

The Antioxidant Activity Potential of *Ceratonia siliqua* (carob) Fruit Extract in *Caenorhabditis elegans*

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INTRODUCTION & OBJECTIVES: The Mediterranean carob tree (*Ceratonia siliqua* L.) has been cultivated and used with the allegedly cholesterol-lowering activities in humans suffering from hypercholesterolemia. In addition, antioxidant properties have been attributed to carob as it contains high amounts of polyphenols. In order to expand the studies related to *C.siliqua* we used the *C.elegans* experimental model in order to verify whether the *C.siliqua* extract would indeed have possible antioxidant effects and reduce lipid accumulation *in vivo*. **MATERIALS AND METHODS:** The *in vitro* antioxidant activity was assessed by reducing the 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical and by the ferric reducing ability of plasma (FRAP). To investigate the antioxidant effect of the extract *in vivo*, we used the nematode *C. elegans* strain N2, GA800 (CTL-1,2,3::GFP) and CF1553 (SOD-3::GFP), 2000 worms were acutely exposed to the extracts (3,1µg, 31,0µg and 62,0µg GAE) for 30 minutes. We performed longevity assay, brood size, and stress-resistance against heat shock and paraquat. To verify lipids levels, we used the Nile Red dye and also measured triglycerides in worms. The statistical analyses were performed by one-way or two-way ANOVA, followed by the appropriate post hoc test. **RESULTS & CONCLUSIONS:** It was observed that the extract has antioxidant activity *in vitro* by DPPH and FRAP methods. On the other hand, *in vivo* the treatment did not cause stress-resistance against heat shock, but there is protection against mortality cause by paraquat. In addition, worms did not depict alterations in lifespan following treatment with the extracts. Furthermore, it was observed a reduction in both triglycerides and lipid droplets of treated worms. Thus it could suggest that the effect of small concentrations of *C.siliqua* extract for a short-term exposure may modulates antioxidant system which may be associated with decreased lipid accumulation, as these pathways are connected in *C.elegans*.

Keywords: *C.siliqua*, lipids, *C.elegans*

Acknowledgements: CNPq and CAPES