

**EVALUATION OF THE TOXICITY OF POLY (E-CAPROLACTONE) NANOCAPSULES
CONTAINING TRIAZINE HERBICIDES**

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Abstract:

Triazines are one of the most commonly used classes of herbicide, and are widely employed to control weeds in maize, sorghum, and sugar cane plantations. The herbicides class includes ametryn (AMT), atrazine (ATZ) and simazine (SIM). Despite their widespread use in agriculture, these herbicides can be dangerous to the environment, depending on their toxicity, the degree of contamination, and the exposition time. Controlled release systems are increasingly used to mitigate problems of toxicity, minimize environmental impacts, and can increase the herbicide efficiency. The objective of this work was to prepare poly (epsilon-caprolactone) nanocapsules containing herbicides (ametryn or atrazine) and evaluate their toxicity in aquatic organisms as well as cytogenetic tests employing human lymphocyte cultures. The PCL nanocapsules were prepared according to the interfacial deposition of pre-formed polymer method and characterized by atomic force microscopy. Ecotoxicological assays were performed with algae *Pseudokirchneriella subcapitata* and microcrustaceans *Daphnia similis*. The cytogenetic study consisted of the exposure of lymphocytes cell cultures with different formulations and the evaluation of the mitotic index alterations. Microscopy analyses showed that the nanocapsules were spherical without aggregates. Ecotoxicological tests showed that herbicides encapsulated with nanocapsules presented lower toxicity upon exposure to algae and greater when it was exposed in microcrustaceans in relation with the herbicide. Cytogenetic tests showed that formulations of nanocapsules containing the herbicides were less toxic than the herbicides. This study opens perspectives for the application of these formulations in agriculture, aiming to reduce the amount of herbicides, reduced environmental impact and human health. Supported by: Fapesp, CNPq, Embrapa, Capes and Fundunesp.