



## Review Article

### A REVIEW ON ANTI - PYRETIC HERBS IN SIDDHA MEDICINE

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#### ABSTRACT

Fever (also known as pyrexia or a febrile response) is defined as a body temperature above the normal range due to an increase in the temperature regulatory set-point. In Siddha medicine fever is considered as a disease which is caused by body heat. According to Sage Theraiyar, the primary cause for fever is 'Aamam' or 'Seetham' which means an upset in the normal gastrointestinal function could be because of dysbiosis, indigestion, dyspepsia etc. Nowadays fever is emerged as an important indicator for infectious disease and a resource for research. In Siddha system of medicine, there are many herbal drugs that are used as antipyretic ingredients in many formulations. Siddha medicine has a wealth of remedies for the treatment of fever and associated conditions. Among them, herbs like *Andrographis paniculata*, *Cedrus deodara* have antimalarial activity. Polyherbal decoction *Nilavembu kudineer* is administered for Chikungunya, swine flu and dengue. Here an attempt has been made to explore the concepts of fever and some common varieties of herbal medicines used for the treatment of fever in Siddha. This article reviews the anti pyretic activity of the commonly used herbs in Siddha medicine.

**KEYWORDS:** Antipyretic herbs, Fever, Pyrexia, Suram, Siddha herbs.

#### INTRODUCTION

Siddha medicine is one of the most ancient and organized medical systems of India. Fundamental principles of Siddha includes theories of Five Elements (Aimpotham), three humours (Mukkuttram) and six tastes. [1-4]

Fever is defined as the elevation of body temperature above the normal range. This occurs due to an increase in the hypothalamic regulatory set point for temperature. In healthy individuals, normal body temperature varies from 36.6 to 37.2°C, usually 98.6° F. There is not a single agreed opinion upon upper limit for normal temperature with sources using values between 37.5 and 38.3 °C (99.5 and 100.9 °F). [5 -11]

In Siddha medicine fever is considered as a disease which results in increased body temperature. So it is called as 'Vemmai', 'veppu noi' and 'kaichal' etc., in Tamil. There are sixty four types of fever according to Siddha literature. Among these twenty are considered to be due to vali derangement, twenty four types due to Azhal, and twenty due to Aiyam. Of these sixty four types of fever fifty two are of intrinsic in origin or due to internal causes and the twelve other types originate from extrinsic sources. *Vatha suram*, *pitha suram*, *kaba suram*, *nalir suram*, *ven suram*, *kozhuppu suram*, *saara suram*, *senkarai suram*, *murai suram*, *thunba suram* *puzhu suram* are some

examples of fever due to internal causes or self origin. *Baya suram*, *pootha suram*, *nanju suram*, *sina suram*, *theyva sina suram*, *maruntheedu suram* are some of the fevers due to external causes. In addition to that there are many other factors which cause fever.

According to Sage Theraiyar, the primary cause for fever is 'Aamam' or 'Seetham' which means an upset in the normal gastrointestinal function could be because of dysbiosis, indigestion, dyspepsia etc. Other causes includes constipation, toxicity, excessive sexual activity, sleeplessness, running for long time, intake of fast foods, excessive anger, exposure to morning sun light, tolerating excessive hunger, excessive eating, carrying heavy weight, excessive shouting, controlling 14 natural urges of the body, indulging in sexual activities on the day of taking oil bath, eating full stomach after heavy hunger, drinking chilled water, malaise etc. Though the cause of fever is multifactorial in nature, when the fever is developed, it is regulated by Vali or Air, which is one of the components of *Tri - thodam*.

As per Siddha literature, signs and symptoms of fever includes lack of interest in any food, heaviness of the body, dryness of the tongue, loss of appetite, aversion towards sweet, sour and salty food items, chillness and shivering of the body, increased

body temperature, giddiness, delirium, loss of taste in tongue, body pain, pain in muscles of thigh and legs, dizziness, excessive sweating, lack of sleep at night. In fever some of the above mentioned symptoms will appear. [12,13]

As it is considered that fever arises mainly due to the derangement of three thodams from their normal states, the following modes of therapy is advocated with the purpose of restoring of the functions of triple *Doshas*. [14]

1) By subjecting the patient to starvation or inducing vomiting or diarrhoea.

2) When the above measures fail, administration of decoction, powder, tablets, and other medicines.

