Antipyretic Activity of JURU-01 - a Polyherbal Formulation

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Abstract: The antipyretic activity of JU-RU-01, a polyherbal formulation was evaluated in Brewers Yeast induced pyrexia in Wistar rats. The formulation (150 and 300 mg/kg) showed very significant reduction of yeast induced pyrexia in rats with respect to control group. The antipyretic activity of the extract was comparable to the standard prototype, paracetamol.

Key words: JU-RU-01, Polyherbal formulation, Antipyretic activity

INTRODUCTION

JU-RU-01 is a poly herbal formulation that contains Adhathoda vasica Nees. Syn. A. zeylanica, Andrographis paniculata Nees. and Moringa oliefera Lam. Syn. M. pterygosperma Gaertn. The leaves and roots of A. vasica are used in bronchitis, cough, asthma, the leaves are used in rheumatism. A. paniculata is used as a tonic. It is useful in debility, dysentery and dyspepsia. The infusion of this plant is used in fever. The bark of M. oliefera acts as abortifacient, the oil from the seeds are used as external application in rheumatism [1,2]. In the different formulations used by different herbal practitioners, these plants were the chief ingredients to treat arthritis and the related pyrexia. The herbalists used to prescribe their formulations to be orally taken in the form of tablet or applied topically and it was claimed by the people to be cured safely. This impressive demonstration of efficacy necessitated this preliminary investigation whose objective is to prepare formulation (JU-RU-01) and verify the same for its anti pyretic activity in animal models.

MATERIALS AND METHODS

Preparation of Poly Herbal Formulation: Ingredients of JU-RU-01: Andrographis paniculata (leaves), Adhathoda vasica (leaves) and Moringa oliefera (bark) were collected from Ranchi, Jharkhand, India. These plants were identified and authenticated by taxonomists of Department of Botany, Ranchi University, Ranchi. The voucher specimen was deposited in University. The powdered materials were taken in the following proportion: Andrographis paniculata (100g), Adhathoda vasica (50g) and Moringa oliefera (100g). All the powdered materials were mixed thoroughly and were extracted through cold maceration in 70 percent ethanolic extract by keeping it overnight. The extracts were concentrated under reduced pressure and controlled temperature (40-50°C) using a rotary vacuum evaporator (Superfit™, India). The extract obtained was dark brown semi solid. It was preserved in refrigerator and used further for experimental studies by making a suspension in 2% aqueous Tween 80 solution in specific doses.

Animals: Albino rats (wistar strain) of either sex weighing 160-200 g were used in the study. The animals were kept in polypropylene cages and maintained by providing balanced food and water ad libitum. Experiments were performed complied with the rulings of the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA) New Delhi, India and the study was permitted by the institutional ethical committee of the Jadavpur University, Kolkata, India.

Antipyretic Evaluation: The antipyretic activity of JU-RU-01 was evaluated using Brewer’s yeast induced pyrexia in rats [3,4]. Fever was induced by subcutaneous injecting 20 ml/kg i of 20 percent aqueous suspension of Brewer’s
Table 1: Effect of JU-RU-01 on Brewer’s Yeast induced pyrexia in Rats

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose (mg/kg)</th>
<th>18 hr after yeast injection</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>2 ml/kg</td>
<td>36.1±0.07</td>
<td>36.4±0.04</td>
<td>36.4±0.19</td>
<td>36.6±0.02</td>
<td>35.8±0.03</td>
<td>36.0±0.04</td>
<td>35.7±0.02</td>
</tr>
<tr>
<td>JU-RU-01</td>
<td>150</td>
<td>35.8±0.03</td>
<td>36.2±0.03</td>
<td>36.0±0.10***</td>
<td>36.9±0.08*</td>
<td>36.4±0.03**</td>
<td>36.0±0.14</td>
<td>36.3±0.11*</td>
</tr>
<tr>
<td></td>
<td>300</td>
<td>35.4±0.02</td>
<td>35.5±0.12</td>
<td>35.5±0.08*</td>
<td>35.5±0.05*</td>
<td>35.8±0.01***</td>
<td>35.5±0.11*</td>
<td>35.2±0.20***</td>
</tr>
<tr>
<td>Paracetamol</td>
<td>150</td>
<td>36.4±0.04</td>
<td>36.7±0.05</td>
<td>36.9±0.03*</td>
<td>36.0±0.08*</td>
<td>35.4±0.11**</td>
<td>35.5±0.1*</td>
<td>35.6±0.07</td>
</tr>
</tbody>
</table>

Values are expressed as mean ± SEM (n=6). Control 2% aqueous Tween 80 Solution; JU-RU-01, polyherbal formulation containing hydroalcoholic (70%) extract of *Adhatoda vasica*, *Andrographis paniculata* and *Moringa oleifera*

DISCUSSION

JU-RU-01 is an ethanol extract developed to have therapeutic effects in antipyretic activity, or in the disease associated with increase in temperature. One such disease is arthritis, which includes cartilage destruction with increase in temperature surrounding the joints and sometimes-whole body. The herbs used in the preparation of JU-RU-01 have been used for hundreds of years and their safety and efficacy are well established through a long history of human use. The scientific research of these plants is currently more focussed on the identification, isolation and characterization of active principle(s) from crude extracts. The fact that strong synergism of several constituents in the crude drug may prove more potent and effective than any single purified compound is always overlooked. Moreover, this may help to nullify the toxic effects (if any) of individual constituents [5,6]. Taking consideration of these facts, a polyherbal formulation JU-RU-01 was prepared. The herbal drugs *Andrographis paniculata* and *Moringa oleifera* were the major constituent where as *Adhthoda vasica* was the supportive drug being less in quantity than those. *A. paniculata* is mainly used for liver disorder, jaundice, fever, dispepsia etc. A large number of pharmacological activities have been reported from these plants [7]. *M. oleifera* is being popularly used for the treatment of rheumatoid arthritis traditionally in Nigeria [6] and India. Whereas the anti-inflammatory activity of the root was reported [7]. This plant has also been used for the study of anti-fertility study i.e. the changes in biochemical and physiological alterations in female reproductive organs [8-9]. The last plant (*Adhthoda vasica*) is a popular plant in traditional Indian system of medicine. It has been used for various ailments like oxytocic, abortifacient and respiratory disorder in particular. A critical review of this plant has been published earlier regarding the traditional use,
ethnopharmacology and toxicological studies. The major chemical constituent of *A. paniculata* among diterpenes are andrographolide (major component), deoxyandrographolide. Among flavonoids 5-hydroxy-2′, 7,8′-trimethoxyflavone, 2′, 5-dihydroxy-7,8-dimethoxyflavone are few to name [10]. Very less information is available about the chemical constituents of *M. oleifera* particularly of bark. Alkaloid vasicine is the major chemical constituents of *A. vasica*.

It may be concluded that the antipyretic activity JU-RU-01 is due the combined effect of these active constituents. The formulation is prepared keeping in view to develop a potent anti arthritic agent, so it is screened initially for yeast induced pyrexia which is found effective and the other relevant activities like analgesic, anti-inflammatory and finally anti arthritic were under process in our laboratory, further standardization of the formulation, which is in process in our laboratory is required to establish it as a potent herbal anti arthritic agent.

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REFERENCES