



## A Drug Review on Nilavagai Chooranam (Internal) and Thaengai Thylam (External) for Karappan (Atopic Dermatitis) in Children

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### ABSTRACT

The ancient traditional medical system known as Siddha system of Medicine has its roots in South India. Various skin illnesses including *Karappan*, have been recorded in Siddha literatures under the name "*Kuttam*". *Karappan* which is similar to the characteristic features of atopic dermatitis is mentioned in the Siddha text "*Balavagadam*". *Karappan* is classified into 18 types as per *Balavagadam*. A persistent skin condition known as atopic dermatitis results in erythema, severe pruritis, oedema, exudation, blistering and scaling. In this research, the therapeutic benefit of the Siddha formulation, "*Nilavagai chooranam*" and "*Thaengai thylam*"—which has antimicrobial, anti-inflammatory and antioxidant properties—for internal and external application is reviewed and analysed.

**Keywords:** Atopic dermatitis, Siddha formulation, karappan.

### INTRODUCTION

Based on empirical knowledge, Siddha Medicine is a science and art of healing that treats the person completely. The most eminent experts in this medicinal technique in antiquity were Siddhars. The ideals of preserving mental and physical equilibrium are related to the Siddha system. An essential organ for communication with the outside world is the skin. The Siddha system states that *sparisam*, or touch sensation, is produced by the skin, one of the five *Aimporigal* (sense organs). Siddha system lists a number of etiological elements that might lead to skin disorders including lifestyle choices, environmental influences, psychological issues and everyday activities. The most prevalent inflammatory skin conditions, atopic dermatitis, affects up to 25% of children and 4-7% of adolescents. *Nilavagai chooranam* and *Thaengai thylam* are the Siddha formulations used to treat *karappan* which is mentioned in siddha classic text "**Bogar 700**". Most of the ingredients present in the formulations are known to cure skin disease. The ingredients are having Anti-inflammatory, Anti-microbial, Immunomodulatory and wound healing activities. *Nilavagai chooranam* is given internally and *Thaengai thylam* is used externally both of which reduces Itching and scaling.

### MATERIALS AND METHODS

**Internal medicine: Nilavagai chooranam**

Reference: Bogar 700 Textbook pg no:38,39

Ingredients:

- *Nilavagai* – Cassia senna – 1 Kg

- *Thiripala (Kadukkai – Terminalia chebula, Nellikai-Phyllanthus emblica, Thandrikai-Terminalia bellerica)* – 1/4 Kg

- *Seeni sarkkarai-Saccharum officinarum* – 1/4 Kg

Purification:

1.*Nilavagai* (*Cassia angustifolia*)

Whole plant should be cut into small pieces and dried. Then it is boiled with milk and dried. (Ref: *Sarakkugalin suthee muraigal*)

2.*Kadukkai* (*Terminalia chebula*)

Soak it in vinegar and evacuate the yellow-coloured water after that remove the seeds then dry the outer part well. (Ref: *Sarakkugalin suthee muraigal*)

3.*Nellikai* (*Phyllanthus emblica*)

Boil it in milk, remove the seeds and then dry it. (Ref: *Sarakkugalin suthee muraigal*)

4.*Thandrikai* (*Terminalia bellerica*)

Remove the nut and use the remaining part of the drug. (Ref: *Sarakkugalin suthee muraigal*)

5.*Seeni sarkkarai* (*Saccharum officinarum*)

Grinded well and the fine particles are collected (Ref: *Sikicha rathna deepam*)

**External medicine: Thaengai thylam**

Reference: Bogar 700 Textbook, pg: 41

Ingredients:

- *Thaengai paal* -*Cocos nucifera* – 2 padi (2.6 litres)



- *Manjal- Cucurma longa* – 1/4 palam (8.75 gms)
- *Karunjeeragam -Nigella sativa* – 1/4 palam (8.75 gms)
- *Kalluppu - Rock salt* – 1/4 palam (8.75 gms)

Preparation:

*Nilavagai chooranam*:

All the raw drugs were purchased from a standard drug shop. The raw drugs were purified as per Siddha texts. The ingredients of *Nilavagai chooranam* were dried and grinded into powder. The powder was then filtered in a sterile white cloth. The medicine was packed in a sterile container.

*Thaengai thylam*:

*Thaengai paal* was obtained from coconut and boiled. The other ingredients are added to it. The preparation is boiled until oil is obtained. It is then filtered. The medicine was packed in a sterile container.

