

Qualitative phytochemical analysis, pharmacological studies and traditional benefits of *Trachyspermum ammi* (L.) Spraug

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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 cure 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, steroids, 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) [2]. *Trachyspermum ammi* (L.) Sprague is a Greek word *Trachy* = rough & *spermum* = seeded, whereas *ammi* is name of plant in Latin syn. *Carum copiticum*, commonly known as Ajwain belonging to Family Apiaceae. The plant has a similarity 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 Chowdhary 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 powdered 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 ml of Mayer'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.) spraug 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.

Table 1: Qualitative phytochemical screening of various extract of *Trachyspermum ammi* (L.) Spraug

Sr. No.	Constituents	Chemical Test	Extracts					
			P.E.	B	C	A	E	W
1.	Alkaloids	Mayer's Test	+	+	-	+	+	+
		Wagner's Test	+	-	+	+	-	+
		Dragendorff's Test	+	+	+	-	-	+
2.	Carbohydrates & Glycosides	Fehling's Test	+	+	+	+	+	+
		Benedict's Test	+	+	+	+	+	+
3.	Steroids	Salkowski's Test	-	-	-	-	-	-
4.	Saponin	Foam Test	+	-	+	+	+	+
5.	Phenolics & Tannin	Ferri's Soln. Test	-	+	+	+	+	+
		Lead Acetate Test	+	+	+	-	-	-
6.	Fixed Oils & Fats	Spot Test	-	+	+	-	-	+
		Biuret Test	+	+	+	+	+	+
7.	Proteins	Millions Test	-	+	-	+	-	-
		Borntragers Test	-	-	-	-	-	-
8.	Anthraquinones glycosides	Keller - Milliani Test	+	+	-	-	-	+
9.	Cardiac glycosides	Shinoda Test	-	-	+	+	+	+
		Lead Acetate Test	+	+	-	-	+	+
11.	Quinone		+	-	-	-	+	+
12.	Coumarins		+	+	+	-	+	+

(Note: "+" = Present and "-" = Absent)

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

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⁽⁴⁾ (Mukherjee *et al.* 1967). In Indian system of medicine, ajwain is administered as a stomach disorder, a paste of crushed fruits is applied externally 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, hypolipidemic, digestive stimulant; anti-diabetic, antihypertensive, hepatoprotective, antispasmodic, broncho-dilating, abortifacient, galactagogue, antiplatelet aggregatory, gastroprotective, nematocidal, anthelmintic, detoxification of aflatoxins, ameliorative effect⁽⁵⁾ (Bairwa Ranjan *et al.*, 2011). Ajowan is much valued for its antispasmodic, stimulant, tonic and carminative properties. It is administered in flatulence, atonic dyspepsia and diarrhea, and often recommended for cholera.

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

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