Phyto-chemical screening of *Eclipta alba*

**PREETI MISHRA** AND **SEEMA GUPTA**

**ABSTRACT**..... *Eclipta alba* is one of higher value herbs with long history of traditional and folk medicine for treatment of various ailments in many tropical and sub tropical countries. Preliminary qualitative phytochemical analysis of alcoholic and aqueous extracts of different plant parts *i.e.* leaf, stem and root were carried out by standard methods. Presence of alkaloid, saponin, tannin and phenol compound was observed in both the extracts of all plant parts. Flavonoid was noticed only in aqueous and alcoholic extracts of leaf and root. Terpenoid was present in aqueous extracts of leaf and stem whereas in alcoholic extracts of stem and root. Quinone was present only in aqueous leaf and alcoholic extracts of leaf, stem and root. Positive test for cardiac glycosides was noticed in aqueous extract of stem and root whereas only in alcoholic extract of root.

**KEY WORDS**..... *Eclipta alba*, Phytochemical constituents, Alcoholic, Aqueous extracts


**INTRODUCTION**..............................

Weeds are regarded as nuisance for crops but have potential to be used as raw material in the pharmaceutical industries as they yield phytochemicals, used in formulation of various drugs and important source of medicines. Medicinally important weed, *Eclipta alba* (Family - Asteraceae) commonly known as Bhringaraja, is considered as highly medicated plant in the Ayurvedic medicine, used as traditional medicine in many countries. The genus name comes from the Greek word meaning “Deficient” with reference to the absence of the bristles and awns on the fruits and the specific *Eclipta alba* means white which refers to the flower’s colour (Mithun *et al*., 2011). This annual herb is found very commonly in paddy growing areas of India. In Chhattisgarh, it is found as a wild plant growing popularly on the banks of paddy fields. Every part of this plant has some medicinal importance. It has been bestowed with the natural gift of a tonic. In Traditional Chinese Medicine, *Eclipta* is said to nourish yin, tonify the kidney and cool the blood. Arabian medicine also uses *Eclipta* known as “Kadim-el-bint” to support liver function. *Eclipta alba* is important plant of Ayurvedic matria media (Singh *et al*., 2010). Its pharmacological activities *viz.*, analgesic, antimicrobial, antiviral, antifungal, antinociceptive, anti-inflammatory, antioxidant, anti-hyperglycemic, hepatoprotective, immunomodulatory, hair growth and wound healing activities were summarized by Thorat *et al*. (2010) and Neeraja and Margaret (2012). Khan and Khan (2008) reported ethno medical uses of *Eclipta*.

In present study the phytochemical constituents of alcoholic and aqueous extracts of different plant parts of *Eclipta alba* has been investigated.

**RESEARCH METHODS**..............................

**Collection and identification of plant** :

The *Eclipta alba* is mostly grow in paddy fields during the rainy and summer season in Chhattisgarh state. This herb plant was identified in the Department of Medicinal and Aromatic Plants, Indira Gandhi Agricultural University, Raipur (C.G.). The mature plants (including roots) were collected from adjoining village area of Raipur city and washed thoroughly with running tap water then with deionized water. Different parts of the plant (leaf, stem and root) were removed separately and shade dried at room temperature for more than 15 days. The air dried plant parts were powdered.
Plant extraction:

Plant samples were extracted with two different solvents viz., alcohol and water by Soxhlet extractor was concentrated in the distillation flask with the help of water bath till semi solid phase was formed. This saturated paste was weighed and actual yield for alcoholic/aqueous extracted substance was estimated.

Phytochemical analysis:

Following tests were carried out in different plant extracts using standard procedures to identify the major groups of constituents.

Test for alkaloid:

1 ml of the extract was treated with few drops of dilute hydrochloric acid. A drop of Mayer’s reagents was added by the side of the test tube. A creamy or white precipitate indicated a positive reaction.

(Mayer’s reagent (Potassium mercuric iodide): 1.36 g of mercuric chloride was dissolved in 60 ml of distilled water 0.5 g of potassium iodide was dissolved separately in 10 ml of water. These two solutions were mixed and diluted to 100 ml with distilled water).

Test for saponin:

5 ml extract was diluted with distilled water. The suspension was shaken in a graduated cylinder for 15 min. 2 cm layer of foam indicates the presence of saponins (Evans, 1996).

Test for tannins:

20 mg of extract was boiled in 20 ml of distilled water in test tubes and filtered. 5 drops of 0.5 per cent ferric chloride was added to it. Brownish green or blue black coloration indicated presence of tannins.

