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In vitro Anthelmintic Activity of *Jasminum mesnyi* Leaves

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Abstract : Globally helminths diseases or contaminations impact a colossal number of populaces, particularly in rising nations. Current available treatment is not deprived of side effect. Hence the search of phytoremedies as anthelmintic which is deprived of side effect are in vogue. **Method:** The anthelmintic activity of hydroalcoholic extract of *Jasminum mesnyi* leaves as well as its chloroform, ethyl acetate and n-butanol fractions were studied against adult earthworm (n=6) *Eiseniafoetida* (redworm) utilizing albendazole as the standard drug. The time taken for paralysis (Vermifuse), and death (Vermicidal) was noted down.**Result:** It was found that hydroalcoholic extract of JM (200 mg/kg) and its ethyl acetate as well as n-butanol fractions (10, 20, 40 mg/ml) possess significant anthelmintic activity which is comparable with albendazole (20 mg/ml). Preliminary phytochemical analysis confirms the presence of tannins, polyphenols and flavonoids in these extracts. Chloroform fraction is deprived of anthelmintic activity.**Conclusion:** It may be concluded that the hydroalcoholic extract of leaves of JM and its corresponding ethyl acetate & n-butanol fraction possessed significant anthelmintic effect. It may also be resolved that tannins, polyphenols and flavonoids are the possible constituents which may be responsible for anthelmintic effect of extract and its fraction.

Key words : Anthelmintic *Eisenia foetida, Jasminum mesnyi,* phytochemicals, fraction.

Introduction

Globally helminths diseases or contaminations impact a colossal number of populaces, particularly in rising nations[1], with about 819 million individuals around the world influenced with ascaris, 438 million by implies of hookworm, and 464 million by trichuris[2,3]. Helminth infection is caused by the wet, humid climate of the equatorial regions, as well as a lack of hygiene sanitation facilities[4]. Synthetic drugs are commonly used to treat helminth infection in humans, but they are out of reach for millions of people and come with a slew of side effects[5].Furthermore, the growing problem of helminth resistance to anthelmintics[6,7] has prompted the suggestion of testing phytoremedies for anthelmintic activity. The plants are acknowledged to provide a wealthy supply of botanical anthelmintics[8,9]. Now a days the search of plant for anthelmintic property is on vogue. One such plant selected for the current study is *Jasminum mesnyi*.

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Jasminum mesnyi is grown in tropical as well as subtropical region throughout the world; particularly in India, where it is found in the Himalayan region. It is a climber shrub with 2.5 m height that crawls on nearby plants[10]. It is also known as peelichameli in the villages of Himachal [11]. It is an evergreen herbaceous, perennial semi-vining shrub that required support unless grown as a bank cover. If given support, it grows like sprawling shrub with long, slenderical, arch-like stems that will climb resembling a rambling vine. Without support, it sprawls like a thick cloud of dark green foliage of about 5-10 feet in height and width [10-12]. The plant is reported to possess antioxidant activity [13], anti-ulcer activity[14], wound healing activity [15], etc. *J. mesnyi* contains a variety of phytoconstituents*viz.*ceryl alcohol, *β*-sitosterol, *α*-amyrin, mannitol, ursolic acid, quercetin, rutin, bitter glucosidelike jasminin[16],secoiridoidglucosides like jasmoside, jasmesoside, jasmosidic acid[17-19]and Caffeic glucoside esters likepoliumoside, forsythoside B,verbascoside[20].

Material and Methods

Chemical and reagents :

Albendazolewas procured from Glaxo Smith Care and stored at 2-4^{o}C protected from light. All other chemicals and biochemical reagents were of analytical grade and procured from reputed drug/chemical manufacturers/commercial supplier.

Plant material :

The plant was collected from the local area of Solandistrict of Himachal Pradesh, India at an altitude of 1400-1500 m. It was taxonomically identified and authenticated as *Jasminum mesnyi* from Department of Plant Product, Herbarium and Museum Division, Dr. Y. S. Parmar University of Horticulture and Forestry, Nauni, Solan, Himachal Pradesh, India. A voucher specimen of the plant sample has been linked to UHF-Herbarium with field book no. 13428. The collected plant material was shade dried and powdered coarsely with a mechanical grinder up to sieve mesh size 20-30.

