Progressive Research 9 (Special) : 466-468 (2014) *Society for Sci. Dev. in Agric. and Tech.*

IN-VITRO ANTHELMINTIC ACTIVITY OF PRUNUS PERSICA AGAINST HAEMONCHUS CONTORTUS

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ABSTRACT

Anthelmintic activity of crude powder, aqueous, diethyl ether and methanol extracts was tested at 0.25, 0.5, 1 and 2 percent concentrations against adult *Haemonchus contortus*. All extracts showed hundred percent efficacies at various concentrations after 24 hours. Overall crude powder and aqueous extracts showed better anthelmintic activity than diethyl ether and methanol extracts. Maximum corrected mortality of 80% was observed in crude powder, aqueous and diethyl extracts.

Key words **:** *Anthelmintic, prunus persica, haemonchus contortus*

In India, gastrointestinal (GI) nematodosis, caused by *Haemonchus*, *Ostertagia*, *Trichostrongylus*, *Bunostomum*, *Strongyloides*, *Cooperia, Nematodirus* spp. is a common problem of small ruminants that results into parasitic gastroenteritis. Among them, *H. contortus* is a predominant and highly pathogenic G.I. nematode responsible for impaired productivity in small ruminants throughout the world (1). G.I. nematodosis can be controlled in various ways *viz.* use of chemical drugs, vaccines, use of biological agents and managemental practices. But in the absence of any effective control method, chemotherapy remains the only option for the satisfactory control of GI nematodosis throughout the world (2). Control of G.I. nematodosis in sheep and goat is a big challenge for Veterinary Parasitologists due to the emergence of drug resistance and lack of any other effective control method. The rapid development of resistance to commonly used drugs among nematodes, associated with high cost, environmental pollution and food residues have gave new interest in medicinal plants as an alternative source of anthelmintic drugs. Use of indigenous medicinal plants is one such option to control GI nematodosis (3). So the present study was planned to evaluate the anthelmintic activity of leaves of *P. persica* against adult *H. contortus.*

MATERIALS AND METHODS

Collection and processing of plant material **:** Leaves of *Prunus persica* were collected from local herbs situated in and around Pantnagar. The leaves of selected plant were cleaned manually by removing the coarse impurity by hand and blowing the air to remove the dust and fine impurities, these were then shade dried in laboratory and further dried in incubator at 39^0C for 6 hours to remove moisture; if any. The leaves were grinded in electric grinder machine at room temperature to obtain coarse powder, which were used for extraction. Three extracts *viz*. cold aqueous, methanol and diethyl ether were prepared for evaluation of anthelmintic activity.

Preparation of organic solvent extract : 50 gm powder was taken for each solvent *viz*. methanol and diethyl ether extracts and soaked in 400 ml of the respective solvent and stirred properly at every one hour interval in clean glass beaker covered with aluminium foil at room temperature. These were later filtered through several layers of muslin cloth and using separating funnels. The filtrate was concentrated by evaporation at lower temp. (40-50^0C) and reduced pressure by using rotatory vacuum evaporator at 50-55^0C (4).

Preparation of aqueous extract **:** 50 gm of powdered sample was soaked in 400 ml. of distilled water and stirred every one hour interval initially for 2-3 times and left undisturbed for 8 hrs. at room temperature and then filtered through muslin cloth and separating funnel. Then after, filtrate was concentrated by using rotatory vacuum evaporator at 50-55^0C.

Evaluation of anthelmintic efficacy : Adult *Haemonchus contortus* worms were procured from the abomasii of freshly slaughtered goat. Then after they were kept in wide mouth container having lukewarm normal saline and brought to laboratory. The motile worms were cleaned with lukewarm normal saline

Table-1 : Effect of *Prunus persica* extract at 0.25% on *Haemonchus contortus*

Extract	No. of worms exposed	Time of exposure in hrs. (number of worms found dead)							
		2	4	6	12	18	24	% mortality	% corrected mortality
Crude powder	10	0	0	0	0	0	10	100	0
Cold aqueous	10	0	0	0	0	0	10	100	0
Methanol	10	0	0	0	0	0	10	100	0
Diethyl ether	10	0	0	0	0	0	10	100	0
Negative control	10	0	0	0	2	7	10	100	-

