

Toxicological Studies of the Extract of *Epipremnum pinnatum*

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ABSTRACT

Medicinal plants are of great significance in the evolution of mankind, and the medical systems that are based on the plants and natural resources are gaining importance. Around 50% of the population in the world are using herbal medicine in the present day. This had been practised and used by many healers and others in the usage of the herbs in emphasizing their potency and lack side effects. The plant, *Epipremnum pinnatum* had been used as a decorative plant in the houses everywhere, and the plant has some potential properties like insecticidal, and anti-hyperlipidemic activities. In the present investigation, the acute, sub-acute and Chronic toxicity of the extract of the aerial parts of the plant were investigated, and the plant safety was suggested based on the results. In this current work, the acute and chronic toxicities of the extracts of the plant were investigated, and the results showed that there was no abnormal weight gain and signs of toxicity. The rats were healthy too. The blood parameters did not show any changes, too indicating that the extract showed no toxicity on the rats.



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INTRODUCTION

Medicinal plants are of great significance in the evolution of mankind, and the medical systems that are based on the plants and natural resources are gaining importance. Around 50% of the population in the world are using herbal medicine in the present day. This had been practised and used by many healers and others in the usage of the herbs in emphasizing their potency and lack side effects [1]. The synthetic drugs used to treat diseases are noted to give side effects, and these are the main reasons for limiting the use of synthetic

drugs. Unfortunately, there are no methods that eliminate the side effects of synthetic drugs, so there had been searches for alternative medicines in a current-generation [2].

Herbal material and drugs are considered safer and effective when compared to the available synthetic drugs in the markets. They are potent and safe [3]. Even though they are safe, the herbs have been limited due to the lack of standardization in terms of the chemical constituents, pharmacological activities and the toxicity remains a significant hurdle for the users worldwide [4].

The plant, *Epipremnum pinnatum* had been used as a decorative plant in the houses everywhere, and the plant has some potential properties like insecticidal, and anti-hyperlipidemic activities [5]. But they are noted to be toxic to the dog and cats. The toxicity of the plants was not analyzed for toxicity, and they are not established for the use as an effective plant. The plants were not established for the acute toxicity too even though they had many activities. This will become dangerous to use such plants without knowing the actual toxicity profile of the plant.

In the present investigation, the acute, sub-acute

and Chronic toxicity of the extract of the aerial parts of the plant were investigated, and the plant safety was suggested based on the results.

EXPERIMENT SECTION

Extraction of chemical constituents

The plant was identified with the help of a botanist, and the aerial parts of the plant were collected like leaves and tender stems. Aerial roots were eliminated for the extraction. The plant material was dried under sunlight for three days and after the dried parts were collected. These parts were passed through a mill for making of powder, and the powder was finely made. The powder was used for extraction.

150g of the powder was used for extraction with 500ml of distilled water, and the suspension was macerated for about one week, and after the time the macerate was collected and filtered through filter paper. The filtrate was evaporated to drying using a rotary evaporator. The resultant was at the yield of 21.2% to the weight of the crude drug powder. The extract was a greenish-brown colour, and the odour was characteristic of the plant.

Laboratory animal treatment

The laboratory animals that are procured to use for the investigation of the activities were the albino rats of the strain of Wistar. They all were weighed and were found to be between 125-145gm. They are all evenly distributed in 6groups. They are segregated as six animals which are divided randomly based on weights, and male and female rats were distributed evenly among all the groups. They are allowed to have pellet food and water with free access and are allowed to adapt to the lab.

Toxicological studies

Acute studies

OECD guidelines were used to study the acute toxicity of the rats in the rule of 423. Three rats were noted for their weights, and they were administered with the maximum dose of 2gram of the extract per kg body weight of the rats [6]. They were allowed to rest for three days during which the rats were not given any food for the first day and are allowed to have pure water in their cages. The rats were noted for their mortality rate. The rats were also noted for the clinical signs of toxicity, like scratching their back and ears. Redness in their eyes and ear flapping and tail scratching also are considered as the signs of abnormal behaviour.

Chronic study

In this step, the survived rats from the acute toxicity were also added into the study. The chronic tests for toxicity were investigated following the standard procedures [7]. The extracts were given to the rats as per the grouping which was done earlier.

