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ACUTE TOXICITY OF CHLOROFORM EXTRACTS OF AMARANTHUS VIRIDIS L

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ABSTRACT

Objective: The current investigation was aimed to evaluate the safety of chloroform extracts of roots of *Amaranthus viridis* L by acute oral toxicity investigation in female rats and find out lower, middle and higher dose from safe dose. **Material and methods:** Rats were administered with of chloroform extracts of roots of *Amaranthus viridis* L in single dosages 2000 mg/kg of body weight. All the animals were individually observed for mortality, wellness parameters and body weight for 14 days. **Results:** The administrated dose did not produced mortality or change in general behaviour and body weight of animals, hence it exhibited the safety of chloroform extracts of roots of *Amaranthus viridis* L in single dosages 2000 mg/kg of body weight. **Conclusion:** Ergo, lower, middle and higher dose of chloroform extracts of roots of *Amaranthus viridis* L were found to be 100 mg/kg, 200 mg/kg and 400 mg/kg respectively.

KEYWORDS: Acute Oral Toxicity, Safe Dose, Amaranthus Viridis L.

1. INTRODUCTION

Traditionally, extracts of poisonous plants used for bloodshed or hunting.[1] Toxicity is quality of being poisonous that manifesting the state of side effects as result of the interaction between toxicants and cells. This interaction may differ rely on the chemical properties of the toxicants and the cell membrane, so it can occur on the cell surface, within the cell body, in the tissues beneath or the extracellular matrix.[2] Toxicology means the branch of science

concerned with the nature, effects, detection, prevention and treatment of poisons. Consequently, appraisal of toxic compounds is crucial due to contemplating for public health protection by reason of exposure to toxic compounds can be hazardous for human being. In laboratory, the investigation typically includes acute, sub-chronic, chronic, carcinogenic and reproductive effects.[2] The plant *Amaranthus viridis* L (*Amaranthaceous***)** is commonly known as "Never-fading flower" and "Slender amaranth" in Greek and English respectively.[3] These plants have been traditionally used as anti-inflammatory, antiemetic, antirheumatic and laxative.[4,5] The current research designs to evaluate the acute toxicity of chloroform extracts of roots of *Amaranthus viridis* L in female rats. The acute oral toxicity was done on animals under the Organization for Economic Cooperation and Development (OECD/OCDE 423) guidelines.

2. MATERIALS AND METHODS

2.1. Plant material and Preparation of extracts: The roots of *Amaranthus viridis* L were collected from Chennai, Tamil Nadu, India and authenticated by Amruta herbals company, Indore, Madhya Pradesh, India, a voucher specimen (AV-GRC-007) were preserved for future references. The roots materials (2kg) were dried powdered and extracted with chloroform using soxhlet methods (60-80^{o}C) for overnight. The filtrate was evaporated at 70 ^{o}C in a vacuum dryer and the percentage yield of extracts was chloroform: 3% w/w.

2.2. Animals: Healthy female adult Wistar rats weighing 200±20 g was obtained from the Central Animal Facilities of St. John's Pharmacy College, Bangalore. All the animals were maintained under standard husbandry conditions, i.e. room temperature of 25 ± 1°C; relative humidity 45-55% and a 12:12h light/ dark cycle. The animals had free access to standard rat pellet (Pranav Agro Industries Ltd, Bangalore, India), with water supplied *ad libitum* under strict hygienic conditions. The study protocol was approved by Institutional Animal Ethics Committee (IAEC), St. John's Pharmacy College, Bangalore and the experiments were conducted according to ethical principles and guidelines provided by Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA).

2.3. Acute toxicity test: Acute toxicity study was carried out *in vivo*. The Acute oral toxicity study was conducted according to OECD/OCDE 423 guidelines at a limit dose of 2000 mg/kg b.w/p.o. Animals were fasted prior to dosing overnight and the extracts were orally administered in a single dose using oral gavage. The volume given was not more than 1 ml/100 gm body weight body wt.). After the extract was administered, food was withheld for

3 to 4 hours. Control animals were administered with 1ml of distilled water. Animals were observed individually after dosing at least once during the first 30 minutes, periodically during the first 24 hours, with special attention given during the first 4 hours, and daily for a total of 14 days. Observations comprehended the changes in skin and fur, pupils, mucous membranes, breathing, torch response; Scrutiny was given for observation of tremors, convulsions, salivation, diarrhoea, hyperactivity, sleep, coma and mortality. Changes in parameters were compared with that of control animals. Body weight Individual weights of animals were recorded before the administration of drug on 1st day of the study and after 7th and 14th day of the experiment. Changes in the weight of individual animals were calculated and compared with that of the control animals. [6]

2.4. Statistical analysis

The results were expressed as mean ± SD .The statistical analysis was performed by t-test.

3. RESULTS AND DISCUSSION

WHO gives prominence to safe use of herbal medicines through conduction of toxicity evaluations in laboratory rodents.[6] Sufficient potential of herbal compounds can be determined from results obtained from acute toxicity investigation which can be helpful in developing pharmacological activity of products.[2] Although, *Amaranthus viridis* L root have been reported for effective pharmacological activity but still there is lacking of toxicity potential investigation of this plant. Consequently, Present investigation was conducted to assess the oral acute toxicity of chloroform extracts of roots of *Amaranthus viridis* L in rats according to OECD/OCDE guideline 423. Table 1 exhibits effect of chloroform extracts of roots of *Amaranthus viridis* L in rats after 14 days. There were no significant changes in body weight between both control and treated group. The increase in body weight of test animals manifests that the administration of chloroform extracts of roots of *Amaranthus viridis* L did not affect the growth of the animals.

Table. 1: effect of chloroform extracts of roots of *Amaranthus viridis* L in rats after 14 days.

Groups	Treatment	Body weight (gm)	
		Before treatment (Mean±SD)	After treatment (Mean±SD)
Control	1ml DW	159±2.76	174±1.87
Treated	2000 mg/kg p.o	189± 2.34	205±2.98

Table 2 indicates main observation for acute toxicity. No significant changes were found in case of skin fur, pupils, mucous membrane, breathing, torch response, salivation and sleep. Grooming, tremors, convulsion, diarrhoea, hyperactivity, coma and mortality did not occur in any of the animals.

Table. 2: main observation for acute toxicity.

Observation	30min	4hrs	24hrs	48hrs	7days	14days
Skin fur	N	N	N	N	N	N
Grooming	Ab	Ab	Ab	Ab	Ab	Ab
Pupils	N	N	N	N	N	N
Mucous membrane	N	N	N	N	N	N
Breathing	N	N	N	N	N	N
Torch response	N	N	N	N	N	N
Tremors	Ab	Ab	Ab	Ab	Ab	Ab
Convulsions	Ab	Ab	Ab	Ab	Ab	Ab
Salivation	N	N	N	N	N	N
Diarrhoea	Ab	Ab	Ab	Ab	Ab	Ab
Hyper activity	Ab	Ab	Ab	Ab	Ab	Ab
Sleep	N	N	N	N	N	N
Coma	Ab	Ab	Ab	Ab	Ab	Ab
Mortality	Ab	Ab	Ab	Ab	Ab	Ab

4. CONCLUSION

The results obtained from investigation recommend that the safety of chloroform extracts of roots of *Amaranthus viridis* L in single dosages 2000 mg/kg of body weight. In addition, lower, middle and higher dose of chloroform extracts of roots of *Amaranthus viridis* L were found to be 100 mg/kg, 200 mg/kg and 400 mg/kg respectively.

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