Qualitative phytochemical analysis, pharmacological studies and traditional benefits of trachyspermum ammi (L.) Sprague

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Abstract
The use of plants as medicine is as old as human civilization. People of all ages in both developing and developed countries use plants in an attempt to care various diseases and to get relief from physical sufferings. Natural products are a source for bioactive compounds and have potential for developing some novel therapeutic agents. Hence in the present study pharmacological activity, traditional benefits and phytochemical analysis of Trachyspermum ammi confirms the presence of various phytochemicals like saponin, terpenoids, steriods, flavonoids, tannins, quinones and alkaloids. The result suggests that, this plant have a great potential for curing various ailments and can be source of useful drugs.

Keywords: Trachyspermum ammi phytochemical screening, pharmacological activities, traditional uses.

1. Introduction
Medicinal plants have been used from centuries as remedy for human diseases because they contain the compounds of therapeutic values. The plant kingdom has proven to be the most useful in the treatment of various diseases and they have provides an important source of all the words pharmaceuticals. The most important bioactive constituents of plants are steroids, terpenoids, carotenoids, flavonoids, alkaloids, tannins and glycosides. Plants in a facet of life have served a valuable starting material for drug development [1] (Singh V.K. et al. 2003) [1]. Trachyspermum ammi (L.) Sprague is a Greek work Trachy = rough & spermum = seeded, whereas ammi is name of plant in Latin syn. Carum copticum, commonly known as Ajwain belonging to Family Apiaceae. The plant has a similarly to parsley. Because of their seed-like appearance, the fruit pods are sometimes called seeds; they are egg-shaped and grayish in colour [2] (Roy Chowdhray 1963).

2. Material and methods
The plant material were collected from the Akola region and identified taxonomically by using standard floras [3-4] (Cook 1967, Kathikeyan, Kambale &Pradhan, Naik). The fresh seeds of the plants Trachyspermum ammi (L.) spraug were air dried under the shade. The dried seeds of the plant are crushed to obtain powder. These powered samples are then stored in air tight polythene bags protected from sunlight until used. The organic solvent like petroleum ether, alcohol, chloroform, acetone, benzene & aqueous extracts of each sample was prepared by soaking as 1:10 ratio that is 3 gm of powder sample in 30 ml of organic solvents and distilled water for 18 hr. The extracts are then filtered using whatman filter paper, and used for phytochemical study.

2.1 Phytochemical Screening
Chemical test were carried out on the organic solvents & aqueous extract and on the powdered specimens using standard procedure to identified the constituents as described by [5] Harborne (1973), Edeoga et al. (2005) and Krishnaiah et al. (2009).

2.2 Test for Alkaloids
To the 2-3 ml of filtrate, 1 ml of dil HCL and 1 larger's reagent was added and shake well. Yellow precipitate was formed showing the presence of alkaloids.

2.3 Test for Flavonoids
To the small quantity of extract lead acetate solution was added. Formation of yellow precipitate showed the presence of flavonoids.

2.4 Test for Steroids
To 2 ml of extract of chloroform & 2 ml of conc. H2SO4 was added. The solution was shaken well. As a result, chloroform layer turned red and acid layer showed greenish yellow fluorescence.

2.5 Test for Tannin
On addition of 5% FeCl3 solution to the extract deep blue black colour appeared.

2.6 Test for Saponin
To 1 ml extract 20 ml distilled water has added and shake well in measuring cylinder. Then 1 cm layer of foam was formed.

2.7 Test for Cardiac glycosides
To the 5 ml of extract 1 ml of conc. H2SO4, 2 ml of Glacial acetic acid and 1 drop of FeCl3 solution was added, Appearance of brown ring shows the presence of cardiac glycosides.

