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Biotic and Abiotic Stress Tolerance in Plants: the Challenge for the 21st Century

BOOK OF ABSTRACTS

6 to 8 • NOVEMBER • 2013

Cana Brava Resort • Ilhéus - Bahia - Brazil

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Workshop on Biotic and Abiotic Stress Tolerance in Plants: the Challenge for the 21st Century

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looked back on the *M. pernicioso* database. Considering that the *M. pernicioso* published sequence only represent 69% of the total genome, the results we obtained confirmed that *N. crassa* could be used as a good model for *M. pernicioso* in systems biology analysis of hyphae proteins.

Work supported by BNB, CNPq, FAPESB, Cirad

S01P14

The coffee gene orphanage

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Coffee is a perennial crop considered one of the most important agricultural commodities in the world. By consequence, aiming at the establishment of tools to help accelerating the genetic improvement of this species, significant advances in coffee genomics have occurred in recent years. As an example, one can cite the recent completion of the complete genome sequencing of *Coffea canephora*, which will serve as a reference sequence for use in advanced molecular genetics, applied directly to the genetic improvement of this species, such as the establishment of genome-wide selection programs (GWS) in coffee. Recent bioinformatics analyses of complete plant genomes indicate that about 20-30% of the total complete set of genes is novel and specific to each species. That is, these genomic sequences do not exhibit any similarity with those already deposited in global databases and are commonly called "no hits". Recent concepts, called these "no hits" as "orphan genes" and postulate that the emergence of these are the result of adaptive responses specific to each species as a function of stresses and adverse conditions faced by these plants during the evolutionary process. Our work is focused on the identification and functional characterization of orphan genes from coffee, which may have a high potential for innovation and biotechnological applications. This study presents data obtained for some of orphan genes, called *CcUnk* (Unknown), previously identified in the coffee genome with special focus on *CcUnk* genes potentially involved in abiotic and biotic-stress responses.

Work supported by CAPES-COFECUB, Consórcio Pesquisa Café and INCT-Café (CNPq/FAPEMIG)

S02P01

Caatinga forest species seeds germinate are highly adapted to biosaline agriculture

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The Caatinga savannah is the only exclusively Brazilian biome, which means that much of its biological heritage cannot be found anywhere else on the planet. Often the soils of the ecosystem are salinized. On the other hand, a great proportion of groundwater of this region is brackish. Due to degradation of this biome, some native species are on the list of endangered species. The production of seeds and seedlings of forest species from Caatinga is important to prevent the loss of biodiversity. To germinate and establish itself in this ecosystem seeds requires a great number of strategies related to environmental stress tolerance. Biosaline agriculture is a broad term used to describe agriculture under a range of salinity levels in groundwater, soils, or a combination of both. This work aimed to evaluate the possibility of production of Caatinga tree seedlings with biosaline agriculture, through the study of the germinative metabolism of the seeds subjected to high electrical conductivities (EC) due to the use of salted and/or biosaline water. Caatinga seeds, such as *Anadenanthera macrocarpa*, *Aspidosperma pyrifolium*, *Erythrina velutina*, *Myracrodruon urundeuva* and *Poincianella pyramidalis* were germinated in EC ranging from 0-18dS.m⁻¹ in germinator, at 25°C, with a 12h photoperiod. The germination kinetic variables were assessed, after that the seeds and seedlings cotyledons, aerial parts, and roots were assayed for seed reserve biomolecules and proline content and antioxidant enzymes activity. The Caatinga seeds are highly tolerant to salinity, with germination limiting EC above 12 dS.m⁻¹. Although, high EC promotes an alteration in seeds metabolism enabling them to tolerate this condition, seedling production is indicated in EC not higher than 6 dS.m⁻¹. Thus Caatinga seedling production is viable through biosaline agriculture, whereas the groundwater of this region presents itself within this level.

Work supported by Embrapa, FACEPE, CNPq.