PHARMACOGNOSTIC STUDIES ON ROOTS OF TRIANTHEMA DECANDRA LINN. AIZOACEAE

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- Trianthema decandra root, Pharmacognostic study, Phytochemical screening, Standardization

ABSTRACT: Trianthema decandra Linn., belongs to family Aizoaceae, commonly known as “Punarnavi” in Sanskrit, “Gadabandi” in Hindi, and “Vellai sharuni” in Tamil. This plant is globally distributed tropical and subtropical regions. In India, it grows in dry-soil lands. It has been known since ancient times for curative properties and has been utilized for treatment of various ailments such as burns and wounds. The roots are aperients and said to be useful in hepatitis, asthma, and suppression of the menses. A decoction of the root-bark is given as an aperients. The juice of the leaves dropped into the nostrils relieves one-sided headache. 1 In the present investigation, the detailed Pharmacognostic study of Trianthema decandra root is carried out to lay down the standards, which could be useful in future Forensic identification of unknown plant material. Results: The study includes macroscopic, microscopic, preliminary phytochemical screening and physicochemical evaluation. The objective this was to characterize the unknown plant material. Conclusion: In recent years there has been a rapid increase in the standardization of selected medicinal plant of potential therapeutic significance. Despite the modern techniques, identification of plant drug by Pharmacognostic study is more reliable.

INTRODUCTION: Trianthema decandra Linn. commonly known as Gadabani and vellai sharuni, belonging to family Aizoaceae is considered as a weed herb plant small evergreen tree found in tropical and sub-tropical parts of India. 2 Stems are elongate, prostrate, not much branched, angular striate, and glabrous. Leaves subfleshy, 2-3.8 by 0.6- 1.6 cm, the opposite pairs somewhat unequal, elliptic-oblong, rounded and usually apires late at the apex; petioles 6-13 mm. long puberulous much dilated and amplexicaul at the base, but not enclosing the flowers.

Flowers in dense axillary subumellated clusters; peduncles and pedicels very short, bracteoles thinly membranous. Calyx 4 mm. long, tube very short, lobes much longer than the tube, oblong, obtuse, with scarinium margins and with a distinct long apiculation at the back below the apex. Stamens 10. Styles 2.
Capsules not enclosed in the tube of the calyx, 4-seeded, the cap very truncate, 3 mm long, solid, subcylindrical with a narrow acute rim round its base, carrying away 2 seeds. Sedds orbicular-reniform, striate, black.

In the traditional Indian system of medicine, the Ayurveda and various folk system of medicine, Trianthema decandra possess several medicinal properties such as toothache, analgesic, anti-inflammatory, anti-diabetic and other skin disorders etc. Chemical studies have shown that, the presence of Carbohydrates, Alkaloids, Steroids, Tannins, Fats, Oils and Saponins.

The current article describes some pharmacognostical, physicochemical and phytochemical characteristics studied. The primary objective of this study is to supplement valuable information with regards to its identification, Characterization, and standardization of plant Trianthema decandra Linn.

**MATERIAL AND METHODS:**
**Collection of Sample:** The fresh plant parts of Trianthema decandra was collected and authenticated by Dr. K. Madhava Shatty, Assitant Professor, Dept. of Botany, S. V. University, Tirupathi, A. P. The plant herbarium was prepared (PRIP-01/13) and deposited in the Department of Pharmacognosy, Pulla Reddy Institute of Pharmacy for further reference. The fresh root parts were used for the study of macroscopical and microscopical characters; whereas the dried root powder was used for determination of powder microscopy and phytochemical analysis.

**RESULTS AND DISCUSSION:**
**Macroscopic Description:**
Determination of Powder Characteristics: 
**Phytochemical Investigations:** The qualitative chemical tests carried out for the identification of the different phytoconstituents present in the powdered crude drug by using methods of Kokate (1996) and Khandelwal (2005).
Trianthema decandra is a prostrate weed with branches up to 2 m long, distributed in the tropical & sub-tropical regions of the world. The macromorphological evolution of Roots showed thin, slender, tapering, and tortuous, with lateral branching fibrous root, 4-12 cm in length; 0.2-1.8 cm in diameter, light yellow externally, creamish white internally, fractures fibrous. Odour is strong & characteristic, and the taste is bitter & disagreeable.
Determination of Powder Characteristics:
Powder Microscopy: The microscopic examination of the powder shows fragments of the fibrous layer, Root hairs, Epidermal cells, Sclerenchyma, Xylem vessels, cortex, Parenchymatous mass, Calcium oxalate crystals, Phloem fibers, and other cell contents Fig. 9.

![Microscopy Images](image1.jpg)

FIG. 8: POWDER MICROSCOPY

Phytochemical Evaluation: The results of the physicochemical constants of raw material lie within the limit which is mentioned in Table 1. This signifies that the quality and purity of raw material was good enough.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Results</th>
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<tbody>
<tr>
<td>Total Ash</td>
<td>5.5%</td>
</tr>
<tr>
<td>Acid-insoluble Ash</td>
<td>0.8%</td>
</tr>
<tr>
<td>Water Soluble Ash</td>
<td>2.5%</td>
</tr>
<tr>
<td>Sulfated ash</td>
<td>1%</td>
</tr>
<tr>
<td>Alcohol Soluble Extractive</td>
<td>2.8%</td>
</tr>
<tr>
<td>Water Soluble Extractive</td>
<td>2.32%</td>
</tr>
<tr>
<td>Loos on drying</td>
<td>8.25%</td>
</tr>
<tr>
<td>Crude Fibre Content</td>
<td>0.5%</td>
</tr>
</tbody>
</table>

TABLE 1: PHYSICOCHEMICAL ANALYSIS

Phytochemical Investigations: The crude extracts obtained from the pilot scale extraction were subjected to Phytochemical screening; the results show the presence of Carbohydrates, Glycosides, Flavonoids, Alkaloids, Steroids, Saponins, etc. Table 2.
Fluorescence Analysis: The results of fluorescence analysis were expressed in Table 3. Fluorescence study is an essential parameter for the first line standardization of crude drug. In fluorescence, the fluorescent light is always of greater wavelength than the exciting light. Light rich in short wavelength is very active in producing fluorescence, and for this reason, UV light produces fluorescence in many substances which do not contain visible fluorescence in daylight.

<table>
<thead>
<tr>
<th>S. no.</th>
<th>Constituents</th>
<th>Pet. Ether</th>
<th>Chloroform</th>
<th>Acetone</th>
<th>Methanol</th>
<th>Ethanol</th>
<th>Aqueous</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Carbohydrates</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>2</td>
<td>Glycosides</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Flavonoids</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Alkaloids</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Steroids</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>Fats and oils</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>Saponins</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

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CONFLICT OF INTEREST: Nil

REFERENCES:
