JOURNAL OF NATURAL REMEDIES
DOI: 10.18311/jnr/2025/49555

SHORT REVIEW

A Comprehensive Review on the Oral Therapeutic Potential of the Classical *Siddha* Formulation *Nathaisoori Chooranam* for Lumbar Spondylosis

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Abstract

Introduction: *Nathaisoori Chooranam* (NC), a traditional *Siddha* herbo-mineral formulation, is prescribed for *Korai Vatham* (KV), a condition analogous to Lumbar spondylosis, a degenerative spinal disorder. **Background:** Conventional treatments for Lumbar spondylosis, like analgesics and anti-inflammatory drugs, often lead to side effects with prolonged use. NC offers a holistic alternative due to its anti-inflammatory, analgesic, and antioxidant properties. **Objective:** To evaluate the pharmacological properties of NC's ingredients through data synthesis from classical *Siddha* literature and scientific research. **Methodology:** A detailed analysis of the active compounds in NC was undertaken to assess their therapeutic potential. **Conclusion:** These findings underscore the potential of integrating traditional *Siddha* medicine with modern therapeutic strategies for managing Lumbar spondylosis.

Major Findings: Phytochemical profiling and literature synthesis of *Nathaisoori Chooranam* (NC) confirm the presence of bioactive constituents with potential efficacy against Lumbar spondylosis.

Keywords: *Borreria hispida*, Herbal, *Nathaisoori*, *Siddha*, Spine

1. Introduction

Lumbar spondylosis is a long-term, non-inflammatory condition resulting from the degeneration of the lumbar discs or facet joints[1]. Modern lifestyles characterised by prolonged sitting, poor diet, inactivity, and high stress significantly contribute to lumbar discomfort across all demographics, thereby increasing the prevalence of lower back pain with intervertebral disc prolapse[2]. Inflammation of joints leads to pain and restricted movement, and prolonged use of painkillers and other medications often causes various side effects, underscoring the need for alternative approaches to manage these diseases. *Siddha* literature offers a wealth of remedies for degenerative conditions. *Nathaisoori Chooranam*, a herbo-mineral formulation in the *Siddha* system of medicine, is specifically indicated for *Korai Vatham* (Lumbar spondylosis - Degenerative spine disease) in *Kumbamuni Vatha nithanam* 800[3]. The annual prevalence of spinal degeneration was 27.3 ± 1.7%, averaged across years. Females exhibited a higher rate (34.7 ± 1.9%) compared to males (18.1 ± 1.8%). Specific conditions showed prevalence rates of 4.5 ± 0.6% for stenosis, 0.11 ± 0.12% for spinal

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Article Received on: 24.04.2025 Revised on: 30.10.2025 Accepted on: 10.11.2025

curvature, 0.017 ± 0.014% for DISH, 0.17 ± 0.20% for spondylitis, 12.2 ± 0.9% for disc degeneration, 8.9 ± 1.0% for osteoporosis, and 1.4 ± 0.6% for other forms of spinal degeneration[4]. This review focuses on providing a scientific rationale for the Siddha novel herbal formulation NC, traditionally cited for its role in managing KV, clinically associated with lumbar spondylosis. The formulation is evaluated for its potential to alleviate pain and modulate inflammatory processes.

2. Materials and Methods

2.1 Location of Survey Area

The study was conducted at Nandha Siddha Medical College and Hospital, Erode, Tamil Nadu, India.

Table 1. Ingredients and their properties in *Nathaisoori Choornam*

Ingredients (in Tamil)	Scientific Name	Part Used
Purified Kaantham	Magnetic Oxide of iron	-
Nathaisoori	*B. hispida*	Whole plant
Thaanrikai	*Terminalia Bellirica*	Unripen fruit
Thippili	*Piper longum*	Unripen fruit
Sivathi	*Operculina turbethum*	Root
Kadukkai	*Terminalia chebula*	Unripen fruit
Sukku	*Zingiber officinalis*	Dried Rhizome
Omam	*Trachyspermum ammi*	Dried fruit
Nellikai	*Phyllanthus emblica*	Dried pericorp
Milagu	*Piper nigrum*	Dried Fruit
Velluli	*Allium sativa*	Bulb
Seeragam	*Cuminum cyminum*	Dried Fruit
Karunseeragam	*Nigella sativa*	Seed
Venthayam	*Trigonella foenum-graecum*	Seed
Kadugurohini	*Picrorhiza kurroa*	Seed
Seeni	*Saccharum officinarum*	Sugar

2.2 Comprehensive Data Collection and Analysis Methods

The data for this review were collected from various sources including journal databases, *Siddha* literatures and books. This process involved examining peer-reviewed articles, traditional texts and modern research to ensure a comprehensive understanding of the topic. By using both ancient and modern sources, the review provides strong scientific evidence.

