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RESEARCH ARTICLE

HEPATOPROTECTIVE EFFECT ON MEDICINAL PLANTS

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ABSTRACT

India is the largest producer of medicinal plants and is rightly called the "Botanical Garden of the World". The medicinal plants have very important place in the health and vitality 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.Although experimental studies have been conducted on a number of these plants and their formulations, however, only some plants have clearly shown the hepatogenic / hepatoprotective effects against liver diseases. Hence, several phytomedicines (medicinal plants or herbal drugs) are now used for the prevention and treatment of various liver disorders. Excessive drug therapy, environmental pollutants, hepatic cancer and alcoholic intoxicants are the main causes of liver disorders. In spite of consistent human effort and drug discovery, modern drug has very little to offer. A phytotherapeutic approach to modern drug development can provide many invaluable drugs from traditional medicinal plants. Search for pure phytochemicals as drugs is time consuming and expensive. Numerous plants and polyherbal formulations are used for the treatment of liver diseases.

Key words: Liver, *Curcuma longa, cassia auriculata, Silybum marianum*

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INTRODUCTION

The liver is a vital organ of paramount importance involved in the maintenance of metabolic functions and detoxification of the exogenous and endogenous challenges like xenobiotics, drugs, viral infections and chronic alcoholism. Diverse homeostatic mechanisms are affected if liver function is impaired, with potentially serious consequences. About 20, 000 deaths occur every year due to liver diseases. Conventional drugs used in the treatment of liver diseases are sometimes inadequate and can have serious adverse effects. Treatment options for common liver diseases such as cirrhosis, fatty liver, and chronic hepatitis are problematic. The effectiveness of treatments such as interferon, colchicine, penicillamine, and corticosteroids are inconsistent at best and the incidence of side-effects profound. All too often the treatment is worse than the disease. Conservative physicians often counsel watchful waiting for many of their patients, waiting in fact for the time when the disease has progressed to the point that warrants the use of heroic measures. Physicians and patients are in need of effective therapeutic agents with a low incidence of side-effects. Plants potentially constitute such a group (Dienstag and Isselbacher, 2001).

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Herbal medicines are in great demand in the developed as well as developing countries for primary healthcare because of their wide biological and medicinal activities, higher safety margins and lesser costs (Chattopadhyay and Bhattacharyya, 2007). Modern drugs have very little to offer for alleviation of hepatic ailments, whereas most important representatives of phytoconstituents used for liver diseases chiefly on regional basis include drugs like silymarine. Medicinal plants play a key role in the human health care. About 80% of the world population rely on the use of traditional medicine which is predominantly based on plant materials (WHO, 1993).

Liver diseases and medicinal plants: 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), hepatosis (non inflammatory diseases) and cirrhosis (degenerative disorder resulting in fibrosis of the liver). Liver diseases are mainly caused by toxic chemicals. Most of the hepatotoxic chemicals damage liver cells mainly by inducing lipid peroxidation and other oxidative damages in liver. Enhanced lipid peroxidation produced during the liver microsomal metabolism of ethanol may result in hepatitis and

cirrhosis (Smuckler, 1975). Hundreds of plants have been so far examined to be taken for a wide spectrum of liver diseases (Asadi-Samani, 2013). Natural products, including herbal extracts, could significantly contribute to recovery processes of the intoxicated liver.

Curcuma longa: *Curcuma longa* L. (Zingiberaceae), commonly known as turmeric, is native to Southwest India with its rhizomes being the source of a bright yellow spice with various medicinal applications. It is widely cultivated throughout the tropics and similarly used for it medicinal value, in the cosmetic industry, and as a dye. Herein, the medicinal potentials of this plant as well as that of one of its bioactive constituents, curcumin, has been compiled. In addition, it is used as herbal remedy due to the prevalent belief that the plant has medical properties. In folk medicine, the rhizome juice from *C. longa* is used in the treatment of many diseases such as anthelmintic, asthma, gonorrhea and urinary, and its essential oil is used in the treatment of carminative, stomachic and tonic (Phansawan and Poungbangpho, 2007). In traditional medicine, several plants and herbs have been used experimentally to treat liver disorders, including liver cirrhosis. *C. longa* possesses antioxidant, anti-tumor, antimicrobial, anti-inflammatory, wound healing, and gastroprotective activities (Pari and Murugan, 2004). The previous studies have also shown that the aqueous extract of *C. longa* has hepatoprotective activity against erythromycin estolate toxicity (Murugan P and Pari, 2005; Pari and Murugan, 2006). Curcumin can help fight inflammation and keep blood sugar levels steady, it could be a useful tool to prevent or treat type 2 diabetes (Murugan and Pari, 2005).

