3RD WORLD PLANT GENOMICS AND PLANT SCIENCE CONGRESS
&
4TH WORLD MYCOLOGY AND MUSHROOM CONGRESS

July 15-16, 2019
Osaka, Japan

Natural variation and selection for contrasting N-use efficient eggplant genotypes by key morpho-physiological traits

Maria Rosa Abenavoli
Mediterranean University of Reggio Calabria, Italy

Eggplant (*Solanum melongena L.*) yield is highly sensitive to N fertilization, whose excessive use is responsible of environmental damages. Lowering N input together with the selection of improved Nitrogen-Use-Efficiency (NUE) genotypes, more able to uptake (NUpE), utilize (NUtE) and remobilize N available in soils, could be challenging to maintain high yields. The aim of this study was to explore the natural variation among 19 eggplant accessions in response to low and high NO3- supply to identify NUE-contrasting genotypes, in hydroponic and greenhouse experiments. AM222 and AM22 accessions were identified in both growing systems as N-use efficient and inefficient, respectively. Overall, the results indicated the key role of N-utilization component (NUtE) to confer high NUE. The higher N-content in AM222 fruits suggesting the efficient N-remobilization as a strategy to enhance NUtE, suggesting GS as a key enzyme. To deeply understanding the mechanisms underlying NUE complex trait, AM222 and AM22 were employed for both transcriptomics and metabolomics approaches. Short- and long-term N-stress were adopted in the same experimental design for both - omics approaches. Metabolomics results highlighted that alanine, aspartate and glutamate metabolism was highly affected in AM222, while RNA-seq analysis underlined differential gene transcripts involved in processes of reactive oxygen species (ROS) rate-limiting production that could be attributed to a higher antioxidant activity ability of N-use efficient genotype. Overall, here we demonstrated the predominant role of NUtE to confer high NUE in eggplant. More interestingly, an integrated network of differential expressed genes and metabolites belong NUtE between AM222 and AM22 were discovered.

Biography

Maria Rosa Abenavoli is currently working as an associate professor in the Department of Agriculture at Mediterranean University of Reggio Calabria, Italy. She has published more than 100 articles in many reputed journals.

mrabenavoli@unirc.it