JOURNAL OF SCIENTIFIC RESEARCH IN ALLIED SCIENCES
ISSN NO. 2455-5800

Contents available at: www.jusres.com

HEPATOPROTECTIVE ACTIVITY OF HYDRO ALCOHOLIC EXTRACT OF MUSA ACUMINATA ROOT

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ARTICLE INFO **ABSTRACT** **ORIGINAL RESEARCH ARTICLE**

Article History
Received: September 2019
Accepted: November 2019
Keywords: Nelumbo carbon tetrachloride; free radical scavenger; hepatotoxicity; musa acuminate

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Aim & object- Musa acuminate has been shown to be hepatoprotective by Indian traditional medicinal system but has not been pharmaceutically approved or evaluated. So the present research work was done to explore the hepatoprotective activity of Musa acuminate against experimentally induced hepatotoxicity in Wistar rats. **Aim of the study**- To identified and scientifically proved the hepatoprotective activity of Musa acuminate. **Materials and methods**- Albino Wistar rat weighing 120-150 g of either sex divided into six groups of six animals each. Group 1 was the control group taking distilled water and a common diet that was given to all other groups. Group 2-carbon tetrachloride 1%v/v olive oil 1mg/kg/BW i.p. injection twice a week. group3- Musa acuminate extract 50% (methanol:h_2o) 250 mg/kg/BW by oral route.+corbon tetrachloride 1%v/v olive oil 1mg/kg/BW i.p. injection twice a week. group4 - Musa acuminate extract 50% (methanol:h_2o) 500 mg/kg/BW by oral route + carbon tetrachloride 1%v/v olive oil 1mg/kg/BW i.p. injection twice in a week . group 5 - Musa acuminate extract 50% (methanol:h_2o) 250 mg/kg/BW by oral route alone.group 6- Musa acuminate extract 50% (methanol:h_2o) 500 mg/kg/BW by oral route.were estimated. Blood was collected from anesthetized animals. ALT, alanine aminotransferase; ALP, alkaline phosphatase; AST, aspartate aminotransferase; ALB, albumin; TP, total protein; MDA, malondialdehyde were estimated. **Results** – ALT, ALP & total protein levels were significantly increased in CCL4 treated group while Musa acuminate displayed a significant reduction in rising in these parameters. **Conclusion** – It can be concluded from the present study that musa acuminate root extract is a potent hepatoprotective agent .it is assumed that this hepatoprotective effect of musa acuminate may be due to several reasons such as antioxidant and or free radical scavenger property and ability to induce hepatic regeneration.

2019, www.jusres.com

Introduction

Hepatotoxicity is derived from two-word hepat means liver and toxicity means an alteration in physiology which is destroying the anatomy of the liver .these changes produce harmful effects on the body and effected other organs of the body. The liver plays a role in detoxification of toxic substances and is affected by the toxicity from these substances. Few xenobiotics, taken in overdoses and sometimes even taken in prescription, may produce harmful effects to the organ. Other artificial substances, which are used in the chemical lab and production house, natural Isolated products (e.g., microcystins) and natural remedies can also produce liver toxicity. substances which are produced hepatic alteration of function are called liver toxins. xenobiotics produced liver toxicity- xenobiotics are a major cause of hepatic injury. In traditional medicine system treatment of hepatotoxicity was done by the medicine which are obtained from natural sources like plant sources .now no any allopathic medicine identified for treatment of liver disease we depend upon traditional medicinal system ayurvedic drugs derived from plant mulethi, bhumiawala, punarnava, so this research work is the study of plants capacity to treat liver and which plant having more potent molecule identified. Liver disease is divided mainly in two types –

A) first is nonalcoholic fatty acid liver disease.

B) second is alcoholic fatty acid liver disease.

The liver is the largest organ in the body but his main work is the secretion of different types of necessary fluids and enzymes which are used to the digestion of ingested material and intoxification so we are called the largest gland of the human body.

Nonalcoholic fatty acid liver disease – non-alcoholic liver it is not related to heavy consumption of alcohol but have a minute quantity of fat in the liver this condition is reversible treatment or physical changes in lifestyle but the other condition in non-alcoholic fatty acid liver disease the fat is produced by the liver. the cells of the liver becoming rupture inflammation in liver scarring in the liver called liver cirrhosis or liver cancer.

