



## Review Article

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### A COMPREHENSIVE REVIEW ON SIDDHA POLYHERBAL FORMULATION KEEDARI THAILAM

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#### ABSTRACT

Keedari thailam is the polyherbal Siddha formulation extensively used for puzhuvettu as external medicine mentioned in the Siddha literature “Theraiyar thaila varka surukkam”. The ingredients of keedari thailam are Poduthalai (*Phyla nodiflora* Linn), elumichai (*Citrus limon* Linn), nallennai (sesame oil) and milagu (*Piper nigrum* Linn). Puzhuvettu can be considered as alopecia areata according to conventional medicine. Due to adverse effects in the treatment of conventional medicine, world is looking for the management of alopecia in traditional medicines for safe drug use. In clinical practice, the ingredients present in the keedari thailam have effective in the treatment of alopecia areata. Hence, this study endeavors to review the essential data focusing on the actions, phytochemistry and pharmacological studies of ingredients of the keedari thailam. Through this extensive review on Siddha literatures and recent research reports, scientific validation has been carried out on various pharmacological actions and therapeutic benefits of each ingredient of keedari thailam. This review revealed the presence of antimicrobial, antifungal, antibacterial, anti inflammatory, analgesic, anti cancer and anti diabetic activities in the ingredients of keedari thailam.

**Keywords:** Puzhuvettu, alopecia, keedari thailam, Siddha, skin disease, autoimmune.

#### INTRODUCTION

Siddha system of medicine is one of the oldest traditions of healthcare in the Indian sub-continent well documented and replete with novel therapeutic interventions and treatment modalities. Siddhars were pioneers in using the herbals, metals, minerals and animal origin as therapeutic agents<sup>1</sup>. There are 32 types of internal and 32 types of external medicine in Siddha system of medicine. Thailam is the oily medications prepared by boiling decoctions, juices, milk and pastes of other raw materials with oil<sup>2</sup>. According to the Siddha literature “Theraiyar thaila varka surukkam”, Keedari thailam is the polyherbal Siddha formulation extensively used for puzhuvettu as the external medicine<sup>3</sup>.

Siddha system of medicine claims that vitiated pitham and vitiated vatham work together to induce hair loss on the scalp. After that, vitiated ratha thathu and kabam block the hair follicles, which prevents the creation of new hair. Thus, the vitiated three doshams as well as ratha thathu are the primary internal causes of puzhuvettu<sup>4</sup>. It can be considered alopecia areata according to conventional medicine. Alopecia areata is an autoimmune condition marked by patchy hair loss mainly on the scalp, without any marked evidence of inflammation. Its prevalence in the general population was estimated to be 0.1-0.2%, with a lifetime risk of 1.7%<sup>5</sup>. According to previous studies, alopecia areata affects male more than children and female<sup>6</sup>. In contemporary medicine, primary method of treatment is corticosteroids, which are dangerous and should not be used for an extended period of

time<sup>7</sup>. Thus, the world is seeking to certain treatments from alternative medical disciplines. Hence, this study aims to review the essential data focusing on the actions, phytochemistry and pharmacological studies of ingredients of the keedari thailam.

#### Ingredients of Keedari thailam

- Poduthalai charu (*Phyla nodiflora* Linn juice) - 1.3 litres
- Elumichai charu (*Citrus limon* Linn juice) - 1.3 litres
- Nallennai (*Sesamum indicum* Linn oil) - 1.3 litres
- Milagu (*Piper nigrum* Linn) - 1½ palam (52.5 grams)<sup>3</sup>

#### Method of preparation

The juices of poduthalai, elumichai and nallennai are mixed along with powdered pepper and mixed at regular intervals. Then the mixture is dried under sunlight until there is no moisture content in it.

**Indication:** Alopecia areata

#### Poduthalai (*Phyla nodiflora* Linn)

**Family:** Verbenaceae

**Part used:** Leaves

**Properties:** Suvai (Taste)- Kaippu (Bitter), Thuvarpupu (Astringent); Thanmai (Character) – Veppam; Pirivu (Division) - Kaarpu (pungent).<sup>8</sup>

**Action:** Demulcent, deobstruent, diuretic, astringent, expectorant, tonic.<sup>8</sup>

**Chemical constituents:** Nodifloretin,  $\beta$ -sitosterol glycoside and stigmasterol glycoside were found from the leaves of *L. nodiflora*. Nodifloridin A and Nodifloridin B along with lactose, maltose, glucose, fructose, and xylose were isolated from the plant<sup>9,10</sup>.

