

**HEPATOPROTECTIVE EFFECT OF MEDICINAL PLANTS: A REVIEW**

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ABSTRACT:

The global burden of hepatotoxicity impacts over fifty million human beings universal. Medicinal natural plant life plays a extremely important position in human health concern. Approximately Eighty percent of global's people makes use of traditional medicine, which basically consists of plant component Ayurveda, Amachi, Unani, Siddha are only some of numerous historic herbal health care practice covered and referred to as traditional medicine. Medicinal plants are being generally used, either as single drug or in aggregate in (health care delivery system). Due to the fact historic instances, human have use medicinal vegetation to relieve illnesses. Those traditional scientific techniques have been used from the start of time, and their steady evolution has been typically based on realistic reports with small to no relation to trendy clinical standards cutting-edge analytical technology and knowledge of active compounds located in plant life have allowed extra insights into pharmaceutical vegetation. Livertoxicity can be medicinal, dietary, chemical or herb-brought on liver damage by means of hepato-pollutants. The human liver metabolizes substances by reduction, oxidation hydration, hydrolysis, condensation, conjugation, isomerization. Disturbance of those processes cause liver toxicity, inflicting liver cancer, cirrhosis and Hepatitis C. "Hepatic disorder" refers to a vast category of conditions that prevent the liver

from wearing out its everyday obligations. More than seventy five%, of the liver tissue ought to be removed until a lower in hobby occurs. It's miles the frame's most large organ, and as it features like a gland. Liver diseases are chargeable for higher demise rates global. Therefore, hepato-protective natural products such as *Phyllanthusamarus*, *Terminaliaarjuna*, *Acacia Catechu*, *Tamarixgallica*, *PhyllanthusNiruri*, *Capparisspinosa*, *Achilleamillefolium*, *Foeniculumvulgare*, *Flacourtiaindica*, *Ocimum sanctum*, *Hylocereuspolyrhizus*, *Lawsoniainermis* Linn.

Keywords: Hepatotoxicity, Hepatoprotection, Medicinal plant, Hepatotoxin.

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INTRODUCTION

Over fifty million human beings worldwide are impacted with the aid of the global burden of hepatotoxicity (1). Ayurveda, Amachi, Unani, Sidha, Siddha, are only a handful of numerous historic herbal health practices contained known as traditional medicine, which is used by nearly 80% of the sector's populace and is in general composed of plant additives. These traditional clinical tactics had been used from the beginning of time, and their consistent evolution has been on the whole based totally on sensible studies with small to no relation to modern medical standards. Medicinal natural flowers are extremely vital to humans (2). Liver is the second one-biggest and one of the in large part essential organs in the frame. It plays a massive component in controlling a ramification of physiological strategies, and its hobby is linked to crucial processes like secretion, metabolism, and storage. Endogenous and external substances are cleansed by liver (3-6). We know liver is a very high capacity for removing toxins and producing beneficial materials (7). A liver disorder is any issue that results in illness. A variety of crucial bodily processes are controlled by the liver; if it is unwell or injured, these processes will stop working, seriously harming the body.

The word "hepatic disease" is used to refer to liver disease. The word "Hepatic disease" refers to a broad category of conditions that prevent the liver from carrying out its normal duties. Over Seventy five% and the liver tissue have to eliminated until a decrease inactivity occurs. Its miles the frame's maximum extensive organ, and as it functions like a gland. Body's maximum stable organ Is liver, and it's far frequently categorised as a gland. It produces and secretes bile. A right quarter of stomach cover the liver by the ribs and It have basic lobe, that's made from numerous tiny lobule. The cells of liver acquire blood beginning two distinct part The hepatic artery transport pure blood from the heart to liver and (portal vein) transports nutrient from the gut and spleen(8-11). Liver is most effective the major organs in human frame and the chief site for extreme metabolism and secretion. Liver Is the frame's maximum substantial organ and is regularly referred as a gland because, amongst other things, liver generate and secrete bile .The Thoracic cage and the superior right part of the stomach surround the liver. It features two large lobes that are divided into several smaller lobules each. Blood enters the liver cells through two distinct openings. Liver is the

biggest organs in the humans and the primary site for intense metabolism and excretion. From the heart hepatic artery carry pure blood to liver, and portal venous system carries nutrients from intestine and spleen. Therefore, it plays a remarkable role in sustaining the body's functionality and controlling homeostasis. Maintaining a sound liver is crucial for general health and wellbeing since it is concerned in nearly all biochemical pathways that lead to growth, the prevention of disease, the supply of nutrients, the creation of energy, and reproduction(12). The main causes of liver ailments are toxins, excessive alcohol intake, infections, and autoimmune diseases. The majority of hepatotoxic substances broadly speaking damage liver cells by causing lipid peroxidation and different oxidative damages (13–14).

