



Gene expression of coffee seed oxidation and germination processes during drying

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ABSTRACT. Coffee (*Coffea arabica* L.) seeds are sensitive to desiccation and oxidative stress during drying processes. We investigated the effect of drying and moisture levels on germination-related gene expressions associated with enzymatic systems that prevent oxidative stress in coffee seeds. Coffee seeds collected at physiological maturity were subjected to slow and quick drying to 40, 30, 20, and 12% moisture levels (wet basis), and as the control, seeds without drying were used. The seeds' physiological quality was calculated as percentage of normal seedlings at 15 and 30 days, normal vigorous seedlings at 30 days, and cotyledonary leaves at 45 days. The isoenzymes esterase, catalase (CAT), peroxidase (POX), and endo- β -mannanase expressions were electrophoretically analyzed. CAT and POX expressions were analyzed using RT-qPCR with specific primers constructed from the target gene sequences from the Brazilian Coffee Genome Database. Slow drying showed better physiological quality for seeds at 40 and 12% moisture levels, while quick drying was the most effective for seeds with 20% moisture. Sensitivity to water loss was confirmed by quick drying and activation of enzymes. CAT and POX transcriptions reduced during drying. RT-qPCR revealed a

complex gene-expression pattern during the oxidative process, with high gene expression in wet seeds.

Key words: Desiccation tolerance; Isoenzyme; Endo- β -mannanase; RT-PCR; Seed aging