



Acute Toxicity and Enzymatic Alterations of *Daphnia similis* Exposed to
4-chloroaniline

Dantzger, D.D.¹; Leme, C.W.¹; Anjos, E.F.¹; Jonsson, C.M.²; Aoyama, H. ¹

¹Departamento de Bioquímica, Instituto de Biologia, UNICAMP, SP, Brazil;

²Laboratório de Ecotoxicologia e Biossegurança, Embrapa Meio Ambiente, SP,
Brazil.

e-mail: darlene@mpc.com.br

The agrochemical diflubenzuron (DFB) is often used in fish farming to combat ectoparasites and can be degraded to the metabolite denominated 4-chloroaniline (PCA). This compound is carcinogenic and can form methemoglobin in mammals. There are few data on the risks that this substance may cause on aquatic organisms. Therefore, a study about the toxicity this compound and its influence on key enzymes are extremely important. In this study was analyzed the acute toxicity of PCA and also its effect on enzymes, such as acid and alkaline phosphatases and catalase of the microcrustacean *Daphnia similis*. To determine the median lethal concentration (LC 50), 20 neonates of *D. similis* were exposed to increasing concentrations of PCA, and after 48 hours, the mobile individuals were counted as survivors. The LC 50 obtained for PCA was of 0.27mg/L. This result and twice that value were used for the enzymatic assays. In this way, the organisms were exposed to 0.27 and 0.54mg/L PCA, for 48 hours, and was determined the specific activity of the enzymes. Acid phosphatase activity did not significantly change; but alkaline phosphatase activity increased 20 and 29%, for 0.27 and 0.54mg/L PCA, respectively. Catalase activity also has increased of 19% for 0.27mg/L PCA, indicating that the metabolite was causing oxidative stress in the organism. For the concentration 0.54 mg/L PCA, catalase was inhibited 17% compared to control. These results suggest that PCA presented toxicity for the *D. similis* and altered the enzyme activities.

Key Words: 4-chloroaniline, acid phosphatase, alkaline phosphatase, catalase, *Daphnia similis*

Supported by FAPESP