Test for flavonoid:

To 5 ml of the diluted ammonia solution, 1 ml of the extract was added, followed by addition of 5 ml concentrated sulphuric acid. Appearance of yellow colouration that disappears on standing indicates the presence of flavonoids (Ayoola et al., 2008).

Test for terpenoid:

5 ml of the extract was mixed with 2 ml of chloroform. 2 ml of concentrated sulfuric acid was layered over it. A reddish brown colouration at the interface showed the presence of terpenoids (Ayoola et al., 2008).

Test for phenol:

The extract was spotted on a filter paper. A drop of phosphomolybdic acid was added to spot and then exposed to ammonia vapour. Appearance of blue colour on spot indicated the presence of phenol. In another test, one or two drops of neutral ferric chloride was added to the sample. Appearance of violet, blue or green colour indicated the presence of phenol (Sawhney et al., 2011).

Test for quinone:

A few drop of sodium hydroxide solution was mixed with the plant extract and shaken vigorously. A blue, green or red colour indicated the presence of quinone (Thenmozhi et al., 2011).

Test for cardiac glycosides:

5 ml of the plant extract was treated with 2 ml of glacial acetic acid containing a drop of ferric chloride solution. Then 1 ml of concentrated sulfuric acid was added. A brown ring at the interface indicates a deoxy sugar characteristic of cardio glycosides (Thenmozhi et al., 2011).

RESEARCH FINDINGS AND ANALYSIS...........

Phytochemical analysis of the extracts from leaf, stem and root of E. alba revealed the presence of alkaloids, saponins, tannins and phenolic compounds in all the extracts (Table 1). Flavonoids were found to be present in leaf and root extracts. Terpenoids were recorded in aqueous extract of leaf and stem and alcoholic extracts of stem and root. Quinones were noticed in alcoholic plant extracts whereas cardio-glycosides were present in root extracts with both the solvents.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Test</th>
<th>Plant extract (Aqueous)</th>
<th>Plant extract (Alcoholic)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Leaf</td>
<td>Stem</td>
</tr>
<tr>
<td>1.</td>
<td>Alkaloid</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>2.</td>
<td>Saponin</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>3.</td>
<td>Tannin</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>4.</td>
<td>Flavonoid</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>5.</td>
<td>Terpenoid</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>6.</td>
<td>Phenol compound</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>7.</td>
<td>Quinone</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>8.</td>
<td>Cardiac glycosides</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>

Several workers have reported the phytochemical screening of leaf extract only and very little information is available in this aspect with stem and root extract using aqueous and ethanolic extractants. The studies showed the absence of quinone in aqueous extract of stem and root however, showing presence in leaf extract. This might be due to its availability in different forms which showed poor solubility in aqueous extractant. Flavonoid and cardiac glycosides were not observed in ethanolic extract of stem.
Some minor flavonoids may have sparingly dissolved in ethanol. The aqueous extract of root showed negative result for terpenoid. On phytochemical screening of leaf of Eclipta alba using alcoholic and aqueous extractants, a sequence of compounds like alkaloid, saponin, tannin, flavonoid, terpanoid, phenol and quinone have been observed. These findings are in agreement with those of many researchers like Karthikumar et al. (2007) who noticed the presence of flavonoid in ethanolic and aqueous extract. Presence of alkaloid, flavonoids tannins and saponin were reported by Sharma and Sharma (2010). Similar results were also concluded the presence of alkaloid, flavonoid, saponin, tannin and sugar in aqueous extract of leaf of Eclipta prostrata (Dhandapani, 2007), saponin, flavonoid, terpanoids and tannin in aqueous extract of leaf of Eclipta prostrata (Khanna and Kannabiran, 2007), phenol and saponin in aqueous extract of leaf (Sagoo et al., 2010), alkaloid, flavonoid, saponin and tannins in aqueous extract of leaf (Singh et al., 2011), saponins, flavonoids, alkaloids, tannins and phenolics in ethanolic extract of Eclipta prostrata (Sharma et al., 2011), alkaloids, flavonoids and terpanoids in alcoholic and aqueous extract of leaf of Eclipta alba (Peraman et al., 2011).

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COOPTED AUTHORS’ –
SEEMAGUPTA, Department of Zoology, Government Nagarjun Post Graduate College of Science, RAIPUR (C.G.) INDIA

LITERATURE CITED..........................................


