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PHARMACEUTICAL EVALUATION OF ERANDADI KWATHA CHURNA AND SHATAPUSHPADI LEPA CHURNA

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ABSTRACT

Medicinal plants form an integral part of traditional healthcare systems and are now recognized globally for their therapeutic importance. Their curative actions are attributed to a wide range of secondary metabolites present in various plant parts**. Erandadi Kwatha** and **Shatapushpadi Lepa** are classical Ayurvedic formulations prepared from multiple herbs possessing potent Vatahara, Shothahara, and Vedanasthapana properties. The present work aims to explore their phytochemical profile, pharmacological attributes, and probable mechanism of action in the management of **Katigraha (Lumbar Spondylosis).** Katigraha is a Vataja Nanatmaja Vyadhi characterized by Katishoola (pain in the lumbar region), Stambha (stiffness), and Graha (restriction of movement), resulting from Vata Dosha Prakopa and Srotorodha. Erandadi Kwatha acts internally by Vatahara, Srotoshodhana, and Agnideepana effects, helping to relieve stiffness and pain, while Shatapushpadi Lepa provides external relief through its Shothahara and Vedanasthapana actions. The present study, carried out at ALN RAO MEMORIAL AYURVEDIC MEDICAL COLLEGE AND PG CENTRE, KOPPA, CHIKMAGALUR (KARNATAKA), includes standardization parameters such as identity, purity, strength, preliminary phytochemical screening, and TLC profiling. These findings play a crucial role in establishing scientific quality control measures and enhancing the therapeutic credibility of Ayurvedic formulations.

KEYWORDS: Erandadi Kwatha, Shatapushpadi Lepa, Katigraha, Vata Vyadhi, Vatahara, Shothahara, Vedanasthapana, Srotoshodhana, preliminary phytochemical screening, TLC profiling.

INTRODUCTION[1,7]

Ayurveda, the ancient science of life, emphasizes not only the therapeutic utility of formulations but also their proper pharmaceutical preparation and scientific evaluation. **Kwatha(decoction)** is a traditional Ayurvedic decoction prepared from selected herbal ingredients using a specified ratio of water. The mixture is boiled steadily until the active constituents of the herbs are fully extracted. **Erandadi Kwatha** is a well-known polyherbal formulation mentioned in ***Śārṅgadhara Saṃhitā (Madhyama Khanda 2/95–96).*** It is prepared with Eranda (*Ricinus communis*), Bijapura (*Citrus medica*), Gokshura (*Tribulus terrestris*), Brihati (*Solanum indicum*), Kantakari (*Solanum surattense*), Pashanabheda (*Bergenia ligulate*), and Bilwa (*Aegle marmelos*) as the main ingredients in equal proportion, with Eranda taila(*Ricinus communis*), Hingu (*Ferula narthex*), Yava Kshara(Potassium carbonate) and Saindhav Lavana(Rock salt) added to enhance Deepana-Pachana and Vatanulomana activity.

Erandadi Kwatha is primarily indicated in Vata Vyadhi, particularly **Katigraha (Lumbar Spondylosis),** which is characterized by Katishoola (low back pain), Stambha (stiffness), and Graha (restricted movement) due to Vata Dosha Prakopa and Srotorodha. The formulation exhibits Vatahara, Srotoshodhaka, Agnideepana, Shoolahara, and Sothahara properties. Each constituent contributes synergistically: Eranda acts as Vata-Kapha Shamaka and Sothahara; Bijapura and Gokshura possess Vedanasthapana and Rasayana actions; Brihati and Kantakari alleviate Shoola and enhance Deepana-Pachana; Pashanabheda provides Shothahara and Antioxidant effects, while Bilwa corrects Agnidusti and strengthens the body. Phytochemical studies reveal the presence of alkaloids, flavonoids, tannins, glycosides, and essential oils that contribute to its anti-inflammatory, analgesic, and antioxidant properties.

