Açaí Pulp Lowers Serum Cholesterol by Regulating the Expression of LDL-R Gene in Hypercholesterolemic Rats

Souza, M.O., Silva, L.S., Figueiredo, B.B., Silva, M.E., Pedrosa, M.L.

Depto de Ciências Biológicas, Depto de Alimentos, Núcleo de Pesquisas em Ciências Biológicas, Universidade Federal de Ouro Preto, MG, Brazil.

Açaí is a typically brazilian fruit. Recently has received much attention due to its role as a functional food. Studies have shown that the açaí promotes an improvement of risk markers of metabolic disease. Thus, the present study investigated the hypocholesterolemic activity of açaí using a rat model of dietary-induced hypercholesterolemia. Parameters such as, total plasma cholesterol and LDL-cholesterol was measured, and the expression of the genes involved in cholesterol biosynthesis in the liver, LDL-R and SREBP-2, was evaluated by qRT-PCR. Female rats were fed a standard AIN-93M diet (C group) or a hypercholesterolemic diet (H group). The test diet was supplemented with 2% açaí pulp for the control (CA group) and hypercholesterolemic rats (HA group) for 6 weeks. At the end of the experimental period, the rats were euthanized, and the blood and livers were collected. The rats of the HA group exhibited a significant decrease in their total plasma cholesterol and LDL-cholesterol (CT: 3.25±0.69mmol/L /LDL-C: 3.10±0.71mmol/L) compared with those fed a high-cholesterol diet alone (H group) (CT: 4.24±1.08mmol/L/ LDL-C: 4.11±1.08mmol/L). The H group presented a reduction in the expression of the LDL-R and SREBP-2 relative to the C group. Interestingly, the açaí increased LDL-R expression, which is the protein responsible for the plasma cholesterol uptake. In addition, the HA group exhibited an increase in the expression of SREBP-2 relative to the H group. These results show that the hypocholesterolemic effect of açaí can be attributed to increased uptake of LDL-cholesterol by the liver via the up-regulation of LDL-R.

Keywords: Açaí, Cholesterol, LDL – receptor, Rats.

Supported by: CNPq, FAPEMIG, UFOP.