LIVER DISEASES

Hepatic disorder is referred as the liver disorder. Hepatic disorder is a widespread disease that encompasses any problem that forestalls liver from acting its supposed functions. Liver disease is any difficulty with the liver results in illness. The liver is liable for number of vital features, causing serious harm to our body. Most strong organ and often categorized as a gland because it produces and secretes bile involving its many features, so more than seventy five%, And the liver tissue have to be affected. If the liver becomes unhealthy or damaged, those functions will stop functioning. The rib cage and the superior proper a part of the stomach surround the liver. There are predominant lobes. The cells of liver get blood from separate outputs. The arteries of liver or hepatic artery distributes pure blood to the liver's primary lobes, which is composed of several little lobules (15–18).

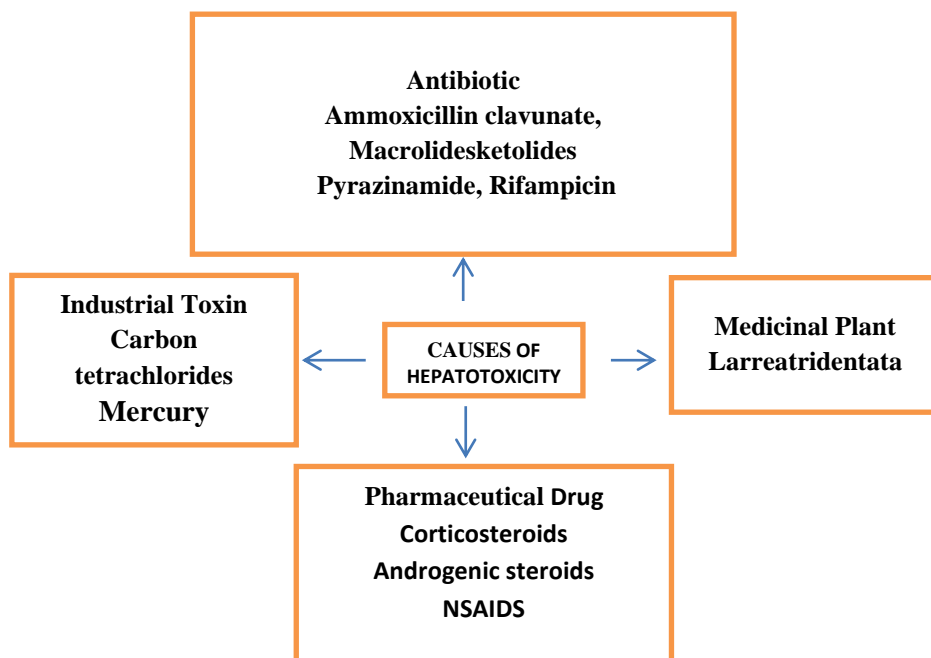


Fig.1- Causes of hepatotoxicity

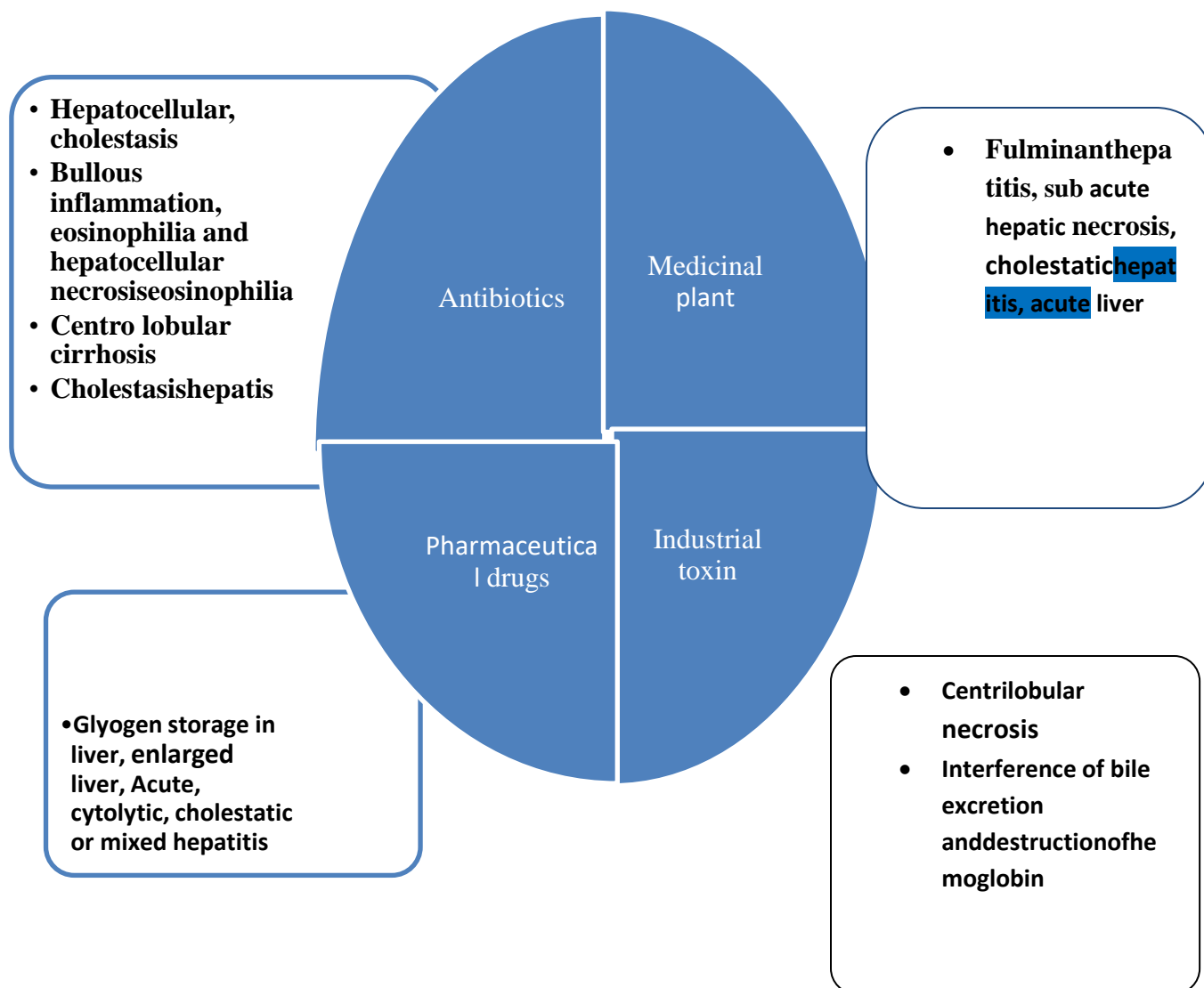


Fig: 2 (Causative agent for hepatotoxicity) (19-25)

MEDICINAL PLANTS WITH POTENTIAL HEPATOPROTECTIVE ACTIVITIES

Phyllanthusamarus:

Family: Phyllanthaceae

Parts Use/Extracts: Leaf and fruits

Pharmacological Action: It extract restored the enzymatic action ofcatalasesuperoxide dismutase, creatine kinase .which have been first lost after exposure to toxicants (26-28).