The pharmacological activities of the ingredients possess potent anti-inflammatory, analgesic, antioxidant, antispasmodic, and tissue-healing properties. Their phytochemicals, including flavonoids, alkaloids, terpenoids, glycosides, and tannins, help inhibit inflammatory mediators like cytokines and prostaglandins, thereby reducing swelling and nerve irritation in the lumbar region. Their strong free-radical scavenging action protects spinal tissues from oxidative damage associated with degenerative changes. Additionally, tannins, glycosides,

and triterpenoids support tissue regeneration, enhancing the strength and repair of muscles, ligaments, and connective tissues. These combined actions effectively reduce pain, stiffness, and inflammation in Katigraha (lumbar spondylosis) and justify the therapeutic use of Erandadi Kwatha.

Lepa Kalpana is one of the oldest and most effective Bahya Prayoga (external application) forms in Ayurveda, where the drug acts locally to relieve Shoola (pain), Shotha (inflammation), and Stambha (stiffness). **Shatapuspadi Lepa**, mentioned in ***Yogaratnakara (Vatavyadhi Nidanam)***, is a classical external formulation composed of Shatapushpa (*Foeniculum vulgare*), Devadaru (*Cedrus deodara*), Arkaksheera (*Calotropis procera*), Kustha (*Saussurea lappa*), Hingu (*Ferula narthex*) and Saindhav Lavana(Rock salt) in equal parts.

This formulation is specifically indicated in Vataja Vikara such as **Katigraha**, where localized pain and stiffness predominate. The ingredients possess Vatahara, Vedanasthapana, Shothahara, Deepana-Pachana, and Balya actions. Shatapushpa and Devadaru help relieve stiffness and inflammation through their Srotoshodhana and Vedanashamana effects. Arkaksheera and Kustha provide Analgesic, Anti-inflammatory, and Rasayana properties that support tissue nourishment and pain reduction. Hingu acts as a Vatanulomaka and enhances penetration (Sukshma Guna) of the Lepa through the skin.

Phytochemical analysis of Shatapuspadi Lepa ingredients reveals bioactive compounds such as anethole, eugenol, terpinol, amyrin, and saussurine, which exhibit anti-inflammatory, analgesic, antioxidant, and immunomodulatory activities, thereby substantiating its therapeutic efficacy in musculoskeletal disorders.

Both Erandadi Kwatha and Shatapuspadi Lepa act synergistically in Katigraha (Lumbar Spondylosis) by pacifying aggravated Vata Dosha, reducing inflammation, relieving pain and stiffness, and improving local circulation and tissue nourishment. Analytical and phytochemical evaluations support their traditional claims and provide scientific validation for their use in Vata Vyadhi management.

The present analytical study includes organoleptic, physicochemical, phytochemical, and TLC profiling parameters, which ensure uniformity, purity, and quality standardization of the formulation as per API/WHO guidelines.

AIMS AND OBJECTIVES

1. To prepare Erandadi Kwatha and Shatapushpadi Lepa according to classical Ayurvedic texts.
2. To evaluate its pharmaceutical parameters including organoleptic, physicochemical, and phytochemical properties.
3. To establish standard quality control measures for the formulation, Erandadi Kwatha and Shatapushpadi Lepa.

MATERIALS AND METHODS

Source of Data

1. Classical text book of Ayurveda
2. Text books of Modern science
3. Published articles from periodical journals another magazines.

Raw Materials

Method of Preparation

All raw drugs were sourced from authentic GMP-certified Ayurvedic suppliers and verified through macroscopic and microscopic evaluation in accordance with API standards. After authentication by the Department of Dravyaguna, the materials were thoroughly cleaned to remove physical impurities and then shade-dried at room temperature to retain volatile and thermolabile constituents. This standardized procedure was applied to the raw drugs of Erandadi Kwatha and the ingredients of Shatapuspadi Lepa, ensuring their purity, potency, and suitability for further formulation.

