

BRASSICA WG REPORT FOR PHASE IX (2014-2018)

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by: Ferdinando Branca

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1. CONTRIBUTION TO ECPGR OBJECTIVES

1.1. Achievements and success stories

Outcome 1. AEGIS is operational. Accessions in AEGIS are characterized and evaluated

COLlection, CHaracterization and EVALuation of wild and cultivated BRASSicas
(COCHEVA BRAS-

The *Brassica* collection characterized by the COCHEVA BRAS project showed the main differences between Portuguese and Italian accessions in terms of biomorphological, biochemical and genetic traits, and allowed identifying the Most Appropriate Accessions (MAAs) to be proposed for inclusion into AEGIS. A great variability was observed for biochemical compounds, both for the *B. oleracea* landraces and for the *Brassica* wild species (n=9) accessions evaluated. The genetic variability observed, for the SSR primers utilized and the sequence of the PCR products for the BoGSL ELONG primer, allowed individuating several SNPs useful to continue work for understanding the metabolic pathway for the glucosinolate biosynthesis. The final report of the COCHEVA BRAS project was sent to the National Coordinators.

1.2. Gaps or constraints identified

The work carried out so far is related only to Italian and Portuguese accessions belonging to the University of Catania (UNICT) and the Portuguese Genebank in Braga (BPGV); other South mediterranean European accessions, in which a wide variability is expected to be found, need to be tested.

2. GRANT SCHEME ACTIVITIES

- **Grant Scheme proposals (submitted: 2; approved: 1)**
 1. [COLlection, CHaracterization and EVALuation of wild and cultivated BRASSicas \(COCHEVA BRAS\)](#) – First Call (2014)
- **Total number of partners involved: 6 from 4 countries**
 - ECPGR-funded: 6 from 4 countries
 - Self-funded: 0
- **Meetings held**
(none)
- **Reports and related data**

Final Activity report

 [COLlection, CHaracterization and EVALuation of wild and cultivated BRASSicas \(COCHEVA BRAS\) – Activity Report](#)

- **Funds mobilized**
 - ECPGR granted funds: € 15 000
 - Inputs in-kind declared in Grant activities: € 10 000

3. OTHER ACTIVITIES (CROSS-WORKING GROUP ACTIVITIES, LINKS WITH OTHER NETWORKS, PROJECTS AND INITIATIVES)

- **Cross-Working Group activities**

The H2020 BRESOV project recently approved by the EU Commission has seen the collaboration of the Solanaceae, Grain Legumes and *Brassica* ECPGR WGs, interacting to exploit PGR for organic breeding. The project also involves several stakeholders such as the European Seed Association (ESA) and several seed companies, NGOs, Associations of farmers and consumers of organic agriculture products, private companies who provide new organic products for plant nutrition and crop protection.
- **Others**

Several proposals were presented in the frame of H2020, such as: INEUOTRAVEGS (2014) (1st stage), REMBRANDT (2015) (approved but not funded), Brassic-ACE (2016) (1st stage), BRASSAGRO (2016) (1st stage), BRESOV (2017) (2nd stage and approved for funding). After several attempts, the project proposal BRESOV (Breeding for Resilient, Efficient and Sustainable Organic Vegetable production) was eventually approved in December 2017 in the frame of the call SFS07-2017 related to organic breeding and it will start on the 1st of May 2018 for four years. The project is supported by a Consortium of 22 partners, of which 16 belonging to EU, 3 to extra-EU countries (2 partners from China and one from South Korea) and 3 to associated EU countries (2 partners from Switzerland and one from Tunisia), and led by the University of Catania. The project deals with the genetic improvement of broccoli, fresh bean and tomato for organic production by phenotyping each crop collection, established mainly with landraces and crop wild relatives (CWRs), for biotic (diseases) and abiotic (water, temperature) stresses and for post-harvest and organoleptic traits. The new candidate pre-breeding and breeding lines will be evaluated for high quality seed production and for on-farm evaluation by all the partners. The ECPGR Secretariat supported the proposal project by a manifestation of interest and is involved as stakeholder in the BRESOV project.

