Original Research Article Website : www.ijbasr.org ISSN : 2349-1965
International Journal of Basic & Applied Science Research
[2014; 1 (2) pp 100-104]

IMPACT OF BLUMEA LACERA ON PROFENOFOS EXPOSED KIDNEY OF WISTAR RAT (RATTUS NOVERGICUS)

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ABSTRACT:

Blumea lacera has been used as a traditional medicine for anti-inflamatory, antimicrobial, anti-oxidant, anti-helminthic and diuretic. Profenofos is organgophosphate compound that generate free radical and damages the cells. In this study, profenofos (50mg/kg bw) was orally administered and 500mg/kg bw *B. lacera* was orally administered. Different kidney function test was performed. It was noticed that after treatment of *B. lacera* concentration of serum creatinine, urea and uric acid was reduced.

KEY WORLD: *Blumea lacera*, Profenofos, Wistar rat and Traditional medicine

INTRODUCTION:

It is very chalanging task to fulfill the food stuff to fast growing population (1.252 billions) of India. In order to provide the sufficient food to the growing population, it is necessary to protect the food stuff from pest and spoilage. Farmers use different chemiclas like herbicides, insecticides, fungicides, pesticides etc., for crop protection, number of organo phosphate have been used frequently from decades in agricultural production, thousands of OPs compounds have been screened and marketed for these purposes (Hassall, 1990; Chirions and Geraud-Pouey, 1996 and Geraud-Pouey, *et al.*, 1997). One of the most frequently used organophosphate is profenofs. It has adverse effects on many organs like kidney, liver of mice (Akhgari, *et al.*, 2003; Gupta, 2006). It interrupts in the metabolic activity of animals (Aprea, 2000). It also effect the immune system (Neishabouri, *et al.*, 2004), urinary system (Rodrigo, *et al.*, 2001), reproductive system (Joshi, *et al.*, 2003), hematological system (De Blaquiere, *et al.*, 2000), muscles (Pournourmohammadi, *et al.*, 2005) and pancreas (Hagar and Fahmy, 2002). Organophosphate affect the nervous system by disrupting the enzyme acetylcholinesterase hydrolyses acetylcholine into choline and acetic acid (Pandit, *et al.*, 2011 and Yurumez, *et al.*, 2007). Profenofos inhibits the enzyme activity of cholinesterase (Anderson, *et al.*, 1977). Its exposure may cause hepatocellular injury, tissue vacuolization, hemorrhage and hyperplasia of Kupffer cells in the liver (Gomes, *et*

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Date of Acceptance : 20.09.2014
Date of Publication : 30.10.2014

al., 1999). It also leads to swelling of Bowman's capsules and tubular degeneration in the kidney (Fawzy, *et al.,* 2007). It happened due to reactive oxygen stress in different organ of animal (Lin, *et al.,* 2003). During the screening of herbal medicinal plants one of the most precious commodity traditional plants is *Blumea lacera*. *Blumea lacera* is known to work as bitter, astringent, acrid, thermogenic, errhine, anti-inflammatory, styptic, opthalmic, digestive, anthelmintic, liver tonic, expectorant, febrifuge, antipyretic, diuretic, deobstruant, and stimulant (Warner, *et al.,* 1996). Essential oil of Blumea shows analgesic, hypothermic and tranquilizing activities (Anonymous, 1972). Different product of Blumea is also used as a homoeopathic drug (Oudhia, *et al.,* 1998) and useful for the treatment of enuresis, neuralgia, headache, cold borne cough and bleeding piles (Ghosh, 1988). In this study, we are trying to look, whether this *Blumea lacera* can useful to treat kidney dysfuction or not due to excessive expousere of profenofos.

MATERIALS AND EXPERIMENTAL PROTOCOLS:

Model Animal:

For this present work, twenty four wistar rats with average body weight ranging from 55-60 gm were housed in P.G. Department of Biotechnology, T. M. Bhagalpur University, Bhagalpur (Bihar), India. Food and water to rat were provided ad libitum, formulated feeds were prepared in the laboratory itself. Animals were housed in colony rooms with 12 hrs light/dark cycle at 25 ± 2^0C.