2.3 Classical Methodology for the Preparation of NC

As cited in Table 1 and referenced in *Kumbamuni Vatha Nithanam*, all ingredients of NC except purified magnetic ore (*Kaantham*) are individually subjected to mild roasting to enhance their therapeutic properties[5]. The magnetic ore undergoes a detoxification process as per the approved *Siddha* Formulary of India, wherein it is baked in an aqueous decoction of horse gram seed (*Macrotyloma uniflorum*) to ensure safety and efficacy[5]. Subsequently, all ingredients are mixed in appropriate proportions, finely pulverized, and sieved through Mesh No. 100 to obtain a uniform powdered dosage form. For therapeutic use, NC is administered orally at a dose of 5 grams for adults[6].

3. Results

3.1 Phytochemical Composition of the Ingredients of *Nathaisoori Chooranam*

The constituent medicinal plants of *Nathaisoori Chooranam* were systematically evaluated for their bioactive compounds using diverse extraction methodologies. The resulting phytochemical profiles of these botanicals are compiled in Table 2.

3.2 Pharmacological Activities of the Ingredients of *Nathaisoori Chooranam*

The pharmacological activities of the individual constituents in *Nathaisoori Chooranam* are summarized below (Table 3).

Table 2. Phytochemical components and extraction methods of *nathaisoori chooranam* ingredients

Ingredient	Part Used	Method of Extract	Active Component	References
Nathaisoori	Whole plant	Petroleum ether	Phytosterols, Fixed oils and fats.	7
		Ethyl acetate	Alkaloids, carbohydrates and glycosides, fixed oils and fats, proteins and amino acids.	
		Methanol	Alkaloids, carbohydrates and glycosides, saponins, phenolic compounds and tannins, proteins and amino acids, coumarins, flavonoids.	
Thaanrikai	Unripen fruit	Petroleum ether	Alkaloids , phytosterols, fixed oils and fats.	8
		Chloroform	Alkaloids , phenols, flavonoids, tannins.	
		Aqueous	Alkaloids , phenols, flavonoids, tannins, saponins, amino acids, quinines.	
Thippili	Unripen fruit	Petroleum ether	Alkaloids, Tanins, Terpinoids, Phenols, Cardiac Glycosides	9
		Acetone	Alkaloids, tanins, terpinoids, resins, phenols, cardiac glycosides.	
		Ethanol	Alkaloids, tanins, terpinoids, resins, phenols, cardiac glycosides, triterpinoids.	
Sivathi	Root	Petroleum ether	Steroids, triterpenes.	10
			Chloroform, triterpenes, glycoside.	
		Aqueous	Glycoside, carbohydrate.	
		Methanol	Glycoside, carbohydrate, flavonoids, saponins.	
Kadukkai	Unripen fruit	Ethanol	Tannins, flavonoids, alkaloids, terpenoids, saponins, glycosides, phenols, steroids, amino acids, proteins.	11
		Petroleum ether	Alkaloids, terpenoids, saponins, phenols.	
		Chloroform	Flavonoids, alkaloids, glycosides, phenols, amino acids, proteins.	
		Aqueous	Tannins, flavonoids, alkaloids, terpenoids, saponins, glycosides, phenols, steroids, amino acids, proteins.	
Sukku	Dried Rhizome	Ethanol	Alkaloids, saponin, flavonoids, terpenoids, cardiac glycoside.	12
		n-Hexane	Alkaloids, saponin, tannins, flavonoids.	
		n-Butanol	Alkaloids, tannins, flavonoids, terpenoids, quinines.	
		Ethyl acetate	Alkaloids, tannins	
		Chloroform	Alkaloids, saponin, tannins, flavonoids, terpenoids.	
		Aqueous	Alkaloids, saponin, tannins, cardiac glycoside.	
Omam	Dried fruit	Petroleum	Alkaloids, carbohydrates and glycosides, saponin, phenolics and tannin, proteins, cardiac glycosides, flavonoids, quinone, and coumarins.	13
		Benzene	Alkaloids, carbohydrates and glycosides, phenolics and tannin, fixed oils and fats, proteins, cardiac glycosides and coumarins.	
		Chloroform	Alkaloids, carbohydrates and glycosides, saponin, phenolics and tannin, fixed oils and fats, proteins, flavonoids, and coumarins.	
		Acetone	Alkaloids, carbohydrates and glycosides, saponin, phenolics and tannin, proteins, flavonoids, and coumarins.	
		Ethanol	Alkaloids, carbohydrates and glycosides, saponin, phenolics and tannin, proteins, flavonoids, quinone, and coumarins.	
		Aqueous	Alkaloids, carbohydrates and glycosides, saponin, phenolics and tannin, fixed oils and fats, proteins, cardiac glycosides, flavonoids, quinone, and coumarins	

