International Journal of Technical Research and Applications e-ISSN: 2320-8163,
www.ijtra.com Volume 2, Issue 1 (jan-feb 2014), PP. 29-32

STUDY OF PATHOLOGICAL, EFFECTS OF CRUDE EXTRACT OF PORTULACA OLERACEA L. IN THE ALBINO MICE ORGANS

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***Abstract*— This study was designed to evaluate the effect of 70% ethanolic crude extract of Portulaca oleracea L on mice orgons . (In vivo),In vivo, the acute toxicity of 70 % ethanolic extract of the plant on normal mice was studied. No toxic effect was noted on normal mice even at 9500 mg /kg B.W S/C injection.Histopathological changes due to ethanolic extract of the plant in healthy mice were summarized in hyperplasia of white pulp with amyloid deposition, proliferation of megakaryocytes and mononuclear cell infiltration in the liver and kidney parenchyma. There were no significant lesions detected in the brain, heart and ovary in all treated groups.**

***Key Words*— Portulaca oleracea (purslane), effect in mice orgins**

I. INTRODUCTION

A. Chemical compounds of Portulaca oleracea

Purslane appears to be the only higher plant reported to contain the beneficial omega-3 fatty acids (O3FAs) - eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). Purslane also contains carbohydrates, lipids, glycosides, alkaloids, sterols, triterpenes, and flavonoids (1). Phenolic constituents of the plant include scopoletin, bergapten, isopimpinellin, lonchocarpic acid, robustin, genistein, and others (2). Purslane is a rich source of vitamins A, B, C, and E (3). Purslane is high in carotenoid content, including beta-carotene (4), (5).

Purslane contains large amount of norepinephrine (noradrenalin), dopa, dopamine, citric acid,waxes, tannic acid, alkaloid, flavinoid, coumarone, saponines, cardiac glycoside, amino acid, anthraquin, oxilic acid (6, 7) determined levels of endogenous antioxidants (alpha-tocopherol, ascorbic acid, beta-carotene and glutathione) in plant leaves. In addition, it was (8) showed that portulaca oleracea have antioxidant and free radical scavenging activities.

Portulaca oleracea L. (PO) It is an edible plant and is usually cut into small pieces and eaten with salt (9). In the United Arab Emirates and Oman, a cultivated variety of PO is used as a vegetable (10). Portulaca oleracea L, has many folkloric uses, it is used in the Arabian Peninsula as antiseptic, anti-scorbutic, antispasmodic (10). In China, it is used as an anti-bacterial and anti-viral agent and for the treatment of viral hepatitis and in diabetes management (11). Portulaca oleracea L showed a tumoricidal activity against KATO III (human gastric carcinoma cell (line) and COLO 320 HSR cells (human colon adenoma cell line) in vivo and in vitro (12, 13) Purslane acts as analgesic, antiarthritic, antiartheriosclerotic and anticancer (breast, colon, forestomach, liver, skin) activities. (14) Mentioned that Polysaccharide from Portulaca oleracea L. has immune effects on mice with tumor S180.

This study was designed to asses the pathological effect of portulaca oleracea crude extract in albino mice organs.

II. MATERIALS AND METHODS

A. Experimental animals for LD50

Nineteen adult Swiss albino balb/C mice (range of body weight=25-30g) were used to determine the subcutaneous median lethal dose (LD50) of ethanolic extract of Portulaca oleracea .

B. Determination of LD50

Graduated doses of Portulaca oleracea ethanolic extract were dissolved in 10 ml distill water and administered S/C as 0.1 ml for each 10 gm of animal body weight. The range was of S/C single doses used in the determination of LD50 of extract was (5000- 9500) mg /kg B.W. Mortality was recorded after 24 hrs and LD50 was calculated according to up and down method described by (15) by employing the following: LD50 =X f +KD Where: Xf is the last dose administered. K is the tabular value, and D is the interval between doses.

C. Animals treated with ethanolic extract of Portulaca oleracea

By returning to results of LD50, and values reported in some references (12), the doses were adjusted in this study (200 mg/ kg B .W. after S/C injection daily for 30 days.

D. The effect of ethanolic extract on healthy mice

Ten healthy female adult mice were used at 8-10 wks of age and 25-30 gm B.W. for examining hisopathological changes after treatment with ethanolic extract of P.O. These animals were divided into 2 groups, each group had 5 animals and as follows:

1. Five adult female albino mice were injected S/C daily with 200 mg/g B.W. of ethanolic extract of P.O for 30 days.
2. Five adult female albino mice were injected S/C daily with D. Was control group for 30 days.

