**Acai (Euterpe oleracea Mart.) Effect on Metabolic Changes Induced by High-fat Diet in Mice**

GUERRA¹, J.F.C.; LAGE¹, N.N.; BONOMO², L.F.; PEREIRA¹, R.R.; SILVA³, M.E. and PEDROSA⁴, M.L.

¹Núcleo de Pesquisa em Ciência Biológicas – Universidade Federal de Ouro Preto (UFOP)
²Departamento de Fármacia – Universidade Federal de Juiz de Fora (UFJF) - Campus Avançado Governador Valadares
³Departamento de Alimentos - UFOP
⁴Departamento de Ciências Biológicas - UFOP

**INTRODUCTION:** Acai (Euterpe oleracea Mart.) is a typical fruit of the Amazon region that gained international popularity due to its high polyphenols content, high antioxidant capacity and potential anti-inflammatory activities, which have been considered promising for the prevention of the insulin resistance and liver steatosis associated with obesity. **OBJECTIVE:** This study investigated the effects of acai treatment on insulin sensitivity, adipokines production and lipid metabolism in the adipose tissue in mice fed high-fat diet. **MATERIAL AND METHODS:** Thirty-two males Swiss mice were divided into four experimental groups and treated by 12 weeks: C and CA (standard diet), and HF and HFA (32% lard and 1% cholesterol). The CA and HFA groups were treated with Acai aqueous extract (AAE), administered as a single daily dose (3 g/kg) via gavage during the light phase. Serum concentrations of glucose were determined enzymatically using kits. Serum insulin and TNF-α levels were quantified using enzyme-linked immunosorbent assays (ELISA). Expression of lipid metabolism-related genes in the epididymal white adipose tissue (WAT) was performed by qRT-PCR. The data were analyzed by one-way analysis of variance (ANOVA) followed by the Bonferroni post hoc test considering significant when \( p<0.05 \). **RESULTS AND DISCUSSION:** AAE administration improved insulin resistance index and decreased TNF-α serum levels and its epididymal WAT expression when compared to high-fat diet. Moreover, we investigated whether AAE administration modulates the expression of lipid metabolism-related genes in the epididymal WAT. It was observed that AAE increased PGC1-α mRNA expression in mice fed control diet and acai HFA group increased PPAR-γ expression and showed an intermediate level of UCP-2 gene expression. **CONCLUSIONS:** Taken together, these results demonstrate that acai could have an important role on insulin sensitivity improvement, and lipid metabolism, which ultimately could attenuate the progression of chronic diseases, such as Diabetes, NAFLD and metabolic syndromes associated.

**Keywords:** Acai, NAFLD, insulin resistance.
**Patronage:** CNPq, CAPES, FAPEMIG.