



International Journal of Ayurveda and Traditional Medicine

New Perspectives of *Ksheerabala Taila* (oil): A Critical Review.

Jatinder Verma¹, Gopesh Mangal¹

¹ Department of Panchakarma, National Institute of Ayurveda, Jaipur, India.

ABSTRACT

Ksheerabala Taila is an important *Sneha Kalpana* (oil formulation) mentioned in Ayurveda texts prepared from *Go-Ksheera* (cow milk), *Bala* (*Sida cordifolia*) and *Tila Taila* (sesame oil). Cow's milk contains all the elements necessary for the growth and nutrition of bones, nerves, muscles and other tissues of the human body. *Bala* is a highly valuable drug in Ayurveda and is one amongst the three most utilized raw drugs. It is abundantly mentioned in Ayurveda and has been largely used in neurological as well as heart diseases and reported to possess analgesic, anti-inflammatory as well as hepato-protective activity. *Tila Taila* nourishes and strengthens all *Dhatu*, checks *Dhatukshaya* and thus alleviates *Vata*. The presence of *Go-Ksheera*, *Bala* and *Tila Taila* makes *Ksheerabala Taila* to pacify all the eighty chronic conditions of *Vata* origin (*Vata Nanatamja Vikara*) such as *Ardita* (~facial paralysis), *Katishula* (~low back ache), *Katigraha* (~Gridhrasi, sciatica), *Sandhigata Vata* (~osteoarthritis), *Greeva Hundana* (~cervical spondylosis), cerebral palsy, *Ardhangavata* (~hemiplegia), *Kampavata* (~parkinson's disease), convulsions and other neurological disorders. It is widely used oil in various *Panchakarma* therapies like *Snehana*, *Kavala*, *Talam*, *Matra Basti*, *Nasya*, *Shirobasti* and other methods of *Moordhini Taila*. Different methods of preparation are described in many texts and various studies have been done to compare the efficacy of *Ksheerabala Taila*. Pharmaceutico-Analytical study of *Trividha Sneha Paka* of *Ksheerabala Taila* shows *Madhayama Paka Ksheerabala Taila* having maximum therapeutic value. The present article reviews different studies on *Ksheerabala Taila* with description of various methods of preparations mentioned in Ayurveda texts, its uses in different forms in diseases and probable scientific mode of action.

Keywords: *Ksheerabala Taila*; Neurological disorders; Sesame oil; *Sida cordifolia*

INTRODUCTION

One of the most popular and important oil formulations in Ayurveda is "*Ksheerabala Taila*" (oil) known for its effectiveness in various diseases such as *Ardita* (~facial paralysis), *Katishula* (~low back ache), *Katigraha* (~gridhrasi, sciatica), *Sandhigata Vata* (~osteoarthritis), *Greeva Hundana* (~cervical spondylosis), cerebral palsy, *Ardhangavata* (~hemiplegia), *Kampavata* (~parkinson's disease), convulsions and other neurological disorders

(including degenerative disorders). The name *Ksheerabala Taila* was first mentioned in *Sahasrayogam* and similar formulations has been mentioned in other classical Ayurveda texts with some different names. In

Correspondence: Dr. Jatinder Verma, Department of Panchakarma, National Institute of Ayurveda, Jaipur, India.
Email: nityanupur76@gmail.com, Phone: +91-9416116378.

Charaka Samhita, it is mentioned as *Shata Paka* and *Sahasra Paka Bala Taila*¹. *Sushruta* mentioned it as *Bala Taila*² and *Shata Paka Bala Taila*² [*Sushruta Samhita*, *Chikitsasthana*, chapter 15, verse 40-43].

In *Ashtanga Hridaya*³ and *Bhavaprakasha*⁴ it is mentioned as *Shata Paka- Sahasra Paka Bala Taila*. *Chakradutta*⁵, *Vangasena*⁶ (mentioned *Dashapaka Bala Taila*, *Shata Paka-Shasra Paka Bala Taila*) and *Gadanigrah*⁷ quoted it as *Dashapaka Bala Taila*. National Ayurvedic formulary of India and pharmacopeia standards of Ayurvedic formulations have adopted the formula of *Charaka* and named as *Ksheerabala Taila*. The rationale behind the study is to compile the different methods of preparation of *Ksheerabala Taila* mentioned in Ayurveda classics and to review the uses of *Ksheerabala Taila* as new perspectives in human health.