Method of Preparation of Erandadi Kwatha[2]

After complete drying, each ingredient was coarsely powdered using a mechanical grinder and passed through a 10# sieve to obtain a uniform coarse powder suitable for Kwatha preparation. The required quantities of the coarsely powdered drugs were mixed thoroughly in a clean stainless steel vessel to ensure uniformity. The sample of the final product was properly labeled with the formulation name, ingredient details, and batch number, and sent to the laboratory for pharmaceutical and pharmacological evaluation.

Method of Preparation of Shatapuspadi Lepa[3]

Each ingredient was then separately powdered using a mechanical pulverizer and passed through an 80# sieve to obtain a fine powder. The sieved powders were mixed thoroughly in

a clean, dry stainless steel container to form a uniform and homogeneous powder mixture.

For the preparation of Lepa, the required quantity of this fine powder was taken and mixed with a sufficient amount of liquid medium (as per classical reference, e.g., warm water, or specified Drava Dravya) to obtain a smooth, uniform paste of applicable consistency. The prepared Shatapuspadi Lepa was then stored in an airtight, moisture-free, and light-resistant container at room temperature. The final product was properly labeled with the name, composition, and preparation details and submitted for pharmaceutical and pharmacological analysis.

Table 1: Ingredients of Erandadi Kwatha.

Ingredients	Latin name	Family	Parts used	Quantity
Eranda	*Ricinus communis*	*Euphorbiaceae*	Moola(Root)	1 part
Bijapura	*Citrus medica*	*Rutaceae*	Moola(Root)	1 part
Gokshura	*Tribulus terrestris*	*Zygophyllaceae*	Moola(Root)	1 part
Brihati	*Solanum indicum*	*Solanaceae*	Moola(Root)	1 part
Kantakari	*Solanum surattense*	*Solanaceae*	Moola(Root)	1 part
Pashanabheda	*Bergenia ligulate*	*Saxifragaceae*	Moola(Root)	1 part
Bilwa	*Aegle marmelos*	*Rutaceae*	Moola(Root)	1 part

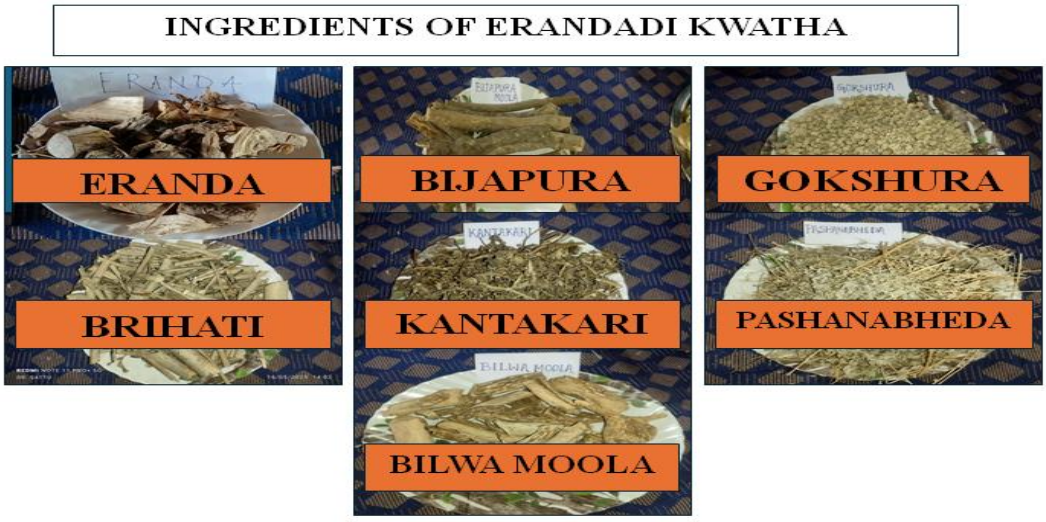


Table 2: Ingredients of Shatapuspadi Lepa.

