

Ayurvedic Management of Chronic Gridhrasi (Sciatica) with Ayurvedic medicine along with Shampakadi Niruha Basti, Murchhita Tila Taila Anuvasana Basti and Patra Pinda Swedana: A Case Report

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Abstract—Gridhrasi, described under Vata Vyadhi in Ayurveda, closely resembles sciatica characterized by radiating pain originating from the lumbosacral region and extending along the course of the sciatic nerve. Conventional treatment frequently provides symptomatic relief but is often associated with recurrence, adverse drug effects, and variable functional recovery. Panchakarma therapies, particularly Basti Karma combined with Swedana, are considered the principal therapeutic interventions for Vata disorders and may offer a comprehensive approach to symptom relief and functional restoration. In this research paper there was a 65-year-old female who presented with severe low back pain radiating to both lower limbs for 18 months. Pain was aggravated by prolonged standing, walking, and sitting, while rest provided partial relief. The patient had a history of hypertension and type 2 diabetes mellitus and was clinically diagnosed with Gridhrasi (sciatica). Physical examination revealed a positive straight leg raise test, while systemic examination was otherwise unremarkable except for facial pallor. The patient thus underwent an integrated Panchakarma protocol consisting of Shampakadi Niruha Basti, Murchhita Tila Taila Anuvasana Basti, and Patra Pinda Swedana administered according to the classical Kala Basti schedule. In addition, Guggulu Gold and Gum Shallaki were administered orally at 2 BD, as documented in the case record¹¹⁻¹⁴. Local *Abhyanga* and *Swedana* were performed as *Poorva Karma* before *Basti* administration. Following completion of therapy, the patient experienced complete resolution of low back pain, radiating pain, numbness, tingling sensation, gait disturbance, muscle weakness, and restriction in activities of daily living. No treatment-related adverse events were documented in the available record. This case thus suggests that a multimodal Panchakarma approach comprising Shampakadi Niruha Basti,

Murchhita Tila Taila Anuvasana Basti, and Patra Pinda Swedana may provide substantial clinical improvement in Gridhrasi. Although encouraging, evidence from controlled clinical studies is required before generalized conclusions can be drawn.

Index Terms—Gridhrasi, Sciatica. Panchakarma, Basti Karma, Patra Pinda Swedana, Vata Vyadhi, Ayurveda, Case Report, Integrative Medicine.

I. INTRODUCTION

Sciatica is among the most common causes of chronic neuropathic pain affecting the lower extremities and is characterized by pain radiating along the distribution of the sciatic nerve due to compression or irritation of the lumbosacral nerve roots. Lumbar disc prolapse, degenerative spinal changes, spinal canal stenosis, and spondylotic alterations constitute the most frequent etiologies. Persistent pain often results in impaired mobility, reduced quality of life, sleep disturbance, psychological stress, and substantial socioeconomic burden^{6,7,8}.

Although pharmacological management with non-steroidal anti-inflammatory drugs, muscle relaxants, corticosteroid injections, and surgical intervention remains the cornerstone of modern treatment, long-term outcomes are frequently unsatisfactory because of recurrent symptoms, adverse drug reactions, and incomplete functional recovery. Consequently, complementary therapeutic approaches that emphasize pain relief, restoration of function, and improvement in overall quality of life are increasingly being explored.

Ayurveda describes a clinical entity known as *Gridhrasi*, classified under *Vata Vyadhi*, which bears close resemblance to sciatica. Classical Ayurvedic texts describe the disease as presenting with *Ruk* (pain), *Toda* (pricking sensation), *Stambha* (stiffness), and *Spandana* (twitching) extending from the *Sphik* (gluteal region) through *Kati* (lumbar region), *Uru* (thigh), *Janu* (knee), *Jangha* (leg), and *Pada* (foot). Two principal varieties are described: *Vataja Gridhrasi* and *Vata-Kaphaja Gridhrasi*, the latter additionally presenting with heaviness, anorexia, and lethargy¹⁻⁴

According to Ayurvedic principles, deranged *Vata Dosha* resulting from factors such as ageing, excessive physical strain, improper posture, prolonged sitting, and degeneration produces impairment of *Kandara*, *Snayu*, *Asthi*, and *Majja*, ultimately leading to radiating pain and functional disability. Therefore, treatment aims not merely to suppress pain but to restore doshic balance, improve tissue nourishment, and enhance neuromuscular function.