METHODS

METHOD OF PREPARATION OF *KSHEERABALA TAILA*

It is one of the *Sneha Kalpana* (oil preparation) prepared using *Ksheera* (cow milk), *Bala* (*Sida cordifolia* Linn.) and *Tila Taila* (sesame oil).

METHOD OF PREPARATION OF *KSHEERABALA TAILA* AS MENTIONED IN *SAHASRAYOGAM*⁸

The method of preparation of *Ksheerabala Taila* is mentioned in *Sahasrayogam*, *Taila Adhikara*. Grind 5 *Pala* (240 grams) fresh roots of *Bala* plant and mix it in *Go-Ksheera* (Q.S.) to make *Kalka* (paste). Take this prepared *Bala Moola Kalka* and mix it in *Go-Ksheera* (4 parts or 960 g) and sesame oil (1 *Prastha* or 768 ml).. Boil the mixture and then simmer (heat on low flame 70-80°C) the mixture until oil remains. The mixture is then allowed to cool. The prepared mixture is then filtered to obtain the *Ksheerabala Taila*.

METHOD OF PREPARATION OF *SHATAPAKA AND SAHASRAPAKA BALA TAILA* IN *CHARAKA SAMHITA* AND *ASTANGA HRIDAYA*

Paste is prepared from 960 g of *Bala Moola* powder. Then, a decoction of *Bala Moola* is prepared by taking 61.44 kg water and reduce to 1/4th i.e. 15.36 kg. 960 g

sesame oil and 960 g of cow milk is added to the mixture. The mixture is heated on simmer until oil remains and water gets evaporated. The mixture is allowed to cool and filtered to obtain *Ksheerabala Taila*. This process is repeated for 100 times and 1000 times to get *Shata Paka Bala Taila* and *Sahasra Paka Bala Taila* respectively.

METHOD OF PREPARATION OF *BALA TAILA AND SHATPAKA BALA TAILA* IN *SUSHRUTA SAMHITA*

i. *BALA TAILA*²

The mixture of *Kwatha* [Table 1], *Tila Taila* and *Kalka* of *Madhura Gana Dravya*, *Kakolayadi Gana Dravya*, *Saindhava Lavana*, *Agaru*, *Raala*, *Dhoop Vriksha*, *Devdaru*, *Manjistha*, *Charila*, *Chandana*, *Kootha*, *Ilaichi*, *Tagara*, *Jatamansi*, *Tejpatra*, *Sariva*, *Vacha*, *Shatavari*, *Punarnava* (taken in equal parts) is heated together to form *Bala Taila* according to *Taila Paka* procedure.

ii. *SHATAPAKA BALA TAILA*³

Tila is processed (7 times) with *Bala Kwatha* (prepared with equal quantity of *Balamoola* as that of *Tila* mixed with 8 parts of water and 1/8th part remains) and oil is extracted from this processed *Tila*. The obtained *Tila Taila* is then processed in *Bala Kwatha* (4 parts) for 100 times. Thus the formed oil is *Shatapaka Bala Taila*.

METHOD OF PREPARATION OF *BALA TAILA* AS PER *SHARANGADHARA SAMHITA*⁹

Ingredients of *Bala Taila* as per *Sharangadhara Samhita* are shown in [Table 2]. The process adopted for the preparation of *Bala Taila* by *Sharangadhara* is same as that of *Sushruta*.

METHOD OF PREPARATION OF *DASHAPAKA BALA TAILA* AS PER *CHAKRADATTA (Vatarakta Chikitsa, Chapter 23/33-34)*

In this method, *Tila Taila* is processed 10 times with *Go-Ksheera* (4 parts) mixed with *Bala Moola Kalka* (1 part) and *Bala Moola Kwatha* (1 part) to form *Dasha Paka Bala Taila*.

