ANTIINFLAMMATORY POTENTIAL OF THE SEEDS OF CARUM COPTICUM LINN.

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ABSTRACT

Objective: To investigate the antiinflammatory principles of the total alcoholic extract (TAE) and total aqueous extract (TAQ) of the seeds of Carum copticum. Linn. (Umbelliferae).

Methods: Antiinflammatory potential was evaluated using acute rat model (carrageenan induced rat paw oedema) and a sub acute rat model (cotton pellet induced granuloma). Aspirin (ASA) (150 mg/kg) and antiinflammatory drug phenyl butazone (PBZ) (150 mg/kg) were used as standard positive controls.

Results: TAE and TAQ in 100 mg/kg doses exhibited significant (P<0.001) antiinflammatory activity in both the animal models. In carrageenan induced rat paw oedema, ASA and PBZ showed an inhibition of 45.23% and 43.83% respectively, while TAE and TAQ extracts showed an inhibition of 38.32% and 41.11%. In cotton pellet induced granuloma studies also TAE and TAQ produced 38.05% and 43.87% inhibition of the pellets weight respectively whereas ASA and PBS produced 44.69% and 42.04% inhibition. The weights of the adrenal glands were found to be significantly increased in TAE and TAQ treated animals (25.53% and 32.2%) whereas ASA and PBS showed an increase of 18.86% and 10.00% respectively.

Conclusion: TAE and TAQ extracts from the seeds of Carum copticum. Linn. exhibit significant antiinflammatory potential.

KEY WORDS Ajowan plant extract carrageenan granuloma oedema

INTRODUCTION

Inflammation is a normal protective response to tissue injury caused by physical trauma, noxious chemicals or microbiologic agents. Inflammation is body’s response to inactivate or destroy the invading organisms, remove irritants and set stage for tissue repair. Inflammation is triggered by the release of chemical mediators from the injured tissues and migrating cells. The specific chemical mediators vary with the type of inflammatory process and include amines such as histamine, serotonin, lipids such as prostaglandins and small peptides such as Kinins. Carum copticum. Linn.syn Trachyspermum ammi. (Family: Umbelliferae) is popularly known as Ajowan. It is widely distributed throughout India and is a highly esteemed medicinal herb from earlier times. As a traditional medicine, the seeds of this plant are made into a decoction and used for curing diarrhoea, amoebiasis, febrile conditions and stomach disorders. It is much valued for its antispasmodic, antiseptic properties and effects against curing dyspepsia and disorders of inflammation. In the Unani system ajowan is used as an enhancer of body’s resistance. However, these claims of the ancient medical literature were not scientifically analyzed. Further the existing antiinflammatory drugs are well-known for their long time side effects. Hence the present study was undertaken to evaluate the antiinflammatory effects of the total alcoholic extract (TAE) and total aqueous extract (TAQ) from the seeds of Carum copticum. Linn. using rat models.
MATERIALS AND METHODS

Plant material: Seeds of *Carum copticum*. Linn were procured from the local market and were authenticated by a botanist. The collected seeds were cleared from impurities and then stored at room temperature for further use.

Preparation of extracts: The TAE was prepared by soaking 500 g seeds of *Carum copticum* in 750 ml of 95% ethanol for 15 days. The clear extract obtained after filtration was concentrated in a water bath maintained at 55°C to obtain a semisolid mass (weight 29.45 g).

The extracted seeds were dried and subsequently extracted with 750 ml of double distilled water for 6 h at 55°C to prepare the TAQ. The extract thus obtained was concentrated to a semi solid mass (weight 37.45 g). TAE and TAQ were stored in a desiccator until used for experiments.

Animals: Wistar Albino rats of either sex (180-200 g) were housed in standard cages. They were provided with food and water ad libitum. The rats were kept for one week for acclimatization before the experimental sessions. The studies were approved by the CPCSEA and the local ethics committee.

Carrageenan induced rat paw oedema: Acute inflammation was induced by subplantar injection of 0.1 ml of 1% freshly prepared suspension of carrageenan (Sigma Chemical Co.) into the right hind paw of each rat. The paw volume was measured at 0 and 2 h after the injection of carrageenan using a plethysmometer. The TAE and TAQ extracts of the seeds of *Carum copticum*. Linn. (100 mg/kg) were administered orally. The standard drugs aspirin and phenylbutazone showed an inhibition of 45.23% and 43.83% respectively in the carrageenan induced rat paw oedema (acute) model.

In the sub-acute model of inflammation (cotton pouch granuloma), TAE and TAQ extracts exhibited significant (P<0.001) reduction in the granuloma weight 38.05% and 43.87% respectively (Table 1). These results were comparable with that of the standard drugs, aspirin and phenyl butazone 44.69% and 42.04%.

