Assessment of Unique Material in the European Collections of Umbellifer Crops

Umbellifer Working Group AEGIS Project

1. Problem

Identification of duplicate and synonymous accessions in collections of plant genetic resources is problematic, but essential to the implementation of AEGIS as the 'most appropriate accession' or MAA from a group of potential duplicates will be selected for inclusion in the future integrated European genebank system. In the case of Umbellifer crops, MAAs must be identified from the entire European Umbellifer collection of ~9400 accessions, which represent a variety of crops from nine genera. Identification of MAAs is an iterative process which needs to take account of duplicates, synonyms and incomplete passport data; a high level of interaction is required among members of the Working Group and collection managers. This project aims to identify duplicate and synonymous accessions within the European Umbellifer collection, and use the list of unique material to select the MAAs to be put forward for inclusion into AEGIS

2. Justification and Rationale

The proposed project is essential for the implementation of AEGIS, with all the benefits to coherent germplasm management that AEGIS can deliver[1]. In order to identify which of the accessions in the various European collections are suitable to put into AEGIS, it is necessary to understand the level of duplication within current collections so that only unique material with a minimum level of passport data is included. Funds are requested to support this work by the Umbellifer Working Group; as such an analysis of existing data is very much a collaborative effort requiring a high level of communication, ECPGR support for two workshops is requested.

3. Background

Work towards the best way of applying the criteria for MAAs has already been carried out in the *Brassica*, *Avena*, *Prunus* and *Allium* Working Groups. Of the four model crops, brassica crops are the most similar to the Umbellifer crops as both groups contain small-seeded, outbreeding species, and the methods of ex-situ conservation and collection management are identical. The *Brassica* Working Group produced a flow diagram indicating the process of decision making which could be followed, which varied according to the level of information available for each accession. This work was carried out using *Brassica rapa* as an exemplar species, with the intention that the process should be applicable to all other brassica crops. Accordingly, it should be suitable for use with Umbellifers.

4. Main and Specific Objectives

The main aim of the work will be to understand and quantify the level of duplication of accessions in the European Umbel collections. Specific objectives are:

- To analyse the existing data associated with the European Umbel collections as held in both the European Umbel Database (EUDB) and the EURISCO catalogue with regard to completeness of passport information. The level of passport data will influence how accessions are assessed for uniqueness.

- To assess the entire European Umbel collections for duplications and synonyms

- To set up a list of criteria for MAA definition based on documents already produced within the AEGIS programme

- To use the results to draw up a list of MAAs for inclusion into AEGIS

5. Materials and Methods

The majority of the proposed work will be carried out by project partners and involves an in-depth examination of passport data from both their own collections and that from collections held at other institutes (where the curator is not a project partner). It will involve a careful comparison of all relevant passport data relating to an accession, including accession name, collection location and date and any other historical identification numbers known to have been assigned.

We propose to follow the protocol developed by the Brassica Working Group for identification of MAAs[2]. This protocol allowed for incomplete passport data and provides a flow chart of the work process (see Figure 1). Accessions with the accession name (ACCNAME) field filled in can be dealt with more easily by following the work flow in Figure 1. Accessions lacking an entry in the ACCNAME field must be handled in a different way, and potential duplicates assessed through comparison of collecting or other numbers. Dialogue with collection managers and project partners is essential in order to clarify as far as possible the identity of accessions. The work will be carried out by the project partners; each partner will take responsibility for the sections of the Umbellifer collection with which they are most familiar (e.g. those held in their own country), together with a portion of the remaining accessions. In this way, the entire European Umbel collections can be assessed.

An essential part of this project will be two workshops for all project participants to be held in Wellesbourne, UK and Angers, France. The first workshop will allow the project partners to discuss the implementation of the proposed methods and the organisation of work (which project partner is responsible for which group of accessions). Any problems and questions can be raised at this stage, and a workshop will allow project partners to work through a small subset of data together so that the methods can be properly understood and validated. The final workshop will be a forum for project partners to present their results and seek feedback on any particular issues arising from the work. From this workshop, an initial list of unique accessions and potential MAAs will be compiled. The final stage of the project will involve communication with collection managers to finalise the list of MAAs.

