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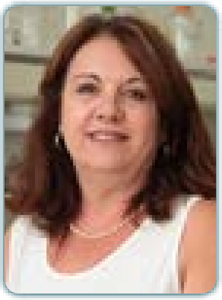

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Molecular mechanisms of sugarcane response to abiotic stress

Sugarcane (*Saccharum* spp.) as an important source of sugar and ethanol became the third most produced commodities in the world (1.4G). In this context, Brazil figure as a major sugarcane producer (500M tons) followed by India (300M), China, Thailand and others. The projections, based on the worldwide increasing demand for food and energy, are that sugarcane global production will increase by 21% until 2024. Among the main factors that can affect agricultural productivity, soil has fundamental importance since it offers not only physical support but also water and the necessary nutrients for plant growth. Aluminum (Al) together with silicon and oxygen are the three most abundant elements in earth crust. Although metallic elements are required for plant growth, aluminum ions (Al^{+3}) can be considered one of the major abiotic factors affecting agriculture productivity. Al is a non-essential element found naturally in the soil but it is toxic and its bioavailability is highest on acidic soils (pH of 5.5 or lower), resulting in inhibition of root growth, architecture alteration and elongation disruption. Plants under stress conditions can undergo gene expression changes or post-transcriptional gene regulation that can led to resistance. Our goal is to understand the molecular mechanisms of abiotic stress tolerance in sugarcane and the role of miRNA's in this response to aluminum stress. To identify the miRNAs involved in the aluminum stress response four-miRNA libraries, generated from the sugarcane roots of two contrasting sugarcane cultivars CTC-2 (Tolerant Aluminum Stress) and RB-855453 (Sensitive Aluminum Stress), under aluminum stress for seven days, were sequenced using Illumina technology. By comparing miRNA libraries sequences from the two contrasting cultivars, we were able to identify 394 differentially expressed miRNAs. The contrast of the cultivars seen in the field is reflected in the microtranscriptome with opposing expression profile. For the tolerant cultivar (TAS) we observed that while 64% of microRNAs are been induced in the sensitive the majority of microRNAs (85%) are been repressed under aluminum stress condition.

Biography

Sonia Marli Zingaretti is an Agricultural Engineer with a Master in Genetics and Plant Breeding and a PhD in Genetics from FMRP-USP. Full Professor at the Biotechnology Unit in the University of Ribeirao Preto, where she has been working in the Graduate Program in Biotechnology since 2005, responsible for Biotechnology, Genomics and Proteomics, she is also a member of the Graduate Committee. She works concurrently also in the Master's/PhD program in Genetics and Plant Breeding at FCAV-UNESP, as Professor responsible for the disciplines of Plant Biotechnology and Fundamentals of Molecular Biology. From 2001 to 2006 she was a curator of the BCCCenter (Brazilian Clone Collection Center) a FAPESP / UNESP project, in Brazil. She is also a reviewer of several international journal articles and ad hoc advisor of projects submitted to FAPESP and CNPq. Performance in Molecular Biology of plants, especially in the analysis of differential gene expression linked to biotic and abiotic stresses. She has published more than 53 papers in reputed journals and has been serving as an editorial board member of repute.

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