Table 2. Continued...

Ingredient	Part Used	Method of Extract	Active Component	References
Nellikai	Unripen Fruit	Aqueous	Carbohydrates, cardiac glycosides, flavonoids, phenols, steroids, tannins and terpenoids.	14
		Ethanol	Alkaloids, carbohydrates, flavonoids, phenols, saponins, steroids, tannins and terpenoids.	
		Methanol	Alkaloids, carbohydrates, cardiac glycosides, flavonoids, glycosides, phenols, quinones, saponins, steroids, tannins, and terpenoids.	
Milagu	Fruit	Methanol	Flavonoids, phenol, tannin, glycosides, saponins, alkaloids, steroids.	15
		Ethanol	Flavonoids, phenol, tannin, glycosides, saponins, alkaloids, steroids.	
		Acetone	Phenol, tannin, glycosides, saponins, alkaloids, steroids.	
		Ethyl acetate	Flavonoids, phenol, tannin, glycosides, saponins, alkaloids, steroids.	
		Petroleum ether	Flavonoids, glycosides, alkaloids, steroids.	
		Chloroform	Flavonoids, glycosides, alkaloids, steroids.	
Velluli	Bulb	Aqueous	Alkaloids, flavonoid, glycosides, saponin, steroids, phenols, terpenoid, anthraquinones, tannin.	16
		Ethanol	Alkaloids, flavonoid, glycosides, saponin, steroids, phenols, terpenoid, anthraquinones, tannin.	
Seeragam	Fruit	Water	Protein, carbohydrate, flavonoids, glycosides, saponin, steroids.	17
		Methanol	Protein, carbohydrate, flavonoids, glycosides, saponin, steroids.	
Karunse eragam	Seed	Chloroform	Alkaloids, terpenoids, steroids, protein and amino acid, fatty acids, caumarin.	18
		Ethyl acetate	Alkaloids, tannins, terpenoids, steroids, protein and amino acid, fatty acids.	
		n-hexane	Alkaloids, tannins, saponins, terpenoids, protein and amino acid, fatty acids.	
		Methanol	Alkaloids, tannins, saponins, terpenoids, steroids, protein and amino acid, fatty acids.	
Venthayam	Seed	Distilled Water	Tanins, flavanoides, alkaloides, terpenoids, saponins, cardiac glycosides, glycosides, reducing sugars, phlobatanins, steroids, phenolic, aminoacids, proteins, quinines.	19
		Methanol	Tanins, anthraquinones, flavanoides, alkaloides, terpenoids, saponins, cardiac glycosides, reducing sugars, phlobatanins, steroids, phenolic, aminoacids, proteins, quinines.	
		Acetone	Tanins, anthraquinones, flavanoides, alkaloides, terpenoids, saponins, cardiac glycosides, glycosides, reducing sugars, phlobatanins, steroids, phenolic, aminoacids, proteins, quinines.	
		Ethanol	Tanins, anthraquinones, flavanoides, alkaloides, terpenoids, saponins, cardiac glycosides, glycosides, reducing sugars, phlobatanins, steroids, phenolic, aminoacids, proteins, quinines.	

Table 2. Continued...

Ingredient	Part Used	Method of Extract	Active Component	References
Kadu gurohini	Seed	Methanol	Flavonoids, phenols, steroids, terpenoids.	20
		Ethanol	Flavonoids, phenols, steroids, terpenoids.	
		Aqueous	Flavonoids, phenols, steroids, terpenoids.	
Seeni	Sugar cane	Aqueous	Sterols, glycosides, saponins, carbohydrates, alkaloids, flavonoids, tannins, amino acids and proteins.	21
		Alcoholic	Glycosides, carbohydrates, alkaloids, flavonoids, amino acids and proteins.	
		Petroleum ether	Glycosides.	