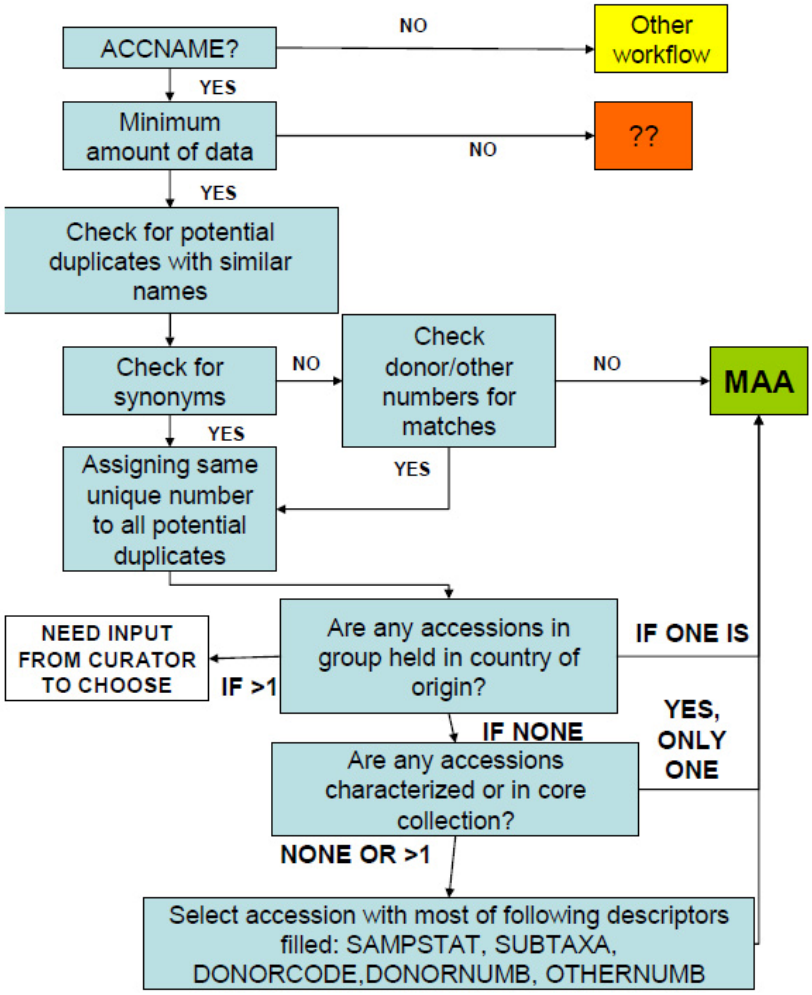


Figure 1. Workflow for selection of MAAs for AEGIS developed by the Brassica Working Group

6. Expected Outputs

The project will result in an analysis of duplication and synonymy within the European Umbel collections. This analysis will be instrumental in informing the selection of MAAs for inclusion into AEGIS. The major output of the project will be a draft list of MAAs for AEGIS that can be put forward for approval by the relevant national co-ordinators. A project report describing the approach taken and methods used will also be written so that the experiences of the Umbel WG can inform other working groups who have not yet undertaken this process. MAAs will also be identified through the inclusion of an additional field in the EUDB.

7. Benefits and Impacts

In order to implement AEGIS, with all the benefits it will deliver, it is essential that MAAs are identified. By identifying duplications within the European collections, this

project will deliver a list of MAAs for Umbellifer crops ensuring that this important group of horticultural and medicinal/spice crops are represented within AEGIS

8. Innovation

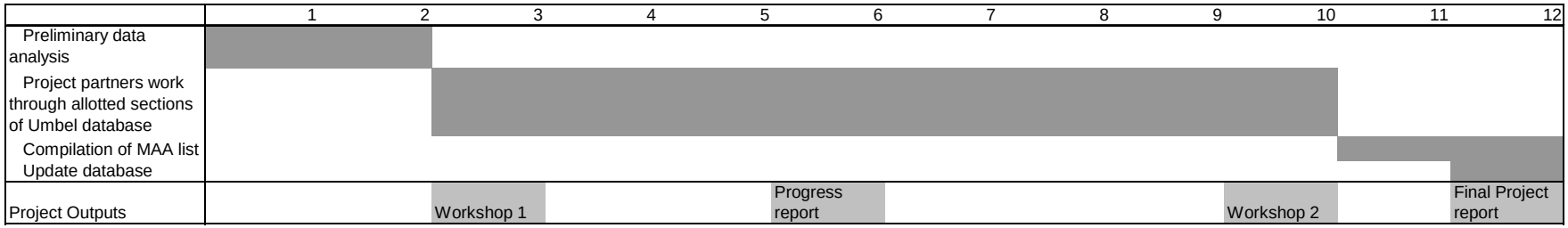
The work described is the first in-depth analysis on a European scale of the European Umbel collections with regard to duplicates and synonymy, and is an essential first step to the implementation of AEGIS.

