



***Thungadrumadi taila*: Composition, variability and therapeutic potential of a classical Kerala formulation**

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Abstract

Thungadrumadi taila is a traditional formulation, used by the Physicians of Kerala for decades, which shows promising benefits in providing relaxation to the mind and relief from insomnia. This preparation is being manufactured by very few pharmaceuticals and the ingredients differ according to different regions based on their availability. Very few research studies and publications have focused on this formulation till now. The present review is based on an analytical study of classical ayurvedic texts and relevant published research articles, in an attempt to explore its composition, variability in formulation and therapeutic potential, and inspire more systematic research in the future. On analysing the ingredients, it is found that they are mostly cold in potency and *vata-pitta hara*, which accounts for the cooling and relaxation action of the formulation. Pharmacological actions like anti-oxidant and neuroprotective effects makes it beneficial in conditions of stress and insomnia, supporting neuronal function, contributing to clarity of mind and overall well-being. The formulation demonstrates potential benefit in insomnia; however, standardization and further clinical evaluation are necessary for broader use.

Keywords: Insomnia, *Murdhni taila*, *Shiroabhyanga*, *Sugandha*, *Thungadrumadi taila*

1. Introduction

Ayurveda, the science of life is full of many formulations that work perfectly but is still unknown to the world. Many classical formulations mentioned are currently prepared using substitute drugs due to the unavailability and lack of standardization of the ingredients. In the current scenario it is very essential to maintain the quality and safety of ayurvedic products owing to the increasing demand and biased views of the world market. Standardization of the formulations is very much essential to make Ayurveda globally acceptable. The fast-paced lifestyle and environmental factors, has brought stress and insomnia to the forefront of health issues of the current generation. This accounts for the growing need of Ayurvedic formulations that provide relief to these health issues without adverse effects. Among them, oil application is one of the most simple and easiest practice

that they can incorporate into their daily routine. *Thungadrumadi taila* is a formulation that is mentioned in *Sahasrayogam* (Aravettazhikath *et al.*, 2019), one of the authentic ayurvedic formulary of Kerala, under the *taila* section, and is considered to be '*shironayana tarpana*' which means it provides nourishment to the head and eyes. since head is the abode of all the sense organs and important *marma* (vital point), and the place where the *masthishka* (brain) is located, nourishment of head is of great importance in the treatment of the *manasika vyadhi* (psychiatric disorders). Traditional practitioners have been prescribing it for insomnia, since ages with consistent results; however, there are only limited number of studies focusing on its standardization and clinical efficacy. Thus, it remains a relatively unexplored formulation with significant potential for wider therapeutic use.

2. Materials and methods

This narrative review was undertaken through detailed examination of classical Ayurvedic texts such as Bhavaprakasha, Rajanigantu, The Ayurvedic Pharmacopoeia of India, The Ayurvedic Formulary of India, along with relevant peer-reviewed publications. Electronic databases including PubMed and Google Scholar were searched for articles published between 2013 and 2025 using the keywords, ‘thungadrumadi taila’ and ‘sugandha’. Information on commercially available formulations with the same nomenclature was additionally gathered through online sources. The retrieved literature was screened for relevance and critically evaluated to develop a rational interpretation based on the pharmacological properties of the constituent ingredients.

3. Results and discussion

3.1. The formulation of *thungadrumadi taila*

This *taila* preparation (oil preparation) can be applied externally on the head in different forms of *murdhni taila*,

namely, - *shiroabhyanga*, *shiroseka*, *shirovasthi* and *shiropichu*, facilitating the absorption of the drug administered through scalp.

3.2. Composition of *thungadrumadi taila*

The Ayurvedic Formulary of India (AFI), accepted ingredients of *thungadrumadi taila* includes *taruna thungadruma jala* (*narikela*), *sugandha*, *lamajja* (*usheera*), *yashtimadhuka*, *utpala*, *chandana*, *dugdha* and *tilataila*. Details regarding the botanical identity, plant parts employed, and quantities of the ingredients are provided in Table 1. The Ayurvedic characteristics of each ingredient, including *rasa*, *guna*, *veerya*, *vipaka*, and *karma*, are described in Table 2, while their chemical composition and pharmacological properties are summarized in Table 3.