Ingredients	Latin name	Family	Parts used	Quantity
Shatapushpa	*Foeniculum vulgare*	*Umbelliferae*	Seed	1 part
Devadaru	*Cedrus deodara*	*Pinaceae*	Resin	1 part
Arkaksheera	*Calotropis procera*	*Asclepiadaceae*	Latex	1 part
Kustha	*Saussurea lappa*	*Compositae*	Root	1 part
Hingu	*Ferula narthex*	*Umbelliferae*	Root	1 part

PHARMACEUTICAL STUDY/ ANALYTICAL STUDY[7,12]

The Shatyadi Curṇa was analyzed by adopting various related analytical parameters like

A. Organoleptic Characters of *Erandadi Kwatha Churna and Shatapushpadi Lepa Churna*

Colour, odour, taste and appearance of Churna were observed and mentioned in (Table no.3)

(Table No. 3)

S. No.	Parameter	Erandadi Kwatha Churna	Shatapushpadi Lepa Churna
1	**Colour**	Creamish green	Greyish green
2	**Odour**	Characteristic	Characteristic
3	**Taste**	Slightly bitter, sweet, astringent	Slightly bitter, salty, sweet, astringent
4	**Texture**	Coarse powder	Fine powder

B. Physiochemical Analysis

Loss on drying at 105^0c, total ash value, water soluble ash, acid insoluble ash, pH value. Alcohol soluble extractives, Water soluble extractives was carried out for raw materials and results are mentioned in (Table no.4)

S. No.	Parameter	Erandadi Kwatha Churna	Shatapushpadi Lepa Churna	Remarks
1	**Loss on Drying at 105°C**	4.37%	3.68%	Within acceptable range indicating low moisture content
2	**Total Ash**	8.27%	9.25%	Shows presence of inorganic constituents
3	**Acid Insoluble Ash**	0.05%	0.31%	Indicates minimal siliceous matter
4	**Water Soluble Ash**	4.16%	2.56%	Represents water soluble inorganic salts
5	**Alcohol Soluble**	21.86%	18.15%	Suggests good presence of alcohol soluble

	Extractives			phytoconstituents
6	**Water Soluble Extractives**	28.57%	37.26%	Indicates rich content of water soluble compounds
7	**pH (5% aqueous solution)**	4.52 ± 0.10	4.61 ± 0.10	Shows slightly acidic nature suitable for formulation stability

These results indicate good quality of the Churna, with optimal moisture and extractive values suggesting stability and solubility.

C. Preliminary Phytochemical Tests (Qualitative Tests)

For various functional groups were done and observation and result of the *churna* was asserted in

(Table no.4).

(Table no.4)

Phytochemical Test	**Erandadi Kwatha Churna**	**Shatapushpadi Lepa Churna**
Carbohydrate	Present	Present
Protein	Present	Present
Alkaloid	Present	Present
Cardiac Glycoside	Present	Present
Flavonoids	Present	Present
Tannins	Present	Present
Anthraquinone Glycoside	Present	Present
Triterpenoids	Present	Present

The presence of these phytochemicals supports the Vatahara, Srotoshodhana, and Agnideepana effects of Erandai Kwatha, helping to relieve stiffness and pain, while Satapuspadi Lepa provides external relief through its Shothahara and Vedanasthapana. properties described in Ayurvedic literature.

D. FLUORESCENT TESTS ANALYSIS

Erandadi Kwatha Churna

Treatment	**Under Visible Light**	**Under Long UV(366mm)**
Sample + Water	Light yellow	Fluorescent yellow
Sample + MeOH	Olive green	Fluorescent yellow
Sample + 10% NaOH	Light orange	Fluorescent green
Sample + 10% HCl	Yellowish orange	Fluorescent green
Sample + 10% HNO_3	Dark orange	Fluorescent green
Sample + 10% H_2SO_4	Light orange	Fluorescent yellow
Sample + 10% NH_3	Brown	Brown

