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KAAYAKAM LEHYAM (KL): UNVEILING TRADITIONAL WISDOM FOR HOLISTIC POSTPARTUM RECOVERY IN WOMEN THROUGH ETHNOMEDICINAL INSIGHTS^[1] Jyothsna Regeti, ^[2] Praveen Boddana, ^[3] Paidi Rama Rao^[1] Centurion University of Technology and Management, Odisha, INDIA^[2] Department of Plant Pathology, M.S. Swaminathan School of Agriculture, Centurion University of Technology and Management, Paralakhemundi, Gajapati, Odisha, INDIA^[3] Department of Botany, Government Degree College, Thogaram, Srikakulam Dist. Andhra Pradesh, INDIA^[1] jyothsna.regeti@gmail.com, ^[2] bpraveen@cutm.ac.in, ^[3] paidiramarao27@gmail.com

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Abstract— As of 2020, the World Health Organization (WHO) reported that an estimated 800 women died daily due to preventable causes linked to pregnancy and childbirth, equating to a woman's death every two minutes. Furthermore, approximately 52% of Indian women don't receive necessary postnatal care within 48 hours after childbirth, as per the National Family Health Survey (NFHS-4). Postpartum care often neglects women's unique needs, lacking attention to their real-life challenges. This review delves into the therapeutic efficacy of Kaayakam Lehyam (KL), a polyherbal remedy rooted in traditional Indian medicine. Comprising twelve plant ingredients from Ayurveda, KL addresses various issues encountered by new mothers. Its pharmacological, therapeutic, and ethnomedicinal characteristics are scrutinized, revealing a wide range of phytoconstituents enhancing its efficacy for postpartum recovery. Additionally, detailed examination of the morphological characteristics and taxonomy of the herbs bolsters KL's legitimacy, bridging ancient wisdom with modern scientific understanding. This research underscores potential synergy between ancient medical practices and contemporary healthcare, emphasizing holistic well-being prioritizing excellent motherhood.

Index Terms— Kaayakam Lehyam, Maternal well-being, Polyherbal remedy, Traditional Indian medicine

1. INTRODUCTION

Within the intricate fabric of global health, prioritizing women's well-being emerges as pivotal for immediate healthcare needs and overarching socio-economic development. Statistics from the World Health Organization (WHO) indicate that addressing women's health issues is imperative, considering that approximately 830 women die every day globally due to preventable causes related to pregnancy and childbirth (WHO). The pivotal roles played by healthy women within families, communities, and societies highlight the importance of addressing various issues encompassing female health. For instance, data from UNICEF reveals that improved maternal healthcare could reduce newborn deaths by about two-thirds and prevent approximately 75% of maternal deaths (UNICEF). Additionally, the WHO reports that mental health disorders, such as depression and anxiety, affect about 10% of pregnant

women and 13% of women who have just given birth (WHO). Issues surrounding reproductive health and maternal care are critical components. According to the United Nations, only 68% of women globally receive antenatal care at least four times during their pregnancy, indicating disparities in accessing essential maternal healthcare services (United Nations). Furthermore, chronic conditions disproportionately affect women. For instance, the Centers for Disease Control and Prevention (CDC) notes that chronic conditions like heart disease, which is the leading cause of death among women globally, affect women differently than men (CDC). Within this comprehensive context, ethnomedicine assumes significance in promoting women's health. Studies suggest that over 70% of the global population relies on traditional and complementary medicine for primary healthcare (Ethnomedicine Studies). In India, particularly, the National Health Profile reported that

Ayurveda, one facet of ethnomedicine, accounted for nearly 65% of the healthcare services provided in rural areas (National Health Profile, India). By delving into India's rich tradition of ethnomedicine, this article sheds light on how cultural heritage deeply embedded in generations offers alternative perspectives to bolster women's well-being. Ethnomedicine's rootedness in cultural wisdom provides valuable insights and supplementary strategies that complement modern healthcare, contributing to holistic approaches for women's health.

The Postpartum Period: A critical time in a woman's life that begins six weeks after giving birth and is marked by significant changes in physical, mental, and lifestyle aspects. This phase requires close monitoring to protect mother and child's health, from vaginal bleeding and uterine involution to breast changes and postpartum depression. Maternal and baby survival is greatly increased by postnatal care, which is essential in maternal health-care services provided through facility-based clinical care, outreach, or family community care [1],[2]. Understanding the significance of this time for renewal, healing, and care, it becomes necessary to offer ongoing nutrition and assistance, keeping in mind that the adaptations and healing can take many months. In addition to being fundamentally significant, moms' survival and well-being are crucial for resolving more significant social, economic, and developmental issues. By putting several policy measures and interventions into place to lower the maternal death rate, the Indian government is making progress [3].

Globally, the Maternal Mortality Rate (MMR) accounts for approximately 800 women daily due to complications linked to pregnancy and childbirth. Postpartum Depression affects roughly 10-15% of women worldwide within the initial year following childbirth. Shockingly, the World Health Organization (WHO) reports that about 40% of women globally do not receive postnatal care within 48 hours of delivering. In India, the Maternal Mortality Rate (MMR) stood at around 113 maternal deaths per 100,000 live births as of 2016, despite showing improvement from prior years. Postpartum Depression affects an estimated one in five Indian women. Alarming, in India, approximately 52% of women do not receive postnatal care within the critical 48 hours following childbirth, based on data from the National Family Health Survey (NFHS-4). It's important to note that these figures can fluctuate annually and are influenced by diverse factors such as healthcare accessibility, socioeconomic conditions, and government initiatives. For the most accurate and recent statistics, referring to current reports from

organizations like WHO, UNICEF, or governmental health bodies is recommended. Despite progress, India still grapples with a relatively high Maternal Mortality Rate, standing at 113 maternal deaths per 100,000 live births in 2016, reflecting the need for sustained improvements in maternal healthcare.

Kaayakam Lehyam-Nurturing Postpartum Well-being Through Holistic Care: Kaayakam Lehyam (KL) epitomizes the pursuit of therapeutic remedies deeply rooted in Indian traditional medicine, aiming for overall well-being. Developed with great care in accordance with Ayurvedic customs, KL is a polyherbal remedy specifically designed to assist women in managing a range of postpartum issues. KL, which addresses a variety of postpartum recovery difficulties, integrates the expertise of twelve carefully selected botanical constituents with the medicinal understanding of Ayurveda. These botanical ingredients combine conventional knowledge with cutting-edge scientific research, all rooted in historical writings and concrete data. In this context, the carefully chosen combination of Ayurvedic herbs known as Kaayakam (local name)/Kaayam (Sanskrit) Lehyam appears as a polyherbal blend. Every herb has been hand-picked to have special qualities that support postpartum health and treat typical issues that moms face following childbirth. With 12 different plant components, plus Ghee and Jaggery (a total of 14 ingredients), carefully incorporated into this recipe, Kaayakam showcases the richness of ethnomedicine by emphasizing the nuances related to the postpartum period [4],[5],[6]. Ayurveda, an ancient healthcare system, emphasizes holistic health through natural remedies and personalized care. KL epitomizes these principles, drawing from a diverse array of phytoconstituents known for therapeutic properties. The synergistic interplay of these phytoconstituents within KL forms a nuanced tapestry of healing potential specifically tailored for postpartum convalescence. This comprehensive review embarks on an exploration of KL's pharmacological, therapeutic, and ethnomedicinal characteristics, shedding light on its multifaceted attributes. By scrutinizing its botanical composition and phytochemical constituents, this analysis aims to unveil the intricate mechanisms underlying KL's therapeutic efficacy in facilitating postpartum recovery.

Moreover, beyond its empirical effectiveness, this review delves into the morphological traits and taxonomic classification of the botanical components constituting KL. This endeavor aims to bridge ancient wisdom with contemporary scientific validation, enhancing the credibility of this traditional formulation. Drawing from an extensive repository of historical texts, empirical evidence, and contemporary

research, this review elucidates KL's broader implications for holistic well-being. By amalgamating traditional healing practices with modern healthcare paradigms, this study spotlights potential synergies that could enhance the spectrum of postpartum care. Through synthesizing historical knowledge, empirical studies, and contemporary scientific understanding, this review aims to present a comprehensive elucidation of KL, offering insights into its traditional roots and potential significance in contemporary healthcare practices.

