



Short Communication

Investigation of Herbal Extract as Hepatoprotective

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Abstract

In this paper we investigate hepatoprotective activity of herbal extracts of *amorphophallus campanulatus*, *casuarina equistifolia*, *orthosiphon stamineus*, *pterocarpus santalinus*, *aegle marmelos*, *chamomile recutita* *ptero corpus marsupial*, *luffa echinata* and *Embelia Ribes*. Results of the studies showed that all tested extract have moderate to excellent hepatoprotective activity with *marmelos* species showing the maximum. Further optimization of the study will results in potent herbal compounds as hepatoprotectives.

Keywords: Hepatoprotective, *amorphophallus*, *casuarina*, *orthosiphon*, *pterocarpus*, *aegle*, *chamomile*, *ptero corpus*, *luffa*, *embelia*.

Introduction

Medicinal practioners have prescribed Ayurved and drug from herbal origin as a system of medicine in India over centuries. Many of the modern drugs mainly based on synthetic chemical compounds however have been found to have harmful side effects on human system. This has triggered off extensive research and development in the field of herbal medicine. In fact there is a growing demand for herbal medicine in most of the developed and developing countries of the world to day.

The predominant type of liver diseases varies according to country and may be influenced by local factors. The causative factors of liver disorders include virus infection exposure to or consumption of certain chemicals. The substance that injures the liver cells in some people and results serious harm to the liver caused by drugs and by the combination of drugs and other substances is an important health problem.

Treatment options for common liver diseases such as cirrhosis, fatty liver and chronic hepatitis are problematic. The effectiveness of treatment such as interferon colchicines, penicillamine and corticosteroid are inconsistent at best and incidence of side effect is profound through the treatment is worse than the disease.

Physician and patients are in need of effective therapeutic agents with low incidents of side effect. There are few effective therapeutic agents with low incident of side effects. There are few effective plants that cure liver diseases so considerable interest has developed in the examination of these numerous plants remedies which are useful in liver diseases.

The present review is aimed at compiling the data on promising herbal extract from plant that have been tested in hepatotoxicity model using modern scientific system.

Material and Methods

Chemicals and reagents: Petroleum ether, ethanol, CCl₄, methanol, paracetamol parts of studied species. Etc.

Methods: Biochemical and histopathological methods

Results and Discussion

Ethanolic and aqueous extract of *Amorphophallus Campanulatus* tubers were evaluated against CCl₄ induced hepatic damage in rats. The extracts at a dose of 500mg/kg were administered orally once daily. The substantially elevated serum enzymatic levels were significantly restored towards normalization by the extracts¹.

The biochemical observations were supplemented with histopathological examination of rat liver section. The result shows that ethanol extract was found more potent hepatoprotective than aqueous extract². The methanol extract of plant material of some plant like *Casuarina equistifolia*, *Cajuns Cajal*, *Glycomiss petophylla*, *Bixa orellvia*, *Argemone Maxicana* *Physatis minima*, *Caesalpinia bondue* belonging to different family were studied for hepatoprotective activity against Swiss albino rats with liver damage induced by CCl₄.

It was found that the methanol extract of *B.orellvia* *C.Cajal*, *G.petophylla* and *C.equistifolia* at a dose of 500 mg/kg body with exhibited moderate protective effect by lowering the serum level of ALT, SGPT AST, SGOT and cholesterol to a significant extent.

The hepatoprotective activity was also supported by histopathological studies of liver tissue³.

Methanol extract of the leaves of *Orthosiphon stamineus* was assessed in paracetamol induced hepatotoxic rats. Alteration in the levels of biochemical markers of hepatic damage like SGOT, SGPT, ALP and lipid peroxides were tested in both paracetamol treated and untreated groups.

Paracetamol (2 gm/kg) has enhanced the SGOT, SGPT, ALP and lipid peroxides in liver. Treatment of methanol extract of *O.stamineus* leaves (200 mg/kg.) has brought back the altered levels of biochemical markers to the near normal levels in the dose dependent manner⁴.

Aegle marmelos leaves (bael, family rutaceae) which is also called as Bilva in ancient Sanskrit, was used as herbal drug in the Indian system of medicine. The hepatoprotective effect of *Aegle marmelos* in alcohol induced liver injury was evaluated rats using essential marker biochemical parameters. The results indicated that Bael leaves have excellent hepatoprotective effect⁵.

Hepatoprotective activity of aqueous ethanol extract of *chamomile recutita* capitula against paracetamol induced hepatic damage in albino rat was observed. The effect of aqueous ethanol extract of *chamomile recutita* capitula on blood and liver glutathione Na⁺, K⁺ At pasé activity, serums marker enzyme, serums bilirubin glycogen and thiobarbutiric acid reactive substances against paracetamol induced damage in the rats have been studied to find out the possible mechanism of hepatoprotective.

