ijcrr
Vol 03 issue 07
Category: Research
Received on:28/04/11
Revised on:16/05/11
Accepted on:27/05/11

EVALUATION OF ANTHELMINTIC ACTIVITY OF MOMORDICA CHARANTIA FRUIT EXTRACT

Shripad M.Bairagi[1], Ritesh S. Mantri[2], Nitin Nema[3]

[1]Department of Pharmacology, MES College of Pharmacy, Sonai, Newasa, Ahmednagar, Maharashtra
[2]MES College of Pharmacy, Sonai, Newasa, Ahmednagar, Maharashtra
[3]Department of Pharmaceutical Sciences, Dr.H.S.Gaur Central University, Sagar(M.P.)

E-mail of corresponding author: ssanandss@yahoo.com

ABSTRACT

The present study is an attempt to explore the anthelmintic activity of Methanolic extract of fruits of *Momordica charantia.* Various doses of methanolic extract were evaluated for their anthelmintic activity on adult Indian earthworms,*Pheretima posthuma.* All extract able to show anthelmintic activity at 25, 50 and 100 mg/ml. The activities are comparable with standard drugs, piperazine citrate and albendazole. All doses of *momordica charantia* showed dose dependent anthelmintic activity in comparison to standard drug. The data were found statistically significant. It is concluded that methanolic extract of *M.charantia* is having anthelmintic activity.

Key words: *Momordica charantia*, *Cucurbitaceae*, Anthelmintic, Piperazine citrate, Albendazole.

INTRODUCTION

Momordica charantia (Fam: *Cucurbitaceae*) grows in tropical areas. The herbaceous, tendril-bearing vine grows to 5 m. It bears simple, alternate leaves 4–12 cm across, with 3–7 deeply separated lobes. Each plant bears separate yellow male and female flowers. Fruit has a distinct warty looking exterior and an oblong shape, it is hollow in cross section, with a relatively thin layer of flesh surrounding central seed cavity filled with large flat seed and pith.[1] *M.charantia* contain novel and biologically active phytochemicals including triterpens, proteins and steroids. In numerous studies, at least three different group of constituent found in all parts of *M.charantia* have clinically demonstrated hypoglycemic properties. [2]

The hypoglycemic chemical includes mixture of steroidal saponin known as charantins, insulin like peptide and alkaloid. *M.charantia* fruits and seeds has been shown to reduce total cholesterol and triglycerides in both the presence and absence of dietary cholesterol [3,4].Noval phytochemical in *M.charantia* demonstrated the ability to inhibit an enzyme named guanylate cyclase. This enzyme thought to be linked to pathogenesis and replication of not-only psoriasis but leukemia and cancer as well. [5-7]The phytochemical momordin has clinically demonstrated cytotoxic activity against Hodgkin's lymphoma in vivo.[8]

MATERIAL AND METHOD

The fruit of *Momordica charantia* were collected from M.P.K.V.Rahuri, Maharashtra, India. And was authenticated by botanical survey of India, Pune, Maharashtra.

Preparation of Extract:

The methanolic extract of air dried fruit powder (500 gm) was prepared by using soxhlet apparatus, concentrated and vaccum dried which give dark a brownish mass (62.20gm).

Anthelmintic Bioassay:

Healthy Indian earthworms (*Pheretima posthuma)* selected due to its anatomical and physiological resemblance with the intestinal round worm parasites of human being were used in the present study.[9-11].All the earthworms were of approximately equal size. They were procured from local supplier and maintained at MES College of Pharmacy, Sonai.

The methanolic extract of *Momordica charantia* was tasted in various doses in each group. Normal saline water used as control. Piperazine citrate and albendazole were used as standard drug for comparative study with methanolic extract.The anthelmintic activity was assessed using earthworm by the Naragund [12] reported method. Earthworm divided into six groups. Each group containing five earthworms. First group (I) serve as normal control which receive saline water only. Second (II) group receive standard piperazine citrate 10 mg/ml, third group (III) receive standard albendazole 10 mg/ml.Group four (IV), group five (V) and group six (VI) receive dose of methanolic extract of 25 mg/ml, 50 mg/ml and 100 mg/ml respectively.