Eduardo Rosa, Portugal, is involved to coordinate a proposal project under the sixth call of the ECPGR Grant Scheme by 31 March 2018.

4. WORKING GROUP DOCUMENTS AND PUBLICATIONS

- Branca F, Chiarenza GL, Cavallaro C, Gu H, Zhao Z, Tribulato A. 2017. Diversity of Sicilian broccoli (*Brassica oleracea* var. *italica*) and cauliflower (*Brassica oleracea* var. *botrytis*) landraces and their distinctive bio-morphological, antioxidant and genetic traits, Genet. Resour. Crop Evol. <https://doi.org/10.1007/s10722-017-0547-8>
- Branca F, Maggioni L. 2018. Exploiting Sicilian *Brassica oleracea* L. complex species for the Innovation of the Agricultural Systems and Products. ISHS PGR 2017 Symposium (Acta Hort., in press)
- Coelho PS, Monteiro AA, Lopes VR, Branca F. 2018. New sources of resistance to downy mildew in a collection of wild and cultivated Brassicas. ISHS Brassica Symposium (Acta Hort., in press)

- Lopes VR, Barata AM. 2017. Integrating omic approaches for sustainable genetics resources' uses in Brassica breeding programmes. Abstract book. COST WG1 / EPPN2020 workshop 29th - 30th of September 2017. Page 26. 2017ISBN 978-86-80417-77-6. Publisher: Institute of Field and Vegetable Crops, Novi Sad, Serbia.
- Ragusa L, Picchi V, Tribulato A, Cavallaro C, Lo Scalzo R, Branca F. 2017. The effect of the germination temperature on the phytochemical content of broccoli and rocket sprouts International Journal of Food Sciences and Nutrition Vol. 68 , Iss. 4.
- Terzo MN, Pezzino F, Amodeo L, Catalano D, Viola M, Tribulato A, Travali S, Branca F. 2018. Evaluation of a Sicilian Black Broccoli Extract on *In Vitro* Cell Models. ISHS Brassica Symposium (Acta Hort., in press).
- Terzo MN, Russo A, Ficili B, Tribulato A, Branca F, Russello D, Travali S. 2018. Neglected Sicilian Landraces of Black Broccoli (*Brassica oleracea* var. *italica* Plenck) and Health Benefits: An *In Vivo* Study. ISHS PGR 2017 Symposium (Acta Hort., in press).
- Tribulato A, Donzella E, Sdouga D, Lopez V., Branca F. 2018. Bio-morphological characterization of Mediterranean wild and cultivated *Brassica* species. ISHS Brassica Symposium (Acta Hort., in press).

5. EXPECTED ADDITIONAL ACHIEVEMENTS AND FUTURE ACTIVITIES

The H2020 BRESOV project will provide for the next four years deliverables useful for the several stakeholders involved in the exploitation of brassica PGR and new opportunities to establish active links among the ECPGR *Brassica* WG members for submission of other proposals in the frame of the opportunities offered by the several EU and national R&D programmes. The BRESOV project will offer also the opportunity to link some members of the Solanaceae and Grain Legumes ECPGR WGs, as project partners, in order to provide news of common interest on the activities carried out for exploiting PGR to improve the resilience, the efficiency and the sustainability of vegetable production.

Violeta Lopes (Portugal) informed that for the next three years the national programme for genetic resources (PDR2020) funded the proposal to ensure the rate of multiplications of regeneration and the rate of characterization and evaluation of the Portuguese collection. For the next four years the Portuguese genebank of Braga will be involved in the production of seed of three new varieties of brassicas in a consortium with a seed enterprise "Sementes Vivas", aiming to register them in the national catalogue as varieties for organic farming. Results will be disseminated in diverse fora, such as possibly the next national congress of nutrition in Portugal.