"Gheorghe Asachi" Technical University of Iasi, Romania

EFFECTS OF α-CYPERMETHRIN PESTICIDE ON DNA STABILITY AND OXIDATIVE ENZYMES IN MAIZE (*Zea mays*)

Ozkan Aksakal

Department of Biology, Science Faculty, Atatürk University, 25240, Erzurum, Turkey
E-mail address: oz_aksakal@yahoo.com; Phone: +90 442 231 43 27; Fax: +90 442 236 0948

Abstract

α-cypermethrin is a pyrethroid and environmental genotoxic pesticide extensively used worldwide for agricultural applications. However, like other pesticides, it affects non-target organisms as well as target organisms and causes various toxic effects. To evaluate α-cypermethrin toxicity in non-target organisms, the effect of α-cypermethrin on the activity of malondialdehyde (MDA, an indicator of lipid peroxidation) content, antioxidant enzymes (superoxide dismutase, SOD; peroxidase, POX and catalase, CAT) and DNA damage were investigated in maize. For this purpose, maize seedlings were exposed to α-cypermethrin in different concentrations (5, 10, 25, and 50 ppm) for 7 days in Petri dishes. After the incubation root length, antioxidant enzyme levels, MDA content and RAPD profiles of seedlings were analyzed to determine toxicity. The results revealed that both MDA content and the activity of antioxidant enzymes (except for 5 ppm at POX application) significantly increased ($p<0.05$) by exposing to α-cypermethrin in a concentration dependent manner. Conversely, significant changes in RAPD profiles were observed after α-cypermethrin applications. These changes included loss of normal bands and the appearance of new bands, in comparison with the control group, and they also were dose-dependent. According to these obtained results, we concluded that α-cypermethrin cause DNA damage in a dose-dependent manner and the root cells of maize exhibits defense against α-cypermethrin-induced oxidative stress by enhancing their antioxidant activities.

Key words: α-cypermethrin, catalase, malondialdehyde, peroxidase, RAPD, superoxide dismutase