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Research article

Evaluation of *Anthelmintic* activity of Siddha formulation *Nelli Kudineer (Phyllanthus emblica)*

[1*]Sumayya M, [1]Ajanthan R, [2]Manoharan A

[1*]PG Scholar, [2]Professor, Head of the Department, Department of *Pothu Maruthuvam*, GSMC, Palayamkottai,Tamilnadu, India

Abstract

Phyllanthus emblica(Amla) are widely used in the Indian system of medicine and believed to increase defense against diseases. This drug is available to manage diabetics, liver diseases, heart disease, cancer,ulcer,haemorrhoids, anemia and various other diseases.(Yadu Nandan Dey and Ajoy Kumar Ghosh,. 2010).Siddha formulation of *Nelli Kudineer* (Phyllanthus emblica)was investigated for its antihelmintic activity against *Pheretima posthuma* and *Tubifex tubifex*.

The extract with the concentrations of 25, 50 and 100 mg/ml were tested in the bioassay, which involved determination of time of paralysis and time of death of the worms. The extract exhibited significant antihelmintic activity at highest concentration of 100 mg/ml. Piperazine citrate (10 mg/ml) was included as standard reference and distilled water as control. The extracts were found not only to paralyze (Vermifuge) but also to kill the earthworms (Vermicidal).

Keywords

Antihelmintic activity, *Nelli Kudineer*, *Pheretima posthuma, Tubifextubifex*

Address for correspondence:

Summaya M

[1]Post Graduate Scholar, Department of Maruthuvam, GSMC, Palayamkottai, Tamilnadu, India

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Introduction

Medicinal plants are nature's gift to human beings to promote a disease free healthy life. Many medicinal plants are present in a group of herbal preparations of the Indian traditional health care system (siddha) named Tripala proposed for their interesting antioxidant activities. *Phyllanthus emblica Linn*. (syn. Emblicaofficinalis), commonly known as Indian gooseberry or amla, family Euphorbiaceae, is an important herbal drug used in unani (Graceo - arab) and ayurvedic systems of medicine.

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Phyllanthus emblica is highly nutritious and could be an important dietary source of vitamin C, amino acids, and minerals. The plant also contains phenolic compounds, *tannins, phyllembelic acid, phyllembelin, rutin, curcum-inoids, and emblicol*. All parts of the plant are used for medicinal purposes, especially the fruit. which has been used in traditional medicine for the treatment of jaundice, and inflammation (Murugesa mudaliar.,2016) Various plant parts show antidiabetic, hypolipidemic, antibacterial, antioxidant, antiulcerogenic, hepatoprotective, gastro protective, and chemopreventive properties(James, et al,.2006).

Helminthes infections are among the most common infections in men, affecting a large proportion of the world's population. In developing countries, they pose a large threat to public health and contribute to the prevalence of malnutrition, anemia, eosinophila and pneumonia. Although the majority of infections due to worms are generally limited to tropical regions, they can occur to those who visited these areas and some of them can develop in temperate climates (Anonymous,.1997). Hence, the increasing prevalence of helminthes parasites those are resistant to conventional anthelmintics has been the spur for different research programs exploiting alternative approaches to parasite control [C.K. Kokata,.1991]

People living in poverty in developing countries often suffer from helminthes infections, which more often physically impair their hosts than kill them. Although the majority of infections due to worms are generally limited to tropical regions, they can occur to travellers who have visited those areas and some of them can develop in temperate climates (Ambujakshi HR, et al,.2009)

Helminthiasis is among the most important animal diseases inflicting heavy production losses. The disease is highly prevalent particularly in third world countries due to poor management Helminthiasis practices (DharDN,et al,.1982). A number of medicinal plants have been used totreat parasitic infections in man and animals. (Nadkarni, A.K, et al 1954., Chopra RN, et al ,.1956. Said M, et al,. 1969.). The plants are known to provided anthelmintics.(Akhtar, MS, et al., 2000., Lewis WH, et al,. 1977.).The anthelmintic assay was carried as per the method of Ajaiyeoba *et al.* with minor modifications. The assay was performed on adult Indian earthworm, *Pheretimaposthuma* and *Tubifextubifex*due to its anatomical and*physiological* resemblance with the intestinal roundworm parasite of human beings.(VidyarthiRD,*et al.,*1967. Thorn GW, *et al., 1977*,ChatterjeeKD,et al.,1967). Because of easy availability, earthworms have been used widely for the initial evaluation of anthelmintic compounds *in vitro (*SzewezukVD,*et al.,2003., .* Dash GK *,et al,.2002)*.

The objective of the present *research* has to prove traditional anthelmintic use of the siddha formulation Nelli Kudineer.

MATERIALS AND METHODS

Collection and Authentication of Plant

The parts of *Nelli* will be freshly collected from in and around the areas of Palayamkottai and *Thirunrlveli,* Tamilnadu.

The plant will be identified and authenticated by the Medicinal Botanist and Gunapadam experts at Government Siddha Medical College and Hospital, Palayamkottai.

