

ANTHELMINTIC ACTIVITY OF *TRACHYSPERMUM AMMI* (L) EXTRACT

AISHWARYA K. APTE*, V. S. KHOT, N. S. BIRADAR, S. B. PATIL

Department of Pharmacy, Dr. J. J. Magdum Pharmacy College, Jaysingpur 416101, India. Email: apteashwarya3@gmail.com

Received: 11 Nov 2013, Revised and Accepted: 03 Dec 2013

ABSTRACT

Objective: The anthelmintic activities of alcoholic and aqueous extract of seeds of *Trachyspermum ammi* L. were evaluated separately on Indian adult earthworm *p.posthuma* (Annelida).

Method: For this work seeds were extracted separately with ethanol and distilled water by soxhalation and maceration method with various concentration (10,20,40mg/ml) of each extract were tested for anthelmintic activity which involve the determination of time of paralysis and time of death of worms.

Result: All extract were able to show anthelmintic activity at all concentration. The activities are well comparable with standard drug albendazole as positive control. Tween 20 with distilled water (for alcoholic extract) and distilled water (for aqueous extract) were used as negative control did not show any anthelmintic activity.

Conclusion: Seeds of *Trachyspermum ammi* L showed good anthelmintic activity against Indian earthworm. Dose dependent activity was observed in plant extract.

Keywords: *Trachyspermum ammi* L., *Pheretima posthuma*, Anthelmintic activity, Alcoholic extract, Aqueous extract.

INTRODUCTION

Helminth infections are among the most widespread infections in human, distressing a huge population in the world. Although the majority of infections due to helminths are generally restricted to tropical regions and cause enormous hazard to health and contribute to the prevalence of undernourishment, anaemia, eosinophilia and pneumonia Parasitic diseases cause ruthless morbidity affecting principally population in endemic area. The gastro-intestinal helminthes becomes resistant to currently available anthelmintic drugs therefore there is a foremost problem in treatment of helminthes diseases. Hence there is an increasing demand towards natural anthelmintics.[1-3]

Ajwain, also known as *Trachyspermum ammi*. L is a small grayish egg shaped seed like fruit that belongs to the family Umbelliferae or Apiaceae is a highly valued medicinally important seed spice. Ajwain was originated in Egypt, but is now primarily grown and used in south Asian countries. Pakistan, India and Saudi-Arabia are the leading users of Ajwain. [4]

Vernacular names

Hindi - Ajwain

English - Bishop's weed

Sanskrit - Dipyaka, Yamini, Yaminiki, Yaviniki

Punjabi - Lodhar

Bengali - Yamani, Yauvan, Yavan, Javan, Yavani

Gujrati - Ajma, Ajmo, Yavan, Javain;

Kannada - Oma, Yom, Omu;

Kashmiri - Kath;

Malayalam - Omam

Marathi - Onva

Oriya - Juani

Tamil - Omam

Telugu - Vamu

In Indian system of medicine, ajwain is administered for stomach disorder, a paste of crushed fruits is applied externally for relieving

colic pain; and a hot and dry fomentation of the fruits is lapped on the chest to cure asthma [5, 6]. Ajwan-ka-arak (aqueous extract) is popular preparation for diarrhoea. Therapeutic uses of *T. ammi* fruits includes stomachic, carminative, expectorant, antiseptic, amoebiasis and antimicrobial activity. It also cures abdominal tumor, abdominal pains and piles.[7] It's also prescribed to comfort dipsomania, hysteria, sore throat; many ajowan ayurvedic formulations are available which is given to overcome infections with worms5. It is also used for relieving flatulence, dyspepsia, spasmodic disorders, flatulence, common cold, acute pharyngitis, sore and congested throat.[8]

The seed of ajwain is bitter, pungent and it acts as Asthma, antibacterial, antifungal, anthelmintic, hypocholesterolemic, bronchodilator and antioxidant effects[9-15]as well as carminative, laxative, and stomachic. It also cures abdominal tumors, abdominal pains and piles. Seeds contain an essential oil containing about 50% thymol which is a strong germicide, anti-spasmodic and fungicide.[16-18]

Huge population in the world is now using herbal products for preventive and therapeutic purpose, still further research and studies are needed to be done to evaluate their pharmacological effects. For this reason, present study was designed.

MATERIAL AND METHODS

Plant material

Plant material was collected from local market and authenticated at KWC-Arts, Commerce, Science, Department of Botany, Sangli.



Fig. 1: *Trachyspermum ammi* L.

Animal

Indian adult earthworms *Pheretima posthuma* were used to study anthelmintic activity *in-vitro* due to its anatomical and physiological

resemblance with the intestinal roundworm parasites of human beings.[19-21]The earthworms were collected from moist soil and washed with normal saline. The earthworms of 5-7 cm in length and 0.1-0.2 cm in width were used for all experimental protocol.

