



**University of Zabol
Graduate school
Faculty of veterinary medicine
Department of basic science**

**The Thesis Submitted for the Degree of Doctor of Professionals
(in the Field of veterinary medicine)**

**Histopathological changes in ovarian tissue of rats exposed to
cadmium and its oxidative stress**

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Abstract

Chemical toxicity with substances, such as cadmium chloride, can cause serious complications including immunodeficiency and carcinogenicity. The destructive effects of this substance on histopathological changes in the ovaries, induced oxidative stress enzymes in serum and tissue, lipid peroxidation level, and protective effects of *Opuntia dillenii* and *Averrhoa carambola* were investigated in the present study. To this end, five groups, each comprising of six female Wistar rats were examined: the cadmium chloride intoxicated group, the intoxicated group treated with *Opuntia dillenii* extract, the intoxicated group treated with *Averrhoa carambola* extract, intoxicated group treated with *Opuntia dillenii*-*Averrhoa carambola* extracts, and control group. The cadmium chloride intoxicated group was intoxicated with an intraperitoneal injection of cadmium chloride (2 mg/kg body weight). The experiment lasted for 10 days and the treatments were administered through gavage feeding. At the end of the experiment, the rats were euthanized and their blood and tissue samples were collected for laboratory tests and preparing tissue sections. The activity of superoxide dismutase enzyme (SOD) in tissue and serum, the activity of catalase enzyme (CAT) in serum, and the malondialdehyde (MDA) level resulted from serum lipid peroxidation were measured. The highest rate of tissue damage, along with a significant increase in MDA level and reduction of serum CAT level in serum, and reduction of SOD level in serum and tissue was observed in the cadmium chloride intoxicated group. As compared to the cadmium chloride intoxicated group, a lower rate of tissue damage, along with a significant reduction of MDA level and elevation of CAT level in serum, and elevation of SOD level in serum and tissue was observed in the groups treated with the extracts. The significantly lower rate of tissue damage was observed in the group treated with the *Opuntia dillenii*-*Averrhoa carambola* extracts.

Keywords: *Opuntia Dillenii, Averrhoa Carambola, Oxidative Stress, Cadmium chloride, Ovary*