Research Article

# Phytochemical Investigation and Anthelmintic Activity of *Passiflora edulis* Linn Leaves Available in South Eastern Odisha

**Lingaraj Nayak and Sangram Keshari Panda**

Department of Pharmacognosy, Jeypore College of Pharmacy, Rondapalli Jeypore, Koraput, Odisha, India

**ABSTRACT**

The objective of present work was to evaluate the anthelmintic activity of petroleum ether chloroform,ethanol and aqueous extract of Leaves of *Passiflora edulis*. using Indian earthworms Pheretimaposthuma as test worm. Various concentrations of each extracts were tested .which involved determination of paralysis time and death time of the worm. albendazole. (10mg/ml) was used as a reference standard. The result of present study indicates that Among all the extract, ethanol and Aqueous extract showed dose dependant & significant anthelminitic activity. Aqueous extract showed better activity as compared to reference drug albendazole.

**Keywords**: *Passiflora edulis;* anthelmintic activity; albendazole.

## INTRODUCTION

The tribal areas of Sosahandi, Koraput (District) of Eastern Orissa. due to its unique varieties geographical and climatic factors has had a rich variety of medicinal plant . *Passiflora edulis Linn* (family: Passifloraceae) also known as passion flower is frecuntly distributed. And extensively used traditionally by the tribal people The purple passionfruit is native from southern Brazil. In India purple passion fruit is harvest in the Nilgiris in the south and in various parts of northern India. The passionfruit vine is a shallow-rooted, woody, perennial, climbing by means of tendrils. The alternate, evergreen leaves, deeply 3-lobed. A single, fragrant yellow colour flower, 2 to 3 in (5-7.5 cm) wide, is borne at each node on the new growth., Traditionally the fruit is used to treat asthma and cough and the juice is considered to be good to the heart[1]. It is used in homeopathic medicine for the treatment of insomnia, epilepsy, tetanus, muscle spasms and leaves presented anxiolytic activity[2] .Folklore claims to have several medicinal properties such as sedative, tranquillizer, diuretic , anti-spasmodic, anti-anxiety[3]. The plant survey also confirms the presence of anti-inflammatory activity, anti-asthmatic,neuropharmacological effects and anti-oxidant property[4] Chemical analysis of the fruit was also done which showed the presence of carbohydrates, ascorbic acid, carotene[5], vitamins,alkaloids, glycosides[6], saponins, tannins & triterpens.

## Experimental

### Collection of Plant Material

The leaves of *Passiflora edulis* were collected from the tribal belts of the Sosahandi forest of koraput district.The plant was identified, confirmed and authenticated by the V.D, College(Autonomous),Dept.Of Botany, Jeypore,Koraput.Odisha ,India ,Vide Voucher specimen no. (V.N. no -1105). After authentification leaves were collected in bulk and washed under running tap water to remove adhering dirt. Then the stem barks were shade dried. The dried materials were made into coarse powder by grinding in mechanical grinder.

**Preparation of Extracts**

The coarse powder was taken in Soxhlet apparatus and extracted successively with petroleum ether, chloroform, ethanol and water. The extraction was done for 72 hours. The marc of each extract was dried and used for extraction with successive solvent. The liquid extracts were concentrated separately under vacuum and resulting extracts were kept in desiccator until further.[8,9]

**Priliminary phytochemical investigation**

The crude petroleum ether, chloroform, ethanolic and aqueous extracts were subjected to preliminary phytochemical analysis in order to detect the presence of various groups of phytoconstituents by carrying out the following chemical analysis[9,10].

**Table 1: Phytochemical screening of *Passiflora edulis* leaf extract**

| Extracts | Phytochemicals | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Alkaloids | Glycosides | Carbohydrates | Steroids | Tannin | Flavonoids | Oil&fats | Saponin |
| Chloroform | - | - | - | + | - | + | - | - |
| Ethanol | - | - | - | + | + | + | + | + |
| Pet. ether | - | - | - | - | - | - | - | - |
| Water | - | - | - | + | + | - | + | + |