### Commonly Used Anti - Pyretic Herbs in Siddha Medicine

**Table 1: Commonly used anti - pyretic herbs in Siddha medicine**

S.No	Botanical name	Family	Siddha name	Part used	Gunapadam Mooligai P. No
1	<i>Aconitum napellus</i>	Ranunculaceae	<i>Nabi</i>	Root	566
2	<i>Adansonia digitata</i>	Bombacaceae	<i>Anaippuliya maram</i>	Leaf, Bark, fruits, Seeds	94
3	<i>Aegle marmelos</i>	Rutaceae	<i>Vilvam</i>	Leaf, Flower, Fruits, Root, Bark	819
4	<i>Atalantia malabarica</i>	Rutaceae	<i>Kattu Elumichchai</i>	Leaf, Fruit	290
5	<i>Alocasia indica</i>	Araceae	<i>Merugu</i>	Kilangu	785
6	<i>Andrographis paniculata</i>	Acanthaceae	<i>Nilavembu</i>	Leaf, Bark	579
7	<i>Anthocephalus cadamba</i>	Rubiaceae	<i>Kadambu</i>	Leaf, Fruit, Seeds, Bark,	186
8	<i>Caesalpinia bonduc</i>	Caesalpinaceae	<i>Kazharchi kodi</i>	Leaf, Seeds, Bark, Root	251
9	<i>Cassia tora</i>	Fabaceae	<i>Usiththagarai</i>	Leaf, Root, Seeds	493
10	<i>Cedrus deodara</i>	Pinaceae	<i>Devadaru</i>	Bark, Wood	546
11	<i>Chukrasia tabularis</i>	Meliaceae	<i>Ayil</i>	Bark	78
12	<i>Clerodendrum inerme</i>	Lamiaceae	<i>Isangu</i>	Leaf, Root	96
13	<i>Commelina benghalensis</i>	Commelinaceae	<i>Kanam vazhai</i>		315
14	<i>Coscinium fenestratum</i>	Menispermaceae	<i>Maramanjil</i>	Sakkai	722
15	<i>Crataeva magna</i>	Capparaceae	<i>Mavilingu</i>	Leaf, Bark, Root	754
16	<i>Erythrina variegata</i>	Fabaceae	<i>Kaliyana murukku</i>	Leaf, Flower, Seeds, Bark	246, 247
17	<i>Exacum pedunculatum</i>	Gentianaceae	<i>Kanappundu</i>	Leaf	212
18	<i>Feronia limonia</i>	Rutaceae	<i>Narivila</i>	Leaf	558
19	<i>Hedyotis corymbosa</i>	Rubiaceae	<i>Parpatakam</i>	Poondur	652
20	<i>Holarrhena pubescens</i>	Apocynaceae	<i>Kudasappalai</i>	Bark, Seeds	352
21	<i>Indigofera enneaphylla</i>	Leguminosae	<i>Cheppu nerunjil</i>	Root fruits,	479
22	<i>Morinda tinctoria</i>	Rubiaceae	<i>Nuna</i>	Leaf, Fruit, Bark, Root	589
23	<i>Rungia repens</i>	Acanthaceae	<i>Kodaga salai</i>		404
24	<i>Vetiveria zizanioides</i>	Poaceae	<i>Kuruver</i>	Root	365
25	<i>Vitex negundo</i>	Verbenaceae	<i>Notchi</i>	Leaf, Flower, Root, Bark	627
26	<i>Withania somnifera</i>	Solanaceae	<i>Amukkura</i>	Leaf, Seeds, Root	29

Various Siddha herbal formulations (Kudineer) are offered for the treatment of fever. Some of the herbal decoctions used in Siddha medicine:

*Nilavembu kudineer*

*Vatha sura kudineer*

*Pitha sura kudineer*

*Kabha sura kudineer*

*Visha sura kudineer*

Advanced researches are going in Siddha Pharmacology to prove the efficacy of the Siddha drugs for various chronic non communicable diseases and also in communicable diseases [11-17]

### 1) *Aconitum napellus*

In Siddha medicine the herb, *Aconitum napellus* used for the treatment of fever. It is also used in the treatment of skin diseases like leprosy, toxic bite, peptic ulcer, worm infections, splenomegali and ascites.<sup>[18]</sup> Ikram M et al. studied the antipyretic activity in *Aconitum napellus*. It showed that Hexane- and chloroform-soluble extracts of *Aconitum napellus* stems exhibited prominent oral antipyretic activity.<sup>[19]</sup>

