



# ECPGR Activity Grant Scheme

## Interim Activity Report

### Third Call – Phase X (2019-2023)

#### Activity Proposal

Activity	
Full title	<b>Capturing Brassica Wild Relatives Diversity in South-Eastern Europe</b>
Acronym (or short title)	<b>EUBRASWILD</b>
Duration of Activity (in months)	24
Start date – End date <i>Please indicate start date not earlier than 3 months after deadline of call</i>	1 October 2020 – 1 August, 2023

#### Applying Working Group(s)

	Working Group	Indicate name and surname of Working Group Chair
1.	<i>Brassica</i>	Ferdinando Branca

#### Activity Coordinator

Activity Coordinator	
Name and Surname	Smiljana Goreta Ban
Nationality	Croatian
Current position	Scientific Advisor
Institute	Institute of Agriculture and Tourism
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## Activity Partners (ECPGR-funded)

*Please note that each partner needs to be a member of an ECPGR Working Group to be eligible for funding. For self-funded partners please use the separate box below.*

Partner ID No.	Name and Surname	Institute	Country
1	Ferdinando Branca	University of Catania (UNICT)	Italy
2	Smiljana Goreta Ban	Institute of Agriculture and Tourism (IPTPO)	Croatia
3	Sokrat Jani	Agricultural University of Tirana, Institute of Plant Genetic Resources (IPGR)	Albania
4	Ana Marjanović Jeromela	Institute of Field and Vegetable Crops (IFVO)	Serbia
5	Vladimir Meglič / Barbara Pipan	Agricultural Institute of Slovenia (KIS)	Slovenia
6	Nataša Mirecki	University of Montenegro Biotechnical Faculty (UNIMO)	Montenegro
7	Georgia Ntatsi	Institute of Plant Breeding and Genetic Resources (IPBGR)	Greece

## Self-funded partners

Partner No.	Name and Surname	Institute	Country
1	Nikola Major	Institute of Agriculture and Tourism	Croatia
2	Nevena Nagl	Institute of Field and Vegetable Crops	Serbia
3	Bernard Prekalj	Institute of Agriculture and Tourism	Croatia
4	Nina Išić	Institute of Agriculture and Tourism	Croatia
5	Dragana Rajković	Institute of Field and Vegetable Crops	Serbia
6	Di Bella Maria Concetta	University of Catania	Italy
7	Treccarichi Simone	University of Catania	Italy
8	Rizzo Giulio	University of Catania	Italy
9	Arena Donata	University of Catania	Italy
10	Lorenzo Maggioni	ECPGR	Italy

## **Introduction:**

The aim of this proposal is to improve the knowledge of the presence, distribution and biodiversity status of the *Brassica* wild relatives in the Eastern and South-Eastern Europe as well as to fill the gaps of Brassicaceae wild relative populations in the EU genebanks and in AEGIS. At the time of preparing the proposal, the AEGIS database consisted of 2,273 *Brassica* accessions mostly held in the UK (909), the Netherlands (673) and Italy (256). From the east Adriatic and western Balkan countries, only 5 accessions from Bosnia and Herzegovina were listed. Out of all *Brassica* accessions in AEGIS, more than half are *B. oleracea* (1490), while *B. napus* (367) and *B. rapa* (375) are also well represented. There are just a few accessions of some species of *Brassica* wild relatives and none from the geographical area of South-East Europe.

The following activities were planned:

- *Two meetings with the aim to define the number of samples and detail protocols for collecting, regenerating and characterizing the collected accessions (kick-off and final meeting managed respectively by IPTPO and UNICT)*
- *Sharing information on the status of national genebanks and national priorities related to Brassica CWRs (all partners)*
- *Collecting and monitoring of at least 10 accessions of Brassica wild relatives populations in each involved country (all partners)*
- *Establishing field/greenhouse collection(s) of gathered CWRs populations and their regeneration (all partners)*
- *Description of morphological traits using the same descriptors (all partners)*
- *Selection of accessions for inclusion in AEGIS (all partners)*