It was observed that extract of *chamomile* has reversal effect on the levels of above mentioned parameter in paracetamol hepatotoxicity. The extract of capitula of chamomile function as hepatoprotective agent and this hepatoprotective activity of chamomile may be due to normalization of impaired membrane function activity⁶.

The aqueous (45 mg/ml.) and ethanol (30 mg/ml) extracts of stem bark in 1% gum tragacanth was administered orally for 14 days and hepatoprotective activity studied in CCl₄ induced hepatic damage model.

The hepatoprotective activity was assessed using various biochemical parameters like serum bilirubin, protein alanine transaminase, aspartate transaminase and alkaline phosphatase along with histopathological studies of the liver tissue.

There was a significant increased in the serum levels of bilirubin ALT, as aspartate transaminase and alkaline phosphatase with decrease in total protein level in the CCl₄ treated animals, reflecting liver injury. Histological study of fatty lobules and cellular necrosis where as ethanol extract treated animals revealed normal hepatic cords without any cellular necrosis and fatty infiltration⁷.

Hepatoprotective effects of the methanol and aqueous extracts of *P.Marsupium* stem bark was evaluated by assay of liver function biochemical parameters (total bilirubins, serum protein alanine aminotransaminase, aspartate aminotransaminase, and alkaline phosphatase activity and histopathological studies of the liver.

In methanol extract treated animals the toxic effects of CCl₄ was controlled significantly by restoration of levels of serum bilirubin protein, and enzyme as compared to the normal and standard drug silymarin treated group histology of liver sections of the animals treated with extract showed the presence of the normal hepatic cords, absence of necrosis and fatty infiltration which further evidenced the hepatoprotective activity⁸.

Embelia ribs commonly known as vidanga has been reported to be useful in jaundice. It is constituent of various formulation marketed for liver ailments. The protective effects of *Embelia ribs* on paracetamol induced liver cell damage were studied using mice as experimental animals. Paracetamol was administered orally in a dose of 500 mg/kg 48 hrs before administration of drugs.

The mice treated with *Embelia ribs* extract (50, 100, 200 mg/100 gm/day) showed a dose dependent fall of 41% 47% and 66% to respectively in the serum SGPT level as compared to the elevated levels in the mice receiving paracetamol only. Histopathology of liver mice revealed 67%, 70% and 80% normal liver respectively in the mice receiving the dose of *E-ribs*. The result suggest that extract of *E.ribs* possesses hepatoprotective activity against paracetamol induced acute hepatocellular damage in the mice⁹.

The different extracts of fruits of *Luffa echinata* Roxb (cucurbitaceae) were tested for their hepatoprotective activity against CCl₄ induced hepatotoxicity in albino rats. The degree of protection was measured by using biochemical parameters like SGOT, SGPT, alkaline phosphatase and total protein and total albumin. The petroleum ether, methanolic extract showed a significant activity comparable with those of silymarin¹⁰⁻¹².

Discussion: Popularity of herbal drugs is increasing globally and at least one quarter of patients with liver diseases use ethno botanicals. More efforts need to be directed towards methodological scientific evaluation for their safety and efficacy by subjecting to vigorous preclinical studies followed by clinical trials to unravel the mysteries hidden in the plants. This approach will help exploring the real therapeutic value of these natural pharmacotherapeutic agents and standardized the dosage regimen on evidence based findings to become more than a fashionable trend¹³. Many herbals are on the market to support health, relieve symptoms and cure diseases. However, most of these products lack scientific pharmacological validation. In experimental hepatotoxicity models in laboratory or higher animals, several herbals exerted

hepatoprotective / curative effects that warrants their clinical testing. Due to lack of scientific based pharmacological data, most of the herbal formulations can not be recommended for the treatment of liver diseases¹⁴⁻¹⁵.

In spite of the availability of more than 300 preparations for the treatment of jaundice and chronic liver diseases in Indian systems of medicine (using more than 87 Indian medicinal plants) only four terrestrial plants have been scientifically elucidated while adhering to the internationally acceptable scientific protocols.

Conclusion

Chronic hepatic diseases stand as one of the foremost health troubles worldwide, with liver cirrhosis and drug induced liver injury accounting ninth leading cause of death in western and developing countries. Therapies developed along the principles of western medicine are often limited in efficacy; carry the risk of adverse effects, and are often too costly, especially for the developing world. Therefore, treating liver diseases with plant derived compounds which are accessible and do not require laborious pharmaceutical synthesis seems highly attractive. In this review article, an attempt has been made to compile the reported hepatoprotective plants from India and abroad and may be useful to the health professionals, scientists and scholars working the field of pharmacology, therapeutics, and pharmacognosy to develop evidence based alternative medicine to cure different kinds of liver diseases in man and animals.

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