

EUBRASWILD

Capturing **Brassica Wild** Relatives Diversity in the South Eastern Europe



Project details:

- Duration: 24 months - **1 October 2020 – 1 August, 2023** (ext. summer 2024)
- Working group: *Brassica*
 - Working group chair: **Ferdinando Branca**
 - Activity Coordinator: **Smiljana Goreta Ban**



Project details

- Activity Partners (ECPGR-funded):

| | | | | | | |
|---|--|--|--|---|---|---|
| 1. Ferdinando Branca <ul style="list-style-type: none">• University of Catania (UNICT)• Italy | 2. Smiljana Goreta Ban <ul style="list-style-type: none">• Institute of Agriculture and Tourism (IPTPO)• Croatia | 3. Sokrat Jani <ul style="list-style-type: none">• Agricultural University of Tirana, Institute of Plant Genetic Resources (IPGR)• Albania | 4. Ana Marjanović Jeromela <ul style="list-style-type: none">• Institute of Field and Vegetable Crops (IFVO)• Serbia | 5. Vladimir Meglič / Barbara Pipan <ul style="list-style-type: none">• Agricultural Institute of Slovenia (KIS)• Slovenia | 6. Nataša Mirecki <ul style="list-style-type: none">• University of Montenegro Biotechnical Faculty (UNIMO)• Montenegro | 7. Georgia Ntatsi <ul style="list-style-type: none">• Institute of Plant Breeding and Genetic Resources (IPBGR)• Greece |
|---|--|--|--|---|---|---|

- Self-funded partners:

| | | | | | |
|---|---|--|--|---|--|
| 1. Nikola Major <ul style="list-style-type: none">• Institute of Agriculture and Tourism• Croatia | 2. Nevena Nagl <ul style="list-style-type: none">• Institute of Field and Vegetable Crops• Serbia | 3. Bernard Prekalj <ul style="list-style-type: none">• Institute of Agriculture and Tourism• Croatia | 4. Dragana Rajković <ul style="list-style-type: none">• Institute of Field and Vegetable Crops• Serbia | 5. Di Bella Maria Concetta <ul style="list-style-type: none">• University of Catania• Italy | 6. Lorenzo Maggioni <ul style="list-style-type: none">• ECPGR• Italy |
|---|---|--|--|---|--|

Project activity description

- **Eastern Europe** is rich in **wild *Brassica* relatives**, but there is a lack of information on existing species and their distribution
- Previously mentioned species: *Brassica rupestris* Raf., *B. villosa* Biv., *B. macrocarpa* Guss., *B. drepanensis* (Caruel) Damanti , *B. incana* and related endemic species such are *B. botterii* Vis., *B. cazzae* Ginzb. & Teyb and *B. mollis* Vis
- No known cultivation in the area, but utilized as food by the local population
- *Brassica* wild species used as leafy vegetables: *Eruca* spp., *Diplotaxis* spp., *Sinapis* spp., *Isatis* spp., *Hirschfeldia* spp.

Aims:

- **to contribute to knowledge on presence, distribution and biodiversity status of wild *Brassica* relatives in the Eastern Europe**
- **filling the gaps of wild *Brassica* in genbanks and AEGIS**

Project activities justification

- **Crop wild relatives (CWRs)** = carriers of desirable agronomic/quality properties →→ breeding programs
- *Brassica* wild relatives are endangered (climatic changes, enlargement of urban areas, tourism, summer fires) due to their specific habitat (coastal cliffs/rocky terrains)
- **AEGIS database** contains 2 273 *Brassica* accessions (UK 909, Netherlands 673, Italy 256) → none from the geographical area that will be covered by **EUBRASWILD**

Expected products and related ECPGR objectives



| Expected products/results | Corresponding ECPGR output, activity |
|--|--|
| 1 Defined accessions for inclusion in AEGIS | Output 1.2.; Activity 1.2.1 - identification of new EU accessions for inclusion into AEGIS |
| 2 Update on crop-specific gen-bank standards for Brassica CWRs | Output 1.6; Activity 1.6.2 - standards – agree on crop-specific gene bank standards |
| 4 Seeds available for exchange among partners and available for AEGIS | Output 1.8; Activity 1.8.3 - ECPGR-mediated regeneration of AEGIS accessions |