Table 1. Ingredients of <i>Bala Taila</i>	
Dravya (Ingredients)	Matra (Quantity)
<i>Bala Moola Kwatha</i> , <i>Dashmoola Kwatha</i> , <i>Kwatha of Ber</i> (<i>Zizyphus mauritiana</i>), <i>Jau</i> (<i>Hordeum vulgare</i>) and <i>Kulthi</i> (Horse gram, <i>Macrotyloma uniflorum</i>), <i>Go-Ksheera</i>	8 parts
<i>Tila Taila</i> (sesame oil)	1 part

Table 2. Ingredients of <i>Bala Taila</i> as Per <i>Sharangadhara Samhita</i> .	
Dravya (Ingredients)	Matra (Quantity)
<i>Bala Moola Kwatha</i>	8 parts (8 Ser)
<i>Dashamoola Kwatha</i>	8 parts (8 Ser)
<i>Kwatha of Ber</i> (<i>Zizyphus mauritiana</i>), <i>Jau</i> (<i>Hordeum vulgare</i>) and <i>Kulthi</i> (Horse gram, <i>Macrotyloma uniflorum</i>)	8 parts (8 Ser)
<i>Go-Ksheera</i>	8 parts (8 Ser)
<i>Tila Taila</i>	1 part (1 Ser)
<i>Kalka of Jeevniye Gana Dravya</i> , <i>Kakoli</i> , <i>Ksheerkakoli</i> , <i>Meda-Mahameda</i> , <i>Jeevaka</i> , <i>Rishbhaka</i> , <i>Jivanti</i> , <i>Mulethi</i> , <i>Mugdaparni</i> , <i>Mashparni</i> , <i>Shatavari</i> , <i>Devdaru</i> , <i>Manjeetha</i> , <i>Kutha</i> , <i>Shailair</i> , <i>Tagara</i> , <i>Agara</i> , <i>Saindhava Lavana</i> , <i>Vacha</i> , <i>Punarnava</i> , <i>Jatamansi</i> , <i>Anantmoola</i> , <i>Shyamalata</i> , <i>Patraka</i> , <i>Saunf</i> , <i>Ashwagandha</i> and <i>Ilaichi</i> .	Equal part

RESULTS

From the above studies about *Ksheerabala Taila* it has been found that there are four types of *Ksheerabala Taila* mentioned by different authors by giving different names. All these are mentioned in *Vatarakta Adhikara* except *Sushruta* who mentioned in context of *Moodgarbha Chikitsa*. Regarding their formula and method of preparation there is little difference in above types. The differences [Table 3] are found in;

- (1) Addition of decoction.
- (2) Amount of milk added.
- (3) Number of repetitions of *Paka* (*Avartana*)

The therapeutic utility of *Ksheerabala Taila* can be described on the basis of *Trividha Paka* [*Sharangadhara Samhita*, *Madhyama Khanda*, Chapter 9] (three types of *Sneha Paka*, types of stages in the preparation of *Ghrita* or oil). These three *Paka* namely *Mridu Paka*, *Madhyama Paka* and *Khara Paka* highlights the importance of pharmaceutical aspect of this formulation. Different studies have been conducted on standardization of *Ksheerabala Taila*^{10, 11}. Pharmaceutico-Analytical study of *Trividha Sneha Paka* of *Ksheerabala Taila*¹² shows that *Madhyama Paka Ksheerabala Taila* has maximum therapeutic value.

PROPERTIES OF MAIN INGREDIENTS OF *KSHEERABALA TAILA*.

GO-KSHEERA

Go-Ksheera (cow milk) contains all the elements necessary for the growth and nutrition of bones, nerves, muscles and other tissues of the human body¹¹. It is *Madhura* in taste, *Snigdha*, *Guru Guna* property, *Sheeta Veerya* and *Madhura Vipaka*. It alleviates *Vata Dosh*³ [*Ashtanga Hridaya*, *Sutrasthana*, chapter 5, verse 21-22]. It is *Jivaniya*, *Brimhaniya*, *Sthanya Vardhaka*, *Balya*, *Snehaniya*, *Dahanashaka*, *Ojovardhaka*, *Vishanasaka*, *Sukrajanaka*, *Agnidepaka*, *Ayurvardhaka*, *Medavardhaka*, *Rasayana*, *Mridu Rechaka*, *Abhisyanda Karaka*.