Journey into Ethnopharmacology: Unveiling Traditional Healing Practices: By exploring the scientific complexities of morphological descriptions, phytochemical components, and pharmacological research, this article aims to clarify the ethnopharmacological aspects of herbal treatments. It seeks to provide a thorough understanding of how this polyherbal composition complies with modern scientific standards while adhering to conventional knowledge by combining data from a variety of sources, including books, websites, and published papers. In the process, it provides a comprehensive understanding of women's health within the context of Indian ethnomedicine, acting as a link between traditional wisdom and contemporary healthcare.

In the context of women's health in Indian ethnomedicine, statistical insights highlight the significance of traditional treatments. For instance, according to research published in the *Journal of Ethnopharmacology*, over 80% of rural Indian women rely on traditional medicine for their primary healthcare needs. Additionally, the National Family Health Survey (NFHS-4) in India reports that around 70% of women in rural areas prefer traditional remedies during their postpartum period.

Furthermore, studies from the World Health Organization (WHO) reveal that approximately 25% of pharmaceutical drugs worldwide contain active ingredients derived from plants used in traditional medicine. These statistics underscore the relevance and importance of exploring ethnopharmacological aspects to understand the potential of traditional healing practices in contemporary healthcare. Postpartum recovery is a critical period for women, both physically and emotionally. Traditional wisdom and ethnomedicinal practices have long been utilized to support holistic postpartum recovery. This literature review aims to explore the potential benefits of Kaayakam Lehyam (KL), a traditional Ayurvedic formulation, in promoting postpartum recovery in women. By integrating and synthesizing the provided research findings, this review will shed light on the efficacy of KL and identify knowledge gaps for future research.

2.MATERIAL AND METHODS

The methodology adopted for this study was designed to encompass a wide spectrum of information sources, ensuring a robust and comprehensive approach to data collection. To achieve this, we initiated an extensive review of literature from reputable databases renowned for their scholarly resources, including Science Direct, Springer, PubMed, Google, and Google Scholar. This allowed us to tap into a wealth of academic and scientific knowledge pertinent to our research objectives.

In addition to this academic exploration, we recognized the invaluable insights that could be gained from direct interactions with individuals intimately familiar with the application and preparation of lehyam. Thus, we engaged in conversations and consultations with local women experienced in utilizing and crafting lehyam, as well as sought guidance and expertise from practitioners well-versed in Ayurvedic medicine. This hands-on approach enabled us to bridge the gap between theoretical knowledge and practical application, enriching our understanding through real-world experiences and expertise.

Regarding the botanical aspects of the herbs incorporated into the lehyam, our quest for accurate and detailed information led us to diligently compile data from esteemed sources such as "The Treatise on Indian Medicinal Plants" and "Wealth of India" [7],[8], [9],[10],[11],[12],[13]. These authoritative references provided in-depth insights into the botanical characteristics, properties, and historical uses of the herbs, enriching our understanding of their contributions to the formulation.

By intertwining information gleaned from scholarly literature with the experiential wisdom offered by practitioners and users, our methodology aimed to create a cohesive and holistic understanding of lehyam. This comprehensive approach allowed us to present a nuanced, multifaceted perspective on the formulation, considering both theoretical underpinnings and practical implications.

3.KAAYAKAM LEHYAM: CRAFTING PROCESS AND METHODOLOGY

The preparation method of KL is a meticulous and intricate process that ensures the quality and effectiveness of this traditional formulation (Fig.1).

1.Ingredient Selection and Cleaning: The process begins with a careful selection of ingredients, emphasizing their quality and purity. These components undergo a thorough cleaning process to eliminate any impurities or contaminants. Dust and debris are meticulously washed away using warm water, ensuring the ingredients are pristine and free from external particles.

2.Soaking Process: The selected twelve herbs are then immersed in water for a deliberate two-hour

soak. This soaking period allows the herbs to absorb moisture, facilitating the release of their essential components. Subsequently, the soaked herbs are wrapped in a clean, white cloth, allowing the collection of the infused water in a bowl.

3. Infusion and Volume Reduction: The cloth-bound bundle containing the soaked herbs is suspended over the bowl, allowing a gentle infusion of the water with herbal essences. This infusion is carefully simmered in a steel or clay bowl, gradually reducing the liquid to half its original volume. This process concentrates the herbal properties within the liquid.

4. Grinding and Paste Formation: After the infusion, the herbs are cooled and finely ground into a powder. This powdered mixture, combined with the previously infused water, forms the fundamental essence of the lehyam. The grinding process ensures the thorough integration of the herbal elements.

5. Jaggery Addition: Simultaneously, jaggery is introduced to boiled water, slowly simmered until it reaches a semi-thick consistency. This step involves patient heating and careful monitoring to achieve the desired texture.

6. Final Concoction: The prepared herbal paste is added to the jaggery-infused water, creating a luscious and thick concoction. Ghee, a clarified butter, is then incorporated into the mixture. This addition of ghee contributes to the blend's richness and flavor, harmonizing the various elements into a cohesive whole.

7. Shaping into Balls: The final lehyam mixture, characterized by its velvety texture and potent herbal composition, undergoes the meticulous process of shaping into manageable and delectable balls. This step showcases the dedication and skill involved in the preparation, creating uniform and aesthetically pleasing forms.

ShelfLife Assessment: The careful preparation ensures the lehyam's quality and potency for a designated period. The determined shelf life of the freshly prepared lehyam is assessed to be 40 days, maintaining its efficacy and freshness within this timeframe. This meticulous process not only guarantees its efficacy but also signifies the cultural artistry and commitment to traditional practices embodied in its preparation.

The dosage recommendations for KL, as suggested by native practitioners and women experienced in its usage, vary based on the delivery method:

For Normal Delivery:

Dosage: Consume a ball of lehyam, approximately 5 grams, in the morning and evening.

Administration: Chew the lehyam thoroughly and then follow it with water or milk.

For C-Section Surgery:

Commencement: Begin taking the lehyam after 11

days from the date of the surgery.

Dosage: Similar to the regimen for normal delivery, ingest a ball of lehyam, around 5 grams, in the morning and evening.

Administration: Chew the lehyam thoroughly and then follow it with water or milk.

General Guidelines:

Duration: This dosage regimen can be followed for a period of up to 3 months or 90 days in the post-pregnancy phase.

These dosage instructions are tailored to accommodate different delivery scenarios – normal delivery and C-section surgery – with a focus on providing holistic postpartum care. The lehyam is recommended to be taken regularly, and the dosage frequency remains consistent for both scenarios, emphasizing its potential benefits during the post-pregnancy recovery period.

4. MEDICINAL ATTRIBUTES OF THE KL:

The information provided in the table 2 resonates strongly with the formulation and significance of Kaayakam Lehyam, that combines various herbs to create a potent therapeutic mixture. The table's detailed breakdown of different herbs, their specific parts used, phytochemical constituents, traditional ethnomedicinal uses, and pharmacological properties aligns with the principles behind KL.

For instance:

Roots and Fruits: The inclusion of roots and fruits containing alkaloids, aiding in digestion, joint health, bronchitis, and asthma, parallels the digestive and respiratory benefits that KL often aims to provide.

Rhizomes, Seeds, and Fruits: The diverse compounds found in these components, from Gingerols in rhizomes to Thymol in seeds and Chebulic acid in fruits, align with the varied therapeutic properties often sought after in Kaayakam Lehyam. These properties include antibacterial, anti-inflammatory, and digestive benefits.