3.3. Method of preparation

Raw drugs two to six were collected in dry form and made into a paste using required quantity of tender coconut water. The *tila taila* is subjected to *murcchana* (pre-processing technique) and then the *kalka* (paste of

Table 1. Ingredients of *thungadrumadi taila* with botanical names, parts used and quantity (Anonymous, 2003)

Sl. No.	Ingredients	Scientific name	Part used	Quantity
1	<i>Chandana</i>	<i>Santalum album</i> L.	Heartwood	32 g
2	<i>Dugdha</i>	-	Cow's milk	768 mL
3	<i>Lamajja</i>	<i>Vetiveria zizanioides</i> L. (Nash)	Root	32 g
4	<i>Sugandha</i>	<i>Hellenia speciosa</i> (J. Koenig)	Rhizome	32 g
5	<i>Taila (tila)</i>	<i>Sesamum indicum</i> L.	Oil	768 g
6	<i>Taruna thungadruma jala</i>	<i>Cocos nucifera</i> L.	Tender coconut water	3.072 L
7	<i>Utpala</i>	<i>Nymphaea stellata</i> Willd.	Whole plant	32 g
8	<i>Yashtimadhuka</i>	<i>Glycyrrhiza glabra</i> L.	Rhizome	32 g

Table 2. *Rasapanchaka* of the ingredients of *thungadrumadi taila*

<i>Dravya</i>	<i>Rasa</i>	<i>Guna</i>	<i>Veerya</i>	<i>Vipaka</i>	<i>Karma</i>
<i>Taruna thungadruma jala</i>	<i>Kashaya, madhura</i>	<i>Snigdha, laghu</i>	<i>Sheeta</i>	<i>Katu</i>	<i>Pittaghna, vataghna, brimhana</i> (Balkrishna, 2013)
<i>Sugandha</i>	<i>Tikta, madhura</i>	<i>Ruksha, laghu</i>	<i>Sheeta</i>	<i>Katu</i>	<i>pittabramahara, kaphapittahara</i> , (Warrier et al, 1997)
<i>Usira</i>	<i>Tikta, madhura</i>	<i>Laghu, snigdha</i>	<i>Sheeta</i>	<i>Madhura</i>	<i>Tridosahara, dahaklanti-hara</i> (Anonymous, 2001)
<i>Yashtimadhu</i>	<i>Madhura</i>	<i>Guru, snigdha</i>	<i>Sheeta</i>	<i>Madhura</i>	<i>Vatapittahara, chakshushya, raktaprasadana</i> (Anonymous, 2001)
<i>Utpala</i>	<i>Madhura, kashaya</i>	<i>Picchila, snigdha, laghu</i>	<i>Sheeta</i>	<i>Madhura</i>	<i>Rasayana, keshya, medhya, pittanashaka</i> , (Anonymous, 2001)
<i>Chandana</i>	<i>Tikta, madhura</i>	<i>Laghu, ruksha</i>	<i>Sheeta</i>	<i>Katu</i>	<i>Pittahara, kaphahara, durgandhahara, vishaghna</i> (Anonymous, 2001)
<i>Go dugdha</i>	<i>Madhura</i>	<i>Snigdha, mridu, slekshna, guru, manda, bahala, picchila, sara, prasanna.</i>	<i>Sheeta</i>	<i>Madhura</i>	<i>Balya, ojavardhaka, dhatuvar-dhaka, jeevaniya, rasayana, medhya</i> (Anonymous, 2001)
<i>Tila taila</i>	<i>Madhura, kashaya, tikta</i>	<i>Snigdha, guru, sukshma, vikasi vyavayi, sara, vishada,</i>	<i>Ushna</i>	<i>Madhura</i>	<i>Chakshushya, keshya, vranasodhana, sandhaniya, vranaropana, vatahara, snehana, medhya</i> (Anonymous, 2001)

