SCOPE OF THE PRESENT INVESTIGATION

One of the vital organs of the human body, the liver performs essential functions including detoxification and maintenance of normal immunity by generating protective antibodies. Liver is susceptible to be encountered with abnormal metabolites and toxins which are of endogenous and exogenous in origin. Environmental pollution, drugs, chronic alcohol consumption, pathogens and hereditary factors can be accounted for susceptibility of liver to various diseases and results in functional deficiency.

Many liver protecting agents are consumed by people either to prevent or to cure liver associated disorders. Allopathic medicines are being used to save those patients by relieving them from the hazardous symptoms. But the contraindication and limitations for their use also keep increasing due to age and sex related side effects.

Since the time of its invention various medicinal plants have been traditionally practised to cure liver diseases or to strengthen the vitality of the organ. Many plants such as *Silybum marianum* (milk thistle), *Picrorhiza kurroa* (kutkin), *Curcuma longa* (turmeric), *Camellia sinensis* (green tea) and *Glycyrrhiza glabra* (licorice) have been clinically proved and patented.

India is one of the holistic countries, which believes in traditional system of folklore medicines made up of medicinal plants. Both single plant and formulation consisting of more than one plant are used in ayurvedic system of medicine. Though many medicinal plants are widely used for liver
complaints the ever increasing problem of pollution and alcohol consumption and thereby liver toxicity demands the screening and identification of new plants which can be superior to allopathic medicines due to their less toxic and cost effective nature.

*Eclipta alba* commonly known as False Daisy and bhringraj, is a plant belonging to the family Asteraceae. Bhrngaraja is equally useful in many diseases both, internally as well as externally. It is one of the best blood purifiers, stimulates the liver and alleviates the general oedema all over the body. *Eclipta alba* also has traditional external uses, like athlete foot, eczema and dermatitis, on the scalp to address hair loss and the leaves have been used in the treatment of scorpion stings. It is used as anti-venom against snakebite in China and Brazil.

*Piper longum* an important medicinal plant belonging to the family of Piperaceae also known as “Thippali” and used in traditional medicine by many people in Asia and Pacific islands especially in Indian system of medicine. *Piper longum* is a component of medicines reported as good remedy for treating gonorrhea, menstrual pain, tuberculosis, sleeping problems, respiratory tract infections, chronic gut related pain, and arthritic conditions.

Traditional system of medicine, which is the only accessible health care system for most of the population in rural areas, should be scientifically evaluated so as to improve the clinical efficacy and safety.
Both *E. alba* and *P. longum* have immense therapeutic properties especially for the treatment of liver related disorders. But the practice is only at the traditional level because of the lack of experimental proof to standardise the optimum dosage, efficacy and toxic effects.

The aim of the present study is to provide experimental proof for the hepatoprotective efficacy of the ethanolic extracts of *E. alba*, *P. longum* and the combined biherbal formulation made up of equal concentrations of *E. alba* and *P. longum*. Polyherbal formulations are considered more effective than the single drug and hence the biherbal formulation has been used in the study and compared with the individual plants *E. alba* and *P. longum*.

The present investigation has been divided into two parts

- The plants have been processed and screened for the phytochemicals and tested for free radical scavenging activities by using standard models *in vitro*.

- The evaluation of non toxic dosage of test drugs by acute and chronic toxicity in albino Wistar strain rat models according to OECD guidelines. After assessing the dosage by acute and chronic toxicity studies efficacy of the single and the biherbal drugs have been ascertained by using CCl$_4$ induced hepatotoxicity model in rats. The hepatoprotective nature of the drugs has been assessed by various biochemical estimations and histological observations. Rats treated with
standard drug silymarin have also been utilised in this study to compare the hepatoprotective efficacy of the test drugs.

The results of this study will throw more light on the mechanism of action of the test drugs, which is hidden so far due to the lack of experimental proof. It is sure that the outcome of this study will result in the identification of a new biherbal formulation, which can be used to treat liver disorders in future.
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