Extraction of Plant:

Fresh and mature leaves of *Blumea lacera* was collected and correctly identified with the help of Herbarium of University Department of Botany, T. M Bhagalpur, Bhagalpur (India) having acession number 1078 dated 28th August, 2014. Ethanolic and aqueous extraction from *B. lacera* was prepared by soaking 3gm/100ml powdered plant material overnight into different solvents. Extract was filtered and evaporated by using soxhlet till 6 to 8 hrs. Extract was finally dissolve in distilled water and administered in different groups of rat.

Profenofos:

Profenofos (50% E.C, Specific gravity 1.34, Trade name; "Carina", PI Industries Ltd.) was purchased from the local market and stock solution (50mg/ml) was prepared.

EXPERIMENTAL PROTOCOLS:

Treatment Protocol:

Animals were placed in four groups and each containing 6 rats having body weight 55-60gms. experiment was setup as per following protocols.

Group – I : Normal control (NC); Food and water to rats were given ad libitum for 30 days.

Group – II : Profenofos control (PC); 100µl Profenofos orally administered. Animals were exposed to profenofos @ 50mg/kg b.w at alternate day till 30 days. Group – III : Profenofos exposed *B. lacera* (ethanolic extract) treated: After 30 days

of profenofos exposure, *B. lacera* (ethanolic extract) 500mg/kg b.w was orally administered daily till 70 days of experiment initiation. Group – IV : Profenofos exposed B. lacera (aqueous extract) treated: After 30 days of profenofos exposure, *B. lacera* (aqueous extract) 500mg/kg b.w was orally administered daily till 70 days of experiment initiation.

Blood Collection:

Blood collection from different groups of rats for biochemical analysis was measured through the retro orbital vein puncture by capillary tube. For each experiment maximum 500µl blood was collected in anti-coagulated blood collection tube or plane vile.

Biochemical Analysis:

After the entire treatment protocols were used for biochemical analysis of different groups of rats. Blood was collected by orbital sinus vein puncture (Van, et al., 1993). The kidney function test (KFT) i.e., creatinine, urea and uric acid were measured respectively by standard kit and observance was measured at wavelength 520 nm by the help of semi autoanalyzer.

RESULTS AND DISCUSSION:

Profenofos is a toxic organophosphate pesticide which kills the pests and simultaniously reduces the hemoglobin concentration in mice (Singh, *et al.*, 2013). It was also reported by Kumar, *et al.*, (2011) Glomerulous of kidney also damaged by profenofos. According to Warner *et al.*, (1996), B. lacera has diuretic and anti-oxidant property. Effect of *B. lacera* on profenofos exposed rat, different biochemical tests of different groups of experimental rat were measured. Kidney function test like creatinine, urea and uric acid was measured. It was analysed that normal control of creatinine urea and uric acid was within the normal range. Profenofos control group had increased concentration of these tests. Both ethanolic and aqueous extract of *B. lacera* decreased the concentration as compared with profenofos control but ethanolic extract is more effective than aqueous extract of *B. lacera* (Table 1).

Table: - 1 Showing different biochemical parameters of kidney functions tests in different groups of experimental mice (data represent in six replicate).

Different Groups	Creatinine (NR:0.6–1.2mg/dl)	Urea (NR: 14-40mg/dl)	Uric acid (NR:3.5-7.2mg/dl)
Normal Control	1.0±0.05	35.0±1.0	6.4±0.6
Profenofos	2.7±0.06	61.0±1.5	9.7±0.5
Ethanolic extract of B. lacera	1.4±0.05	36.5±1.0	6.6±0.5
Aqueous extract of B. lacera	1.5±0.04	38 ± .1.0	7.0 ± 0.5

ACKNOWLEDGEMENT:

Authors pay their thanks to HOD, P. G. Department of Biotechnology, T. M. Bhagalpur University, Bhagalpur for providing infrastructure for doing this study.

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