# Cellular immunity and phagocytosis byhyaline haemocytes of *Ucides cordatus* exposed to the toxic metal cadmium

Melo, F. G.[1,2], Duarte, L. F. A.[3], Pinheiro, M. A. A.[3], Zanotto, F. P.[1]

[1]Laboratório de Biologia Celular de Invertebrados Marinhos, Instituto de Biociências, Departamento de Fisiologia, Universidade de São Paulo (USP), São Paulo, Brazil.
[2]Universidade Federal de São Carlos, campus Sorocaba, São Paulo, Brazil.
[3]Universidade Estadual Paulista (UNESP), campus São Vicente, São Paulo, Brazil.

Invertebrates have innate immunity, different from vertebrates that display acquired immunity when faced with infections of any kind. Cellular defense in crabs such as *Ucides cordatus* occurs in general through haemocytes (blood cells) recruitment. The objective of this work was to study one type of haemocyte (hyaline cells)separated by percoll gradient, exposed to cadmium chloride ($CdCl_2$) at different concentrations *in vitro* and to evaluate phagocytosis capacityand cell integrity through trypanblue and neutral red. In order to do that, hyaline cells of three crabs were exposed to $CdCl_2$ (0, 0.5, 1.0 and 1.5 µM) and collected using anti-clotting solution with 0.1M glucose (1:1.5),n=4. After counting total haemocytes in a Neubauer camera, cell phagocytosis capacity after 120 minutes of exposure to Cd was 42.9 $\pm$ 5.0 % for control cells and decreased to half (24.0 $\pm$ 4.3%) for hyaline cells exposed to 1.5 µM $CdCl_2$. Exposure to neutral red caused a loss of the dye after 45 minutes exposure to $CdCl_2$ at 1.5 µM. Dye loss started to occur only after 120 minutes for both control and the other Cd concentrations (0.5 and 1.0 µM). Cell viability decreased and was smaller for Cd treated cells when compared to control (80% against 69% on average) after 120 minutes exposure. The results show that Cd, a non-essential toxic metal, decrease haemocyte phagocytosis as Cd concentration increasesand is deleterious to crab haemocytes for concentrations as low as 0.5 µM. In conclusion, crabs are more vulnerable against pathogens invasion when exposed to cadmium.

**Key words:** metal cadmium, innate immunity, ecotoxicology.