2.8 Test for Quinones
To the 2 ml of extract conc. H2SO4 was added and shake well for 5 min. shows the Red Colour.

2.9 Phytochemical analysis
i) Qualitative phytochemical analysis
The qualitative phytochemical screening of Trachyspermum ammi (L.) spraug in six different extracts i.e. Petroleum ether, benzene, chloroform, acetone, ethanol and water showed that
there is presence of carbohydrates, glycosides, proteins, alkaloids, saponin, coumarins, flavonoids, steroids, tannins, phenolic compounds. However steroids and anthraquinone glycosides were totally absent in all extracts. Ethanol extract of *T. ammi* (L.) Sprag was accounted for the presence of alkaloids, carbohydrates, glycosides, proteins, saponin, coumarins, flavonoids, quinones, phenol and tannin. While acetone and water extract showed the presence of alkaloids, carbohydrates, glycosides, saponin, flavonoids, proteins, tannins, phenolic compounds. Only benzene, chloroform and water extract showed the presence of fixed oils and fats. Chloroform, acetone and ethanol extract analyzed least number of compounds. All the six extract showed the presence of alkaloids, proteins, flavonoids, phenols and tannins. (Table-1). This could make, this plant useful for treating diabetes and different ailments as having a potential of providing useful drugs of human use. This is because of pharmacological activity of any plant is usually traced to a particular compound.

2.10 Pharmacological Studies

Preliminary pharmacological studies of the oil indicated that it had a parasympathomimetic effect and produced contraction of the isolated ileum, tracheal chain and bronchial musculature in guinea pigs. On account of its low toxicity, further trials of the oils on hypotensive agent are recommended. The drug also seems to possess some antidiuretic effect [6] (Mukherjee et al. 1967). In Indian system of medicine, ajwain is administered as a stomach disorder, a paste of crushed fruits is applied extremely for relieving colic pains; and a hot and dry fomentation of the fruits applied on chest for asthma. *T. ammi* has been shown to possess antimicrobial, hypolipidaemic, digestive stimulant; anti-diabetic, antihypertensive, hepatoprotective, antispasmodic, broncho-dilating, abortificant, galactogogic, antiplatelet aggregatory, gastroprotective, nematicidal, anthelmintic, detoxification of aflatoxins, ameliorative effect [7] (Bairwa Ranjan et al., 2011). Ajowan is much valued for its antispasmodic, stimulant, tonic and carminative properties. It is administered in flatulence, atomic dyspepsia and diarrhea, and often recommended for cholera.

### Table 1: Qualitative phytochemical screening of various extract of Trachyspermum ammi (L.) Sprag

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Constituents</th>
<th>Chemical Test</th>
<th>P.E.</th>
<th>B</th>
<th>C</th>
<th>A</th>
<th>E</th>
<th>W</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Alkaloids</td>
<td>Mayer’s Test</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>2.</td>
<td>Carbohydrates &amp; Glycosides</td>
<td>Wagner’s Test</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>3.</td>
<td>Steroids</td>
<td>Dragendorff’s Test</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>4.</td>
<td>Saponin</td>
<td>Fehling’s Test</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>5.</td>
<td>Phenolics &amp; Tannin</td>
<td>Benedikt’s Test</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>6.</td>
<td>Fixed Oils &amp; Fats</td>
<td>Salkowski’s Test</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7.</td>
<td>Proteins</td>
<td>Foam Test</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>8.</td>
<td>Anthraquinones glycosides</td>
<td>Fecl Solt. Test</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>9.</td>
<td>Cardiac glycosides</td>
<td>Lead Acetate Test</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>10.</td>
<td>Flavonoids</td>
<td>Fehling’s Test</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>11.</td>
<td>Quinone</td>
<td>Millions Test</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>12.</td>
<td>Coumarins</td>
<td>Shinoda Test</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

(Note: ‘+’ = Present and ‘-’ = Absent)

Where, P.E. = Petroleum ether, B = Benzene, C = Chloroform, A = Acetone, E = Ethanol, and W = Water extract respectively.

2.11 Traditional uses & benefits

1. Ajwain seeds are also known as a digestive aid, and combines well with fennel to relieve gas and bloating.
2. They are used in treatment of influenza, asthma, coughs, colds, colic, diarrhea, cholera, indigestion, edema, rheumatism.
3. For relieving flatulence, dyspepsia and spasmodic disorder, a teaspoonful of ajwain seeds with little amount of rock salt, mixed with water taken internally.
4. For removing phlegm; Ajwain seed powder and butter milk given internally.

3. References