IN PROGRESS ACTIVITIES OF THE BRASSICA WORKING GROUP OF THE EUROPEAN COOPERATIVE PROGRAMME FOR PLANT GENETIC RESOURCES (ECPGR)

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Objectives

During Phase VIII (2009-2013) of the ECPGR Programme, its Brassica Working Group (BWG) decided to focus attention of all members to the priority actions represented by the development of AEGIS (A European Genebank Integrated System), and to characterize collections both of *B. rapa,* which could be defined as a multicrop species for its multiple utilization, and of wild (n=9) *Brassica* species distributed in the Mediterranean basin.
The activities foreseen will be carried out by DISPA-University of Catania (UNICT), the Centre for Genetic Resources, the Netherlands (CGN), the Institute of Sustainable Agriculture of Cordoba (CSIC-Spain), and N.I.Vavilov Research Institute of Plant Industry (VIR). Brassica WG members discussed the minimum descriptors which will be similar to those previously used in the GENRES project CT99 108-112.

Materials and Methods

It was agreed to identify about 100 'unknown' accessions of *Brassica rapa* and 20 accessions of wild *Brassica* species (n=9) with the aim of characterizing and evaluating them for several aspects such as bio-morphological traits, oils and nutraceutical compounds, DNA analysis, etc.
Antioxidant compounds are being analyzed with common protocols, whereas for DNA molecular analysis, standard AFLP and SSR primers are being utilized.
The characterization fields were set up by UNICT where the climatic conditions are optimal for wild (n=9) *Brassica* species, whereas *B. rapa* is growing in the VIR fields in St. Petersburg with 30 IBPGR (*International Board for Plant Genetic Resources*) descriptors.
As far as the antioxidant and nutraceutical compounds are concerned, samples of roots, leaves and inflorescences of *B. rapa* and of leaves of wild *Brassica* species accessions have been freeze-dried by UNICT and VIR and are being analyzed by CSIC by protocol ISO 9167-1, 1992. The molecular analysis will be carried out by UNICT on DNA extracted from young leaf samples. At the end of the project, all data acquired will be available via the website of the Bras-EDB.

Results

In the frame of the wild *Brassica* population were characterized 26 accessions of wich not all were corrispondent to the species indicated in the genebank database except one. Twenty accessions of wild Brassica species reached reproductive phase within one year after transplanting. We clustered the studied accessions in group were *B. macrocarpa* and *B. balearica* were distinguieshed form other wild *Brassica* populations

For wild *Brassica* species wide range of variation in total glucosinolate content: from 5,38 µmol/g ^{dw} in *B. villosa* from Italy to 52,48 µmol/g ^{dw} in *B. balearica* from Spain. Glucoiberin is the principal glucosinolate in *B. montana* and *B balearica*, while sinigrin is the predominant glucosinolate in *B. macrocarpa*. These species are good candidates to the genetic study of the pathway of synthesis of aliphatic glucosinolates (Tab. 1, Fig. 1). For Brassica rapa the variation in total glucosinolate content was from 0,37 µM g $^{-1\ dw}$ in broccoletto - K 7884 - to 38,68 µM g $^{-1\ dw}$ in turnip - BRA 2842 - (Tab. 2, Fig. 2). Gluconapin and glucobrassicapin are the predominant glucosinolates in all the samples analyzed until now.

Tab. 1 Glucosinolates profile wild *Brassica* species (µM g $^{-1\ dw}$)

Accession	Specie	t-GLS	GIB	PRO	SIN	GRA	GNA	GBN	GBS	NGBS	others
BRA 1644	*Brassica montana*	**20,59**	10,16	0,5	4,82	1,43	0,76	0	1,85	0,52	0,55
BRA 1727	*Brassica fruticolosa*	**9,22**	0	0,1	0	0	1,78	6,02	0,32	0,47	0,55
BRA 1810	*Brassica fruticolosa*	**27,28**	0	0,09	0,1	0,11	25,86	0,47	0,1	0	0,54
BRA 1896	*Brassica villosa*	**5,38**	1,39	0,47	0,68	1,45	0,15	0	0,68	0,4	0,16
BRA 2850	*Brassica balearica*	**52,48**	31,57	0	20,27	0,21	0,05	0	0,02	0,01	0,35
BRA 2944	*Brassica macrocarpa*	**32,31**	1,48	0,05	30,08	0	0,16	0	0,16	0	0,37
BRA 2990/K10127	*Brassica barrelieri*	**16,5**	0,15	0,27	6,68	0,1	7,9	0,51	0,1	0,01	0,79

Tab. 2 Glucosinolates profile *Brassica rapa* (µM g $^{-1\ dw}$)

Accession	Specie	t-GLS	GIB	PRO	SIN	GRA	GNA	GBN	GBS	NGBS	others
K 6337		**24,39**	0,08	1,31	0,00	0,00	13,33	6,45	1,02	1,36	0,84
BRA 2842		**38,68**	0,00	0,41	0,06	0,04	34,14	1,50	0,42	1,28	0,84
K 7884		**19,38**	0,00	0,20	0,00	0,00	5,19	7,36	2,33	3,22	1,08
K 9013		**0,37**	0,00	0,09	0,00	0,00	0,00	0,00	0,01	0,02	0,25
K 7904		**32,03**	0,00	0,18	0,07	0,04	30,08	0,48	0,15	0,56	0,47
K 8083		**17,11**	0,00	0,97	0,00	0,00	4,84	8,06	0,55	0,55	2,13
BRA 1772		**24,18**	0,00	0,35	0,00	0,00	6,50	10,80	0,87	4,82	0,83

Fig. 1 Chromatogram BRA 2850

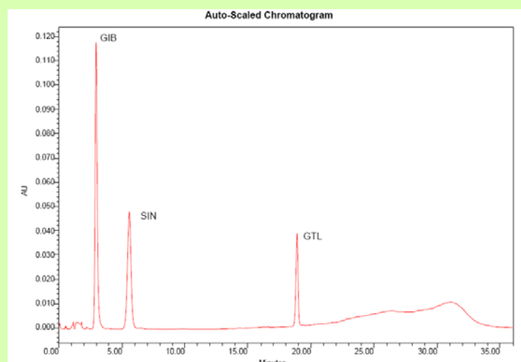
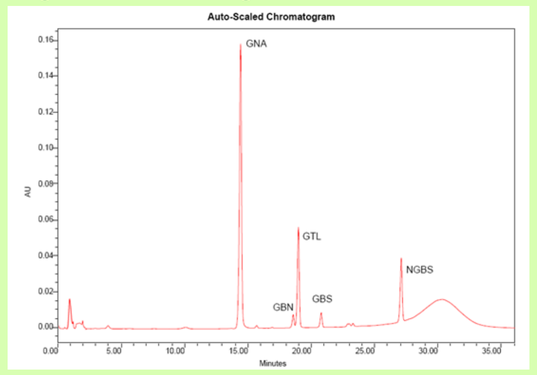


Fig. 2 Chromatogram BRA 2842



Brassica villosa

Brassica rupestris

Brassica rapa

Conclusion

The in progress activities of the VIII phase ECPGR project of the Brassica WG have started to offer first interesting informations which will be consultable on the Bras-EDB (http://documents.plant.wur.nl/cgn/pgr/brasedb/)

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