SCREENING OF PHYTOCHEMICALS AND ANTIBACTERIAL EFFICACY OF ECLIPTA ALBA HASSAKS

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ABSTRACT
Plants possess non nutritive plant chemicals that contain protective disease preventing compounds against various microorganisms. Nowadays it becomes centre of attraction for the people in the health care profession and pharmaceutical industry. This study enlightened the presence and absence of some significant chemical compounds of Eclipta alba. The antimicrobial activity of the plant was also screened against some pathogenic bacteria and results were discussed.

KEYWORDS: Eclipta alba, Staphylococcus aureus, S. mutants. P.aeruginosa.

INTRODUCTION
Phytochemicals are non nutritive plant chemicals that contain protective, disease preventing compounds. They contain properties that aid the prevention of diseases like diabetes, cardiovascular disease, hypertension, cell damage, cancer etc. The traditional methods, especially the use of herbs still play a vital role to cover the basic health needs in the developing countries [¹]. A wide variety of plant compound derived from plants used in ethano-medicine has antimicrobial activity against various microorganisms [²]. In this present scenario of the emergence of multiple drug resistance to human pathogenic organisms, this has necessitated a search for new antimicrobial substances from plants in our surroundings.

Staphylococcus aureus causes significant infections in human like diarrhoea, nausea, vomiting, cramps, abdominal discomforts, shock hypertension, headache and sunburn like
rash that leads to peeling of the skin especially on the hands and feet \cite{6}. *Streptococcus mutants* is implicated as causative agent of dental caries.

*Pseudomonas spp.* Plays a vital role in nosocomial infection. It gains entry into host through the burns and 80% of this infections leads to death. In normal cases, it causes skin disorders.

**MATERIALS AND METHODS**

**Plant materials**

For the preliminary screening work, the herb *Eclipta alba* Hassak were collected from roadsides and fields.

**Bacterial strains**

The pure culture of *Staphylococcus aureus*, *Streptococcus mutant* and *Pseudomonas aeruginosa* were obtained from Sea Horse Hospital, Tiruchirappalli.

**Preparation of culture media**

The medium used for the antibacterial activity was Muller Hinton Agar, Beef extract 2 g; Casein acid hydrolyslate 17.5 g, Starch 1.7g, Agar 17g, Distilled water 1000ml, pH 7.4±0.2.

**ANTIBACTERIAL SENSITIVITY TEST**

**Kirby Bauer Method**

The leaves of *Eclipta alba* were thoroughly washed under tap water followed by washing with distilled water. They are surface sterilized using 0.1% Hgcl2 solution and subsequently washed with distilled water, 2-3 times prior to use. After surface sterilization, leaves were crushed with pestle and mortar using distilled water.

Sterile discs of 0.5 cm diameter were soaked separately in 1 ml aqueous extracts of 50% concentration for 1 hour. They well allowed to dry for 30 minutes under aseptic condition. The paper discs prepared were placed equidistantly on inoculated plates. Paper discs soaked with the extract were placed in plates were incubated at 30\(^{0}\)C for 24 hours and the zone of inhibition was recorded.

**Preliminary screening of Phytochemicals**

The plant *Eclipta alba* were collected from field, wasteland and roadside and were used for preliminary screening of secondary metabolites. Test 1-8 indicated in table – 2 were carried
out with fresh materials consisting of stem, leaves and flowers, while test 1-8 indicated in table -3 were carried out using 80% ethanolic extract \(^{[3,4]}\).

**RESULT AND DISCUSSION**

The results of phytochemical analysis of *Eclipta alba* were presented in the table 2 and 3. From the tables it is clear that *Eclipta alba* posses carbohydrates, flavonoids, lignin, terpenoids, steroids and phenols. Cyanogenic glycosides, saponins, syringaldehyde and tannins are absent. From the above results, it is evident that the plant E. Alba posses various secondary plant products which could be utilized for the benefit of mankind.

The leaf extract *E.alba* proved inhibitory to human pathogenic organism *Staphylococcus aureus*, *Streptococcus mutans* and *Pseudomonas aeruginosa* (Table -1).

The leaf extract of *E. Alba* showed 30 mm, 27mm and 23 mm diameter of zone of inhibition at 50% concentration against *Staphylococcus aureus*, *Streptococcus mutant* and *Pseudomonas aeroginosa* respectively.

The results revealed that the above mentioned leaves possess antibacterial potential against the selected human pathogens \(^{[5]}\) reported that Ocimum sanctum and *Eclipta alba* showed antibacterial activity against *S. aureus*.

**Table: 1 Effect of leaf extract of *Eclipta alba* against some pathogens**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of Organisms</th>
<th>Zone of inhibition at various concentration (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>10%</td>
</tr>
<tr>
<td>1</td>
<td><em>Streptococcus aureus</em></td>
<td>8±1.8</td>
</tr>
<tr>
<td>2</td>
<td><em>Staphylococcus mutans</em></td>
<td>9±2.1</td>
</tr>
<tr>
<td>3</td>
<td><em>Pseudomonas aureogin</em></td>
<td>7±2.2</td>
</tr>
</tbody>
</table>

**Table: 2 Preliminary screening of phytochemicals by using fresh materials**

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name of the plant</th>
<th>Test with fresh material</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td><em>Eclipta alba</em></td>
<td>-</td>
</tr>
</tbody>
</table>


+ Positive

- Negative
Table: 3 Preliminary screening of Phytochemicals by using Ethanol extracts

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name of the plant</th>
<th>Test with Ethanol extract</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Eclipta alba</em></td>
<td>1 2 3 4 5 6 7 8</td>
</tr>
</tbody>
</table>


+ Positive  - Negative

Hence the plant medicine may be used in the place of modern medicine. Since these possess enough antibacterial activities. More research is needed to design and pattern these medicines of herbal origin. So, it is in our hands to conserve and utilize these valuable plants for the betterment of humans.

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REFERENCE