

## STUDY ON ANTHELMINTIC ACTIVITY OF *Rosmarinus officinalis*

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### ABSTRACT

Anthelmintic activity was observed on different extracts of *Rosmarinus officinalis* after studying the acute toxicity on the plant. Two doses 30 mg/ml and 40 mg/ml of ethyl acetate, ethanolic and water extracts were taken to observe the paralysis time (PT) and death time (DT) of earthworms with these doses. It was observed that all the extracts of exhibited dose dependent anthelmintic activity against earthworms. Ethyl acetate extract was more significant followed by ethanol and water extract in causing paralysis and death of earthworms when compared with the standard drug (piperazine citrate, 10 mg/ml). It had been reported that phenolics, flavonoid, diterpenoid, phytosterol are responsible for anthelmintic activity of many plants. So, on the basis of constituents present in *Rosmarinus officinalis* species, it can be concluded that anthelmintic activity of plants was due to the following constituents present in them.

Key words- Anthelmintic, *Rosmarinus officinalis*.

### INTRODUCTION

The World Health Organization (WHO) have been assumed that 4 billion person, 80% of the total world population, currently use herbal remedy for some aspect of primary health care. Herbal medicine is a major component in all indigenous traditional medicine and a common element in Ayurvedic, Homeopathic, Naturopathic, traditional oriented, medicine. WHO notes that of 119 plants derived pharmaceutical medicines; almost 74 per cent are used in modern medicine in ways that simultaneous directly with their traditional uses as plant medicines by native cultures. Development of anthelmintic resistance against helminthes is reported in number of countries which gives a clear indication that control programs based exclusively on their use are not sustainable. The development of integrated programs to control helminthic is vital, but such control programs

require viable alternatives to the use of anthelmintic. Medicinal plants have served through ages, as a constant source of medicaments for the exposure of a variety of diseases. The history of herbal medicine is almost as old as human civilization. The plants are known to provide a rich source of botanical anthelmintics, antibacterials and insecticides. A number of medicinal plants have been used to treat parasitic infections in man and animals (Iqbal et al., 2001). Anthelmintics are the drugs that expel parasitic worms from the body by either stunning or killing them. They may also be called as vermifuges (stunning) or vermicides (killing) (Dwivedi et al., 2009).

## **METHADODOLOGY**

### **ANTHELMINTIC ACTIVITY**

The anthelmintic activity was performed on adult earthworm (*Eisenia foetida*) owing to its anatomical and physiological resemblance with the intestinal roundworm parasites of human beings.

Each groups consisted of 12 adult earthworms (*Eisenia foetida*):

- 1<sup>st</sup> group - Vehicle (Normal saline)
- 2<sup>nd</sup> group - Standard drug (Piperazine citrate)
- 3<sup>rd</sup> group - Ethyl acetate extract of *Rosmarinus officinalis* (30 mg/ml)
- 4<sup>th</sup> group - Ethyl acetate extract of *Rosmarinus officinalis* (40 mg/ml)
- 5<sup>th</sup> group - Ethanol extract of *Rosmarinus officinalis* (30 mg/ml)
- 6<sup>th</sup> group - Ethanol extract of *Rosmarinus officinalis* (40 mg/ml)
- 7<sup>th</sup> group - Aqueous extract extract of *Rosmarinus officinalis* (30 mg/ml)
- 8<sup>th</sup> group - Aqueous extract of *Rosmarinus officinalis* (40 mg/ml)

### **Procedure**

Test samples of three extracts (ethyl acetate, ethanol and aqueous) were prepared at the concentrations of 30 mg/ml and 40 mg/ml in 25 ml of normal saline. 12 worms of approximately equal size were placed in petridish containing above solution of extracts. Piperazine citrate (10 mg/ml) was used as reference standard and normal saline as control. Time of paralysis was noted when no movement was observed except when the worms were shaken vigorously. Time of death of worms were recorded after ascertaining that worms neither moved when shaken vigorously nor when dipped in warm water (50°C). All the readings were taken in triplicate. Then all the

extracts were compared with the standard by observing the paralysis time and death time of earthworms on different extracts (Aswar *et al.*, 2018, Kosalge *et al.*, 2019).