**Pharmacognostical aspect:** Colour is deep green when fresh and pale white to light brown on drying. Odour is characteristically distinct like castor. Leaves are small (1.5-3x1-1.2 cm), simple, opposite, obtuse, obovate, spatulate, cuneate at the base deeply and sharply serrate towards apex, sometimes nearly glabrous. Both surfaces are shiny, hairy with modified white strigose hairs, nerves and margins hairier<sup>11,12</sup>.

**Pharmacological aspect:** Durairaj *et al* and Salve *et al* reported the ethanol extract showed significant antibacterial activity against *E. coli*, *P. aeruginosa* and *Staphylococcus aureus* due to the presence of bio-active compounds when compared with petroleum-ether and aqueous extract<sup>13,14</sup>. Shukla *et al* revealed the antidiuretic activity of methanol and aqueous extracts of the aerial parts in albino rats using *in-vivo* Lipschitz test model<sup>15</sup>. Ahmed *et al* evaluated the methanolic extract of the leaves of *P. nodiflora* for antinociceptive activity in carrageenan induced paw edema in rats and anti-inflammatory activity against acetic acid induced writhing in white albino mice<sup>16</sup>. Dodala *et al* examined the anti urolithiatic activity of *P. nodiflora*<sup>17</sup>.

#### Elumichai (*Citrus limon* Linn)

**Family:** Rutaceae

**Part used:** Fruits

**Properties:** Suvai (Taste) - pulippu (sour); Thanmai (Character) – veppam (hot); Pirivu (Division)-Kaarpu (pungent).<sup>8</sup>

**Action:** Refrigerant.<sup>8</sup>

**Chemical constituents:** Flavonoids (e.g., diosmin, hesperidin, limocitrin) and phenolic acids (e.g., ferulic, sinapic, p-hydroxybenzoic acids). The essential oil is rich in bioactive monoterpenoids such as D-limonene,  $\beta$ -pinene,  $\gamma$ -terpinene.<sup>18</sup>

**Pharmacognostical aspect:** The whole fruit is yellowish green in colour, ovoid or obovoid in shape, 6 to 10 cm long, 4 to 7 cm wide with a nipple-shaped apex. It has 8 to 10 loculi, each of which is completely filled with juice filled small outgrowths from the inner epidermis of the outer pericarp wall and from the placenta. The pulp has an agreeable strongly acidulous taste.<sup>19</sup>

**Pharmacological aspect:** Chikako *et al* studied the effects of lifelong intake of lemon polyphenols on aging and intestinal microbiome in the senescence. This result suggested that the lemon polyphenols have anti-aging effects not only on host health but also on the intestinal environment<sup>20</sup>. Yoji kato *et al* documented the effect of ingestion of lemon and walking in the management of blood pressure<sup>21</sup>. Elham *et al* evaluated the antiviral activity of *Citrus limon*, *Matricaria recutita* L., *Allium ascalonicum* L., and *Rosa damascene* against Newcastle Disease Virus<sup>22</sup>. Boshtam *et al* revealed that citrus peel and juice increases plasma antioxidant capacity in rabbits and can thus prevent or decelerate the process of atherogenesis<sup>23</sup>. Alshatwi *et al* conducted the study on methanolic extract of lemon juice was investigated in the anti-tumour activity on the MUF-7 breast cancer cell line by *in vitro*<sup>24</sup>. Ashok kumar *et al* studied the Antibacterial activity of five different solvent extracts (ethyl acetate, acetone, ethanol, petroleum ether and water) against five pathogenic bacteria *Staphylococcus aureus*, *Bacillus subtilis*, *Escherichia coli*, *Klebsiella pneumonia* and *Salmonella typhi*<sup>25</sup>. Yasmin khan *et al* reported the hypolipidemic effects of lemon juice in high fat induced rabbits<sup>26</sup>.

