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Review Article

Murmakki (*Commiphora myrrha*): An Integrative Review of Unani Medicine, Phytochemistry and Pharmacological Evidence

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Abstract

Background: Murmakki, commonly known as myrrh and botanically identified as *Commiphora myrrha* (T.Nees) Engl., is an important oleo-gum-resin used in Unani medicine for various inflammatory, infectious, gastrointestinal, respiratory, wound-related and gynaecological conditions. Despite its longstanding traditional use, the available evidence remains scattered across classical literature and modern scientific studies. **Objective:** This review aims to provide an integrative and critical overview of Murmakki, with particular emphasis on its Unani traditional concepts, botanical and pharmacognostic characteristics, phytochemical constituents, pharmacological activities, clinical evidence, safety, and quality-control considerations. **Methods:** Relevant literature was reviewed from classical Unani texts, pharmacognostic references, and scientific databases including PubMed/MEDLINE, Scopus, ScienceDirect, and Google Scholar. Published literature concerning *Commiphora myrrha*, Murmakki, myrrh, phytochemistry, pharmacology, clinical studies, safety, and Unani medicinal applications was evaluated and organised according to the level of available evidence. **Results:** *C. myrrha* contains diverse phytoconstituents, particularly terpenoids and characteristic furanosesquiterpenes. Experimental studies have reported anti-inflammatory, analgesic, antimicrobial, antioxidant, antidiabetic, neuroprotective, cytotoxic and gastroprotective activities. These findings provide varying degrees of preclinical support for several traditional applications. However, clinical evidence remains limited, and differences in botanical source, chemical composition, extraction methods, and standardization affect reproducibility and interpretation. **Conclusion:** Murmakki demonstrates considerable pharmacological potential; however, most evidence remains preclinical. Proper botanical authentication, chemical standardization, detailed safety evaluation, and well-designed clinical trials are required to establish its efficacy, safety, dosage, and therapeutic relevance.

Keywords: Murmakki; *Commiphora myrrha*; Myrrh; Unani medicine; oleo-gum-resin; Phytochemistry; Pharmacology

1. Introduction

Medicinal plant resins have played an important role in traditional healthcare systems for centuries because of their characteristic aromatic properties and diverse therapeutic applications. Among these natural resinous materials, myrrh, traditionally known as Murmakki or Murr, is an important oleo-gum-resin obtained from species of the genus *Commiphora* belonging to the family Burseraceae. *Commiphora myrrha* (T.Nees) Engl. is one of the principal botanical sources associated with myrrh and is naturally distributed mainly across arid and semi-arid regions of northeastern Africa and the Arabian Peninsula. The resin has attracted considerable medicinal and pharmacological interest because of its long history of traditional use and its chemically diverse composition.[1–3]

The medicinal use of myrrh extends across several traditional systems of medicine. Historical and ethnopharmacological literature describes its use in traditional Chinese medicine for conditions associated with trauma, pain, fractures, arthritis and inflammatory disorders. In Ayurveda and related South Asian traditions, *Commiphora* resins have also been used for inflammatory and metabolic disorders and other chronic conditions. These traditional applications have contributed to sustained scientific interest in the genus and have provided a basis for investigating its pharmacological properties using contemporary experimental approaches. [2,3]

In the Unani system of medicine, Murmakki occupies a distinctive position among the medicinal resins. Classical descriptions attribute several actions to Murmakki, including *Dāfiʿ-i-Taʿaffun* (antiseptic), *Muḥallil* (resolvent/anti-

inflammatory), *Qābiḍ* (astringent), *Jālī* (detergent), *Mudir-i-Ḥayḍ* (emmenagogue), *Qātil-i-Kirm-i-Shikam* (anthelmintic), and *Munaffith-i-Balgham* (expectorant).