***+ = Present and - = Absent***

**Antheminitic activity**

**Worm collection and authentication**

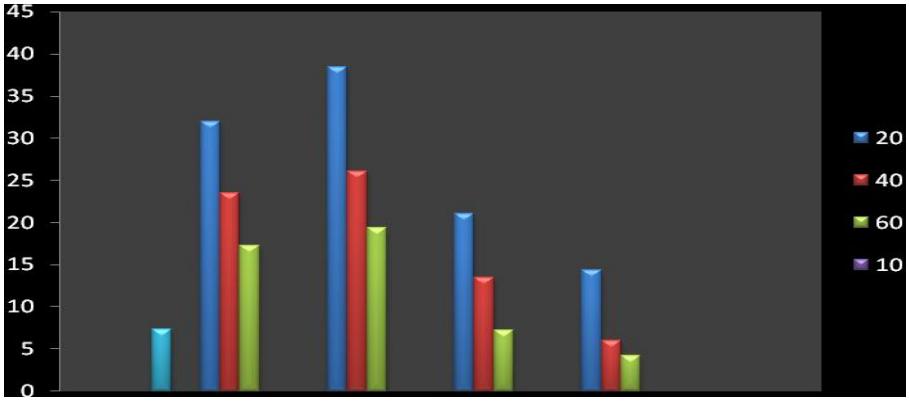
The anthelmintic activity was evaluated on adult Indian earthworm Pheretimaposthuma. because It resembles anatomically and physiologically with the intestinal round worm parasite of human being . Indian earthworms were obtained from vermiculture area and were identified at jeypore College of Pharmacy, Jeypore,Koraput,Odisha by Dept. of pharmacology.

The anthelmintic activity was evaluated on adult Indian earthworms by the reported methods with minor modification. The assay was performed on adult Indian earthworm Pheretima posthuma its anatomical and physiological resemblance with the intestinal roundworm parasite of human beings. And also easy availability earthworms have been used widely for the initial evaluation of anthelmentic activity.

The in-vitro anthelmintic activity was determined by taking seventeen groups of approximately equal sized Indian earthworms consisting of six earthworms in each group was released into 10 ml of desired formulation. Each group was treated with one of the following vehicle control(5%DMFin normal saline), albendazole. or pet.ether extract or chloroform extract or ethanol extract or aqueous extract (20,40 and 60mg/ml,each) of leaf of Passiflora edulis in normal saline containg 5%DMF**.** Observations were made for the time taken to paralysis and/or death of individual worms. Paralysis was said to occur when the worms do not revive even in normal saline water. Death was concluded when the worms lose their motility followed with fading away of their body color.[11,12]

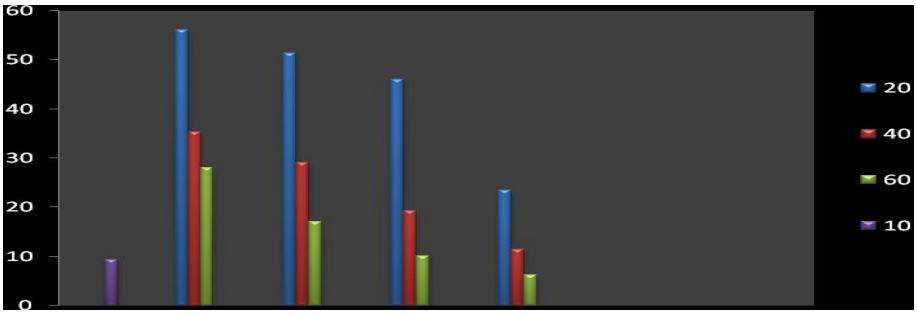
**Table 2: Anthelmintic Activity of *Passiflora edulis* leaf extract**