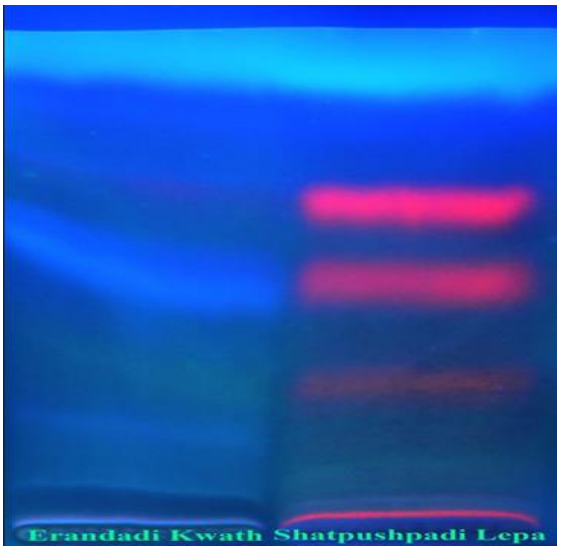
Shatapushpadi Lepa Churna

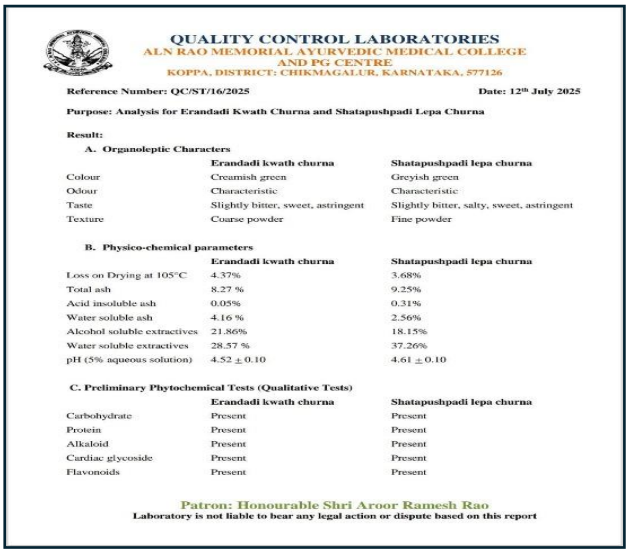
Treatment	Under Visible Light	Under Long UV
Sample + Water	Greenish yellow	Fluorescent yellow
Sample + MeOH	Light green	Fluorescent yellow
Sample + 10% NaOH	Brownish red	Fluorescent green
Sample + 10% HCl	Light yellow	Fluorescent yellow
Sample + 10% HNO_3	Light green	Fluorescent green
Sample + 10% H_2SO_4	Greenish yellow	Fluorescent green
Sample + 10% NH_3	Light brown	Brown

E, TLC PROFILE

Solvent System: Toluene: Ethyl acetate:: 80:20

Error! Filename not specified. S. No.	Rf Value	Erandadi Kwatha Churna	Shatapushpadi Lepa Churna
1	0.03	Fluorescent blue	---
2	0.04	---	Orange
3	0.06	---	Fluorescent blue
4	0.08	---	Fluorescent green
5	0.11	Fluorescent blue	---
6	0.12	---	Fluorescent green
7	0.14	---	Fluorescent green
8	0.20	---	Fluorescent green
9	0.23	Fluorescent blue	---
10	0.31	---	Orange-red
11	0.35	Orange	---
12	0.50	---	Fluorescent red
13	0.54	Fluorescent blue	---
14	0.58	---	Fluorescent blue
15	0.65	---	Fluorescent red
16	0.71	Fluorescent blue	---
17	0.83	Fluorescent blue	Fluorescent blue





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Reference Number: QC/ST/16/2025 **Date: 12th July 2025**

Purpose: Analysis for Erandadi Kwath Churna and Shatapushpadi Lepa Churna

Result:

