Global Science Research Journals

Global Journal of Molecular Evolution and Genomic

Extended Abstract Open Access

Reproductive toxicity associated with diazinon exposure in male rats: The protective effects of Cedrelopsis grevei leave extract

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Pesticides have contributed for many public health hazards in man including infertility. So, the present study aims to assess the protective role of Cedrelopsis grevei leave extract against the incidence of reproductive toxicity resulting from diazinon (DIA) exposure in mature male Wistar rats. Group I served as control. Groups II rats were received 150 mg/kg extracts. Groups III rats were given DIA at a dose of 12.50 mg a.i. kg-1 b.wt., 1/100 LD50. Groups IV rats were simultaneously given the same doses of extract and DIA as in groups II and III, respectively. All the applications were given a single daily dose via oral gavage for 70 days to complete the spermatogenic cycle. The results revealed that exposure to DIA significantly decreased the fertility index, weights of sexual organs (testes, seminal vesicles, epidermis and prostate gland), sperm characteristics as well as serum testosterone level, while increased sperm abnormality. In addition, the testicular tissue level of reduced glutathione and the activities of SOD, CAT, GPx and GST enzymes were significantly decreased while increased the level of testicular tissue LPO compared with the control group. The testicular histopathological sores were described by moderate to extreme degenerative changes of seminiferous tubules and inadequate capture of spermatogenesis. Co-administration of the extract to treated-animals alleviates the reproductive toxicity and testicular oxidative damage. All in all, the utilization of Cedrelopsis grevei leave separate had all the earmarks of being gainful in weakening and improving the testicular harm and conceptive poisonousness continued by bug spray presentation in male rats. The ability of chemical pollutants to affect reproductive health has garnered significant attention in recent decades and is further compounded by the accumulation of endocrine disruptive chemicals in the environment. Chemicals that disrupt normal endocrine function may interfere with the hormonal pathways responsible for the control of reproduction triggering morphological and functional abnormalities. Diazinon acts on the nervous system through the inhibition of the acetylcholinesterase activity at the synapses and neuromuscular junctions and is manifested by overstimulation of acetylcholine receptors and impeded neurotransmission. The inescapable movement of both nicotinic and muscarinic cholinergic receptors alongside selection of oxidative concern in various tissues may have genotoxic, immunotoxic, nephrotoxic, hepatotoxic, and cardiotoxic impacts. Diazinon smothers regenerative capacity with endogenous hormonal interruption prompting histopathological modifications in testicles and spermatogenic unsettling influences. Presentation to diazinon contrarily influences sperm motility and DNA respectability, which may add to diminished semen quality and accompanying abatements in ripeness. Humans are exposed to mixtures of chemicals which can interact. The most common approach to describe the combined action of the components in the mixture is to perform experimental studies comparing the effects of the mixture to

the effects of the individual compounds. In this manner, the current investigation was planned for distinguishing the potential cooperations among cadmium and diazinon on testis and epididymis following subchronic peroral organization to rodents as a result of their conceivable event in the evolved way of life. The male Wistar rats were individually housed in plastic cages in an environment maintained at 20–24°C, % humidity, and 12/12 h pattern of light and haziness with access to food and drinking water not obligatory. All experiments were conducted in accordance with standard guide for the care and use of laboratory animals in an accredited laboratory. The 4-week-old rats were randomly assigned into 4 groups of 10 males each. Rats in group B were dosed with cadmium at 30 mg/L in drinking water for 90 days. Rats in group C were presented to diazinon at 40 mg/L in drinking water for 90 days. Rats in the group D were given a mixture of cadmium and diazinon in drinking water for 90 days. All experimental groups were compared to a control group A with no intervention. The portion routine and course of organization were picked dependent on the test points of reference set in the writing so as to create an objective organ harmfulness emerging from rehashed introduction which doesn't initiate creature mortality. The rats were watched day by day for endurance and clinical indications of harmfulness. Individual body weights, food consumption, and water consumption were measured at weekly intervals. No significant differences on the final body and testicular weight, nor any gross pathological changes that could be attributed to diazinon exposure at 40 mg/L, were found. This biometric data is in line with what was previously reported. Histopathologically, the testicular tissue showed varying degrees of distortion. Many tubules did not corroborate a significant change of germinal epithelium and interstitial tissue. The others appeared markedly necrotic, with degeneration of epithelial cells and only remnants of the basement membrane. Peeling of germ cells into the rounded lumen mirrors the harm of Sertoli cells and the annihilation of cell affiliation. Disrupting of tight junctions and adherent junctions between cells increased epithelial and endothelial permeability. The morphometric investigation affirmed a noteworthy increment of intraepithelial void spaces joined by an extraordinarily diminished tubule volume because of introduction to diazinon. In the most damaged tubules, the germ cells were not detectable, and several multinucleated cells were frequently seen together with large vacuoles. Analysis of testis sections revealed dilated and congested blood vessels. As per the current examination, gentle to extreme degenerative changes in seminiferous tubules after introduction to different portion levels of chlorpyrifos were found. In like manner, fourteen days of presentation to diazinon brought about an exceptionally noteworthy decrease of measurement size in the lumen in male grown-up bluegills. Desquamation of germ cells, degeneration of Sertoli cells, appearance of vacuoles, and decrease in cell populace happened following presentation to quinalphos in sublethal dosages. Results reported herein support previous research into diazinon-induced changes to testis histopathology and corroborate reproductive toxicity following organophosphate exposure. Diazinon prompts the creation of oxidative worry by change of cancer prevention agent protein action and expanding lipid peroxidation. Increased oxidative stress in the testis is associated with the suppression of Leydig cell steroidogenesis, disruption of spermatogenesis, and implications for male fertility. Subjective investigation of epididymal histology in rats presented to diazinon indicated no stamped auxiliary modifications. Minimalistically orchestrated tubules with efficient pseudostratified epithelium and lumen loaded up with spermatozoa were encircled by connective tissue without obvious visible signs of inflammation.