E. Histopathology study

At the end of the experiment, the animals were sacrificed and postmortem was done for all animals. The macroscopic appearances were recorded to detect any abnormal gross changes in internal organs. Specimens were taken from all internal organs; the tissues were kept in 10% formaldehyde immediately after removal. After 48 hours of the fixation, the processing was routinely done with a set of increasing alcohol concentrations, tissue section were embedded in paraffin blocks, and sectioned by microtome at 5µm for all tissues. All tissues were stained with hematoxylin and eosin stain and the histopathological changes were observed under light microscope (16).

III. Results and Discussion

A. Median lethal Dose (LD 50)

Acute toxicity test of portulaca oleracea extract showed no toxic symptoms on the animals when extracted by 70 % ethanolic solution .Different doses ranging from (5000 to 9500) mg/kg B.W injected subcutaneously caused no deaths in experimental mice. Portulaca oleracea was considered safe even at high dosage (17).

B. Spleen of healthy mice treated with P.O only

Organ of this group showed extensive hyperplasia of white pulp in the periarterial sheath (T-cell region), extensive hyperplasia of remainder region of white pulp (B-cell region) and amyloid deposition surround the follicles and proliferation of megakaryocytes (Figure: 1-2;)

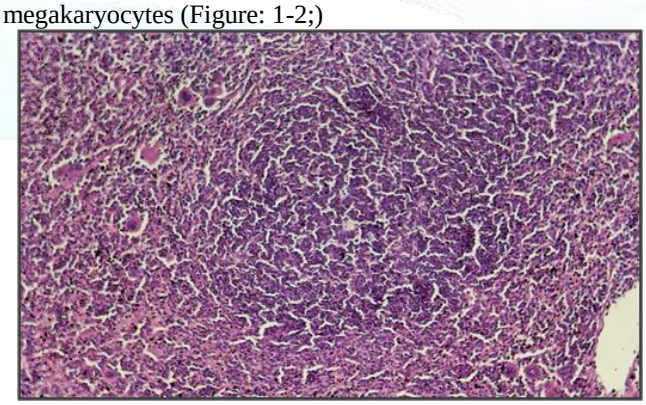

Figure 1: Histological section in spleen of healthy female mice received 200mg/kg B.W S/C of P.O only for 30 days, showing extensive hyperplasia in white pulp in the periarterial sheath region (T-cell region) and extensive hyperplasia of remainder region of white pulp (B-cell region)and proliferation of megakaryocytes (100XH&E).

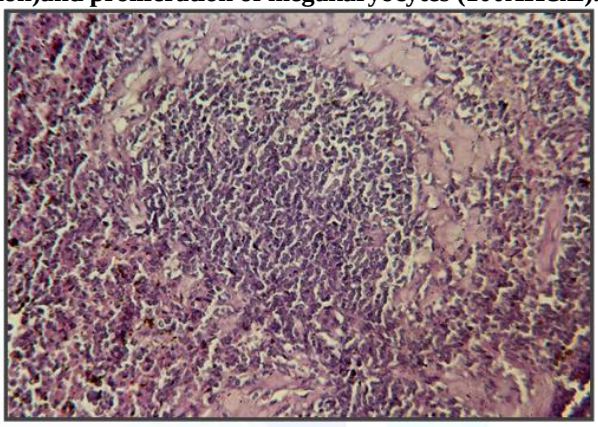

Figure 2: Histological section in spleen of healthy female mice received 200 mg/kg. B.W S/C of P.O only, showing hyperplasia in white pulp and amyloid deposition inclosed the white pulp (200XH&E).

C. Liver of normal mice received ethanolic extract of P.O only

Liver of this group showing aggregation of mononuclear cells to forming early pericentilobular granuloma, also hydropic degeneration seen in hepatocytes (Figure: 3-4).

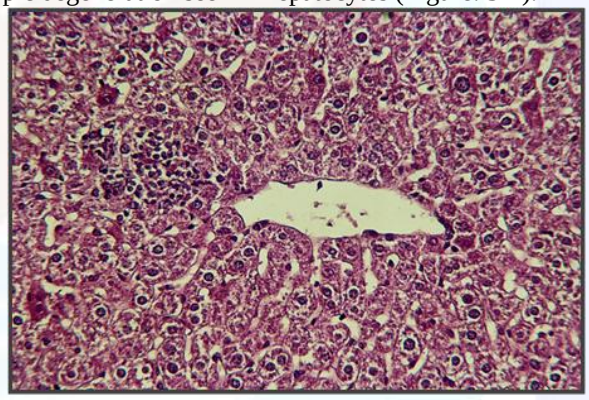

Figure 3: Histological section in liver of healthy female mice received 200mg/k. B.W S/C of P.O only for 30 days showing mononuclear cell aggregation to forming early granuloma (200XH&E).