#### Nallennai (*Sesamum indicum* Linn)

**Family:** Pedaliaceae

**Part used:** Seed oil

**Properties:** Suvai (Taste) - Inippu (Sweet); Thanmai (Character) – veppam (hot); Pirivu (Division) - Inippu (Sweet).<sup>8</sup>

**Action:** Emmenagogue, stimulant, tonic, diuretic, lactagogue, laxative.<sup>8</sup>

**Chemical constituents:** Sesamin, sesamol, sesamol, proteins, amino acids, carbohydrates, lipids, unsaturated fatty acids, lignin.<sup>27</sup>

**Pharmacognostical aspect:** According to the difference in germplasm color, sesame can be classified as white sesame, black sesame, and yellow sesame, among which black and white sesame are the more common and widely grown dominant species.<sup>28</sup>

**Pharmacological aspect:** Devarajan sankar *et al* reported that Seed oil of sesame with anti diabetic medication exhibited synergistic effect as combination therapy in mild to moderate cases<sup>29</sup>. Edmund HSU studied the anti inflammatory and antioxidant activities of sesame seeds<sup>30</sup>. Sesamol plays against oxidative stress through its radical scavenging ability and lipid peroxidation lowering potential is analyzed. Amin F Majdalawieh *et al* evaluated the anticancer activity using various cell lines and animal model<sup>31</sup>. Mohamed saleem *et al* examined the antimicrobial activity against *Bacillus subtilis*, *Staphylococcus aureus*, *Proteus vulgaris* and *Streptomyces gresius*<sup>32</sup>. Toshiko ogawa *et al* revealed that sesamin and fatty acid components of sesame oil are involved in its antifungal activity<sup>33</sup>. Analgesic and anti-inflammatory activity in few experimental models tested. Incomparable analgesic activity was found in the hot plate, acetic acid induced writhing and formalin induced pain model<sup>34</sup>.

*Coccus aureus* (NCIM 2602), *Escherichia coli* (NCIM), *Salmonella typhi* (NCIM 2493), *Proteus vulgaris*, *Cornebacterium diphtheria*, *Streptomyces gresius*.

#### Milagu (*Piper nigrum* Linn)

**Family:** Piperaceae

**Parts used:** Seeds

**Properties:** Suvai (Taste) - Kaippu (Bitter), Kaarppu (Pungent); Thanmai (Character) – Veppam; Pirivu (Division) - Kaarpu (pungent).<sup>8</sup>

**Action:** Acrid, carminative, antiperiodic, rubefacient, stimulant, resolvent, anti-Vata.<sup>8</sup>

**Chemical constituents:** Piperine and other phytochemicals such as amides, piperidine, pyrrolidines, and trace amounts of saffrole are present.<sup>35</sup>

**Pharmacognostical aspect:** The matured fruits are spherical in shape (~ 5 mm diameter) and belong to drupe type. The harvested fruits are sun-dried for further use.<sup>36</sup>

**Pharmacological activity:** According to Rani *et al* piperine had potential antimicrobial activity as well as antifungal effects against *Staphylococcus aureus*, *Bacillus subtilis*, *Escherichia coli*, *Aspergillus niger*, *A flavus*, *Alternaria alternata* and *Fusarium oxysporum*<sup>37</sup>. Makhov *et al* reported synergistic effect during co-administration of piperine and docetaxel in human prostate cancer<sup>38</sup>. Piperine plays an important role in the management of osteosarcoma and lung cancer<sup>39,40</sup>. Echeverría *et al* revealed that polyphenolic compound Hydroxytyrosol (HT), has a potent antioxidant effect on hydrogen donation and improved radical stability<sup>41</sup>. Bagheri *et al* revealed its Antioxidant activity through 2,2-diphenyl-1-picrylhydrazyl (DPPH) scavenging assay<sup>42</sup>. Black pepper has been reported to have a gastrointestinal activity to increase appetite, piles, anti diarrheal, antispasmodic and anthelmintic<sup>43</sup>. Dudhara *et al* mentioned piperine as the bio-enhancer<sup>44</sup>. Jeena *et al* examined the anti-inflammatory and antinociceptive activities in Carrageenan induced acute inflammatory Balb/C mice<sup>45</sup>.

## CONCLUSION

This extensive systemic review revealed the presence of antimicrobial, antifungal, antibacterial, anti-inflammatory, analgesic, anti-cancer and anti-diabetic activities in the ingredients of Keedari Thailam. Phytochemical constituents are responsible for the therapeutic effects of this formulation. Further clinical studies are warranted to prove the efficacy of the drug Keedari Thailam in the management of Alopecia areata.

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