

P 11: Introduction of wild MAP species into the field culture

Elena Dušková, Karel Dušek, Kateřina Smékalová, Marie Orságová

Department of Genetic Resources for Vegetables, Medicinal and Special Plants, Centre of the Region Haná for Biotechnological and Agricultural Research, Crop Research Institute, Šlechtitelů 29, Olomouc, 78371, Czech Republic, e-mail: Smekalova@genobanka.cz (corresponding author)



DOI 10.5073/jka.2016.453.044

Abstract

Althea officinalis L., *Dracocephalum moldavica* L., *Gentiana lutea* L., *Rhodiola rosea* L., and *Valeriana officinalis* L. are the species of wild medicinal plants which are not very commonly grown in field culture. The methods and practical experiences of their multiplication and growing in a field nursery in Olomouc (the Czech Republic) are explained and shown in the manuscript.

Keywords: field nursery, *Althea*, *Dracocephalum*, *Gentiana*, *Rhodiola*, *Valeriana*

Introduction

Medicinal and aromatic plants (MAPs) are a very heterogeneous group with very different pedigree status of species. Some of them are known, used and cultivated for a very long time but others are wild and still just collected by hand from natural fields. However in some cases also these wild species are useful or necessary to introduce into the field culture and to grow and propagate them in an organized way. An example of such introduction is *ex-situ* genetic resources maintenance where also minority and/or endangered species should be collected, grown and reproduced. The method of cultivation and propagation of some examples of such medicinal plants, that are in the care of the curators of collection of Czech MAPs genetic resources in Olomouc, are presented here. *Althea officinalis* L. (marsh mallow), *Dracocephalum moldavica* L. (Moldavian dragonhead), *Gentiana lutea* L. (great yellow gentian), *Rhodiola rosea* L. (golden root, rose root), and *Valeriana officinalis* (valerian) L. were selected for example.

Materials and Methods

A new species and/or genotypes of wild medicinal plants come to the MAPs collection usually as vegetative material or seed samples from the collection missions. Vegetative material (bunches, rhizomes, root sprouts etc.) together with ball of soil are picked up at original locality (at least 10 plants per accession) and then rooted to the *ex situ* collection immediately next day for founding of a field nursery. Seeds are dried in a drier with controlled air flow, 1/3 of seeds are saved in the seed bank as a security stock and the rest of seeds is sown depending on the species' requirements (DUŠEK et al., 2010, DUŠKOVÁ et al., 2010). Then a preliminary multiplication (JARAMILLO and BAENA, 2002) of both types of original material follows.

Before the planting of original vegetative material and/or seedlings, careful soil preparation has a crucial role in the founding of the field nursery. A lot of introduced species are perennial plants and will stay several years on the same spot. A rigorous weed clearance and optimal nutrient reserve in the soil is a basic precondition for a successful growing and introduction into the field culture.

The *ex situ* collection is organised in 50 m long rows or double rows in Olomouc, which enable mechanical cultivation and technical isolation by mobile isolation cages (see manuscript "Ex situ regeneration of cross-pollinated MAP genetic resources in the Czech Republic" in this issue). Single rows have 2 m space between them and double rows have 0.5 m distance between two neighbouring rows and 2 m between each row pair. The single row organization is preferred for sturdier species where the free access to plants is desirable. On the other hand double rows organization is suitable for small-growing species, where it safes cultivation area and helps in technical isolation by mobile isolation cages. In case of well growing species, the plants from double rows sometimes grow together into one huge row. During the whole vegetative season, a com-

mon mechanical cultivation is done by compact tractor between the rows and/or by hand between the plants in the row. Since all wild MAPs are planted “on water” (i.e. to the well watered holes), additional irrigation is usually not necessary or it is provided only for few months after planting. The pruning is practised in early spring, before the growing of new sprouts.

Besides the above mentioned universal practices also some individual species requirements should be announced here (Tab. 1). For *Althea officinalis* an every year low dose NPK fertilization and aphid chemical control can be recommended. The seeds of *Gentiana lutea* are sown to the boxes right after harvest and placed outside to the safety place where they winter. Such stratification is necessary for good seed germination and sprouting. The seedlings stay almost two years in the box up to planting to the field nursery because earlier manipulation causes plant damage according our experiences. The best results with *Rhodiola rosea* multiplication and growing were obtained when root sprouts were planted to containers in the spring and then they spend the summer in the shadow area. In the autumn or next spring, the well rooted young plants can be transplanted into the field nursery. *Valeriana officinalis* does not require any special procedures and the young plants can be situated to the field nursery in the same year when the seeds were sown. Only the aphid chemical control can be recommended for this crop.

Results

The best overview on successful introduction of presented MAP species is shown in Fig. 1-3. All mentioned species are as *ex situ* collection cultivated already several years in Olomouc and their generative and/or vegetative multiplication is fruitful.

Tab. 1 The multiplication and growing procedures recommended to the selected MAPs species

Species	Life form	Original material	Seed sowing	Planting	Field organization
<i>Althea officinalis</i>	perennial	rhizomes or seeds	mid March	March - April	single rows; 40 cm
<i>Dracocephalum moldavica</i>	annual	seeds	mid March	mid May	double rows; 40 cm
<i>Gentiana lutea</i>	perennial	seeds	promptly after seed harvest	mid September (2 years old plants)	single rows; 40 cm
<i>Rhodiola rosea</i>	perennial	root sprouts		rooted plants in the end of summer or in the spring	single or double rows; 40 cm
<i>Valeriana officinalis</i>	perennial	seeds	mid March	September	single rows; 40 cm

Acknowledgement

The financial support of grant No. LO1204 is gratefully acknowledged. The plant material was obtained thanks to the National Programme on Conservation and Utilization of Plant, Animal and Microbial Genetic Resources for Food and Agriculture No. 206553/2011-MZE-17253.



Fig. 1 *Althea officinalis* L. and *Gentiana lutea* L. in field nursery in Olomouc



Fig. 2 *Dracocephalum moldavica* L. in compact double row planting



Fig. 3 Three years old plants of *Rhodiola rosea* L. in single row planting

References

- Dušek, K., Dušková, E. and K. Smékalová, 2010. Variability of morphological characteristics in *Agrimonia eupatoria* L. in the Czech Republic. In: *Pharmacognosy Magazine* 6 (22 Suppl.): 109. Abstracts Book of 6th CMAPSEEC.
- Dušková, E., Dušek, K. and K. Smékalová, 2010. Variability of morphological characteristics in *Hypericum perforatum* L. in the Czech Republic. In: *Pharmacognosy Magazine* 6 (22 Suppl.): 103-104. Abstracts Book of 6th CMAPSEEC.
- Jaramillo, S. and M. Baena, 2002. *Ex situ* conservation of plant genetic resources: training module. International Plant Genetic Resources Institute, Cali, Colombia.