Among Panchakarma procedures, *Basti Karma* is regarded as the foremost therapy for *Vata* disorders because of its systemic action through the colon and its capacity to normalize aggravated *Vata*. Classical texts recommend *Niruha Basti*, *Anuvasana Basti*, and external therapies such as *Snehana* and *Swedana* for the management of *Gridhrasi*. *Patra Pinda Swedana* provides simultaneous oleation and fomentation, thereby reducing stiffness, improving circulation, relieving inflammation, and facilitating functional recovery^{1,3,5}.

The present case describes the successful management of chronic bilateral *Gridhrasi* in a 65-year-old female using a combined Panchakarma protocol comprising *Shampakadi Niruha Basti*, *Murchhita Tila Taila Anuvasana Basti*, and *Patra Pinda Swedana*. The report has been prepared in accordance with the CARE reporting principles using the available clinical information and aims to contribute to the growing evidence supporting integrative management of chronic musculoskeletal disorders¹⁰.

II. CASE PRESENTATION

A 65-year-old female homemaker from Jalandhar, Punjab, India, presented to the Outpatient Department of Kayachikitsa with the chief complaint of chronic low back pain radiating to both lower limbs for the

preceding 18 months. The patient reported progressive worsening of symptoms that interfered with routine household activities and ambulation. The pain had an acute onset approximately 18 months before presentation. It originated in the lower lumbar region and radiated bilaterally to the lower limbs. The pain was aggravated by prolonged standing, walking, and sitting, whereas adequate rest provided partial relief. There was no diurnal or seasonal variation. The patient also experienced sweating and orthopnea during painful episodes but denied nausea, vomiting, cough, fever, or headache. Her medical history was significant for hypertension of 20 years' duration and type 2 diabetes mellitus for 15 years, both under medical management. There was no documented history of bronchial asthma, pulmonary tuberculosis, trauma, spinal surgery, or malignancy. The patient consumed a vegetarian diet with normal appetite (two meals daily). Bowel and bladder habits were normal. Sleep was reported to be satisfactory with regular use of prescribed medication for approximately 10–15 years. There was no documented history of tobacco or alcohol use.

III. CLINICAL FINDINGS

On general examination, the patient was conscious, cooperative, well oriented to time, place, and person, and haemodynamically stable. General physical examination demonstrated facial pallor without evidence of icterus, cyanosis, clubbing, or lymphadenopathy. Vital parameters were as follows:

Table 1. Baseline Clinical Parameters

Parameter	Finding
Age	65 years
Sex	Female
Occupation	Homemaker
Blood Pressure	110/70 mmHg
Pulse	84/min, regular
Respiratory Rate	17/min
Temperature	98.6°F
Oxygen Saturation	97%

Systemic examination revealed normal cardiovascular and respiratory findings with bilaterally clear breath sounds and normal heart sounds. Musculoskeletal examination was remarkable for a positive Straight Leg Raise (SLR) test, indicating sciatic nerve root

irritation. The patient also exhibited radiating pain extending from the lumbar region to both lower extremities, which correlated with the classical Ayurvedic description of Gridhrasi.