The emphasis on diverse phytochemicals, traditional uses, and pharmacological properties of each herb mirrors the holistic approach of KL. It reflects the aim to amalgamate multiple herbs with unique therapeutic qualities to create a comprehensive and multi-faceted medicinal blend addressing various health concerns. The inclusion of specific plants highlighted in the table 1, such as:

1. Piper longum (Long Pepper): Known in Ayurveda as Pippali, it possesses properties beneficial for digestion and respiratory health. In postpartum care, Pippali's digestive qualities might aid in improving the mother's digestion, which can be compromised after childbirth.

2. Zingiber officinale (Ginger): Ginger's presence in the formulation could contribute to its warming properties and potential benefits for digestive health.

It might assist in postpartum recovery by aiding digestion and addressing any digestive discomfort after delivery.

3.Terminalia chebula (Myrobalan): This herb is recognized for its multifaceted health benefits. In postpartum recovery, it may assist in overall wellness, supporting the body's rejuvenation and potentially aiding in the restoration of strength and vitality.

In the context of postpartum recovery in women, these herbs, with their traditional uses and pharmacological properties, align with the broader ethos of ethnomedicine.

5.BENEFITS FOR WOMEN'S POSTPARTUM WELL-BEING

This review delves into the research findings surrounding KL, shedding light on its multifaceted benefits for women's postpartum well-being. Through a synthesis of empirical studies, this report examines its effects on physical recovery, emotional well-being, lactation support, and its underlying antioxidant and anti-inflammatory properties.

Improvement in Postpartum Physical Recovery: Sharma's [14] study highlighted KL's impact on postpartum physical recovery. Their findings revealed that women who incorporated KL into their postpartum regimen exhibited accelerated healing of perineal tears and a reduction in postpartum bleeding compared to those who did not. This suggests KL's potential in promoting faster and more effective physical healing following childbirth.

Enhancement of Emotional Well-being: Devi [15] contributed insights into the emotional well-being aspect of postpartum care linked to KL consumption. Their research showcased a notable reduction in postpartum depression symptoms and an overall improvement in mood among women who consumed KL. This finding underscores KL's potential to positively impact the emotional health of postpartum women, addressing critical mental well-being concerns during this phase.

Support for Lactation: Nair's [16] study emphasized KL's role in supporting lactation among postpartum women. Their research demonstrated that women who included KL in their diet experienced increased breast milk production and achieved better breastfeeding outcomes compared to those who did not. This suggests that KL may serve as an aid in promoting successful breastfeeding during the postpartum period.

Antioxidant and Anti-inflammatory Properties: Menon[17] delved into the bioactive compounds within KL, unveiling its antioxidant and anti-inflammatory effects. Their study revealed the presence of compounds that exhibited robust antioxidant and anti-inflammatory properties within KL. These properties potentially contribute to its

overall health benefits in facilitating postpartum recovery by mitigating oxidative stress and inflammation.

The synthesis of these research findings accentuates the potential of Kaayakam Lehyam (KL) in providing comprehensive support for women's postpartum recovery. From expediting physical healing to fostering emotional well-being, supporting lactation, and harnessing antioxidant and anti-inflammatory properties, KL stands as a promising traditional remedy. The synergy between ancient medicinal wisdom and modern scientific exploration underscores the significance of KL in addressing the holistic needs of women during the postpartum period. Further research and exploration into KL's mechanisms and applications hold promise for enhancing postpartum care and well-being.

6.THE MARKET DEMAND FOR KAAYAKAM LEHYAM: It stems from several critical factors aligning with the current health and wellness landscape.

1.Specialized Postpartum Care: There's a growing recognition of the unique challenges women face post childbirth. KL with its tailored formulation, meets the rising demand for specialized postpartum care products.

2.Herbal and Holistic Health Trends: Consumers are increasingly drawn to herbal and holistic healthcare solutions. KL deeply rooted in Ayurvedic traditions, caters to this rising preference for natural remedies.

3.Traditional Medicine Revival: The resurgence of interest in traditional medicinal practices, particularly Ayurveda, contributes to the demand for products like KL which amalgamate ancient wisdom with modern scientific validation.

4.Women's Health Focus: The emphasis on women's health and well-being, especially during the postpartum phase, has intensified. KL's focus on addressing postpartum issues aligns with this increasing concern.

5.Research-Backed Formulations: The incorporation of traditional Ayurvedic knowledge merged with contemporary scientific research and data in Kaayakam Lehyam makes it appealing to a market seeking evidence-based herbal remedies.

The "need of the hour" involves providing comprehensive postpartum care that doesn't just address physical recovery but also considers mental and emotional well-being. KL fulfills this need by offering a holistic approach to postpartum care, leveraging traditional Ayurvedic herbs known for their beneficial qualities. Its formulation, consisting of 12 plant components along with Jaggery[18],[19] and Ghee[20] underscores the richness of ethnomedicine and targets the nuanced requirements of the

postpartum period, aligning with the current demand for specialized and holistic women's healthcare solutions.

7.KNOWLEDGE GAPS AND FUTURE RESEARCH DIRECTIONS

While the provided research findings shed light on the potential benefits of KL in postpartum recovery, there are still several knowledge gaps that warrant further investigation. Future research could focus on the following areas:

1.Mechanisms of action: While the existing research points to the positive effects of KL, understanding how it works within the body remains unclear. Future studies could delve deeper into the specific biochemical pathways or physiological mechanisms through which KL operates. Investigating its interactions with biological processes could provide a clearer understanding of its therapeutic actions.

2.Safety and dosage: The safety profile and optimal dosage of KL for postpartum women haven't been extensively studied. Further research is essential to evaluate potential side effects, interactions with other medications or conditions, and to establish evidence-based dosage recommendations ensuring its safe use.

3.Comparative studies: Comparative studies comparing KL with other traditional postpartum recovery practices or modern interventions would be valuable. This could offer insights into the relative efficacy, safety, and potential advantages of KL compared to other established treatments or interventions.

4.Long-term effects: The long-term impact of KL on postpartum recovery and women's overall health beyond the immediate postpartum period remains unknown. Investigating the sustained benefits of KL usage and its potential influence on long-term maternal health outcomes would be crucial for comprehensive understanding.

5.Cultural and social factors: Understanding the cultural and social factors influencing the acceptance and utilization of KL in postpartum recovery is important. Exploring women's and healthcare providers' perceptions, beliefs, experiences, and potential barriers to the adoption of KL can provide insights into its integration into diverse cultural and social contexts.

Addressing these knowledge gaps through rigorous scientific inquiry and interdisciplinary research endeavors would further illuminate the potential of KL in postpartum care. This would not only expand the understanding of its efficacy and safety but also pave the way for its informed and culturally sensitive integration into healthcare practices.

8.CONCLUSION

Kaayakam Lehyam (KL) combines ancient Ayurvedic

principles with modern ethnomedicinal insights to aid women's postpartum recovery. It's a blend of herbs, natural elements, and minerals chosen for their therapeutic benefits. KL aims to support digestion, boost immunity, and promote overall well-being in new mothers. By drawing on traditional healing practices, it seeks to provide comprehensive postpartum care. In countries like India, postpartum care is crucial for maternal and infant health, and government policies reflect its importance.

1.Insights Provided by the Review: The review has provided a comprehensive understanding of these medicinal plants, shedding light on several aspects such as their physical characteristics, classification within the plant kingdom, pharmacognostic features (morphology, taste, odor, etc.), and chemical constituents (phytochemicals). This detailed insight is crucial in identifying the diverse components present in the formulation and understanding their potential health benefits.

2.Importance of Further Research: While the review has offered valuable information, it emphasizes the necessity for continued and more focused research. Specifically, further exploration into the specific phytochemical compositions of the "Kaayakam" formulation is crucial. Detailed analysis of the bioactive compounds present in these herbs can provide deeper insights into their medicinal properties, mechanisms of action, and potential synergistic effects when combined.

3.Potential Implications and Applications: Understanding the precise phytochemical constituents and their interactions within the "Kaayakam" formulation could have substantial implications. This knowledge might not only validate the traditional uses of these herbs but also open doors for the development of new pharmaceutical drugs or therapeutic interventions. It could attract interest from research institutions and pharmaceutical industries for the formulation of novel, evidence-based medicines.