Table 3. Chemical constituents and pharmacological activities of the ingredients

Sl. No.	Ingredients	Chemical constituents	Pharmacological activities
1	<i>Chandana</i>	Santalol, α - and β - santalic acids, tannins, terpenes and resins	Antioxidant, stress-modulatory, memory enhancer and neuroprotective (Kumar <i>et al.</i> , 2015)
2	<i>Go dugdha</i>	phospholipids, Docosahexaenoic acid, Conjugated linoleic acids, casein, b- carotene and essential fatty acids (linoleic, linolenic and arachidonic).	Reduces insomnia (Mo <i>et al.</i> , 2023)
3	<i>Sugandha</i>	Alkaloids, Phytosterols, saponins, Phenolics, flavonoids and costunolide	Anti-inflammatory, antioxidant and adaptogenic (El-Far <i>et al.</i> , 2018)
4	<i>Taruna thungadruma</i>	Proteins, minerals, vitamins, iron, citric acid, carbohydrates, cytokinins and amino acids	Antioxidant effect, anti-inflammatory, antipyretic and wound healing activity, neuroprotective effects and anxiolytic (Ganesh <i>et al.</i> , 2023)
5	<i>Tila taila</i>	Sesamolinal, sesaminol, sesamol, sesamolin, sesamin, lignans, polyphenols, phytosterols and phenols,	Antioxidant, antipyretic, antihypertensive and anti-inflammatory (Mili <i>et al.</i> , 2021)
6	<i>Ushira</i>	β -vetinone, β -vetinene, flavonoids, alkaloids, saponins, terpenoids, tannins and phenolics	Antioxidant, antidepressant, anti-convulsant, anxiolytic and Nootropic (Bhushan <i>et al.</i> , 2013)
7	<i>Utpala</i>	Nyphalin, quercetin, kaempferol, saponins, tannins, sterols, alkaloids, and flavonoids.	Antioxidant, antinociceptive, anti-depressant, analgesic and anti-inflammatory (Kiranmai <i>et al.</i> , 2023)
8	<i>Yashtimadhu</i>	naringenin4'-O-glucoside, glabrin, neoliquiritin, glabrol, isoliquiritin, and 3'[O],4'-(2,2-dimethylpyrano)-3,7-dihydroxyflavanone and glabridin	Antioxidant, antidepressant, sedative and neuroprotective (Hasan <i>et al.</i> , 2021)

drugs), milk and tender coconut water are added to it with continuous stirring. The heating continues until *madhyamapaka sneha siddhi* (the intermediate stage of oil preparation) is obtained.

3.4. Challenges in standardization

Among the *kalka dravya* (drugs used to prepare paste), the drug *sugandha* is identified as *channakizhangu*, *Hellenia speciosa* (J. Koenig) and *utpala* as '*Chengazhuneerkizhangu*' (*Kaempferia rotunda* L.) according to the Malayalam text. Even though there are a few drugs with synonym *Utpala* (Table 4), and since the API designates *utpala* as *Nymphaea stellata* Willd., this identification can be accepted. Moreover, *utpala* is commonly identified with *N. stellata* and classical texts consistently attribute this botanical source to the drug. The documented pharmacological activities together with

its described Ayurvedic attributes (Table 2 and 3) suggest a calming and *pitta* pacifying influence on mind. Considering that insomnia is often associated with heightened mental activity, stress *vata* and *pitta* aggravation, the cumulative actions of *utpala* support its relevance in sleep modulation. Thus, its inclusion in the formulation appears rational from both classical and contemporary perspectives.

But there is no confirmation for the drug *sugandha*. so far, very few articles have been published on *thungadrumadi taila*, with majority of them related to its efficacy in reducing insomnia. Some articles about *thungadrumadi taila* mentions *vacha* (*Acorus calamus* L.) as *sugandha*. Only a single study was focused on pharmacognosy and physicochemical evaluation. Interestingly, in this study, the formulation being tested contains *N. stellata* and

Table 4. Drugs having the synonym *Utpala* (Anonymous 2001; Murthy, 2001; Tripathi, 2003)

Sl. No.	Botanical name	Common name	Sanskrit name
1	<i>Hemidesmus indicus</i> (L.) R. Br	Indian sarsaparilla	<i>Utpalasariva</i>
2	<i>Nelumbo nucifera</i> Gaertn.	Lotus	<i>Mahotpala</i>
3	<i>Nymphaea alba</i> L.	White water lily	<i>Swetotpala</i>
4	<i>Nymphaea stellata</i> Willd.	Blue water lily/star lotus	<i>Neelotpala</i>
5	<i>Saussurea lappa</i> (C.B Clarke) Sch. Bip	Indian costus	<i>Kushta</i>

Curcuma zedoaria (Christm.) Roscoe (Pawar *et al.*, 2020). There are many drugs with the synonym *sugandha* (Table 5), with different properties and some of them even possesses anxiolytic properties. Preclinical findings suggest its potential to facilitate sleep initiation and prolong sleep duration indicating a possible modulatory effect on neurochemical pathways involved in anxiety and sleep regulation. Although this drug is not described in API, its inclusion is supported by references in classical compendia such as Sahasrayoga and its regional interpretations. Given its documental traditional usage and wide availability in Kerala, the selection of *Hellenia speciosa* (J. Koenig) appears both textually justified and contextually appropriate.