Genetic material

- **Genetic material** in national collections of participated countries + samples collected during this project will be biochemically and molecularly analyzed at UNICT, IPTPO and/or IPBGR
- Obtained results = comparison with already analyzed samples characterized by the partners

= Evaluation and description of the genetic diversity and relationships between *Brassica* CWRs in SE EU

*costs funded by the H2020 BRESOV project and other interested partners

Expected impact

- 1.** widening activities of Brassica working group to members of underrepresented genebanks in EURISCO and particularly AEGIS
- 2.** capturing of Brassica CWRs diversity in SE Europe
- 3.** exploration and identification of new accessions of Brassica CWRs for inclusion into AEGIS
- 4.** improvement of genebank management in accordance with principles of AEGIS
- 5.** recommendations for future activities contributing to long-term in situ and ex situ conservation of Brassica CWRs

M i s s o n s

| Taxon | Locality | Country | Date | GPS | Gene bank accession numbers |
|------------------------------------|-------------------------|---------|-----------|----------------------|--|
| <i>Brassica cretica</i> Lam. | Tuneli (Uji Ftohtë) | ALB | July 2020 | 40.25170N;019.2918E/ | AGB4451; AGB4452; AGB4453; AGB4454; AGB4455 |
| | | | | 40.2519N/019.2920E | |
| <i>Brassica cretica</i> Lam. | Bar-Restaurant "Kala" | ALB | July 2020 | 40.2446N; 019.2851E | AGB4456; AGB4457; AGB4458; AGB4459 |
| <i>Brassica cretica</i> Lam. | Radhimë | ALB | July 2020 | 40.2452N; 019.2858E | AGB4460 |
| <i>Brassica cretica</i> Lam. | Vlore,Resort Marina Bay | ALB | July 2020 | 40.2455N; 019.2904E | AGB4461; AGB4462 |
| <i>Brassica rupestris</i> Raf . | Skele, Vlore | ALB | July 2020 | 40.2729N; 019.2930E | AGB4463 |
| <i>Brassica incana</i> Ten. | Potam, Himara | ALB | July 2020 | 40.0523N; 019.4508E/ | AGB4464; AGB4465; AGB4466; AGB4467; AGB4468 |
| | | | | 40.0524N; 019.4514 | |
| <i>Brassica juncea</i> (L.) Czern. | Himara | ALB | June 2020 | 40.0603N; 019.4428E | AGB4469; AGB4470 |
| <i>Brassica cretica</i> Lam. | Sazani island | ALB | July 2021 | 40.2927N; 019.1629E/ | AGB4471; AGB4472; AGB4473; AGB4474; AGB4475; |
| | | | | 40.3047N; 019.1601E | |

M i s s o n s

| Taxon | Locality | Country | Date | GPS | Gene bank accession numbers |
|--|-----------------------------|---------|-----------|---------------------------------------|-----------------------------|
| <i>Brassica cretica</i> subsp. <i>aegaea</i> | Manikia, Evia | Greece | June 2022 | 35o 19.772'N, 25o 41.458' E | <i>to be assigned</i> |
| <i>Brassica cretica</i> subsp. <i>aegaea</i> | Ymittos, Attiki | Greece | June 2022 | 37o 56" 40.24" N, 23o 48" 01.78" E | <i>to be assigned</i> |
| <i>Brassica cretica</i> subsp. <i>cretica</i> ή <i>nivea</i> | Akrokorinthos, Korinthos | Greece | May 2022 | 37o 53.363'N, 22o 52.138'E | <i>to be assigned</i> |
| <i>Brassica cretica</i> subsp. <i>cretica</i> | Crete | Greece | May 2021 | 35o 19.772'N, 25o 41.458' E | <i>to be assigned</i> |
| <i>Brassica cretica</i> subsp. <i>laconica</i> | Leonidio, Arkadia | Greece | June 2022 | 37o 9.940'N, 22o 52.255'E | <i>to be assigned</i> |