Observations were made for the time taken to cause paralysis and death of individual worm for two hours. Paralysis was confirmed when the worm did not revive even in normal saline water. Death was concluded when worms lost their motility followed by fading away of their body colour. [13]

Statistical analysis:

The data expressed as mean ± standard deviation (n=5). For determining the statistical significance, standard error mean and analysis of variance (Anova) at 5% level significance was employed. P values < 0.05 were considered significant.

RESULTS

The methanolic extract of *M.charantia* produced a significant anthelmintic activity in dose dependent manner as shown in Table-1. Normal saline water used as control. The activity shown by methanolic extract is of considerable importance. All data were found to be statistically significant at 5% level of significance ($P<0.05$) when subjected to one way ANOVA. The extent of activity shown by the extract was found to be dose dependent and same effect as that of piperazine citrate (10 mg/ml) and albendazole (10mg/ml) was seen as shown in Fig.1.

DISCUSSION

The anthelmintic of the methanolic extract was comparable with that of standard drugs. Albendazole and piperazine citrate are used as anthelmintic drugs but they having some adverse effect such as bronchospasm, GIT disturbance and they are contraindicated in pregnant woman.So if we formulate the anthelmintic drug from *M.charantia* will show very less adverse effect because of herbal formulation. And the *M.charantia* easily available in local market so the formulation cost will be low. More work is required to identify the main active principle responsible for anthelmintic activity.The above result reveled that methanolic extract of *M.charantia* is having anthelmintic activity.

CONCLUSION

The fruit extract of *M.charantia* has activity against *Pheretima posthuma.* However the activity observed in this study, would appear to justify the ethonomedical use in the recipes for anthelmintic activity. Further studies would

focus on isolation of the bioactives, biological and chemical characterization.

ACKNOWLEDGEMENT

The authors are grateful to Dr.V.K.Deshmukh, Principal MES College of Pharmacy, Sonai, Ahmednager for providing the lab facilities for the research work.

