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PHTOCHEMICAL & PHARMACOLOGICAL HEPATOPROTECTIVE SCREENING OF LUFFA ACUTANGULA

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ABSTRACT

The Present investigation entitled "Phytochemical & Pharmacological Hepatoprotective screening of Luffa acutangula" on Experimental Animals has been carried out and presented in the thesis.

The aim of present study to evaluated heptoprotective activity of Luffa acutangula. Hepatotoxicity in rats was induced by carban tetrachloride (1ml/kg). Alcoholic extract of Luffa acutangula showed good hepatoprotective activity.

The present investigation is concerned with the widely distributed indigenous plants Luffa acutangula from the survey of literature of this plant, it is observed that this plant is well known, in order to do a systematic study. We have gone in for a treatment of a set of ailments by diverse plants species from different family. Luffa acutangula belongs to the family of Cucurbitaceae was reported to possess Hepatoprotective and. Mature fruits are used as natural cleaning sponges. Its fruit slightly resembles a cucumber or zucchini with ridges. It ranges from central and eastern Asia to southeastern Asia.

Luffa acutangula was observed to be good source of fiber (20.6 %) and minerals (7.7 %). The estimated world market for plant and plant derived drugs which would cross more than 2000 billion during 2015 it was understood that a major percentage of world population relies mainly on plants and plant extracts for health care.

KEYWORDS: Luffa acutangula, Hepatoprotective, Antioxidant activity.

INTRODUCTION

The liver is the largest organ in the body. Individuals may not realize that the liver is moreover the largest organ in the body. The liver is really two distinct sorts of organ. It is a secretary organ since it has a specific structure that is intended to enable it to make and emit bile into the bile channels. It additionally is endocrine organ since it makes and secretes synthetic concoctions specifically into the blood that have consequences for different organs in the body. Bile is a liquid that the two guides in assimilation and ingestion of fats and also conveys squander items into the digestive system.

The liver weighs around three and a half pounds (1.6 kilograms). It gauges by and large, around 8 inches (20 cm) on a level plane (over), and 6.5 inches (17 cm) vertically (down), and is 4.5 inches (12 cm) thick.

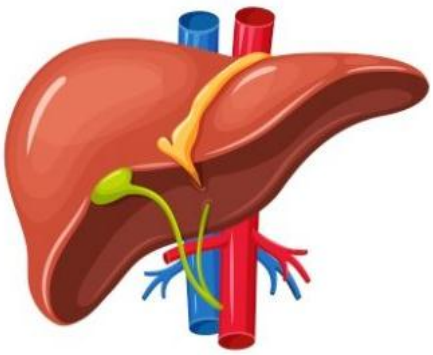

Figure 1 – Liver.

The liver and its partner biliary tree and gallbladder are viewed as together due to their anatomic nearness and interrelated capacities and the covering highlights of a few infections that influence these organs. It has by a long shot the more noteworthy part in typical physiology and is the site of a wide assortment of maladies.

Regular items from plant, creature and minerals were used for the cure of human ailment. In creating nations 80 % of individual still transfers for conventional pharmaceutical construct to a large extent in beam of types of plants and creatures for their human services. Normal items are as of now sought after and their fame is expanding step by step (Verma and Singh, 2008). Normal items plan has achieved far reaching agree ableness as clinical restorative specialists for diabetics, arthritics, liver infections, hack cures, memory enhancers and adoptogens. WHO definition, there are three sorts of home grown meds: crude plant material, prepared plant material and therapeutic home grown items. (Choudhary and Sekhon, 2011).

It is evaluated that 7,600 florae are utilize as an ingredient of human wellbeing conventions in, for the largely part, country and ancestral towns of India socity. Out of these, the genuine therapeutic estimation of more than 4,100 plants is either minimal known or until now obscure to the standard populace. The established frameworks of prescription, for example, Siddha, Amchi, Unani Ayurveda and Tibetan use around 1,100 plants (Kumar et.al., 2011). The consumption of Natural substance getting to be prominent because of low poisonous quality and reactions of allopathic pharmaceuticals. The practices proceed with today due to its natural advantages and also situate in common conviction in numerous parts of world and have made an extraordinary commitment towards keeping up human wellbeing (Vermaand Singh, 2008).

Worldwide evaluations show that 80% of around 4 billion populaces cannot manage the cost of the result of the now days' medicine and need to depend upon the uses of conventional medications. This reality is all around reported in the stock of Natural substance therapeutic plants, posting more than 21,000 species. Notwithstanding the staggering impacts and our reliance on present day medication and enormous advances in engineered drugs, a vast part of the total population still likes medicine of flora. As a piece of the procedure to less the funds related weight on creating nations, clearly an expanded utilization of plant medications will be followed later on (Kumar et.al., 1997).

