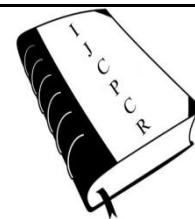




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**ANTHELMINTIC ACTIVITY OF NILAVAAGAI CHOORNAM –  
A POLY HERBAL SIDDHA FORMULATION**

**M.Ravichandran\*, S.Sulfin nihar, V.Murugan**

Department of Gunapadam (UG, PG), Govt.Siddha Medical College, Palayamkottai, Tamilnadu, India.

**ABSTRACT**

The present study was carried out with the aim to evaluate anthelmintic activity of *Nilavaagai choornam* – a Siddha poly herbal formulation which containing important plant materials, such as *Nilavaagai - Cassia senna*, *Milagu- Piper nigrum*, *Chukku- Zingiber officinale*, *Omam – Trachyspermum ammi*, *Vayu vidangam- Embelia ribes*. *Nilavaagai choornam* commonly used Siddha medicine especially for Laxative, worm infestation and also well known for their therapeutic effect, since from the ancient times. The aqueous extract showed significant Anthelmintic activity in the dose dependent manner. The extract showed significant activity than the standard drug Piperazine citrate. This might be due to the presence of Anthroquinones, Sennaside and other alkaloids which may be responsible for the activity. In this article an attempt was made to find out the activity which is mentioned in the literature and further studies needed to find out the phyto constituent which is responsible for this activity.

**Key words:** Siddha medicine, *Nilavaagai choornam*, Piperazine citrate, *Pheritima posthuma*, Anthelmintic activity.

**INTRODUCTION**

Helminthiasis is a worldwide and one of the common diseases of all ages. As per WHO more than two billion people suffered from this infestation every year. From this survey only few drugs are frequently used in the treatment of helminthes in human. Due to the cost and the development of resistance against these drugs turned the attention of many researchers towards the evaluation of traditional Medicines. These factors paved the way to find out the effective herbal formulation for helminthiasis. In traditional Siddha system of Medicine many formulations are available for the treatment of worm infestation. These traditional preparations are being used for ages without scientific validation. . Unique way of prescribing medicines by this system draws attention worldwide for keen research in drugs for reverse pharmacology manner. In this current study, an attempt was made to investigate one of the traditional Siddha polyherbal formulation- *Nilavaagai choornam* for its anthelmintic activity. *Nilavaagai choornam* is made up of combination of important plant materials, such as *Nilavaagai - Cassia*

*senna*, *Milagu- Piper nigrum*, *Chukku- Zingiber officinale*, *Omam – Trachyspermum ammi*, *Vayu vidangam- Embelia ribes*. All these plant materials are used as main ingredients of *Nilavaagai choornam*. Traditionally it has been used for the management of worm infestation, Constipation, Flatulence, Indigestion, Urticaria. The present study was undertaken to explore the anthelmintic activity of *Nilavaagai choornam*. The present study is also aimed to establish its possible mechanism of action of *Nilavaagai choornam*

**MATERIALS AND METHODS**

**Collection of Plant materials**

The plant materials of *Nilavaagai - Cassia senna*, *Milagu- Piper nigrum*, *Chukku- Zingiber officinale*, *Omam – Trachyspermum ammi*, *Vayu vidangam- Embelia ribes* were purchased from the local market of Tirunelveli and the plant materials were authenticated by the Gunapadam and Medicinal botany experts of Govt. Siddha Medical College. Palayamkottai.

Corresponding Author :- **M.Ravichandran** Email:- sreeveeka.rv@gmail.com

The collected raw drugs of the respective plants materials were shade dried and preserved for the further preparation.

### Preparation of *Nilavaagai choornam*

The dried material of *Nilavaagai* - *Cassia senna*, Milagu- *Piper nigrum*, Chukku- *Zingiber officinale*, Omam – *Trachyspermum ammi*, Vayu vidangam- *Embelia ribes* were thoroughly, powdered, mixed and then sieved through 20 mesh size to get a fine powder [1] Figure 1.

### Preparation of the aqueous extract

Two concentrations (25mg/ml and 50mg/ml) of *Nilavaagai choornam* were prepared in normal saline and used for this study.

### Preparation of Standard Solution

Piperazine Citrate is taken as standard drug and the concentration of the standard drug was dissolved in 50ml of normal saline solution to get 20mg/ml of solution. Normal saline alone was used as control.

### Evaluation of anthelmintic activity

#### Animal

The Indian earth worm *Pheretima Posthuma* was used to study anthelmintic activity. Adult earth worms were collected (due to their anatomical and physiological resemblance with the intestinal round worm parasites of human beings) [2-5]. Because of easy availability earthworms have been used widely for the initial evaluation of anthelmintic compounds. These in vitro [6-11] screening are important as they give basic for further in vivo studies. The earth worms are 5 to 6cm length and 0.2- 0.3cm width were used for all experimental protocol. Earth worms were

thoroughly washed with normal saline to remove the fecal matter and adhering material.