Table 3. Showing the difference between the methods of preparation of *Ksheerabala Taila*.

<i>Ksheerabala Taila</i>	<i>Shatapaka- Sahasra Paka Bala Taila</i>	<i>Bala Taila and Shata Paka Ksheerabala Taila</i>	<i>Dasha Paka Ksheerabala Taila</i>
It is mentioned in <i>Sahasrayogam</i> . Formula contains a single drug for <i>Kalka</i> . Milk is used as <i>Drava Dravya</i> . No <i>Kwatha</i> is mentioned.	It is mentioned in <i>Charaka Samhita, Ashtanga Hridaya, Bhavaprakash</i> as <i>Shata Paka – Sahasra Paka Bala Taila</i> . The preparation contains a single drug for <i>Kwatha</i> (decoction) and <i>Kalka</i> (paste). Milk and decoction are added in equal amounts. If the processing repeated 100 times then <i>Shata Paka Ksheerabala Taila</i> and 1000 times <i>Sahasra Paka Ksheerabala Taila</i> .	It is mentioned in <i>Sushruta Samhita</i> . The recipe contains a single drug for decoction. <i>Kalka Dravya</i> is not mentioned. But <i>Dalhana</i> mentioned the <i>Kalka Dravya</i> .	It is mentioned in <i>Chakradatta, Vangasena, Gadanigraha</i> and <i>Bhavaprakasha</i> . It contains only one drug for <i>Kwatha</i> and <i>Kalka</i> . Amount of milk is added four times to oil. The preparation is repeated for 10 times hence it is called <i>Dasha Paka Bala Taila</i> .

BALA

Bala is a highly valuable drug in Ayurveda and the fact that it is one amongst the three most utilized raw drugs¹³ by Ayurvedic pharmaceuticals. Presently many species of *Sida* are recognized as *Bala* throughout the country. *Sida cordifolia* Linn. is proposed as source plant in Ayurvedic Formulary of India¹⁴. *Bala*, as the name itself suggests a drug providing energy or strength. It is abundantly mentioned in Ayurveda and has been largely used in neurological as well as heart diseases. *Sida cordifolia* contains alkaloids to extent of 0.085 per cent. The main portion of the alkaloid is identified to be ephedrine¹¹ by virtue of which it possesses psycho-stimulant properties on CNS¹⁵. It is kept among *Balya Mahakashaya* [Charaka Samhita, Sutrasthana, chapter 4, verse 7] and *Madhura Skandha* [Charaka Samhita, Vimana Sthana, chapter 8, verse 139] by *Charaka*. *Sushruta* has kept it among *Vatashamaka Gana*, hence it is best for promoting strength and alleviating *Vata*. The root possesses *Madhura Rasa, Guru, Snigdha Guna, Sheeta Veerya* and *Madhura Vipaka*. It is *Balya, Rasayana, Brimhaniya, Oojavardhaka, Raktapittahara, Vrishya, Vatahara, Kshayanashaka, Prajastapana, Grahi*. It is useful in neurological disorders like hemiplegia, facial paralysis, sciatica, general debility, headache, dysuria, leucorrhoea, tuberculosis, diabetes, fever and uterine disorders. *Sida*

cordifolia has been reported to possess analgesic, anti-inflammatory as well as hepato-protective activity^{16, 17, 18}.

TILA TAILA (SESAME OIL)

Tila Taila is oil extracted from the seeds of *Sesamum indicum*. Sesame oil contains a crystalline substance sesamin and phenol compound sesamol. Sesame oil is used as a base for oil preparation¹¹. *Tila Taila* is *Madhura Rasa* and *Vipaka, Balya* and *Rasayana* in *Karma*; it nourishes and strengthens all *Dhatu*, checks *Dhatukshaya* and thus alleviates *Vata*. *Snigdha* and *Guru Guna* decreases *Rukshata* of *Vata* and with the help of *Ushna Guna* and *Veerya* it alleviates *Vata*. *Tila Taila* is *Brimhana/ Lekhana, Preenana, Vrushya, Tvakprasadana, Mardavakara, Sthairyakara, Balya, Garbhashaya Shodhaka, Bhagna Sandhanakara, Medhavardhaka, Keshya, Shulaprashamana, Ropaka, Vrana-Nashaka*. It provides lipophilic base to *Nasya* drug which helps in its better absorption as lipid soluble substances have greater affinity through cell membrane of nasal mucosa¹⁹. It also possesses anti-inflammatory and antioxidant properties²⁰. Moreover *Tila* is a good source of Vitamin E (1.4mg/100g) and other ingredients like magnesium, copper, calcium, iron, zinc and Vitamin B₆, are reported to have beneficial effects in dysmenorrhea²¹.

