and environmental protection- Ramsar Convention, CITES, Bern Convention, Convention on Biological Diversity, etc. Handbook for determination of habitats with European significance in Bulgaria was published (Kavrukova et al., 2005).

One of the most effective manner for protection and conservation of the MAP is the cultivation of some rare and valuable species. Bulgaria has an old tradition for cultivation of some economically valuable plants as: *Mentha piperita* L., *Melissa officinalis* L., *Valeriana officinalis* L., *Matricaria recutita* L., etc. In the last years the interest for cultivation of rare MAP is increasing rapidly. Some protected plants as: *Ruta graveolens* L., *Sideritis scardica* Griseb., *Rhodiola rosea* L., *Alchemilla mollis* (Buser) Rothm. have been cultivated successfully in small plantations (Evstatieva, Hardalova, 2004).

Scientific investigations

At present, the main centre for scientific investigations and protection of Map's resources in Bulgaria is the Institute of Botany, BAS, Department of Applied Botany. The research projects, supported by the MEW and the National Research Foundation for mapping the MAP,s resources, have been carried out by the Bulgarian botanists. The management programs for the sustainable use and protection of MAP on the territory of the National Parks have been established also (Genova, 2004).

Two experimental fields for ex-situ conservation of rare and threatened MAP were created some years ago in the Institute of Botany, BAS (Evstatieva, Hardalova, 2004) One of them is close to Sofia (550 m a.s.l.) and the second is in the Rhodopes mountains (1 550 m a.s.l.).

Other two collections for ex situ and in vitro conservation of rare and threatened plants were created in the Institute for Plant Genetic Resources in Sadovo (Koeva et al., 2005). These collections could be used as a source for seeds, vegetative materials for cultivation of plants in small plantations.

The research project "Alternative Approaches of bioproduction of alkaloids and active substances from Bulgarian rare and threatened medicinal plants", supported by NATO under the science for Peace Programme, was finished successfully in 2006. Five-years monitoring of natural populations of *Leucojum aestivum* L. was performed. In vivo and in vitro multiplied original plant material were adapted in ex-situ collection of the Institute of Botany, BAS.

Bulgarian *Leucojum aestivum* Database containing data about diversity, population characteristics, soil parameters in some habitats and galanthamine content was elaborated.

Further goals

There are some very important goals in the field of protection and conservation of MAP in front of the Bulgarian botanists:

- To develop the management plans for the Map's resources in the protected areas
- To elaborate the certificated system for the MAP according to the requirements of the European market
- To develop the monitoring system and to organize the database for some rare, protected and threatened MAP.
- To organize courses, workshops for education and training of collectors, traders and all people who have interest in sustainable use and protection of Map's resources**.**

SUMMARY

Medicinal and aromatic plants present very important part of the Bulgaria's biodiversity. The scientific investigations and the activity of the Bulgarian government for the sustainable use and protection of their resources have been discussed in this paper.

REFERENCES

1. GENOVA E., 2004 - Mapping, sustainable use and protection of the natural resources of

medicinal and aromatic plants in Bulgaria. Hop bulletin, 11, Zalec, 25-29.
2. GUSSEV CH., 2005 - Characteristic of wild medicinal plants resources in Bulgaria and their sustainable management. In: Petrova, A. (ed.). Current state of Bulgarian biodiversity-problems and perspectives. Bulgarian bioplatform, Sofia, 75-104.
3. EVSTATIEVA L., R. HARDALOVA, 2004 - Conservation and sustainable use of medicinal plants in Bulgaria. Medicinal Plant Conservation, 24-28.
4. EVSTATIEVA L., A. VITKOVA, 2000 - Biodiversity of the medicinal plants in the Central Balkan National Park. In: Sakalian, M. (ed.) Biological diversity of the Central Balkan National Park, Pensoft, Sofia. 58-105.
5. HARDALOVA R., L. EVSTATIEVA, CH. GUSSEV, 1994 - Characteristics of the wild medical plant resources in Bulgaria and recommendations for their long term development. In: Sakalian, M. (ed.). National Biological Diversity: Conservation strategy for the Biodiversity protection. vol. II, MEW, Sofia. 41-72.
6. KATHE W., HONNEL S., HEYM A., 2003 - Medicinal and aromatic plants in Albania, Bosna-Herzegovina, Bulgaria, Croatia and Romania. A study of the collection and trade in medicinal and aromatic plants (Map's) , relevant legislation and potential MAP use for financing nature conservation and protected areas. WWF Deutschland (TRAFFIC Europe-Germany. German Federal Agency for Nature Conservation (BfN), Bonn and Vilm.
7. KAVRUKOVA V., D. DIMOVA, M. DIMITROV, R. TSONEV, T. BELEV (eds.), 2005 - Handbook for determination of the habitats with European significance in Bulgaria. WWF, MEW, Sofia, 128.
8. KOEVA R., ANGELOVA S., GUTEVA Y., 2005 - Plant genetic resources and their biological potential intergrated in the agro-ecological systems. In: Petrova, A. (ed.). Current state of Bulgarian biodiversity-problems and perspectives. Bulgarian bioplatform, Sofia, 509-524.
9. LANGE D., 1998 - Europe.s medicinal and aromatic plants: their use, trade and conservation. TRAFFIC International, Cambridge, Unitet Kingdom.
10. PALAMAREV E., 2001 - Bulgarian Botany-Quo vadis in the XXIth Century. In: Temniskova., D. (ed.). Proceeding of Sixth National Conference of Botany, June 18-20, 2001, Sofia, Sofia University "St. Kl. Ohridski" Press, 9-16.
11. PEEV D., S. KOZUHAROV, M. ANCHEV, A. PETROVA, D. IVANOVA, S. TZONEVA, 1998 - Biodiversity of vascular plants in Bulgaria. In: Curt Meine (ed.) Bulgaria's Biological Diversity. Conservation status and Needs Assessment, v.1. Washington, D. C. Biodiversity support Program, 55-88.
12. PETROVA A., V. VLADIMIROV, D. DIMITROVA, D. IVANOVA, 2005 – Current state of the Bulgarian fern and seed plant biodiversity. In: Petrova, A. (ed.). Current state of Bulgarian biodiversity-problems and perspectives. Bulgarian bioplatform, Sofia, 75-104.
13. STANIMIROVA M., N. IVANOVA, 2005 - National Biodiversity Monitoring system. In: Chipev, N., V. Bogoev (eds.) Biodiversity Ecosystems. Global changes. First National Scientific Conference on Ecology, november 4-5 2004, Sofia, Petekston, Sofia, 31-38.
14. VITKOVA A., L. EVSTATIEVA, 2000 - Biodiversity of the medicinal plants in the Rila National Park. In: Sakalian M. (ed.). Biological diversity of the Rila National Park. Pensoft, Sofia, 79-116.

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