



EXPRESSION OF DORMANCY ASSOCIATED MADS-BOX GENES IN DIFFERENT APPLE TREE ORGANS

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In peach tree, a mutation in the dormancy-associated MADS-box genes (DAM) causes the inability of the plant to cease growth and enter dormancy. With the goal to find and characterize DAM orthologous in apple (*Malus x domestica* Borkh.), this study describes the expression profile of six potential MdDAM in different apple tree organs, as well as in dormant buds exposed to cold treatments. Apple organ samples were chosen according to the standardized phenological scale of Fleckinger (1984). Twigs from the contrasting chilling requirement cultivars Royal Gala and Castel Gala were collected in June 2009 in Papanduva city/SC and incubated in BOD chambers set to 6°C for one and five weeks. The maximum bud break of these twigs was monitored by forcing them in a growth-permissive environment. Selected material for analysis was frozen in liquid nitrogen and stored at -80°C. Total RNAs were isolated from samples by LiCl precipitation and complementary DNAs were synthesized, which were used to quantify gene expression. Each one of the six genes was amplified by reverse transcription quantitative polymerase chain reaction using specific primers. MdDAM2, MdDAM3 and MdDAM6 genes had higher expression in dormant buds and seeds. The MdDAM1 gene was detected only in these two samples. MdDAM4 and MdDAM5 genes were expressed in greater amounts in buds, leaves and seeds. Cold treatments in 'Royal Gala' and also in 'Castel Gala' caused a decrease in the expression of all genes, specially for MdDAM3 and MdDAM6 and no effect was observed for MdDAM4. The cold treatment had greater impact in repressing MdDAM3 and MdDAM6 genes. The higher expression of MdDAM1, MdDAM2, MdDAM3 and MdDAM6 genes in dormant buds and seeds is compatible with growth-inhibiting functions. The profile of these genes in both cultivars was very similar, suggesting that the difference of timing bud break control between 'Royal Gala' and 'Castel Gala' involves other mechanisms than those in which MdDAM participate. The overall expression pattern of MdDAM genes, especially MdDAM1, MdDAM2, MdDAM3 and MdDAM6 is consistent with a role as quantitative repressors of bud break, similarly to the well-characterized peach DAM genes.

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