

# 3<sup>RD</sup> WORLD PLANT GENOMICS AND PLANT SCIENCE CONGRESS & 4<sup>TH</sup> WORLD MYCOLOGY AND MUSHROOM CONGRESS

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## Highlighting differential expressed genes and metabolites related to N-pathway in eggplants

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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 (NUE) 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 NO<sub>3</sub>- 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 (NUE) to confer high NUE. The higher N-content in AM222 fruits suggesting the efficient N-remobilization as a strategy to enhance NUE, 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 NUE to confer high NUE in eggplant. More interestingly, an integrated network of differential expressed genes and metabolites belong NUE between AM222 and AM22 were discovered.



### Biography

Francesco Sunseri is an associate professor of Plant Genetics and Breeding at the Department Agraria, University of Mediterranean di Reggio Calabria, Italy. His research activity is focused on genetics and MAS on vegetable crops. Genomics and Transcriptomics, QTL analysis and cloning and plant abiotic stress with particular interest to Nitrogen Use Efficiency (NUE) are his interest. He is an associate editor of BMC Plant Biology and an Editor-in-Chief for the open access Journal of Genetics and Plant Breeding. Occasional reviewer for several scientific journals, he is author of about 60 scientific publications indexed in ISI and Scopus databases.

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