Petri dishes of equal size were collected and 20ml of normal saline alone was poured in the first Petri dish, 20ml of Piperazine Citrate solution in the concentration of 20mg/ml were poured in second Petri dish. Then 20ml (25mg/ml, 50mg/ml) of the test solutions that is, the aqueous extracts of *Nilavaagai choornam* were taken in third, fourth, petridishes respectively. Placed six earthworms of nearly equal size in each petridish and time taken for the induction of paralysis (motion less) and complete death of earthworms was noted. The experiment was repeated thrice and confirmed the readings.

### Statistical Analysis

The data obtained were expressed as mean  $\pm$  SEM (n=6). Statistical analysis were performed by one way analysis of variance (ANOVA) followed by student 't' test. At 95% confidence interval, \* P< 0.001, \*\*P<0.02, \*\*\*P<0.5 values were considered significant. The results were tabulated in Table 2 [12].

## RESULTS AND DISCUSSION

The results of the above studies demonstrated that, the aqueous extract of *Nilavaagai choornam* shows potent anthelmintic activity with varying magnitudes. Which is almost effective than the standard Piperazine citrate. However, significant difference was observed when compared the induction of paralysis time of Piperazine with aqueous extracts. But the extract of *Nilavaagai choornam* showed highest activity. The standard drug Piperazine Citrate acts by blocking the acetylcholine response to the nerve endings of worm muscle, resulting in flaccid paralysis of the worm.

**Table 1. Information about the ingredients of *Nilavaagai choornam***

S.No	Common name (Tamil name)	Botanical name	Parts used	Phytoconstituents	Action
1.	Nilavaagai	<i>Cassia senna</i>	Leaves	Anthroquinones including diantherone, glycosides, Sennaside A,B, Sennaside C,D,	Purgative
2.	Chukku	<i>Zingiber officinale</i>	Rhizome	Protein, Fat, Fibre, Carbohydrate, Minerals, VitA, B, C, Essential Acid, Sesquiterpine, Zingiberane, Camphene, Phellandrene, Geraniol.Cineol, Gingerol, Zingerone, Shogaol, Volatile oil.	Carminative, Stimulant, Colic pain, Dyspepsia
3.	Milagu	<i>Piper nigrum</i>	Dry fruit	Starch, Resin, Volatile essence, Acrid oil, Piperine, Malic acid, Mineral salt.	Aphrodisiac, Stomach ache, Stimulant, Carminative, Dyspepsia, Malaria, Haemorrhoids, Tremors, Delirium,
4.	Omam	<i>Trachyspermum ammi</i>	Seeds	Essential oil, Thymol	Anthelmintic, Carminative, Antispasmodic.
5	Vaividangam	<i>Embelia ribes</i>	Dry fruit	Embelic acid, Vilangin Vilandin	Vermifuge, Anthelmintic, Carminative.

**Table 2. Anthelmintic activity of Nilavaagai choornam**

Group/ Treatment	Concentration	Time Taken for Paralysis (Min)	Time Taken for Death (Min)
Control (Normal Saline)	-	-	-
Piperazine citrate	20 mg/ml	47 ± 0.4	51 ± 0.2
Nilavaagai choornam	25 mg/ml	52± 0.3	57 ± 0.1
Nilavaagai choornam	50 mg/ml	42± 0.3	48 ± 0.2

n=6 for all the Groups; Values are recorded as Mean ± SEM.; \* P< 0.001, \*\*P<0.02, \*\*\*P<0.5 as compared to standard.

**Figure 1. Shows the Ingredients of Nilavaagai choornam**



Flaccid paralysis leads to expulsion of worm from the intestine by peristalsis [13, 14]. In Siddha system of medicine Nilavaagai choornam processed with Nilavaagai - Cassia senna, Vayu vidangam- Embelia ribes which has laxative activity, purgative activity in addition with anthelmintic activity. By these activities the paralyzed and dead worms can be easily flushed out effectively. It is

**CONCLUSION**

The anthelmintic activity of Nilavaagai choornam has been confirmed and further studies needed to find out

evident that the Siddhars were the men of highly cultured, intellectual and ancient scientist in ancient times. The plant ingredients of Nilavaagai choornam have shown the presence of alkaloids, flavonoids, tannins and steroids (Table 1). It indicates that the Nilavaagai choornam is a mixture of all these phytoconstituents might be responsible for the anthelmintic activity. the active constituents, which is responsible for anthelmintic activity.

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