IV. DIAGNOSTIC ASSESSMENT

Based on the patient's clinical history, physical examination, and positive SLR test, a diagnosis of *Gridhrasi* (Sciatica) was established. Besides this, comprehensive laboratory evaluation comprising complete blood count, fasting blood glucose, glycated haemoglobin (HbA1c), serum electrolytes, liver function tests, renal function tests, lipid profile, iron profile, vitamin B12, vitamin D, thyroid function tests, urine routine examination, and echocardiography had been done. From an Ayurvedic perspective, the clinical presentation corresponded predominantly to *Vataja Gridhrasi*, characterized by⁶⁻⁸

1. *Ruk* (pain)
2. Radiating pain along the lower limb
3. Restriction of movement
4. Difficulty in walking
5. Positive SLR

6. Chronicity of symptoms

No significant clinical features suggestive of *Kapha* predominance, such as marked heaviness (*Gaurava*), excessive lethargy (*Tandra*), or anorexia (*Aruchi*), were documented. The diagnosis was established after correlating the patient's symptoms with both Ayurvedic and contemporary clinical criteria. The principal differential diagnoses considered include:

1. Lumbar intervertebral disc prolapse
2. Lumbar spondylosis
3. Lumbar spinal canal stenosis
4. Sacroiliac joint dysfunction
5. Piriformis syndrome
6. Peripheral neuropathy associated with diabetes mellitus

Although imaging findings were unavailable, the clinical presentation, positive Straight Leg Raise test, chronic radiating pain, and absence of systemic red-flag symptoms strongly supported the diagnosis of sciatica/Gridhrasi. Within Ayurveda, the condition was interpreted as Vata Prakopa affecting *Kandara*, *Snayu*, *Asthi*, and *Majja*, resulting in impairment of locomotor function and radiating pain along the course of the lower limb⁶⁻⁸.

Table 2. Duration of Treatment

Timeline	Clinical Events
18 months before presentation	Acute onset of low back pain radiating to both lower limbs
Following months	Progressive increase in pain during standing, walking, and prolonged sitting
Initial OPD evaluation	Clinical examination, positive SLR test, diagnosis of Gridhrasi (Sciatica)
Baseline investigations advised	CBC, HbA1c, RFT, LFT, TFT, Vitamin D, Vitamin B12, Iron profile, Electrolytes, Lipid profile, Urine examination, Echocardiography
Panchakarma initiated	Shampakadi Niruha Basti + Murchhita Tila Taila Anuvasana Basti + Patra Pinda Swedana
Completion of treatment	Complete relief in pain, numbness, tingling, gait disturbance, and functional restriction

V. AYURVEDIC DIAGNOSIS AND TREATMENT

Based on the patient's clinical presentation of chronic radiating low back pain extending to both lower limbs, a positive Straight Leg Raise (SLR) test, and restriction of movement, the condition was diagnosed as *Gridhrasi* (*Vataja type*). According to Ayurvedic principles, Gridhrasi is a manifestation of aggravated *Vata Dosh*, affecting the *Kandara* (ligaments/tendons), *Snayu* (nerves), *Asthi* (bone), and

Majja (marrow/nervous tissue), resulting in pain, stiffness, and impaired locomotion. As *Basti* is regarded as the principal treatment for Vata disorders, a multimodal Panchakarma protocol was selected comprising^{1,3,5}

1. *Shampakadi Niruha Basti*
2. *Murchhita Tila Taila Anuvasana Basti*
3. *Patra Pinda Swedana*

This combination was intended to alleviate aggravated Vata, nourish musculoskeletal tissues, reduce pain and

stiffness, improve neuromuscular function, and restore mobility.

Table 3. Therapeutic Intervention done is as

Oral Ayurvedic medicines: In addition to the Panchakarma procedures, the patient received Guggulu Gold and Gum Shallaki, 2 BD, as recorded in the clinical case sheet. Gum Shallaki refers to gum resin of *Boswellia serrata*; clinical studies of

standardized *Boswellia* extracts have reported improvements in pain, stiffness, and physical function in osteoarthritis, although such evidence should not be extrapolated directly to sciatica¹¹⁻¹³. The composition of the proprietary preparation Guggulu Gold was not specified in the available case record; therefore, no constituent-specific pharmacological claim is made for this product.