## **Completed activities during the reporting period (October 2020 – January 2022)**

### **A) Meetings**

The first kick-off meeting of the ECPGR activity EUBRASWILD was held on 30 November 2020 in virtual form using the Zoom platform. All countries involved in the Activity had their representatives present in the meeting, except Montenegro (Fig. 1a). The kick-off meeting was organized with the aim to introduce all participants, discuss the Activity as a whole and exchange information. The *Brassica* Working Group Chair Ferdinando Branca shared information on the history and current status of the Working Group. Lorenzo Maggioni (ECPGR Secretary) shared information and updates on ECPGR. Smiljana Goreta Ban then introduced the participants of the meeting to the EUBRASWILD Activity with a presentation showing Activity details, duration, participants, aims, justifications and expected impacts. Then the participants took turn in sharing information on the status of the *Brassica* collections in their respective countries (Albania, Croatia, Greece, Italy, Serbia and Slovenia). In addition, during the meeting, participants discussed: possible accessions to be shared and used as a 'standard' for each species; exchange of information on the methods for survey and collection of *Brassica* CWRs; protocols for collection, regeneration and characterization of targeted species and plans for next activities.

The second meeting of the ECPGR activity EUBRASWILD was held on 3 March 2021 in a virtual form, using the Zoom platform. All involved countries had their

representatives present in the meeting, except Montenegro (Fig. 1b). Activity coordinator Smiljana Goreta Ban opened the Zoom meeting with an introductory welcome to all participants. Lorenzo Maggioni (ECPGR Secretary) shared information about project financing and the procedures to receive payments for the activities. Smiljana Goreta Ban opened the discussion on the reduction of the number of proposed descriptors for *Brassica* and it was agreed that the passport data will be used for collecting the seed and other samples of targeted *Brassica* species, while the further description in the field will be made with the proposed descriptors (Descriptors for Brassica and Raphanus, IBPGR, 1990) according to each partner's availability. A protocol for regeneration was discussed, but not defined since Ferdinando Branca could not attend the meeting.

For the next period, it was agreed that the following activities will be undertaken: participants from Croatia will be making expeditions to collect *Brassica* WRs and wild *Brassica* species in May/June 2021; Serbia, Albania and Slovenia also reported plans for the spring/summer collecting expeditions and regeneration plans; Greece will regenerate selected *Brassica* species from the seeds acquired from genebanks, but also do expeditions for collecting *B. incana* and *B. cretica*.



Figures 1a and 1b. Virtual meetings were held on 30 November 2020 (left) and 3 March 2021 (right)

### ***B) Progress on collection and establishment of field/greenhouse collections***

#### *Albania:*

Due to a lack of additional funding, the Albanian partner could not proceed with activities.

#### *Croatia:*

IPTPO group collected samples of several species of wild *Brassica* from the coastal and islands area of the Adriatic Sea. The siliques, seeds and plants of *B. incana* (*mollis*) were collected in the area of southern Adriatic at locations Koločep and Korčula and the siliques and seeds were morphologically analyzed. In the area of middle Dalmatia at Zagvozd, one accession of *Bunias erucago* L. (corn rocket) was collected, as well as 4 accessions of *Diplotaxis* spp. in Istria. In addition, the plants of *B. incana* and *B. mollis* grown from the seed collected previously at 5 locations were grown under greenhouse conditions and maintained in vegetative stage since 2020 (Fig. 2). Only a few seeds were produced after hand pollination during spring 2021 (Fig. 3). However,

the plants survived the summer and autumn of 2021 and we expect another flowering during spring 2022. We plan to enable controlled pollination using small hives with bumblebees to enhance seed production.



Figure 2. *B. mollis* (Koločep, left) and *B. incana* (Vis, right) grown under greenhouse conditions at IPTPO, Croatia



Figure 3. *B. incana* at flowering stage, IPTPO, Croatia

#### Greece:

During previous times, the Greek genebank had shared with project participants the coordinates where the *Brassica* wild relative species, possibly *B. cretica* and *B. incana*, could be collected. However, due to COVID-19 travel restrictions, it was impossible for participants to travel around Greece and collect seeds. Therefore, the collection activities are planned for spring/summer 2022.