## REVIEW OF DRUGS

**Internal medicine: (*Nilavagai chooranam*)**

### 1. *Cassia angustifolia*: *Nilavagai*

Taxonomical classification:

Kingdom: Plantae

Subkingdom: Tracheobionata

Division: Magnoliophyte

Class: Magnoliopsida

Family: Fabaceae

Genus: Cassia

Species: *angustifolia*

Suvai: Kaippu

Thanmai: Veppam

Pirivu: Kaarppu

Parts used: Leaves

Action and uses: Purgative, Laxative

*Nilavagai kudineer* (*Nilavagai* 34 gram, *Chukku* powder 1950 mg soaked in water) 30 – 60 ml of the decoction is mixed with vinegar and applied over the body to treat rashes, scabies and other skin infections.

Laxative and purgative, used in constipation, loss of appetite, hepatomegaly, splenomegaly, indigestion, malaria, skin diseases, jaundice and anemia

Chemical constituents:

*Senna* plant parts, including the roots, stem, leaves and seeds, are traditionally used to cure a wide range of illnesses. The plant's extract possesses significant antibacterial, antioxidant, and health-promoting properties. *Senna*'s many phytochemicals are responsible

for these biological functions. The genus *Senna* contains several bioactive compounds including rutin, sennosides, proanthocyanidins, scutellarin and epicatechin which are all responsible for their bioactivity.<sup>1</sup>

*Pharmacological activity*:

Antibacterial and Antifungal activities: *Senna* extracts are largely derived from leaf extraction. The smallest concentration of sample required to stop microbial growth is known as the minimum inhibitory concentration (MIC), and it is typically determined in research. For plant materials, a MIC value of 100–200 µg/mL is usually acceptable.<sup>2</sup> When the bioactive components are separated from the extracts, the MIC values drop and the antimicrobial properties rise, even if the extracts of the sections of the genus *Senna* could not reach such MIC values.<sup>3</sup>

Antioxidant activity: Using several in vitro models, Ita and Ndukwe investigated the antioxidant activity of *S. alata* roots. To ascertain the antioxidant qualities of roots, they extracted the material using three different solvents—acetone, ethanol, and water—and then assessed the root's ferric reducing power, DPPH, ABTS (2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid)) radical-scavenging capabilities and metal chelating activity. With values of 78.21 mg of gallic acid equivalent (GAE)/g and 39.29 mg of quercetin equivalent (QE)/g, researchers reported that ethanol extract had significant levels of total phenolics and flavonoids. It also showed the best antioxidant potential according to DPPH and ABTS protocols.<sup>4</sup>

### 2. *Terminalia chebula* - *Kadukkai*

Taxonomical classification:

Kingdom: plantae

Phylum: Tracheophyta

Class: Magnoliopsida

Order: Myrtales

Family: Combretaceae

Genus: Terminalia

Species: *chebula* Retz

Suvai: Thuvarppu, Inippu, Kaippu, Pulippu, Kaarppu

Thanmai: Veppam

Pirivu: Inippu

Parts used: Dried fruit

Action and uses: The whole plant is grinded with milk and taken for eczema, insect bite, leprosy and other skin ailments.

Chemical constituents:

A group of researchers found 14 components of hydrolysable tannins (gallic acid, chebulagic acid, punicalagin, chebulanin, neo chebulinic acid, ellagic acid,



chebulinic acid, 1,2,3,4,6-penta-O-galloyl-β-D-glucose, 1,6-di-O-galloyl-D-glucose, casuarinin, 3,4,6-tri-O-galloyl-D-glucose, terchebulin) from *T. chebula* fruits.<sup>5</sup> Phenolics such as ellagic acid, chebulinic acid and anthraquinones are among the other ingredients. Polyphenols such corilagin, galloyl glucose, punicalagin, terflavin A and maslinic acid were among the other minor components.<sup>6</sup>

#### Pharmacological activity:

**Antifungal activity:** It is effective against the pathogenic yeast *Candida albicans* and dermatophytes *Epidermophyton*, *Floccosum*, *Microsporum gypseum* and *Trichophyton rubrum*.<sup>7</sup> Its inhibitory effect on three dermatophytes (*Trichophyton* spp.) and three yeasts (*Candida* spp.) has also been documented.<sup>8</sup>

**Anti-inflammatory activity:** *T. chebula*'s dried fruit aqueous extract demonstrated anti-inflammatory properties by preventing the formation of inducible nitric oxide.<sup>9</sup> The start and progression of collagen-induced arthritis in mice were considerably inhibited by chelagic acid derived from immature seeds of *T. chebula*.<sup>10</sup>

### 3. *Terminalia bellerica* - *Thandrikka*

#### Taxonomical classification

Kingdom: Plantae  
Phylum: Tracheophyta  
Class: Magnoliopsida  
Order: Myrtales  
Family : Combretaceae  
Genus: Terminalia  
Species: *bellerica* Roxb  
Suvai: Thuvarppu  
Thanmai: Veppam  
Pirivu: Inippu

