EURIGEN: CHARACTERIZATION OF EUROPEAN RICE GERMPLASM FOR STRESS RESPONSE TRAITS

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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 agronomic and quality traits relevant to breeding programs.

The main platform of the project is the classification, maintenance and regeneration of the temperate rice germplasm bank. A panel of 455 rice accessions relevant for the breeding programs in European growing areas were analysed at both phenotypic and genotypic level. A centralised seed bank of the Eurigen collection was established and a DNA biorepository organised in bar-coded 96-well plates was created and made available to the Eurigen partners. A core collection of 200 rice genotypes was selected based upon phylogenetic analyses and phenotyped in field and controlled conditions for blast resistance, adaptation to reduced water availability and salinity tolerance. To identify favourable alleles as well as molecular markers correlating with improved performance under stress conditions, the 200 rice accessions were molecularly characterized by high-throughput SNP genotyping using the ILLUMINA BeadExpress platform. A panel of 384 SNPs was selected in candidate genes involved in stress responses based on literature data and preliminary results from ongoing projects at international level.

The integration of phenotypic and genotypic data will enable us to carry out association analyses to exploit the existing natural variation to devise novel strategies of rice improvement in EU countries.

The EURIGEN actions 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) Nº 870/2004 establishing a Community Programme on the conservation, characterization, collection and utilization of genetic resources in agriculture.
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