M i s s o n s

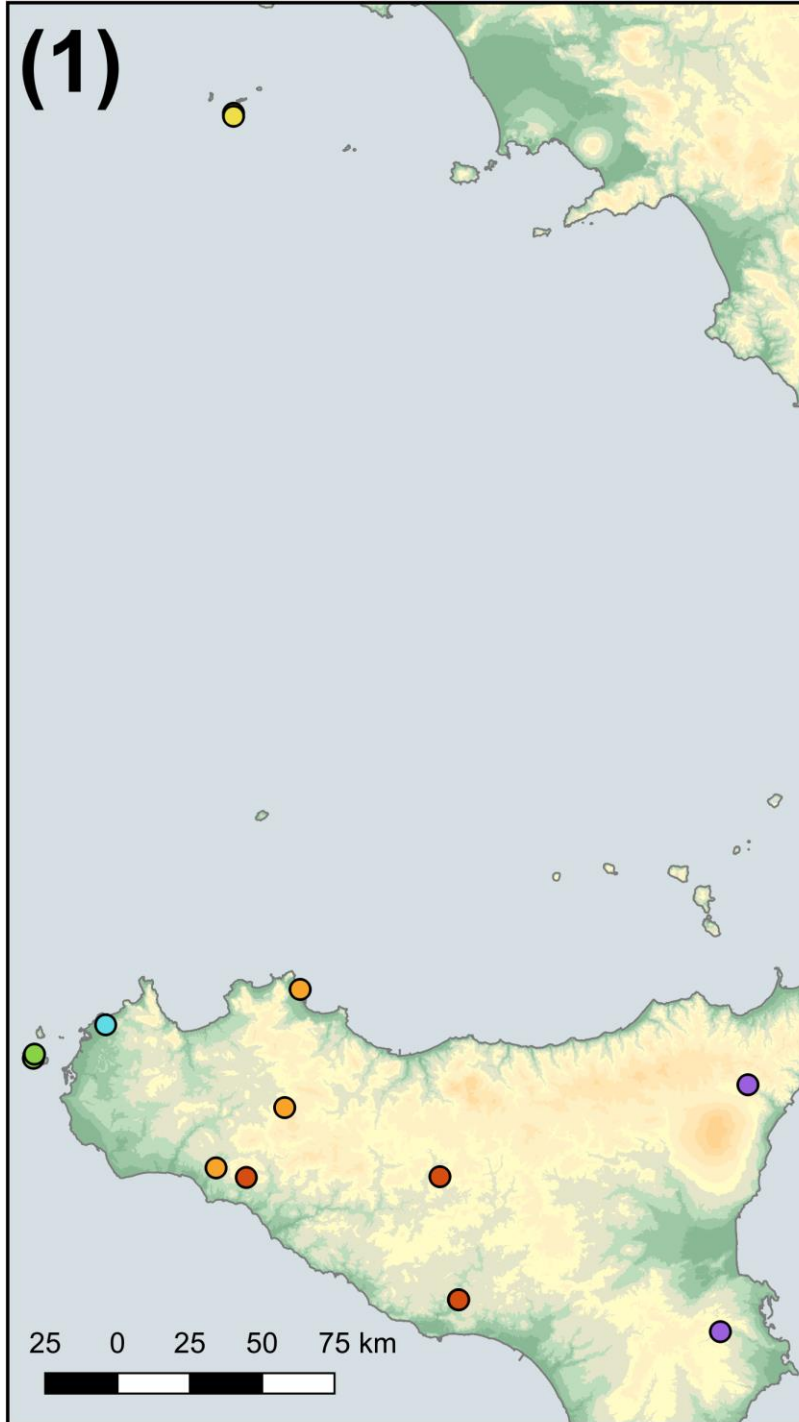
| Taxon | Locality | Country | Date | GPS | Gene bank accession numbers |
|-------------------------|---|---------|--------------|-------------------------|-----------------------------|
| <i>Brassica botteri</i> | Sušac | HRV | July 2022 | 42.751570, 16.489470 | IPT521 |
| <i>Brassica botteri</i> | Kosor | HRV | July 2022 | 42.901346, 16.761636 | IPT518 |
| <i>Brassica botteri</i> | Stupa | HRV | July 2022 | 42.894560; 16.786568 | IPT522 |
| <i>Brassica botteri</i> | Obljak | HRV | July 2022 | 42.904644, 16.749480 | IPT520 |
| <i>Brassica incana</i> | Koločep | HRV | October 2021 | 42.668715, 18.014589 | IPT517 |
| <i>Brassica incana</i> | Svetac | HRV | May 2023 | 43.019725, 15.728069 | IPT 618 |
| <i>Brassica incana</i> | Vis (Oključina) | HRV | May 2023 | 43.074649, 16.102745 | IPT 619 |
| <i>Brassica incana</i> | Vis (Gradac) | HRV | May 2023 | 43.075623, 16.134977 | IPT 620 |
| <i>Brassica incana</i> | Vis (Sv. Duh) | HRV | May 2023 | 43.036415, 16.114780 | - |
| <i>Brassica incana</i> | Vis (hiking trail from St. Duh church to St. Nikola church) | HRV | May 2023 | 43.034960, 16.110665 | IPT 621 |
| <i>Brassica incana</i> | Vis (Crvene stijene) | HRV | May 2023 | 43.047342, 16.107393 | IPT 622 |
| <i>Brassica incana</i> | Vis (St. Mihovil church) | HRV | May 2023 | 43.048160, 16.112421 | IPT 623 |
| <i>Brassica incana</i> | Svetac | HRV | May 2023 | 43.019725, 15.728069 | IPT 618 |