Parts used: Leaves, Seeds, Fruit

Action and uses: Astringent, Expectorant, Laxative, Tonic

**Chemical constituents:** Beta-sitosterol, gallic acid, ellagic acid, ethyl gallate, galloyl glucose and chebulagic acid are its main phytoconstituents. There have been discovered four lignans: termilignan, thannilignan, hydroxy-3', 4'-(methylenedioxy) flavan, and anolignan-B (Singh, 2006). Fruit is rich in terpenoids such as belleric acid and chebulagic acid, saponins such as bellericanin and bellericoside and tannins, which are made up of corilagin, glucogallin, 1, 2, 3, 4, 6-trigalloylglucose, chebulinic acid, and chebulagic acid. Seeds contain alkaloids, coumarin, flavone and glycosides (D-glucose, fructose, sucrose, galactose, and mannose). Beta-sitosterol, tannins, gallic acid, ellagic acid and catechol are found in bark.<sup>11</sup>

#### Pharmacological activity:

**Antimicrobial activity:** One of *S. aureus* main virulence factors is called coagulase, which causes blood clots by converting the host's plasma fibrinogen to fibrin. When *S. aureus* grows in the presence of *T. bellerica* extract, the activity of this enzyme is inhibited. The effectiveness of *T. bellerica* phytoconstituents against *S. aureus* was indicated by the reduced MIC values of crude and methanol extracts.<sup>12</sup>

**Immunomodulatory activity:** It has been demonstrated that *T. bellerica* acetone extract increases T- and B-cell proliferation and IL-10 secretion while decreasing IFN-γ and IL-2 production.<sup>13</sup>

### 4. *Emblica officinalis* – *Nellikai*

#### Taxonomical classification

Kingdom: Plantae  
Phylum: Tracheophyta  
Class: Equisetopsida C.Agardh  
Order: Malpighiales Juss.ex Bercht  
Family: Phyllanthaceae  
Genus: Phyllanthus  
Species: *emblica* L.  
Suvai – Thuvarppu, Inippu  
Thanmai – Veppam  
Pirivu – Inippu  
Parts used: Stem bark, Leaves, Dried fruit -Astringent,  
Action and uses: Flower – refrigerant, laxative  
Fruit – refrigerant, laxative, diuretic

**Chemical constituents:** Bioactive components of *Phyllanthus emblica* fruit include a group of phenolic compounds (tannins, phenolic acids and flavonoids), alkaloids, phytosterols, terpenoids, organic acids, amino acids, and vitamins.<sup>14</sup>

#### Pharmacological activity:

**Anti-inflammatory activity:** COX-2 inhibition may control inflammation in inflammatory diseases and abnormalities. *Phyllanthus emblica* exhibited its anti-inflammatory activities by inhibiting NO production to avoid excess NO production in macrophage cells and COX-2 enzyme. The extracts of *P. emblica* showed significantly higher COX-2 inhibition compared to hot water and commercial extract with the highest COX-2 inhibition shown at 10 μg/mL concentration (46.4%).<sup>15</sup>

**Anti-hyper lipidemic activity:** The flavonoids in *Phyllanthus emblica* act as hypolipidemic agents by inhibiting the activity of HMG-CoA reductase and concurrently increasing the activity of plasma lecithin cholesterol acyl transferase (LCAT). *Phyllanthus emblica* has a flavonoid



content that affects blood cholesterol levels in atherogenic albino rats.<sup>16</sup>

### External medicine: Thaengai thylam

#### 1. *Cocos nucifera* – *Thaengai*

Kingdom: Plantae

Phylum: Tracheophyta

Class: Monocot

Order: Arecales

Family: Arecaceae

Genus: *Cocos*

Species: *nucifera*

Suvai – Inippu

Thanmai – Thatpam

Pirivu – Inippu

Parts used: Stem bark, Leaves, Fruit, Root, Shell.

Action and uses: *Thaengai paal* – Refrigerant, Aperient, Nutrient, Diuretic

Chemical constituents: Phytochemical studies of the coconut fibre (mesocarp) ethanolic extract showed that the presence of phenols, tannins, leucoanthocyanidins, flavonoids, triterpenes, steroids, and alkaloids,<sup>17</sup> whereas butanol extract recovered triterpenes, saponins, and condensed tannins.<sup>18</sup>

#### Pharmacological activity:

Anti-inflammatory activity: A study that used subcutaneous air pouch model and formalin test animal models of inflammation revealed that aqueous crude extracts of *C. nuciferavar. typica* (50, or 100 mg/kg) significantly ( $P < 0.05$ ) inhibited the amount of time animals spent licking their formalin-injected paws and decreased inflammation caused by subcutaneous carrageenan injection by lowering TNF- $\alpha$  production, cell migration, and extravasation of protein.<sup>19</sup>