DISCUSSION

The probable mode of action of *Ksheerabala Taila* could be analyzed by its *Rasa Panchaka*. All the three ingredients *Bala*, *Ksheera* and *Tila Taila* possess *Madhura Rasa* and *Vipaka*. *Madhura Rasa* mitigates both *Vata* and *Pitta Dosha*. It is *Dhatunaamprabalam* (strength to the tissue) and is good for sense organs and pleasing to mind (*Shadindriyaprasadaka*). It nourishes the body (*Tarpayati*) and plays a major role in promoting life (*Jeevayati*). *Tila Taila* possesses *Tikta Rasa* (bitter taste), the most effective in mitigating *Pitta Dosha* and *Kapha Dosha* in addition to *Madhura Rasa*. *Tikta Rasa* is effective in relieving fainting (*Murchaprasamana*) and promotes memory and intellect (*Medhya*). *Ushna Veerya* (of heating virtue) of *Tila Taila* reduces the *Vata* and *Kapha*. Since it has gone through processing by *Sheeta Veerya* drugs like *Bala* and *Ksheera*, its *Ushnatva* may get altered. *Vata* and *Kapha* are alleviated without agitating *Pitta* which is also *Ushna*. Thus, *Ushna Guna* of *Ksheerabala* acts without having adverse on *Dhatu*. This clears the channels, thereby allowing the action of the properties like *Snigdha*, *Manda*, *Sukshma* and *Vyavayi*. *Ksheerabala Taila* is said to have pacifying effects on all the eighty chronic conditions of *Vata* origin (*Vata Nanatamja Vikara*) such as *Akshepaka* (~convulsions), *Vepathu* (~tremors), *Shrama* (~fatigue), *Glani* (~malaise), *Vishada* (~depression), *Aswapna* (~insomnia) and *Anavasthithachitata* (~behavioral disorders)⁴. *Ksheerabala Taila* is being utilized as a *Rasayana* drug in conventional Ayurveda treatment for epilepsy. The continuous administration of this formulation prevents the release of abrupt electric discharges and improves the physical and mental condition of the patient. It has profound soothing and relaxing effect on mind²². Recent research has showed that it reduces the oxidative stress in rat brain and hence proven effect on neurotoxicity²³. The oxidative stress is the most important mechanism in the development and progression of epilepsy and other diseases including Alzheimer's disease, chronic degenerative disorders, stroke, rheumatoid arthritis, diabetes and cancer. The presence of flavonoids in *Sida cordifolia* has been confirmed by phytochemical analysis and these as well as their glycosides exert anxiolytic, sedative and anticonvulsant effects on the central nervous system²⁴. The presence of antioxidants prevents the possible damage of neurons. The anti-inflammatory

