



Gene expression and enzymatic activity of pectin methylesterase during fruit development and ripening in *Coffea arabica* L.

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ABSTRACT. Coffee quality is directly related to the harvest and post harvest conditions. Non-uniform maturation of coffee fruits, combined with inadequate harvest, negatively affects the final quality of the product. Pectin methylesterase (PME) plays an important role in fruit softening due to the hydrolysis of methylester groups in cell wall pectins. In order to characterize the changes occurring during coffee fruit maturation, the enzymatic activity of PME was measured during different stages of fruit ripening. PME activity progressively increased from the beginning of the ripening process to the cherry fruit stage. *In silico* analysis of expressed sequence tags of the Brazilian Coffee Genome Project database identified 5 isoforms of *PME*. We isolated and cloned a cDNA homolog of PME for further characterization. *CaPME4* transcription was analyzed in pericarp, perisperm, and endosperm tissues during fruit development and ripening as well as in other plant tissues.

Northern blot analysis revealed increased transcription of *CaPME4* in the pericarp 300 days after flowering. Low levels of *CaPME4* mRNAs were observed in the endosperm 270 days after flowering. Expression of *CaPME4* transcripts was strong in the branches and lower in root and flower tissues. We showed that *CaPME4* acts specifically during the later stages of fruit ripening and possibly contributes to the softening of coffee fruit, thus playing a significant role in pectin degradation in the fruit pericarp.

Key words: Coffee; Maturation; Quality; PME; Gene expression