HEPATOTOXICITY

Hepatotoxicity is characterized as not proper working of the liver that is related with debilitated liver capacity caused by presentation to a medication or another non-infectious operator (Navarro and Senior, 2006). The synthetic concoctions that reason liver damage are known as hepatotoxins or hepatotoxicants.

REASONS FOR HEPATOTOXICITY

Hepatotoxicity is the result of

- Exposure of poisonous substances
- Harmful operators
- Toxic substances
- Biological perils, and so onward whenever of the patient's life (Singh et.al, 2011)

SYMPTOMS OF HEPATOTOXICITY

- Nausea and regurgitating
- Pain in the stomach area
- Diarrhea
- Fatigue or tiredness
- Weakness
- Jaundice or yellow staining of the skin
- Liver extension
- Increase of weight
- Bleeding time takes additional time
- Water maintenance (Tostmann et.al, 2007)

PLANT PROFILE

Luffa acutangula (Family: Cucurbitaceae) is usually known as Ridge gourd. It is a widely growing vegetative climber. The fruits are baseball club shaped. It is pharmacologically action are hepatoprotective activity, antidiabetic activity, antioxidant activity, fungistatic property, CNS depressant activity etc. It may be found carbohydrates, carotene, fat, protein, phytin, amino acids, alanine, arginine, cystine, glutamicacid, glycine, hydroxyproline, leucine, lectin, serine, tryptophan, pipecolic acid 6-8 chemical constitute. It is manger hepatoprotective agents Many effective activities of L.acutangula experimentally were reported.

PLANT DESCRIPTION (Pingale et al,2018)

Distribution: Luffa acutangula cultivated throughout India as it is pan tropic.
Habit: Herb.
Propagation: Propagation of L.acutangulaisbyseeds.
Native range: India and Naturalized throughout the moister Tropics

