Biochemical assessment of *Ceratonia siliqua* (carob) Fruit Extract in *Caenorhabditis elegans*

Rodrigues, C. F.¹, SOARES, A.T.¹, VASCONCELLOS, M.¹, DERNARDIN, C.¹
Ávila, D. S.¹

¹Grupo de Pesquisa em Bioquímica e Toxicologia em *Caenorhabditis elegans* – GBToxCe - Universidade Federal do Pampa, Uruguaiana, Brasil

**INTRODUCTION & OBJECTIVES:** The carob tree (*Ceratonia siliqua* L.) has been widely cultivated in Mediterranean countries for years and it contains high amounts of polyphenols. For this reason, *Ceratonia siliqua* fruit extract has been used in the folk medicine for its putative cholesterol-lowering activities in humans suffering from hypercholesterolemia and for its antioxidant properties. Therefore, we choose the experimental model *C. elegans* in order to verify whether the mechanisms of antioxidant activity of *C. siliqua* extract and to verify its lipid reduction effect in vivo.

**MATERIALS AND METHODS:** 2000 worms were acutely exposed to the extracts (3.1µg, 31.0µg and 62.0µg GAE) for 30 minutes. We used strains N2, GA800 (ctl-1,2,3::GFP, CF1553 (sod-3::GFP), CL2166 (gst-4::GFP), GR1971 ([lipl-4p::GFP) and RB1600 (tub-1(ok1972). It was assessed the activities of the antioxidant enzymes SOD (superoxide dismutase), CAT (catalase) and GST (glutathione-S-transferase), as well as their respective enzymatic expressions. Furthermore we measured the safety of the extract by analyzing survival, longevity and brood size. To measure the lipids levels, we used the Nile Red dye and also measured triglycerides in L4 worms. The statistical analyses were performed by either one-way or two-way ANOVA. **RESULTS & CONCLUSIONS:** We observed that both expressions of the enzymes were increased, however their activities were reduced. Furthermore, the extract depicted a reduction in both lipid droplets and triglycerides in *tub-1* and N2 worms. In addition, we did not observe any toxic effects of the extract. Thus, we can suggest that in a short-time exposure the *C. siliqua* extract modulates antioxidant enzymes and this may be associated to the lipid reduction. Considering that SOD and GST-4 are targeting genes of DAF-16, and that DAF-16 also upregulates lipases as LIPL-4, we will further investigate the role of these genes in worms exposed to *C. siliqua* extract.

Keywords: *C. siliqua*, antioxidant, lipidic, *Caenorhabditis elegans*

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