Analgesic activity: An ethanol extract of the husk fibre (40, 60, or 80 mg/kg) demonstrated notable analgesic effects, as demonstrated by a decrease in the quantity of writhes and stretches that 1.2% acetic acid caused in mice.<sup>20</sup>

#### 2. *Nigella sativa*- *Karunjeeragam*

Kingdom: Plantae

Phylum: Tracheophyta

Class: Eudicots

Order: Ranunculales

Family: Ranunculaceae

Genus: *Nigella*

Species: *sativa*

Suvai – Kaippu

Thanmai – Veppam

Pirivu – Kaarppu

Parts used: Seeds

Action and uses: Astringent, Diuretic, Anthelmintic, Parasiticide.

Chemical constituents: Thymoquinone (30%-48%), thymohydroquinone, dithymoquinone, p-cymene (7%-15%), carvacrol (6%-12%), 4-terpineol (2%-7%), t-anethol (1%-4%), sesquiterpene longifolene (1%-8%),  $\alpha$ -pinene, and thymol, among other chemicals, are the most significant active components. Trace levels of other chemicals are also present in black seeds. Two distinct kinds of alkaloids are found in seeds: pyrazol alkaloids, also known as indazole ring carrying alkaloids which include nigellidine and nigellicine, and isoquinoline alkaloids, such as nigellicimine and nigellicimine-N-oxide. Additionally, the seeds of *N. sativa* contain saponin, a possible anticancer agent and alpha-hederin, a water-soluble pentacyclic triterpene.<sup>21</sup>

#### Pharmacological activity:

Anti-bacterial activity: The antibacterial activity of *N. sativa* against clinical isolates of methicillin-resistant *Staphylococcus aureus*. With a minimum inhibitory concentration (MIC) of 0.2–0.5 mg/mL, the ethanolic extract of *N. sativa* was found to be effective against all tested strains of methicillin-resistant *Staphylococcus aureus*.<sup>22</sup>

Anti-inflammatory activity: The methanol extracts from the shoots, roots, and seeds of *N. sativa* were investigated for their antibacterial, anti-inflammatory, anticancer and antioxidant properties. When lipopolysaccharide-stimulated RAW 264.7 macrophages were exposed to the methanol extract, the seeds hexane fraction shown strong anti-inflammatory activity by blocking nitric oxide release with an IC50 value of 6.20  $\mu$ g/mL.<sup>23</sup>

#### 3. *Cucurma longa*-*Manjal*

Kingdom: Plantae

Phylum: Tracheophyta

Class: Monocots

Order: Zingiberales

Family: Zingiberaceae

Genus: *Cucurma*

Species: *longa*

Suvai – Kaarppu, Kaippu

Thanmai – Veppam

Pirivu – Kaarppu

Parts used: Rhizome



Action and uses: Carminative, Stimulant, Hepatic, Tonic

Chemical constituents: The *C. longa* plant is known to contain acidic polysaccharides (ukonan A, B, C, and D), 4.2% volatile oils (turmerone, ar-turmerone, curcumene, germacrone, and ar-curcumene as main constituents) and 5.8% essential oils (0.5% borneol, 0.6% sabinene, 1%  $\alpha$ -phellandrene, 1% cineole, 53% sesquiterpenes, 25% zingiberene, and 3-4% curcumin).<sup>24</sup>

#### Pharmacological activity:

Anti carcinogenic activity: Curcumin has a general anti-carcinogenic effect on rat aortic smooth muscle cells through mechanisms such as activation of apoptosis and suppression of cell-cycle progression.<sup>25</sup>

Anti histaminic activity: As assessed by serum-dependent leukotriene C4, dependent prostaglandin D2, and histamine levels, curcumin significantly reduced IgE/Ag-induced PSA (passive systemic anaphylaxis), suggesting that it might be helpful to develop medications for allergic inflammatory diseases.<sup>26</sup>

#### 4.Common salt- Kalluppu

Action and uses: stomachic, purgative, anthelmintic, emetic, febrifuge.

### DISCUSSION AND CONCLUSION

The medicines Nilavagai chooranam and Thaengai thylam can be effectively used to treat *karappan* (atopic dermatitis) in children. The drugs possess anti-histamine, Immunomodulatory, anti-inflammatory, antioxidant activities. These pharmacological activities are necessary to treat *karappan* which reduces the itching, oozing, scaling, crusting, hyper pigmentation. The medicines contain less ingredients and also cost effective. So further indepth research studies are needed to be carried out to explore the drug.

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