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COMPARATIVE ANTHELMINTIC ACTIVITY OF *AEGLE MARMELOS* AND *TERMINALIA BELLERICA*

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ABSTRACT

Anthelmintic activity was observed on different extracts of *Aegle Marmelos* 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 *Aegle Marmelos* species, it can be concluded that anthelmintic activity of plants was due to the following constituents present in them. Anthelmintic activity was observed on different extracts of *Termilalia Bellerica* 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 *Termilalia Bellerica* species, it can be concluded that anthelmintic activity of plants was due to the following constituents presen.

Key words- Anthelmintic, *Termilalia Bellerica*, *Aegle Marmelos.*

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 helminthes is vital, but such control programs require viable alternatives to the use of anthelmintics. 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).

METHADOLOGY

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*):

- 1st group - Vehicle (Normal saline)
- 2nd group - Standard drug (Piperazine citrate)
- 3rd group - Ethyl acetate extract of *Aegle Marmelos and Terminalia Bellerica* (30 mg/ml)
- 4th group - Ethyl acetate extract of *Aegle Marmelos and Terminalia Bellerica* (40 mg/ml)
- 5th group - Ethanol extract of *Aegle Marmelos and Terminalia Bellerica* (30 mg/ml)

- 6th group - Ethanol extract of *Aegle Marmelos and Terminalia Bellerica* (40 mg/ml)
- 7th group - Aqueous extract extract of *Aegle Marmelos and Terminalia Bellerica* (30 mg/ml)
- 8th group - Aqueous extract of *Aegle Marmelos and Terminalia Bellerica* (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)**	***Aegle Marmelos* Extract**	
		Paralysis Time (Mean±SEM)	**DeathTime (Mean±SEM)**
Contol	Normal Saline (25ml)	_	_
Piperaze citrate	10	21.66±0.88	61.33±1.33

Ethyl acetate extract	30	8.42±0.81**	11.9±0.20**
	40	3.43±0.29**	7.16±0.12**
Ethanol extract	30	12.70±0.35**	17.23±0.11**
	40	10.36±0.08**	15.9±0.20**
Aqueous extract	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 *Aegle Marmelos* 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 *Aegle Marmelos* 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 *Aegle Marmelos* on earthworms

Table 21 Evaluation of Anthelmintic activity

Treatment	**Dose (mg/ml)**	*Termilalia Bellerica* **Extract**	
		Paralysis Time (Mean±SEM)	**DeathTime (Mean±SEM)**
Control	Normal Saline (25ml)	_	_
Piperazine citrate	10	19.66±0.66	51.33±1.03
Ethyl acetate extract	30	7.42±0.81**	11.9±0.20**
	40	3.43±0.29**	7.16±0.12**
Ethanol extract	30	11.70±0.35**	16.23±0.11**

	40	9.36±0.08**	16.9±0.20**
Aqueous extract	30	52.2±0.11**	65.85±0.20**
	40	21.26±0.11	26.16±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.

significant at **P<0.01, *P<0.05.

Anthelmintic activity was observed on different extracts of *Termilalia Bellerica* 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 *Termilalia Bellerica* species, it can be concluded that anthelmintic activity of plants was due to the following constituents presen.

Fig. 30: Piperazine citrate (10mg/ml)

Fig.31 : Normal saline with Tween

Fig. 32: Aqueous extract

Fig. 33: E.A extract

Fig. 34: Ethanol extract

Fig. 30-44 Effect of different extracts of *Termilalia Bellerica* on earthworms

REFERENCES

Ahmed, S.M., Vrushabendra, S.B.M., Gopkumar, P., Dhanapal, R., Chandrashekara, V.M.(2005). Anti-Diabetic activity of *Terminalia catappa Linn.* Leaf extracts in alloxan–induced diabetic rats. *Iranian Journal of Pharmacology and Therapeutics* 4, 36–39.

Ahmad, M.; Feza, S.K.; Saxena, R.R. Sharma and S.K. Singh. (2004). Effect of *Azotobacter chroacoccum* on nutrient uptake in Amrapali mango under high density planting. *Indian J. Hort*, 61(4); 348.

Anjana J., Monika B., Sangeeta S. (2007). Protective effect of *Terminalia bellerica* Roxb. and gallic acid against carbon tetrachloride induced damage in albino rats, *Journal of Ethnopharmacology* 109, 214-218.

