Antibacterial activity of water extract and active constituents were isolated of butanol from a *Triumfetta rhomboidea* and analytical study by HPLC

Prasad Ekanath Funde

*Department of Drug Chemistry, S.M.B.S.T College Arts, Science and Commerce Sangamner Dist. Ahmednagar, Maharashtra, India*

**ABSTRACT**

The purpose of this study was investigating experimentally the possible Antibacterial Activity of Water Extract and Active constituents were Isolated of Butanol from a *Triumfetta rhomboidea* and Analytical Study by HPLC Method. The Antibacterial activity of the Water Extract of *Triumfetta rhomboidea* was evaluated at two different concentrations by the diffusion method. The water Extract of the *Triumfetta rhomboidea* shows antibacterial activity at varies levels in *The E. coli*, *S. aureus*, *B. cereus* Bacteria. The Bacteria *B. cereus* was found to be more active and *E. coli*, *S. aureus* was found to be less active in inhibition zone. Antibacterial activity of water extract of the plant was performed. Results exhibited that *Triumfetta rhomboidea* contain good Antibacterial action and Active constituents were Isolated of Butanol.

**Key words:** *Triumfetta rhomboidea*, HPLC Chromatography, Analytical study, Butanol, *E. coli*, *S. aureus*, *B. cereus*.

**INTRODUCTION**

Important role in ancient therapy. Various parts of the plant used therapeutically are fruits, flowers,[4] leaves, barks and root. Root is tonic styptic, galactogogue, aphrodisiac, cooling, useful in dysentry and as diuretic. Pounded roots are given in the treatment of Intestinal ulcer. Leaves, Flowers and Fruits are mucilaginous demulcent, astringent, and also used in gonorrhoea and against leprosy.[4]

There are numerous Traditional Medicines are Complementary and Alternative Medicines (CAM) of Herbal Origin, used all over India. According to WHO survey up to 70% of the population of Developing Countries utilize TM/CAM for their primary health care needs, with
advantages such as Affordability, Low technology solutions, Few reported adverse effects, Cultural acceptance and Availability.[7]

These medicines are practiced in Rural and Adivasi Communities of Maharashtra for centuries together. These Medicines are free from side-effects and cheap compared to Allopathic Medicines. But still common people /educated people do not use them, as they are prepared and practiced by the Traditional Medical Practitioners (Vaidyas, Babas and Maharajas),[17-18-19] who are not trained by recognized medical Authorities and are not STANDARDIZED[2]

There are many Institutions abroad, taking keen interest in Herbal Medicines of India origin. If the Traditional Medicines are not properly taken care of, it is cock sure that these valuable medicines will vanish along with their practitioners and the foreign investigators will have the Patents [25]for the same in near future.

In order to get rid of above mentioned problems, the present work is undertaken. Triumfetta rhomboidea plant is native of Western Ghats. The Common name: Burr Bush, Chinese Burr, Diamond Burrbark, Chiriyari (Hindi), Thinjhira (Marathi), Ottu Pullu (Tamil), Bankathuthara (Telugu), Bon okhra (Bengali), Kadu bende (Kannada), Agra (Assamese)

**Botanical name:** Triumfetta rhomboidea **Family:** Tiliaceae (phalsa family) Erect, woody herb or shrub 75-150 cm in height. Stems glabrous, longitudinally grooved. Leaves simple, alternate; blade ovate to rhomboid in shape with 3-5 lobes, sometimes nearly as wide as broad, and 2-10 cm long. Leaf margins irregularly serrate, leaf surfaces softly-pubescent with stellate...
hairs, blade palmately veined. Flowers small yellow clustered, clustered on the leaf axils. Five yellow, obovate petals about 5 mm long. Stamens 10-15. Fruit a subglobose bur with the body 3-4 mm in diameter, covered with 75-100 hooked spines 1.0 to 1.5 mm long.

The *Triumfetta rhomboidea* for extractive values, ash values, pH refractive Index and separation of total extractive into acids and neutrals. The Antibacterial activity of water extract of the plant was performed. Results exhibited that *Triumfetta rhomboidea* contain good antibacterial action and Active constituents were Isolated of Butanol.

**MATERIALS AND METHODS**

**Collection of plant material**
Fresh green plant of *Triumfetta rhomboidea* were obtained from the plants grown in Sangamner College Dist. Ahmednagar,Maharashtra,India and the fresh green plant of *Triumfetta*
**Preparation of extract**

The powder prepared from shade dried plant was extracted directly with water using Soxhlet extractor as per the procedure standardized. Methanol was used in the present study. The extracts were stored in desiccators until further use.