Alcoholic fatty acid liver disease – the main reason is the heavy consumption of alcohol quantity increase of alcohol consumption also increase liver damage.

The reasons are unknown about the disease of non-alcoholic fatty acid liver disease. But the suspected persons which are suffered from this disease few reasons are as follows-

1. Pre diabetic person.
2. The person who is suffered from metabolic disorders like thyroid disease.
3. A person who is in contact with toxins.
4. Persons having high cholesterol like triglyceride.
5. Corticosteroids or metabolic drugs are taken by the person.
6. High b.p. patients.
7. The person who is suffered from hepatitis C.
8. Obesity.

The liver also called hepatic is a greek wordplay a major function in our body like hemostasis, immune system, metabolism etc few of its important function is reported as following-

-the reservoir of glycogen and excretion of biles
-manufacturing of protein and lipids.
-it makes circulatory material toxin-free by blood purification.
-in placenta (during pregnancy) complete blood purified by liver and supply also.

The weight of the liver is about 1/40 part of total body weight.at birth its weight about 150 grams.

Its color is reddish-brown.

Musa acuminate is the most common plant in India it is distributed in a different state of India like M.P., U.P., Maharashtra, Karnataka, Kerala, Tamilnadu, Andhra Pradesh, Assam, Telangana, in India it is used to food material its leaf used to cover and protect the substances from heat and maintain moisture. it is cultivated from the rhizomes and these rhizomes are grown around after 4-5 weeks these rhizomes are developed about 2to3 feet. It required moisture for development. 6-7 months required for the

fully developed plant that is ready for flowering and development of fruit. at starting tinny size green particle introduce. After 1-2 month fruits are become yellowish .they are not stored in ripen condition so long .it is stored only when they are not riped. **Medicinal & economical value of banana-** banana is the common fruit in India its plant is used by different ways all parts of the plant are used leaf, root, stem , flower, fruit. A) its fruit has a very large nutritional value it is a rich source of k^+, N_a^+ C_a^+, carbohydrate, sugar, flavonoid, and many more. it is used in the treatment of diarrhea, malnutrition, bacterial infection, weakness it produces quick energy . in India large number of people depend upon its agriculture and use to business purpose.

Material and method –

Collection and authentication of plant material- the root of the plant *Musa acuminate* is collected from the botanical garden of Sir Madan Lal Institute of pharmacy in the month of May 2018. It is authenticated by the specimen present in the pharmacognosy lab.

extraction process – the root of the banana plant is dried under the shade in the normal temperature surrounded by the environment in the month of may about $40^{\circ}_{C.}$ dried root introduced to the pulverizer and ground in the form of fine powder .it is extracted by the soxhlet apparatus solvent use methanol: distilled water(50:50).extract was collected by the continues extraction. dried in the oven where water and methanol evaporated obtained fine dried powder in the percentage of 6%quantity of total ground material.

Animals - swiss Wistar rats of both sex in equal quantity male and female obtained from the animal house of pharmacology lab SMGI where they maintained according to the CPCSEA guideline. 12 hour light and dark, sanitation free from disease healthy feed and water facility must for best result.

Acute toxicity studies - any unknown substance without dose determination taken may be harmful effects to the body so it is a must to confirm the quantity to take the effective dose concentration of the drug is $1/10^{th}$ portion of the lethal dose. Effective dose concentration is safe for population .it is the median value of 50% population .meaning it is effective for 50%

Experimental design -

In present research work hepatotoxicity produced by CCl_4.

Each animal has a weight of about 120 to 150 gram maintained a healthy diet and hospitality conditions. Male Wistar rats divided into six groups each group contain 6 animals-

1) Control group taking distilled water and common diet which was given to all other groups.
2) Carbon tetrachloride 1%v/v olive oil 1mg/kg/BW i.p. injection twice a week.
3) Musa accuminata extract 50% (methanol:H_2O) 250 mg/kg/BW by oral route.+corbon tetra chloride
4) Musa accuminata extract 50% (methanol: H_2O) 500 mg/kg/bw by oral route + carbon tetrachloride.
5) Musa accuminata extract 50% (methanol: H_2O) 250 mg/kg/BW by oral route alone.
6) Musa accuminata extract 50% (methanol: H_2O) 500 mg/kg/BW by oral route alone.

Biochemical study- .collection of blood after 15 days of oral administration of each extract and control group 24 hours after the last dose administration to every group of animals. First, each group of animals anesthetized by chloroform .then catch the tail vein of rats and blood collected by using disposable 5ml syringe stored in ethylene diamine tetraacetic acid test tube by running it to the side of the test tube. Mix it well to the EDTA and close tight with the help of the cotton plug. the sample test tube labeled according to each group.

SGOT and SGPT are the main biochemical biomarker for the identification of alteration in the liver function these all study done by the sample collection from the central tail vein of the rat. MDA (malonaldehyde) concentration in the serum is also detected it works as a biomarker of lipid peroxidation in the liver.

Statistical analysis- For the statistical determination of data collected by experiment .it

is must to minimum error and mean of all data should be near significance level of p<0.5 .this statistical analysis is performed by student t-test (standard error of the mean).

All the data of biochemical analysis are collected because these are the different data collected from 6 rats of 6 groups which have different weights and physical condition so the data are applying to the Anova t-test methanol for getting an actual and correct mean value of research analysis.

Result

Assessment of liver function parameters

Table-1

Treatment/group	**Dose(per/kg)**	**ALT(U/l)**	**AST(U/l)**	**ALP(U/l)**	**ALB(g/dl)**	**TP(g/dl)**
Controlgroup	distilled water and diet	73.4±4.07	147.6±18.73	258.4±44.08	3.98±0.14	7.20±0.32
CCl_4	CCl_4 in olive oil (1:1)1ml	166.3±21.41***	251±30.46***	590.4±45.99***	2.50±0.22**	6.15±0.20**
MA+CCl_4	250mg/kg	128.9±17.72 **	226.8±32.66*	514.7±65.24***	2.70±0.09***	6.50±0.13*
MA+CCl_4	500mg/kg	86.6±9.75 c	178.7±48.29	410.4±72.29**b	3.05±0.05a	6.70±0.36
MA alone	250mg/kg	73.4±8.38 c	165.7±24.16b	309.1±59.32c	3.30±0.08b	7.10±0.29c
MA alone	500mg/kg	63.8±3.87 c	150.2±18.51b	271.2±41.15c	3.35±0.07b	7.25±0.30a

The values are reported as the mean ±SD (n=8)MA,hydro-alcoholic extract from *Musaaccuminata*root; ALT, alanine aminotransferase; ALP, alkaline phosphatase; AST, aspartate aminotransferase; ALB, albumin; TP, total protein; MDA, malondialdehyde. all the data of biochemical analysis are collected because these are the different data collected from 6 rats of 6 groups which have different weights and physical condition so the data are applying to the Anova t-test method for getting an actual and correct mean value of research analysis.

* p<0.05,
** p<0.01,
*** p<0.001vs.controlgroup.
a p<0.05,
b p<0.01,
c p<0.001vs.CCl4group.

DISCUSSION

In the above table, reading shows the different quantity of enzymes which are found out by the biochemical study from the laboratory animal which is treated by the various dosage form and chemicals they indicated that what are the effect produced in the liver of the laboratory animal and which doses form having the capacity to protect the liver. in the above table the five types of biomarker show their value according to

liver capacity ALT, AST, ASP value should be increased if toxicity in the liver increased.

ALB, TP value decreased if toxicity increased in the liver.the table shows clearly that biomarkers are isolated from the collected blood from the systemic circulation and the blood is centrifuged in 2000rpm and isolate serum. these markers are indicated how much enzyms are present in the animal and what is the condition of liver.so this is clear that ccl_4 treated animals reading is much away from the reading of control animal like this Musa acuminata alone treated animal reading is nearest to the control animal and ccl_4 + Musa acuminata in different dose increasing order as per increasing dose of Musa acuminata. beneficial as a therapeutic agent as well as a dietry product.

CONCLUSION

In the present study hydroalcoholic extract of Musa acuminata root shows vitamins, minerals and different phytochemicals are present in it they play better antioxidants, and antibacterial activity they have the capacity to control enzyme function change near to normal activity .they control SGOT, SGPT level as normal which required for normal liver function. They also reduce liver cell necrosis.

The research work is indicated that plant Musa acuminata having a capacity to reduced the hepatotoxic effect of toxins so this plant and its different parts have a medicinal property in the favor of liver protection and it should be used to further study for find out the potency accurate highly effective concentration. And the basic responsible lead or phytochemical should be isolation is must from the extract which is responsible for activity in further study.

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