#### Italy:

UNICT collected several samples of *Brassica* CWRs around key points of Sicily during two different expeditions. The first expedition was conducted during the end of May 2021, a total of 4 different accessions were collected: 3 accessions of *B. rupestris* from Corleone (Palermo province), Monte Pellegrino (Palermo province) and "Gole della Tardara", located near Sambuca di Sicilia (Agrigento province); 1 accession of *B.*

*villosa* from Caltabellotta (Agrigento province). During the second expedition, conducted during the end of July 2021, a total of 2 different accessions were collected: 1 accession of *B. macrocarpa* from the island of Favignana (Trapani province) from two different stations; 1 of *B. villosa* subsp. *drepanensis* from Mount Erice (Trapani province). The seeds of the accessions collected were cleaned, dehydrated, classified and then stored by UNICT in order to preserve the accessions and to regenerate them. Accessions of *B. rupestris* from the first expedition were already sowed for characterization and regeneration.

In July 2021, Lorenzo Maggioni (ECPGR), collected two accessions of *B. montana* in the Island of Ponza (Latina province) and sent half of the sample to UNICT for multiplication and long-term conservation.

### Serbia:

In June and July 2021, researchers from the Institute of field and vegetable crops (Serbia) went on two expeditions at Stara Planina mountain to collect wild *Brassicaceae* (Fig. 4). During the first expedition, organized 28- 29 June 2021, plant material from eight species (*Isatis tinctoria*, *Raphanus raphanistrum*, *Lunaria annua*, *Alyssoides utriculata*, *Alyssum orientale*, *Sinapis arvensis*, *Aurinia corymbosa*, *Aurinia saxatilis*) was collected on six locations.



Figure 4. *Isatis tinctoria* from location Sićevačka klisura, IFVCNS, Serbia

The second expedition was carried out on 13-15 July 2021. During this field work, plant material from three species (*Brassica rapa*, *Diplotaxis tenuifolia*, *Sinapis arvensis*) was acquired at three locations. Additionally, during August and September, seeds were collected from plants that were not ripe at the time of the previous expeditions, as well as from *Sisymbrium loeselii*.

Collected plant material (siliques and silicles with seeds), was dried and the number of seeds was calculated. Herbarium specimens from 10 out of 11 collected species were deposited in HMN Herbarium of the Faculty of Sciences and Mathematics, Department of Biology and Ecology, University of Niš.

### Slovenia

In 2021, KIS performed status review activities within the national Slovenian Plant Gene, related to wild *Brassicaceae*. There is a collection of 18 wild *Brassicaceae* accessions which mainly belong to *Diplotaxis* spp., some of them to *Diplotaxis*

*tenuifolia* and *Diplotaxis muralis* (see Table below). The availability of seeds is very limited and is urgent to regenerate them.

In addition, some spring/summer collecting expeditions were performed. The mature seeds of one accession belonging to *Eruca/Diplotaxis* sp. were collected. The unknown wild Brassicaceae accession was found in Zapogje village (46.17823, 14.46273; sub-alpine climate; central Slovenian region). The plant, along with soil, was transferred to greenhouse pot conditions to obtain mature seeds (Fig. 5) for further project activities/assessments.



Figure 5. Mature seeds of collected *Eruca/Diplotaxis* sp., KIS, Slovenia

### **C) Conclusions and plans for the future**

The planned activities for the first interim period were generally fulfilled, although some modifications were necessary and the planned meetings were in virtual form. Also, the expeditions were limited by restrictions on travelling due to the COVID-19 pandemic. However, it seems that the planned number of accessions will be fulfilled by most of the involved partners.

For the next period, the partners are planning at least one *on-site* meeting during 2022 (Catania) and the collection of the new accessions and regeneration process will be the focus.