**HPLC chromatography analysis**

HPLC was applied for testing the presence of number of organic compounds available of Water extract of *Triumfetta rhomboidea* and this water extract Active constituents were Isolated of Butanol from Water extract. One of the major organic components with 100 % and 4.428 retention time may have detected.

**Method**

**Antibacterial Activity**

In the present research work, the antibacterial activity [13-14] spectrum of water extract of *Triumfetta rhomboidea* was analyzed. (Table-1) Two Gram-positive bacteria, *Staphylococcus aureus*, *Bacillus cereus* and One Gram negative bacteria *Escherichia coli* were used. Inoculum size was adjusted to 1 to 2 × 10^7 CFU (Colony Forming Units)/ml by serial dilution with sterilized nutrient broth media. Nutrient agar (pH 7.2-7.4) was used for routine susceptibility testing of nonfastidious bacteria. Stock solution of 10000 µg/ml was prepared in 20 % v/v water in DMSO. Using the stock solution, 6000 µg/ml, 4000 µg/ml, 2000 µg/ml and 1500 µg/ml solutions were prepared from which 100 µl solution was taken for assay. Ciprofloxacin was used as a standard. 20 % v/v WFI in DMSO was used as a control. Antibacterial assay was carried out by agar Well Diffusion Method. [1-3] After 16 to 18 hours of incubation, each plate is examined.

**RESULTS AND DISCUSSION**

The results of preliminary evaluation showed that the Antibacterial activity of the water Extract of *Triumfetta rhomboidea* was evaluated at two different concentrations by the diffusion method. The water Extract of the *Triumfetta rhomboidea* shows antibacterial activity at varied levels in The *E. coli*, *S. aureus*, *B. cereus* Bacteria. The Bacteria *B. cereus* was found to be more active and *E. coli*, *S. aureus* was found to be less active in inhibition zone. Antibacterial activity of water extract of the plant was performed.
Table I. Zone of inhibition of different concentration of Water extract of *Triumfetta rhomboidea* by the diffusion method

<table>
<thead>
<tr>
<th>Bacteria</th>
<th>Inhibition Zone</th>
<th>Reference substance</th>
<th>Water extract</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>150 µg/ well</td>
</tr>
<tr>
<td><em>E. coli</em></td>
<td>35.60 ± 0.53</td>
<td>1.50 ± 0.10</td>
<td>2.60 ± 0.10</td>
</tr>
<tr>
<td><em>S. aureus</em></td>
<td>39.10 ±0.95</td>
<td>12.10± 0.85</td>
<td>24.33±0.59</td>
</tr>
<tr>
<td><em>B. cereus</em></td>
<td>36.67 ± 0.61</td>
<td>12.30± 0.30</td>
<td>26.32 ± 1.08</td>
</tr>
</tbody>
</table>

Table II The water extract of *Triumfetta rhomboidea* for extractive values, ash values, Ph, refractive index and separation of total extractive into acids and neutrals

<table>
<thead>
<tr>
<th>Sr.No</th>
<th>Parameter</th>
<th>Standard Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Total Ash</td>
<td>0.25±0.05%</td>
</tr>
<tr>
<td>2</td>
<td>Total dissolved solids</td>
<td>22±2%</td>
</tr>
<tr>
<td>3</td>
<td>Total Acids</td>
<td>90±1%</td>
</tr>
<tr>
<td>4</td>
<td>Total neutrals</td>
<td>9±1%</td>
</tr>
<tr>
<td>5</td>
<td>Refractive Index</td>
<td>1.395</td>
</tr>
<tr>
<td>6</td>
<td>pH (Extract)</td>
<td>5.9</td>
</tr>
</tbody>
</table>

HPLC chromatography analysis spectrum of Active constituents were Isolated of Butanol from Water extract of *Triumfetta rhomboidea*

HPLC was applied for testing the presence of number of organic compounds available of Water extract of *Triumfetta rhomboidea* and this water extract Active constituents were Isolated of Butanol from Water extract. One of the major organic components with 100 % and 4.428 retention time may have detected.
Analytical study suggests that water extract contain various constituents which are given in the table 2. Preparative HPLC study revealed presence only one constituents were isolated of Butanol from water extract of *Triumfetta rhomboidea* and further investigations are in progress in the laboratory to identify the active structure and synthesis for application of this compound. The results concluded showed that the water extract of *Triumfetta rhomboidea* posses good antibacterial activity and only one constituents were isolated of Butanol from water extract of *Triumfetta rhomboidea*.

**REFERENCES**