4.Advancement of Knowledge and Holistic Health: The pursuit of in-depth research on the polyherbal formulation "Kaayakam" is pivotal for advancing scientific knowledge. Unlocking the full potential of these versatile herbs could contribute significantly to holistic health and overall well-being. It may lead to the development of holistic treatment approaches that harness the therapeutic benefits of these herbs in promoting human health.

In summary, the conclusion emphasizes the importance of further detailed investigations into the specific phytochemical constituents of "Kaayakam" to unlock their complete medicinal potential. This understanding could catalyze advancements in medicine and pave the way for evidence-based therapeutic interventions, potentially benefitting

global healthcare.

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10.CONFLICT OF INTEREST

The authors affirm that they do not have any conflicts

of interest to declare.

11.ABBREVIATIONS

CDC: Centers for Disease Control and Prevention; KL: Kaayakam Lehyam; MMR: Maternal Mortality Rate; NFHS: National Family Health Survey; UNICEF: United Nations Children's Fund; WHO: World Health Organization

REFERENCES

1. WHO, UNICEF, UNFPA, World Bank. Trends in maternal mortality: 1990 to 2010. Geneva: World Health Organization 2012.
2. Darmstadt GL, Bhutta ZA, Cousens S et al. Evidencebased, cost-effective interventions: how many new born babies can we save? Lancet 2005; 365:977-88.
3. MoHFW. Reproductive and Child Health Programme: Schemes for Implementation. New Delhi: Department of Family Welfare, MoHFW 1997.
4. Chaturvedi,A, Tiwari AK, Mani RJ. Traditional practices of using various medicinal plants during postnatal care in Chitrakoot district Indian J Traditional Knowledge, 2017; 16: 605– 613.
5. Goyal, M. Use of ethnomedicinal plants for prophylaxis and management of postpartum complications among the Marwari community of Jodhpur District of Rajasthan. Food Quality and Safety, 2017; 1(3), 203-210.
6. Sonitha S, Kumar SP. Traditional practices of postnatal care using medicinal plants in Tirunelveli district, Tamil Nadu, India. J Med Plants, 2021; 9(5), 59-62.
7. Asima Chatterjee, Satyesh Chandra Prakash, The Treatise on Indian Medicinal plants, National Institute of Science Communication, CSIR. Reprint, 1997; 1.
8. Asima Chatterjee, Satyesh Chandra Prakash, The Treatise on Indian Medicinal plants, National Institute of Science Communication, CSIR. Vol 2, reprint 2000.
9. Asima Chatterjee, Satyesh Chandra Prakash, The Treatise on Indian Medicinal plants, National Institute of Science Communication, CSIR., second edition, 1997; 3.
10. Asima Chatterjee, Satyesh Chandra Prakash, The Treatise on Indian Medicinal plants, National Institute of Science Communication, CSIR, 1997; 5.
11. The Wealth of India – Raw materials, A, Council of Scientific and Industrial Research, 1956; 1.
12. The Wealth of India – Raw materials, F-G, Council of Scientific and Industrial Research, 1956; 1(4): 151-154.
13. The Wealth of India – Raw materials, Vol III: D-E, , Council of Scientific and Industrial Research, 1952; 149-160.
14. Sharma A, Singh R, Patel S. Effects of Kaayakam Lehyam on Postpartum Physical Recovery. Journal of Traditional Medicine, 2018; 12(3), 45-58.
15. Devi P, Kumar N, Gupta S. Kaayakam Lehyam and Emotional Well-being in Postpartum Women. International Journal of Women's Health, 2019; 6(2), 112-125.
16. Nair K, Reddy M, Thomas L. Role of Kaayakam Lehyam in Supporting Lactation: A Comparative Study. Journal of Herbal Medicine, 2020; 18(4), 275-288.
17. Menon S, Sharma P, Kapoor A. Bioactive Compounds in Kaayakam Lehyam and Their Antioxidant and Anti-inflammatory Effects. Journal of Ethnopharmacology, 2017; 25(1), 32-45.
18. Parth Hirpara, Nitin Thakare, VD Kele and Dhruvin Patel. Jaggery: A natural sweetener. J Pharmacogn Phytochem 2020;9(5):3145-3148.
19. Sharifi-Rad J, Painuli S, Sener B, Kılıç M, Kumar NV, Semwal P, Docea AO, Suleria HA, Calina D. Revisiting the nutraceutical profile, chemical composition, and health benefits of jaggery: Updates from recent decade. eFood. 2023 Apr;4(2):e75.
20. Kumar A, Tripathi S, Hans N, Pattnaik HS, Naik SN. Ghee: Its properties, importance and health benefits. Lipid Universe. 2018;6:6-14.
21. Subramaniam K, Subramanian SK, Bhargav S, Parameswari R, Praveena R, Ravikumar R, Yuvaraj E, Kumar VM. Review on potential antiviral and immunomodulatory properties of Piper Longum. InIOP Conference Series: Materials Science and Engineering Apr 1 (Vol. 1145, No. 1, p. 012099). IOP Publishing, 2021.
22. Chatterjee A, Dutta CP. The structure of piperlongumine, a new alkaloid isolated from the roots of Piper longum. Sci Cult, 1963; 29: 568-70.
23. Singh S, Priyadarshi A, Singh B, Sharma P. Pharmacognostical and phytochemical analysis of Pippali (Piper longum Linn.). The Pharma Innovation Journal, 2018; 7(6): 286-9.
24. Atal CK. Occurrence of sesamin in Piper longum Linn. Indian J Chem, 1966; 4: 252.
25. Pradeepa R, Vijayakumar TM, Manikandan K,

