



## A Review on Anthelmintic Potential of Herbs Mentioned in Siddha Medicine

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### Abstract

*Synthetic medicines are very effective in curing disease but also cause a number of side effects. A large variety of medicinal plants were used in ancient Siddha system of medicine. Now a day's researches are mainly concentrates on that due to its efficacy, safety and easily accessibility. A large number of medicinal plants are claimed to possess anthelmintic activity in Siddha medicine. The current review focuses on the phytochemical screening and various in-vitro and in-vivo studies on some of the major plants such as Kuppaimeni (*Acalypha Indica*), poondu (*Allium sativum*), Madhulai (*Punica Grantum*), Malaivembu (*Melia Azederach*), Palasu (*Butea Monosperma*), Karum Seeragam (*Nigella Sativa*), Agathi (*Sespania Grandiflora*), Alinjill (*Allingium Salvifolium*), Veliparuthy (*Pergularia Daemia*) and Vaividangam (*Embelica Ribes*) which were claimed in Siddha system for its Anthelmintic activity. The review validates al the plants possess very effective anthelmintic potential based on Siddha literatures and recent researches.*

**Keywords:** Siddha herbs, anthelmintic, helminthiasis, herbals, siddha medicine, Siddha literature.

### INTRODUCTION

Humans are appears to be affected with more diseases than any other species. At present living an entire life without any disease in a life span is difficult to an individual. Since our changed life style, food habits, physical activity etc. had been changed a lot than earlier. Helminths infections are one of the most common infections in man which affects the large proportions of the world population especially in developing countries.

Helminths are also known as parasitic worms or also referred as intestinal worms even though not all helminths reside in intestines. Infection by the helminths is called as Helminthiasis. Now a day it increases the mortality and morbidity day by day. This includes intestinal nematodes (Round worm),

Trematodes (flukes) and cestodes (tape worms). Low income countries and developing countries are victims of this. In which children's and women's are get more affected.

Helminthes have plugged humans since before the era of earliest history. In siddha literatures siddhars had mentioned a lot of herbs and simple herbal preparations with anthelmintic activity. About 70-80% of whole population still uses herbals as main source of medicine for primary health care, because of better acceptability, compatibility and no side effects with human body. This article is to simply evaluate some remedial plants mentioned in Siddha literature for their proclaimed anthelmintic efficacy.

### 1. *Accalypha Indica*

**Tamil Name: Kuppaimeni**

**English: Indian Acalypha**

**Bot. Name: Acalypha indica**

**Family: Euphorbiaceae.**

**Parts used: Leaves**

Siddha literature '*Gunapadam*' it's described that *Acalypha indica* leaves extract or infusion of leaves or powder intake will cure helminthiasis.<sup>1</sup>

Phytochemical screening of crude extracts revealed presence of flavanoids and alkaloids like acalypus and acalyphine is the major chemical constituents. The leaves extracts of *Acalypha indica* contains cynogenic glycosides, inositol methylether, resin, triacetomamine and volatile oils. The presence of terpenoids, flavonoids and polyphenols shown anthelmintic activity<sup>2</sup>.

While the *Acalypha indica* were screened for the evaluation of its anthelmintic activity, the aqueous and ethanolic extracts of this plant posses potent anthelmintic activity compared with standard drug piperazine citrate at 100 mg/ml against pheretima posthuma at different concentrations<sup>2</sup>.

### 2. *Allium sativum*

**Tamil Name: Poondu**

**English Name: Garlic**

**Bot. Name: Allium sativum**

**Family: Lilliaceae**

**Parts used: Bulb.**

In Siddha literature *Gunapadam*, it's described that 20 – 30 drops of allium sativum juice twice or thrice daily will cure helminthiasis.<sup>1</sup>

In *Allium Sativum* Bulb contains phytochemicals such as flavanois, alkanoids, and the alcoholic extract of allium sativum shows moderate in-vitro anthelmintic activity against human *Ascaris lumbricodes*. *Allium sativum* has effective in the exposure of dysentery and also act as vermifuge. The active chemical in garlic is Allicin, which is produced by crushing or chewing of raw garlic. It's shows anthelmintic activity which comparable to standard drug Piperazine citrate.<sup>3</sup>

The methonolic extract of the plant showed effective anthelmintic acivity at 2 and 4 h post exposure in in vitro screening while exposing the adult *Haemonchus contortus*<sup>3</sup>.