Therapy	Purpose
Shampakadi Niruha Basti	Vata shamana, pain reduction, nourishment of Asthi–Majja
Murchhita Tila Taila Anuvasana Basti	Oleation, Vata pacification, lubrication of tissues
Patra Pinda Swedana	Reduction of pain, stiffness, inflammation, and muscle spasm
Guggulu Gold + Gum Shallaki [11–13]	Adjunct oral analgesic/anti-inflammatory support; Gum Shallaki (<i>Boswellia serrata</i>) has clinical evidence for musculoskeletal pain and stiffness [11–13]

Dose: Guggulu Gold and Gum Shallaki were administered 2 BD.

The patient received therapy according to the Kala Basti regimen described in the Ayurvedic classics^{1,3,5}

Table 4. Kala Basti Schedule

Day	Procedure	Medicine	Dose	Administration
1	<i>Anuvasana Basti</i>	<i>Murchhita Tila Taila</i>	40 ml	After food
2	<i>Niruha Basti</i>	<i>Shampakadi kwatha</i>	180 ml	Empty stomach
3	<i>Anuvasana Basti</i>	<i>Murchhita Tila Taila</i>	40 ml	After food
4	<i>Niruha Basti</i>	<i>Shampakadi Niruha Basti</i> ,	230 ml	Morning
5	<i>Anuvasana Basti</i>	Murchhita tila taila	40 ml	After food
6	<i>Niruha Basti</i>	<i>Shampakadi Niruha Basti</i> ,	280 ml	Morning
7	<i>Anuvasana Basti</i>	Murchhita Tila Taila	40 ml	After food
8	<i>Niruha Basti</i>	<i>Shampakadi Niruha Basti</i> ,	330 ml	Morning
9	Anuvasana Basti	Murchhita Tila Taila	40 ml	After food
10	Niruha Basti	<i>Shampakadi Niruha Basti</i> ,	380 ml	Morning
11	Anuvasana Basti	Murchhita Tila Taila	40 ml	After food
12	Niruha Basti	<i>Shampakadi Niruha Basti</i> ,	430 ml	Morning
13	Anuvasana Basti	Murchhita Tila Taila	40 ml	After food
14	Anuvasana Basti	Murchhita Tila Taila	40 ml	After food
15	Anuvasana Basti	Murchhita Tila Taila	40 ml	After food
16	Anuvasana Basti	Murchhita Tila Taila	40 ml	After food

Retention time on an average was 13 -20 minutes for Niruha Basti.

Table 5. Ingredients of Shampakadi Niruha Basti

Ingredient (<i>Shampakadi -Niruha Basti</i>)	Ingredient (<i>Murchhita Tila Taila-Anuvasana Basti</i>)
Shampaka	Tila Taila
Eranda	Manjistha
Punarnava	Haridra
Shalaparni	Lodhra
Kachura	Musta
Ashwagandha	Haritaki
Bala	Bibhitaki
Prishniparni	Amalaki

Brihati	Kevada flower
Kantakari	Vata Jata
Gokshura	
Yashtimadhu	
Musta	
Pippali	
Rasna	
Guduchi	
Shatapushpa	
Saindhava Lavana	
Madhu	

The formulation consists predominantly of herbs possessing *Vatahara*, *Shothahara*, *Vedanasthapana*, *Rasayana*, and *Balya* properties. Collectively, these drugs are traditionally indicated for musculoskeletal disorders associated with pain, stiffness, and degeneration. The use of Madhu and Saindhava Lavana facilitates proper emulsification and enhances the dispersion of the therapeutic formulation during Basti administration. *Murchhita Tila Taila* used in *Anuvasana Basti* provides sustained oleation, supports Vata pacification, and promotes tissue nourishment. The incorporated herbal drugs are traditionally described as possessing anti-inflammatory, antioxidant, and tissue-supportive properties, contributing to symptomatic relief in *Vata*-dominant musculoskeletal disorders.

