

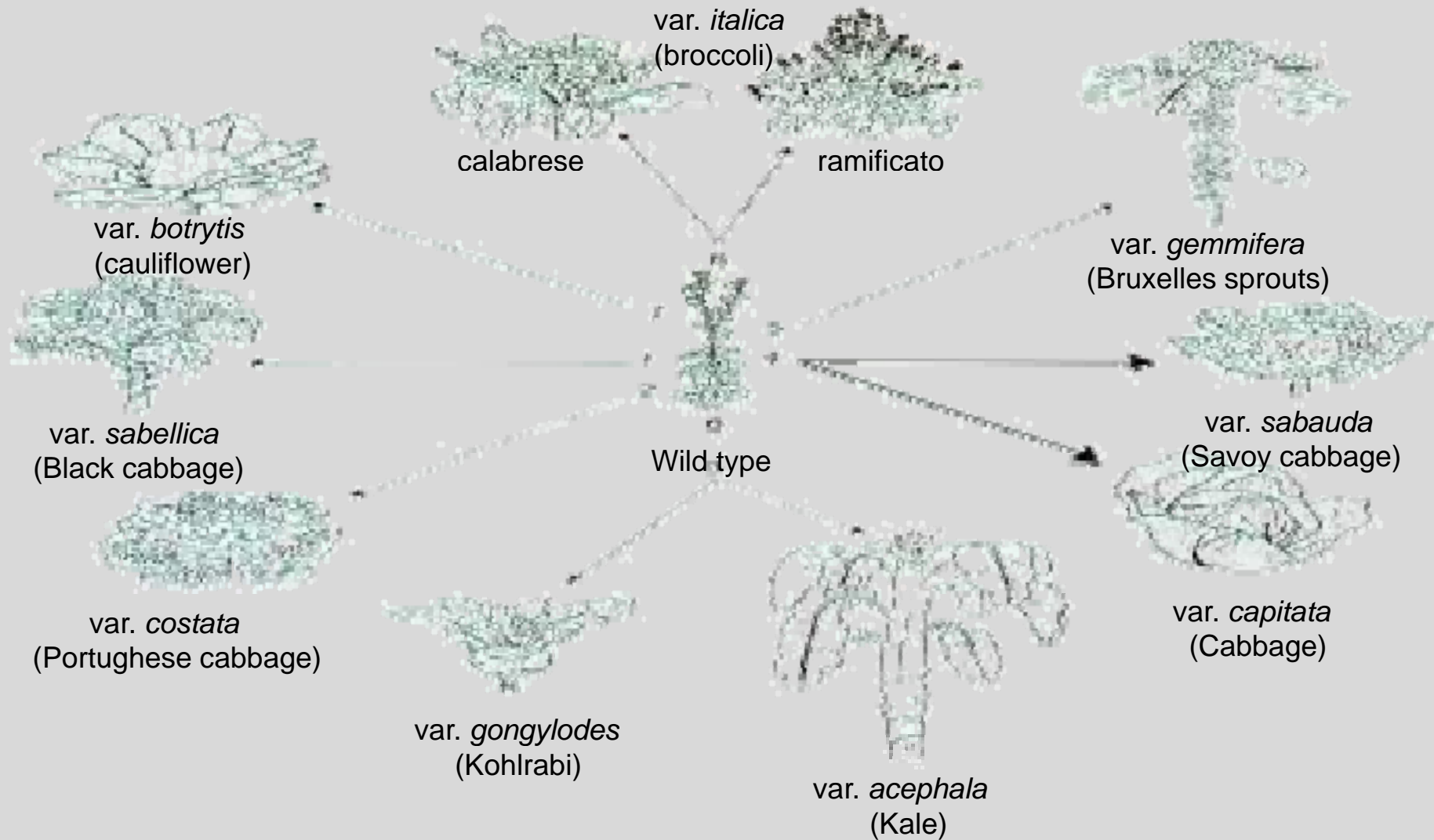


WORK IN PROGRESS IN VIEW TO SET UP GENETIC RESERVES FOR SICILIAN BRASSICA WILD RELATIVES

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- **Brassicas are widely popular in human diet as important source of vegetables, condiments, and edible oils.**
- **In the recent past, many *B. oleracea* crops, representing traditional European crops, became widespread in Asia whereas their presence in Europe has been quite stable.**

