Collecting Umbellifer Wild Relatives, progress and results: Prospection in Albania

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Collecting wild relatives, progress and results

Albania is situated on the western part of the Balkan Peninsula, between geographic latitude of 39°38’ and 42°39’ N and geographic longitude of 19°16’ and 21°04’ E.

Thanks to our climate conditions, Albania is a rich country with a wide diversity of plant genetic resources. There are a lot of primitive cultivars and indigenous landraces, and wild species as well, especially of Umbellifer plants. Primitive cultivars and indigenous landraces are cultivated especially in farmers’ orchards, even in the most remote rural villages.
Collecting wild relatives, progress and results

The wild relatives of our crops represent a vital source of untapped genetic diversity, which is now at risk of disappearing, when it is most needed. As they have traits allowing them to be successful at the current extremes of a crop’s range and beyond, wild relatives can be extremely important in adapting crops to climate change.

They typically display characteristics, such as heat and drought tolerance, pest and disease resistance and the ability to thrive in saline soils, which would allow crops to cope with a wider range of environments and stresses.
Collecting wild relatives, progress and results

- Collecting and more detailed description of these crop wild relatives typical for Albania has never been seriously done. These crop wild relatives are still maintained but there is evident decrease and lost of some of the populations. Since they are specific crops, characteristic of the narrow area, and because of the lack of means for more detailed collecting in the framework of ECPGR regular activities, we suggested additional and more detailed stock-taking, collecting seeds of these crops, making documentation and preservation of the collected material in the national gene banks.

- Thanks to the support of Bioversity International, Umbellifer working group and especially Mr Emmanuel GEOFFRIAU, is undertaking the project (Collecting the Crop Wild Relatives of the Umbellifer Crops in Albania), which has begun to implement.
Methodology

- Based on this occurrence and thanks to Bioversity International Project, collecting missions of Umbellifer wild relatives in the coastal and western lowland territory of Albania were organised.

- In order to complete this project, a working plan was designed, and exploration and collecting missions were undertaken for these species such as carrots, dill, parsley, fennel, coriander, anise, bishop weed, athamanta, etc.

- All this process has been conducted by project staff and ATTC- Lushnje with the cooperation of the Agricultural Regional Services.

- Guidelines were followed refer to the following main fields:
  - consulting and gathering of the information about the villages where we could be able to get the best variation of wild umbelifer plants;
  - exploration and collection through missions in the field;
  - evaluation of the collected populations - when collecting wild species ensure that attention is paid to varying habitats at a site;
  - recording the local information about species and traditional knowledge and traditional utilization by interviewing farmers, and other persons.
Action plan, progress and results

The action will be focused on collecting expeditions, mapping, *ex situ* and *in situ* preservation and construction of the database with accessions of collected species.

Main tasks:

- Preparation and design of detailed terrain plan (March-April): the coastal and western lowland territory of Albania will be divided into three sub-areas (north, center and south), giving a description of the growth conditions of umbellifer plants.

- Field work and research (May-August):
  - consulting and gathering information about the villages where we could be able to get the best variation of Umbellifer CWR;
  - exploration and collection through missions in the field;
  - estimation of populations size, geographical referencing,

- Data analysis, organisation of long term storage and project reports (September-November).

At the end of the project, there will be held an annual meeting in the form of a workshop where the main achievements of the project will be reported, presented and disseminated.
Preparation Phase

1. Soil and climatic conditions

- Albania has a total area of 28,748 Km².
- It’s coastline length is 611 km and extends along the Adriatic and Ionian seas.
- Albania has a high number of climatic regions relative to its landmass. The coastal lowlands (18% of territory) have typically Mediterranean weather; it varies markedly from north to south.
- For our project, the coastal and western lowland territory (Mediterranean lowland zone) is divided into three sub-areas:
  - I.A-north,
  - I.B-centre, and
  - I.C-south,
  giving a description of the growth conditions of umbellifer plants.
Preparation Phase

2. Consulting and gathering information, via internet, literature and herbaria

The main activity in the preparatory phase is making sure “all the homework is done”.

- This includes having very clear collecting objectives. A major preparatory activity is obtaining as much information as possible about the target germplasm and area where the collecting is to take place.

- Much information may be available via the internet but it is often also very worthwhile visiting herbaria with material of the target species to accumulate data that might not be available on the internet.

- More value can be the utilization of literature, especially special editions on the country's flora and its different regions, climate zones and micro zones.
Consulting and gathering information
(with specialist and farmers in exploration regions)
Exploration and collection through missions in the field

The objective of collecting for ex situ conservation is to efficiently gather and document the genetic diversity of the target species in a particular area.

Hence the job of collecting in the field has two distinct components:

(a) sampling the plant populations,
(b) documenting as thoroughly as possible the sampled population and its environment.

One of the greatest constraints for sampling in the field is time. Initially it is necessary to canvass an area to find target plants and then determine their distribution in a locality and any obvious ecological or phenotypic variation in the sampling area.

