Ilex Paraguariensis Reduced Fat Storage in *Caenorhabditis elegans* Dependent on *ador-1* Receptor

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Introduction: Obesity is characterized by an excess of adipose tissue, and is associated with several disorders like health risks and increased mortality. *Ilex paraguariensis* is a native tree species in South America, its aqueous extract is widely consumed every day by billions of people, and is characterized for high caffeine concentration, which is known for its thermogenic and stimulating proprieties *in vitro*.

Objective: Investigate the chronic consumption effects of *I. paraguariensis in vivo*, using the nematode *Caenorhabditis elegans* as a model.

Materials and methods: First, L1 N2 wild-type and EG6870 *ador-1(ox489)* knockout strains was treated with 1 mg/mL of *Ilex paraguariensis* until adulthood. This *ador-1* gene encodes an ortholog of human adenosine receptor. Subsequently, was evaluated the lipid accumulation using BODIPY labeling and behavioral changes in N2 wild-type. Finally, we measured total body energy expenditure through oxygen consumption in N2 wild-type and EG6870 *ador-1(ox489)* strains.

Results: *Ilex paraguariensis* decreased the fluorescence of BODIPY labeling in 63.36% compared to control, and did not alter behaviors related to energetic balance, such as pharynx pumping, egg production, defecation cycles or movement in N2 wild-type. Furthermore, *I. paraguariensis* increased oxygen consumption rate in 70.16% compared to control in N2 wild-type, but EG6870 ador-1(ox489) treated worms did not showed significative differences from control group, suggesting that the fat reduction effect of *Ilex paraguariensis* is depend on ador-1.

Conclusion: *Ilex paraguariensis* is capable to reduce lipid storage in *Caenorhabditis elegans* wild-type, and we believe that the purinergic system could be, in some way, involved in the *Ilex paraguariensis* mechanism to alter the lipid metabolism.