### 3. *Punica Grantum*

**Tamil Name: Madhulai**

**English Name: Pomegranate**

**Bot. Name: Punica granatum**

**Parts used: Root bark.**

In Siddha literature *Gunapadam* it's described that infusion made of *punica granatum* root bark and *syzygium aromaticum* with water in a dose of 15-30 ml twice daily before food for 6 days internally gives a good result for Helmnthiasis.<sup>1</sup>

The alcoholic extract of bark was evaluated for its proclaimed anthelmintic potential. The activity was found dose dependent inhibiting transformation of eggs to filariform larvae of *Haemonchus contortus*<sup>4</sup>. In clinical studies the plant shows efficacy against nematodiasis in calves<sup>5</sup>. The stem bark is reported to contain an alkaloid Pelletierine tannate, which was considered to be the most effective and least harmful form of the remedy because of its insolubility it prevents its rapid absorption and thus enabled a prolonged contact with the worms. *Punica grantum* bark 5 %, all of the extracts were able to killed all tested parasites with the LT100 The porcine ascarides , porcine cestodes, chicken ascarids and chicken trematodes.<sup>6</sup>

### 4. *Melia Azedarach*

**Tamil Name: Malai vembu**

**English Name: Common beard tree**

**Bot. Name: Melia azadiracta**

**Family: Meliaceae**

**Parts used: Root bark.**

*Gunapadam* Literature said that infusion of *Melia azedarach* in a dose of 15-30ml will cure helmnthiasis<sup>1</sup>.

Extracts obtained from the drupes of *M. azedarach* are active against both the tapeworm

and the earthworm tested. It is worth to mention that the drupe extracts are comparatively more active than piperazine phosphate against *Taenia solium*. The antiparasitic activity against this tapeworm was better than that of piperazine phosphate (80 min at 0.1 %, and 56 min at 0.2%) at drupe extract concentrations of 0.1 % and 0.2 % (mean death values of 52 and 32 min, respectively).<sup>7</sup>

### 5. *Butea Monosperma*

**Tamil Name:** Palasu.

**English Name:** Flame of the forest

**Bot. Name:** *Butea monosperma*

**Family:** Fabaceae

**Parts used:** Seeds.

In *Gunapadam* Siddha literature it's mentioned that purified seeds of *Butea monosperma* 260 mg thrice a day with honey for 3 days will cure helminthiasis<sup>1</sup>.

In seeds of *Butea monosperma* present Triterpene, butein, butin, isobutrin, coreopsin, isocoreopsin (butin 7-glucoside), sulphurein, monospermoside (butein 3-e-D-glucoside) and isomonospermoside, chalkiness, aureoles, flavonoids (palasitrin, prunetin) and steroids<sup>8</sup>.

A lactone called Palasonin, present in *Butea Monosperma* seeds was evaluated and found anthelmintic activity<sup>9</sup>. It has also shown effective anthelmintic activity against *Ascaris lumbricoides*<sup>10</sup>

### 6. *Nigella Sativa*

**Tamil Name:** Karunseeragam

**English Name:** Black cumin

**Bot. Name:** *Nigella sativa*

**Family:** Ranunculaceae.

**Parts used:** Seeds.

In Siddha literature 'Gunapadam' revealed that 3-5 gm *Nigella sativa* seeds twice a day internally and also paste made with *Citrus colocynthis* juice and applied externally on children's flanks will expel worms<sup>1</sup>.

*Nigella sativa* seeds contain active compounds such as thymoquinone, thymohydroquinone, dithymoquinone, p-cymene, carvacrol, 4-terpineol, t-anethol, sesquiterpene longifolene,  $\alpha$ -pinene and thymol etc. Isoquinoline alkaloids e.g. nigellicimine and nigellicimine-N-oxide, and pyrazol alkaloids or indazole ring bearing alkaloids which include nigellidine and nigellicine are present in Black seeds. Also other compounds like carvone, limonene, citronellol were found in trace amounts.<sup>11</sup>

Thymoquinone and dithymoquinone-cymene and  $\alpha$ -pinene are the major active principles in *N. sativa*. The anthelmintic potential of essential oil *N. sativa* Linn was evaluated against earthworms, tapeworms, hookworms and nodular worms exhibited fairly good activity against earthworms and tapeworms. Activity against hook worms and tape worms are comparable with that of hexyl resorcinol<sup>12</sup>.

