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Research Article

Estimation of anthelmintic potential of *Prunus domestica*

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Abstract

In the present work, experiments were conducted to evaluate the possible anthelmintic effects of petroleum ether extract of *Prunus domestica* (leaves). 100mg/ml concentration of extract was tested and results were expressed in terms of time for paralysis and time for death of worms. Piperazine citrate was used as a reference standard and 1% Gum acacia in normal saline as a control group. Obtained results stated that tested dose showed significant anthelmintic activity when compared to standard.

Keywords: Anthelmintic, Petroleum ether, Worm, Gum acacia.

Introduction

Helminthes parasite infections are global problems with serious social and economic repercussions in the Third World countries. The diseases affect the health status of a large fraction of the human population as well as animals.[1] Herbal drugs have been in use since ancient times for the treatment of parasitic disease in human and could be of value in preventing the development of resistance.[2, 3] In the series of medicinal plants, *Prunus domestica* is selected as a herbal remedy for the assessment of anthelmintic activity. *Prunus domestica* (family-Rosaceace) commonly known as Plum tree or Prune tree in English, Prunier in French and Kokkymilia in Greek. A tree has unarmed branches and glabrous pedicles in pairs. The fruits are used as laxative and refrigerant. Prunes are often added to cathartic decoctions, improving their flavor and promoting their effect. They are also given in combination with other drugs in leucorrhoea and irregular menstruation.[4] Literature survey revealed that plant extract has yet not been screened for anthelmintic activity. Therefore, the objective of this work was to assess the anthelmintic activity of *Prunus domestica* leaves.

Material and Methods

Collection of plant material

Leaves of *Prunus domestica* were collected from local area of Bhopal and authenticated by Dr. Ziaul Hasan, Department of Botany, Safia Science College, Bhopal. (Voucher specimen no.243/Bot/Safia/2011). Collected leaves were washed and dried at room temperature. After complete drying, leaves were powdered and passed through a sieve and stored in air tight container.

Extraction of plant material

About 80g of the air dried powdered plant material was extracted with Petroleum ether (60-80^0). Solvent was evaporated and accurate weight of the extract was taken. The extractive value (%) was calculated with reference to air dried drug. (Yield-14% w/w)

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Experimental worms

The earthworms of 3-5 cm in length and 0.1-0.2 cm in width were used for all the experimental protocol due to its anatomical and physiological resemblance with the intestinal roundworm parasites of human beings.[5, 6]

Anthelmintic screening

The anthelmintic assay was carried out as per the protocol of Ajaiyeoba *et al.*[7] Three groups of approximately equal size Indian earthworms consisting of four earthworms in each group were used for the study. Each group was treated as following;

Group-I - Vehicle (1% Gum acacia in normal saline)

Group-II - Piperazine citrate (10 mg/ml)

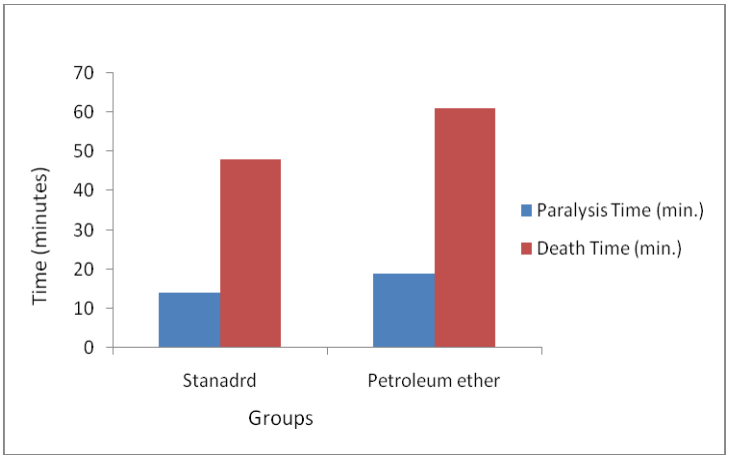
Group-III- Petroleum ether extract (100 mg/ml.)

Observations were made for the time taken to paralysis and death of individual worms. Time for paralysis was noted when no movement of any sort could be observed except when the worms were shaken vigorously. Death was concluded when the worms lost their motility followed with fading away of their body colors.[8, 9]

Statistical analysis

Values are expressed as mean+SEM. Results were analysed by one way ANOVA followed by Dunnett's test. $P<0.05$ was considered significant.