Terminaliaarjuna

Family: Combretaceae

Parts Use/Extracts :Bark

Pharmacological Action: Its extract give antioxidant action through reducing oxidative strain, and supports the conventional treatment of Terminalia arjuna to stop the early results of alcohol on the liver (29).

Acacia catechu

Family:Leguminosae

Parts Use/Extracts: Powdered palecatechu
 Pharmacological Action: It exerts Hepato-protective actions with the aid of anti-oxidant activity by increasing the level of SOD and GSH and decreasing lipid peroxidation (30).

Tamarix gallica

Family: Tamaricaceae

Parts use/Extracts: Leaves

Pharmacological Action: It gives hepato-defensive (liver-protecting) feature, its extract can be a useful resource within the organization of liver illnesses. Anti-oxidants (flavonoids) that fend towards free-radical & save you liver cell decline (31-32).

Phyllanthus Niruri

Family: Phyllanthaceae

Parts Use/ Extracts: Stem and leaves

Pharmacological Action: It possesses strong hepato shielding effect against viral hepatitis and toxicity as a result of exceptional drugs and ecological toxicants. It progresses as a strong antioxidant (33).

Capparis spinosa

Family: Capparidaceae

Parts use/ Extracts: Root bark

Pharmacological action: It possesses hepato-protective in conjunction and restores the hepatic and serum (FGF21) stages that fall inside the fatty liver model in rat (34).

