B2 Influence of Abiotic Stresses in Phenotypic Expression of Transgenic Plants of *Coffee Arabica* under Action CcDREB1D Promoter.


*Federal University of Lavras, MG, Lavras, BRAZIL.
**CIRAD, UMR IPME, Montpellier, FRANCE.
***EMBRAPA Tabuleiros Costeiros, Aracaju, BRAZIL.
****Embrapa Genetic Resources and Biotechnology, Brasilia, DF, BRAZIL.
*****EMBRAPA Coffee-INOVACAFÉ, Lavras, BRAZIL.
******CIRAD, UMR AGAP, Montpellier, FRANCE.

Rationale

Plants have biochemical mechanisms to cope with abiotic stress and respond to such conditions by changing the expression of many genes, such as those belonging to the DREB subfamily. DREB is a transcription factors that plays important roles in regulating the expression of genes in response to a variety of abiotic and biotic stresses (Yamaguchi-Shinozaki and Shinozaki, 2005). The comprehension of regulation of CcDREB1D promoters in coffee during a representative range of abiotic stress such as drought, cold, heat, photo-oxidative stress and abscisic acid (ABA) depends on understanding the transcriptional activity of allelic and homolog forms of this promoter isolated from clones of *C. canephora* combined with RNA-seq data.

Methods

In order to study the regulation of CcDREB1D promoters to abiotic stresses, binary vectors harboring three different haplotypes of this CcDREB1D cloned in front of the *uidA* reporter gene, were constructed and used to transform *C. arabica* cv. Caturra. The functional analysis of the CcDREB1D promoter haplotypes under the first 20 hours of different abiotic stresses was performed by performing GUS histochemical assays and by checking *uidA* gene expression.

Results

The expression of the *uidA* reporter gene under different abiotic stresses in leaves, meristems and roots of transgenic coffee plants enabled to fully characterize the pCcDREB1D promoter specificity, with expression levels ranging from low to high levels depending of CcDREB1D promoter haplotype and abiotic stress applied.

Conclusions & Perspectives

Our results showed that specific and spatio-temporal expression of the pCcDREB1D occurred in plant tissues/organs of transformed plants of *C. arabica*. These results also revealed the specific activity of the promoter CcDREB1D in guard cells of stomata during drought stress. RNA-Seq data and RT-qPCR are underway to confirm these histochemical results.

References