Kaff-e-Maryam (Anastatica hierochuntica L.): Evaluation of gastroprotective activity and toxicity in different experimental models

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Introduction: Anastatica hierochuntica L., (Brassicaceae) is distributed throughout Arabian Peninsula, and elsewhere. It is locally called "Kaff-e-Maryam". All parts of the plant are used in folk medicine.

Objective: "Kaff-e-Maryam" is used to treat stomach cancer and stomach problems, infections, and to ease childbirth. There are no reports on its role in protection of gastric mucosa against toxic damage and nothing is known about its toxic potential. Ethanol treated rats were investigated in detail. The gastroprotective activity of "Kaff-e-Maryam" extract was evaluated in rats while toxicity studies were done in Brine shrimp and mice.

Materials & Methods: Ethanol extract of the whole plant was prepared and animals were treated with the standard necrotizing agents. Different doses of the extract were used for pharmacological and toxicity evaluation.

Results: The group of rats treated (gavage) with necrotizing agents including 80% ethanol, caused damage to the stomach wall. The depletion of stomach-wall mucus, concentration of proteins, nucleic acids, and NP-SH groups occurred. The extract treatment caused protection against the changes induced by ethanol. Histopathological studies supported the findings. In brine shrimp toxicity test as well during acute and chronic toxicity studies in mice, A. hierochuntica treatment showed low toxicity.

Discussion & Conclusion: Pretreatment with A. hierochuntica extract offered protection against toxic damage to stomach wall; thus supporting the folklore claim. The extract was found to exert its defensive role through its free radical scavenging and prostaglandin inducing activities. Based on the results of current study, the use of A. hierochuntica was found to be safe in the given doses. The toxicity studies revealed A. hierochuntica extract in the given dose range, was not toxic.

Exposure of phthalates is associated with embryonic toxicity, fatty liver changes and hypolipidemia via impairment of lipoprotein functions

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Phthalates are widely used for the industrial production of various items such as plastics and medical devices. Phthalates are notorious for high potential toxicity in endocrinological and reproduction systems of humans and animals. In this study, we investigated the cardiovascular toxic effects of phthalates on human lipoproteins, macrophages, and zebrafish embryos. Treatment of phthalate into human plasma HDL3 caused aggregation and degradation of lipoprotein in a dose-dependent manner. Phthalates promoted foam cell formation via accelerated phagocytosis of LDL by macrophages as well as exacerbated cellular senescence in human dermal fibroblasts. Zebrafish were exposed to water containing phthalates (final 11 and 22 ppm) for 4 weeks under normal diet (ND) or high cholesterol diet (HCD) consumption. ND group showed 59% reduction of plasma total cholesterol (TC), whereas HCD group showed 49% reduction of plasma total cholesterol (TC), whereas HCD group showed 49% reduction of TC. Serum triglyceride (TG) levels of ND and HCD groups were 45% and 32% lower than that of control, respectively. Serum enzyme levels of hepatic inflammation were significantly increased by the phthalate exposure compared to the control group. Exposure of zebrafish embryos to water containing phthalates (final 11 and 22 ppm) caused early death along with increased oxidized products and impaired development. In conclusion, phthalate showed strong pro-atherogenic effects via severe modification of lipoproteins and induction of aging process in human dermal fibroblast cells in addition to pro-inflammatory activity and immune stimulation in zebrafish embryos.