REFERENCES

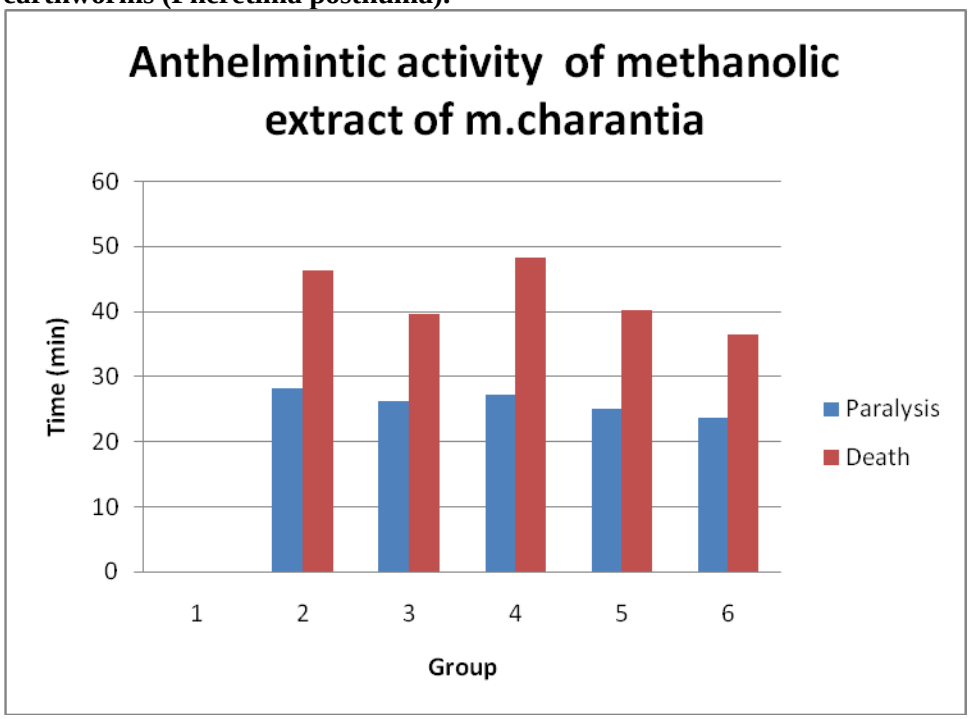
1. Grover JK,Yadav SP,Pharmacological actions and potential uses of momordica charantia,J.Ethnopharmacol,93 (1),2004,123-32.
2. Raza H,Moduation of xenobiotic metabolism and oxidative stress in chronic streptozotocin induced diabetic rat fed with momordica charantia fruit extract,J.Biochem Mol.Toxicol.14(3),2000,131-39
3. Jayasooyiya,AP, Effect of momordica charantia powder on serum glucose level and various lipid parameters in rats fed with cholesterol free and cholesterol rich diets,J.Ethnopharmacol,72(1-2),2000,331-36
4. Ahmed I,Hypotriglyceridemic and hypocholesterolemic effect of anti-diabetic momordica charantia (karela) fruit extract in streptozotocin induced diabetic rat, J.Diabetis Res.Clin.Pract,51(3),2001,155-61
5. Takemoto,DJ,Partial purification and characterization of a guanylate cyclase inhibitor with cytotoxic properties from the bitter melon(momordica charantia),J.Biochem.Biophys.Res.Commun ,94(1),1980,332-39.
6. Claflin AJ,Inhibition of growth and guanylate cyclase activity of an undifferentiated prostate adenocarcinoma by an extract of the balsam pear (momordica charantia abbreviata),J. Proc Nati.Acad. Sci.,75(2),1978,989-93.
7. Vesely DL, Isolation of a guanylate cyclase inhibitor from the balsam pear(momordica charantia abbreviate)J.Biochem.Res.Commun.77(4),1 977,1294-99.
8. Terenzi A, Anti-CD30 (BER=H2) immunotoxins containing the type-1 ribosome-inactivating proteins momordin and PAP-S (pokeweed antiviral protein from seeds) display powerful anitumour activity against CD30+tumor cells in vitro and in SCID mice.Br.J.Haematol,92(4),1996,872-79.
9. Vidyaethi RD,A textbook of zoology,Chand and Co.Press,New delhi, 14th ed^{n}, 1977,329.
10. Thron GW,Harrison's principles of internal medicine, MC Grew Hill,New York,1977,1088.
11. Vigear Z, Atlas of medical parasitology, Publishing House,Singapore,2nd ed^{n},1984,216.
12. Jayachandran E,Bhatia K,Naraguand V and Ray A,Anthelmintic activity of 2[3-amino,5-8 methyl-6-carboxamidepyrazol-1-yl] 6-fluro-7-substituted (1,3) benzothiazoles on pheritima postuma, Indian drugs,40(7),2003,408.
13. Mali RG,Hundiwale JC,Sonawane RS,Patil RN,Indian J.Nat.Prod.,20(4),2004,10.

Table-1 Anthelmintic activity of methanolic extract of *Momordica charantia*

Group	Treatment	Dose (mg/ml)	Time taken for paralysis (min) Mean± S.D.	Time take for death (min) Mean±S.D.
I	Control (Normal saline water)	…..	…..	…..
II	Standard-1 (Piperazine citrae)	10	28.2±0.30	46.4±0.81
III	Standard-2 (Albendazole)	10	26.3±0.61	39.7±0.61
IV	Metahnolic Extract	25	27.2±0.31	48.3±0.38
V	Metahnolic Extract	50	25.1±0.63	40.2±0.71
VI	Metahnolic Extract	100	23.6±0.74	36.4±0.51

Each value represented as mean±standard deviation. When compared with standard drug using one way ANOVA.

Fig-1 Anthelmintic activities of methanolic extract of fruits of *Momordica charantia* on Indian earthworms (Pheretima posthuma).



Group-I control (normal saline water), group-II-standard-1(piperazine citrate), group-III-standard-2(albendazole),group-IV to VI methanolic extract of dose 25,50,100 mg/ml respectively.