



XIV OPTIMA Meeting

September, 9-15 2013

Palermo

Abstracts



Fondazione
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Mediterraneo





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OPTIMA (Organization for the Phyto-Taxonomic Investigation of the Mediterranean Area)
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Cytogenetical test to predict the vigour potential in brassica seeds under long-term storage

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Preservation of intraspecific diversity in seed banks is a common strategy to frontier the loss of biodiversity, however long-term storage inevitably results in the loss of a certain percentage of seeds, therefore causing the genetic erosion of a seed collection. For this reason seed quality monitoring is of outstanding importance to ensure that the regenerated genetic material is representative of the endemic natural diversity once reintroduced in the environment, as well as to preserve the genetic biodiversity of species economically relevant for modern agriculture. Ageing amplification tests, in which seeds undergo osmotic stresses, enable to detect little differences in the vigour of seeds with high germination percentage (%G) thereby allowing to predict precociously damages induced by long-term storage.

In the present research the quality of *Brassica villosa* subsp. *drepanensis* seeds stored in a genebank (at -20°C for sixteen years) was compared to seeds at harvest (control) by combining %G and mean germination time (MGT) measurements, ageing amplification tests and cytogenetic changes in primary roots.

Comparison of %G and MGT between control and stored seeds showed no significant differences. Conversely ageing amplification tests where a saline shock (NaCl -0.9 MPa) was given for six hours to control seeds or after storage, evidenced no significant influence on %G of control seeds, but significantly reduced the % G of stored seeds. The treatment with 1.4 MPa osmotic potential significantly reduced %G of control and stored seeds (50 and 4% respectively).

Cytogenetic analysis clearly showed significant reductions of the mitotic index, the appearance of c – metaphases, chromosomes laggings and bridges in stored seeds in respect to control seeds germinated in water. While the treatment with -0.9 MPa osmotic potential had no significant effects in both groups, the treatment with -1.4 MPa osmotic potential had inhibitory effects in root apices of control seeds and completely prevented cell division in stored ones.

The results presented in this study indicate that despite a comparable germinative response of seeds, long-term storage induces cytogenetical damages and increase susceptibility to salt stress, therefore lowering the seed quality.

We suggest the use of the ageing amplification test and cytogenetical parameters as more sensitive, reliable and inexpensive methods compared to germination percentage tests, allowing an early prediction of genetic erosion events in germplasm banks and representing a valuable alternative tool for seed producers.