Fig. 1: Anthelmintic activity of Petroleum ether extract of *Prunus domestica* (leaves) against Earthworms



Results and discussion

The petroleum ether extract of *Prunus domestica* demonstrated paralysis as well as death of worms in a less time as compared to piperazine citrate at concentration of 100 mg/ml. (As shown in Fig. 1) Preliminary phytochemical analysis revealed the presence of steroids, terpenoids and tannins in petroleum ether extract of *Prunus domestica* (leaves). Earlier studies showed that tannins and terpenoids are responsible for anthelmintic activity.[10-12] Tannins, the polyphenolic compounds, are shown to interfere with energy generation in helminths parasites by uncoupling oxidative phosphorylation or, binds to the glycoprotein on the cuticle of parasite and cause death.[13] It is possible that tannins and terpenoids present in the extract of *Prunus domestica* produced similar effects.

Conclusion

Obtained results concluded that petroleum ether extract of *Prunus domestica* has potent anthelmintic activity when compared with the conventionally used drug. Further, it would be remarkable to isolate the possible constituents those are responsible for anthelmintic activity.

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References

1) Daniel Vivek, Daniela Kratika, Goyal Swapnil, Parihar S Mahendra and Singh Mangal. (2010). Synthesis and In-vitro Anthelmintic Activity of Some 4-aminophenol Derivatives. International Journal of Pharmaceutical Research, Vol 2, (2): 21-24.
2) Chopra RN, Nayer SC, Chopra IC. (1956). Glossary of Indian Medicinal Plants. New Delhi, CSIR. 160.
3) Hammond DA, Feilding D, Bishop SC. (1997). Prospects for plant anthelmintic in tropical veterinary medicine. *Vet Res Comm*, 21: 213-228.
4) Kirtikar KR, Basu BD. (2005). Indian Medicinal Plants, Vol. 2. International book Distr., 961.
5) Thorn GW, Adams RD, Braunwald E, Isselbacher KJ, Petersdorf RG. (1977). *Harrison's Principles of Internal Medicine*, McGraw Hill Co, New York.
6) Vigar Z. (1984). *Atlas of Medical Parasitology*, 2nd Edn., P.G. Publishing House, Singapore.
7) Ajaiyeoba EO, Onocha PA and Olarenwaju OT. (2001). *In vitro* anthelmintic properties of *Buchholzia coriaceae* and *Gynandropsis gynandra* extract. *Pharm Biol.*, 39: 217- 20.
8) Vagdevi HM, Latha KP, Vaidya VP, Vijayakumar M and Pai KS. (2001). Synthesis and Pharmacological screening of some novel naphtha (2, 1-b) Furo-pyrazolines, isoxazoles and isoxazolines, *Indi. J. Pharma. Sci*, 63: 286-291.
9) Bolton S: In Pharmaceutical Statistics-Practical and Clinical Applications. (1997). New York: Marcel Dekker, 69-78.
10) Waller PJ. (1999). International approaches to the concept of integrated control of nematode parasites of livestock. *Int. J. Parasitol.*, 29: 155–64.
11) Athnasiadau S, Kyriazakis I, Jackson F, Coop RL. (2001). Direct Anthelmintic effects of condensed tannins towards different gastrointestinal nematodes of sheep: *in vitro* and *in vivo* studies. *Vet.parasitol* Vol. l, 99: 205-219.
12) Lahlou M. (2002) Potential of *Origanum compactum* as a cercaricide in Morocco. *Ann. Trop. Med. Parasitol.*, 96: 587-593.
13) Thompson DP, Geary TG. (1995). The structure and function of helminths surfaces in Biochemistry and Molecular Biology of parasites 1st ed. *Academic press*, New York, pp.203-232.

Table 1: Anthelmintic activity of Petroleum ether extract of *Prunus domestica* (leaves) against Earthworms

S.N.	Groups	Concentration	Time of paralysis (Minutes)	Time of death (Minutes)
1.	Control	-	-	-
2.	Standard (Piperazine citrate)	1%	14.25±1.537	48.29±0.322
3.	Petroleum ether extract	100mg/ml	19.75±2.715	61.15± 0.467

All the values are Mean ± SEM (n = 4). P<0.05 = Significant