9. Application of Results

The results of this project not only contribute directly to the implementation of AEGIS, but are essential for it. A list of MAAs must be compiled by each Working Group, and this will involve an in-depth analysis of existing collection holdings as well as a high level of interaction between members of the working groups and collection managers. By publishing a report detailing the methods and findings of the Umbellifer Working Group, this project will contribute toward the implementation of AEGIS by other working groups who may need to use a similar approach.

10. Workplan

The workplan shows the timing of the various activities over the 12 months of the project. All project partners will contribute equally to all tasks, except preliminary work, organisation of workshops and the final project report (Charlotte Allender and Emmanuel Geoffriau to take the lead in these areas)



Preliminary data analysis: comparison of EUDB and Eurisco datasets, initial allocation of datasets to each project partner

Workshop 1: Presentation and discussion of methods, finalisation of workload of each participant, resolution of problems and queries regarding workplan and an opportunity to examine a defined subset of accession data so that project partners are familiar with the work process

Progress Report: Compiled via email – check on the progress of each project partner in analysing their data subset, opportunity for identification of problems which may have arisen since Workshop 1.

Workshop 2: Presentation of results from each project partner; discussion of results and any problems or issues which have arisen, initial compilation of data

11. Budget

The funds requested are based on the costs of holding two workshops, one at Warwick HRI and one in Angers during the course of the project. Travel costs have been based on air fares through online travel agents such as Expedia, with an allowance for transfers. Funds are also requested to offset administrative costs involved in organising and hosting the workshops and administering the project funds. A consumables budget of 300€ is requested for each participant to offset the costs of office supplies, computer media and software and any domestic travel required during the course of the project.

Institute	Item	Budget	
Agricultural Technology Transfer Center of Lushnje, Albania	Travel to workshops	€ 1,000.00	
	Accommodation	€ 350.00	
	Meals	€ 84.00	
	Consumables	€ 300.00	
	Total		€ 1,734.00
Crop Research Institute Olomouc, Czech Republic	Travel to workshops	€ 600.00	
	Accommodation	€ 350.00	
	Meals	€ 84.00	
	Consumables	€ 300.00	
			€ 1,334.00
Institute for Agrobotany, Hungary	Travel to workshops	€ 600.00	
	Accommodation	€ 350.00	
	Meals	€ 84.00	
	Consumables	€ 300.00	
	Total		€ 1,334.00
NordGen, Sweden	Travel to workshops	€ 625.00	
	Accommodation	€ 350.00	
	Meals	€ 84.00	
	Consumables	€ 300.00	
	Total		€ 1,359.00
Georgian Research Institute of Farming, Georgia	Travel to workshops	€ 1,250.00	
	Accommodation	€ 350.00	
	Meals	€ 84.00	
	Consumables	€ 300.00	
	Total		€ 1,984.00
Agrocampus Ouest Angers INHP, France	Travel to workshops	€ 375.00	
	Meeting costs	€ 187.00	
	Accommodation	€ 175.00	
	Meals	€ 84.00	
	Consumables	€ 300.00	
	Total		€ 1,121.00

University of Warwick, Wellesbourne, UK	Organisation/administration costs	€ 592.60	
	Meeting costs	€ 187.00	
	Travel to workshops	€ 375.00	
	Accommodation	€ 175.00	
	Meals	€ 84.00	
	Consumables	€ 300.00	
	Total		€ 1,713.60
		GRAND TOTAL	**€ 10,579.60**

12. Contributions foreseen by applicant

The work involved in assessing the level of duplication in the umbel collections and preparing a list of MAAs will be carried out as an 'input in kind' by the project partners. A rough idea of effort based on estimates presented in the Brassica WG Progress report has been calculated as 2-3 weeks work to identify duplicates and synonyms and then a further 2-3 weeks by nominated partner(s) to compile a list of MAAs. Support is requested from ECPGR to fund the two workshops required to begin and permit the project partners to interact with each other and report problems and final results.

13. Bibliography

[1] **A Strategic Framework for the Implementation of a European Genebank Integrated System (AEGIS): A Policy Guide.**
http://www.ecpgr.cgiar.org/AEGIS/Docs/AEGIS_StrategicFramework_PolicyGuide.pdf

[2] **Model Crop Progress Report : Brassica Working Group (July 2008)**
http://www.ecpgr.cgiar.org/AEGIS/Docs/Brassica_ProgressRep_July08.pdf