### 2) *Adansonia digitata*

*Adansonia digitata* is indicated for periodic fever in Siddha medicine. A decoction of the bark can be used to treat periodic fever.<sup>[18]</sup> Sufferers of malaria in Africa, India, Sri Lanka and the West Indies are said to consume a mash containing dried baobab bark as a febrifuge in order to treat the fever associated with this illness<sup>[18]</sup>. Fruit pulp and seeds are also widely used for their anti-pyretic properties at a dose of 200 mg/kg and/or 100 mg/kg<sup>[20,21]</sup>. Baobab (*Adansonia digitata*) fruit pulp has also been shown to lower elevated body temperature without affecting normal body temperature.<sup>[21,22]</sup>

### 3) *Aegle marmelos*

The serial extracts of the leaves (50 mg/kg) of *Aegle marmelos* Corr. were investigated for antipyretic properties. Paracetamol (150 mg/kg) served as the reference drug. The most of the extracts derived from the plant *Aegle marmelos* caused a significant reduction in hyperpyrexia in rats, with activity being pronounced within 60 min after administration of the extracts.<sup>[23]</sup> In Siddha medicine the herb, *Aegle marmelos* is used for fever, peptic ulcer, giddiness, dropsy, diarrhoea, hiccup, continuous vomiting, emaciation of the body.<sup>[18]</sup>

### 4) *Atalantia malabarica*

*Atalantia malabarica* used for fever, peptic ulcer, cough, headache.<sup>[18]</sup> The plant extracts in dose levels of 50,100 and 200 mg/kg orally were used in anti-pyretic studies. It has shown that the crude leaf extracts of the plant possess potent anti-pyretic activity<sup>[24,25]</sup>

### 5) *Alocasia indica*

In siddha medicine the herb, *Alocasia indica* is indicated for fever affecting bones, abdominal disorders, piles, cough and venereal diseases.<sup>[18]</sup>

### 6) *Andrographis paniculata*

*Andrographis paniculata* used for fever, head ache, giddiness, indigestion, diarrhoea.<sup>[18]</sup> In Asian countries, *A. paniculata* has been widely used for its antipyretic, analgesic, protozoacidal, antihepatotoxic, anti-HIV, immunostimulant, anticancer effects.<sup>[26]</sup> It had been reported that andrographolide, with oral doses of 100 and 300 mg/kg, produced a significant

antipyretic effect after 3hr administration of brewer's yeast-induced fever in rats.<sup>[27]</sup> In addition, doses of 180 or 360 mg/kg of andrographolide were also found to relieve fever in humans by the third day after administration.<sup>[28]</sup>

### 7) *Anthocephalus cadamba*

Extracts of the plant *anthocephalous cadamba* at dose of 200 mg/kg body weight showed significant antipyretic effect. Standard drug used was Paracetamol 150 mg/kg body weight.<sup>[29]</sup> *Anthocephalus cadamba* used for fever, eye disease, toxic bite, anasarca, indigestion, periodic fever, arthritis.<sup>[18]</sup>

### 8) *Caesalpinia bonduc*

In Siddha medicine the herb, *Caesalpinia bonduc* used for fever, piles, wounds, leucorrhoea and urinary disorders, intestinal worms, tumours, cough, amenorrhoea.<sup>[18]</sup> The ethanolic and aqueous extracts of the plant leaves showed less significant antipyretic activity at the dose of 50,100 and 200 mg/ kg., body weight.<sup>[30,31]</sup>

### 9) *Cassia tora*

Decoction of the fruit of *Cassia tora* is used in the treatment of fever.<sup>[32]</sup> It is also used for fever, tinea infection, indigestion as per Siddha literature.<sup>[18]</sup>

### 10) *Cedrus deodara*

*Cedrus deodara* used for fever, sinusitis, head ache, heaviness of head, cough, ear ache, diarrhoea.<sup>[18]</sup> Essential oil from *Cedrus deodara* has antimalarial activity. Essential oil was evaluated for bioactivity against the adults of *C.quinuefasciatus* & *A.aegypti*.<sup>[35]</sup> Adults of *A.aegypti* were insensitive towards the oil of *Cedrus deodara* under the concentration range (0.5-10%) & 1 hr. of exposure whereas against *C.quinuefasciatus* reported LC 50 was 2.48% respectively, indicating low effectivity. Plant shows moderate activity against these two mosquitoes.<sup>[33,34]</sup>

### 11) *Chukrasia tabularis*

In Siddha medicine the herb, *Chukrasia tabularis* used for chronic fever, leucoderma.<sup>[18]</sup> A moderate antipyretic activity was observed for the ethanol extracts of the leaves as compared to Paracetamol; the effect being more pronounced after two hours.<sup>[35]</sup>