Extraction, fractionation and qualitative phytochemical screening :

About 200 g of dried leaveswere defatted with petroleum ether (60-80^{o}C) and extracted utilizing 95% methanol by the continuous hot extraction process. The extract was filtered and evaporated under reduced pressure to give a dry hydroalcoholic extract (14.6 g). The hydroalcoholic extract of plant (10 g) was suspended in water (100 ml) and was extracted successfully thrice (25 ml each) with chloroform, ethyl acetate, and n-butanol using separating funnel. Eachfraction was filtered separately through filter paper (Whatman no. 41) to eliminate residue particles. The fractions were evaporated through a rotary evaporator under reduced pressure to produce the dry crude fraction[21]. The extract and its fractions were chemically investigated for phytoconstituents like phenolic compounds, flavonoids, saponin, alkaloids, glycosides, *etc.* [22-26]. The fractions were stored in a desiccator for further experiments.

Preparation of doses :

The doses of extract and fractions were prepared in 1% carboxy methyl cellulose (CMC). 1% CMC was taken as control group, and albendazole as standard drug.

Experimental animal :

Adult earthworm *Eisenia foetida* (redworm) were used for the evaluation of *in vitro* anthelmintic activity. They were collected from Haryana Agriculture University, Hisar, Haryana. The average length of earthworm was 2-6 cm and width was 0.1-0.3 cm.

Experimental procedure :

The anthelmintic activity was performed according to the method of Dhamijaet al[27] and Rana et al [28]. On adult earth worm *Eisenia foetida* as it has anatomical and physiological resemblance with the intestinal round worm parasites of human beings. *Eiseniafoetida* (redworm) was placed in Petri dish containing three different concentrations of extract (50, 100, 200 mg/ml)and fractions (10, 20, 40 mg/ml). Each petridish was

placed with 6 worms and observed for paralysis and death. The mean time for paralysis was noted when no movement of any sort could be observed, except when the worm was shaken vigorously; the death time of worm (min) was recorded after ascertaining that worms neither moved when shaken nor when given external stimuli. In the same manner albendazole was included as reference compound. The test results were compared with standard compound albendazole (20mg/ml) treated samples.

Statistical analysis :

The statistical significance between groups was analyzed using one way ANOVA followed by dunette's test.

Results and Discussion

At 200 mg/ml concentration hydroalcoholicextract proved to be potent by recording the time of paralysis of earthworms at 27.7±1.65 minutes and time of death of earthworms at 35.6±1.76 min. The ethyl acetate and n-butanol fraction of extract produce significant anthelmintic effect at all the dose which is comparable with the standard drug albendazole with paralysis time at 11.3±0.19 and death time at 19.8±0.35min (Table 1 and Figure 1).However, chloroform fraction of extract did not produce significant anthelmintic effect. Thus, extract and its ethyl acetate as well as n-butanol fraction possessed dose dependent anthelmintic activity.

Table 1: Anthelmintic activity of *Jasminummesnyi*leaves

Sr. No.	Group	Concentration (mg/ml)	*Eiseniafoetida* (earthworm/redworm)	
			Time taken for paralysis (P) in min. (Mean±SEM)	Time taken for Death (D) in min. (Mean±SEM)
1	Hydroalcoholic extract of JM	50	59.5±2.34	81.4±3.76
		100	30.3±2.65*	39.5±1.54 *
		200	27.7±1.65 **	35.6±1.76**
2	Chloroform fraction	10	78.5±3.24	101.4±3.33
		20	69.5±2.76	92.2±2.44
		40	63.5±1.16	89.6±2.65
3	Ethyl acetate fraction	10	29.4±1.56*	38.3±0.23*
		20	20.4±1.94 **	29.5±0.65**
		40	13.5±0.46**	21.4±.67**
4	n-butanol fraction	10	27.4±0.82**	35.2±0.68**
		20	18.2±0.12**	26.5±0.38**
		40	12.7±0.45**	20.1±0.29**
5	Albendazole	20	11.3±0.32**	19.8±0.65**
6	Control	----	----	----

Preliminary phytochemical screening confirms the presence of tannins, polyphenols and flavonoids in extract as well its ethyl acetate and n-butanol fractions. But chloroform fraction did not contain these types of constituents.

