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Letter to Editor

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Protective role of Indian medicinal plants against liver damage

Ram Vishal

India is the largest producer of medicinal plants. The medicinal plants have very important role in the health of human beings as well as animals. As per the WHO estimates, about three quarters of the world's population currently use herbs and other traditional medicines to cure various diseases, including liver disorders. Hence, several phytomedicines (medicinal plants or herbal drugs) are now used for the prevention and treatment of various liver disorders.

Herbal drugs have gained importance and popularity in recent years because of their safety, efficacy and cost effectiveness. The Indian Traditional Medicine like Ayurveda, Siddha and Unani are predominantly based on the use of plant materials. The association of medical plants with other plants in their habitat also influences their medicinal values in some cases. One of the important and well documented uses of plant products is their use as hepatoprotective agents. Hence, there is an ever increasing need for safe hepatoprotective agent. In spite of tremendous strides in modern medicine, there are hardly any drugs that stimulate liver function, offer protection to the liver from damage or help regeneration of hepatic cell. Many formulations containing herbal extracts are sold in the Indian market for liver disorders. But management of liver disorders by a simple and precise herbal drug is still an intriguing problem. Several Indian medicinal plants have been extensively used in the Indian traditional system of medicine for the management of liver disorder. Some of these plants have already been reported to possess strong antioxidant activity.

Liver Diseases and Medicinal Plants

Liver, the largest gland is a vital organ. It is the metabolic "engine-room of the body". Almost all the drugs, foods and water constituents are metabolized and detoxified in the liver, and as such it is often exposed to maladies resulting in a number of clinical syndromes. Many chemicals, foods, drugs and infections (parasitic, bacterial, viral or fungal) can cause variety of liver diseases such as hepatitis, jaundice, cirrhosis, liver cancer, etc.

Liver has a pivotal role in regulation of physiological processes. It is involved in several vital functions such as metabolism, secretion and storage. Furthermore, detoxification of a variety of drugs and xenobiotics occurs in liver. The bile secreted by the liver has, among other things, an important role in digestion. Liver diseases are among the most serious ailment. They may be classified as acute or chronic hepatitis

(inflammatory liver diseases), hepatitis (non inflammatory diseases) and cirrhosis (degenerative disorder resulting in fibrosis of the liver).

iver diseases are mainly caused by toxic chemicals (certain antibiotics, chemotherapeutics, peroxidised oil, aflatoxin, carbon-tetrachloride, hlorinated hydrocarbons, etc.), excess consumption of alcohol, infections and autoimmune disorder. Most of the hepatotoxic chemicals damage liver cells mainly by inducing lipid peroxidation and other xidative damages in liver. Enhanced lipid peroxidation produced during the liver microsomal metabolism of ethanol may result in hepatitis and cirrhosis.¹⁻³

Medicinal Plants with protective role against Liver Disease

| Name of the Plants | Family | Parts use | Hepatotoxicity inducing agents |
|------------------------------------|-----------------|-------------------------|--|
| <i>Astragalus polysaccharides</i> | Magnoliaceae | Dried fructus | Carbon tetrachloride |
| <i>Arachniodes exilis</i> | Dryopteridaceae | Rhizomes | Carbon tetrachloride |
| <i>Asparagus racemosus</i> | Liliaceae | Whole plant | Γ-radiation |
| <i>Amaranthus spinosus</i> | Amaranthaceae | Whole plant | Carbon tetrachloride |
| <i>Apium graveolens</i> | Apiaceae | Seeds | Paracetamol and thioacetamide |
| <i>Aloe barbadensis</i> Mill | Liliaceae | Dried aerial parts | Petroleum ether , chloroform and methanol |
| <i>Artemisia absinthium</i> | Asteraceae | Powdered aerial parts | Carbon tetrachloride and by injection of endotoxin |
| <i>Azadirachta indica</i> | Meliaceae | Leaf | Paracetamol |
| <i>Acacia confuse</i> | Leguminosae | Bark | Carbon tetrachloride |
| <i>Baliospermum montanum</i> | Euphorbiaceae | Roots | Paracetamol |
| <i>Cassia fistula</i> | Leguminosae | Leaf | Carbon tetrachloride |
| <i>Calotropis procera</i> | Apocynaceae | Flowers | Paracetamol |
| <i>Decalepis hamiltonii</i> | Asclepiadaceae | Roots | Carbon tetrachloride |
| <i>Euphorbia fusiformis</i> | Euphorbiaceae | Tubers | Rifampicin |
| <i>Glycyrrhiza glabra</i> Linn | Fabaceae | Root powder | Carbon tetrachloride |
| <i>Ginkgo Biloba</i> | Ginkgoaceae | Dried extract | Carbon tetrachloride |
| <i>Gentiana asclepiadea</i> L. | Gentianaceae | aerial parts, root | Carbon tetrachloride |
| <i>Hygrophila auriculata</i> | Acanthaceae | Root | Carbon tetrachloride |
| <i>Halenia elliptica</i> | Gentianaceae | Whole plant | Carbon tetrachloride |
| <i>Juncus subulatus</i> | Juncaceae | Powdered tubers | Paracetamol |
| <i>Momordica dioica</i> | Cucurbitaceae | Leaves | Carbon tetrachloride |
| <i>Meconopsis integrifolia</i> | Papaveraceae | Flowers | Carbon tetrachloride |
| <i>Melochia corchorifolia</i> | Malvaceae | aerial part | Carbon tetrachloride |
| <i>Orthosiphon stamineus</i> | Lamiaceae | Leaves | Acetaminophen |
| <i>Ocimum sctum</i> | Lamiaceae | Leaf | Paracetamol |
| <i>Pterocarpus marsupium</i> Roxb. | Papilionaceae | Stem bark | Carbon tetrachloride |
| <i>Piper longum</i> | Piperaceae | Fruits and roots powder | Carbon tetrachloride |
| <i>Pittosporum</i> | Pittosporaceae | Stem bark | Carbon tetrachloride, d- |

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|-------------------------------------|------------------|--------------------|-----------------------------------|
| <i>neelgherrense</i> | | | galactosamine and acetaminophen |
| <i>Phyllanthus amarus</i> Schum | Euphorbiaceae | Aerial part | Ethanol |
| <i>Rubia cordifolia</i> Linn | Rubiaceae | Roots | Carbon tetrachloride |
| <i>Ricinus Communis</i> | Euphorbiaceae | Leaves | Carbon tetrachloride |
| <i>Silybum marianum</i> | Asteraceae | Leaves | Thioacetamide |
| <i>Scoparia dulcis</i> | Scrophulariaceae | Whole plant | Carbon tetrachloride |
| <i>Spondias pinnata</i> | Anacardiaceae | Stem heart wood | Carbon tetrachloride |
| <i>Tylophora indica</i> | Asclepiadaceae | Leaf powder | Ethanol |
| <i>Trichosanthes cucumerina</i> | cucurbitaceae | Whole plant | Carbon tetrachloride |
| <i>Tridax procumbens</i> | Asteraceae | Leaves | Carbon tetrachloride |
| <i>Vitex negundo</i> Linn. | Verbenaceae | Root, leaf, flower | Isoniazid, rifampin, pyrazinamide |
| <i>Vitex trifolia</i> | Verbenaceae | Leaves | Carbon tetrachloride |
| <i>Withania somnifera</i> | Solanaceae | Root | Carbon tetrachloride |
| <i>Woodfordia fruticosa</i> Kurz | Lythraceae | Flowers | Carbon tetrachloride |
| <i>Zanthoxylum armatum</i> | Rutaceae | Bark | Carbon tetrachloride |

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