- Ananth Kumar, Kammala, Cytochrome P450-mediated alterations in clinical pharmacokinetic parameters of conventional drugs coadministered with piperine: a systematic review and meta-analysis, *Journal of Herbal Medicine*, Volume 41, 2023, 100713, ISSN 2210-8033
26. 26. Elazzouzi, Hanane & Fadili, Kamal & Cherrat, Ali & Amalich, Smail & Zekri, Nadia & Zerkani, Hannou & Tagnaout, Imane & Hano, Christophe & Lorenzo, Jose M. & Zair, Touria. *Phytochemistry, Biological and Pharmacological Activities of the Anacyclus pyrethrum (L.) Lag: A Systematic Review. Plants.* 2022; 11. 2578. 10.3390/plants11192578.
 27. 27. Jawhari FZ, El Moussaoui A, Bourhia, M, Imtara, H, Mechchate H, Es-Safi I, Ullah R, Ezzeldin E, Mostafa GA, Grafov A et al. *Anacyclus pyrethrum (L.): Chemical Composition, Analgesic, Anti-Inflammatory, and Wound Healing Properties. Molecules* 2020; 25, 5469.
 28. 28. Gautam H, Asrani R. *Phytochemical and Pharmacological Review of an Ethno Medicinal Plant: Saussurea lappa. Veterinary Research.* 2018; 6(01): 01-09.
 29. 29. Madhuri K, Elango K, Ponnusankar S. *Saussurea lappa (Kuth root): review of its traditional uses, phytochemistry and pharmacology. Oriental Pharmacy and Experimental Medicine.* 2012; 12(1). <https://doi.org/10.1007/s13596-011-0043-1>
 30. 30. Zahara K, Tabassum S, Sabir S, Arshad M, Qureshi R, Amjad M. et al. *A review of therapeutic potential of Saussurea lappa- An endangered plant from Himalaya. Asian Pac J Trop Med* 2014; 7(1):S60- S69.
 31. 31. Rao KS, Babu GV, Ramnareddy YV. *Acylated Flavone Glycosides from the Roots of Saussurea lappa and Their Antifungal Activity. Molecules* 2013; 12(3):328-344.
 32. 32. Kokate CK, Purohit AP, Gohkale SB. *Pharmacognosy. In: Terpenoids, 21st Edition, Nirali Prakashan, Pune, 2002; 377-378.*
 33. 33. Paritakul Punwara, Ruan Grong Morakotkasem. *Laosooksathil Wipadaet. All. The effect of ginger on breast milk volume in the early post-partum period, A Randomised double-blind controlled trial. Breast feeding medicine* 2016;11(7):361-365.
 34. 34. Poonam Chhabra et al. *A review on shunthi (Zingiber officinale Rosc.) with special reference to nighantus. J Pharm Sci Innov.* 2020;9(6):171-174.
 35. 35. *Ginger from Farmyard to Town: Nutritional and Pharmacological Applications* Jeremiah Oshiomame Unuofin, Nelisiwe Prenate Masuku , Oluwatomiwa Kehinde Paimo and Sogolo Lucky Lebelo | published: 26 November 2021 doi: 10.3389/fphar.2021.779352
 36. 36. Bhatt, Neeru & Waly, Mostafa & Essa, MM & Ali, Amanat. (2013). *Ginger: A functional herb.*
 37. 37. Ravi Kumar, Lakshmanan AJ, Ravi S. *Chemical constituents from Clerodendron serratum. J Asian Nat Prod Res.* 2008; 10 (7- 8): 659- 62.
 38. 38. Vidya SM, Krishna V, Manunatha BK, Mankani KL, Ahmed M, Singh SD. *Evaluation of the hepatoprotective activity of Clerodendrum serratum L. Indian J Exp Biol.* 2007;45 (6): 538- 42.
 39. 39. Narayanan N, Thirugnana- Samantha M P, Viswanathan S, Vijayasekaran, V Sukumar E. *Antinociceptive, anti-inflammatory and antipyretic effects of ethanol extract of Clerodendron serratum roots in experimental animals. J Ethnopharmacology.* 1999; 65 (3): 237-41.
 40. 40. Kumar, Praveen & Nishteswar, K.. *Phyto-chemical and pharmacological profiles of Clerodendrum serratum Linn. (Bharngi): A review. International Journal of Research in Ayurveda and Pharmacy.* 2013; 4. 276-278. 10.7897/2277-4343.04239.
 41. 41. Patel, Dr & D, Bhoja. *Phytochemical and Pharmacological Properties of Clerodendrum serratum LINN.: A Comprehensive Review. International Journal of Pharmaceutical Sciences Review and Research.* 2023; 80. 10.47583/ijpsrr. 2023.v80i01.010.
 42. 42. Mohamad Hesam Shahrajabian, Wenli Sun, Qi Cheng. *Pharmaceutical Benefits and Multidimensional uses of Ajwain (Trachyspermum ammi L.). Pharmacogn. Commn.* 2021;11(2):138-141
 43. 43. Goyal, Saloni, Chaturvedi, Varunesh, Dhingra, Garima, Tanwar, Sonia, Sharma, Kapil Singh, Sandeep. *Trachyspermum ammi A review on traditional and modern pharmacological aspects. Biological Sciences.* 2022; 2. 324-327. 10.55006/biolsciences.2022.2401.
 44. 44. Akhilesh Kumar: *Pharmacognostical And Phytochemical Evaluation Of Haritaki (Terminalia chebula Retz.) Fruit Pulp, Ijpcbs* 2017; 7(4), 381-387.
 45. 45. Singh Rajani, Rath Sudipta Kumar. *Review of haritaki (terminalia chebula retz.) As an ekal dravya chikitsa in brihatrayee. International Journal of Ayurveda and Pharma Research,* 2021; 9(1), 33-40.
 46. 46. Tejaswini ,Prasad Babar., *Haritaki- An Ayurvedic Literature Review, International Journal Of Scientific Research Volume - 10 | Issue - 07 | July - 2021 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr*
 47. 47. Mohiuddin AKM, Islam, Maidul Mahmud, Shahin Aminul, Md Apu, Md. Aminul Islam Halder, Joyanta Sadek, Md Khoka, Md. Sadek Rakib, Hasibul Shome, Binita Islam, Md Islam, Shariful. *A comprehensive biological, ethno-pharmacological and phytochemical update review on ayurvedic plant of terminalia chebula (hortoki) of bangladesh. World Journal of Pharmaceutical Research.* 2015; 4. 386-405.
 48. 48. Damanhoury ZA, Ahmad A. *A review on therapeutic potential of Piper nigrum L. Black Pepper): The King of Spices. Med. Aromat. Plants.* 2014;3(3):161.
 49. 49. Majumdar, Banishree & Malviya, Rishabha & Sharma, Akanksha. *Therapeutic Benefits of Piper nigrum: A Review. Current Bioactive Compounds.* 2021 18. 10.2174/1573407218666211222143301.
 50. 50. Takooree, Heerasing, Aumeeruddy, Zakariyyah & Rengasamy, Kannan & Venugopala, Katharigatta & Jeewon, Rajesh & Zengin, Gokhan & Mahomoodally, Fawzi. *A systematic review on black pepper (Piper nigrum L.): From folk uses to pharmacological*

- applications. *Critical Reviews in Food Science and Nutrition*. 2018; 59. 10.1080/10408398.2019.1565489.
51. 51. Al-Snafi AE. The pharmacological activities of *Cuminum cyminum*-A review. *IOSR Journal of Pharmacy*. 2016; 6(6):46-65.
 52. 52. Allaq A, Sidik N, Abdul-Aziz A, Ahmed I. Cumin (*Cuminum cyminum* L.): A review of its ethnopharmacology, phytochemistry. *Biomedical Research and Therapy*, 2020; 7(9), 4016-4021.
 53. 53. Tembhurne SV, Feroz S, More BH, Sakarkar DM. A review on therapeutic potential of *Nigella sativa* (kalonji) seeds. *Journal of Medicinal Plants Research*. 2014; 17;8(3):167-77.
 54. 54. Wani, Imtiyaz. *Nigella sativa*—A Medicinal herb with immense therapeutic potential (a systematic Review). 2023; 5. 755-762.
 55. 55. Sadik Aref .Role of *Nigella sativa* in Preventing Oxidative Stress Damage Using *Planaria* as Model Organism, *Journal of Herbs, Spices & Medicinal Plants*, 2023. DOI: 10.1080/10496475.2023.2255164
 56. 56. JaniceS Mani, JoelB Johnson, Surya Bhattarai, Tienneke Trotter,Mani Naiker. Phytochemistry and Therapeutical Potential of New *Nigella Sativa* Genotypes from Australia, *Journal of Herbs, Spices & Medicinal Plants*, 2023; 29:3, 229-249, DOI: 10.1080/10496475.2022.2140738
 57. 57. Eram SH, Mujahid M, Bagga PA, Ansari VA, Ahmad MA, Kumar AR, Ahsan FA, Akhter MS. A review on phytopharmacological activity of *Alpinia galanga*. *Int J Pharm Pharm Sci*. 2019;11:6-11.
 58. 58. Verma RK, Garima M, Pradeep S, Jha KK, Khosa RL. *Alpinia galanga*-an important medicinal plant: a review. *Der Pharmacia Sinica*. 2011;2(1):142-54.
 59. 59. Chudiwal AK, Jain DP, Somani RS. *Alpinia Willd.*—An overview on phyto-pharmacological properties.
 60. 60. Ye Y, Li B. 1'S-1'-acetoxychavicol acetate isolated from *Alpinia galanga* inhibits human immunodeficiency virus type 1 replication by blocking rev transport. *J Gen Virol*. 2006; 87(7): 2047-53. 86.
 61. 61. Lim MA, Pranata R. The insidious threat of jamu and unregulated traditional medicines in the COVID-19 era. *Diabetes Metab Syndr*. 2020; 14(5): 895-6. 87.
 62. 62. Utomo RY, Ikawati M, Meiyanto E. Revealing the potency of Citrus and Galangal constituents to halt SARS-CoV-2 infection. *Preprints*. 2020; 2020030214.

