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Protective effects of *Urtica dioica* seed extract in aflatoxicosis: Histopathological and biochemical findings

A Uyar, Z Yener and **A Dogan**
Yuzuncu Yil University, Turkey

The ameliorative potential and antioxidant capacity of an extract of *Urtica dioica* seeds (UDS) was investigated using histopathological changes in liver and kidney of broiler, measuring serum marker enzymes, antioxidant defence systems and lipid peroxidation (malondialdehyde (MDA)) content in various tissues of broilers exposed to aflatoxin (AF). A total of 32 broilers were divided randomly into 4 groups: control, UDS extract-treated, AF-treated and AF+UDS extract-treated. Broilers in control and UDS extract-treated groups were fed on a diet without AF. The AF-treated group and AF+UDS extract-treated groups were treated with an estimated 1 mg total AF/kg feed. The AF+UDS extract groups received in addition 30 ml UDS extract/kg diet for 21d. The AF-treated group had significantly decreased body weight gain when compared to the other groups. Biochemical analysis showed a small increase in the concentrations of serum aspartate aminotransferase, alanine aminotransferase, gamma glutamyl transpeptidase and lactate dehydrogenase in the AF-treated group compared to that of the control group, whereas concentrations of these enzymes were decreased in the AF+UDS group compared to that of the AF-treated group. Administration of supplementary UDS extract helped restore the AF-induced increase in MDA and reduced the antioxidant system towards normality, particularly in the liver, brain, kidney and heart. Hepatorenal protection by UDS extracts was further supported by the almost normal histology in AF +UDS extract-treated group as compared to the degenerative changes in the AF-treated broilers. It was concluded that UDS extract has a protective hepatorenal effect in broilers affected by aflatoxicosis, probably acting by promoting the antioxidative defence systems.

uyarahmet@hotmail.com

Electrochemical determination of Disulfoton and its metabolites in real samples

Bakhtiyar Qader, Mark Baron, Issam Hussain and **Jose Gonzalez Rodriguez**
University of Lincoln, Brayford Pool, UK

A simple, rapid and sensitive electrochemical method for determination of Disulfoton and its metabolites (Disulfoton Sulfone) in a real sample was developed. The electrochemical behavior of Disulfoton and Disulfoton Sulfone by differential pulse voltammetry technique on a bare glassy carbon working electrode in a $NaClO_4$ solution was investigated. An anodic peak current at potential 1136 mV for Disulfoton and 1285 mV for Disulfoton Sulfone were found. Oxidation peaks showed a linearity over a concentration range of 5-75 μM (r2=0.9991) and 10-100 μM (r2=0.9988) with lower limit of detection of 3.2 μM and 1.73 μM for Disulfoton and Disulfoton Sulfone, respectively. Intra-day and inter-day assay precisions, expressed as the relative standard deviation, were overall less than 7.54% for both analytes. The developed method showed a mean recovery percentage of 97.16% for Disulfoton and 97.54% for Disulfoton Sulfone in the prepared samples. The obtained recovery rates showed a good agreement comparing to those of recovered from GC-MS as a reference method. The proposed methods has been employed to determine Disulfoton and Disulfoton Sulfone in spiked plasma and urine samples with recovery ranging from 88.2% to 104.13% indicating that the developed methods can be applied for measuring the toxicant and its metabolite in a real sample.

bqader@lincoln.ac.uk