| Treatment vehicle | Concentration used | Time taken(in min.) | |
|---|---|---|---|
| | | For paralysis | For death |
| Pet.ether extract | 20mg/ml | 32.02 ± 1.214 | 56.04±1.24 |
| | 40mg/ml | 23.45 ± 1.58 | 35.34±1.234 |
| | 60mg/ml | 17.23 ± 0.31 | 28.07±1.56 |
| Chloroform extract | 20mg/ml | 38.44±1.256 | 51.32±1.17 |
| | 40mg/ml | 26.09 ± 1.78 | 29.04±1.23 |
| | 60mg/ml | 19.33 ± 0.17 | 17.03±0.26 |
| Ethanol extract | 20mg/ml | 21.02 ± 0.47 | 46.09±1.283 |
| | 40mg/ml | 13.43±0.7 | 19.22±0.13 |
| | 60mg/ml | 7.23 ±0.3 | 10.02±0.25 |
| Aqueous extract | 20mg/ml | 14.31± 0.72 | 23.5±0.231 |
| | 40mg/ml | 6.05±0.21 | 11.42±0.63 |
| | 60mg/ml | 4.24±0.34 | 6.23±0.29 |
| Albendazole | 10mg/ml | 7.32±0.14 | 9.36±0.213 |
| Normal saline(0.9%) | control | ----- | ----- |




Standard Pet.Ether Extract Chloroform Extract Ethanol Extract Water Extract

**Fig. 1: Anthelmintic activity of Passiflora edulis Linn.(Paralysis Time)**




Standard Pet.Ether Extract Chloroform Extract Ethanol Extract Water Extract

**Fig. 2: Anthelmintic activity of Passiflora edulis Linn. (Death Time)**

## RESULTS AND DISCUSSION

The preliminary phytochemical investigation showed the presence of phytochemical such as Steroids, Tannin, Flavonoids, Oil&fats and Saponin and absence of Alkaloids, Glycosides& Carbohydrates. The alcoholic and aqueous extract of leaves of *P.edulis* showed significant anthelmentic activity at higher concentration.(60mg/ml) The extract showed a dose dependent activity like shortest time of paralysis and death with (60mg/ml) concentration. The ethanol extract of *P.edulis* leaf caused paralysis in 7.23 min. and death at 10.02min. while aques extract showed paralysis in 4.24min. and death at 6.23min.as compared to the reference drug albendazole showed the same at 7.32min. and 9 .36min. respectively.

## CONCLUSION

Among all the extract, ethanol and Aqueous extract showed dose dependant & significant anthelminitic activity. Aqueous extract showed better activity as compared to reference drug albendazole. From Phytochemical analysis, the presence of tannins as one of the chemical constituent said to possess anthelmentic activity. The folklore claim of leafs of *P.edulis* as an anthelmentic have been confirmed as the leaf extract showed activity against the earthworms used in the study. Further studies to isolate and reveal the active compound present in the crude extract of *P.edulis* leaf and to establish the MOA of anthelmentic activity.

## ACKNOWLEDGEMENTS

Authors wish to thank to local people of south eastern odisha and V.D, College (Autonomous),Department of Botany, ,Jeypore, koraput, Odisha India, for providing valuable information about the plant and its identification.The author wish to express their gratitude to Jeypore College of Pharmacy, Rondapalli, Jeypore, Koraput, Odisha.

## REFERENCES

1. Sherma Z and Waston RR. Evidence-Based Integrative Medicine 2004; 1(3): 183-187.
2. Yuldasheva LN, Carvalho EB, Catanho MTJA and Krasilnikov OT.Cholesterol-dependent hemolytic activity of *Passiflora quadrangularis* leaves. 2005;38(7):1061-1070.
3. Ligia MS, Silvana MZ, Flavio HR, Eloir PS and Thereza CM. J Exp Biol Med 2009;2.
4. Ripa FA, Haque M, Nahar L and Islam MM. Euro J Sci Res. 2009;31(4):592-98
5. Mercadante AZ, Britton G and Rodriguez DB. J Agric Food Chem. 1998;46(10):102-6.
6. David C and Jean C. Phytochemistry. 1998;49(3):757-59.
7. Harbone JB. Phytochemical methods, London:Chapman and Hall, Ltd. 1973;49-188
8. Trease GE, Evans WC, Trease and Evans' Pharmacognosy:
9. A Physician's Guide to Herbal Medicine, 13Ed,Bailliere Tindall, London, 1989;912.
10. Kokate CK. Practical Pharmacognosy, Vallabh Prakashan, New Delhi 4th edn., 2005;107-9.
11. Mali RG.Indian J Nat Prod. 20(4):10.
12. Das GK,Mishra B, Panda A, Patro P and Ganapaty S. Indian J Nat prod. 2003;19:24.