3 EUROPEAN PLANTS

3.1 Introduction to Medicinal Plants of Europe

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Medicinal, aromatic and spice plants are a specific group of plants in Europe, and their cultivation has a long tradition in the continent (Ministry of Agriculture of the Czech Republic, 2012). It is estimated that the European herbal industry processes approximately 200 species of medicinal and aromatic plants (MAPs), mainly from field crops (Spychalski, 2013). However, the number of plants used in physiotherapy, and in the culinary, cosmetic and food industries is much higher and reaches 2 000 species. Europe is one of three-trading centers of MAPs in the world, beside the American and Asian markets, whilst Central Europe is the most important import market (EUROPAM, 2010; Ministry of Agriculture of the Czech Republic, 2012).

In Europe, due to climate and soil conditions, Mediterranean as well as Central and East European countries are the best localizations for growing herbs. The total area of MAPs covers approximately 70 000 hectares (Spychalski, 2013; Ministry of Agriculture of the Czech Republic, 2012). Poland, Germany, France, Great Britain, Italy and Spain are the most important traditional European importers and exporters of MAPs. Also, Bulgaria, Romania, Hungary and Albania belong to the 12 most significant exporters in the last decade. Germany is an important axis of medicinal plant trade and supplies in Europe, especially as it connects Southeast European markets with central and Western Europe (Hartman, 2007; Spychalski, 2013).

The processors prefer cheaper raw material in homogeneous batches. This situation limits the level of breeding, seed management and innovations in the growing technologies in European countries (EUROPAM, 2010; Ministry of Agriculture of the Czech Republic, 2012).

Regardless of the method of cultivation, a long tradition of high scientific and technological level can be found in the European environment. The most important cultivated European species are caraway (*Carum carvi*), coriander (*Coriandrum sativum*), fennel (*Foeniculum* spp.), milk thistle (*Silybum marianum*), anise (*Pimpinella anisum*), wormwood (*Artemisia* spp.), chamomile (*Matricaria recutita*) and St. John's Wort (*Hypericum perforatum*), sage (*Salvia officinalis*), peppermint (*Mentha x piperita*), lemon balm (*Melissa officinalis*). In general, the current situation in the EU can be described as follows – the MAPs are grown and collected in the eastern and southern European countries. Whereas, advanced countries in western and northern Europe process these plants (Ministry of Agriculture of the Czech Republic, 2010; Bauer, 1999).

Currently, we can observe the rebirth of the use of medicinal plants world-wide. European scientific teams verify the empirical knowledge of traditional medicinal species systematically and try to find new plants and their active substances. The cultivation of wild plant species is important as well as the breeding and development of modern agro-technologies (Palas, 2014). In the case of wild plant species used in therapy, and in the cosmetic and food industry, the principles of sustainable collection practices have to be respected (WWF Hungary and TRAFFIC, 2012). For processors, to ensure the required and consistent quality of herbal substances (preparations), it is necessary to follow good agricultural and collection practices for medicinal plants (GACP), as well as the concept of good manufacturing practice (GMP) for the manufacture, processing, packaging and storage of medicinal plants (EMEA, 2006).

This chapter summarizes the production of medicinal, aromatic and spice plants in chosen European countries over the last ten years. Tab. I shows the most cultivated and collected species from the group of MAPs in chosen European countries from 2010–2013.

