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ACUTE TOXICITY STUDIES OF EDIBLE OIL EXTRACTED FROM INDIGENOUS SEEDS

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ABSTRACT

Now a days ayurvedic dosage forms are preferred over allopathic. So for the safer use these plants and its preparations need to be evaluated for their toxicity. The main aim of this study was to test the acute toxicity of natural oils extracted from indigenously edible such as *Buchanania lanzan spreng*. belonging to family Anacardiaceae, commonly known as Chironji in Hindi, *Buchanania lanzan* spreng is a tree of 12-15 mt high, with straight trunk, and *Simmondsia chinesis*., belonging to family from Simmondsiacea commonly known as Jojoba in Hindi is a large, evergreen, forest tree more than 30 mt in height a tree. These two plants are easily available and their various parts are used in treatment of various diseases traditionally. The acute toxicity study was studied on Swiss mice with a dose of 2 g/Kg body weight orally. The single administration exposure of the seed oil on Swiss mice was carried out and the exposure route was oral with water as a vehicle. The observations of changes in body weight, food and water intake as well as cage side observations were reported. The plants were found to be nontoxic as no mortality was recorded even at the highest dose level.

KEYWORDS: Ayurvedic, Toxicity, Natural oil.

INTRODUCTION

Buchananialanzanspreng belonging to family Anacardiaceae commonly used as edible oil in food. Chemically, The kernels contains moisture , 3.0; protein 19.0; fat,59.0; fibers, 3.8; carbohydrates 12.1; and minerels 3.0g/100gm; calcium, 279.0; phosphours, 528.0 (phytin phosphorus, 158.0); iron, 8.5; oxalic acid, 2.0; magnisum, 373.0; sodium, 10.2; potasium, 436.0; copper, 0.86; sulphur, 186.0; chorine, 25.0; thiamine, 0.69; riboflavin, 0.53; niacin, 1.5; and vitamins C, 5.0mg/100.[1] The roots are acrid, astringent, cooling, depurative and constipating, and are useful in treatment of diarrhoea. Leaves are used in the treatment of skin diseases. Fruits are used in treating cough and asthma. The fruit is sour, sweet, fattening, laxative, binding cooling, aphrodisiac; cures biliousness, fevers, thirst, ulcers, blood diseases. The seed is sweet; aphrodisiac, cardiotoni, astingent to the bowels; cures biliousnesssensation of the body. The juice of the leaves is digestive, expectorant, aphrodisiac, purgative; purifies the blood; allayss thirst; lessens biliousness. The oil extracted from the kernels of the fruit is used as a substitute for almond oil in native medicinal preparation and confectionery. It is also applied to glandular swellings to the neck.[2]

Simmondsiachinesis belonging to family Simmondsiaceait is a complex mixture of naturally occurring long-chained linear esters with many functional cosmetic properties that are far superior to triglycerides. Over 97% of jojoba is composed of an array of liquid wax esters, with a combination of mixed tocopherols, free sterols and other unsaponifiable material making up the balance.[3]

In addition to the obvious chemical difference, jojoba differs from triglyceride seed oils in important functional features. Nearly all triglyceride fats and oils are easily hydrolyzed and oxidized for internal food metabolism. Jojoba, like other wax esters in nature, resists hydrolysis and oxidation for more effective, non-occlusive, moisture control and for photoprotection on the external surfaces of skin, hair, eyes and plant leaves.[4]

MATERIALS AND METHODS

Plant collection and authentication

The fruits were collected from local market of Maharashtra and Jaipur. The plant material was identified and authenticated from Dr. Wankhede, HOD, DravyagunaDept, SMBT Ayurved Hospital, Maharshtra, Nashik, India.

Extraction

Oil was extracted by cold press method. Seeds were took to the Lakadi Ghana and was pressed and extracted.

Animal Maintenance

15 male and Female Swiss albino mice of body weight from 25-30 g were procured. The animals were housed in polypropylene cages in air conditioned room with controlled temperature and alternating 12 hour periods of light and dark were maintained. The animals were acclimatized to standard laboratory conditions prior to experimentation. Guidelines of Organization for Economic Cooperation and Development (OECD) 2001-gudeline on acute oral toxicity (AOT) Environmental health and safety monograph series on testing and adjustment No.423 were strictly followed.

Composition of diet

The animals were fed on the standard pellet diet and water was given *ad libitum.* The standard pellet diet comprised 20% proteins, 5% lipids, 4% Crude, fiber, 8% ash, 1%, calcium, 0.6% phosphorous, 3.4% glucose and 2% vitamins and 55% nitrogen free extract (carbohydrates).

Acute Pharmacological Study

Acute toxicity of oil was determined according to the OECD (TG 423) test guide line for testing of chemical. Albino mice (either sex) fasted over night, but allowed access to water *ad libitum*. Animals were randomly divided in to three groups. The control received water. Group I-III were orally treated with test material (OBL and OSC) at dose of 5g/kg.

RESULT AND DISCUSSION

Clinical observation

Assessment of the behavior of animals was carried out by general observations of each animal on alternative basis from the stage of dosing to the end of the study. Any changes or abnormalities recorded could be an indication of toxicity. The test animals at all dose levels showed no significant changes in behavior before and after the administration of oral dose of oil. The clinical observation for two oil under investigation detailed in Table 1.

Table 1: Evaluation of LD_{50} of oil obtained from seeds of *Buchananialanzan* and *Simmondsiachinesis* (*linn*.)Dose 2000mg/kg BW, Species: Albino mice: Male and Female Date 23/03/2018, duration:15 days, TRE- Tremor, CON- Convulsion, SALI-Salivation, Diah- Diarrhea, LET-Lethargy) (×= Negative, √= Positive),OBL= Oil of *Buchananialanzan* and OSC=oil of *Simmondsiachinesis*

Sr.no.	Oil	Toxicity study		Time of death	Skin	Resp.	Eyes	CNS	Observation					
		Onset	Stop						Tre	Sali	Diarh	Let	Com	Sleep
1	OBL	×	×	×	×	×	×	×	×	×	×	×	×	×
2	OSC	×	×	×	×	×	×	×	×	×	×	×	×	×

Body Weight Changes

Body weight is an important factor to monitor the ofhealth of the animal. The loss of body is frequently the first indicator of the onset of an adverse effect. A dose, which causes 10 % or more reduction in 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 weight for all the 14 days as compared with the 0 day it thus indicating no signs of toxicity.

Food and water consumption

There was not significant change in water and food consumption.

Mortality

Mortality is the main criterion in assessing the acute toxicity (LD_{50}) of a drug. There was no mortality found or recorded even at highest dose level of all groups.

CONCLUSION

From the results of this study it is observed that there is no significant change in body weight, food and water consumption by the Albino Swiss mice from all the dose groups. There was no mortality recorded even a highest dose level i.e. 2 g/kg body weight, which proves that oil extracted from *Buchananialanzan* and *Simmondsiachinesis* (*linn*.) have no toxic effect in Albino Swiss mice. The results have indicated that these plants are safe and can be used for efficacy studies.

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