M i S S O n S

| Taxon | Locality | Country | Date | GPS | Gene bank accession numbers |
|---------------------------------------|-------------------------------|---------|---------------------|------------------------------|-----------------------------|
| <i>Brassica rupestris</i> | Caltabellota (AG) | Italy | May 2021 | 37°36'55.7"N 13°03'12.0"E | UNICT 5284 |
| <i>Brassica rupestris</i> | Sambuca di Sicilia (AG) | Italy | May 2021 | 37°36'11.1"N 13°02'47.7"E | UNICT 5285 |
| <i>B. rupestris subsp. tardarae</i> | Sambuca di Sicilia (AG) | Italy | May 2021 | 37°36'55.7"N 13°03'12.0"E | UNICT 5286 |
| <i>Brassica rupestris</i> | Monte Pellegrino (PA) | Italy | May 2021 | 38°10'05.9"N 13°21'07.6"E | UNICT 5290 |
| <i>Brassica villosa</i> | Caltabellotta (AG) | Italy | May 2021 | 37°36'55.7"N 13°03'12.0"E | UNICT 5287 |
| <i>Brassica villosa subsp. tineoi</i> | Villalba (CL) | Italy | March 2022 | 37°12'57.5"N 14°00'31.9"E | UNICT 5291 |
| <i>Brassica villosa subsp. tineoi</i> | Marianopoli (TP) | Italy | March 2022 | 37°29'56.9"N 14°05'38.9"E | UNICT 5292 |
| <i>Brassica villosa subsp. tineoi</i> | Ravanusa (AG) | Italy | October 2022 | 37°12'56.8"N 14°00'36.6"E | UNICT 5312 |
| <i>Brassica drepanensis</i> | Erice (TP) | Italy | July 2021 | 38°02'06.2"N 12°35'29.3"E | UNICT 5288 |
| <i>Brassica macrocarpa</i> | Favignana (TP) | Italy | July 2021 | 37°55'15.9"N 12°18'47.9"E | UNICT 5289 |
| <i>Brassica macrocarpa</i> | Favignana (TP) | Italy | July 2021 | 37°56'02.4"N 12°19'01.0"E | UNICT 5308 |
| <i>Brassica macrocarpa</i> | Punta Bassano, Marettimo (TP) | Italy | July 2021 | 37°56'55.7"N 12°05'00.1"E | UNICT 5309 |
| <i>Brassica insularis</i> | Pantelleria (TP) | Italy | July 2021 | 37°47'54.4"N 13°18'26.2"E | UNICT 5307 |
| <i>Brassica montana</i> | Ponza (LT) | Italy | June 2021 | - | UNICT 5306 |
| <i>Brassica incana</i> | Sortino (SR) | Italy | June 2022 June 2021 | 37°06'45.3"N 15°09'51.1"E | UNICT 5310 |
| <i>Brassica incana</i> | Francavilla (ME) | Italy | July 2021 | 37°54'17.8"N 15°07'29.7"E | UNICT 5311 |