https://doi.org/10.11118/978-80-7509-881-8-0019

I: *Production of MAPs in chosen European countries*

Country	Plant species	Area in hectares
Austria	Pumpkin (*Cucurbita pepo*), caraway (*Carum carvi*), parsley (*Petroselinum crispum*), fennel (*Foeniculum vulgare*), milk thistle (*Silybum marianum*), St. John's Wort (*Hypericum perforatum*) and coriander (*Coriandrum sativum*). **Wild species:** mountain pine (*Pinus mugo*)	17 720
Bulgaria	Coriander (*Coriandrum sativum*), lavender (*Lavandula angustifolia*), fennel (*Foeniculum vulgare*), Damask rose (*Rosa damascena*). **Wild species:** rose hip (*Rosa canina*), black elder (*Sambucus nigra* and *S. ebulus*), stinging nettle (*Urtica dioica*), wild berries.	83 199
Czech Republic	Milk thistle (*Silybum marianum*), caraway (*Carum carvi*), poppy straw (*Papaver somniferum*), ergot (*Claviceps purpurea*), fennel (*Foeniculum vulgare*), coriander (*Coriandrum sativum*), chamomille (*Matricaria recutita*), peppermint (*Mentha x piperita*), lemon balm (*Melissa officinalis*). **Wild species:** black elder (*Sambucus nigra*), stinging nettle (*Urtica dioica*), rose hip (*Rosa canina*), birch (*Betula pendula*), linden flower (*Tillia* spp.), St. Jon's Wort (*Hypericum perforatum*), horsetail (*Equisetum arvense*), raspberry and blackberry leaves (*Rubus* spp.).	7 225
Finland	Caraway (*Carum carvi*), dill (*Anethum graveolens*), parsley (*Petroselinum hortense*), garlic (*Allium sativum*), sea buckthorn (*Hippophae rhamnoides*), coriander (*Coriandrum sativum*), peppermint (*Mentha x piperita*), nettle (*Urtica dioica*) and Rhodiola rosea. **Wild species:** nettle (*Urtica dioica*), birch (*Betula* sp.), bearberry (*Arctostaphylos uva-ursi*), erica (*Calluna vulgaris*), juniper (*Juniperus communis*), yarrow (*Achillea millefolium*), goldenrod (*Solidago virgaurea*).	17 230
France	Lavandin (*Lavandula x intermedia*), lavender (*Lavandula angustifolia*), clary sage (*Salvia sclarea*), ginkgo (*Ginkgo biloba*), thyme (*Thymus vulgaris*), parsley (*Petroselinum crispum*), basil (*Ocimum basilicum*). **Wild species:** daffodil (*Narcissus* spp.), oak moss (*Evernia prunastri*).	54 700
Germany	Parsley (*Petroselinum crispum*), chives (*Allium schoenoprasum*), marjoram (*Origanum majorana*), dill (*Anethum graveolens*), chervil (*Anthriscus cerefolium*), sweet basil (*Ocimum basilicum*), celery (*Apium graveolens*), coriander (*Coriandrum sativum*), caraway (*Carum carvi*), chamomile (*Matricaria chamomilla*), mint (*Mentha x piperita*), thyme (*Thymus vulgaris*), lemon balm (*Melissa officinalis*), St. John's wort (*Hypericum perforatum*), purple coneflowers (*Echinacea* spp.), valerian (*Valeriana officinalis*), plantain (*Plantago lanceolata*), sage (*Salvia officinalis*), fennel (*Foeniculum vulgare*), milk thistle (*Silybum marianum*), seabuckthorn (*Hippophae rhamnoides*).	10 149
Greece	Garlic (*Allium sativum*), saffron (*Crocus sativus*), oregano (*Origanum vulgare* spp. *hirtum*), clary sage (*Salvia sclarea*), gum mastic tree (*Pistacia lentiscus* var. *chia*), mountain tea (*Sideritis* spp.). **Wild species:** oregano (*Origanum* spp.), thyme (*Thymus* spp.), chamomile (*Matricaria chamomilla*), mint species (*Mentha* spp.), mountain tea (*Sideritis* spp.), sage (*Salvia fruticosa*)	5 247
Italy	Parsley (*Petroselinum crispum*), basil (*Ocimum basilicum*), bergamot (*Citrus bergamia*), peppermint (*Mentha* x *piperita*), bergamot, chamomile (*Matricaria recutita*), lavender (*Lavandula angustifolia*), lavandin (*Lavandula* x *intermedia*), liquorice (*Glycyrrhiza glabra*), St. John's wort (*Hypericum perforatum*), myrtle (*Myrtus communis*), curry plant (*Helichrysum italicum*), immortelle (*Helichrysum stoechas*).	3 300
Latvia	Culinary species, caraway (*Carum carvi*)	6 500

I (continued): Production of MAPs in chosen European countries

Country	Plant species	Area in hectares
Netherlands	Caraway (*Carum carvi*), flaxseed (*Linum usitatissimum*), chervil (*Anthriscus cerefolium*), celery leaves (*Apium graveolens*), lovage (*Levisticum officinale*), parsley (*Petroselinum crispum*), foxglove (*Digitalis lanata*), purple cone flower (*Echinacea purpurea*), valerian (*Valeriana officinalis*).	2 884
Poland	Chamomile (*Chamomilla recutita*), peppermint (*Mentha piperita*), valerian (*Valeriana officinalis*), St. John's wort (*Hypericum perforatum*), milk thistle (*Sylibum marianum*).	35 000
Romania	Coriander (*Coriandrum sativum*), caraway (*Carum carvi*), fennel (*Foeniculum vulgare*), aniseed (*Pimpinella anisum*), hop (*Humulus lupulus*), lemon balm (*Melissa officinalis*), peppermint (*Mentha* x *piperita*), sage (*Salvia officinalis*), marigold (*Calendula officinalis*), purple coneflower (*Echinacea purpurea, E. angustifolia*), globe artichoke (*Cynara scolymus*), plantain (*Plantago lanceolata*), milk thistle (*Silybum marianum*). **Wild species:** linden (*Tilia* spp.), rose hip (*Rosa* spp.), hawthorn (*Crataegus* spp.), sea buckthorn (*Hippophae rhamnoides*), black elder (*Sambucus nigra*), St' John's wort (*Hypericum perforatum*).	12 000
United Kingdom	Borage (*Borago officinalis*), parsley (*Petroselinum crispum*), coriander (*Coriandrum sativum*), chamomile (*Matricaria recutita*), lavender (*Lavandula angustifolia*), mint (*Mentha spicata*). **Wild species:** black elder (*Sambucus nigra*), bog myrtle (*Myrica gale*).	6 495

Source: Kathe *et al.*, 2003; Seidler-Lozykowska, 2012

Summary

Cultivation of MAPs is a "healthy" alternative to traditional production-intensive agriculture, as well as a means of environmental protection and restoration of landscape. An important option is the use of MAPs for plant protection or as a stimulant of plant growth and development. This is an opportunity for MAPs, considering the EMA (European Medicines Agency) documents, like adopting internal guidelines of the association of growers to provide improved qualitative factors. Development of MAPs depends on the provisioning policy, the availability and development of mechanization (especially harvesting machinery) and on the selection of proper varieties, as well as on the respect for the natural habitats of wild plant species which have to be collected sustainably. Promotion, advertising and education also contribute a lot in this sector. The main risk for the development of MAPs is the importation of lower quality drugs.

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