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# EVALUATION OF ACUTE TOXICITY EFFECT OF *SMILAX GLABRA* EXTRACT ON WHITE ALBINO RATS

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## ABSTRACT

*Smilax Glabra* is a Chinese Medicinal plant used for the treatment of the many diseases. The purpose of the study was to test the acute oral toxicity of the extract of the plant rhizome. Acute toxicity of aqueous extract of *Smilax glabra* was evaluated in albino Swiss female mice. The acute toxicity studies were carried out based on OECD guidelines and 423 and fixed dosage studies was adopted where the limit dose is 3gm/kg body weight of test animal. Were orally administered a single dose of 3gm, 5gm/kg body weight. Sign of toxicity and mortality were noted after 24 hrs.of administrations (5gm/kg body weight) did not produced mortality or changes in the general behavior of the test animals. These results indicates that the safety usage of extract from this plant in traditional medicine.

**Keywords:** Acute toxicity, administration, *Smilax glabra,* Albino Swiss mice

## 1. INTRODUCTION

In recent years, there is a growing interest in herbal therapy. More than 13,000 plants have been studied during last decade period [1] and approximately 10,000 of them have documented medicinal use. More than 90% of current therapeutic classes have been derived from a natural prototype and the discovery of such prototype has led to significant changes in the practice of medicine [2, 3]. Pharmacological studies have established their growing relevance in search of more dependable herbal drugs free of any side effects [4].Thus, toxicity testing in animals is carried out on new drugs to identify potential health hazards before the drugs are given to man. Toxicity studies involve wide range of tests in different species with regular monitoring for physiological and biochemical abnormalities observed in long term administration of the drugs [5].The main aim of our study was to evaluate the toxicity effect of the extract before it can be used for applications concern with public. Genus *Smilax* belong family Liliaceae includes about 300 species and widely distributed in tropical and temperate regions throughout the world, especially in the East Asia and North America and in China. Many of them have been used as traditional Chinese Medicine [6-9] out of which 24 of species are found in India Some of them are *smilax glabra, S. zeylanica,. S.aspera*(Linn) *S. perfoliata, S.weightii, S.ovalifolia, and S.lanceifolia* (Roxb) and many more [10].

*Smilax glabra* plant belongs to family *smilaceae* commonly known as *Chobchini* and habitat in Thickets in uplands, W. China Forests, thickets, thinly forested slopes along valleys, river banks at elevations of 300 - 1800 meters range from E. Asia - China to the Himalayas. The main chemical constituents in the rhizomes of *S.glabra* includes are - isoflavone, 7,6'-dihydroxy 3'-methoxy isoflavone, taxifolin, astilbin, smitilbin, engeletin, dihydroquercetin, eurryphin, resveratrol, and 5-*O*-caffeoylshikimic acid [11,12, 6] and recently all together 57 known compounds were isolated and indentified [13]. It have been demonstrated that the rhizomes of *S. glabra* can be used as a Traditional Chinese Medicine for numerous conditions, including acute bacterial dysentery, colds, cancer, nephritis, mercury poisoning, rheumatoid arthritis, colitis and skin disorders [8, 9, 14]. Hence, the aqueous extract *of smilax glabra* was analyzed for their acute toxicity profile with reference to behavioral aspect in Swiss albino mice.

## 2. MATERIALS AND METHODS

### 2.1. Animal maintenance

The animals used in this study were 20 adult female rats between the bodyweight 23-27 gms. The animal rooms were maintained on a cycle of twelve hours light and twelve hours darkness. The relative humidity of the rooms was maintained at 70±5 %. The animals were housed in polyurethane rat and mice cages. The cages were provided with rice husk bedding

for the animals and were cleaned daily. The animals were provided with drinking water and were fed on commercially available mice feed supplied by *Amrut Feed*.

### 2.2. Preparation of the aqueous crude extract of smilax glabra

Freshly harvested Rhizomes of smilax glabra plants were used for the preparation of the extract. The plants were authenticated by Dr.Shankaran from Sathaye College, Mumbai. The rhizomes were weighed and macerated using mortar and pestle. A specific quantity of water was added to ensure proper maceration and to also obtain an extract of 500mg/ml concentration. Thereafter, the solution was filtered through Whatman filter paper, and filtrate extract was then administered orally via gauze to the rats 2ml at predetermined dosages daily for 14 days . The control group received distilled water instead of extract. The study was carried out as per the details laid down in the OECD guidelines 423 viz., Fixed Dose Procedure (Evident Toxicity). The limit test dose of 3gms /kg and 5gms/kg body weight was used following OECD Guidelines [15].