M i s s o n s

(1)

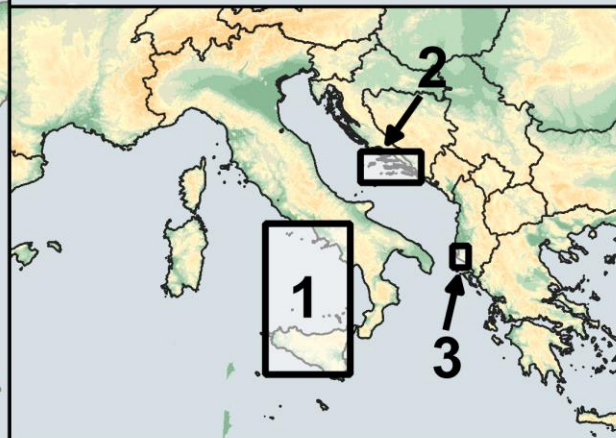


(2)



Table of coordinates

- *Brassica cretica*
- *Brassica drepanensis*
- *Brassica incana*
- *Brassica macrocarpa*
- *Brassica montana*
- *Brassica rupestris*
- *Brassica villosa*



(3)

M i s s o n s

| Number | Species | Inventory | UTM | Seed num |
|--------|--|-----------|------------------------------|----------|
| 1 | <i>Alyssoides utriculata</i> (L.) Moench | 14553 | 42°59'27.75"N, 22°37'50.68"E | 270 |
| 2 | <i>Alyssum orientale</i> | | 42°58'51.77"N, 22°38'19.60"E | 190 |
| 3 | <i>Aurinia corymbosa</i> Griseb. | 14555 | 43°19'56.52"N, 22° 5'45.61"E | |
| 4 | <i>Aurinia saxatilis</i> (L.) Desv. | 14556 | 42°58'51.77"N, 22°38'19.60"E | 500 |
| 5 | <i>Brassica rapa</i> L. | 14560 | 43°15'23"N, 22°32'24"E | 19018 |
| 6 | <i>Brassica rapa</i> L. | | 43°15'23"N, 22°32'24"E | 986 |
| 7 | <i>Brassica rapa</i> L. | | 43°15'23"N, 22°32'24"E | 4489 |
| 8 | <i>Brassica rapa</i> L. | | 43°15'23"N, 22°32'24"E | 3756 |
| 9 | <i>Diplotaxis tenuifolia</i> (L.) DC. | | 43°18'51.84"N, 21°54'55.35"E | 34 |
| 10 | <i>Diplotaxis tenuifolia</i> (L.) DC. | 14557 | 43°18'51.84"N, 21°54'55.35"E | 50 |
| 11 | <i>Diplotaxis tenuifolia</i> (L.) DC. | 14557 | 43°18'51.84"N, 21°54'55.35"E | 2995 |
| 12 | <i>Diplotaxis tenuifolia</i> (L.) DC. | 14558 | | 80 |
| 13 | <i>Diplotaxis tenuifolia</i> (L.) DC. | | 43.327529, 22.160774 | 149 |
| 14 | <i>Diplotaxis tenuifolia</i> (L.) DC. | | | 90 |
| 15 | <i>Isatis tinctoria</i> L. | 14549 | 43°20'2.70"N, 22° 5'38.84"E | 2328 |
| 16 | <i>Isatis tinctoria</i> L. | 14550 | 42°58'51.77"N, 22°38'19.60"E | 240 |
| 17 | <i>Lunaria annua</i> L. | 14552 | 43°20'2.70"N, 22° 5'38.84"E | 55 |
| 18 | <i>Lunaria annua</i> L. | 14559 | 43°20'2.70"N, 22° 5'38.84"E | |
| 19 | <i>Raphanus raphanistrum</i> L. | 14551 | 43°18'51.84"N, 21°54'55.35"E | 94 |
| 20 | <i>Raphanus raphanistrum</i> L. | | 43°17'37"N, 22°00'29"E | 151 |
| 21 | <i>Sinapis arvensis</i> L. | 14554 | 43° 2'37.75"N, 22°49'23.83"E | 1851 |
| 22 | <i>Sinapis arvensis</i> L. | | 43.115135, 22.905408 | 760 |
| 23 | <i>Sinapis arvensis</i> L. | 14604 | 45.236370, 19.791623 | 159 |
| 24 | <i>Sisymbrium loeselii</i> L. | 14561 | 43°17'37"N, 22°00'29"E | 500+ |
| 25 | <i>Sisymbrium loeselii</i> L. | 14605 | 45.235172, 19.792977 | |

