ISSN: 2230-7346

V. Sreenivasulu et al. / Journal of Global Trends in Pharmaceutical Sciences 5(2)-(2014) 1716 –1718

(Research Article)

Journal of Global Trends in Pharmaceutical Sciences

Journal home page: www.jgtps.com

ANTHELMENTIC ACTIVITY OF *ACTINIOPTERIS RADIATA* (LINN.)

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ABSTRACT

The Ethanol extract was prepared from whole plant of *Actiniopteris radiata Linn*. Was evaluated for *invitro* anthelmenthic effect. In present study different concentration of Extract 50 mg/ml, 100 mg/ml, 200 mg/ml were investigated for its anthelmentic activity. The result indicates that the 200 mg/ml Extract posses significant anthelmentic activity. Dose dependent effects were observed with 50 mg/ml, 100 mg/ml, 200 mg/ml. The paralysis time [P] and death time [D] is comparable with standard Albendazole 20 mg/ml.

Keywords: *Actiniopteris radiata Linn*, Paralysis time, Anthelmenthic activity.

INTRODUCTION:

Helminthiasis is a disease in which a part of the body is infested with worms such as pinworm, roundworm or tape worm. Typically, the worms reside in the gastrointestinal tract but may also burrow into the liver and other organs. They produce harmful effect on host by depriving him of food, causing blood loss and by secreting toxins. In India, infections with these parasites are regarded as amongst the most common public health problems, particularly in rural areas and urban slums. Anthelmintics from natural sources could play a key role in the treatment of this parasite. Gastro intestinal Helminthes are resistant to currently available drugs. So the discovery and development of new chemical substances for helminthes control is greatly needed and has promoted studies of traditionally used anthelminthic plants, which are generally considered to be very important sources of bioactive substance.

Actiniopteris radiata Linn more commonly known as *Nemaliadugu* in telugu which belongs to the family Actiniopteridaceae, is a fern widely distributed throughout Africa and adjacent Islands, Madagascar, Arabia, Iran, Afghanistan, Nepal, India, Burma and Australia.[1, 2, 3, 4]. The plant is claimed to possess anti-histaminic activity, anti-cholinergic, anti-microbial activity, anti-inflammatory activity, anthelmenthic activity, analgesic activity and used as styptic.[5] The aim of our study was to investigate the Anthelmenthic activity of Ethanolic extract of whole plant *Actiniopteris radiata Linn*.

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MATERIALS AND METHODS

Plant Materials: The whole plant of *Actiniopteris radiata Linn* were collected from Tirumala Hills, Tirupati and Chittoor district of Andhra Pradesh in the month of July - October and identified by Dr. K. Madhava Chetty, Assistant Professor, Department of Botany, S.V.University and Tirupati.

Preparation of Extract: The powder of whole plant of *Actiniopteris radiata Linn* was extracted with n-Hexane, Chloroform, Ethyl acetate and Ethanol successively by Soxhlation method and concentrated over water bath and evaporated under reduced pressure**.** The Ethanolic extracts was chosen for Anthelmenthic activity.[1, 2]

Animals: Indian adult earthworms (*Pheretima posthuma*) were used to study anthelminthic activity. The earthworms were collected from moist soil and washed with normal saline to remove all fecal matter. Earthworms 3-5 cm in length and 0.1-0.2 cm in width were used for all experimental protocol.

Drugs and Chemicals: Albendazole, n-Hexane, Chloroform, Ethanol, and all are analytical grade.

EXPERIMENTAL PROCEDURE: [10]

Anthelminthic Assay:

Anthelminthic activity was carried as per the method reported by *Rajesh. R et al.*, with minor modifications. All the extracts and the standard drug solution were freshly prepared before starting the experiments. Pheretima posthuma was placed in petridish containing three different concentrations (50, 100, 200 mg/ml) of Ethanol extract of whole plant of *Actiniopteris*

radiata Linn. Albendazole is used as a standard reference. Each petridish was placed with 4 worms and observed for paralysis (or) death. Observations were made for the time taken to paralyze and / or death of individual worms. Paralysis was said to occur when the worms do not move even in normal saline. Death was concluded when the worms lost their motility followed with fading away of their body colour.