activity of *Trividha Paka* of *Ksheerabala Taila* against carrageenan induced acute inflammation and edema was compared to the standard anti-inflammatory drug, Diclofenac. Significant anti-inflammatory activity with late onset was observed in the *Mridu* and *Madhyama Paka* of *Ksheerabala Taila*²⁵. The *Nasya* with *Ksheerabala Taila* suppresses nerve inflammation due to its *Sheeta* property and promotes nerve regeneration and gives strength to muscles due to its *Balya* and *Brihmana* properties of drug present in it. It precludes wear and tear of nervous and muscular tissue²⁶. Another similar study shows that *Ksheerabala* (101) significantly protects brain cells and reduces the severity of damage caused by alcohol intoxication²⁷. *Nasya* with *Ksheerabala Taila* in case of *Sandhigata Vata* with special reference to cervical spondylosis shows highly significant results²⁸. *Shirobasti* with *Ksheerabala Taila* along and *Navana Nasya* with *Mahamasha Taila* are found to be effective in the management of *Ardita* (facial paralysis)²⁹. *Snehana Karma* with *Ksheerabala Taila* nourishes the *Sleshaka Kapha* stimulate the sensory nerve endings and provide strength to the facial muscles¹ [Charaka Samhita, Sutrasthana, chapter 14, verse 20-24]. *Moordha Taila* with *Ksheerabala Taila* when applied on the head, produces clarity of the sense organs, confers strength to the voice, lower jaw and head. It serves to rejuvenate the body and eliminate mental exhaustion³⁰. *Ksheerabala Taila Matra Basti*³¹ and *Parisheka Sweda*³² has a role in the management of *Katigraha* (lumbar spondylosis). *Ksheerabala Taila* is used for the purpose of *Anuvasana Basti*. *Panchatikta Ksheera Basti* and *Anuvasana Basti* with *Ksheerabala Taila* as per *Yog Basti* regime are found significant in case of *Greeva Hundana* (cervical spondylosis)³³. *Ksheerabala Taila Basti* is one among the treatment protocol in the management of childhood *Karshya* (undernutrition)³⁴. *Ksheerabala Taila Matra Basti* has effect in children with cerebral palsy³⁵. *Talam* with *Ksheerabala Taila* is one of the complementary treatment protocols for Diabetic Retinopathy³⁶. *Kavala* (gargling) with *Ksheerabala Taila* (10-15 ml) along with other therapies is found effective in the management of Oral Submucous Fibrosis³⁷ (OSMF). *Virechana* (therapeutic purgative), *Tarpana* (ocular therapy used to treat eye disorders) and *Nasya* (errhine therapy with *Ksheerabala Taila*) can be adopted as a line of treatment for Stargardt's Disease³⁸. *Ksheerabala Taila Matra Masti*

helps to prevent recurrence of dysmenorrhea³⁹. *Shirobasti* and *Nasya* with *Ksheerabala Taila* show improvement in patients of *Kampavata* (parkinson's disease)^{40, 41}.

CONCLUSIONS

Different methods of preparation are described in many texts and numerous studies have been conducted regarding the clinical efficacy of *Ksheerabala Taila*. Pharmaceutico-Analytical study of *Trividha Sneha Paka* of *Ksheerabala Taila* shows *Madhayama Paka Ksheerabala Taila* having maximum therapeutic efficacy. The presence of *Go-Ksheera*, *Bala* and *Tila Taila* makes *Ksheerabala Taila* to pacify all the eighty chronic conditions of *Vata* origin It is widely used oil in various *Panchakarma* therapies like *Snehana*, *Kavala*, *Talam*, *Matra Basti*, *Nasya*, *Shirobasti* and other methods of *Moordhini Taila*. *Ksheerabala Taila* is an important oil formulation and there is a need to conduct more scientific studies on *Ksheerabala Taila* in order to prove its efficacy on various neurological disorders.

ACKNOWLEDGEMENT

I sincerely acknowledge my colleagues for their valuable guidance.