Evolution of the different *B. oleracea* crops from the wild relative

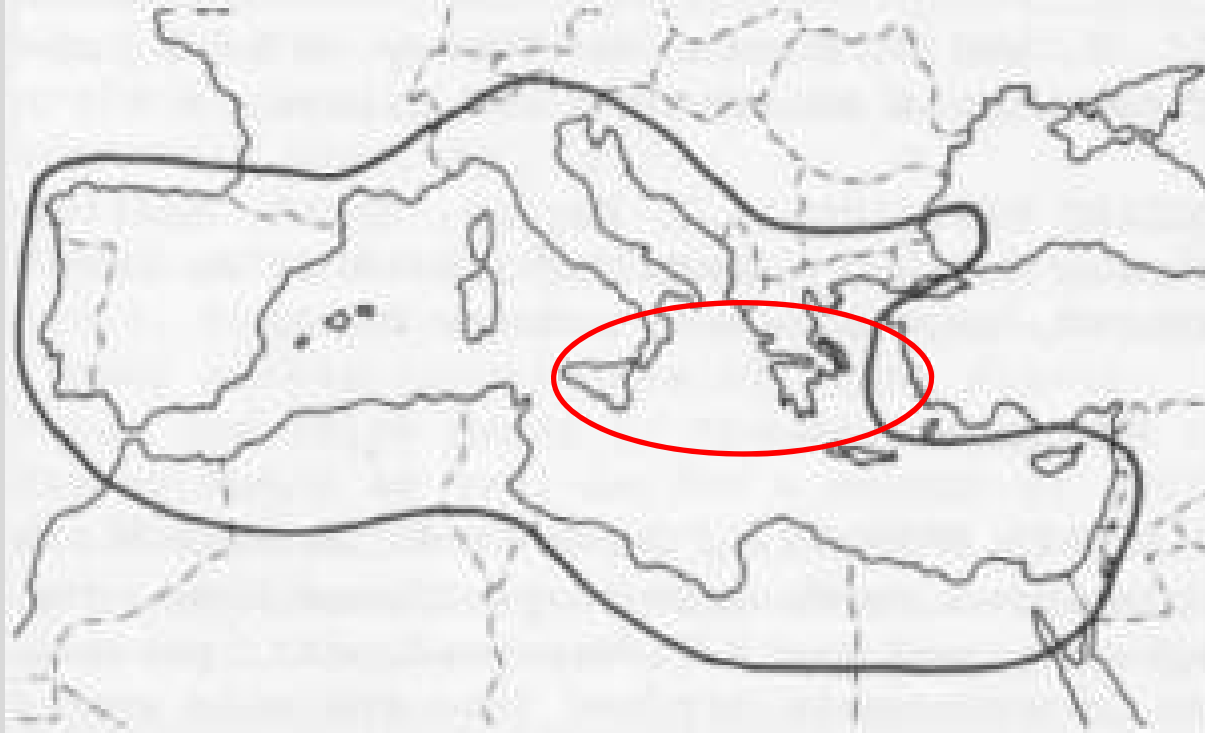


The interest in Brassica vegetable crops has recently grown due to the breeding programs carried out in several countries - mainly in Asia, Europe and the USA.



New opportunities are also offered by the food processing industry in exploiting traditional and new phenotypes for new products (IV and V gamma).





Recently several Authors showed molecular DNA evidences on the wide diversity between Mediterranean *Brassica* wild species and those from North Europe indicating that domestication of *B. olearacea* cultigroups occurred in of the central and central-eastern areas of Mediterranean basin.



***Brassica* wild relatives are perennial, with woody stems up to 1.5 m, large leaves and high glucosinolate content. Genotypes are diploid ($2n=18$), often self-incompatible, with a high mutation tendency and cross pollinating.**

Several Authors showed that in Sicily wild Brassicas (n=9) are fertile crossing with *B. oleracea* and have been monitored and studied for several purposes.

- ***Brassica* wild relatives are valuable sources of genes for crop improvement. They have been widely used since more than one century to increase **resistance/tolerance** to biotic and abiotic stresses in several cvs.**
- **Recently they have been used to increase **nutritional value** in edible parts like enhancing proteins or vitamins content.**

- **High anticancer properties were individuated in some Sicilian broccoli landraces.**
- **Crossing them with wild relatives allowed to obtain new cultivars with high levels of **glucosinolates** like glucoraphanin, a cancer fighting antioxidant which prevents DNA damages.**



In the frame of the Brassica case of study of AEGRO project, four wild Brassica species growing in Sicily have been analysed and characterised.

Brassica incana



Brassica macrocarpa



Brassica rupestris



Brassica villosa



**After a first step
related to the**

- **identification**
- **collection**
- **monitoring**

**of wild Brassicas
occurring in
different sites
priorities were
pointed to their
in situ conservation.**





For some accessions there was a high adaptability to environmental conditions



Among the Brassica wild relatives species priorities has been given on *Brassica macrocarpa* Guss.



This is an endemic wild Sicilian species, widespread on small islands where its populations grown on rocky cleaves and are endangered by human activity and animal grazing.

***B. macrocarpa* populations are still present in Favignana and Marettimo while recently disappeared in Levanzo.**



Although nature protection is a large concept our case of study related to Sicilian *Brassica* wild relatives deals with their protection and with their *in situ* conservation.



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- Many International Institutions involved in nature protection listed these species in the “**IUCN Red List of Threatened Species**”, which provides taxonomic, conservation status and distribution information on taxa that are facing a high risk of global extinction.
- Since five years the Sicilian Brassica wild species represent a priority for the **Brassica working group** of the European Cooperative Programme on Genetic Resource (ECP/GR) managed by Biodiversity International.

The aim of the genetic reserve proposed is the conservation of the whole existing gene pool in both islands in view to maintain all the genetic variability.

















To this purpose the DOFATA is involved in characterization activities pointing major attention on biological, morphological, biochemical and molecular traits starting to analyse Favignana population with the aim to monitor the genetic variability and to individuate appropriate strategies for their *in situ* conservation.

- **DOFATA** cooperates with the **Centro Universitario per la Tutela e la Gestione degli Ambienti Naturali ed Agricoli (CUTGANNA - University of Catania)** which already manages seven natural reserves in Sicily and offers its expertises to set up these new genetic reserves.
- **CUTGANNA** manages now about 430 Ha of inland reserves and about 1000 Ha of marine reserves.

B. incana*, *B. rupestris* and *B. villosa, already occur in protected areas and managers were contacted in order to sensitize them on the genetic relevance of these crop wild relatives and to individuate specific actions to protect their integrity.



Thanks for your attention ...