

**Promoting the implementation and the
establishment of the
European MAP Collection
(MAPEUROCOLLECTION)**

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Interim Activity Report (April 2017-April 2018)



Participants in the MAPEUROCOLLECTION meeting, 27-28 April 2017, Braga, Portugal.

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INTRODUCTION

The Second Report on the State of the World's Plant Genetic Resources for Food and Agriculture (FAO 2010), regarding global germplasm holdings, shows that a total of 160 050 accessions of medicinal, aromatic, spice and stimulant crops are maintained in genebanks worldwide, while botanical gardens, globally, have about 1800 medicinal plant taxa represented in their collections.

In Europe, at least 2000 Medicinal and Aromatic Plants (MAP) taxa are used commercially, of which two-thirds (1200-1300 species) are native to Europe. The countries involved in the Medicinal and Aromatic Plants Working Group (MAP WG), have reported previously a total of 23 480 accessions preserved in *ex situ* conditions and from those, 4624 accessions from the priority species, chosen as models by the MAP WG. For these taxa, species-specific descriptors were proposed and are available on the WG webpage¹: *Achillea millefolium* agg.; *Artemisia absinthium*; *Carum carvi*; *Gentiana lutea*; *Hypericum perforatum*; *Mentha piperita* and *M. spicata*; *Melissa officinalis*; *Origanum spp.*; *Salvia officinalis*; *Thymus vulgaris* and *T. serpyllum*.

The European Collection (<http://www.ecpgr.cgiar.org/aegis/european-collection/>) with a total of 28 686 European Accessions, only refers 82 accessions as MAP species. The effort to increment the number of accessions in the European Collection is therefore of major importance.

In the context of the MAPEUROCOLLECTION proposal, WG members were encouraged to initiate the process of recommending accessions to be flagged as AEGIS to increase the MAP European Collection.

APPROACH

Meeting

A two-days meeting took place 27-28 April 2017 and was hosted by Banco Português de Germoplasma Vegetal - INIAV (Portugal) to update the progress of the national MAP collections, their conservation status and documentation, agree on the criteria for the inclusion of accessions in the European Collection, revise the crop-specific standards for orthodox seeds, considering the AEGIS Quality System, and discuss and propose the workplan for the necessary activities and rules of management of the accessions in accordance with the principle of AEGIS.

Participants from the Czech Republic, Hungary, Italy, Latvia, Lithuania, Norway, Portugal, Romania, and Slovenia participated in the workshop.

An opening session and the policy context of Plant Genetic Resources and the National Programme for Plant Genetic Resources in Portugal was presented by the Portuguese National Coordinator. Lorenzo Maggioni (ECPGR Secretary) presented the ECPGR context

¹ <http://www.ecpgr.cgiar.org/working-groups/medicinal-and-aromatic-plants/medicinal-and-aromatic-plants-working-group-documents-and-publications-of-interest/>

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and update (<http://www.ecpgr.cgiar.org/working-groups/medicinal-and-aromatic-plants/map-eurocollection/map-eurocollection-presentations/>).

Progress and update on national MAP conservation

National Inventory update and status of MAP collections in each country were presented by the WG members participating in the proposal, towards the update of national MAP inventories. The last Inventory for the MAP species dated back to the last WG meeting, 2009 (see the meeting report, Barata et al. 2009).

The following country reports were presented:

- Czech Republic (Kateřina Smékalová)
- Hungary (Beáta Gosztola)
- Italy (Pietro Fusani)
- Latvia (Irina Sivicka)
- Lithuania (Jolita Radušienė and Laima Šveistytė)
- Norway (Mette Goul Thomsen)
- Portugal (Violeta Lopes)
- Romania (Diana Batir)
- Slovenia (Dea Baričević and Nataša Ferant)

Country reports update showed improvements of *ex situ* and *in situ* conservation of MAP species in Europe.² However, while there has been an important dynamics in this group of species, there is still a substantial dispersion of institutions working in this subject and consequently in some cases the country capacity shows difficulty to integrate the results and the sustainable MAP genetic resources management.

Criteria for the inclusion of accessions in the European Collection

Selection and approval of the criteria to integrate the MAP European Collection was the major goal of the meeting where these criteria were proposed, discussed and agreed.

During the meeting the 13 WG members discussed the actual situation of European MAPs in the context of *ex situ* and *in situ* conservation, characterization and evaluation and numbers were updated. The European Collection of flagged MAP priority species in AEGIS consists of 84 accessions of MAP WG priority species contributed by the Nordic countries, Germany and Romania.