REFERENCES

1. Vd. Harish Chandra Singh Kushwaha, editor, Charaka Samhita, Varanasi: Chaukhambha Orientalia; 2016. Vol II, *Chikitsa Sthana*, chapter 29, verse 119-120.
2. Kewal Krishan Thakral, editor. Sushruta Samhita. Varanasi: Chaukhambha Orientalia; 2014. *Chikitsa Sthana*, chapter 15, verse 28-29.
3. Vaidya Yadunandana Upadhyaya, editor. Astanga Hridaya. Varanasi: Chaukhambha Prakashan. *Chikitsa Sthana*, chapter 22, verse 45-46.
4. Bhisagaratna Pandit Shri Bhrahma Shankara Mishra, editor. Bhavaprakasha, Chikitsa Prakarana. Varanasi: Chaukhambha Sanskrit Bhawan; 2000. *Vatarakta-Adhikara*, chapter 29, verse 155-156, 163-164. p.320.
5. Indradeva Tripathi, editor. Chakradatta. Varanasi: Chaukhambha Sanskrita Bhawan. *Vatarakta-chikitsa*, chapter 23, verse 33-34. p.161.
6. Harihar Prasad Tripathi, editor. Vangsen Samhita. Varanasi: Chaukhambha Sanskrit Series Office; 2009. *Vatarakta-Adhikara*, chapter 61, verse 112-115. p.718.
7. Indradeva Tripathi, editor. Gadanigraha: Vidyotini Hindi Commentary. Vol. 2. Section Kayachikitsa Khanda. Varanasi: Chaukhambha Sanskrit Series Office; 2011. *Vatarakta-Adhikara*, chapter 20, verse 47-48. p.531.
8. R Vidyantath, K Nishteshwar. Sahasra Yoga. 2nd ed. Varanasi: Chaukhambha Sanskrit Series Office; 2008. *Taila Prakarana* . p.110-12.
9. Smt. Shailaja Srivastava, editor. Sharangadhara Samhita. Varanasi: Chaukhambha Orientalia; 2003 *Madhyama Khanda, sneha kalpana*, chapter 9, verse 114-118. p.230.
10. V. Nageshwar Rao, T. Shanker, S.K Dixit, A.B Ray. Standardization of Ksheerabala Taila. Ancient Science of Life. 1996;17;21-25.
11. Joshi P et al. Standardization of Herbal Ayurvedic Oil Formulation - Ksheerabala Taila. Asian Journal of Pharmaceutical Research and Development. 2013;1(3);123-126.
12. Anand kumar et al. Pharmaceutico- Analytical Study of Trividha Sneha Paka of Ksheerabala Taila. IJRAP. 2012;3 (6);p. 884-887.
13. Ved K, Goraya GS. Demand and Supply of medicinal plants in India. NMPB, New Delhi FRLHT, Bangalore, India; 2007. p.16.
14. Govt. of India. List of single drugs of plant origin: The Ayurveda Formulary of India. Part 1, 2nd ed. (revised). Delhi: Controller of publications-Civil Lines; 2003. p-30.
15. Adam C Munhall, Stevan W Johnson. Dopamine mediated actions of ephedrine in the rat substantia nigra. Brain Research. 2006;1069(1):96-103.
16. Kanth VR, Diwan PV. Analgesic, anti-inflammatory and hypoglycemic activities of Sida Cordifolia. Phytother Res. 1999;13:75-77.
17. Rao KS, Mishra SH. Anti Hepatotoxicity activity of Sida Cordifolia whole plant. Fitoterapia. 1998;LXIX: 20-23.
18. Sutradhar RK, Rahman MA, Ahmad MU, Datta BK, Bachar SC, Saha A. Analgesic and anti-inflammatory activities of Sida Cordifolia Linn. Indian J Pharmacol. 2006;38:207-208.
19. Srikanth KY et. al. Pharmacodynamics of Nasya Karma - A Review Article. IJRAP. 2011;29(1): 96-103.
20. Mohita Bohra, Sharma KK. Role of ksheerabala Taila Nasya and Ksheerdhooma in the Management of Ardita: A Review. Ayurpharm Int J Ayur Alli Sci. 2015;4(3):54-59.
21. Wilson M, Murphy P. Herbal and dietary therapies for primary and secondary dysmenorrhea. Cochrane Database