Conclusion

From the above result it may be concluded that hydro alcoholic extracts of leaves of*Jasminummesnyi* as well as its ethyl acetate and n-butanol fraction possessed a potent anthelmintic activity and is comparable with standard drug albendazole. It is also concluded that chloroform fraction is deprived of any anthelmintic effect.

Furthermore, it is very clear from the result of preliminary phytochemical screening that except chloroform fraction all other extract contains tannins, polyphenols and flavonoids. Thus, it may be resolved that tannins, polyphenols and flavonoids are the constituents which may be responsible for anthelmintic effect of extract and its fraction.

Further studies involving *in vivo* model are required to find out and to establish effectiveness and pharmacological rationale for the use of drug as anthelmintic drug.

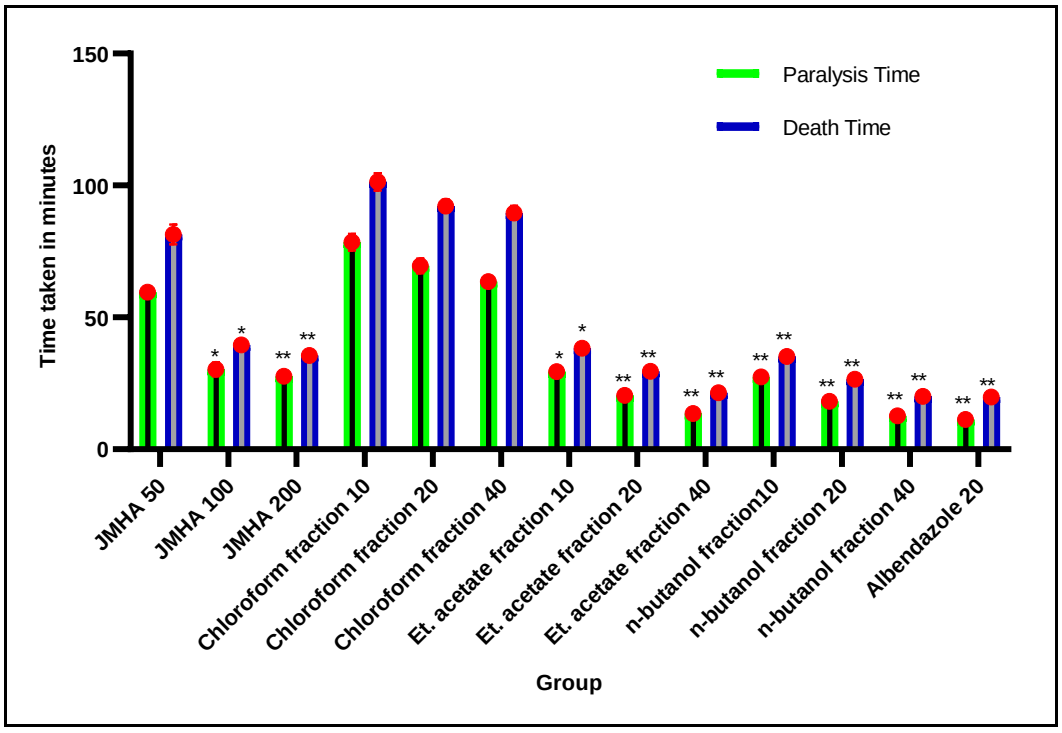

Figure 1: Anthelmintic activity of *Jasminum mesnyi* leaves

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Conflict of interest The authors have no conflict of interest to declare.

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