The update of the EURISCO database (24 April 2017) showed 2923 accessions for the MAP priority species (Fig. 1) and the number of contributing countries to *ex situ* conservation of

² Presentations are available online ([here](#))

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the priority list range, depending on the species, between 1 and 22 (Fig. 2). Considering both figures together, there are 22 countries contributing to *ex situ* conservation of *Hypericum perforatum* with 591 accessions while only one country with a single accession of *Achillea millefolium*.

The level of morphological and chemical characterization and evaluation has increased, although less intensely than desired, conditioned by human and financial resources; when these problems can be solved, further increase can take place. Molecular evaluation is not very common for this group of species.

Evaluation and characterization can be promoted to increment the sustainable use of MAPs in Europe. As these groups of plants have a strong demand for several uses, they support different agricultural dynamics; however, the market continues to be provisioned to a large extent by collecting from the wild and therefore *ex situ* and *in situ* conservation remain vital tasks for these plant genetic resources.

Conditions to increase the MAP European Collection with more priority accessions are present, as EURISCO indicates that these collections are documented. It is therefore desirable to have an increasing number of AEGIS MAP accessions and an increasing quality and quantity of MAP data in EURISCO.

Each WG member should provide to their respective National Coordinator the list of recommended accessions for consideration and formal inclusion in the MAP European Collection. The respective EURISCO National Focal Points, after consultation with their National Coordinators, should then decide whether they can flag these accessions in EURISCO as part of AEGIS, i.e. part of the European Collection.

According to the opinion of the WG members, the most important limiting factors for the flagging of MAP accessions for AEGIS, besides institutions coordination and logistic, are the financial fragilities and lack of funding.

Most of the MAP WG members who participated in this proposal had not yet defined AEGIS candidate accessions. Thus, the major task ahead consists in the identification of eligible MAP AEGIS candidate accessions for the priority species within each updated national inventory.

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Fig.1. Total number of accessions for the priority species in EURISCO (accessed on 24.04.2017)

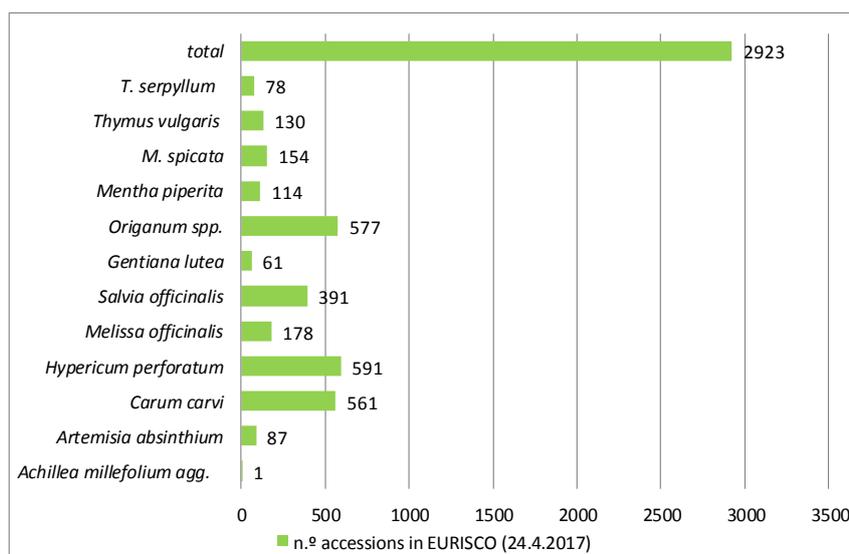
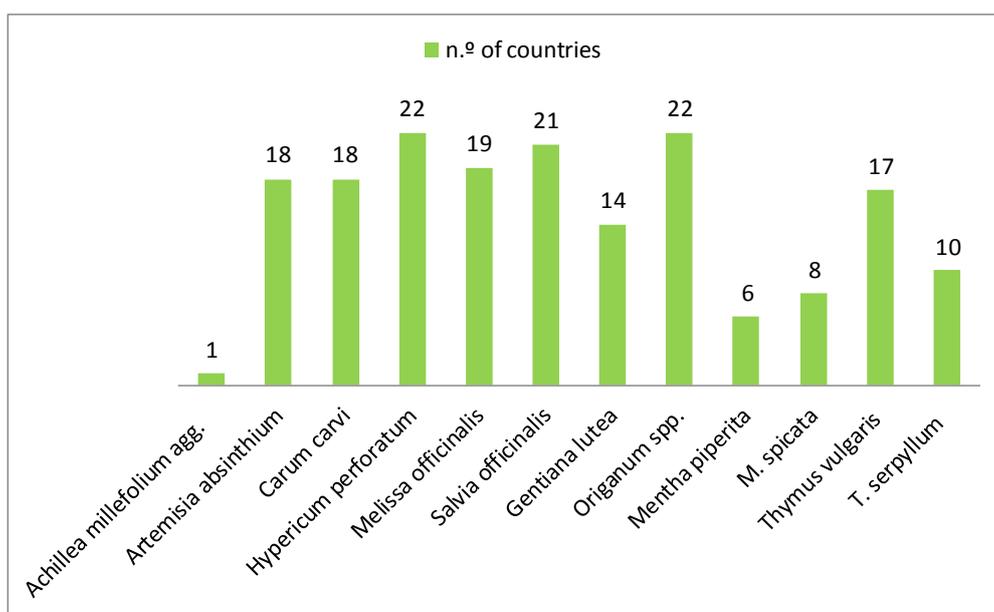