A. Organoleptic Characters

	Erandadi kwath churna	Shatapushpadi lepa churna
Colour	Creamish green	Greyish green
Odour	Characteristic	Characteristic
Taste	Slightly bitter, sweet, astringent	Slightly bitter, salty, sweet, astringent
Texture	Coarse powder	Fine powder

B. Physico-chemical parameters

	Erandadi kwath churna	Shatapushpadi lepa churna
Loss on Drying at 105°C	4.37%	3.68%
Total ash	8.27 %	9.25%
Acid insoluble ash	0.05%	0.31%
Water soluble ash	4.16 %	2.56%
Alcohol soluble extractives	21.86%	18.15%
Water soluble extractives	28.57 %	37.26%
pH (5% aqueous solution)	4.52 ± 0.10	4.61 ± 0.10

C. Preliminary Phytochemical Tests (Qualitative Tests)

	Erandadi kwath churna	Shatapushpadi lepa churna
Carbohydrate	Present	Present
Protein	Present	Present
Alkaloid	Present	Present
Cardiac glycoside	Present	Present
Flavonoids	Present	Present

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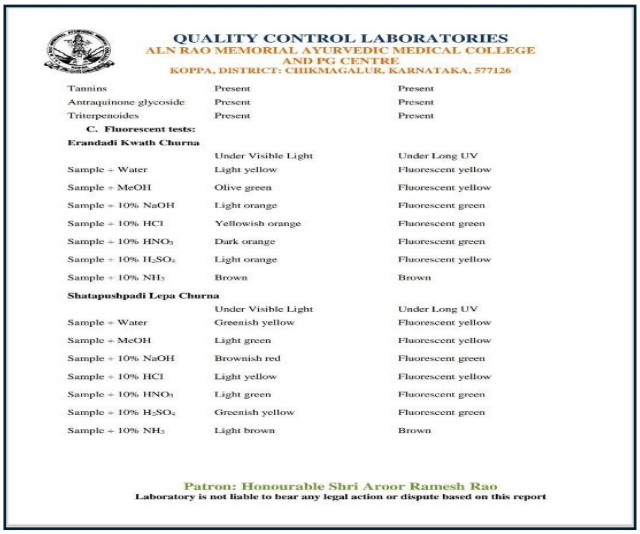

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Tannins	Present	Present
Antraquinone glycoside	Present	Present
Triterpenoides	Present	Present

C. Fluorescent tests:

Erandadi Kwath Churna

	Under Visible Light	Under Long UV
Sample + Water	Light yellow	Fluorescent yellow
Sample + MeOH	Olive green	Fluorescent yellow
Sample + 10% NaOH	Light orange	Fluorescent green
Sample + 10% HCl	Yellowish orange	Fluorescent green
Sample + 10% HNO_3	Dark orange	Fluorescent green
Sample + 10% H_2SO_4	Light orange	Fluorescent yellow
Sample + 10% NH_3	Brown	Brown

Shatapushpadi Lepa Churna

	Under Visible Light	Under Long UV
Sample + Water	Greenish yellow	Fluorescent yellow
Sample + MeOH	Light green	Fluorescent yellow
Sample + 10% NaOH	Brownish red	Fluorescent green
Sample + 10% HCl	Light yellow	Fluorescent yellow
Sample + 10% HNO_3	Light green	Fluorescent green
Sample + 10% H_2SO_4	Greenish yellow	Fluorescent green
Sample + 10% NH_3	Light brown	Brown

