PRELIMINARY PHYTOCHEMICAL STUDIES OF LANTANA ACULEATA ROOTS

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ABSTRACT

Lantana aculeata, a sprawling weed belongs to the Verbenaceae family available in plenty in many parts of the Indian Subcontinent and is known for its variety of biological uses due to the presence of various phytocomponents. The roots of the plant in general contain a plethora of active compounds with varied chemical structures. Mature roots extracts have been chosen for the present phytochemical investigation as no study on this part was reported so far.
KEY WORDS

*Lantana aculeata*, Verbenaceae, Phytochemical analysis.

INTRODUCTION

Plants contain a wide variety of chemical compounds broadly classified as primary metabolites, secondary metabolites and semantides. Primary metabolites are parts of vital metabolic pathways and most of them are of universal occurrence, which include starch, cellulose, carbohydrates, etc. Secondary metabolites such as alkaloids, steroids, terpenoids, flavonoids, quinonoids, etc. that is responsible for a wide variety of biological activities of the plant. Their isolation, structural elucidation and studies on their biological activities form the basis for drug discovery programmes. Semantides are the information carrying molecules (DNA is a primary semantide, RNA is a secondary semantide and proteins are tertiary semantides). The plant kingdom represents an extraordinary resource of organic compounds. However, only few plants have been investigated chemically. The rapid disappearance of tropical forests has meant that it is essential to have access to methods which lead to the rapid isolation and identification of bioactive natural products and also minimize the amount of plant material used in a phytochemical study\(^1\). Research on bioactive constituents of the extract or pure natural products for biomedical applications has been extremely useful to design new drugs. *Lantana aculeata*, an indigenous weed, finds a conspicuous place in the list of medicinal plants\(^2\). Various parts of this taxon are attributed with medicinal properties\(^3\). The roots are used in the treatment of malaria, rheumatism and skin rashes\(^4\). In view of this, it is essential to have efficient systems available for the rapid chemical screening of the plant extracts selected for investigation.

MATERIALS AND METHODS

**Plant Material:**

Mature roots of *Lantana aculeata* (Verbenaceae) were collected during the month of October – November from Puducherry (India). The plant materials was identified and authenticated by Dr. P. Jayaraman, Director, Plant Anatomy Research Centre, Medicinal Plant Research Unit, Chennai (India). A voucher specimen of both has been deposited for future reference (No. PARC/2006/8).

**Preparation of Extract:**

The roots were chopped into small pieces, shade dried and coarsely powdered. About 1-5 gram of each was extracted with n-hexane, ethyl acetate, chloroform, acetone and ethanol at room temperature; after 72 hours, the solvents were decanted. Further concentrations were done in vaccum under reduced pressure using rotary flash evaporator and finally dried in dessicator.

**Phytochemical Screening:**

The various phytoconstituents present in roots of *Lantana aculeata* were detected by their respective chemical tests using the appropriate extracts\(^5-10\).
RESULTS

The phytoconstituents in the roots of *Lantana aculeata* were recorded (Table 1).

### Table 1

*Phytochemical Screeening of Lantana aculeata roots*

<table>
<thead>
<tr>
<th>Phytoconstituent</th>
<th>Test</th>
<th>n-hexane</th>
<th>Ethyl acetate</th>
<th>Chloroform</th>
<th>Acetone</th>
<th>Ethanol</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alkaloids</strong></td>
<td>Dragendroff’s test</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td></td>
<td>Hager’s test</td>
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<tr>
<td></td>
<td>Wagner’s test</td>
<td>-</td>
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</tr>
<tr>
<td></td>
<td>Mayer’s test</td>
<td>-</td>
<td>-</td>
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<tr>
<td><strong>Sterols</strong></td>
<td>Salkowski test</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Triterpenoids</strong></td>
<td>Libermann-Buchardt</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td><strong>Phenolics</strong></td>
<td>Ferric chloride test</td>
<td>-</td>
<td>-</td>
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<tr>
<td></td>
<td>Folin ciocalteu test</td>
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<tr>
<td><strong>Flavonoids</strong></td>
<td>Shinoda test</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lead acetate test</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td><strong>Glycosides</strong></td>
<td>Baljet test</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
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<tr>
<td></td>
<td>Keller Killiani test</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td><strong>Anthraquinone</strong></td>
<td>Borntrager test</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td><strong>Tannins</strong></td>
<td>Lead acetate test</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
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</tr>
</tbody>
</table>

*Present; - Absent*

DISCUSSION

*Lantana aculeata* is a pan-tropical weed bounty in vast areas of the country\(^1\). It was thought worth while to investigate the roots scientifically. As no detailed work has been done on root, it has been envisaged to consider it for the study. The chemical profile of the plant material served as diagnostic tool in correct identification. The colour tests on the root extract showed the presence of terpenoids, phenols, flavonoids and glycosides as some of its secondary metabolites and indicated that the roots of *Lantana aculeata* possessed plethora of active compounds, an important target for new pharmacological tests. Hence it can be concluded that chemical screening provides important information about the plant constituents and will be a sufficient condition for the discovery of potent new drugs.

ACKNOWLEDGEMENTS

The authors acknowledge the Management, Post Graduate and Research Department of Zoology of the New College, Chennai (India).

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