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Phytochemical investigation and *in vitro* antihepatotoxic activity of *Eclipta* Methanolic extract *of Prostrata (L.)L.*

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Abstract

Eclipta Prostrata (L.)L is medicinally important plant species to treat of different diseases such as hepatic diseases. The present work is aimed to screen this medicinal plant for phytochemicals.leaf, stem, flower and root of this plant were extracted in methanol solvents by sox let extraction and screened for secondary metabolites. The plant has been reported to contain alkaloids, steroids, polypeptides, phytosterols, β-amyrin, triterpenes, phenols, flavones, Luteolin, coumarin and wedelolactone. The study confirmed that *Eclipta Prostrata (L.)L* has good antihepatotoxic potential effects due to the presence of wedelolactone. Luteolin, coumarin using methanol extract.
Keywords: *Eclipta Prostrata (L.)L* – Anti-hepatotoxic activity, Luteolin, wedelolactone, coumarin

1. Introduction

The herb *Eclipta Prostrata (L.)L* (family, Asteraceae) is commonly known as Bhringaraja (Sanskrit),maka (Marathi))and Bhangra(Hindi)has been reported to show protective effect on experimental liver damage in rats[1].The plant grows commonly in moist places as a weed in warm temperate to tropical areas worldwide. It is widely distributed throughout India, china, Thailand and Brazil [2]. The whole plant has been reported for the treatment of liver cirrhosis and infective hepatitis. The plant is known to have some important pharmacological activities such as hepato protective, antimicrobial, analgesic, anti-inflammatory, and antiviral activity [3].

Eclipta Prostrata (L.)L has been used in traditional systems of medicine and also by traditional healers especially in south region of India for the treatment of liver diseases since ancient times [4].The Phytochemical screening is very important in identifying new sources of therapeutically and industrially important compounds like alkaloids, saponins, flavonoids, steroids, phenolic compounds, coumarin luteolin, wedelolactone, triterpenoids, proteins, aminoacids, reducing sugar etc [5]. The present study aimed to investigate the Phytochemical constituents present in the Methanolic extracts of *Eclipta Prostrata(L.)L* subjected to analyze the anti-hepatotoxic activity [6].

2. Materials & Methods

2.1 Collection and preparation of plant materials

Eclipta Prostrata (L.)L were collected from Trichy, Tamilnadu, India and confirmed by Dr. S. John Britto, The Rapinat Herbarium, ST. Joseph's college, Tiruchirappalli. The leaves were thoroughly washed thoroughly and the leaves were shade dried and coarsely powdered in a grinder [7].

2.2 Extract preparation

Shade dried powder was extracted with methanol (1:3w/v).Methanol extract was prepared by cold percolation and it is concentrated under reduced pressure using rotatary evaporator at 4°C. Finally crude extract was obtained. The crude extract was stored at 4°C until further use. [8]

3 Phytochemical screening

Phytochemical analysis of methanol extract of *Eclipta Prostrata (L.) L* was carried out qualitatively to test for the presence of phenols, alkaloids, proteins, amino acids, tannins, carbohydrates, flavonoids, Phytosterols, saponins etc. [9]

3.1. Detection of alkaloids

Extracts were dissolved individually in dilute hydrochloric acid and filtered. The filtrates were used to test for the presence of alkaloids.

(a) Mayer's test: Filtrates were treated with Mayer's reagent (Potassium mercuric iodide).Formation of a yellow color precipitate indicates the presence of alkaloids.

(b) Hager's test: Filtrates were treated with Hager's reagent (saturated picric acid solution).Formation of a yellow colored precipitate indicates the presence of alkaloids.

3.2. Detection of saponins

(a) Foam test: Small amount of extract was shaken with little quantity of water. If foam produced persists for ten minutes it indicates the presence of saponins.

3.3. Detection of carbohydrates

Extracts were dissolved individually in 5ml distilled water and filtered. The filtrates were used to test for the presence of carbohydrates.

(a) Benedict's test: Filtrates were treated with Benedict's reagent and heated on a waterbath.Formation of an orange red precipitate indicates the presence of reducing sugars.

(b) Molisch's test: Filtrates were treated with 2 drops of alcoholic α-napthol solution in a test tube and 2ml conc. sulphuric acid was added carefully along the sides of the test tube. Formation of violet ring at the junction indicates the presence of carbohydrates.

3.4. Detection of phytosterols

(a) Liebermann bur chard's test: Extracts were treated with chloroform and filtered. The filtrates were treated with few drops of acetic anhydride. Boiled and cooled. Conc. Sulphuric acid was added carefully along the sides of the test tube. Formation of brown ring at the junction indicates the presence of phytosterols.