## 3. RESULTS AND DISCUSSION

### 3.1. Body weight changes

Body weight is an important factor to monitor the health of an animal. Loss of body weight is frequently the first indicator of the onset of an adverse effect. A dose, which causes 10% or more reduction in the body weight, is considered to be a toxic dose. It is considered to be the dose, which produces minimum toxic effect, irrespective of whether or not it is accompanied by any other changes. All the animals from treated groups did not show any significant decrease in body weights for all the 14 days as compared with the 0 day values, indicating no signs of toxicity. The data is given in Table 1.

### 3.2. Food and Water Consumption

There was no significant change in food and water intake of the test animals at all dose levels. The data for food and water consumption is given in Table.3 and Table.4 respectively.

Similar study on *Carica papaya* aqueous extract toxicity was done on Wistar rats exhibited no effect after 90 days of treatment [16], rhizome of Smilax zeylannica Linn alcohola and aqueous extract also found to be non toxic upto 3000mg/kg while studying its antiepileptic activity [17]. Many such studies are to support the present investigations are available in literature since decades.

**Table 1. Daily Body Weight Record**

| Days | I | II |
|---|---|---|
| **Day 0** | 25.2 | 25.7 |
| **Day 1** | 24.6 | 26.1 |
| **Day 2** | 24.5 | 25.4 |
| **Day 3** | 25.1 | 24.9 |
| **Day 4** | 24.2 | 24.6 |
| **Day 5** | 25 | 25.3 |
| **Day 6** | 24.1 | 25.1 |
| **Day 7** | 24.3 | 24.1 |
| **Day 8** | 25.4 | 25.2 |
| **Day 9** | 25.8 | 24.7 |
| **Day 10** | 24.7 | 24.6 |
| **Day 11** | 24.6 | 24.3 |
| **Day 12** | 25 | 25.1 |
| **Day 13** | 25.1 | 25.2 |
| **Day 14** | 24.9 | 24.5 |

*Note: All values expressed as average weight of animals in each group. The number of animals in each group =five*

Physical appearance such as eye colour, mucus membrane, salvitation, discharge, fur colour, lethargy, restlessness did not shows any change when compared to the control at the end of 14 days of general observation.

### 3.3. Mortality

Mortality is the main criteria in assessing the acute toxicity ($LD_{50}$) of any drug. There was no mortality recorded even at the highest dose level i.e. 5.0 gm/kg body weight.

**Table 2. Food Intake**

| Days | I | II |
|---|---|---|
| **Day1** | 24 | 28 |
| **Day 2** | 28 | 24 |
| **Day 3** | 30 | 20 |
| **Day 4** | 21 | 23 |
| **Day 5** | 27 | 20 |
| **Day 6** | 20 | 18 |
| **Day 7** | 22 | 21 |
| **Day 8** | 20 | 19 |
| **Day 9** | 19 | 17 |
| **Day 10** | 18 | 19 |
| **Day 11** | 21 | 19 |
| **Day 12** | 24 | 21 |
| **Day 13** | 22 | 24 |
| **Day 14** | 26 | 25 |

*Note: All values expressed as weight of food consumed by each group, from a known weight of food provided. The number of animals in each group = five*

**Table.3. Water Intake**

| Group | I | II |
|---|---|---|
| **Day1** | 18 | 24 |
| **Day2** | 16 | 22 |
| **Day3** | 20 | 19 |
| **Day4** | 17 | 17 |
| **Day5** | 21 | 21 |
| **Day6** | 16 | 20 |
| **Day7** | 19 | 17 |
| **Day8** | 22 | 22 |
| **Day9** | 21 | 20 |
| **Day10** | 19 | 19 |
| **Day11** | 20 | 17 |
| **Day12** | 21 | 21 |
| **Day13** | 18 | 23 |
| **Day14** | 21 | 22 |

*Note: All values expressed as cm³ of water consumed by each group from a known amount of water provided. The number of animals in each group = five*

## 4. CONCLUSION

From the results of this study, it is observed that there is no change in body weight, food and water consumption by the animals from all dose groups (3.0 g/kg body weight and 5.0 g/kg body weight). There was no mortality recorded even at the highest dose level i.e. 5.0 g/kg body weight, which proves that *Smilax glabra* rhizome has no significant toxic effect in mice.

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