Curcuma Longa Extract: Curcuma longa is extremely versatile. It supports the liver, helps the immune system to function normally, has a beneficial effect on the cardiovascular system, supports the nervous system and works as an antioxidant. • Natural extract of fresh turmeric • Is converted effectively into the important metabolites DMC, BMC and THC • Supports normal immune system function During past research into Curcuma longa, the focus has always been on the main ingredient curcumin. It has now been shown that, in the body, the turmeric is converted into many more interesting substances, including desmethoxycurcumin (DMC), bisdemethoxycurcumin (BMC) and tetrahydrocurcumin (THC). These metabolites have a supportive function and their own range of effectiveness. However, not every curcuma extract yields high curcumin levels. We therefore use CurcuWIN™ to produce our Curcuma longa extract. This ingredient has very high water solubility and long-lasting bioavailability. As a result of that, this product is absorbed optimally and remains active in the body for a long time. We also chose CurcuWIN™ because it has the same curcuminoid profile that occurs naturally in the curcuma rhizome: curcumin (approx. 75%), demethoxycurcumin (approx. 15%) and bismethoxycurcumin (approx. 5%).

Silybum marianum: Silybum marianum is currently the most well researched plant in the treatment of liver disease (with over 450 published peer review papers). The genus Silybum is a member of the daisy family (Compositae). The leaves are characterized by distinct white “milky” veins that give the plant its common name. Silymarin, derived from the milk thistle plant, Silybum marianum, has been used for centuries as a natural remedy for diseases of the liver and biliary tract. As interest in alternative therapy has emerged in the United States, gastroenterologists bave encountered increasing numbers of patients taking silymarin with little understanding of its purported properties (Kren, 2005). Silymarin and its active constituent, silybin, have been reported to work as antioxidants scavenging free radicals and inbibiting lipid peroxidation. Studies also suggest that they protect against genomic injury, increase hepatocyte protein synthesis, decrease the activity of tumor promoters, stabilize mast cells, chelate iron, and slow calcium metabolism (Kidd and Head, 2005). The active constituents of milk thistle are flavonolignans including silybin, silydianin, and silychristine, collectively known as silymarin. Silybin is the component with the greatest degree of biological activity, and milk thistle extracts are usually standardized to contain 70-80 percent silybin. Silymarin is found in the entire plant but is concentrated in the fruit and seeds. Silybum seeds also contain betaine (a proven hepatoprotector) and essential fatty acids, which may contribute to silymarin’s anti-inflammatory effect (Tamayo and Diamond, 2007). Silymarin is useful in helping reverse virally induced liver damage. It is effective in both acute and chronic viral hepatitis. In one study of acute viral hepatitis (Pari and Murugan, 2006), patients treated with silymarin showed a definite therapeutic influence on the characteristic increased serum levels of bilirubin and liver enzymes compared with a placebo group.

Cassia auriculata: *Cassia auriculata* Linn commonly known as Tanners Senna, is also known as Avaram tree. It is distributed throughout hot deciduous forests of India. Wild in dry regions of Madhya Pradesh, Tamil Nadu Rajasthan and other parts of India.The plant has been reported to possess antipyretic (Chandra and Gupta, 1972), hepatoprotective, antidiabetic,antiperoxidative and antihyperglyceamic andmicrobicidal activity. *C.auriculata* has beenshown to antiviral activity and anti spasmodic activity. The plant is used in the traditionalsystem of medicine for female antifertility, leprosy, worm infestation, diarrhoea, disease of pittam. The plant has been widely used as acure for rheumatism (Murugan, 2010) and conjunctivitis (Pari and murugan, 2007). Thevarious parts of the plant were reported to exert abeneficial effect to alleviate the symptoms ofdiabetes (Murugan, 2015). The flowers are used to treat urinary discharges, nocturnal emissions, diabetes and throat irritation. The Bark is used in skin conditions; bark as astringent; useful in checking secretion or haemorrhage. They also restore the disordered processes of nutrition (Murugan, 2015).

The Leaf extract has a protective action against alcohol induced oxidative stress to the cells as evidenced by the lowered tissue lipid peroxidation and elevated levels of the enzymatic and nonenzymatic antioxidants and experimentally induced alcohol related liver damage. The seeds of tanner’s cassia find their application in purulent opthalmia i.e., inflammation of the eye or conjunctiva. They should be finely powdered and blown into the affected eyes (Murugan, 2015). Seeds areastringent, sour, cooling, constipating, depurative, aphrodisiac, anthelmintic, stomachic, alexeteric, useful in diabetes, chyluria, ophthalmic, dysentery, diarrhoea, swellings, abdominal disorders, leprosy, skin diseases, worminfestations, chronic purulent conjunctivitis (Teresa Klepser and Nicole Nisly, 2000). The Roots are used in skin diseases and asthma. The roots are astringent, cooling, alterative, and depurative and alexeteric, and are useful in skin diseases, leprosy, tumors, asthma and urethroroea. Leaves, Flowers and Fruits as antihelmintic; its leaves and petals are both mildly astringent in

taste. It also checks the flow of extra amount of urine and helps in absorption of required amount of fluids in the kidneys and intestines (Murugan, 2010).

Conclusion

Natural medicine is a holistic approach to treat liver diseases. Naturopathy for liver disease is developing rapidly in clinical practice and theoretical research. However, the mechanisms of function and safety remain incomprehensive and even controversial. Natural agents have multiple therapeutic effects, based upon their antioxidant, anti-inflammatory, antiviral and antitoxic properties, etc. Because of the diverse therapeutical effects and relatively mild side effects, patients usually appreciate the use of natural agents to treat liver diseases.

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