

**IN VITRO ANTHELMINTIC ACTIVITY OF WHOLE PLANT OF VENTILAGO DENTICULATA WILLD. AGAINST PHERETIMA POSTHUMA**MEHTA PREETI\*<sup>1</sup>, PHUTANE SHWETA<sup>1</sup>, SUTAR SHREYAS<sup>1</sup><sup>1</sup>JSPM's Jayawantrao Sawant College of Pharmacy & Research, Hadapsar, Pune-411028, India. Email: preetigandhi2007@gmail.com

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**ABSTRACT**

*Ventilago Denticulata* Willd. belonging to the family Rhamnaceae is widely distributed in India. In the present study the aqueous and ethanolic extracts of whole plant of *Ventilago Denticulata* were evaluated for in-vitro anthelmintic activity on the Indian adult earthworms *Pheretima posthuma*. The three concentrations (10, 25, 50mg/ml) of each extracts were tested and results were expressed in terms of time for paralysis and time for death of worm. The extracts of *Ventilago Denticulata* exhibited a dose dependant inhibition of spontaneous motility (Paralysis) of earthworms. Albendazole (10mg/ml) was used as a reference standard. Both the extracts showed better anthelmintic activity than albendazole. As compared to aqueous extract, alcoholic extract took less time to cause paralysis & death of the earthworm. Thus the present study indicates that *Ventilago Denticulata* could be used as an anthelmintic herbal drug.

**Keywords:** Anthelmintics, *Ventilago Denticulata*, Rhamnaceae, *Pheretima posthuma***INTRODUCTION**

Helminthic diseases have a worldwide distribution. They affect billions of people in endemic areas and can result in serious clinical complications. Anthelmintics are drugs that either kill or expel parasitic worms. The majority of drugs available to treat these infections possess some common side effects like nausea, vomiting, abdominal pain, expulsion of ascaris from mouth or nose, allergic reactions, loss of hair, urticaria, granulocytopenia, fall in blood pressure, sedation, fever, body ache etc.<sup>1</sup> Plants have been used for medicinal purposes long before recorded history because of their negligible side effects and better potency. Recently, the World Health Organization estimated that 80% of people worldwide rely on herbal medicines for some part of their primary health care. Increasing problems of development of resistance in helminthes against anthelmintics have led to the proposal of screening medicinal plants for their anthelmintic activity.<sup>2,3,4</sup>

*V. denticulata* Willd. commonly called the Red Creeper is an extensively branched, woody climber with hanging branches. The stem and root bark of this plant is a source of a red dye 'ventilagin', which is used for coloring cotton, wool and tasar.<sup>5</sup> Stem bark when powdered and mixed with sesame oil, can be externally applied to treat skin diseases and sprains.<sup>6</sup> Root bark is used for atonic dyspepsia, mild fever and debility. Sap is used for the treatment of deafness. The ethanolic extract of plant also shows antiinflammatory activity.<sup>7</sup> The plant is rich in many pharmaceutical active ingredients. The stem bark contains friedelin and several anthraquinones. The root contains anthraquinones, ventinones A and B. Major constituents of the root bark are emodin, its glucoside and corresponding analogues, ventiloquinones. The fruit, leaves and stem give lupeol, beta-sitosterol and its glucoside.<sup>8</sup> Literature survey revealed that the plant extract has yet not been screened for anthelmintic activity. Therefore the objective of current work was to evaluate the anthelmintic properties of whole plant of *Ventilago Denticulata*.

**MATERIALS AND METHODS****Collection of plant & Authentication**

The plant *Ventilago denticulata* was collected from the Pune District of Maharashtra, India during Aug- Sept. 2011. The plant was authenticated from Botanical survey of India, Pune (Ministry of environment and forest)

**Determination of physical constants**

Physical constants of powdered plant material like Ash value & Moisture content (LOD) were determined.

**Preliminary Phytochemical Investigation**

Phytoconstituents were detected by applying qualitative chemical tests on aqueous and ethanolic extracts of whole plant of *Ventilago Denticulata*.

**Preparation of extracts****Preparation of aqueous extract**

The plant was collected, dried and powdered to get a coarse powder. To the dried powdered material (100gm) sufficient amount of water was added and kept for soxhlet extraction for 4 days. The extract obtained was filtered and concentrated on hot plate.

**Preparation of alcoholic extract**

The plant was collected, dried and powdered to get a coarse powder. To the dried powdered material (100gm) sufficient amount of ethanol was added and kept for soxhlet extraction for 4 days. The extract obtained was exposed to open air for evaporation to obtain dry concentrated extract which was used to determine the activity against worms.

