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

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Rationale

Plants have biochemical mechanisms to cope withabiotic 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 ordertostudy 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 byperforming 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 p*CcDREB1D*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

1. Yamaguchi-Shinozaki K., Shinozaki K. (2005). Organization of *cis*-acting regulatory elements in osmotic- and cold-stress-responsive promoters. *Trends Plant Sci.* 10: 88-94.