### 7. *Sespania Grandiflora*

**Tamil Name:** Agathi

**English Name:** August tree

**Bot. Name:** *Sespania Grandiflora*

**Family:** Fabaceae

**Parts used:** Leaves

In *Gunapadam*' Siddha literature it's said that decoction made of *Sespania grandiflora* leaves with small quantity of palm jaggery internally had vermifuge action<sup>1</sup>. And also intake leaves as food<sup>13</sup>.

Phytochemical analysis reported the presence of flavanoid, phenol, tannin, alkaloid, saponin, steroids and triterpenoid in leaf aqueous extract of *Sespania grandiflora*. It recorded a definite anthelmintic efficacy against *A. galli* and *G. domesticus*. Increasing the concentration of the extracts decreased the survival of *A. galli*.<sup>14</sup>

### 8. *Allingium Salvifolium*

**Tamil Name:** Alinjil

**English name:** Sage-leaved alangium

**Bot. Name:** *Allingium Salvifolium*

**Family: Cornaceae**

**Parts used: Root bark**

'Gunapadam' Siddha literature said that decoction made of *Allingium salvifolium* root bark along with ghee is best for helminthiasis<sup>1</sup>.

*Allinjium salvifolium* contains active constituents such as Alkaloids, Tannins, Triterpene, Steroids, Phenolic compounds, Flavinoids, Methyl-1H-pyrimidine-2,4-dione and 3-O-b-D-glucopyranosyl-(24 $\beta$ )-ethylcholesta-5,22,25-triene, Phenolic glycosides, Salviifosides A,C and Salicin, Kaempferol, Kaempferol 3-O-b-Dglucopyranoside.<sup>15</sup>

The aqueous and alcoholic extracts of roots of *Alangium salviifolium* was evaluated against *Pheritima posthuma* for its Anthelmintic activity. Three different concentrations (50, 100 and 150 mg/ml] of crude extracts of hexane, ethyl acetate, chloroform and methanol were tested. Parameters such as; paralysis and death period of the worm were evaluated. It shows significant anthelmintic activity of methanol and chloroform extracts<sup>16</sup>.

### 9. Pergularia Daemia

**Tamil Name: Veliparuthy**

**English Name: trellis-vine**

**Bot. Name: Pergularia daemia**

**Family: Asclepiadaceae**

**Parts used: leaves**

In Siddha literature Gunapadam it mentioned that decoction made of *Pergularia Daemia* is good for helminthiasis<sup>1</sup>.

*Pergularia Daemia* contains flavonoid, tannins, alkaloids, glycosides, terbenoids, steroids and carbohydrates.<sup>17</sup>

*Pergularia daemia* leaves not only demonstrated paralysis, but also caused death of worms especially at higher concentration of 100 mg/ml, in shorter time as compared to standard drug Albendazole. Phytochemical analysis of the crude extract revealed the presence of tannins and phenolic compounds is one of the chemical constituents contained within them. Tannins were shown to produce anthelmintic activities<sup>18</sup>.

### 10. Embelia Ribes

**Tamil Name: Vaividangam**

**English Name: False pepper**

**Bot. Name: Embelia Ribes**

**Family: Myrsinaceae**

**Parts used: leaves: Seeds**

In Siddha literature *Gunapadam* said that 4-16 gm of *Embelia ribes* seeds powder mix with honey twice or thrice daily will eliminate intestinal worms.

Phyto chemical study of *Embelia ribes* seeds shows, it contains Non-reducing polysaccharides, Gums, Mucilage, Proteins, Amino acids, Fats and oils Steroids, Glycosides, Saponin, Flavonoids, Alkaloids, Tannins and Volatile oil.

Tannins, the polyphenolic compounds, are shown to interfere with energy generation in helminth parasites by uncoupling oxidative phosphorylation or, binds to the glycoprotein on the cuticle of parasite, and cause death.<sup>19-20</sup>

The ethanolic extract of the seeds *Embelia ribes* (10-200  $\mu$ g/mL) exhibited potent anthelmintic activity.

### Conclusion

A large variety of plants, in total or their products are used for wide variety of diseases in Siddha system of Medicine. A potent anthelmintic drug will eradicate the worm infestation without affecting the host by affecting the physiological activities of worms. By screening the crude plant extracts, essential oils and isolated active principles for in-vitro and in-vivo anthelmintic studies substantiate the above mentioned plants in Siddha system of medicines possess good results. To conclude, in future efforts should made to standardise the plant extracts with good anthelmintic activity to formulate good herbal formulation rather than synthetic ones. For that Phytochemical study, clinical study, and possible studies on molecular mechanism of action in herbal plants is in need.

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