Table-2 : Effect of *Prunus persica* extract at 0.50% on *Haemonchus contortus*

Extract	No. of worms exposed	Time of exposure in hrs. (number of worms found dead)							
		2	4	6	12	18	24	% mortality	% corrected mortality
Crude powder	10	0	0	0	0	0	10	100	0
Cold aqueous	10	0	0	0	0	0	10	100	0
Methanol	10	0	0	0	0	0	10	100	0
Diethyl ether	10	0	0	0	0	0	10	100	0
Negative control	10	0	0	0	2	7	10	100	-

Table-3 : Effect of *Prunus persica* extract at 1% on *Haemonchus contortus*

Extract	No. of worms exposed	Time of exposure in hrs. (number of worms found dead)							
		2	4	6	12	18	24	% mortality	% corrected mortality
Crude powder	10	0	0	0	6	8	10	100	0
Cold aqueous	10	0	0	0	10	-	-	100	80
Methanol	10	0	0	0	2	6	10	100	0
Diethyl ether	10	0	0	0	0	0	10	100	0
Negative control	10	0	0	0	2	7	10	100	-

Table-4 : Effect of *Prunus persica* extract at 2% on *Haemonchus contortus*.

Extract	No. of worms exposed	Time of exposure in hrs. (number of worms found dead)							
		2	4	6	12	18	24	% mortality	% corrected mortality
Crude powder	10	0	0	0	10	-	-	100	80
Cold aqueous	10	0	0	0	10	-	-	100	80
Methanol	10	0	0	0	6	9	10	100	0
Diethyl ether	10	0	0	0	10	-	-	100	80
Negative control	10	0	0	0	2	7	10	100	-

solution. The cleaned worms were transferred in beaker containing Lock's solution at 37^0C (5). Different concentrations *viz.* 0.25%, 0.5%, 1% and 2% were prepared in Lock's solution for evaluation of their anthelmintic activity. Ten adult *H. contortus* were taken in each small petridishes having different dilutions of test extract in Lock's solution viz. 0.25%, 0.5%, 1% and 2%. Total volume of each petridishes was kept at 15 ml. Exclusive 15 ml Locks solution was taken as control. It was then incubated at 37^0C±1^0C for hours and number

of live and dead adult worms was counted at 2, 4, 6, 12, 18 and 24 hours interval. The minimum lethal time for all the ten worms in each extract was recorded. The viability of the worms was determined by pinch technique (the absence of motility for an observation period of 5-6 second) (6) and (7)**.** The corrected mortality for each extract was calculated by taking into account the mortality of worms, if any, in the Locks solution. Corrected mortality was calculated as per the formula (8).

$$\% \text{ corrected mortality} = \frac{\text{Total mortality} - \text{Control mortality}}{\text{Total mortality}} \times 100$$

RESULTS AND DISCUSSION

The anthelmintic activity of different extracts of *Prunus persica* at various concentrations is presented in Table-1 to 4. Crude powder of *Prunus persica* showed 100, 100,100 and 100 percent anthelmintic activity at 0.25%, 0.5%,1% and 2% concentrations with percent corrected mortality of 0, 0, 0 and 80, respectively whereas aqueous extract showed 100, 100,100 and 100 percent mortality at 0.25%, 0.5%,1% and 2% concentrations with percent corrected mortality of 0, 0, 80 and 80, respectively.

Methanol extract showed hundred percent mortality with corrected mortality of 0% in all tested concentrations while diethyl ether extract showed 100%,100%,100% and 100% mortality was observed with diethyl ether at 0.25%, 0.5%,1% and 2% concentrations with percent corrected mortality of 0, 0, 0 and 80, respectively. In the present study, hundred percent mortality in various extracts at different concentration was recorded along with mortality in control group. An efficacy of 97% efficacy in sheep against gastrointestinal nematodes following treatment with leaves of *Prunus persica* @3gm/kg body weight has been recorded by other worker also (9). The differences in findings might be due to denaturation of phytoconstituents in organic solvents.

Thus, the results of present study suggest that Prunus persica may be used as an alternative treatment of gastrointestinal nematodosis in small ruminants especially during low degree of infection to avoid indiscriminative use of drug responsible for emergence of resistance.

ACKNOWLEDGEMENT

The facilities provided by the Dean, College of Veterinary and Animal Sciences and Director, Experiment Station, G.B. Pant University of Agriculture and Technology, Pantnagar to carry out this study is thankfully acknowledged.

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