Table 3. Pharmacological activities of the constituents in *nathai soori chooranam*

Traditional Name	Scientific Name	Pharmacological Activity	References
Purified *Kaantham*	Magnatic oxide of iron	Antioxidant, anti-inflammatory	22,23
Nathaisoori	*B. hispida*	Antioxidant, anti-inflammatory, analgesic, hypolipidimic, anti diabetic, hepato productive, antihypertensive, antifungal, anti-cancer	24-26
Thaanrikai	*T. bellirica*	Anti-diabetic, anti-microbial, anti-*salmonella*, anti-biofilm, anticancer, hepatoprotective, anti-pyretic and anti-diarrheal, analgesic.	27,28
Thippili	*P. longum*	Antiamoebic, antimicrobial, antidiabetic, hypocholesterolaemic, antioxidant, analgesic, immuno modulatory, anticancer, anti-depressant, anti-ulcer, anti-inflammatory.	29-31
Sivathi	*O. turbethum*	Anti-inflammatory, analgesic, antioxidant, antidiabetic, antidiarrhoeal, hepatoprodective, anti-microbial, anti-Cancer.	32,33
Kadukkai	*T. chebula*	antiprotozoal activity, antibacterial activity, anti-inflammatory activity, anti-diabetic activity, wound healing activity, anti-ulcer activity, anti-caries activity.	34-36
Sukku	*Z. officinalis*	Antioxidant, anti-inflammatory, anticoagulant, antiemetic, antinociceptive, antimicrobial, antitussive.	37-39
Omam	*T. ammi*	Anti-flatulent, anti spasmodic, gastro productive activity, antimicrobial, anti-fungal, anti-inflammatory, antitussive. hepatoprotective, anti-hypertensive, broncho dialating activity, antihelmintic, antilithiasis, diuretic.	40-42
Nellikai	*P. emblica*	Antioxidant, hepatoprotective.	43,44
Milagu	*P. nigrum*	Antioxidant, anti-inflammatory, anti-cancer, anti-obesity, anti-depressant, anti diabetic, anti-microbial, gastro productive activity, anti-fungal, anti protozoal, antiviral, antioxidant, anti-inflammatory, anti-cancer.	45-49
Velluli	*A. sativa*	Anti-bacterial, anti-hypertensive.	50-52
Seeragam	*C. cyminum*	Anti-bacterial, anti-fungal, anti-inflammatory, antioxidant, astringent.	53-55
Karunseeragam	*N. sativa*	Antidiabetic activity, anticancer activity, hepato-protective activity, neuro-pharmacolgical activities, cardiovascular activity, gastro-protective activity, antibacterial activity, immunomodulatory activity, antifungal activity, anti-histaminic or anti allergic, anticonvulsant activity, anti-inflammatory properties, anti-microbial, antiviral, antioxidant activity, contraceptive and anti-fertility activity, nephroprotective activity, anti-asthmatic, antiparasitic	56-59

Table 3. Continued...

Traditional Name	Scientific Name	Pharmacological Activity	References
Venthayam	*T. foenum graecum*	anti-inflammatory, anticancer, antimicrobial, antioxidative, fat metabolism, hypocholesterolemic, hypoglycaemic, immunomodulatory, neuroprotective effects.	60-62
Kadugurohini	*P. kurroa*	Anti-microbial, hepatoprotective, antioxidant, anti-bacterial, anti-mutagenic and anti-cancer activities.	63
Seeni	*S. officinarum*	Antioxidant, antiinflammation, hepatotoxicity, anti-obesity, antimalaria and anticancer activity.	64-66

4. Discussion

The phytochemical and pharmacological evaluation of *Nathaisoori Chooranam* (NC) reveals a comprehensive profile of bioactive compounds that collectively support its traditional use in managing *Korai Vatham* (Lumbar spondylosis). The formulation comprises 16 botanicals and one mineral component, each contributing distinct therapeutic actions relevant to degenerative spinal disorders.

Borreria hispida (*Nathaisoori*) contains alkaloids, flavonoids, glycosides, and phenolic compounds, exhibiting antioxidant, anti-inflammatory, analgesic, and hepatoprotective activities[7,24-26]. These properties are crucial in mitigating oxidative stress and inflammatory cascades associated with lumbar disc degeneration. *T. bellirica* (*Thaanrikai*) and *T. chebula* (*Kadukkai*) are rich in tannins, flavonoids, and alkaloids, offering hepatoprotective, antimicrobial, and analgesic effects[8,11,27,28,34-36]. Their role in tissue repair and pain modulation reinforces their relevance in spinal care.