Arif-ullah Khan, Anwarul Hassan Gilani,(2008). Pharmacodynamic Evaluation of *Terminalia bellerica* for Its Antihypertensive Effect. *Journal of Food and Drug Analysis* 16(3), 6-14.

Amrane ,A.(2003). Seed culture and its effect on the growth and lactic acid production of Lactobacillus helveticus. *J Gen Appl Microbiol* 49(1):21-7.

Asthana, M, Kumar, A, Sharma S.(2011). Cytogenetical Effects of *Terminalia bellerica*, Roxb. on Root Meristem of Viciafaba. *Adv. Biores*. 2(1):174-77.

Ayoob, FA, Awad, H.M, El-Kousy, S.M, Rashed, K.N, Al- Sayed, N.H. (2014).Phytochemical and biological investigations of *Terminalia bellerica* Roxb. leaves. *J Pharm Res.* 8(4):500-10.

Bhalla, S, Verma, M. and Rawal, S. (2012). Invitro Antioxidant Activity of the Methanolic Extract of *Aegle Marmelos* Leaf, *International Journal of Natural Product Science. Spl Issue1*:185-190.

Bandyopadhyay, D, Chattopadhyay, A, Ghosh, G, Datta, A.G. (2004). Oxidative stress-induced ischemic heart disease: protection by antioxidants. *Curr Med Chem.*11:369-387.

Badam, L, Bedekar, S, Sonawane, K.B, Joshi, S.P. (2002) In vitro antiviral activity of bael (*Aegle marmelos* Corr) upon human coxsackieviruses B1-B6. *J Commun Dis*. 34(2):88-99.

Babu, Naresh. (2003). Effect of organic inputs and potassium on growth and yield of'Co 5' papaya *[Carica papaya). Indian J. of Agrt Set,*73 (4) : 212-214.

Balkrishnan, S.M.; Selvarajan and Siddeswar, K. (2001). Effect of Biofertilizers in custard apple. *South Indian Hort.*,49:185-186.

soil characteristics in banana. *Indian J. Hort,* 61 (4) : 354-356.

Gaurishanker; Verma, L.P. an Singh, Room. (2002). Effect of integrated nutrient management on yield and quality of Indian mustard (B. *juncea)* and properties of soil. *Indian J. of Agricul Set,* 72 (9) :551-552.

Chandrashekhar, C.H., Latha, K.P., Vagdevi, H.M., Vaidya, V.P., 2008. Anthelmintic activity of the crude extracts of *Ficus racemosa*. Int. J. of Green Pharmacy. 103.

Das Kuntal and Einstein John Wilking, 2007. Samambaia - The future focus for Indian researchers in the treatment of psoriasis. Thai J. Pharm. Sci. 31, 45-51.

Dwivedi, A., Dwivedi, S., Sitoke, A.K., Patel, R., Jhade, D., 2009. Anthelmintic activity of a polyherbal preparation. Ethnobotanical leaflets. 13, 259-262.

Gogai, D.; Kotoky, U. and Hajaiika, S. (2004). Effect of biofertilizers on productivity and soil characteristics in banana. *Indian J. Hort*, 61 (4) : 354-356.

Journal of Ethnopharmacology 85, 169–172

Kaur S., Arora S., Kaur K., Kumar S.(2002). The *in vitro* antimutagenic activity of Triphala, *an Indian herbal drug, Food and Chemical Toxicology* 40, 527–534.

Khan, A.U, Gilani, A.H. (2008). Pharmacodynamic Evaluation of *Terminalia belerica* for its Anti Hypertensive Effect. *J.of Food and Drug Analysis.* 16:6-14.

Kumar, B, Divakar, K, Tiwari, P, Salhan, M, Goli, D. (2010). Evaluation of antidiarrhoeal effect of aqueous and ethanolic extracts of fruit pulp of *Terminalia belerica* in rats. *Int. J. Drug Dev. & Res*. 2(4):769-79.

Kumar ,B, Divakar ,K, Tiwari, P, Salhan, M, Goli, D. (2010). Evaluation of antidiarrhoeal effect of aqueous and ethanolic extracts of fruit pulp of *Terminalia belerica* in rats. *Int. J. Drug Dev. & Res*. 2(4):769-79.