VI. PATRA PINDA SWEDANA

Following local oleation, Patra Pinda Swedana was administered using heated herbal boluses over the lumbar region and lower limbs. Initially, the bolus was gently applied because of its high temperature; once tolerable, linear strokes were used over the extremities and circular movements over the joints. Freshly heated boluses were substituted as required to maintain therapeutic warmth, and fomentation was continued for approximately one hour. After the procedure, the patient rested briefly before cleansing with warm water. The rationale for Patra Pinda Swedana is to combine *Snehana* and *Swedana*, thereby reducing stiffness, relieving pain, improving local circulation, and enhancing neuromuscular function^{3,5,16}

VII. BASTI ADMINISTRATION

It was performed in three sequential stages. First of all is Poorva Karma where the patient underwent local Abhyanga followed by Swedana before Basti administration. For Niruha Basti, the procedure was carried out on an empty stomach, whereas a light meal preceded Anuvasana Basti. During Pradhana Karma, The patient was placed in the left lateral position with the right hip and knee flexed. The anal region and Basti Netra were lubricated before administration of the medicated formulation through the rectal route using uniform pressure. After complete administration, the catheter was removed carefully. In the last during Paschat Karma, Following the urge for evacuation, the patient passed stools in the squatting position. A warm water bath and light meal were advised after Niruha Basti. After Anuvasana Basti, gentle buttock tapping, abdominal massage, and elevation of the lower limbs were performed to improve retention of the medicated oil. At completion of therapy, the patient demonstrated marked clinical improvement. According to the case record:

Table 7. Clinical Outcome Recorded before and after treatment.

Clinical Parameter	Before Treatment	After Treatment
Low back pain	Present	Absent
Radiating pain	Present	Absent
Numbness	Present	Absent
Tingling sensation	Present	Absent
Muscle weakness	Present	Absent
Gait disturbance	Present	Absent
Restriction in daily activities	Present	Absent

No adverse events or treatment-related complications were documented in the available case record. The report states that the patient became symptom-free by the end of therapy, with complete resolution of pain and restoration of routine daily activities¹⁰.

VIII. DISCUSSION

Gridhrasi is one of the most frequently encountered Vata Vyadhi described in the Ayurvedic classics and clinically resembles lumbar radiculopathy or sciatica. It is characterized by radiating pain originating in the Sphik (gluteal region) and extending through the Kati (lumbar region), Uru (thigh), Janu (knee), Jangha (leg), and Pada (foot). Classical descriptions emphasize symptoms such as Ruk (pain), Toda (pricking pain), Stambha (stiffness), and Spandana (twitching), which correspond closely with the neuropathic pain, muscle spasm, paresthesia, and movement restriction observed in patients with sciatica. The present case involved a 65-year-old woman with chronic bilateral radiating low back pain persisting for approximately 18 months, associated with difficulty in standing, walking, and prolonged sitting. Clinical examination demonstrated a positive Straight Leg Raise test, supporting the diagnosis of lumbar nerve root irritation, while the symptom complex closely matched the Ayurvedic description of Vataja Gridhrasi. Ageing itself is recognized in Ayurveda as a period of physiological Vata predominance, predisposing elderly individuals to degenerative disorders affecting Asthi and Majja Dhatu. Degenerative spinal changes, reduced tissue nutrition, and chronic mechanical stress further aggravate Vata, producing pain, stiffness, and restricted movement. In contemporary medicine, similar mechanisms include intervertebral disc degeneration, osteophyte formation, ligamentous hypertrophy, chronic inflammation, and compression of the lumbosacral nerve roots. Although imaging findings were unavailable in this case, the clinical presentation was compatible with chronic sciatica⁶⁻⁸. Among all Panchakarma procedures, Basti Karma occupies a unique position because it is regarded as the principal therapy for disorders caused by aggravated Vata. Classical Ayurvedic texts describe Basti as exerting systemic therapeutic effects beyond the gastrointestinal tract through normalization of disturbed Doshas and nourishment of body tissues.