Achillea millefolium

Family: Asteraceae

Parts Use/ Extracts: Hydroalcoholic extract

Pharmacological Action: It exerts antioxidant interest by way of an increase inside the degree of SOD and GSH-P levels as well as MDA ranges a sign of lipid peroxidation are also available (35).

Foeniculum vulgare

Family: Umbelliferae

Parts Use/ Extracts: Fruit

Pharmacological Action: It exerts hepato-protective by different activity like antioxidant, antibacterial, anti-inflammatory (36-37).

Flacourti indica

Family: Salicaceae

Parts Use/ Extracts: Stem Bark

Pharmacological Action: It will prevent mixed infiltrates, focal necrosis, scattered fatty changes, giant inflammatory cell lines, damaged hepatocytes, hepatocyte cord degeneration, and affected hepatocytes arranged in sinus compression. Deformed cords are all present in sinusoidal formation due to drug-induced liver damage (38).

Ocimum sanctum

Family: Lamiaceae

Parts Use/ Extracts: Leaves

Pharmacological Action: It performs hepato-protective action by normalizing levels of liver enzymes responsible for liver damage such as ALP, AST, ALP as well as serum bilirubin levels and thus leads to hepatocyte regeneration and restoration of liver function (39-40).

Hylocereuspolyrhizus

Family: Cactaceae

Parts Use/Extracts:Fruits

Pharmacological Action:Hepatoprotective potential and antioxidant ability of *Hylocereuspolyrhizus* collectively at the histological and enzymatic level. with respect to the enzymatic concentrations of alkaline phosphate, alanine, aspartateaminotransferase and total protein, as well as oxidative stress at such malondialdehyde level, reduction of glutathione and superoxide dismutase actions and catalase has been shown to be reversible towards the normalization of dragon fruit, silymarin and dragon fruit extracts even at the highest levels Non-toxic dosage(41-42).

Lawsoniainermis Linn.

Family: Lythraceae(43-44)

Parts Use/Extracts: bark leaves and seeds of the plant areused medicinally

Pharmacological Action: Bark of *L.inermis* and its alcoholic extracts showed hepatoprotective activity against CCL4 induced increase in serum bilirubin, (GOT and GPT) serum marker enzymes, liver lipid peroxidation and decrease in total protein serum, glutathione-s-transferase,liver glutathione, glycogen, supeoxide dismutase and catalase activity. Hepatoprotective activity of dried leaves and its ethanolic extracts of *L.inermis* and crude fractions ethyl aceate, petroleum ether butanone fractions and butanol was evaluate against (CCL4) induced liver toxicity in mice. The fractions and ethanolic extract decreased SGOT,SGPT,

bilirubin content & SAL activities and reduced weight of liver compare to control (LIV-52)(45-49)

DISCUSSION

At least 25% of persons with liver issues use ethno botanicals, and herbal therapies are growing in popularity worldwide. To uncover the mysteries buried in plants, it is needed to carry out thorough preclinical studies and clinical trials. Here many natural products that maintain health, treat symptom and stop disease. This strategy will help determine true therapeutic advantage of these natural substances and normalize the dosing schedule according to the outcome of thereadingtoconquerthetemporarystate. though,themajority of these products are not supported by scientific pharmacological research. Further clinical research is warranted because many herbs haveshownhepatoprotective/healing effects in experimental modelsof hepatotoxicity in the laboratory or in higher animals. The majority of herbal remedies cannot recommended for the management of liver troubles due to lack of scientificallybased pharmacological study(50).It is imperative to confirm the efficacy of a small number of reported active compoundsthat are potential therapeutic candidates. Studies focusing on theisolationof bioactive components and analysisofextracts on cultured cell lines should replace studies usingwhole plant extracts (51).

CONCLUSION

The main goal of ethnopharmacological studies on therapeutic plants should not be the discovery of unique pure prototype compounds as drugs. Active (extracts), fractions, or mixtures of fractions and extracts may use to create potent medications. Drug derivative from plants should be capable of treating severe liver problems caused by toxins and viruses (hepatitis B and C), too much alcohol consumption, Energetic extract, fractions, or mixtures of fractions and extract may use to create extremely powerful medicinal drug. drugs derivative starting plants must be able to treating intense liver troubles caused by pollutants, viruses (which includes hepatitis B and C), immoderate alcohol intake, and so forth., whether used in combination or as single agents. All severe liver problems cannot be treated with a single drug. To create efficient formulations, pharmacological and clinical experiments utilizing regional medicinal herbs are required. The manufacturing of items made from plants should be governed by safety and efficacy standards.

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