Purification

All the ingredients of this herbal formulation will purify according to the suitable procedure methods described in Siddha classical literature. The adulterants from the raw drugs will be removed, cleaned and dried in shade. The purified raw drugs will be Coarsely powdered and taken as a *Kudineer Chooranam*.

Method of preparation

25gms of the *Kudineer Chooranam* will be boiled with 500ml of water till reduced to 100ml of *Kudineer*.

Worms

Indian earthworm *Pheretima posthuma* (Annelida) were collected from the water logged areas of soil in Madurai. *Tubifex tubifex* (Annelida) were collected from Aquarium of the local market. The average size of *Pheretima posthuma*and *Tubifex tubifex*were 6-8 cm and 1-1.5 cm respectively.They were washed with water to remove dirt.

Chemicals

-Piperazine Citrate (Glaxo)

-Double distilled water

Procedure

The anthelmintic assay was carried as per the method of Ajayieoba E. O. et al. with minor Modifications. The experiments were done on adult Indian earthworm *Pheretima posthuma* and the aquarium worm, *Tubifex tubifex*, because they belong to same group of Annelida (Mueller, 1774). 20 ml formulations containing three different concentrations,Nelli Kudineer (25, 50 and 100 mg/ml in double distilled water) were prepared and taken in different petridishes and six earthworms (same type) were placed in the solutions respectively. Similarly lump of *Tubifex* worms were placed in the test solutions. All the test solution and standard drug solution were prepared freshly before starting the experiments. Time for paralysis was noted when no movement of any sort could be observed except the worms were shaken vigorously. Time for death of worms were recorded after ascertaining that the worms neither moved when shaken vigorously nor when dipped in warm water at 50°C. Piperazine citrate (10 mg/ml) was used as reference standard while distilled water as the control.(Mali RG,. Et al,.2005). Three sets of experiments were done statistical significance.

RESULTS

Table 1.. *Anthelmintic activity of Nelli Kudineer (Mean±SD)*

Groups	Conc. mg/ml	*Pheretima Posthuma* Paralyzing Time	*Pheretima Posthuma* Death Time	*Tubifex tubifex* Paralyzing Time	*Tubifex tubifex* Death Time
Normal Control	-	-	-	-	-
Nelli Kudineer	25	64.85±0.575	83.75±0.660	63.25±0.880	77.40±0.450
Nelli Kudineer	50	37.15±0.445	62.30±0.530	32.33±0.450	36.42±0.268
Nelli Kudineer	100	20.48±0.343	43.20±0.440	16.05±0.260	22.65±0.212
Piperazine Citrate	10	24.32±0.346	64.25±0.582	22.65±0.350	43.30±0.312

DISCUSSION

From the above study it was seen that the Nelli kudineer(NK) extract showed dose dependent antihelmintic activity as compared to a standard drug piperazine citrate (Table 1). The meanparalyzing time of Pheretima posthuma with the dose of 25, 50 and 100 mg/ml were found to be 64.85, 37.15 and 20.48 minutes respectively.In the meantime piperazine citrate a dose of 10 mg/ml cause paralysis in the above helminth in 24.32 minutes. The mean death time of Pheretimaposthuma with the dose of 25, 50 and 100 mg/ml were found to be 83.75,62.30 and 43.20 minutes respectively.

In the meantime piperazine citrate at a dose of 10mg/ml cause paralysis in the above helminth in 64.25minutes .The mean paralyzing time of *Tubifex tubifex* with the dose of 25, 50 and 100 mg/ml were found to be 63.25, 32.33 and 16.05 minutes respectively. In the meantime piperazine citrate at a dose of 10 mg/ml cause paralysis in the above helminth in 22.65 minutes. The mean death time of *Tubifex tubifex* with the dose of 25, 50 and 100 mg/ml were found to be 77.40,36.42 and 22.65 minutes respectively. In the meantime piperazine citrate at a dose of 10 mg/ml cause death in the above helminth in 43.30 minutes.

CONCLUSION

Phyllanthus Emblica is a multipurpose plant with several preventive and therapeutic potentials. In this investigation the *Nelli Kudineer* were used to evaluate anthelmintic activity by using the above models. The increase concentrations of *Nelli kudineer* showed paralysis and death of the organism . Phytochemical analysis of the *Phyllanthus Emblica* extracts showed the presence of tannins and saponins as one of the chemical constituents.

Tannins and saponins were shown to possess anthelminthic activity [Niezen JH, et al,.1995. Pal DK,. et al 2007]. Tannins are found to bind to free proteins in the gastrointestinal tract of the host animal or glycoprotein on the cuticle of the parasite and cause death [Mali RG,et al,.2008].

In conclusion, only the anthelmintic activity was evaluated for the *samoolam* of *Nelli kudineer*. The present study clearly *proves Nelli kudineer* has an Anthelmintic property .Current study gives the evidence that it may be a fruitful medicine of tomorrow.

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CONFLICT OF INTEREST

None declared

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