3.5. Detection of flavonoids:

(a) Zinc hydrochloric acid reduction test: To the alcoholic solution of extracts, a pinch of Zinc dust and conc. HCl was added. Appearance of magenta color after few minutes indicates the presence of flavonoids.

(b) Alkaline reagent test: Extracts were treated with few drops of sodium hydroxide solution. Formation of intensive yellow colour, which becomes colorless of dilute acid, indicates the presence of flavonoids.

3.6. Detection of proteins and amino acids:

(a) Xanthoproteic acid test: The extracts were treated with few drops of conc. nitric acid solution. Formation of yellow color indicates the presence of proteins.

(b) Ninhydrin test: To the extracts were treated with 0. 25% ninhydrin reagent was added and boiled for few minutes. Formation of blue color indicates the presence of amino acids.

3.7. Detection of phenols

(a) Ferric chloride test: Extracts were treated with few drops of ferric chloride solution. Formation of bluish black color indicates the presence of phenols.

3.8. Detection of Tannins

(a) Gelatin test: To the extract, 1% gelatin solution containing sodium chloride was added. Formation of white precipitate indicates the presence of tannins.

3. Antihepatotoxic activity

The Phytochemical analysis of plants contains various pharmacological activities. Medicinal plants are important substances for the study of their traditional uses through the verification of pharmacological effects and can be natural composite sources that act as new ant infectious agents [10].

The liver reacts with eight different types of responses to injury towards variety of metabolic, toxic, and microbial Circulation and neoplastic insults. Damage from toxic or immunologic insult may cause hepatocytes to take on a swollen and edematous appearance (ballooning degeneration) with irregularly clumped cytoplasm and larger clear places. About 3000 materials from 2764 plant species have been screened for their pharmacological and antihepatotoxic properties. Methanol extracts of various parts of a plants analyzed by using chromatographic methods. The Phytochemical compounds are responsible for the treatment of antihepatotoxic effects by using the solvents of methanol.[11]

4. Results and discussion

The Phytochemical screening and the qualitative estimation of *Eclipta Prostrata (L.)L* showed that the leaves are rich in tannins, alkaloids, saponins, phenols, flavonoids, Coumestans and carbohydrates (Table-1) but the root does not contain alkaloids and carbohydrates. Protein and amino acids were contributed to the structure of living cells. Flavonoids and tannins have been reported to possess antioxidant, antihepatotoxic, antimicrobial and antitumor activities. The liver injuries can be induced by various hepatotoxins and it is observed from the elevated serum levels of hepato specific enzymes.

In the present study, different types of Phytochemical present in weed extract have been identified. Alkaloids may have anti-malaria, analgesic properties and can be used in the treatment of stomach cancer; Traditional reports on *Eclipta Prostrata (L.)L* indicates that it is one of the herbs used for treatment of stomach, digestive diseases and also skin diseases. The results from the current studies clearly shows that Phytochemical constituent such as wedelolactone could be the main constituent responsible for these treatments as it exhibited good activity against them. The *in-vitro* study mainly involved for the treatment of hepatotoxic activities from the extracts of leaves, stem and root.

Table-1: Phyto chemical constituents of *Eclipta Prostrata (L.)L* in various parts of a plant

S. No.	Phytochemical constituents	Natural plant extract		
		leaf	stem	root
1.	Alkaloids	+	+	-
2.	Saponins	+	+	+
3.	Carbohydrates	+	+	-
4.	Phytosterols	+	+	+
5.	Flavonoids	+	+	+
6.	Proteins and amino acids	+	+	+
7.	Phenols	+	+	+
8.	Tannins	+	+	+
9.	Coumestans	+	+	+

[+] →Indicates the presence of phytochemical constituents

[-] →Indicates the absence of phytochemical constituents

4. Conclusion

On the basis of our results of this study, it is concluded that the Methanolic extracts of Eclipta *Prostrata (L.)L* has the significant reaction in antihepatotoxic activity compared to other well characterized, standard. In addition, the antihepatotoxic activity may be due to the presence of Phyto chemicals such as flavonoids, alkaloids, tannins and phenols in weed extracts. The biochemical parameters indicated by increase in serum enzyme activities due to various hepatotoxins. It should be considered for the antihepatotoxic properties and also beneficial role in their prevention of human diseases by using Phytochemical compounds such as alkaloids. tannins, phenols, wedelolactone etc. The results obtained in the study indicated weed extracts are a potential source of natural Phytochemical constituents.

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