Preparation of extract

Aqueous extract (Maceration method)

500 gm of seeds of *Trachyspermum Ammi*. L was kept for maceration with 1000 ml of distilled water for 7 days. The extract was double filtered by using muslin cloth and Whatman no.1 filter paper and concentrated by evaporation on water bath. The extract was dried and used. The percentage yield of extract was found to be 2.4 percent.

Alcoholic extract (Soxhaletion method)

500g of dried seeds of *Trachyspermum Ammi*. Linn was extracted exhaustively for 72 hours in a soxhalet apparatus with ethanol.

Drugs and chemicals

Albendazole suspension was used. The solvents and other chemicals of analytical grade were used during experimental protocol. [22]

Anthelmintic Activity

Alcohol extract and aqueous extract from the seeds of *Trachyspermum ammi* investigated for their anthelmintic activity against *Pheretima posthuma*. All the test solutions and standard drug solutions were prepared freshly before starting the experiment. Various concentrations (10 mg/ml, 20 mg/ml and 40 mg/ml) of extract were tested in the bioassay, which involved determination of time of paralysis and time of death of the worms. Albendazole was included as standard reference and distilled water as control. The

assay was performed on adult Indian earthworm, *Pheretima posthuma*, collected from moist soil and washed with normal saline to remove all faecal matter were used for the anthelmintic study. The earthworms of 5-7 cm in length and 0.1-0.2 cm in width were used for all the experimental protocol. In the first set of experiment, six groups of six earthworms were released in to 25 ml of solutions of albendazole, aqueous extracts of seeds of *Trachyspermum ammi* (10%, 20%, and 40%) in distilled water. Observations were made for the time taken to paralysis and death of individual worms. Time for paralysis was noted when no movement of any sort could be observed except when the worms were shaken vigorously. Death was concluded when the worms lost their motility followed with fading away of their body color.

RESULT AND DISCUSSION

Preliminary phytochemical screening has shown the presence of volatile oil, tannins, glycosides and steroidal substances in alcoholic extract of plant. Tannins are chemically polyphenolic compound and where shown to produce anthelmintic activities and reported the effect of tannin can bind to free proteins in gastro intestinal tract of host animal or glycoproteins on the cuticle of parasite and may cause death.

From the result shown in table alcoholic extract of *trachyspermum ammi* exhibited anthelmintic activity in dose dependent manner giving shortest time of paralysis and death. The aqueous extract of seeds of *trachyspermum ammi* at higher concentration (40mg/ml) showed good anthelmintic activity and alcoholic extract of *trachyspermum ammi* normal concentration showed good anthelmintic activity and this is compared with effect produced by reference standard drug albendazole. The experimental evidence obtained in the lab model could provide a rationale for the traditional use of this plant as anthelmintic.

Table 1: Anthelmintic activity of *Trachyspermum ammi* (L)

Extract	Concentration (mg/ml)	<i>Trachyspermum ammi</i>	
		Paralysis (P) (Time in min)	Death (D) (Time in min)
Control	-	-	-
Standard	10mg/ml	59.87±1.73	72.28±0.98
	20mg/ml	57.91±3.04	59.85±1.72
	40mg/ml	40.99±1.41	49.00±1.93
Ethanol extract	10mg/ml	59.76±1.59	82.38±1.43
	20mg/ml	52.14±1.63	68.41±2.31
	40mg/ml	34.18±1.25	48.21±1.86
Aqueous extract	10mg/ml	62.33±0.53	84.50±0.39
	20mg/ml	55.27±0.37	72.92±1.25
	40mg/ml	35.63±1.22	52.42±0.68

Results are expressed as mean ±SEM. The results were analyzed by Analysis of variance (ANOVA)

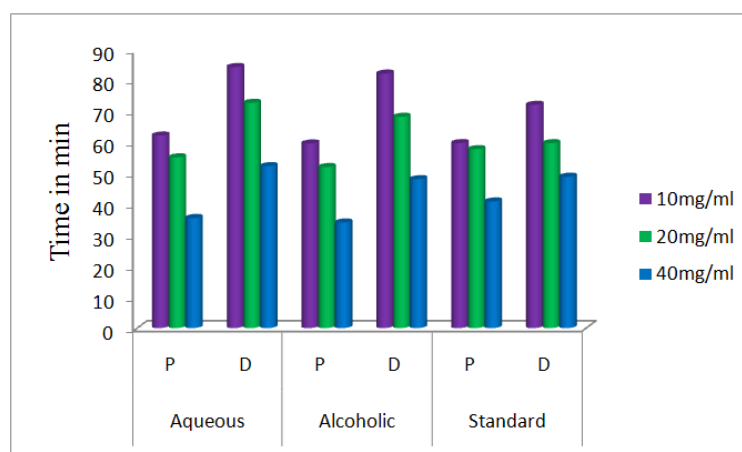


Fig. 1: Anthelmintic activity of Aqueous, Alcoholic and Standard drug

CONCLUSION

It was concluded based on findings of present study that seeds of *trachyspermum ammi* passes varying degree of anthelmintic activity against Indian earthworm the dose of extract increase a gradual increase in the activity of extract is dose dependent. This study strongly supports the traditional use of seeds as anthelmintic.