## RESULT & DISCUSSION

### Anthelmintic Activity

#### Plant authentication

Plant materials were authenticated at G.B.P.U.A.T., Pantnagar, Uttarakhand..

#### Experimental animal's approval

The experimental procedure was approved by SARC (Scientific and Applied Research Center), Meerut,U.P.

#### Earthworms authentication

The earthworms of species *Eisenia foetida* were obtain from G.B.P.U.A.T., Pantnagar, Uttarakhand.

**Table 20 Evaluation of Anthelmintic activity**

Treatt	mgml)	<i>Rosmarinus officinalis</i> Extract	
		Paralysis Time (Mean±SEM)	DeathTime (Mean±SEM)
<b>Contol</b>	Normal Saline (25ml)	–	–
<b>Piperaze citrate</b>	10	21.66±0.88	61.33±1.33
<b>Ethyl acetate extract</b>	30	8.42±0.81**	11.9±0.20**
	40	3.43±0.29**	7.16±0.12**
<b>Ethanol extract</b>	30	12.70±0.35**	17.23±0.11**
	40	10.36±0.08**	15.9±0.20**
<b>Aqueous extract</b>	30	54.2±0.11**	66.85±0.20**
	40	22.23±0.11	28.16±0.12**

Each value represent Mean±SEM, n=5. One-way ANOVA followed by Dunnet test through Instat software, compare all vs. standard applied. Statistically significant at \*\*P<0.01, \*P<0.05.

Anthelmintic activity was observed on different extracts of *Rosmarinus officinalis* after studying the acute toxicity on the plant. Two doses 30 mg/ml and 40 mg/ml of ethyl acetate, ethanolic and water extracts were taken to observe the paralysis time (PT) and death time (DT) of earthworms with these doses. It was observed that all the extracts of exhibited dose dependent anthelmintic activity against earthworms. Ethyl acetate extract was more significant followed by ethanol and water extract in causing paralysis and death of earthworms when compared with the

standard drug (piperazine citrate, 10 mg/ml). It had been reported that phenolics, flavonoid, diterpenoid, phytosterol are responsible for anthelmintic activity of many plants. So, on the basis of constituents present in *Rosmarinus officinalis* species, it can be concluded that anthelmintic activity of plants was due to the following constituents present in them.



**Fig. 25:** Piperazine citrate (10mg/ml)



**Fig.26 :** Normal saline with Tween



**Fig. 27:** Aqueous extract



**Fig. 28:** E.A extract



**Fig. 29:** Ethanol extract

**Fig. 25-29** Effect of different extracts of *Rosmarinus officinalis* on earthworms

## Conclusion

Ethyl acetate extract was more significant followed by ethanol and water extract in causing paralysis and death of earthworms when compared with the standard drug (piperazine citrate, 10 mg/ml). It had been reported that phenolics, flavonoid, diterpenoid, phytosterol are responsible for anthelmintic activity of many plants. So, on the basis of constituents present in *Rosmarinus officinalis* species, it can be concluded that anthelmintic activity of plants was due to the following constituents present in them. Two doses 30 mg/ml and 40 mg/ml of ethyl acetate, ethanolic and water extracts were taken to observe the paralysis time (PT) and death time (DT) of earthworms with these doses. It was observed that all the extracts of exhibited dose dependent anthelmintic activity against earthworms. Ethyl acetate extract was more significant followed by ethanol and water extract in causing paralysis and death of earthworms when compared with the standard drug (piperazine citrate, 10 mg/ml). It had been reported that phenolics, flavonoid, diterpenoid, phytosterol are responsible for anthelmintic activity of many plants. So, on the basis of constituents present in *Rosmarinus officinalis* species, it can be concluded that anthelmintic activity of plants was due to the following constituents present in them.

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