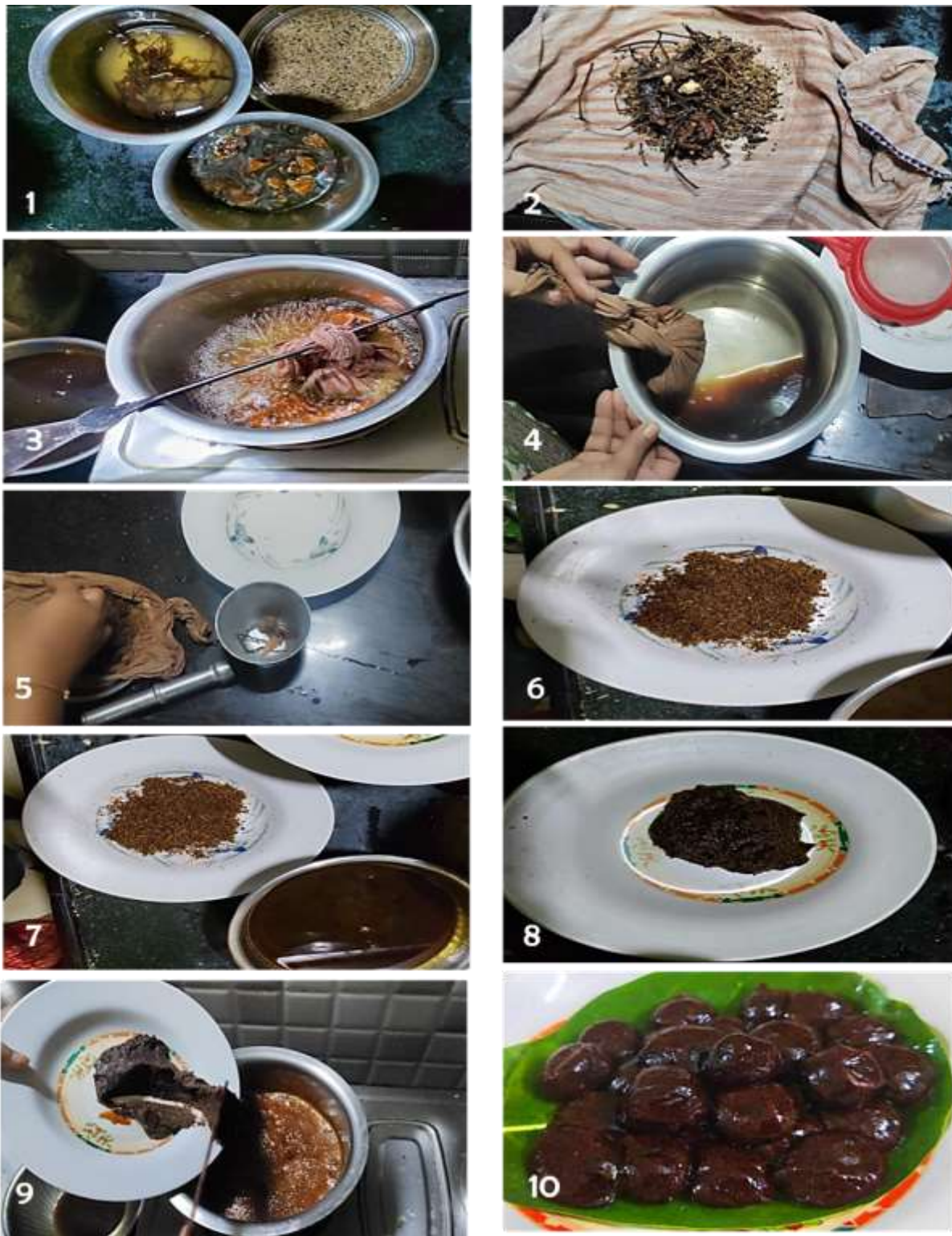






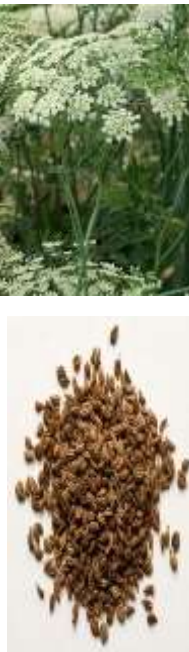




Figure 1: Sequential Steps in the Preparation of Kaayakam Leyham: 1. Soaking, 2. Cloth Binding, 3. Infusion, 4. Extraction, 5. Ingredient Grinding, 6. Powder Preparation, 7. Combining Infused Water with Powder, 8. Paste Formation, 9. Mixing Paste with Jaggery, 10. Shaping Kaayakam Leyham Balls



Table 1: Plant Profile and Characteristics: Including Plant Images, Parts Used, Classification, Vernacular Names, and Morphological Descriptions.

Sl.no	Plant Image	Classification	Vernacular names	Morphological Description	Reference
1		<p>Kingdom: Plantae</p> <p>Division: Magnoliophyta</p> <p>Class: Magnoliopsida</p> <p>Order: Piperales</p> <p>Family: Piperaceae</p> <p>Genus: Piper</p> <p>Species: Longum</p>	<p>Telugu: Pippallu Pippali</p> <p>Hindi: Pipali Pipar Pipal</p> <p>Sanskrit: Ushana Kana Magadhi Pippali Krishnapippali</p> <p>English: Long pepper</p> <p>Ayurveda: Pippali, pippalimula</p>	<p>It's a perennial climbing plant, a fragrant shrub from the Piperaceae family. The plant has woody roots and broad ovate leaves shaped like a heart. Its stem creeps, forming joints and thickened nodes. The leaves, which vary in size, are spreading, alternate, lack stipules, and range from 5-7 cm long at the bottom to 2-3 cm long at the top. The flowers are cylindrical, growing in solitary spikes, while the small fruits are ovoid, appearing in fleshy spikes, and measure 2.5-3.5 cm in length and 5 mm in width. When mature, the spikes become elongated, cylindrical, and oblong. The berries, red or black, possess a pungent taste and aromatic odor and are harvested and dried for commercial pippali. The root, known as pippalimula, is utilized in medicinal contexts.</p>	[21],[22], [23],[24]
2		<p>Kingdom: Plantae</p> <p>Division: Magnoliophyta</p> <p>Class: Magnoliopsida</p> <p>Order: Piperales</p> <p>Family: Piperaceae</p> <p>Genus: Piper</p> <p>Species: Longum</p>	<p>Telugu: Pippallu Pippali</p> <p>Hindi: Pipali Pipar Pipal</p> <p>Sanskrit: Ushana Kana Magadhi Pippali Krishnapippali</p> <p>English: Long pepper</p> <p>Ayurveda: Pippali, pippalimula</p>	<p>This plant, part of the Piperaceae family, is a petite, perennial climber and emits a delightful aroma. Its roots are sturdy and wide-ovate, while the stem, which creeps along, forms joints and thickens at the nodes. The leaves, alternately spread, lack stipules, and come in various blade sizes. Ranging from 5-7 cm at the base to 2-3 cm at the top, the leaves differ in length. Its flowers are cylindrical and appear singularly on spikes. The small, ovoid fruits grow in fleshy spikes, are blunt, oblong, blackish-green, about 2.5-3.5 cm long, and 5 mm wide. When mature, the spikes elongate, becoming long, cylindrical, and oblong. The red or black berries emit an aromatic scent and have a pungent taste, making them suitable for collection and drying as commercial pippali. The root, known as pippalimula, holds medicinal significance.</p>	[21],[22], [23],[24]