### 12) *Clerodendrum inerme*

*Clerodendrum inerme* used for fever, skin diseases, venereal diseases, toxic bites, leucorrhoea as per Siddha literature.<sup>[18]</sup> Aqueous extract obtained from *Clerodendrum inerme* leaves possesses a significant antipyretic effect (at doses 100 mg/kg and 200mg/kg) in yeast-provoked elevation of body

temperature in rats, and its effect is comparable to that of paracetamol (standard drug).<sup>[36]</sup>

### 13) *Commelina benghalensis*

In siddha medicine the herb, *Commelina benghalensis* [Tamil name- kanam vazhai] used for fever, non healing ulcer in breast, dysentery.<sup>[18]</sup>

### 14) *Coscinium fenestratum*

*Coscinium fenestratum* used for internal fever, piles, tastelessness, primary complex. <sup>[18]</sup> Plant extract at the dose of 1,000 mg/kg showed antipyretic activity. <sup>[37-39]</sup>

### 15) *Crataeva magna*

*Crataeva magna* used for the treatment of fever, urticaria, snake bite, renal stones, arthritis in Siddha medicine.<sup>[18]</sup> It was evaluated for the antipyretic activity of the crateva magna extract in TAB (Typhoid) vaccine-induced pyrexia in rabbits at doses of 100 and 200 mg/kg orally. Paracetamol (100 mg/kg) was used for comparison. It showed significant antipyretic activity. The antipyretic effect of *C. magna* indicated a likelihood of intervention with prostaglandin synthesis since prostaglandin is believed to be a regulator of body temperature. <sup>[40,41]</sup>

### 16) *Erythrina variegata*

*Erythrina variegata* is indicated for vomiting, abdominal disease, fever, oral ulcer, intestinal worms, diarrhoea.<sup>[18]</sup> Antipyretic activity was measured by Brewer's induced pyrexia model in rats. standard drug received was Paracetamol 33mg/kg i.p. The rats were treated with Ethanol, Water and Ethyl acetate extracts of *Erythrina variegata* leaves (200mg/kg and 400mg/kg, p.o). Antipyretic activity of water extract was found to appreciable when compared to ethanol and ethylacetate extract of *Erythrina variegata*.<sup>[42-44]</sup>

### 17) *Exacum pedunculatum*

In siddha medicine the herb, *Exacum pedunculatum* used for fever, cough, indigestion. It reduces body heat. <sup>[18]</sup>

### 18) *Feronia limonia*

*Feronia limonia* is used in the treatment of fever, dryness of the tongue, leucorrhoea, skin diseases. <sup>[18]</sup> Antipyretic effect evaluated in mice. (at a dose of 100mf/kg and 200 mf/kg). The extract showed antipyretic activity against Brewer's yeast-induced pyrexia. At dose levels of 50 to 100mg/kg i.p. it significantly reduced the temperature. This effect lasted for 1-2 hr. at higher dose levels (0.5 and 1 g/kg) its effect persisted for up to 4 hr. <sup>[45]</sup>

### 19) *Hedyotis corymbosa*

*Hedyotis corymbosa* used for fever, thirst, psychic disorders, burning sensation in eyes. <sup>[18]</sup> A study was conducted to screen antipyretic activity of

the petroleum ether, ethyl acetate, butanone, butanol extract of *Hedyotis corymbosa* on yeast induced pyrexia model in albino rats. Results from the study suggested that among the various extracts used in the study, only petroleum ether extract did not shown any significant antipyretic activity, whereas other extracts i.e., ethyl acetate, butanone, n-butanol, solvent ether showed significant antipyretic activity compared with paracetamol treated group.<sup>[46,47]</sup>

### 20) *Holarrhena pubescens*

In Siddha medicine the herb, *Holarrhena pubescens* used for fever, diarrhoea, leucorrhoea, skin diseases.<sup>[18]</sup>

### 21) *Indigofera enneaphylla*

*Indigofera enneaphylla* used for fever, leucorrhoea as per Siddha literature in Single and multi herbal medicine preparations. <sup>[18]</sup>

### 22) *Morinda tinctoria*

*Morinda tinctoria* used for fever, skin diseases, ulcer, peptic ulcer, indigestion. <sup>[18]</sup>

### 23) *Rungia repens*

The plant *Rungia repens* is used for fever, skin diseases and ulcer in siddha medicine. <sup>[18]</sup> The antipyretic activity of hydroalcoholic extract (50:50) of *Rungia repens* was evaluated. The anti-pyretic activity of the plant was studied in Brewer's yeast-induced pyrexia in rats. The plant extract at a dose level of 400 and 800 mg/kg body weight showed significant activity.<sup>[48,49]</sup>

