

EURIGEN: CONSERVATION AND VALORIZATION OF THE EUROPEAN RICE GERMPLASM

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The general objective of the EU-funded EURIGEN project is the characterisation and exploitation of European rice genetic resources of the temperate rice growing area, to enhance competitiveness of Europe in rice production, and alleviation of biotic and abiotic constraints typical of the Mediterranean area. This goal is achievable by means of the acquisition, evaluation and conservation of existing rice accessions, and identification of new genetic materials targeted at sustainable agricultural systems, making use of the most updated genomic tools. The project has two major targets: i) identification and conservation of genetic resources and ii) identification of valuable sources of new genes and alleles for important traits to breeding program.

The main platform of the project is the classification, maintenance and regeneration of the temperate rice germplasm bank. A panel of selected rice genotypes will be evaluated in field and controlled conditions for of elite traits including: resistance to biotic (*M.grisea*) and abiotic (reduced water availability and saline soils) stresses. The same traits will be characterised in the corresponding areas of the genome within a sub-sample of the EURIGEN collection using a set of SSRs markers for each consensus QTL, and one linked SSR for each candidate gene under examination.

For each target trait, by studying SNPs profiles and haplotypes associated, a set of best performing genes and alleles as well as associated molecular makers will be identified and will be made available to breeding program. The target zones whose interest has been confirmed in term of explanatory effect on the phenotypic variation within the *japonica* sub-group, will be used for gene-based association mapping with selected SNPs. Finally, the SNP and haplotype analysis will be used to develop LD analysis and diversity evaluation across a range of candidate genes linked to traits of agronomic importance, and on two genomic regions that have been the subject of selection during the evolution and domestication of rice (shattering, and pericarp red color).

The EURIGEN actions will pursue the general objectives in accordance with the assessments of the FAO International Treaty on Plant Genetic Resources for Food and Agriculture, and of the Council Regulation (EC) N° 870/2004 establishing a *Community Programme on the conservation, characterization, collection and utilization of genetic resources in agriculture*. The innovative aspect of the EURIGEN project is represented by the direct application of molecular tools to link phenotypic evaluations to well-defined genomic allelic variations. Results of this project will

support sustainable development of rice culture in the Mediterranean area by means of the exploitation of novel sources of agronomically valuable traits.

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