INVESTIGATION OF IN-VITRO ANTI-ARTHRTIC ACTIVITY OF ABUTILON MUTICUM

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ABSTRACT
The various extracts of Abutilon muticum were investigated for its anti-arthritis activity in male albino rats. The evaluation of anti-arthritis activity was carried out using cotton pellet granuloma method and Freund’s adjuvant induced arthritis model. Prednisolone (5 mg/kg bw) was used as a standard drug. The methanolic extract of Abutilon muticum exhibited significant anti-arthritis activity as compared to other extracts. The doses of 200 mg/kg bw of the methanolic extract of Abutilon muticum, in chronic model of granuloma pouch in rats produced 51.0% and in arthritis model produced 46.0% inhibition respectively with that of the standard drug Prednisolone (5 mg/kg) which produced 59% and 61% inhibition.

KEYWORDS: Abutilon muticum, Anti-arthritic, cotton pellet granuloma, Freund’s adjuvant.
ANIMALS:
Experiments were performed on albino rats of either sex (Wistar strain) weighing about 120-160 g, divided into groups of six each. Test drug was freshly prepared as a fine homogenized suspension in tween-80 (2%w/v). Indomethacin (10 mg/kg bw) was used as a standard drug. All the animals were approved by the ethics committee of the institute.

COTTON PELLET GRANULOMA IN RATS:
Autoclaved cotton pellets 50±1 mg was implanted subcutaneously by incision on the back under ether anaesthesia. Drugs were administered orally for 7 days. Animals were killed on day 7 and the granuloma was dissected out, dried in an oven at 60°C and weighed to determine the percent inhibition of granuloma (Table 1).

Table 1: Effect of various extracts of *Abutilon muticum* in Cotton pellet granuloma model.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Cotton pellet granuloma</th>
<th>Percent inhibition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control tween-80 (2%)</td>
<td>192.15±1.11</td>
<td>-</td>
</tr>
<tr>
<td>Prednisolone (5 mg/kg)</td>
<td>81.26±1.55#</td>
<td>59</td>
</tr>
<tr>
<td>PE extract (200 mg/kg)</td>
<td>109.47±2.16#</td>
<td>44</td>
</tr>
<tr>
<td>DE extract (200 mg/kg)</td>
<td>119.33±2.85#</td>
<td>40</td>
</tr>
<tr>
<td>EA extract (200 mg/kg)</td>
<td>123.67±2.10#</td>
<td>37</td>
</tr>
<tr>
<td>ME extract (200 mg/kg)</td>
<td>96.85±1.15#</td>
<td>51</td>
</tr>
</tbody>
</table>

N=6 animals per group. Values are mean±SEM. #P<0.05 (as compared to control)

ADJUVANT INDUCED ARTHRITIS IN RATS:
Arthritis was induced in rats in groups of six animals by injecting 0.05 ml of 0.5% (w/v) suspension of killed *Mycobacterium tuberculosis* in paraffin oil by intradermal injection into the left hind paw. Paw volume was measured till the 12th day by using Plethysmometer (Model 7140). Drug treatment was started on day 13 and terminated on day 21. The difference in paw volume on day 13 and day 21 were considered as oedema volume. The percent inhibition of oedema was determined. The details of drug dosage for the granuloma and arthritis experiments are given in Table 2.

DATA ANALYSIS:
Data are expressed as a mean±SEM. Statistical analysis was performed by one-way ANOVA followed by Dunnet’s test. P values <0.05 were considered as significant

RESULTS AND DISCUSSION:
The LD50 values of all the extracts were found to be more than 2000 mg/kg. All the extracts of *Abutilon muticum* showed potent antiarthritic activity and the potency of the extracts follows the order standard > ME > PE > DE > EA. The results of cotton pellet granuloma model as well as adjuvant induced arthritis model indicate that among all the extracts, the methanolic extract shows more potent activity. In chronic cotton pellet granuloma model, oral administration of 200 mg/kg of the methanolic extract produced 51% inhibition of granuloma as compared to standard Prednisolone (5mg/kg) which produced 59% inhibition of granuloma. Oral administration of 200 mg/kg of methanolic extract inhibited Freund’s adjuvant induced rat paw oedema by 46% after 21 days where as Prednisolone (5 mg/kg) inhibited rat paw oedema by 61% after 21 days.
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