Anti-arthritis activity of Gymnema sylvestre root extract

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(Received: January 03, 2008; Accepted: April 28, 2008)

ABSTRACT

The ethanolic extract of Gymnema sylvestre root was studied for anti-inflammatory activity against oedema produced by carrageenan and histamine. The extract was compared with the activity of diclofenac sodium against the two types of inflammation. The ethanolic extract at doses of 100mg, 150 and 200mg/kg exhibited significant (P<0.001) anti-inflammatory activity in inflammatory models. At 200mg/kg the ethanolic extract showed maximum inhibition of 39-75% in carrageenan-induced rat paw oedema while the standard diclofenac sodium inhibited 52-19% after 3 hr of carrageenan injection. The ethanolic extract (150, and 200mg/kg) significantly (P<0.001) inhibited histamine induced rat paw oedema and the percentage inhibition is found to be 37.33% and 41.08% respectively. All the results obtained suggest significant anti-inflammatory activity of the extract.

Key words: Gymnema sylvestre, Anti-inflammatory, Carrageenan, Histamine.
**EXPERIMENTAL**

**Animals**

Albino wistar rats (160-200g) of either sex were used for experimental study. The animals were procured from National Institute of Nutrition, Hyderabad. The animals were housed in cages and are provided with light. All the animals were acclimatised to laboratory environment for 1 week to 10 days before the experiment. They were provided with free access to food (Supplied by National Institute of Nutrition Hyderabad) and water ad libitum.

**Carrageenan Induced rat paw Oedema**

Oedema was induced by sub plantar injection of 0.1 ml of 1% freshly prepared suspension of λ-carrageenan (Supplied by Tablets India, Chennai). The paw volume was measured using a plethysometer before 0 and 3 hr after the injection of carageenan.

The ethanolic extract of Gymnema Sylvestre (100, 150 and 200 mg/kg) and diclofenac sodium 25mg/kg were orally administered to different groups of rats. All the treatments were given orally 1 hr. prior to the injection of carageenan.

### Table 1: Effect of ethanolic extract of Gymnema sylvestre on carrageenan induced rat paw oedema

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Dose (mg/kg)</th>
<th>% increase in paw volume</th>
<th>% inhibition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrageenan control</td>
<td></td>
<td>52.88±1.28</td>
<td>-</td>
</tr>
<tr>
<td>Diclofenac Sodium standard</td>
<td>25</td>
<td>25.28±1.60a</td>
<td>52.19</td>
</tr>
<tr>
<td>Ethanolic extract of Gymnema sylvestre root</td>
<td>50</td>
<td>40.50±1.30a</td>
<td>12.29</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>36.36±1.10a</td>
<td>31.24</td>
</tr>
<tr>
<td></td>
<td>200</td>
<td>31.86±1.72a</td>
<td>39.75</td>
</tr>
</tbody>
</table>

Each value represent the mean ± SEM n = 6
a.p<0.001

### Table 2: Effect of ethanolic extract of Gymnema sylvestre on histamine induced rat paw oedema

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Dose (mg/kg)</th>
<th>% increase in paw volume</th>
<th>% inhibition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Histamine control</td>
<td>-</td>
<td>48.67±1.72</td>
<td>-</td>
</tr>
<tr>
<td>Diclofenac sodium standard</td>
<td>25</td>
<td>25.42±1.38a</td>
<td>47.69</td>
</tr>
<tr>
<td>Ethanolic extract of Gymnema sylvestre root</td>
<td>50</td>
<td>37.12±1.39a</td>
<td>23.73</td>
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<tr>
<td></td>
<td>100</td>
<td>30.50±1.42a</td>
<td>39.33</td>
</tr>
<tr>
<td></td>
<td>200</td>
<td>28.43±1.63a</td>
<td>41.08</td>
</tr>
</tbody>
</table>

Each value represent the mean ± SEM n = 6
a.p<0.001
Histamine induced rat paw Oedema

The paw oedema was produced by subplantar administration of 0.1 ml of a 0.1% freshly prepared solution of histamine in to the right hand paw of rats. The paw volume was recorded before 0 and 1 hr after histamine injection. Different groups of animals were pretreated with ethanolic extract (100, 150 and 200mg/kg) and with 5 ml/kg of 1% w/v carboxymethylcellulose and diclofenac sodium 25mg/kg standard drug. The doses were administered orally 1 hr before eliciting paw oedema. The percentage inhibition of oedema was calculated for all above models as described by T Sai and Lin (1999).

DISCUSSION

The ethanolic extract at doses 100, 150 and 200mg/kg exhibited significant (P<0.001) antiinflammatory activity in all the animal models. The ethanolic extract (200mg/kg) exhibited maximum inhibition of 39.75% in carrageenan induced rat paw oedema whereas diclofenac sodium produced 52.19% of inhibition after 3hr of carrageenan injection (Table 1). The ethanolic extract (100, 150 and 200mg/kg) significantly (P<0.001) inhibited histamine induced rat paw oedema. Surprisingly with (150 & 200mg/kg) the inhibition activity found to be very encouraging percentage inhibition are 37.33% & 41.08% respectively.

The present study establishes the anti inflammatory activity of the ethanolic extract of Gymnema sylvestre in number of experimental rat models. This study demonstrates the efficacy of Gymnema sylvestre as an anti inflammatory agent and also justifies the use of the plant as an anti inflammatory agent in folk medicine.

ACKNOWLEDGEMENTS

The authors wish to thank vice-president Tablets India Ltd for providing standard reference drug samples and lyla impex vijayawada for providing facilities to carry out the work.

REFERENCES