The weight of the adrenal glands significantly increased in TAE and TAQ treated animals. TAE and TAQ showed maximum increase of 25.53% and 32.2%. The results were compared with the standard drugs both of which showed an increase of about 18.86 and 10% respectively (Table 1).

DISCUSSION

The results of the present investigation suggest that TAE and TAQ extracts of *Carum copticum* seeds produced significant antiinflammatory effect. Carrageenan induced inflammatory process is believed to be biphasic. The initial phase seen at the 1st hour is attributed to the release of histamine and
Table 1. Effect of *Carum copticum* Linn. seed extracts on carrageenan induced paw oedema, cotton-pouch granuloma and weight of the adrenal glands in rats.

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose mg/kg, p.o.</th>
<th>Carrageenan induced rat paw oedema</th>
<th>Cotton-pouch granuloma</th>
<th>Adrenal glands</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Vol. of rat-paw oedema (ml) mean±SEM</td>
<td>Percentage inhibition</td>
<td>Weight of granuloma (mg) mean±SEM</td>
</tr>
<tr>
<td>Control</td>
<td>10 ml/kg</td>
<td>1.22±0.04</td>
<td>-</td>
<td>75.33±1.85</td>
</tr>
<tr>
<td>(Normal Saline)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aspirin</td>
<td>150</td>
<td>0.67±0.05**</td>
<td>45.23</td>
<td>41.66±2.81**</td>
</tr>
<tr>
<td>Phenylbutazone</td>
<td>150</td>
<td>0.68±0.04**</td>
<td>43.83</td>
<td>43.66±0.93**</td>
</tr>
<tr>
<td>TAE</td>
<td>100</td>
<td>0.75±0.02**</td>
<td>38.32</td>
<td>46.66±3.04**</td>
</tr>
<tr>
<td>TAQ</td>
<td>100</td>
<td>0.72±0.03**</td>
<td>41.11</td>
<td>42.28±1.75**</td>
</tr>
</tbody>
</table>

Values are mean±SEM. n=6 in each group. *P<0.05, **P<0.001 when compared to control.

Total alcoholic extract (TAE); Total aqueous extract (TAQ)

The anti inflammatory activity exerted by TAE and TAQ extracts suggest that they could have acted by affecting kinnin, prostaglandin, bradykinin and lysozyme synthesis. In the cotton pouch granuloma test significant antiinflammatory activity (P<0.001) were exerted by the extracts. Its efficacy to inhibit the inflammation might be due to an increase in the number of fibroblasts and synthesis of collagen and mucopolysaccharides during granuloma tissue formation. Salicylate cause enlargement of adrenal glands through stress mediated stimulation of hypothalamic hypophysial release of ACTH which subsequently produce hypertrophy and hyperplasia of the gland. Catecholamines from the adrenal medulla would have contributed either to a stress associated release of ACTH or to a rise in intracellular cyclic AMP and catecholamine release is associated with enlargement of adrenal gland. Presence of terpenes, glycosides and sterols in plant have been found to exert active antiinflammatory effects. Phytochemical analysis of *Carum copticum* has revealed the presence of terpenes and sterols. The more pronounced activity of the TAQ extract may be due to the presence of certain polar constituents such as flavonoids and glycosides. The marked antiinflammatory activity of the extracts against acute and subacute inflammation suggest that their activity may occur via inhibition of prostaglandin synthatase.

TAE and TAQ extracts from the seeds of *Carum copticum* showed an inhibitory effect on carrageenan induced oedema. The results provide a scientific basis for the utilization of this herb in traditional medicine for the treatment of inflammatory disease. The test drugs have been found to be effective in both acute and sub acute models. Further tests are needed to explore the exact active principle(s) responsible for the antiinflammatory activity.
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TRIAL RESULTS HAVE DRAMATICALLY REDUCED HRT USE

More than half (58%) of women stopped taking HRT after the publication of a large trial in 2002 concluded that it was not suitable for the prevention of chronic diseases, finds a study in BMJ.

Six months after the trial results were published, researchers in New Zealand surveyed 776 women who were taking HRT.

Of 734 respondents, 423 (58%) had stopped taking HRT when the results were published, 132 (18%) had restarted at the time of the survey, and 291 (40%) had not.

Of the 132 women who restarted, 100 did so because of the return of symptoms, 16 because they “felt better” on HRT, and 15 for other reasons.

Most respondents (83%) reported that they had discussed HRT with a health professional. The authors also found that older age, use of combined HRT, and longer duration of HRT were associated with stopping HRT.

(Changes in use of hormone replacement therapy after the report from the Women’s Health Initiative: cross sectional survey of users-http://bmj.com/cgi/content/full/327/7419/ 845)