Dose Selection: Albendazole 20 mg/ml and extract 50, 100, 200 mg/ml dissolved in normal saline.

EXPERIMENTAL DESIGN

The animals were divided into 5 groups each group contains 4 animals.

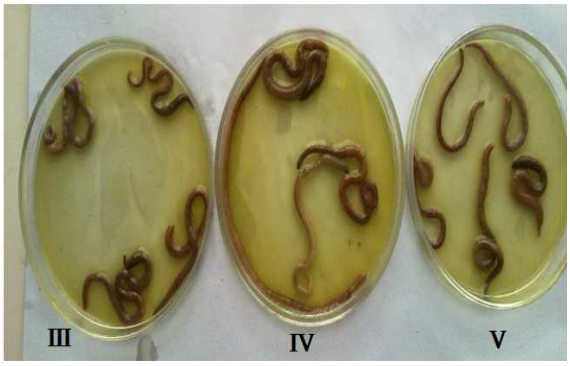
I. Earth worms treated with normal saline.
II. Earth worms treated with Albendazole 20 mg/ml.
III. Earth worms treated with extract 50 mg/ml.
IV. Earth worms treated with extract 100 mg/ml.
V. Earth worms treated with extract 200 mg/ml

RESULTS AND DISCUSSION: [10]

The assay was performed on adult Indian earthworm, Pheretima posthuma due to its anatomical and physiological resemblance with the intestinal roundworm parasite of human beings. Because of easy availability, earthworms have been used widely for the initial evaluation of anthelminthic compounds in vitro. Albendazole citrate by increasing chloride ion conductance of worm muscle membrane produces hyperpolarisation and reduced excitability that leads to muscle relaxation and flaccid paralysis so that they are expelled in the feces. As shown in Table. The Ethanol extract of whole plant of *Actiniopteris radiata Linn* exhibited anthelminthic activity in dose dependent manner taking shortest time for paralysis (P) and death (D) with 200mg/ml concentration. Hence the extract in its different concentration exhibited anthelminthic activity. It show shortest time of paralysis (P=24 min) and death (D=54min) in 200 mg/ml concentration, while the time of paralysis and death will increase in 100 mg/ml concentration (P=33min & D=61min) and in 50 mg/ml concentration (P=37min&D=70min) respectively as compare to Albendazole (20mg/ml) used as standard reference (P= 22 min& D= 48) and normal saline as control. The predominant effect of Albendazole on worm is to cause a flaccid paralysis those results in expulsion of the worm by peristalsis. Thus the Ethanol extract of whole plant of *Actiniopteris radiata Linn* showed significant Anthelminthic activity as compare to standard reference and control.

S. No	Group	Concentration (mg/ml)	Time taken for paralysis (min)	Time taken for death (min)
1	Group-I	Normal saline	-	-
2	Group-II	Albendazole	22±3.12	48±3.14
3	Group-III	Extract 50	37±3.60	70±6.53
4	Group-IV	Extract 100	33±3.24	61±6.25
5	Group-V	Extract 200	24±3.75	54±5.33

All values expressed as mean ± SEM, one way ANOVA followed by dunnet's test and n=4



CONCLUSION:

Traditionally medicinal plants have been used in folk medicine throughout the world to treat various diseases. Further studies using more specific methods are required to explore the constituents responsible for the activity and the mechanism of this activity which might prove important and improved therapies for the treatment and prevention of helmentheasis. From the result, it is conclude that the extract 200 mg/ml showed significant anthelminthic activity when compared with the standard anthelminthic drug. However further *invivo* studies needed to find out the potential pharmacological profile of the extract as an anthelminthic drug.

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How to cite this article:
V.Sreenivasulu[1], S. Chand Basha[2], Y. Adinarayana[1], V. Lingaswamy[1], U. N. Praveen Kumar[1]: Anthelmentic activity of *Actiniopteris radiata* (linn.), 5(2): 1716 - 1718. (2014)