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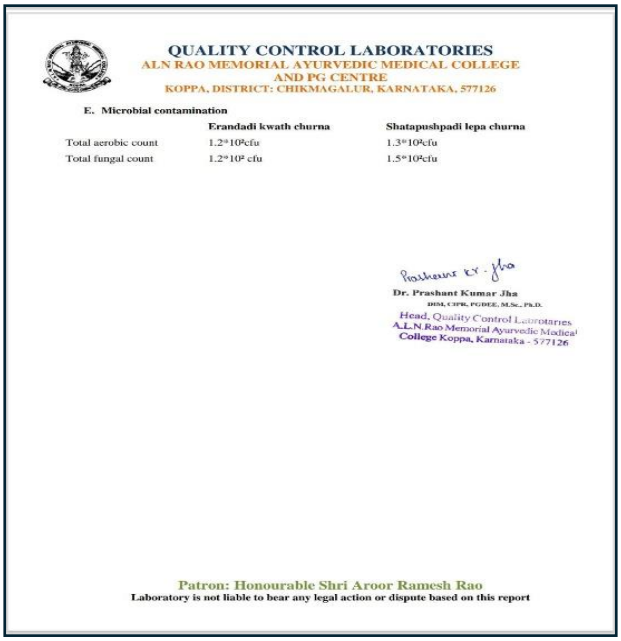

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E. Microbial contamination

	Erandadi kwath churna	Shatapushpadi lepa churna
Total aerobic count	$1.2*10^6$cfu	$1.3*10^6$cfu
Total fungal count	$1.2*10^2$ cfu	$1.5*10^2$cfu

Prashant Kr. Jha
Dr. Prashant Kumar Jha
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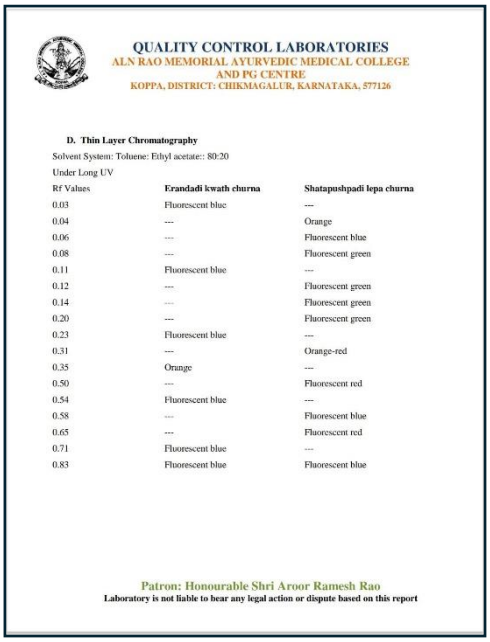

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D. Thin Layer Chromatography

Solvent System: Toluene: Ethyl acetate:: 80:20

Under Long UV

Rf Values	Erandadi kwath churna	Shatapushpadi lepa churna
0.03	Fluorescent blue	---
0.04	---	Orange
0.06	---	Fluorescent blue
0.08	---	Fluorescent green
0.11	Fluorescent blue	---
0.12	---	Fluorescent green
0.14	---	Fluorescent green
0.20	---	Fluorescent green
0.23	Fluorescent blue	---
0.31	---	Orange-red
0.35	Orange	---
0.50	---	Fluorescent red
0.54	Fluorescent blue	---
0.58	---	Fluorescent blue
0.65	---	Fluorescent red
0.71	Fluorescent blue	---
0.83	Fluorescent blue	Fluorescent blue

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DISCUSSION[11,17]

In Ayurveda, the vitiation of Vata dosha particularly Prana, Vyana, and Apana Vata is closely associated with disturbances in the Majja Dhatu and Nadi systems, which correspond to neurological functions. When Vata becomes aggravated, it disrupts Nadi-Sancharana (neural conduction), Manovaha Srotas (psychosomatic pathways), and Karmendriya coordination, leading to symptoms such as Shoola (pain), Stambha (stiffness), Toda (tingling), Bhrama (dizziness), and Anidra (insomnia). Ayurveda explains these dysfunctions through impaired Gati (movement) and Cheshta (neuromuscular activity), whereas modern science attributes them to altered nerve signaling, autonomic imbalance, and neuroinflammation. Both systems, though conceptually different, describe a common theme: disturbed regulatory mechanisms of the body leading to neuromuscular and sensory disorders.

