IPMB 2015
South America
11th International Congress of Plant Molecular Biology
Iguassu Falls, Brazil
October 25th - 30th, 2015

Hormonal balance characterization of dormant buds in apple

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Plant Metabolism - Plant primary metabolismo

Apple tree, as a temperate plant, become dormant during the winter season in response to environmental cues like photoperiod and cold temperatures. The plants cease vegetative growth and set bud to enter the ecodormant state in early fall, followed by transition into the endodormant state in later fall or early winter. Once dormancy is established, prolonged chilling exposure is necessary for dormancy release, when the bud is left in a quiescent, ecodormant state that is capable of resuming growth when the conditions are favorable. Our group has investigated the expression of the entire set of apple genes in response to chilling accumulation and identified genes linked to hormonal signaling among the selected candidates. Based on these findings, the aim of this work is develop a multi-hormone extraction protocol (abscisic acid, auxin, gibberellin, zeatin, salicylic acid and jasmonate) as start point to investigate the hormonal balance during the dormancy process. This protocol will be used to compare the hormonal balance between different apple cultivars (Gala Standard, Castel Gala and Fuji Precoce) grafted on different rootstocks (Marubakaido, M9 and Marubakaido with M9 as inter-stock) using Ultra Performance Liquid Chromatography – Mass Spectrometry employing deuterated patterns. Ours first tests showed us that extraction solutions with water are better than usual extraction solutions based only in methanol and formic acid. Methanol, acetic acid and water are efficient enough to extract all the hormones, but a column solid phase extraction will be used to enhance sensitivity, selectivity and robustness of the results.

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