POSSIBLES NEUROPROTECTIVE EFFECTS OF ILEX PARAGUARIENSIS UNDER PARAQUAT INDUCED NEUROTOXICITY IN HIPPOCAMPUS OF PREPUBERTAL RATS


Departmento de Bioquímica, Centro de Ciências Biológicas - CCB, Universidade Federal de Santa Catarina - UFSC, Santa Catarina, Brazil

INTRODUCTION: Paraquat (PQ), a widely used pesticide, induces oxidative stress and cell death. Despite its banishment in many places in the world, it is still used in Brazil in different crops. *Ilex paraguariensis* (*IP*) commonly known as “mate” is a traditional beverage consumed in South America, largely described due to its beneficial effects on different systems. The aim of this study was to investigate the protective effect of *IP* on prepubertal rats treated with PQ on glutamate metabolism and oxidative stress.

METHODS: Wistar rats (21-days-old) were divided into 4 groups (control, CT; Paraquat, PQ; Ilex paraguariensis, *IP*; Ilex paraguariensis and Paraquat, *IP*+PQ). Animals received daily intraperitoneal injections of PQ (10mg/Kg) for 5 days. *IP* and *IP*+PQ groups received a pre-treatment with *IP* (200mg/Kg) by gavage and then for more 5 days as a co-treatment with PQ. Experiments were carried out with 27 day-old pups. The enzymatic activities of glutamine synthetase (GS), glutathione reductase (GR), catalase, gamma-glutamyl transferase (γ-GT) and aspartate aminotransferase (AST) were determined in rat hippocampus. The glutamate uptake was measured by using 14C-glutamate.

RESULTS AND DISCUSSION: Results showed decreased 14C-glutamate uptake and inhibition of GS and AST activities on PQ-group, suggesting herbicide-induced alterations on glutamate metabolism and transport system. The activities of GR and catalase were induced on PQ-group while γ-GT activity was decreased. *IP* supplementation reverses the decreased glutamate uptake and showed a protective effect on GR and γ-GT activities. CONCLUSION: Altogether, our results demonstrate that PQ induced alterations on glutamate metabolism and on the enzymatic antioxidant defense system and that *IP* seems to protect or reverse some of its harmful effects. Further experiments are necessary to determine whether these effects may compromise neuronal metabolism and if *IP* might be a potential therapeutic.

Key words: paraquat, *Ilex paraguariensis*, oxidative stress.

Acknowledgement: CAPES, CNPq, FAPESC, PPG-BQA-UFSC, PGFAR-UFSC.