From a modern physiological perspective, several mechanisms have been proposed to explain the therapeutic effects of medicated enemas, including modulation of the enteric nervous system, interaction with the gut microbiome, absorption of bioactive phytochemicals through the rectal mucosa, and neuroimmune regulation. Although these mechanisms remain under investigation, they provide plausible biological explanations for the clinical improvements reported in patients receiving Ayurvedic Basti therapy^{1,3,5}.

In the present case, *Shampakadi Niruha Basti* was selected because classical Ayurvedic literature recommends this formulation for pain involving the lumbar region, pelvis, thighs, and lower extremities. The ingredients collectively possess *Vatahara*, *Vedanasthapana*, *Shothahara*, *Balya*, and *Rasayana* properties. Herbs such as *Rasna*, *Eranda*, *Guduchi*, *Ashwagandha*, *Bala*, and *Punarnava* have also been investigated experimentally for anti-inflammatory, antioxidant, analgesic, and neuroprotective activities, which may complement their traditional therapeutic indications. Similarly the administration of *Murchhita Tila Taila Anuvasana Basti* provided sustained oleation and tissue nourishment. Sesame oil has long been regarded in Ayurveda as one of the most effective media for pacifying aggravated Vata because of its *Snigdha* (unctuous), *Guru* (heavy), and *Sukshma* (penetrating) qualities. Modern pharmacological studies suggest that sesame oil contains unsaturated fatty acids, lignans, tocopherols, and antioxidant compounds that may contribute to anti-inflammatory effects and improved tissue lubrication. Although the precise mechanism in rectal administration has not been fully elucidated, these properties may support symptom relief in chronic musculoskeletal disorders^{5,15}. Oral Guggulu Gold and Gum Shallaki were used as adjuncts in this case. Evidence for standardized *Boswellia serrata* extracts supports potential benefit in musculoskeletal pain and stiffness, but these studies concern osteoarthritis rather than sciatica^{11,13}. Guggulu preparations have a long history in Ayurveda, and experimental studies of guggulsterone suggest anti-inflammatory pathway modulation; however, the composition of the proprietary Guggulu Gold product was not available in the case record, so product-specific efficacy cannot be inferred^{14,18}. Besides Basti, the combination of *Abhyanga* followed by *Patra Pinda Swedana* represents simultaneous

application of oleation and fomentation. Classical Ayurveda recommends this approach to relieve Stambha, Shoola, and Gaurava while improving circulation and flexibility.

Thermal therapy and massage may help reduce pain and improve function in some patients with low back pain. Massage has been evaluated in systematic reviews, although the quality and magnitude of evidence vary. These supportive effects are consistent with, but do not establish, the contribution of Patra Pinda Swedana in this individual case¹⁷. An important feature of this case is that the patient received a multimodal Panchakarma protocol rather than a single intervention.

IX. LIMITATIONS

As a single-patient case report, the findings cannot be generalized to broader patient populations and should instead serve as hypothesis-generating evidence for future controlled clinical studies. Overall, this case from one side, illustrates the potential role of an *individualized Panchakarma* regimen in the management of chronic *Gridhrasi* while highlighting the need for rigorous randomized controlled trials using standardized diagnostic criteria, validated outcome measures, and long-term follow-up to establish effectiveness and safety.

