INTERNATIONAL JOURNAL OF FRONTIERS IN SCIENCE AND TECHNOLOGY

www.ijfstonline.org

Research Article

ISSN 2321 – 0494

Indexed in CAS, OPEN J-gate and GOOGLE SCHOLAR

Received on: 20.7.2014., Revised and Accepted on:25.8.14

EVALUATION OF ACUTE TOXICITY STUDY OF ROOT OF *ABUTILON INDICUM* [L] SWEET

Kousalya .M*, Kokila.N and Balamurugan.N

Department of Pharmacology, College of Pharmacy,

Madras Medical College, Chennai-03, India.

ABSTRACT

The present study investigated the acute toxicity of petroleum ether extract of the root of *Abutilon indicum* [L] Sweet in female wistar albino rats. The petroleum ether extract of the root of *Abutilon Indicum* (L) sweet was administered orally at dose of 2000mg/kg body weight and the animals were observed continuously for the first 4 hours for any behavioral changes and they were then kept under observation up to 14 days after drug administration to find out the mortality. From the results it is concluded that at doses of 2000mg/kg body weight is nontoxic since no marked changes in behavioral, food and water intake were observed. The root of *Abutilon indicum* (L) sweet was found to be safe. No lethality or adverse toxic signs were seen during the experimental period and during 14 days observation period. No delayed toxic signs were noted in all experimental groups. These findings suggest that the root of *Abutilon indicum (*L) sweet could be relatively safe when administered orally in female wistar albino rats

Keywords: *Abutilon indicum*, Acute toxicity, Mortality, Female wistar albino rats

Corresponding author. Kousalya , e mail.id:kokilammc89@gmail.com

INTRODUCTION

Ayurveda is practiced in India since time immemorial as it is being cheap and easily available, Ayurveda drugs are considered as safe. *Abutilon indicum* is a small shrub, native to tropic and subtropical regions and sometimes cultivated as an ornamental [1]. This plant is often used as a medicinal plant and is considered invasive on certain tropical islands [2]. In traditional medicine, *Abutilon indicum* is used as a demulcent, aphrodisiac, laxative, diuretic, pulmonary and sedative (leaves). The bark is astringent and diuretic; laxative, expectorant and demulcent (seeds); laxative and tonic, anti-inflammatory and anthelmintic (plant); analgesic (fixed oil); diuretic and for leprosy (roots) [3]. In ancient days, maidens were made to consume a spoonful of this powder with a spoonful of honey, once in a day for 6 months until the day of marriage for safe and quick pregnancy. The leaves can also be used to treat ulcers, headaches, gonorrhea and bladder infection [3]. The plant is very much used in Siddha medicines. In fact the root, bark, flowers, leaves and seeds are all used for medicinal purposes by Tamils. The leaves are used as adjunct to medicines used for pile complaints. The flowers are used to increase semen in men [4]. A methanol extract of *Abutilon indicum* had some antimicrobial properties [5]. A chemical compound β-sitosterol, identified as the active ingredient in many medicinal plants is present in *Abutilon indicum* and a petroleum ether extract provided larvicidal properties against the mosquito larvae *Culex Quinquefasciatus* [6]. Toxicity is the fundamental science of poisons. The organization for Economic co-operation and Development (OECD) mentioned acute toxicity as the advance effect occurring within a short time of oral administration of a simple dose of a substance or a multiple doses given within 24 hours. Phytochemical interactions of poisons lead to injury or death of living tissues. Toxicology study includes observational data gathering and data utilization to predict outcome of exposure in human and animals.

The ancient humans categorized some plants as harmful and some as safe [7- 9]. All organisms are exposed constantly and unavoidably to foreign chemicals or xenobiotics which include both manmade chemicals such as drugs industrial chemicals pesticides, pollutants, pyrolysis products in cooked foods, alkaloids secondary plant metabolites and toxins produced by moulds, plants and animals. Poisons are any agent capable of producing a deleterious response in a biological system, seriously injuring function or producing death. Toxicologists usually divide that exposure of animals into four categories which are acute, sub acute, sub

chronic and chronic. The aim of the present work is to study the toxic effect of petroleum ether extract of root of *Abutilon indicum [L]*sweet.

MATERIALS AND METHODS:

Plant collection and authentication:

The plant was collected from the forest around Tuticorin in the month of August and authentified by Prof. Dr. P. Jayaraman Ph. D., The Director, Plant Anatomy Research centre, Pharmacognosy Institute, West Tambaram and Chennai. The root was cut off and cleared from impurities and stored at room temperature for further use.