3.5 Ingredients of *thungadrumadi taila* used by different pharmaceutical companies

On analysing the available product in market, there are only few manufacturers producing this formulation, and the composition in most of them largely corresponded with classical formulation with minor variations observed primarily in the identification of *utpala* and *sugandha*. They consider *Kaempferia galanga* L. (Warrier *et al.*, 1997) and *H. speciosa* as *sugandha* and *K. rotunda* as *utpala*. Formulations containing differing ingredients have been documented separately in Table 6 for clarity. However, incomplete disclosure of ingredients by several manufacturers limited the scope of comprehensive comparative analysis. The product available in the market differs due to the difference in the regions and the availability of the raw drug. The method of preparation may also vary according to the manufacturer.

3.6. Ingredients in the available samples

In Ayurvedic Pharmacopoeia of India (API), *K. galanga* is mentioned under the name *kachora*, (Malayalam name: *kacholam*) and it exhibits anti-inflammatory, analgesic, anti-microbial, antinociceptive, antioxidant and sedative activities, which accounts for its selection in the formulation. It possesses *ushna veerya* (hot in potency) and *kapha-vata shamaka* (pacifies *kapha* and *vata dosha*) properties which may not align with the *snigdha-sheeta* (unctuous-cold) effect of the formulation. Moreover, its therapeutic indications are *agnimandhya*, *amavata*, *shoola*. *K. rotunda* is *bhuchambaka* (Indian crocus) as identified by aromatic and medicinal research station and mentions that it is applied locally for wounds, tumour and swellings. It is also identified from a book named Indian medicinal plants- a compendium of 500 species and its Malayalam name '*chengazhineerkizhangu*' fits correctly in the *Sujanapriya Vyakhyana* of Sahasrayogam. It is found to possess anti-inflammatory, analgesic, and wound-healing activity. Sahasrayogam explains *sugandha* as '*channakizhangu*' which is identified as *C. speciosus* in the book Malayalam Oushadha Sasyangal- 2 (Medicinal Plants-2) and was traced to be the same in the book-Indian Medicinal plants. This identity is better suitable in this formulation as it possesses anxiolytic and antidepressant activity along with antioxidant activity. API designates *utpala* as *N. stellata* and *thungadrumadi taila* is explicitly mentioned under the formulations section of *utpala*. Its antioxidant, anti-inflammatory, sedative effects, along with its *pittanashana* (pacifying the *pitta dosha*) action makes it appropriate in the formulation.

Table 5. Drugs having the synonym *Sugandha* (Murthy, 2001; Tripathi, 2003)

Sl. No.	Botanical name	Common name	Sanskrit name
1	<i>Alpinia galanga</i> L. Willd.	Greater galangal	<i>Sugandhi Vacha</i>
2	<i>Anethum graveolens</i> L.	Indian Dill	<i>Satahva</i>
3	<i>Aristolochia indica</i> L.	Indian birthwort	<i>Rudrajata, ishwari</i>
4	<i>Cinnamomum zeylanicum</i> Blume.	Cinnamon	<i>Twak</i>
5	<i>Hellenia speciosa</i> (J. Koenig)	Crepe ginger	<i>Chanda</i>
6	<i>Hemidesmus indicus</i> (L.) R. Br	Indian sarsaparilla	<i>Sariva</i>
7	<i>Ixora parviflora</i> Vahl.	Torch tree	<i>Navamallika /nevari</i>
8	<i>Jasminum auriculatum</i> Vahl.	Indian jasmine	<i>Mallika</i>
9	<i>Momordica dioica</i> Roxb. ex Willd.	Spiny gourd	<i>Vandhyakarkotaki</i>
10	<i>Nardostachys jatamansi</i> (D.Don) DC.	Musk root	<i>Jatamansi</i>
11	<i>Oscimum tenuiflorum</i> L.	Holy basil	<i>Thulasi</i>
12	<i>Rauwolfia serpentina</i> (L.) Bent.	Indian snake root plant	<i>Sarpagandha</i>
13	<i>Vitex negundo</i> L.	Five leaved chaste	<i>Neelanirgundi</i>