- Syst Rev. 2001;3:CD002124.PMID: 11687013 DOI: [10.1002/14651858.CD002124](https://doi.org/10.1002/14651858.CD002124).
22. Nimmy et. al. A Comparative Study on Anticonvulsant Effect of Ksheerabala Taila- Ayurveda Formulation Made with Two Source Plants of Bala (*Sida Cordifolia* Linn. And *Sida Retusa* Linn.). IAMJ. 2017;1(5): 549-56.
 23. Swathy SS, Indira M. The Ayurvedic drug, Ksheerabala, ameliorates quinolinic acid induced oxidative stress in rat brain. International Journal of Ayurveda Research. 2010;1(1):4-9. DOI:10.4103/0974-8520.182749.
 24. S Shrestha, J H Park, D Y Lee et al. Rhusparviflora and its biflavonoid constituent rhus flavone, induce sleep through the positive allosteric modulation of GABA A-benzodiazepine. 2012;142(1);213-20.
 25. Chithra G. Nair et al. A Comparative Study on the Anti-Inflammatory Effects of Trividha Paka of Ksheerabala Taila. Int. J. Res. Ayurveda Pharm. 2015;6(6):692-95.
 26. Mohita Bohra, Sharma KK. Role of ksheerabala Taila Nasya and Ksheerdhooma in the Management of Ardita: A Review. Ayurpharm Int J Ayur Alli Sci. 2015;4(3):54-9.
 27. Rejitha S, Pratibha P, Madambath I. The Ayurvedic drug Ksheerabala (101) ameliorates alcohol-induced neurotoxicity by down-regulating the expression of transcription factor (NFkB) in rat brain. Ayu. 2015;36 (3): 323-28. doi.4103/0974-8520.182749.
 28. Pankaj et. al. A Study of ksheerabala Tail Nasya in the Management of Sandhigata Vata with special reference to Cervical Spondylosis. WJPMR. 2019;5 (4);142-46.
 29. Anil Gupta. Role of Navana Nasya with Mahamasha Taila and Shirobasti with Ksheerabala Taila in the Management of Ardita: A Comparative Clinical Study. Int. J. Res. Ayurveda Pharm. 2017;8(6),74-8.
 30. Murdha Tail. Ayurvedic oil treatment on head article by Dr. Raghuram YS. Available: easyayurveda.com/2016/05105/moordhatail.
 31. Rabinarayan Tripathy, Parmeshwar Namboothiri, Susmita Priyasarshinee Otta. Open Label Comparative Clinical Trial of Dvipanchamooladi and Ksheerabala Taila Matra Vasti in the Management of Low Back Ache. International Journal of Ayurveda and Pharma Research. 2016;4(6):19-26.
 32. Jindal Dilbag et. al. A Clinical Study to Assess the Efficacy of Parisheka Sveda in the Management of Katigraha. Journal of Biological & Scientific Opinion. 2013;1(2): 84-87.
 33. Yadav Rajesh Kumar, Singh Pushpinder. A Clinical Study To Evaluate the Effect of Panchtikta Ksheer Vasti and Ksheera Bala Taila Anuvasana Vasti in the Treatment of Greeva Hundana (Cervical Spondylosis). International Ayurvedic Medical Journal. 2018 Nov.;6(11):2411-16.
 34. Masram et al. Efficacy of Ayurvedic Treatment Protocol in the Management of Childhood Karshya (Undernutrition). An Overview of the Research Works. J. res. Tradit. Medicine. 2016;2(3):87-93.
 35. Lande Prashant et al. Effectiveness of Ksheerabala Taila Matra Basti in Children with Cerebral Palsy. UJAHM. 2016;4(6):8-11.
 36. Krishna Kumar V. Ayurvedic Treatment of Diabetic Retinopathy- A Review. International Journal of Ayurvedic and Herbal Medicine.2018;8(3):3235-40.
 37. Patel KR, Rajagopala M, Vaghela DB, Shah A. A Pilot Study on Ayurvedic Management of Oral Submucous Fibrosis. Ayu. 2015;36:34-40.
 38. Shaw SK, Apoorva M N, Sujathamma K. Management of Stargardt's disease through Ayurvedic Science. Delhi J Ophthalmol. 2018;28:56-8.
 39. Lakshmi et al. A Case Report of Ksheerabala Taila Matrabasti in Udavartini Yonivyapat (Primary Dysmenorrhea). WJPMR. 2017;3(2):236-39.
 40. Jatinder et al. Management of *Kampavata* w.s.r to Parkinson's disease through Panchakarma- a case report. WJPLS. 2018;4(10):115-19.
 41. Jatinder Verma, Surya Prakash, Gopesh Mangal. Effect of panchkarma therapy in the management of kampavata w.s.r to parkinson's disease - a case study. Int. J. Adv. Res. 2018;6(9):312-18. DOI: 10.21474/IJAR01/7678.

Source of Support: Nil
Conflict Of Interest: None Declared

© The Author(s) 2019. This work is licensed under a Creative Commons Attribution 4.0 International License. The images or other third party material in this article are included in the article's Creative Commons license, unless indicated otherwise in the credit line; if the material is not included under the Creative Commons license, users will need to obtain permission from the license holder to reproduce the material. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>

