



Anthelmintic activity of leaves of *Garcinia cambogia*

Githa Elizabeth Mathew*¹, Bijo Mathew², Mohamed Sheneeb.M³, Nyanthara³, Y.Haribabu³

¹Department of Pharmacology, Grace College of Pharmacy, Palakkad, Kerala, India

²Department of Pharmaceutical Chemistry, Grace College of Pharmacy, Palakkad, Kerala, India

³Grace College of Pharmacy, Palakkad, Kerala, India

ABSTRACT

Human beings are primary hosts for many helminthes. Most worms reproduce sexually in the human host, producing eggs or larvae that pass out of the body and infect the secondary host. Anthelmintic from natural sources may play an important role in the treatment of those parasite infections. In this view our attempt has been made to study the leaves of *Garcinia cambogia* by method described in details by Kuppast and Nayak. In this study petether, chloroform, and ethanolic, extracts were used and studied for paralysis and death of earthworm. The ethanol extract was found to be more effective to execute the earthworm.

Keywords: *Garcinia cambogia*; Anthelmintic activity; *Pheretima posthuma*.

INTRODUCTION

Garcinia cambogia, is the member of the *Guttifererae* family. It is a small, sour fruit of an evergreen tree that grows in India and southeastern Asia. It is the source for a revolutionary natural diet ingredient which is currently a range in America, Japan, Europe and other western countries. In Ayurveda, it is said that sour flavors, such as those from *Garcinia*, activate digestion. *Garcinia* has also been considered to make foods more filling and satisfying, and has been used routinely for many centuries with no known toxicity. This herb has been used historically in India to support the treatment of various health conditions (Nandan kumar, 2008). As a chemical constituent of *Garcinia cambogia* a new xanthone, garbogiol was isolated from root (Sriyani., et al 1998). The major organic acid in *Garcinia cambogia* has been found to be (-)-hydroxycitric acid present in concentrations of 16-18%, using HPLC, with 10Mm sulphuric acid as eluent (Jayaprakasha., et al 1998). It was found that *Garcinia* extract inhibits the cytoplasmic lipid accumulation as well as adipogenic differentiation of preadipocytes (Kim., et al 2004). *Garcinia cambogia* extracts a herbal preparation that has been suggested as a useful in the treatment of gastrointestinal disorders (Mahaedran., et al 2002), anti-obesity activity (Kim., et al 2008), anti-cancer activity (Liao., et al 2005), anti-inflammatory activity (Dos Reis., et al 2008) and lipid lowering property (Asha Koshy., et al 2001) From these findings our attempt was to check the An-

thelmintic activity of the various extracts of the leaves of *Garcinia cambogia*.

MATERIALS AND METHODS

Collection and extraction

Leaves of specified plant collected from the botanical garden of Palakkad, during the month of March 2010 and were identified by Dr.K.Suleka from the Dept. of Botany, Govt. Victoria College, Palakkad. Leaves of the above plant was collected and dried under shade in room temperature for 15 days and then homogenized to get a coarse powder. The petether, chloroform and ethanol extracts of the leaves of *Garcinia cambogia*, were prepared by soxhletion. In this extraction procedure 45g of the dried powder was extracted with 500 ml of the above solvents. After successive extraction, slurry was obtained and which is evaporated yield solid masses.

Drugs and Chemicals

Albendazole pure drug was supplied from Micro labs private Ltd, Bangalore. The solvents, used in the extraction were obtained commercially and were of analytical grade.

Anthelmintic activity

All the extracts from the leaves of *Garcinia cambogia* were tested for Anthelmintic activity screening according to the method described in details by Kuppast and Nayak. *Pheretima posthuma* (earth worms obtained from the Botanical garden of Grace College of pharmacy, Kerala) of nearly equal size (6cm±1) were selected randomly for present study. The worms were acclimatized to the laboratory condition before experimentation. The earthworms were divided into four groups of six earth worms each. Albendazole first dissolved in minimum amount of ethanol and diluted with normal

* Corresponding Author

Email: bijovilaventgu@gmail.com

Contact: +91-9946700219

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Table 1: Anthelmintic activity of various extracts of *Garcinia cambogia*