ACKNOWLEDGMENT

The author Mrs. A.K.Apte vice principal is thankful to the Management of Dr.J.J.Magdum college of pharmacy Jaysingpur, India for providing the laboratory facility to carry out this work.

REFERENCES

- Bundy D. A. (1994) *Trans Royal Soc Trop Med Hyg*, 8: 259-261.
- Tagbota S., Townson S. (2001) *Adv Parasitol*, 50:199-205.
- Sondhi S.M., Shahu R., Magan Archana.(1994) *Indian Drugs*, 31(7): 317-320.
- Malhotra SK, Vijay OP. Ajowan. In: Peter KV (ed).Hand book of Herbs and spices. Vol 2. Woodhead Publishing Limited: Cambridge; 2004. pp 107-16.
- Singh VK, Govil JN, Arunachalam C. Recent Progress in Medicinal Plants. Houston Texas (USA); 2007: 17.
- Kapoor LD. Handbook of Indian Ayurvedic Medicinal plants. CRC Press Inc: Florida; 1990.
- Krishnamoorthy V, Madalageri MB. Bishop weeds (*Trachyspermum ammi*): an essential crop for north Karnataka. *J Med and Aromat Plants Sci* 1999; 21(4): 996- 998.
- Ranjan B, Manmohan S, Singh SR, Singh RB. Medicinal Uses of *Trachyspermum Ammi*: A Review. *The Pharma Research* 2011; 5(2): 247-258.
- Kapoor LD. Handbook of Indian Ayurvedic Medicinal plants. CRC Press Inc: Florida; 1990.
- Hammond JA, Fielding D, Bishop SC. Prospects for plant anthelmintics in tropical veterinary medicine. *Vet Res Communication* 1997;21(3): 13-28.
- Saksena NK. Comparative evaluation of some essential oils for their antifungal activity against some dermatophytes. *Indian Perfum* 1984; 28:35-37.
- Lateef M, Iqbal Z, Rauf Jabbar AR. Anthelmintic activity of carum Copticum seeds against gastrointestinal nematodes of sheep. *J Anim Pl Sci* 2006; 16:1-2.
- Agrawala JN, Pant MC. Effect of feeding carum Copticum seeds on serum lipids, high density lipoproteins(HDL), and serum cholesterol binding reserve in the albino rabbits. *J Med Res* 1986;83:93-95.
- Boskabady MH, Shaiki J. Inhibitory effect of carum Copticum on histamine (H1) receptors of isolated guinea pig tracheal chains. *J Ethnopharmacology* 2000; 69:217-27.
- Mehta RL, Zayas JF, Yang SS. Ajowan as a source of natural lipid antioxidant. *J Agri Food Chem* 1994;42 (7): 1420-2.
- Krishnamoorthy V, Madalageri MB. Bishop weed (*Trachyspermum ammi*): an essential crop for north Karnataka. *J Med Aromatic Plant Sci* 1999;21:996-8.
- Nagalakshmi S, Shankaracharya NB, Naik JP, Rao. Studies on chemical and technological aspects of Ajowin, (*Trachyspermum ammi*(L), syn. *Carum Copticum* Hiern seeds. *J Food Sci Technol* 2000;37:277-81.
- Gersbach PV, Reddy N. Non- invasive localization of thymol accumulation in *Carum copticum* (Apiaceae) fruits by chemical shift selective magnetic resonance imaging. *Ann Botany* 2002;90:253- 7.
- Vidyarthi R.D. (1977) *A Textbook of Zoology, 14th edn, Chand and Co. Press, New Delhi*, 329-31.
- Thorn G.W. (1977) *Harrison's Principles of Internal Medicine, Mc Grew Hill, New York*, 1088-90.
- Vigar Z. (1984) *Atlas of Medical Parasitology, 2nd edn., Publishing House, Singapore*, 216-18.
- Sucheta A Gaikwad et al, Anthelmintic activity of *Cassia auriculata* L. extracts-*In vitro* study, *Scholars Research Library, J. Nat. Prod. Plant Resour.*, 2011, 1 (2): 62-66.