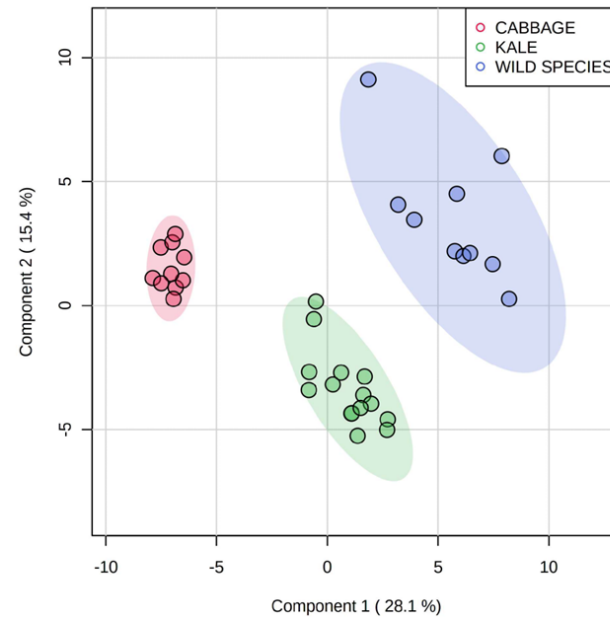
Characterization, regeneration, multiplication

- Vegetative and generative propagation:

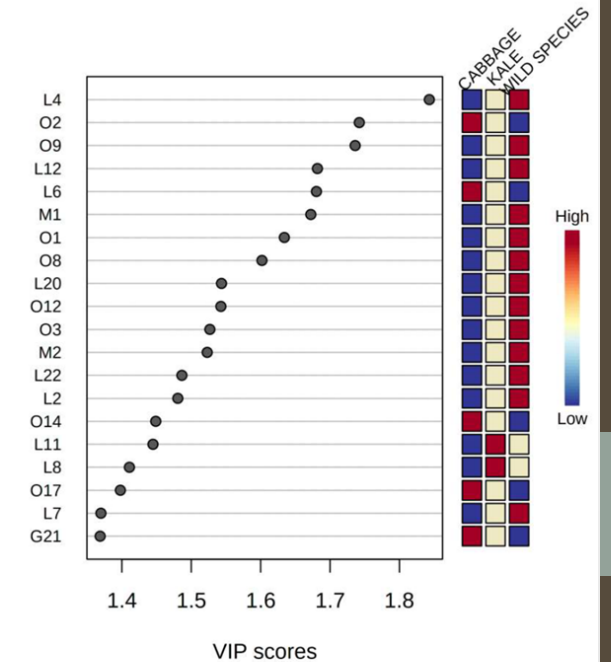


To be done

- Morphological and biological characterisation
- Molecular
- Biochemical
- Abiotic and biotic stress resistance



(a)



(b)

