



## GENE EXPRESSION ANALYSIS SHOWS DIFFERENCES IN COLD ACCLIMATION BETWEEN THREE ALMOND CULTIVARS



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### ABSTRACT:

Facing more severe climatic conditions, late spring frosts can become one of the limiting factors of the almond (*Prunus dulcis* [Mill.]) crop preventing the expansion of cultivation area towards harsher climate. Frost can damage up to 90% of the harvest. In order to identify key genes related to cold tolerance response in almond, branches from three genotypes with contrasted capabilities for cold acclimation: two traditional cultivars 'Desmayo Langueta' and 'Marcona', as well as 'Guara', the most planted cultivar in Spain during the last 20 years, were exposed at -4 °C during 24 h in a constant climate chamber. qRT-PCR Fluidigm technology was used to monitor the relative expression of 46 candidate genes previously identified *in silico*. Differences in the expression of genes involved in crucial cold-response pathways [kinase-response, cold-regulated genes (COR) and brassinosteroids-response] have been observed depending on the time of exposure. 'Guara' had a greater acclimation capacity to cold during the time of exposure. The expression of different key transcription factors was increased after 2 h of exposure to cold in this traditional cultivar. 'Desmayo Langueta' and 'Marcona' did not show a cold acclimation during the 24 h of exposure to -4 °C. In addition, some analyzed genes showed a different response to cold stress within each cultivar. Moreover, different commercial varieties are also under study to identify the range of cold tolerance and to develop molecular markers to select the most tolerant genotypes among several progenies.



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