

Dietary carotenoid-rich pequi oil reduces plasma lipid peroxidation and DNA damage in runners and evidence for an association with MnSOD genetic variant -Val9Ala

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ABSTRACT. Physical training induces beneficial adaptations; however, exhausting exercise increases reactive oxygen species generation, resulting in damage to DNA and tissues. Pequi (*Caryocar brasiliense*), a fruit of the Brazilian Cerrado, contains a carotenoid-rich oil. We investigated whether pequi oil had antioxidant effects in runners. Evaluations were made after outdoor races before and after ingestion of 400 mg pequi-oil capsules for 14 days. Blood samples were taken after races and submitted to comet and TBARS assays and biochemical analyses of creatine kinase (CK), aspartate aminotransferase (AST) and alanine aminotransferase (ALT). To determine if the protective effects of pequi-oil were influenced by antioxidant enzyme genotypes, MnSOD (-Val9Ala), CAT (-21A/T)

and GPX1 (Pro198Leu) gene polymorphisms were also investigated. Pequi oil was efficient in reducing tissue injuries evaluated for AST and ALT, particularly in women, and in reducing DNA damages in both sexes. Except for CK levels, the results were influenced by MnSOD genotypes; heterozygous excess was related to less DNA damage, tissue injury and lipid peroxidation, besides presenting a better response to pequi oil against exercise-induced damage.

Key words: *Caryocar brasiliense*; Exercise-induced damage; Biochemical markers; TBARS assay; Comet assay; Antioxidant enzyme polymorphisms