HAEMATO-BIOCHEMICAL EVALUATION OF ACUTE TOXICITY OF *Wedelia trilobata* IN RATS

C. S Shilpashree.[1], J.A Mammen.[2], J. G Ajith.[3], N. D Nair.[4], S Sujith.[5]
Department of Veterinary Pathology,
College of Veterinary and Animal Sciences,
Mannuthy, Kerala-680651

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Abstract

The study was aimed at assessing the toxic effect of aqueous extract of dried leaves of *Wedelia trilobata.* Adult female rats were used as experimental models for the present study. The aqueous extract was administered at a dose rate of 5000 mg/kg body weight by oral gavage. The single dose oral administration of the extract of the leaves revealed that the acute dose did not produce any signs of toxicity. No mortality was observed during a period of 24 hours and for further 14 days. Aqueous extract of dried leaves of *W. trilobata* showed no effect on the body weight, hematological values including hemoglobin, PCV, TLC, DLC and serum biochemistry including creatinine, BUN, ALT, AST, ALP, TP and LDH. The extract had no effect on hematological and biochemical parameters at a dose of 5000 mg/kg. In the light of these findings it is concluded that *W. trilobata* is safe and can be used as a traditional medicinal herb.

Key words: *Wedelia trilobata,* acute toxicity, hematological values, serum biochemistry

Wedelia trilobata, commonly known as "Manja kanjunni" is a member of the Asteraceae family. It is a soil creeper, which is very attractive as it forms a thick carpet on ground with prolific blooming. It has antioxidant, antidiabetic, antiprotozoal, analgesic antimicrobial, anti-inflammatory, and wound healing properties. (Balekar *et al.,* 2014). It has fibroblast stimulatory activity (Balekar *et al*., 2012). Determination of toxic effects of medicinal plants is a vital requirement (Bellini *et al*., 2008)

Materials and methods

Mature leaves of *W. trilobata* were collected from the surroundings of College of Veterinary and Animal Sciences, Mannuthy and identified by a Taxonomist, Department of Botany, Farook College, Kozhikode. The leaves were subjected to thorough cleaning and shade dried. The leaves were pulverized in a plant pulverizer and extracted using double distilled water in a soxhlet apparatus. The aqueous extract thus obtained was concentrated in rotary evaporator followed by lyophilization to get powder and stored under 4^0C for further use.

1. *MVSc Scholar, email id: shilpasreecs@gmail.com, Mob: 7025498894*
2. *Professor*
3. *Associate Professor*
4. *Professor and Head*
5. *Assistant Professor, Department of Pharmacology and Toxicology*

Adult female Sprague Dawley rats were procured from Small Animal Breeding Station, Mannuthy for acute oral toxicity studies. Rats were reared in identical feeding and management conditions for 7 days prior to the study. The study was conducted for 14 days.

The lyophilized aqueous extract of *W. trilobata* leaves was suspended in double distilled water just prior to administration. The extract was given as a single dose using an oral gavage needle at dose rate of 5000 mg/kg as per OECD guidelines 420. After the administration of the extract rats were observed at 30 minutes interval for next 4 hours followed by regular interval observation for next 24 hours. The rats were checked daily for next 14 days for mortality and signs of toxicity. The body weight was recorded on day 0, 7 and 14 of the experiment.

Blood was collected under mild anesthesia from retro orbital plexus from all the six rats on day 0 and day 14 for evaluating hematological parameter and biochemical evaluation of serum.

Whole blood for VPRC, Hb, TLC and DLC was collected into vials containing anticoagulant ethylene diamine tetra-acetic acid and were estimated using automatic blood analyser (Orphee, Switzerland model: Mythic 18 vet). While, samples for creatinine, Blood urea nitrogen(BUN), Alanine amino transferase (ALT), Aspartate amino transferase (AST), Alkaline phosphatase (ALP), Total protein (TP) and Lactate dehydrogenase (LDH) were collected in plain vials and estimated in semiautomatic blood analyser (Hospitex, Italy) using kits provided by Cormey®.

Data were analyzed statistically as per method of Snedector and Cochran, 1994 using paired t test with SPSS version 21.0.

Results and Discussion

The dose of 5000 mg/kg body weight of lyophilized aqueous extract of *W. trilobata* leaf did not produce any signs of toxicity except for decreased locomotor activity. There was no mortality of the rats during an observation period of 14 days. No alteration in body weight gain of the treated rats was recorded due to the effect of the treatment but difference in the weight gain was noticed in first and second week. The body weight gain has beenrepresented in table 3. Hematological parameters such as hemoglobin, VPRC, TLC and DLC. BUN, creatinine, ALT, AST, ALP, TP and LDH concentrations in serum of the rats both on day 0 and day 14 remained within the limits and did not show appreciable variation. The results obtained are represented in the table 1 and 2.

The use of medicinal plants and plant products for phyto-theraphy is very common in developing countries. These plants are usually postulated to be safe in spite of lack of scientific evidences with regard to their toxic effects. This inadequacy has led to acute toxicity study of *W. trilobata.*

Lyophilized aqueous extract of *W. trilobata* leaves fed at dose of 5000 mg/kg body weight showed no acute toxicity on adult Sprague Dawley rats as it did not change the body weight gain, hematological parameters and serum biochemistry parameters.

The effect of lyophilized aqueous

Table 1 : Effect of aqueous extract of *W. trilobata* leaves on hematological parameters (Mean ± SE, n=6)

Hematological parameters	Day	
	0	14
PCV (%)	33.150 ± 0.69	32.700 ± 1.00
Hb (g/dL)	10.883 ± 0.252	11.217 ± 0.373
TLC (10^3/mm^3)	17.617 ± 0.749	15.233 ± 1.489
Lymphocyte (%)	79.20 ± 2.53	75.277 ± 1.3413
Monocyte (%)	6.9 ± 0.65	7.70 ± 0.53
Granulocyte (%)	13.9 ±1.81	16.95 ± 1.90

Table 2: Effect of aqueous extract of *W. trilobata* leaves on serum biochemical parameters (Mean± SE, n=6)

Serum parameters	Day	
	0	14
Creatinine (g/dL)	1.417 ± 0.1537	1.395 ± 0.058
BUN (g/dL)	17.150 ± 0.314	17.183 ± 0.268
ALT (IU/ml)	46.366 ± 2.899	45.183 ± 3.190
AST (IU/ml)	135.00 ± 9.532	135.33 ± 10.819
ALP (IU/ml)	117.83 ± 8.650	117.83 ± 9.075
TP (g/dL)	7.766 ± 0.260	7.663 ± 0.1797
LDH (IU/ml)	735.00 ± 120.491	735.466 ± 129.88

Table 3: Effect of aqueous extract of *W. trilobata* leaves on body weight (Mean± SE, n=6)

Day	Body weight (g)
0	223.667^{a} ± 5.88
7	229.33^{b} ± 5.829
14	232.67^{c} ± 6.009

extract of *W. trilobata* leaves falls in line with the nontoxic effect of the acute (Suchantabud *et al.*, 2015) and chronic (Suchantabud *et al.*, 2017) toxicity studies of ethanolic extract of leaves of *Sphagneticola trilobata* and hydroalcoholic extract of aerial parts of *Wedelia paludosa* (Burger *et al.,* 2005).

From the results it could be concluded that the aqueous extract of *W. trilobata* leaves at a single dose of 5000 mg/kg body weight in female rats did not produce any significant toxicity. Hence *W. trilobata* can be considered safe to be used for medicinal purposes up to dose rate of 5000 mg/kg as a single dose.

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