**Preparation of different concentrations of plant extract**

Dried extracts both aqueous & alcoholic were powdered with the help of mortar and pestle. Various concentrations were made (10, 25, 50mg/ml) with the help of 1% acacia in normal saline. All the solutions were evaluated for anthelmintic activity. Albendazole solution of concentration 10mg/ml was prepared similarly and used as standard.

**Experimental Model**

Adult Indian earthworms, *Pheretima posthuma* having anatomical and physiological resemblance with intestinal roundworm parasite of the human being,<sup>9,10</sup> were used to evaluate anthelmintic activity. These were collected from moist soil and washed with normal saline to remove all faecal matter.

**Anthelmintic activity**

The anthelmintic assay was carried out as per the method of Ajaiyeoba et.al.<sup>11</sup> Eight petridishes of equal size were taken & numbered. Six earthworms of similar sizes were placed in each petridish as indicated in Table No.1. Albendazole is used as a reference standard and 1% gum acacia in normal saline as a control.

**Table No. 1:Arrangement of the Petri dishes, Earthworms, Plant extracts and Standard drug.**

Petri dish no.1	Earthworms+50 ml of the ethanolic extract (10mg/ml)
Petri dish no.2	Earthworms+50 ml of the ethanolic extract (25mg/ml)
Petri dish no.3	Earthworms+50 ml of the ethanolic extract (50mg/ml)
Petri dish no.4	Earthworms+50 ml of the aqueous extract (10mg/ml)
Petri dish no.5	Earthworms+50 ml of the aqueous extract (25mg/ml)
Petri dish no.6	Earthworms+50 ml of the aqueous extract (50mg/ml)
Petri dish no.7	Earthworms+50 ml of the aqueous albendazole (10mg/ml)
Petri dish no.8	Earthworms+50 ml of 1%gum acacia in normal saline

Observations were made for the time taken for paralysis and death of worms. Paralysis was said to occur when worm did not revive in normal saline. Time for death of worms was recorded after ascertaining that worms neither moved when shaken vigorously nor when dipped in warm water (50°C), followed with fading away of their body colours.

## RESULT AND DISCUSSION

### Physical constants

a) Ash Value:

**Table No. 2: Ash values of *Ventilago denticulata***

Sr.No	Types of ash	Results in percentage
1	Total ash	10%
2	Acid insoluble ash	3%
3	Water soluble ash	4%

b) Loss on drying:

The observed loss on drying was 10%

### Preliminary Phytochemical screening

The phytochemical screening revealed that aqueous and ethanolic extract contain carbohydrates, reducing sugars, steroids, glycosides, alkaloids, tannins and phenolic compounds.

### Anthelmintic activity

The results of anthelmintic activity are shown in table 3. In the present study it was observed that all the three concentrations of aqueous and ethanolic extract (10, 25 & 50 mg/ml) of whole plant of *Ventilago denticulata* show better & potent anthelmintic activity than that of standard drug Albendazole. Both the extracts produced a significant anthelmintic activity in dose dependent manner. Moreover, as alcoholic extract took less time to cause paralysis & death of the earthworms, it was found to be more potent than that of aqueous extract.

Thus the activity shown by *Ventilago denticulata* is of considerable importance & justify its use in controlling the diseases caused by worms.

**Table No.3. Data of time taken for paralysis and death of earthworms**

Drug	Concentration (mg/ml)	Time For Paralysis(min)	Time For Death(min)
		Mean±SEM	Mean±SEM
Normal saline(50ml)	-	-	-
Albendazole	10	54.34±0.34	58.55±0.22
Aqueous Extract	10	16.13±0.09	17.09±0.10
Aqueous Extract	25	14.67±0.17	16.71±0.28
Aqueous Extract	50	11.20±0.14	12.67±0.23
Ethanolic Extract	10	10.49±0.29	11.56±0.23
Ethanolic Extract	25	10.15 ±0.28	11.28±0.14
Ethanolic Extract	50	9.34 ±0.31	10.05 ±0.02

### Statistical analysis

All the results were expressed as mean±SEM (n=6). Data was found to be statistically significant by employing one way ANOVA (p< 0.01).

## CONCLUSION

In conclusion, the present study has shown that, the aqueous and ethanolic extracts of whole plant of *Ventilago denticulata* have significant anthelmintic activity, the ethanolic extract being more potent. But further studies are required to identify & isolate the actual phytoconstituents present in this plant which are responsible for anthelmintic activity.

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