It has traditionally been used in conditions involving wounds, ulcers, inflammatory disorders, gastrointestinal complaints, respiratory conditions and selected gynaecological disorders. These traditional descriptions are of particular interest for pharmacological research because some of the claimed actions, such as anti-inflammatory, antimicrobial, analgesic and wound-related effects, can be investigated using experimentally measurable endpoints. Modern reviews of *C. myrrha* similarly document traditional applications involving wounds, oral disorders, pain, gastrointestinal complaints, microbial infections and inflammatory conditions. [1,4]

The therapeutic importance of myrrh is not limited to its traditional reputation. Phytochemical investigations have shown that *C. myrrha* resin contains a complex mixture of volatile and non-volatile constituents, including monoterpenes, sesquiterpenes, furanosesquiterpenes, diterpenes, triterpenes and other resinous components. Furanosesquiterpenes are particularly characteristic of myrrh and include compounds such as furanoeudesma-1,3-diene, curzerene, lindestrene, furanodiene and furanodienone. The chemical composition of the resin is, however, influenced by factors such as botanical source, geographical origin, extraction procedure and processing conditions. [1,3,5]

Experimental research has provided evidence for several biological activities of *C. myrrha*. Extracts and isolated constituents have been investigated for anti-inflammatory and analgesic effects in experimental models, while other studies have reported antimicrobial and antioxidant activities. Further preclinical investigations have explored antidiabetic, antiparasitic, neuroprotective, gastroprotective and cytotoxic effects. For example, Su et al. demonstrated anti-inflammatory and analgesic effects of different *C. myrrha* extracts in experimental models, providing pharmacological support for some of the traditional applications of the resin.[6] Studies examining the chemical composition of myrrh resin and its essential oil have also demonstrated antioxidant and antimicrobial activities, although these findings remain predominantly experimental and cannot by themselves establish clinical efficacy.[5]

Interest in *Commiphora* has increased further because of the possibility of identifying bioactive compounds that may explain some of its traditional therapeutic effects. Reviews of the genus have reported more than 300 secondary metabolites from different *Commiphora* species and have emphasised the importance of terpenoid constituents in the biological activity of these plants. At the same time, researchers have highlighted an important limitation: different *Commiphora* species and preparations may differ considerably in their chemical composition. Consequently, pharmacological findings obtained using one species, extract or chemical fraction should not automatically be extrapolated to all materials marketed as "myrrh". [2,3]

Quality control and botanical authentication are therefore particularly important in the scientific evaluation of Murmakki. Recent literature has emphasised that inadequate identification of the original plant material and insufficient standardisation of extracts can reduce the reproducibility of pharmacological studies. Differences in species, geographical origin, harvesting, extraction and storage may influence the concentration of characteristic constituents and consequently affect biological activity. Establishing appropriate botanical, physicochemical and chromatographic standards is therefore an essential step toward the rational evaluation and future therapeutic development of Murmakki.[3]

Although several publications have reviewed the phytochemistry and pharmacology of *Commiphora* species, there remains a need for an integrated assessment specifically focused on Murmakki that brings together its Unani identity, traditional therapeutic concepts and contemporary scientific evidence. Such an approach is important because traditional claims and modern experimental findings represent different levels of evidence and should not be considered equivalent without appropriate validation. A critical review can therefore help identify which traditional applications have experimental support, which remain insufficiently investigated and where well-designed clinical and toxicological studies are still required.

The present review aims to provide a comprehensive and updated account of Murmakki (*Commiphora myrrha*), covering its botanical identity, geographical distribution, pharmacognostical characteristics, traditional Unani concepts and therapeutic uses, phytochemical constituents, pharmacological activities, available clinical evidence, safety considerations and quality-control aspects. Particular emphasis is placed on correlating selected traditional Unani actions with findings from contemporary pharmacological research while maintaining a clear distinction between traditional use, preclinical evidence and established clinical efficacy.