The pharmaceutical evaluation of Erandadi Kwatha and Shatapuspadi Lepa demonstrated that both formulations possess suitable organoleptic and physicochemical characteristics appropriate for their respective dosage forms. The extractive values of Erandadi Kwatha reflect optimal solubility of bioactive constituents in aqueous and alcoholic media, ensuring effective extraction of therapeutic components, while the ash and extractive values of Shatapuspadi Lepa confirm the presence of both volatile and non-volatile active principles that contribute to its efficacy. Phytochemical analysis of both formulations revealed the presence of alkaloids, flavonoids, glycosides, saponins, and terpenoids, supporting their Vatahara, Shothahara (anti-inflammatory), and Vedanasthapana (analgesic) properties. These

characteristics justify their traditional use in Katigraha, where Erandadi Kwatha acts systemically through Srotoshodhana, Vata Anulomana, and Shula Prashamana, while Shatapuspadi Lepa acts locally through Sthanik Karma to relieve pain, inflammation, and stiffness in the lower back.

The physico-chemical analysis of Erandadi Kwatha Churna and Shatapushpadi Lepa Churna showed that all parameters were within acceptable limits, indicating good pharmaceutical quality and stability. The low moisture content 4.37% in Erandadi Kwatha Churna and 3.68% in Shatapushpadi Lepa Churna—suggests minimal microbial risk. Total ash values (8.27% and 9.25%) indicate moderate inorganic matter, while acid-insoluble ash values (0.05% and 0.31%) confirm negligible siliceous impurities. Water-soluble ash values (4.16% and 2.56%) reflect the presence of beneficial inorganic salts. Alcohol- and water-soluble extractive values were 21.86% and 28.57% for Erandadi Kwatha Churna, and 18.15% and 37.26% for Shatapushpadi Lepa Churna, indicating good proportions of phytoconstituents contributing to therapeutic efficacy. The slightly acidic pH values (4.52 ± 0.10 and 4.61 ± 0.10) ensure stability and compatibility for internal and external applications.

The Phytochemical screening further confirmed a diverse range of bioactive compounds, including carbohydrates, proteins, alkaloids, cardiac glycosides, flavonoids, tannins, anthraquinone glycosides, and triterpenoids, highlighting their antioxidant, anti-inflammatory, analgesic, and detoxifying potential, which are beneficial in managing Katigraha.

TLC analysis of both churnas revealed multiple phytochemical spots with distinct Rf values and fluorescent reactions, indicating chemical diversity and the presence of flavonoids, phenolic acids, terpenoids, and glycosides. A common fluorescent spot at Rf 0.83 in both formulations suggests a shared phytochemical marker. The TLC profile confirms the multi-component nature of both formulations, supporting their synergistic therapeutic activity in Katigraha. Overall, the comprehensive pharmaceutical evaluation underscores the importance of proper standardization to ensure uniformity, stability, and scientific validation of these traditional Ayurvedic formulations.

CONCLUSION

The Erandadi Kwatha and Shatapushpadi Lepa, prepared according to classical Ayurvedic guidelines and evaluated through modern pharmaceutical parameters, meet the essential

qualitative standards required for safe and effective formulations. The analytical results demonstrate that both formulations possess desirable organoleptic and physicochemical characteristics, along with the presence of vital phytochemical constituents that substantiate their classical indications in the management of Katigraha. The multiple phytochemical markers detected suggest potent Vatahara, Shothahara (anti-inflammatory), Vedanasthapana (analgesic), and Srotoshodhana properties. These attributes collectively contribute to alleviating stiffness, pain, and restricted movement associated with Katigraha by pacifying vitiated Vata and improving local circulation. Further advanced analytical and pharmacological studies are warranted to strengthen the scientific validation and expand the therapeutic applicability of Erandadi Kwatha and Shatapushpadi Lepa in Katigraha and related Vata Vyadhi conditions.

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