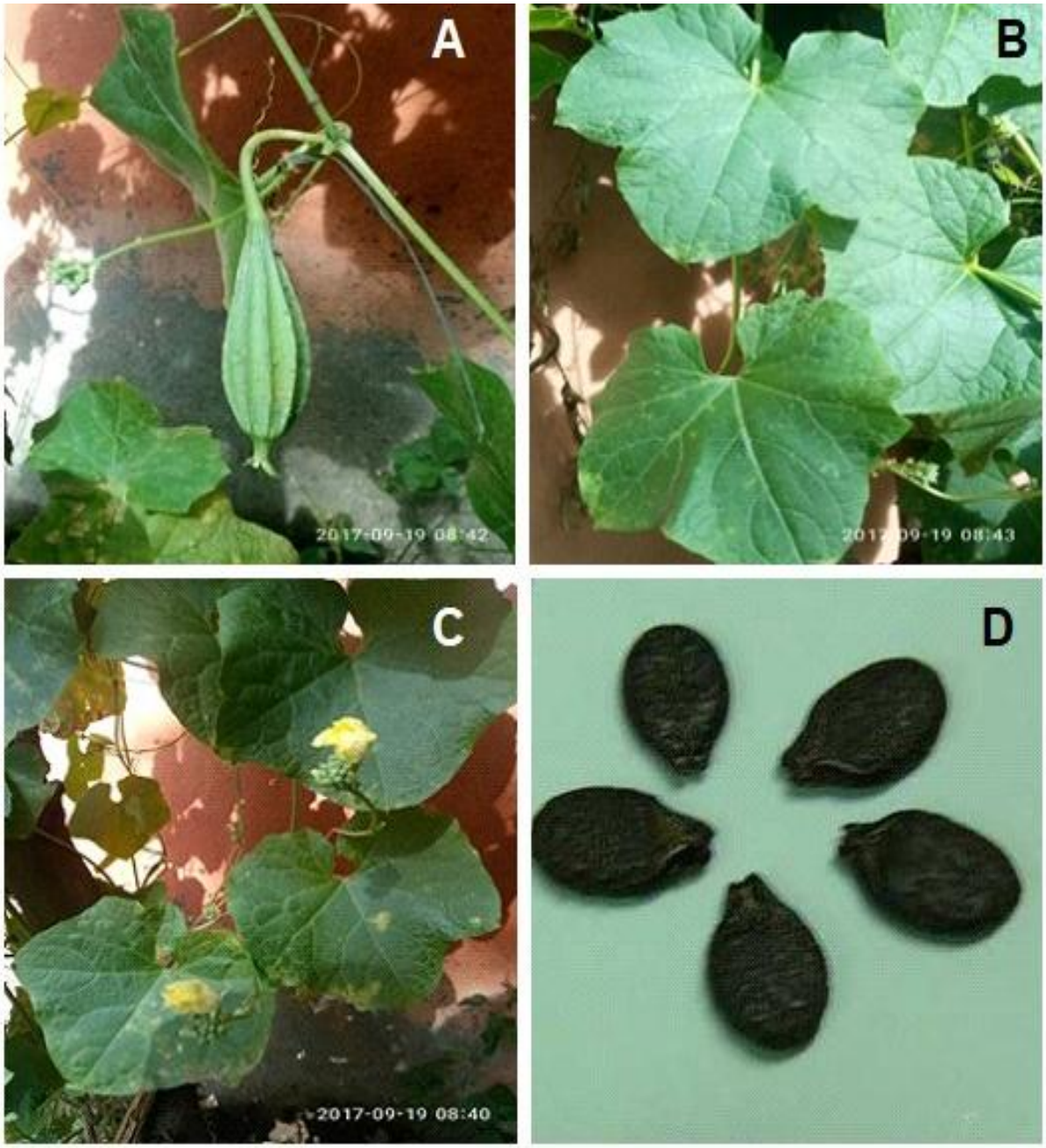

Figure 2: ***Fruite of Luffa acutangular, Leaves of Luffa acutangular, Flower of Luffa acutangular, Seeds of Luffa acutangular.***

PHYTOCHEMICAL CONSTITUENTS: (Jyothi.V et.al. 2010)
Phytochemical screening done by standard methods.

MATERIALS AND METHOD
COLLECTION OF PLANT MATERIAL
Leaves of Luffa actutangula plant were cultivated from Rajpura, Meerut, Uttar Pradesh.

DRYING OF PLANT MATERIAL
Leaves of the plant was dry beneath shade for 30 days at a temperature of $25^{\circ} \pm 2^{\circ}$ C. After drying Leaves were manually grinded to fine powder and pass out sieve no. 40.

EXTRACTION OF PLANT MATERIAL
Aqueous extraction was done by Maceration. Leave powder (100gm) was taken in a clean separating funnel and soaked in 400ml of distilled water. The funnel with its container was enclosed with a suitable in closer and hold on a period of 36hrs accompanied by shaking. The remove was filter. The resulting filtrate was concentrated by evaporating at a temperature of 60^{o}C.

PHARMACOLOGICAL STUDIES
APPROVAL OF PROTOCOL
A male wistar rats of weight 150-250gm were obtained. Before the experiments the rats were trained for 10 days with the maintained the room temperature (25±2 ^{0}C). The experimental rats trained in water libitum, pellet and

standard dry. The investigational procedure was accepted by the Institutional Animal ethical committee of Translam Institute of Pharmaceutical Education and Research, Meerut and was executed according to the guidelines of the (CPCSEA), India.

STATISTICAL ANALYSIS

The data obtained from animal experiments are articulated as mean ± SEM. For arithmetical study data were subjected ANOVA test.

ACUTE TOXICITY STUDY

The acute toxicity was performing as per OECD guidelines. The acute toxicity study was performed for deciding safe doses for further pharmacological studies, along with this study any behavioral or physiological changes due to extract administration was also observed. The selected experimental rats were used for toxicity studies. The albino rats were divided into three groups of three animals in each group. Experiment before animals are fasting overnight. Given the extract graded dose orally according to the body weight. instantly, after dosing, the animals were observed constantly for first four hours for behavioral change and for humanity at the end of 24 hr and daily up to 14 days for any behavioral change or mortality. No mortality was reported even after 14 days. The extract is not harmful upto 2000 mg/kg body weight. The 200 and 400 mg/ kg b. w of the test extracts were used for further pharmacological activities (i.e. 1/5th and 1/10th of the maximum safe dose).

EVALUVATION OF HEPATPOTOXICITY ACTIVITY

PCM induced hepatotoxicity

In this study rat's weight between 150-250 gm were divided into four groups with six rats in each. Group I (Control) given the dose only distilled water, 1 ml/kg, p.o. for 9 days. Group II (Standard) received Silymarin, 100 mg/kg/day, p.o for 9 days and PCM 1gm/kg, p.o. on the 9th day (in 3 divided doses). In the group III and IV were given the aqueous extract of *Luffa actangula* at doses of 200 and 400 mg/kg/day, p.o for 9 days and PCM 1gm/kg, p.o. on 9thday (in 3 divided doses).

RESULTS AND DISCUSSION

PHYTOCHEMICAL SCREENING

The beginning phytochemical screening of various constituents in extracts of *L. acutangula* leaves. The results of phytochemical screening are given in the table below.