2. Review Methodology

The present review was conducted as an integrative narrative review of Murmakki (*Commiphora myrrha*), covering its botanical, pharmacognostical, phytochemical, Unani, pharmacological, clinical and safety aspects. Relevant literature was searched through PubMed/MEDLINE, Scopus, ScienceDirect and Google Scholar using terms such as "*Commiphora myrrha*," "Murmakki," "Murr," "Myrrh," "Unani medicine," "phytochemistry," "pharmacology," "clinical studies", and related pharmacological activities. Classical and authoritative Unani sources, including *Khazain-ul-Advia, Makhzan-ul-Mufradat, Muheet-e-Azam, Qarabadeen-e-Azam* and the *National Formulary of Unani Medicine (NFUM)*, were consulted for information on *Mizaj, Afʿāl*, traditional uses, dose, *Badal, Muslih* and *Muzir*. Relevant pharmacognosy and medicinal-plant references, original research articles, clinical studies and recent reviews were also evaluated. Literature from Ayurveda and

other traditional systems was considered where relevant. The available evidence was critically organized into traditional, *in vitro*, experimental and clinical evidence, with particular attention to botanical identity, preparation, chemical composition and standardisation.

3. Botanical Profile

3.1 Scientific Classification of Murmakki

Murmakki, commonly known as myrrh, is botanically identified as *Commiphora myrrha* (T.Nees) Engl., a resin-producing species belonging to the family Burseraceae. It is an aromatic shrub or small tree characteristically adapted to arid and semi-arid environments. The species was formerly described as *Balsamodendron myrrha* Nees, which is considered a synonym. The accepted taxonomic classification of *C. myrrha* is presented below.[7]

Taxonomic rank	Classification
Kingdom	Plantae
Phylum	Streptophyta
Class	Equisetopsida
Subclass	Magnoliidae
Order	Sapindales
Family	Burseraceae
Genus	*Commiphora*
Species	*myrrha*

3.2 Botanical Description

Commiphora myrrha is an aromatic, resin-producing shrub or small tree adapted to hot, dry and semi-arid environments. The plant develops a relatively short, irregularly branched growth habit, with a bark that exudes an aromatic oleo-gum-resin when injured. The resinous exudate gradually hardens after exposure to air and forms the crude drug commonly known as myrrh or Murmakki. The characteristic resin production and adaptation to arid habitats are important botanical features of the species and contribute to its medicinal and commercial significance.[12,18]

Fig. 1: *Commiphora myrrha* Oleo gum resin

3.3 Geographical Distribution and Habitat

Commiphora myrrha is naturally distributed mainly across the arid and semi-arid regions of northeastern Africa and the southern Arabian Peninsula. Its native range includes Ethiopia, Eritrea, Djibouti, Kenya, Somalia, Oman, Saudi Arabia and Yemen. The species is typically associated with dry shrublands, desert margins and open *Acacia–Commiphora* vegetation, where it grows under low-rainfall conditions. In parts of East Africa, the plant has been reported from shallow, often rocky or limestone-associated soils at approximately 220–800 m altitude. These ecological conditions favour the development of the resinous exudate that constitutes the medicinal drug Murmakki (myrrh).[1,7]

3.4 Vernacular Names

Murmakki (*Commiphora myrrha*) is known by different names across regions and languages. The commonly reported vernacular names are presented below.

Language	Vernacular Name
Arabic	Al Murr[31]
Bengali	Gandhbol, Gandharash[8,9]
Chinese	Mo yao (没药)
English	Myrrh [28]
French	Myrrhe
German	Myrrhe
Greek	Smyrna, Myrrha
Gujarati	Bol[9,] Hirabol
Hindi	Bol[28], Hirabol[8]
Japanese	Mirura, Myrrh
Kannada	Bola[28] Gandharasa, Guggula
Malayalam	Narumpasa, Narumpasamaram[28]
Marathi	Hirabol, Balata-bola
Persian	Bol[9]
Sanskrit	Bolah, Rasagandhah[33]
Spanish	Mirra
Tamil	Vellaippa-polam, Vellaippapolam[28,] Vellaibolam
Telugu	Balimtra-polam[28,] Balintrapolum, Balin-tabolu, Valentrapolam
Unani	Murmaki, Bol[17]