Preparation for the extract:

The root was cut into pieces and shade dried at room temperature. The root was subjected to size reduction to a coarse powder and passed through sieve. 50g of this powder and packed into soxhlet apparatus and extracted with solvents of increasing polarity such as petroleum ether, ethyl acetate, ethanol and water. The extract obtained was stored in air tight container and keep it in refrigeration for further studies.

Acute toxicity studies:

The present study was conducted after obtaining the approval of our experimental protocol by Institutional Animal Ethical Committee and CPCSEA proposal / IEAC No: I/07/CLBMCP/2013.The acute toxicity studies were done as per OECD 423 guidelines for testing of chemicals, acute oral toxicity.

Selection of dose levels and administration of doses:

Abutilon indicum (L) sweet, being a traditional herbal medicine, the mortality is unlikely at the highest dose level (2000mg / kg body weight).

Experimental animals:

Healthy female wistar albino rats (3nos): weighing 250-300g were randomly selected and used in this research. Animals were fasted prior to drug treatment. Food was withheld for 3-4

hrs in rats. Animals were weighed and a limit test at one dose level of 2000mg/kg body weight of petroleum ether extract of the plant *Abutilon Indicum* (L) sweet was administered orally for 3 female rats. After that food was withheld for 3-4 hrs.

Observation:

The animals were observed individually after the drug treatment for first 30 minutes with special attention. Then they were periodically watched for 4 hrs, 24 hrs thereafter for 14 days. Animals were provided with food and water ad libitum

Parameters observed:

1. Body weight
2. Cage side observations such as faeces colour, consistency, changes in skin and fur, eyes and Mucous membrane (nasal) of the animal was observed once in a week.

Central Nervous System:

The parameters observed were Ptosis, drowsiness, gait, eye prominence, eyelid closure, convulsions, biting, straub's test, motor inco-ordination, writhing, stereotypy, aggression, righting reflex, pinna reflex, corneal reflex, touch response, pain response, abdominal tone, spontaneous activity, twitching, limb tone, restlessness, tremors, convulsions and coma.

Autonomic nervous system:

The parameters observed were Diarrhoea, salivation, piloerection, urinary incontinence and defecation.

RESULT AND DISCUSSION:

Table 1: Acute toxicity studies

Observations	**Results**
Toxic signs	Absent
Pre-terminal deaths	Absent
Body weight	No change
Cage side observation	Normal
Motor activity	Normal
Convulsions	Absent
Piloerection	Absent
Righting reflex	Present
Lacrimation	Normal
Salivation	Normal
Respiration	Normal
Skin colour	Normal
Muscle spasm	Absent

Table 1 shows the results of acute toxicity studies.

Acute toxicity studies upon oral ingestion of test drug were carried out in 3 female wistar rats. Detailed observations on integumental, somatosensory, CNS, respiratory, ocular, cardiovascular, gastrointestinal, behavior and physical parameters were recorded. The extract of *Abutilon indicum* (L) sweet was well tolerated by all the animals and there was no mortality.

CONCLUSION

In this study acute toxicity was determined as per guidelines. It was also observed that there was no mortality in any of the dose up to 2000mg/kg body weight. The administration of petroleum ether extract of root of *Abutilon indicum [L] sweet* did not show any significant changes in the body weight indicating that it did not have any adverse effects on body weight. All groups were almost continuously observed for mortality and behavioral changes during first 24 hr and then daily for a fortnight. There was no abnormality observed in any one of the rats.

REFERENCES

1. Matlwaska, Acia Poloniac Pharmaceutic - Drug Research, 2002, 59: 227-229.
2. *Abutilon indicum*, Pacific Island Ecosystems at Risk, Retrieved 2008, 06:18.
3. Nishanta Rajakaruna, Cory S. Harris and G.H.N. Towers, Pharmaceutical Biology, 2002, 40: 235–244.
4. Dr. J.Raamachandran,"HERBS OF SIDDHA MEDICINES-The First 3D Book on Herbs, p4
5. Jigna Parekh, Nehal Karathia, Sumitra Chanda., Indian Journal of Pharmaceutical Sciences, 2006, 68 (6): 832.
6. Abdul Rahuman, Geetha Gopalakrishnan, P. Venkatesan and Kannappan Geetha, Parasitology Research, 2008,102.
7. Indian Herbal Pharmacopoeia, pub: Regional Research Laboratory, Jammu Tawi & Indian Drug Manufacturer's Association Mumbai, 1999, 2: 85 – 92.
8. Pingale SS, Pharmacologyonline, 2008, 3:80-84
9. Pingale SS, Markandeya A G and Gawali S, IRJP 2011, 2 (1): 263-266