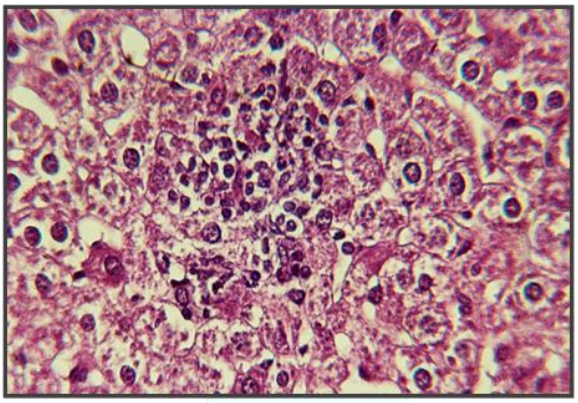

Figure 4: Histological section in liver of healthy female mice received 200mg/k. B.W S/C of P.O only, at high magnification of Figure 3 of early granuloma (400XH&E)

D. Kidney of normal mice received ethanolic extract of P.O only

Kidneys in this group showing sever perivascular infiltration of mononuclear cells (lymphocyte and macrophage) in kidney paranchamia also hydropic degeneration of renal tubules (Fig. 5).

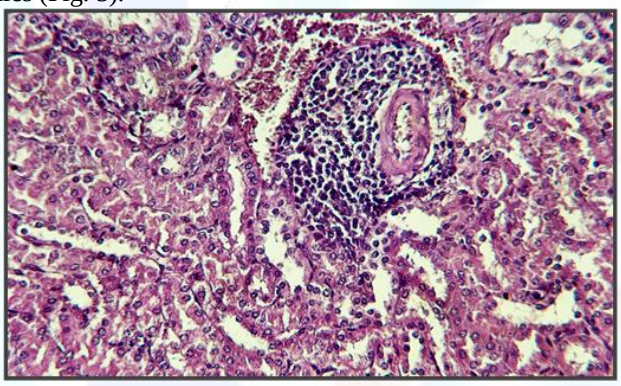

Figure (5): Histological section in kidney of healthy female mice received 200 mg/kg. B.W S/C of P.O only for 30 days, Showing sever perivascular infiltration of mononuclear cells (lymphocyte and macrophage) in kidney paranchyamia (200XH&E).

Healthy mice treated with P.O only, showed hyperplasia of white pulp and aggregation of mononuclear cell in liver parenchyma and hydropic degeneration of hepatocytes and sever perivascular infiltration of mononuclear cells (lymphocyte and macrophage) in kidney paranchamia and hydropic degeneration of renal tubules.

The 2nd lymphoid organs comprise the spleen, lymph nodes and (Vinuesa and Cook. 2007). Liver had been considered the largest reservoirs of CD+ 4 memory T cells in mice after the effectors phase of an immune reaction (18, 19).

Portulaca oleracea have active compound like antioxidant, flavonoid, catechine and alkaloids which may act as immune stimulant and increased splenocyte proliferation (20, 21) showed that spleen follicular hyperplasia due to catechines of Camellia sinensis plant extract.

There was deposition of amyloid in spleen in the health mice treated with P.O only and. Deposition of amyloid fibril protein (Amyloid light chain) type is a (22), a ssociated with some form of monoclonal B-cell proliferation nd proliferation of megakaryocytes in their spleen as a result of response to multiple cytokines (23), which secreting immune mediators to enhance immune response.

Healthy mice treated with P.O that received 200 mg/kg. B.W S/C of P.O only for 30 days, showed high mononuclear cell infiltration between renal tubule as a result of high immune complex compared with healthy mice treated only with distill water that have no significant lesion detected. Also the role of purslane extract components give toxic effect on epithelia such as hepatocytes, renal epith. And cause cloudy swelling and hydropic degeneration in addition the role of pursline extract components like antioxidant, flavonoid, catechine and alkaloids have immunological effect on ymphoid tissue couse spleen hyperplasia and infiltration of mononuclear cells (Lymphocytes and macrophages) in the liver and kidney (22).

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