4. Biological Source

Murmakki (Myrrh) is the dried oleo-gum-resin obtained mainly from the stem and bark of *Commiphora myrrha* (T.Nees) Engl. of the family Burseraceae. The resin is released following natural or deliberate injury to the bark and gradually hardens on exposure to air, forming irregular masses of the crude drug. Myrrh consists principally of gum, resin and volatile oil, with the relative proportions varying according to botanical source and geographical origin.[31]

5. Pharmacognostical Characteristics

Murmakki occurs as irregular, rounded or angular masses of variable size, ranging from small tears or granules to larger resinous pieces. The colour varies from yellowish-brown to reddish-brown or dark brown, depending on the source and degree of maturation. The surface is generally dull, and the fractured surface is uneven, brittle and may show translucent or slightly granular areas. It possesses a characteristic aromatic odour and a bitter, slightly pungent taste. On exposure to air, the initially soft resinous exudate gradually hardens. These macroscopic characters are useful for the preliminary identification and quality assessment of myrrh, although microscopic and chromatographic methods provide additional confirmation.

6. Unani Profile of Murmakki

6.1 *Mizāj* (Temperament)

In Unani medicine, *Mizāj* refers to the inherent temperament or qualitative nature of a substance, influencing its therapeutic properties. Murmakki is traditionally described as hot and dry in the second degree.[13,20,29]

6.2 *Afʿāl* (Actions and Traditional Uses)

- *Mudir-i-Ḥayḍ* (emmenagogue) [16,17,7,8,9,10,11,13,14,28]
- *Muḥallil-i-Awrām* (anti-inflammatory/resolvent) [16,17,7,8,10,13]
- *Dāfiʿ-i-Taʿaffun* (antiseptic) [16,17,7,8,10,11,13,14,28,29]
- *Mujaffif* (siccative/desiccative) [16,11]
- *Jālī* (detergent) [16,8,10,11,14]
- *Kāsir-i-Riyāḥ* (carminative) [16,7,8,10,11,14,28]
- *Muqawwī-i-Miʿda* (gastric tonic) [10,11]
- *Muḥallil* (resolvent) [10,11,14]
- *Mufattiḥ* (deobstruent) [16,11]
- *Musakhkhin* (warming agent) [16,10]
- *Muḥarrik* (stimulant) [16,7,9,10,11]
- *Munaffith-i-Balgham* (expectorant) [2,16,17,7,9,10,11,13,14,8,28,29]
- *Tiryāq* (antidote) [16]
- *Qābiḍ* (astringent) [17,7,8,9,10,11,13,28]
- *Qātil-i-Dīdān-i-Amʿā* (anthelmintic) [10,11,13,14,8,28,29]
- *Hāḍim* (digestive) [9,13]
- *Mudir-i-Bawl* (diuretic) [8,10,13,14]
- *Musaffī* (blood purifier) [7]
- *Muqawwī-i-Bāh* (aphrodisiac) [10,8,28]
- Deodorant [8,10]

Traditional Therapeutic Uses

- *Warm-i-Shuʿab al-Riyah* (bronchitis) [8,28]
- *Wajaʿ al-Mafāṣil* (joint pain/rheumatoid arthritis) [8,28,29]
- *ʿIrq al-Nisā'* (sciatica) [8,28,29]
- *Qurūḥ* (ulcers) [3,8]
- *Amrāḍ-i-Jild* (skin diseases) [8,28]

6.3 *Miqdār-e-Khurāk* (Dose)

The traditionally reported dose of Murmakki is 1–2 g [approximately 1–2 *Masha*].[13,29,30]

6.4 *Badal* (Substitute)

The traditionally reported substitutes for Murmakki are:

- *Qusṭ* (*Qist*) (Saussurea lappa C.B. Clarke)[13,29,30]
- *Jund Bedaster (Castoreum; animal-origin drug)*[20,29,30]
- *Mūmiyā'ī* (*Mumiyo*) or Shilajit (*Asphaltum punjabianum*)-(mineral/organic-mineral origin) [29,30]