<p>3</p>		<p>Kingdom: Plantae</p> <p>Division: Magnoliophyta</p> <p>Class: Magnoliopsida</p> <p>Order: Asterales</p> <p>Family: Asteraceae</p> <p>Genus: Anacyclus</p> <p>Species: pyrethrum</p>	<p>Telugu: Akkalakarra Akarakaram</p> <p>Hindi: Akarkara</p> <p>Sanskrit: Akarkara</p> <p>English: Pellitory</p> <p>Ayurveda: Akarkara</p>	<p>Pyrethrum, a perennial member of the Asteraceae family, stands at a height ranging from 40 to 60 cm. Its defining features include multiple simple or slightly branched stems sprouting from the earth and adorned with delicately pubescent, finely cut leaves. The flowers, centered in yellow, boast white ray florets internally and purple exteriors. Its roots, lengthy and robust, sport a brown exterior and a white interior. The fruit, known as Achene, appears bald or occasionally bears a faint crown.</p>	<p>[26],[27]</p>
<p>4</p>		<p>Kingdom: Plantae</p> <p>Division: Magnoliophyta</p> <p>Class: Magnoliopsida</p> <p>Order: Asterales</p> <p>Family: Asteraceae</p> <p>Genus: Saussurea</p> <p>Species: Lappa</p>	<p>Telugu: Changalakosta Changalva Koshtu</p> <p>Hindi: Kostum, Kutha</p> <p>Sanskrit: Koshtu</p> <p>English: Costus Kut root</p> <p>Ayurveda: Kushta Amaya Pakala</p>	<p>Saussurea lappa, commonly referred to as Costus, is a towering perennial herb, reaching heights of 1-2 meters. Its upright stem is robust and fibrous, while the root extends approximately 60 cm, carrying a distinctive fragrance. The leaves, characterized by lobes, are stalked, membranous, and irregularly toothed. Upper leaves tend to be smaller, whereas basal leaves are larger and possess long, lobately winged stalks. Its stalkless flowers, in shades ranging from dark purple to black, cluster in terminal and axillary heads. The pappus, about 1.7 cm long, is fluffy and feathery, lending an intriguing appearance to the fruiting flower heads. The fruit of S. lappa is cupped, curved, compressed, and covered in fine hair.</p>	<p>[28],[29]. [30],[31]</p>
<p>5</p>		<p>Kingdom: Plantae</p> <p>Division: Magnoliophyta</p> <p>Class:Liliopsida</p> <p>Order: Zingiberales</p> <p>Family: Zingiberaceae</p> <p>Genus: Zingiber</p> <p>Species: Officinale</p>	<p>Telugu: Sonthi, Sunti</p> <p>Hindi: Sonth</p> <p>Sanskrit: Sunthi, Ausadha Muhausadha, Nagara, Vishva, Vishvabhesaja, Shringavera, Vishva, Vishvausadha</p> <p>English: Ginger root</p> <p>Ayurveda: Sunthi</p>	<p>It's an upright perennial herb characterized by its aromatic rhizome. The stem stands erect, leafy, ranging from 15 to 150 cm in height. Its leaves, nearly stalkless, are linear-lanceolate or lanceolate, tapering to a point, smooth, and measure 10-30 cm in length. Flowers, extending up to 12 cm, are covered with sheaths; the bract is 2-5 cm x 2 cm, light green; the corolla tube is light yellow, while the lip is orbicular, displaying a dull purple hue with creamy blotches. The rhizome, laterally compressed, carries short, flattened, ovate, and slanting attributes, emitting an agreeable and aromatic odor, with a taste that is both agreeable and pungent. The roots are fibrous and fleshy.</p>	<p>[32],[33]. [34],[35]. [36]</p>

<p>6</p>		<p>Kingdom: Plantae</p> <p>Division: Magnoliophyta</p> <p>Class: Dicotyledons</p> <p>Order: Lamiales</p> <p>Family: Verbenaceae</p> <p>Genus: Clerodendrum</p> <p>Species: serratum</p>	<p>Telugu: Gantubharangi</p> <p>Hindi: Bharangi Babhanaiti</p> <p>Sanskrit: Bharangi , Padma, Kharasakha</p> <p>English: Glory bower, Beetle Killer, Blue glory, Turk’s turban moon</p> <p>Ayurveda: Bhrgubhava Padma phanji, brahmana yastika</p>	<p>Clerodendron, derived from "clero" meaning chance due to the uncertain medical properties, and "dendron" signifying shrub. Bharangi is a shrub reaching up to 7 feet in height. The stem of Bharangi is distinctly four-sided, with young parts appearing smooth. Its opposite leaves are sizable, often around 12-15 cm long and 5.5-6 cm wide, oblong or elliptic, pointed at the ends, deeply and sharply serrated, smooth, with robust petioles measuring 6 mm long. The inflorescence of Bharangi forms a panicle, about 15-20 cm long. Its fruit is a drupe, approximately 6 mm long, somewhat juicy, broadly obovoid, typically divided into four lobes.</p> <p>The roots of Bharangi are hard, cylindrical, dark brown, featuring scattered patches of small bead-like warts and circular scars. Upon splitting, the internal parts exhibit a creamish-yellow, longitudinally ridged woody surface with distinct pith. The bark, up to 2 mm thick, consistently encompasses a significant portion of the woody root. This root is tough, fibrous, and resistant to breakage, lacking any noticeable odor.</p>	<p>[37],[38], [39],[40], [41]</p>
<p>7</p>		<p>Kingdom: Plantae</p> <p>Division: Spermatophyta</p> <p>Class: Dicotyledons</p> <p>Order: Apiales</p> <p>Family: Apiaceae</p> <p>Genus: Trachyspermu m</p> <p>Species: Ammi</p>	<p>Telugu: Vamu</p> <p>Hindi: Ajwain, Jevain</p> <p>Sanskrit: Yamini, Yaminiki, Yaviniki</p> <p>English: Bishop's weed</p> <p>Ayurveda: Ajwain</p>	<p>Ajwain is an extensively branched annual herb, reaching heights of 60-90 cm. Its stem bears distinctive striations. The inflorescence forms a compound umbel containing 16 umbellets, each capable of holding up to 16 flowers. These actinomorphic flowers appear white and exist in male and bisexual forms. The leaves are pinnate, comprising a terminal leaflet and seven pairs of lateral leaflets. The fruit is aromatic, ovoid, cordate, and consists of a cremocarp with a persistent stylopodium. Each fruit contains two mericarps, appearing grayish-brown, ovoid, and compressed.</p>	<p>[42],[43]</p>

<p>8</p>		<p>Kingdom: Plantae</p> <p>Division: Magnoliophyta</p> <p>Class: Dicotyledons</p> <p>Order: Myrtales</p> <p>Family: Combretaceae</p> <p>Genus: Terminalia</p> <p>Species: Chebula</p>	<p>Telugu: Karakkaya</p> <p>Hindi: Harre, Harad, Harar</p> <p>Sanskrit: Abhaya, Kayastha, shiva, Pathya</p> <p>English: Myrobalan</p> <p>Ayurveda: Haritaki</p>	<p>Terminalia chebula is a moderate-sized deciduous tree reaching heights of up to 25 meters and a diameter of 60-80 centimeters. Its crown is rounded with spreading branches, displaying dark brown branches adorned with woody scales. The leaves are thin-coriaceous, ovate, and round at the base, supported by petioles of up to 2 centimeters in length. The tree blooms with spike flowers measuring 5-7 centimeters long, featuring a five-lobed calyx and an absent corolla. The flowers also bear 10 stamens and a single-celled ellipsoid drupe fruit that ranges from yellow to orange-brown when ripe.</p>	<p>[44],[45]. [46],[47]</p>
<p>9</p>		<p>Kingdom: Plantae</p> <p>Division: Magnoliophyta</p> <p>Class: Equisetopsida</p> <p>Order: Piperales</p> <p>Family: Piperaceae</p> <p>Genus: Piper</p> <p>Species: Nigrum</p>	<p>Telugu: Miriyalu</p> <p>Hindi: Kali Mirch</p> <p>Sanskrit: Maricha</p> <p>English: Black Pepper</p> <p>Ayurveda: Vellaja</p>	<p>It's a woody climber that can extend up to 10 meters by utilizing aerial roots. Each slender spike holds around 40-50 small blossoms that shift to a yellowish-red hue when mature, carrying a single seed at that stage. The drupe fruit, referred to as peppercorn, measures approximately 5mm in diameter. Black pepper harbors essential oils that impart its distinctive aromatic fragrance.</p>	<p>[48],[49]. [50]</p>