Test substance	Concentration used in mg/ml	Time taken for paralysis(min)	Time taken for death(min)
Pet ether	20	2.54±0.03	7.45±0.32
	40	2.34±0.32	6.31±0.21
	60	1.56±0.43	5.48±0.07
Chloroform	20	2.35±0.21	5.51±0.81
	40	1.56±0.23	4.45±0.45
	60	1.35±0.09	3.43±0.32
Alcohol	20	2.08±0.21	4.53±0.21
	40	1.27±0.32	4.02±0.26
	60	1.12±0.21	3.12±0.42
Albendazole	20	2.13±0.28	5.12±0.29
	40	1.43±0.65	4.18±0.32
	60	1.19±0.54	3.25±0.92
Control (DMF+ Normal saline)	-	-	-

P<0.05 when compared to the control. Values are expressed as ±SEM

saline solution to obtained a in the concentration of 20, 40, 60 mg/ml were served as a standard and poured in to a Petri dishes. All the extracts were prepared in minimal quantity of DMF and diluted with normal saline to prepare the above concentrations for each extract. A specific ratio of DMF with normal saline is served as a control. Six earth worms were nearly equal size 6cm±1are taken for each concentration and placed in Petri dishes at room temperature the time taken for complete paralysis and death are recorded. The mean paralysis time and mean lethal time for each sample was calculated (each reading were taken triplicate). The time taken for worms become motionless was noted as paralysis time and to ascertain death, each worm was frequently applied with external stimuli which stimulates and induce movement in earth worms, if alive. All the results were expressed as a mean ±SEM of six animals in each group (Kuppast *et al.*, 2003).

RESULTS AND DISCUSSION

Preliminary phytochemical analysis showed the presence of carbohydrates, proteins, alkaloids, glycosides, flavonoids, and triterpenoids like phytoconstituents in the extracts of the leaves of *Garcinia cambogia*. About this some of the phytoconstituents may responsible for showing anthelmintic activity. The time taken for the paralysis and death of worms in all extracts and standard drug were show in Table no: 1. Results expressed as mean ± S.E., were evaluated by unpaired student T test. Values of P<0.05 were considered statistically significant .The standard drug, Albendazole showed 1.19 minutes for paralysis (time taken for motionless) and 3.25 minutes for death in 60 mg/ml. All the extracts of the leave showed a good to significant activity, while compared with that of standard. Out of all extracts ethanol extract showed a significant activity. It showed 1.12minutes for paralysis and 3.12 minutes for death in 60 mg/ml.

CONCLUSION

From the above result we concluded that the all extracts from the leaves of *Garcinia cambogia* showed have potent anthelmintic activity when compared with the conventionally used drug. Further studied using *in vivo* models are required to carry out and establish the effectiveness and pharmacological rationale for the use of *Garcinia cambogia* as an anthelmintic drug. The drug may be further explored for its phytochemical profile to identify the active constituents responsible for anthelmintic activity

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REFERENCES

- Asha Koshy S., Vijayalakshmi N.R. Impact of certain flavonoids on lipid profile, Phytotherapy and Research 2001,15(5):395-400.
- Dos Reis S.B., De oliveria C.C.,Acedo S.C. Attenuation of colitis injury in rats using *Garcinia cambogia* extract, Phytother Res 2008,2(1):34-36.
- J.H.A.Nandan kumar. Phytopharm. 2008,9:3-5.
- Jayaprakasha G.K G.K., Sakariah K.K. Detrmination of organic acid in *Garcinia cambogia* by HPLC,Journal of chromatography.A1998,806(2):337-339
- Kim M.S., Kim J.K., Kwon D.Y.,Park R. Antiadipogenic effects of *Garcinia* extract on the lipid droplet accumulation,Biofactors 2004,22:193-196.
- Kim M.S., Kim J.K.,Lee J.H. A mixture of the aqueous extract of *Garcinia cambogia* reduces the accumula-

tion of visceral fat mass in rats rendered obese by a high fat diet, *Genes nutrition* 2008,2(4):353-358.

Kuppast I.J., Nayak ., Vasudev. *Indian J.Natural Product* 2003,19(3):27-29.

Liao C.H., Sang S., Lin J.K. Garcinol modulates tyrosine phosphorylation of FAK and subsequently induces apoptosis through down regulation of Src, ERK, and Akt survival signaling in human colon cancer cells, *Journal of cell biochemistry* 2005, 96(1)155-169.

Mahaedran P., Sabitha K.E., Devi C.S. The anti-ulcer activity of *Garcinia cambogia* extract against indomethacin-induced gastric ulcer in rats, *Phytother Res* 2002,16(1):80-83

Sriyani H.T.B., Guntalika A.A.L. A xanthone from *Garcinia cambogia*, *Phytochemistry* 1998,3:1169-1172.