Table 1: Yield of *L. acutangula* leaf extract.

***Luffa acutangula* leaf extract**	**Yield of Extract (gm)**	**% Yield**
Aqueous Extract of *Luffa acutangula* leave	4.2	4%

Table 2: Preliminary qualitative tests of *Luffa acutangula* leaf extract.

Constituents	**Results**
Alkaloids	+
Tannins	+
Flavonoids	+
Glycosides	+
Phenols	-
Carbohydrate	-
Saponins	+
Sterols	-

Note: Sign indicates, (+) presence;(-) absence-

The result of phytochemical screening found that the presence of glycosides, tannins & flavonoid contents. At that time the extracts were abundant in presence of steroids but the fatty material and volatile oil constituents were not found present. The carbohydrates and amino acids were present in Aq. Extract.

ACUTE TOXICITY STUDY

The extracts of *L. acutangula* did not caused any mortality upto 2000mg/kg and were considered as safe. 1/5th and 1/10th dose of extracts has been fixed for pharmacological activity.

HEPATOTOXICITY STUDY

Table 3: Hepatoprotective effects of extract of *L. acutangula* in hepatotoxicity study.

Group	**Treatment**	**ALT**	**AST**	**ALP**	**Bilirubin**
I	Control	77.44±1.40	189.56±3.98	346.95±3.96	0.37±0.05
II	Standard (Silymarin) 100mg/kg/day	778.33±1.08	197.72±1.99	395.11±2.98	0.48±0.08
III	Aqueous extract 200mg/kg/day	92.14±2.48	467.13±3.49	518.10±6.39	1.62±0.06
IV	Aqueous extract 400mg/kg/day	97.40±2.00	400.42±2.01	489.13±1.24	1.14±0.08

All values expressed as mean ± SEM; n=5; GP II was compared with group I and GP III- IV were compared with GP II *P<0.05, **P<0.01, one way ANOVA test.

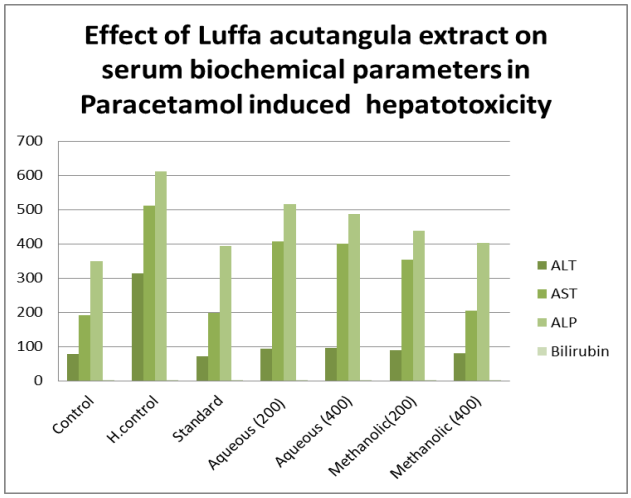

Figure 3: Effect of aqueous extract of *L.acutangula* on serum biochemical parameters in paracetamol induced acute hepatotoxicity study.

PCM caused significant liver damage as evidenced by altered serum biochemical parameters. PCM significantly level of AST, ALT, ALP and Bilirubin levels in the blood circulation. Pre-treatment with low dose (200mg/kg) and high dose (400mg/kg) of extract of *L. acutangula* showed significant ($P < 0.001$, $P < 0.01$) decrease in AST, ALT, ALP and Bilirubin levels as compared to the toxin control group.

CONCLUSION

The present study was to evaluate the hepatoprotective activity of extract of L. *actangula* and to compare its results obtained from the extracts.

The Analysis of the extracts revealed the presence of glycosides, tannins and phenolic compounds as well as flavonoid contents. At the same time the extracts were abundant in presence of steroids but the fatty material and volatile oil constituents were not found present. The carbohydrates and amino acids were present in extract.

In the same course of study, antioxidant property of the extracts was analyzed by using phosphomolybdate method and the results were compared and found the 3.33µg/ml for aqueous extract respectively.

In this study, the pharmacological potential of extract of L. *Actangula*, they were analyzed in terms of hepatoprotective. the extracts were evaluated for their hepatoprotective potential for paracetamol induced acute hepatotoxicity.

The hepatoprotective activity of the plant may be due to the presence of cardiac glycosides/ bufadienolides in the flowers of *Luffa actangula*.

The results indicated the higher hepatoprotective potential of extract might be due to the more antioxidant property yet the future work is required to establish the activity at molecular level.

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