Groups-a: this group was a normal group that received only distilled water and normal food which was standard pellet diet

Groups-b: normal saline solution of 2ml for a kg of the animal which is at the concentration of 1% solution. This solution was administered to the animals orally.

Groups-c: for this group of animals, the extract of the plant was given at a dose of 0.100g/kg orally.

Groups-d: for this group of animals, the extract of the plant was given at a dose of 0.200g/kg orally.

Groups-e: for this group of animals, the extract of the plant was given at a dose of 0.500g/kg orally.

Groups-f: for this group of animals, the extract of the plant was given at a dose of 1.00g/kg orally. These all groups of animals were allowed to have food and water in their cages freely and on the 45th day after receiving the extracts, the animals were let to fast, and the blood was withdrawn to check the blood profile as per standard procedures [8].

RESULTS

Epipremnum pinnatum is a household plant that has toxicity for dogs and cats; these pets show some allergic reactions to the plant. So acute and chronic toxicity of the extract was determined using the method which is standard described. The animal ethics committee guidelines were followed to deal with the experimental animals.

The maximum dose was administered the rats of 2g/kg of the body weight. After three days, the rats were examined carefully for any signs of acute toxicity and were found healthy and showed no signs at all. There is no abnormal weight gain, and in one rat, there was a slight variation which might be due to the excessive eating. Apart from that, the rats did not show any other signs. There was no mortality of the rats, and they were healthy and active.

In the chronic toxicity study, the plant extract was given to the rats in a prolonged period of about 45days, and the changes in the blood profile were tabulated in Tables 1 and 2.

The rats were given various doses according to the grouping done. All the rats were analyzed for the blood parameters, and it showed no change in the enzyme levels in the blood. The rats tolerated well

Table 1: Effect of the Plant Extract of Epiprenium on the Blood Parameters

Treatment	Urea mg/dL	Uric acid mg/dL	Creatine mg/dL	SGOT unit/L	SGPT unit/L
Distilled water	24.50±0.72	6.13± 0.64	0.96± 0.41	54.16±4.12	32.5±0.83
Saline-5ml/kg	25.04±0.83	7.05±0.93	3.17± 0.68	55.63±5.44	33.71±0.91
Extract-0.250g/kg	26.18±0.98	8.61±0.70	4.1±0.89	56.4±4.03	34.25±1.46
Extract-0.500g/kg	24.06±1.0	6.8±0.51	3.07±0.92	54.02±3.61	32.3±1.15
Extract-1.0g/kg	25.23±0.56	7.42±0.82	5.86±0.87	56.16±4.10	33.8±0.70
Extract-2.0g/kg	27.31±0.61	9.53±1.15	6.10±0.73	56.28±6.26	35.11±1.02

Table 2: Effect of the Plant Extract of Epiprenium on the Blood Parameters

Treatment	Bilirubin mg/dL	ALP unit/L	Protein g/dL	Glucose mg/dL	Cholesterol mg/100ml
Distilled water	3.81±0.09	10.13±0.41	8.01±0.59	87.02±4.26	64.9±5.24
Saline-5ml/kg	3.06±0.22	11.34±0.53	9.42±0.74	88.3±5.0	65.82±6.17
Extract-0.250g/kg	4.13±0.51	12.7±0.72	9.27±0.63	89.0±7.12	66.4±5.19
Extract-0.500g/kg	3.90±0.38	10.5±0.83	8.34±0.46	87.9±4.11	64.11±4.18
Extract-1.0g/kg	3.01±0.47	11.09±0.61	10.13±0.90	88.16±6.20	66.0±7.01
Extract-2.0g/kg	3.42±0.64	14.42±0.90	12.02±0.85	90.17±8.0	67.9±8.35

the maximum dose, and so the ED50 value was calculated as 200mg/kg.

CONCLUSION

In this current work, the acute and chronic toxicities of the extracts of the plant were investigated, and the results showed that there was no abnormal weight gain and signs of toxicity. The rats were healthy too. The blood parameters did not show any changes, too indicating that the extract showed no toxicity on the rats.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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