Fig 2. Number of National Inventories including priority species in EURISCO (accessed on 24.04.2017)



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Selection and Approved Criteria to include MAP accessions in the European Collection

The following criteria were approved by the project partners:

Priority species (seed-propagated)
National origin
Wild populations or landraces or obsolete cultivars
EURISCO minimum passport data available (national inventory code, inst. code, accession number, genus)
AEGIS minimum passport data available (species, country of origin, sample status, collecting source, accession name for cultivars, others if possible)
Availability for users
Long-term conservation conditions
Minimum germination value for cultivated accessions: 75% or lower for wild materials
Number of (viable/germinating) seeds available - cross-pollinated species: recommended sample size: 2000 germinating seeds in long-term conservation
Number of plants necessary for regeneration: recommended size of minimum 30-60 plants <i>in situ</i> as well as <i>ex situ</i>

Documentation

During the meeting, the project partners stated the importance of the Passport descriptors, (Site and Habitat), Environment and Site, as well as the Management descriptors (management + multiplication/regeneration descriptors), to support crop conservation standards.³

Based on the accumulated experience with the use of priority species descriptors, the group decided to start a revision and update process, including the finalization of missing descriptors for *Achillea millefolium*, *Artemisia absinthium* and *Gentiana lutea*. These descriptors will be presented by Dea Baričević by the end of the year 2018.

³ Document developed by the MAP WG: [Proposal for a MAP descriptor list](#)

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Future information on characterization and evaluation: morphology; phenology; chemical composition of main compounds (essential oils, phenolic compounds, others); resistance to pests and diseases; molecular data, should also be prepared for inclusion into EURISCO.

Crop-specific conservation standards for orthodox seeds

Previously crop-specific genebank standards for orthodox seeds were discussed among all the MAP WG members, as well as the standards for *in vitro* culture cryopreservation and field genebank conservation.

The crop-specific conservation standards to be used for orthodox seeds as part of the AEGIS Quality System were also revised during the meeting.

The following criteria were approved by the project partners:

Biological status of the accession :

Wild, Cultivated, Breeding material (hybrid, genetic stock...)

Seed viability (germination requirements according to standards)

Seeds with low germination rate ($\leq 50\%$ for cultivated accessions and $\leq 40\%$ for wild accessions) - REGENERATION

Seeds with high germination rate ($\geq 75\%$ for cultivated accessions and $\geq 60\%$ for wild accessions) - CONSERVATION

Size of the accession for conservation

Cross-pollinated - 10 000 seeds

Self-pollinated - 5000 seeds

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EXPECTED ADDITIONAL ACHIEVEMENTS

The MAP Working Group has also considered during the meeting actions to be taken in the near future. These could be subjects for the preparation of Activity proposals under the ECPGR Grant Scheme:

- Expand the original “priority list” of MAP species, identified by the WG members to show the existence of some common regional strategies and priorities. This expanded priority list can show the level of threat and the Red List status for MAP species in Europe and give support to the Strategy for European MAP Conservation.
- Systematic actions for documentation of *ex situ* collections and *in situ* populations: information organized according to EURISCO.
- Compile systematic information that contains ‘key aspects’ of the MAP species [e.g. annual or perennial species; type of seed (orthodox, intermediate, recalcitrant); optimum germination.
- Other opportunities for cooperation and integration between WG members and other WGs: increase the focus on *in situ* conservation; potential of *in vitro* or cryopreservation methods to improve the status of conservation and safety-duplication of MAP species.
- Orchestrate the know-how available in the respective pool of experts to resolve specific technical issues that might evolve as part of the operation of the WG.

In conclusion, the Activity partners will apply the approved criteria for inclusion of accessions in the European Collection to their MAP collection and use the remaining available funds from the Activity budget for multiplication of candidate AEGIS accessions, which are in the process of confirmation.

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