Table 6. Ingredients used in available samples (Warrier *et al.*, 1997)

Sl. No.	Botanical name	Synonym used	Common name	Sanskrit name
1	<i>Kaempferia galanga</i> L.	<i>Sugandhamoola</i>	Aromatic ginger	<i>Sati</i>
2	<i>Kaempferia rotunda</i> L.	<i>Saugandhikam</i>	Indian crocus	<i>Bhumichampaka</i>

3.7. Probable mode of action

Murdhni taila is a type of *bahya snehana*, in which, warm medicated/ non-medicated oil is retained in contact with the scalp for a fixed time. Head is the *adhishtana* (seat) of *prana vayu* and the sense organs. Human body is considered to be an inverted tree with head as the root and the branches pointing downwards. Thus, head controls all the other systems. Regular application of oil over the head provides a cooling effect and enhances circulation to scalp and brain. *Thungadrumadi taila* provides the nourishment to the *shiras* and *indriyas* (head and senses). The mind and sense organs are said to be at peace when *tridoshas* are in equilibrium and the body functions well. An individual with a *pravara satva* (strong mind) tends not to be influenced by the disturbances of the mind. But in weak minded personalities, when the *manodosha* and *sharirika dosha* gets vitiated, the mind becomes agitated and may lead to mental disorders and loss of sleep. In such conditions, there is the need of therapeutic interventions that can calm the aggravated *vata-pitta* and soothen the nervous system. *Thungadrumadi* is one of such preparations that could serve this purpose. *Tila taila* (sesame oil) acts as the base facilitates drug delivery and can alleviate the aggravated *vata dosha*. *Snigdha-sheeta* (unctuous and cool) property of the drugs, acts upon the *rooksha-ushna* (dry-hot) conditions in the body that has arisen due to the stress and imbalance of the *tridosha*. Sleep could be restored when this dryness is subsided. Most of the ingredients of the formulation are cold in potency, which could help in reducing *pitta*-induced symptoms like restlessness and irritability. This might bring in an antistress effect and revitalize the nervous system. The chemical constituents present in the drugs exhibit proven sedative action, cortisol modulating activity, anxiolytic and anti-depressant activity, neuroprotective activities, which may help in reducing the stress, calming the mind and maintaining sleep. Since this *taila* (oil) has a cooling effect, it may stimulate the thermoregulatory centres of hypothalamus, which brings about the contraction of blood vessels (sympathetic vasoconstriction), activation of the parasympathetic nervous system and promotes relaxation. Studies have shown that glabridin present in *yashti* is lipid soluble and so can be absorbed into the system through an oil medium, thereby exerting gaba-a receptor potentiating, neuroprotective and anti-oxidant activities. Tender coconut water too has proven gaba modulation action.

So, when this oil is applied on the scalp, these phytoconstituents might enter the skin, and reach the central nervous system after crossing the blood-brain barrier and reduce stress and makes the healing process faster on reaching the limbic system and thalamus. Further research is required to confirm whether these pharmacological actions are retained in the oil preparation and their systemic absorption will happen when applied over scalp. Interventional studies like Sharma *et al.*, (2019) showed positive significant results with

thungadrumadi taila application as *shiro-abhyanga* for insomnia. Also, studies show reduction in symptoms of insomnia by *shirodhara*, *shirobasti* and *padabhyanga*. In another study for generalized anxiety disorder, *shirodhara* and *shiro-abhyanga* showed positive results. Some factors of modern follicular drug delivery system like prolonged contact, occlusion, follicle targeted absorption (Gu *et al.*, 2022) are similar to the traditional approach of *murdhni taila*.

4. Conclusion

Thungadrumadi taila is a formulation which helps in *tridosha* balance by alleviating the aggravated *vata-pitta dosha* and a therapeutically relevant formulation for insomnia since ages. Variability in the pharmacological effect may occur due to the differences in raw materials which highlights the need to standardize this formulation. Proper standardization should be done to ensure that it effectively delivers its therapeutic intends. *Thungadrumadi taila* nourishes the *indriya* (senses) and clears the *manovaha srothas* (channels of the mind) while maintaining homeostasis. It shows great potential to bring relief on regular use as *murdhni taila*. The phytoconstituents present in the formulation may exert anxiolytic effects promoting mental calmness and physical relaxation. Further studies are required to explore the phytochemical constituents, clinical efficacy and delivery systems in detail, so that this formulation can benefit a larger population.

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