REFERENCES

- [1] Sharma RK, Dash B, translators. Charaka Samhita of Agnivesa: text with English translation and critical exposition. Vol 5. Varanasi: Chowkhamba Sanskrit Series Office; 2014.
- [2] Srikantha Murthy KR, translator. Madhava Nidana of Madhavakara: English translation and notes. Vol 1. Varanasi: Chaukhambha Orientalia; 2012.
- [3] Murthy KRS, translator. Vagbhata's Ashtanga Hridaya: text, English translation, notes and indices. Vol 2. Varanasi: Krishnadas Academy; 2012.
- [4] Murthy KRS, translator. Sushruta Samhita: English translation and notes. Vol 2. Varanasi: Chaukhambha Orientalia; 2017.
- [5] Sharma PV, translator. Charaka Samhita: Siddhi Sthana, text and English translation. Varanasi: Chaukhambha Orientalia; 2014.
- [6] Koes BW, van Tulder MW, Peul WC. Diagnosis and treatment of sciatica. BMJ. 2007;334(7607):1313-7. doi:10.1136/bmj.39223.428495.BE.
- [7] Jensen RK, Kongsted A, Kjaer P, Koes B. Diagnosis and treatment of sciatica. BMJ. 2019;367:l6273. doi:10.1136/bmj.l6273.
- [8] Finnerup NB, Haroutounian S, Kamerman P, Baron R, Bennett DLH, Bouhassira D, et al. Neuropathic pain: an updated grading system for research and clinical practice. Pain. 2016;157(8):1599-606. doi:10.1097/j.pain.0000000000000492.
- [9] Qaseem A, Wilt TJ, McLean RM, Forciea MA. Noninvasive treatments for acute, subacute, and chronic low back pain: a clinical practice guideline from the American College of Physicians. Ann Intern Med. 2017;166(7):514-30. doi:10.7326/M16-2367.
- [10] Gagnier JJ, Kienle G, Altman DG, Moher D, Sox H, Riley D; CARE Group. The CARE guidelines: consensus-based clinical case reporting guideline development. Glob Adv Health Med. 2013;2(5):38-43. doi:10.7453/gahmj.2013.008.
- [11] Majeed M, Majeed S, Narayanan NK, Nagabhushanam K. A pilot, randomized, double-blind, placebo-controlled trial to assess the safety and efficacy of a novel Boswellia serrata extract in the management of osteoarthritis of the knee. Phytother Res. 2019;33(5):1457-68. doi:10.1002/ptr.6338.
- [12] Dubey V, Kheni D, Sureja V. Efficacy evaluation of standardized Boswellia serrata extract (Aflapin®) in osteoarthritis: a systematic review and sub-group meta-analysis study. Explore (NY). 2024;20(5):102983. doi:10.1016/j.explore.2024.02.001.
- [13] Majeed A, Majeed M, Nagabhushanam K, et al. A standardized Boswellia serrata extract shows improvements in knee osteoarthritis within five days—a double-blind, randomized, three-arm, parallel-group, multi-center, placebo-controlled trial. Front Pharmacol. 2024;15:1428440. doi:10.3389/fphar.2024.1428440.
- [14] Zeng Y, et al. Commiphora mukul (Hook. ex Stocks) Engl.: historical records, application

rules, phytochemistry, pharmacology, clinical research, and adverse reaction. *J Ethnopharmacol.* 2023;316:116779.

doi:10.1016/j.jep.2023.116779.

- [15] Afroz M, Zihad SMN, Uddin SJ, Rouf R, Rahman MS, Islam MT, et al. A systematic review on antioxidant and antiinflammatory activity of sesame (*Sesamum indicum* L.) oil and further confirmation of antiinflammatory activity by chemical profiling and molecular docking. *Phytother Res.* 2019;33(10):2585-2608. doi:10.1002/ptr.6428.
- [16] Bhatta M, Patil SS, Yadav SS, Somanadhapai S, Thapa R. Effects of yoga and add-on Ayurvedic Kati Basti therapy for patients with chronic low back pain: a randomized controlled trial. *J Ayurveda Integr Med.* 2024;15(4):101030. doi:10.1016/j.jaim.2024.101030.
- [17] Furlan AD, Imamura M, Dryden T, Irvin E. Massage for low back pain: an updated systematic review within the framework of the Cochrane Back Review Group. *Spine (Phila Pa 1976).* 2009;34(16):1669-84. doi:10.1097/BRS.0b013e3181ad7bd6.
- [18] Shishodia S, Aggarwal BB. Guggulsterone inhibits NF-kappaB and IkappaBalpha kinase activation, suppresses expression of anti-apoptotic gene products, and enhances apoptosis. *J Biol Chem.* 2004;279(45):47148-58. doi:10.1074/jbc.M408093200.