RESULTS obtained from exploration and collecting missions, carried out from May 20 to June 18, 2013.
Exploration and collection through missions in the field

1. Wild carrot (*Daucus carota*. L)

A-Plants that grow fences, near water canals, with multiple branches, long and thin stem, ending with umbel (the inflorescence - a cluster of flowers). These plants grow in a wide territory (Fier district)

B-Plants with long and strong stems, ending with large and uncompressed umbel. (Lushnje district)
C-Plants with long stem and purple color, ending with flat umbel. (Kavaja district)

D-Plants with long and strong stem, ending with large flowers, white color, umbel convex shape from above. (Kavaja district)
E-Vigorous plants with long and strong stems, which grow in agricultural plots. (Lushnje district)

F-Weak plants, with the short stem, long internodes, with few ramifications, and purple color, which grow on roadsides or railway. It is a rare plant. (Durres district)
Exploration and collection through missions in the field

2. Dill (*Anethum graveolens* L)

Vigorous plants with long and strong stems, grown in agricultural plots. It is a rare plant. Some of it are found around the Lushnja and Fieri cities, used as kitchen aromatic herbs.
Exploration and collection through missions in the field

3. Parsley (*Petroselinum crispum* L)

Plants with long and thin stems, small and very aromatic leaves. (Lushnje district)
Exploration and collection through missions in the field

4. Cow Parsley (*Anthriscus sylvestris*)

Vigorous plants with long and strong stems, long internodes, dark green leaves, grown on the side of roads, in the green fences and the old walls.

(Grown in a wide territory, from Tirana to Vlora)
Exploration and collection through missions in the field

5. Wild Fennel (*Foeniculum vulgare* L.)

Vigorous plants with long and strong stems, long internodes, and dark green leaves, grown on roadsides, near canals in the green fences.

(Grown in a wide territory, from Durres to Vlora)
Exploration and collection through missions in the field

6. Coriander (*Coriandrum sativum. L*)

Robust plants, highly branched, with long stems, many leaves, dark green color, grown as weed plants mainly in the fields of wheat and other cereals, in the green fences, etc.

These plants grow in a wide territory, from Shkoder in north to Vlore district in south Albania.
Anise is sweet and very aromatic, distinguished by its characteristic flavor. A landrace form that grows in southeastern Albania (Permet district) and used as kitchen herbs.

House hold agricultural farms of Leshice village, Petran municipality, Permet district (Dionis Barxho, farmer)
Exploration and collection through missions in the field

8. Bishop weed (*Ammi visnaga. L*)

Robust plants, with long stems and many leaves, dark green color, grown as weed plants in the side of agricultural fields or roadsides, etc)

Grown in a wide territory, from Shkoder in north to Vlore district in south Albania.
Exploration and collection through missions in the field

9. Poison hemlock (*Conium maculatum*)

Big weed plants, grown mainly on the side of roads or agricultural fields, etc.

(Grown in a wide territory, from Durres to Vlora).
Exploration and collection through missions in the field

10. Alexander (*Smyrnium olusatrum* L.)

Note: This specie is not completely identified and defined

Big weed plants, grown mainly on roadsides, etc.

(Grow in a relatively narrow territory, around the Bay of Vlora).
Exploration and collection through missions in the field

Note: This specie is not identified and defined

Herbaceous plants, with a few branches, straight shaggy stalk, 100-120 cm high. Many-pinnate leaves. Umbel flowers are small and with white color. It grows mainly in relatively dry places in the street sides, green fences and abandoned terrain, etc.

(It is a rare plants, that grows in a wide territory, especially in the Bay of Vlora).
Exploration and collection through missions in the field

Note: This specie was found and described, but it is still unidentified and undefined

Herbaceous plants with big mass, typical of places with high moisture and humidity. Plant with fragile stems, many side branches and long internodes. Smooth plant, 150-180 cm long, with angle stems at the base of the plant. The leaves are large and with many pinnate. The plant has umbrella type, small and white flowers.

This specie grows mainly in places with high humidity such as water canals, especially in the former lagoon areas (wetlands) Myzeqe in Lushnja district.
Exploration and collection through missions in the field


Note: This specie was found by a specialist of Vlora agricultural region, which has informed the working group of this project. It needed to be explored by the working group, described, photographed and afterwards collected.

The Alpin Athamanta (*Athamanta cretensis*) is a flowering plant of the family Umbelliferaea (Apiaceae). This plant prefers limestone rocks, most often found in hilly and mountainous areas, waste limestone rocks, wet and cool air. It is a rare plant. Some of it are found in the southern sub-zone of western lowland country, with typical Mediterranean climate, mainly in the Bay of Vlora.
Future developments

- Will continue the collecting missions of Umbellifer wild relatives, according to the action plan,
- Estimation of populations size, geographical referencing,
- Mapping of geographic distribution areas of wild relatives of umbrellifer crops, according to GIS system,
- Collecting seeds of species assessed,
- Organization of the drying process of the seeds and their manipulation,
- Data analysis,
- Organisation of long term storage (will be separated for safe duplication),
- Prepare the project reports.

At the end of the project, there will be held an annual meeting in the form of a workshop where the main achievements of the project will be reported, presented and disseminated.
Thank you for your attention

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