<p>10</p>		<p>Kingdom: Plantae</p> <p>Division: Tracheophyta</p> <p>Class: Magnoliopsida</p> <p>Order: Apiales</p> <p>Family: Apiaceae</p> <p>Genus: Cuminum</p> <p>Species: cyminum</p>	<p>Telugu: Jeela karra, Jeelakari, Jelakara</p> <p>Hindi: Safad Jeera, Jeera, Sada jeera</p> <p>Sanskrit: Jeerak, Deeraghjeerak, Jaran</p> <p>English: Cumin, Roman caraway</p> <p>Ayurveda: Jeerak,Jiraka</p>	<p>The plant is a slender, smooth annual that stands between 10 to 50 cm tall. Its stem bifurcates at the base and remains smooth. The leaves are also smooth and finely pinnatifid, tapering into oblong-linear tips, predominantly doubly trifoliate at the lower ends. Its fruit, a schizocarp, measures roughly 6 mm in length and 1.5 mm in width, topped with awl-shaped calyx tips. The mericarp is nearly round in cross-section, featuring five thread-like, bristly main ribs along with bristly secondary ribs.</p>	<p>[51],[52]</p>
<p>11</p>		<p>Kingdom: Plantae</p> <p>Division: Tracheophyta</p> <p>Class: Magnoliopsida</p> <p>Order: Ranunculales</p> <p>Family: Ranunculaceae</p> <p>Genus: Nigella</p> <p>Species: Sativa</p>	<p>Telugu: Nallajila</p> <p>Hindi: Kalonji, Kala Jeera, Kalongi</p> <p>Sanskrit: Kalajaji, Krishana jiraka</p> <p>English: Black Cumin, Blackcaraway</p> <p>Ayurveda: Kalonji,Nigella</p>	<p>It's a compact, self-branching plant, typically reaching 50 to 60 cm in height. The leaves are segmented into linear sections, about 2 to 3 cm long, arranged oppositely in pairs along the stem. Lower leaves tend to be smaller and have petioles, while upper leaves are elongated. The plant blooms with pale bluish or white flowers that emerge at the tips of its branches. Nigella sativa reproduces independently, producing fruit capsules containing numerous trigonal seeds. Upon maturation, the capsule opens, revealing triangular, black seeds with a potent, pungent aroma, indicative of the considerable oil content they contain.</p>	<p>[53],[54], [55],[56]</p>


<p>12</p>		<p>Kingdom: Plantae</p> <p>Division: Magnoliophyta</p> <p>Class: Liliopsida</p> <p>Order: Zingiberales</p> <p>Family: Zingiberaceae</p> <p>Genus: Alpinia</p> <p>Species: Galanga</p>	<p>Telugu: Dumpa rastram</p> <p>Hindi: kulanjan</p> <p>Sanskrit: kulanja</p> <p>English: greater galangal</p> <p>Ayurveda: Kulanjan</p>	<p>It's an herbaceous plant capable of reaching up to 3.5 centimeters in height, characterized by its underground rhizomes and small adventitious roots. These rhizomes display a red-brown hue on their surface, while their interior showcases shades of brown and orange. Typically measuring 2.5–10 cm long, the plant features an erect pseudo-stem adorned with leaves. Its compound flowers, about 3–4 cm in length, emit a pleasant fragrance, with green bases transitioning into white buds. The resulting fruit takes on an ellipsoidal, capsule-like shape.</p>	<p>[57],[58], [59],[60], [61],[62]</p>
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Table 2: Herbs with their phytochemicals, Pharmacological, and Ethnomedicinal uses.

This table presents various herbs along with their specific parts used, phytochemical constituents, traditional ethnomedicinal uses, and pharmacological properties:

Sl.No	Part used	Phytochemical constituents	Ethnomedicinal uses	Pharmacological and Therapeutic Properties	Reference
1&2	Root	Alkaloids-piperine, piperlonguminine, Piperlongumine.	Root improve digestion, joint health, reproductive health. Fruit helps in bronchitis, asthma, tuberculosis, fever.	Antibacterial, Antimicrobial, Anti-amoebic, Antidiabetic, Antioxidant, Neuroprotective, Anti-asthmatic, Anti-tumor, Anticancer, Hepatoprotective, Antiplatelet, Analgesic, Melanin inhibiting activity, Anti-inflammatory.	[21][22][23][24][25]
3	Root	Tannins, alkaloids, resin, tannic acid, sesamin, lignin.	Against rheumatism, colds, mouth inflammation, toothaches.	Antioxidant, Antidiabetic, Insecticidal, Antidepressant, Antimicrobial, Anti-inflammatory, Aphrodisiac, Anticonvulsant, Anticancer, Immunostimulator, Stomach ailments treatment.	[26][27]
4	Root	Alkaloid-saussurin, bitter	For stomach-ache,	Antidepressant, Antimicrobial,	[28],[29],[30],[31]

Sl.No	Part used	Phytochemical constituents	Ethnomedicinal uses	Pharmacological and Therapeutic Properties	Reference
		resin, tannins, Acylated flavone glycosides.	headache, rheumatism, chest pain, fever, hiccups.	Bronchitis treatment, Cancer management, Immuno-modulation, Epilepsy.	
5	Rhizome	Phenols, Volatile compounds, Gingerols, Shogaols, Bisapolene, Zingiberene, Zingiberol, Sesquiphellandrene, Curcumene, and more.	Digestion, motion sickness, respiratory issues, blood circulation.	Antibiotic, Analgesic, Anti-diabetic, Anti-inflammatory, Antioxidant, Anti-obesity, Anti-hypertension, Cardioprotective, Male infertility protection.	[32],[33],[34],[35],[36]
6	Root	Serratin, D-mannitol, gamma-Sitosterol, saponins, ursolic acid, catechin, flavonoids, etc.	Against cold, cough, asthma, liver disorders, rheumatism.	Antimicrobial, Anti-inflammatory, Bronchodilator, Antiallergic, Antioxidant, Vasorelaxant.	[37],[38],[39],[40],[41]
7	Seed	Thymol, Carvacol, Dillapiole, Limonene, Linoleic acid, Gamma terpinene, and more.	Treats various ailments from cold to pneumonia.	Antiseptic, Antispasmodic, Expectorant, Antifungal, Antihypertensive, Anti-inflammatory, Diuretic, Antitussive, Anti-lithiasis.	[42],[43]
8	Fruit	Glycosides, Flavonoids, Chebulic acid, Gallic acid, Ellagic acid, Sorbitol, Anthraquinone, etc.	Alleviates constipation, respiratory infections, oral care, digestive health.	Anticancer, Antibacterial, Antidiabetic, Antifungal, Antioxidant, Anti-inflammatory, Anti-aging.	[44],[45],[46],[47]
9	Fruit	Piperine, Phenolics, Alkaloids, Terpenes, Amides, Lignans, etc.	Treats fever, cough, dysentery, and digestive issues.	Antihypertensive, Anticancer, Antioxidant, Anti-inflammatory, Antidiarrheal, Antispasmodic, Immunomodulatory, Antibacterial, Antifungal.	[48],[49],[50]
10	Fruit	Alkaloid, Coumarin, Anthraquinone, Flavonoid, Glycoside, Resin, Tannin, Acids, etc.	Addresses hoarseness, dyspepsia, and other ailments.	Antimicrobial, Antioxidant, Anti-inflammatory, Analgesic, Antipyretic, Immunological effects.	[51],[52]
11	Seed	Thymoquinone, Thymol, Alkaloids, Flavonoids, Glucoside, Rutin, etc.	Used for asthma, hypertension, and other disorders.	Anti-obesity, Anti-inflammatory, Digestive, Antitussive, Diuretic, Galactogogue, Anti-tumor, Anti-allergic, Antiviral.	[53],[54],[55],[56]
12	Rhizome	Alpinine, Kaempferide, Camphor, Galangin, Pineol, etc.	For stomach pain, rheumatism, asthma, diabetes, heart disease.	Antimicrobial, Anti-inflammatory, Antioxidant, Immunomodulatory, Anti-tumor, Anti-allergic, Anti-SARS-CoV-2 activity.	[57],[58],[59],[60],[61],[62]