### 24) *Vetiveria zizanioides*

*Vetiveria zizanioides* belonging to the family Gramineae, is widely used as a traditional plant as refrigerant that cools and calms the entire body. Antipyretic effect of the plant extract at 75mg, 150mg and 300mg/kg dose was evaluated in albino rats (yeast-induced pyrexia) potential of the hexane extract and methanol extract of *Vetiveria zizanioides* root. It showed significant antipyretic activity. Standard antipyretic agent used was paracetamol (150 mg/kg body wt, p.o).<sup>[50,51]</sup> As per Siddha literature, the herb *Vetiveria zizanioides* used for excessive thirst, jaundice, hypertension, head ache, eye diseases, syncope, burning sensation in the body, dryness of the tongue. <sup>[18]</sup>

### 25) *Vitex negundo*

*Vitex negundo* used for fever, head ache, splenomegaly, abdominal pain.<sup>[18]</sup> The antipyretic activity of the alcoholic extract of *Vitex negundo* Linn in albino rats was studied by using Prostaglandin E1 (100µg/kg) induced hyper pyrexia method. The Alcoholic extract of *Vitex Negundo* at a dose of 2000mg/kg body weight has shown significant (p0.05) antipyretic activity. Whereas at a dose of 4000mg/kg shown highly significant (P < 0.000)

antipyretic activity. The response was compared to that of a standard antipyretic drug Aspirin.<sup>[52]</sup>

## 26) *Withania somnifera*

In Siddha medicine, the herb *Withania somnifera* is used for treating fever, *Vatha* diseases, eczema, swelling and its good appetizer. <sup>[18]</sup> Antipyretic activity was studied (20/30mg/kg b.wt) in mice. It is a characteristic of drugs or compounds which have an inhibitory effect on prostaglandin-biosynthesis (Vane, 1987). It showed that Withaferin A has significant antipyretic activity. The yeast induced pyrexia test in mice was done to investigate the anti-pyretic effect of Withaferin A. It was found that caused a significant reduction in the rectal pyrexia similar to the standard drug Indomethacin.<sup>[53]</sup>

## DISCUSSION

Fever is considered as the body's natural response to a pathogen. Fever has been shown to stimulate the immune system to produce antibodies and to enhance the elimination of toxins from the body. Many herbs may act through an anti microbial action, through stimulation of immune system, and help the body clear out toxins.

The root cause of the disease is derangement of three humours. These three humours are composed of five elements. Likewise each taste is predominantly composed of any two of these five elements. Since taste of the herbs have an intrinsic relationship with their efficacies, in Siddha system herbs are selected according to their taste and element constitution to normalise the humour affected.

In Siddha system of medicine, surfeit of herbs are used to treat fever and its related illnesses. Here, review of commonly used antipyretic herbs are put forth for assured management of infectious fevers. Both single herbal drug and poly herbal formulations are used in Siddha for the management of fever. These herbs are easily available, less harmful and cost effective. Among them, *Andrographis paniculata* and *Cedrus deodara* have antimalarial activity. Poly herbal decoction *Nilavembu kudineer* is administered for Chikungunya, swine flu and dengue.

The stem extract of *Aconitum napellus*, fruit pulp and seeds of *Adansonia digitata* has been found to have significant antipyretic activity. Studies on the leaves extracts of *Aegle marmelos*, *Atalantia malabarica*, *Chukrasia tabularis*, *Clerodendrum inerme*, *Erythrina variegata*, *Vetiveria zizanoides*, *Vitex negundo* has been reported to have significant antipyretic activity.

Considering the several side effects of synthetic drugs, medicinal plants and polyherbal formulations with comparatively fewer side effects

should be looked for as a better alternative for the treatment of fever.

## CONCLUSION

Siddha system of medicine is one of the ancient medical system in India which has immense medicinal plants wealth used for treating many diseases from fever to cancer. Now a days fever emerged as an important lead for infectious disease research. In the present scenario, world's focus turns to the herbal medicine because of the side effect of chemical drugs. The herbs mentioned in this article are used by Siddha practitioners and from this review it is proved that these herbs have potent anti pyretic activity. All these herbs are very much promising in the discovery of new generation anti-pyretics and the pharmacological studies emphasises the importance of these medicines.

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**Cite this article as:**

P. Parvathy, V.Srinivasan , M. Ramamurthy, S. Elansekaran , G. J. Christian. A Review on Anti - Pyretic herbs in Siddha Medicine. International Journal of Ayurveda and Pharma Research. 2018;6(11):44-50.

**Source of support: Nil, Conflict of interest: None Declared**

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