Piper longum (*Thippili*) contributes piperine and other alkaloids with antioxidant, analgesic, and immunomodulatory effects[9,29-31]. *O. turpethum* (*Sivathi*) adds triterpenes and glycosides that support anti-inflammatory and hepatoprotective actions[10,32,33]. *Z. officinalis* (*Sukku*) contains gingerols and terpenoids with anti-inflammatory, antinociceptive, and antimicrobial properties[12,37-39], aiding in pain relief and muscle relaxation.

Trachyspermum ammi (*Omam*) offers a broad spectrum of actions including anti-flatulent, anti-spasmodic, hepatoprotective, and bronchodilating effects[13,40-42]. These support systemic balance and respiratory comfort, often compromised in chronic pain conditions. *P. emblica* (*Nellikai*) provides antioxidant and hepatoprotective benefits[14,43,44], while *P. nigrum* (*Milagu*) enhances bioavailability and contributes anti-inflammatory, anti-obesity, and neuroprotective effects[15,45-49].

Allium sativum (*Velluli*) and *C. cyminum* (*Seeragam*) exhibit antibacterial, anti-inflammatory, and antioxidant activities[16,17,50-55]. *N. sativa* (*Karunseeragam*) is notable for its immunomodulatory, neuropharmacological, and hepatoprotective properties[18,56-59], supporting systemic resilience. *T. foenum graecum* (*Venthayam*) contributes anti-inflammatory, hypoglycemic, and neuroprotective effects[19,60-62], while *P. kurroa* (*Kadugurohini*) offers hepatoprotective and anticancer actions[20,63].

Saccharum officinarum (*Seeni*), used as a sugar base, adds antioxidant, anti-inflammatory, and hepatoprotective properties[21,64-66], enhancing palatability and therapeutic synergy. The inclusion of purified *Kaantham* (Magnetic oxide of iron) introduces mineral support with documented antioxidant and anti-inflammatory effects[22,23], aligning with recent findings in nanomedicine. Together, these ingredients reflect a holistic approach to managing lumbar spondylosis. Their combined actions target inflammation, oxidative damage and pain, core aspects of *Korai Vatham*. While traditional usage and pharmacological data support NC's efficacy, further clinical validation is essential to optimize dosage and compare outcomes with conventional therapies.

5. Conclusion

This comprehensive review substantiates the therapeutic relevance of *Nathaisoori Chooranam* (NC) in the management of *Korai Vatham*, clinically analogous to lumbar spondylosis. The formulation's constituent botanicals and mineral each validated through phytochemical profiling and

pharmacological literature exhibit a spectrum of bioactivities including antioxidant, anti-inflammatory, analgesic, hepatoprotective, immunomodulatory, and neuroprotective effects. These actions directly target the pathophysiological mechanisms underlying lumbar disc degeneration, such as oxidative stress, inflammatory cytokine activity, and neuromuscular dysfunction.

The presence of flavonoids, alkaloids, terpenoids, glycosides, and phenolic compounds across NC's ingredients reinforces its systemic efficacy. Notably, the inclusion of purified *Kaantham* (magnetic oxide of iron) introduces mineral synergy, enhancing anti-inflammatory potential and aligning with emerging nanomedicine insights. The classical *Siddha* preparation method roasting, detoxification, and fine pulverization ensures bioavailability and safety, while the oral dosage form facilitates patient compliance.

By integrating traditional *Siddha* wisdom with modern pharmacological evidence, NC emerges as a scientifically grounded herbo-mineral formulation capable of addressing the multifactorial etiology of lumbar spondylosis. The findings of this review strongly support *Nathaisoori Chooranam* offers a comprehensive and credible therapeutic approach for lumbar spondylosis and other degenerative spinal conditions. Future clinical investigations are warranted to validate its efficacy, optimize dosing protocols, and establish its role in integrative spine care.

6. Acknowledgement

The authors gratefully acknowledge Nandha Educational Institution for its support and encouragement throughout the preparation of this review.

7. Author Contribution

Subathra Devadoss: Conceptualization, methodology, writing- original draft preparation. Kirubakaran Ramachandran: Data curation, writing- reviewing and editing. Thanigavelan Vembu: Supervision. Menaka Moorthy: Validation. All authors have read and agreed to the published version of the manuscript.

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