6.5 *Muṣliḥ* (Corrective)

Pure honey is considered the *Muṣliḥ* (corrective) of Murmakki.[20]

6.6 *Mużir* (Adverse Effects)

- Headache [3,8,15]
- Unsuitable for individuals with a hot temperament (*Ḥārr Mizāj*) [3,8,15]
- May adversely affect the bladder [14]

6.7 Compound Unani Formulations

- *Ḥabb-i-Mudir* [11,12,13,14,15]
- *Majūn Kundar* [16,17]
- *Majūn Murmakki* [17]
- *Dawā' al-Kurkum Ṣaghīr* [17]
- *Dawā' al-Kurkum Kabīr* [17]
- *Tiryāq-i-Arbaʿa* [3,6,11,13,14,15]
- *Tiryāq-i-Wabā'ī* [13,16,17]
- *Qurs Musallas* [5,16]
- *Tiryāq-i-Nazla* [16]
- *Ḥabb-i-Ṭāʿūn* [11,12,13]
- *Tiryāq-i-Samāniyā* [16]
- *Zimād-e-Khinzīr* [16]

7. Phytochemical Constituents

Myrrh is chemically complex and contains several groups of secondary metabolites, including volatile oils,

monoterpenes, sesquiterpenes, furanosesquiterpenes, diterpenes, triterpenes, steroids, sterols, gum polysaccharides and resinous constituents. Among these, furanosesquiterpenes are particularly characteristic of the volatile oil of *Commiphora myrrha*. Important compounds reported from *C. myrrha* include furanoeudesma-1,3-diene, curzerene, lindestrene, isofuranodiene, furanodienone and β-elemene. Recent gas chromatography–mass spectrometry (GC–MS) investigations have shown that furanosesquiterpenes may constitute a major proportion of the essential oil, although the relative abundance of individual constituents varies considerably among samples. Such variation may be associated with differences in botanical source, geographical origin, harvesting conditions, storage and extraction procedures and should therefore be considered when evaluating the pharmacological properties and standardisation of Murmakki.[6]

8. PHARMACOLOGICAL ACTIVITIES

8.1 Anti-inflammatory Activity

Myrrh has a long history of use in traditional Chinese medicine for trauma, pain, swelling, joint inflammation and fractures, often in combination with frankincense. *Commiphora myrrha* has also traditionally been used for skin sores and ulcers, with its anti-inflammatory effects investigated in experimental models. Ethanolic extracts and different fractions of *C. myrrha* demonstrated inhibitory effects on formalin-induced paw oedema and modulated PGE_2, while studies of *C. myrrha* alone and with *Boswellia carterii* reported activity against inflammation and pain induced by formalin and carrageenan. These findings suggest that modulation of prostaglandins and other inflammatory mediators may contribute to its traditional anti-inflammatory effects.[6]

8.2 Antioxidant Activity

Antioxidant activity has been demonstrated experimentally in *C. myrrha* resin extracts and may be associated with its diverse terpenoid and other phytochemical constituents. A 2023 preclinical study using aqueous myrrh resin extract in streptozotocin-induced diabetic rats reported antioxidant activity alongside antidiabetic and antimicrobial effects. However, these findings are limited to experimental evidence and should not be interpreted as proof of clinical antioxidant benefits in humans.[23]

8.3 Antimicrobial Activity

Myrrh has traditionally been used for wounds, oral ulcers, skin disorders and fungal infections, supporting its longstanding antimicrobial applications. *In vitro* studies have demonstrated antibacterial and antifungal activity of *C. myrrha* resin extracts against organisms including *Staphylococcus aureus, Bacillus subtilis, Escherichia coli, Klebsiella pneumoniae, Proteus vulgaris, Pseudomonas aeruginosa, Candida albicans* and *Aspergillus niger*. Methanolic and aqueous extracts showed notable activity against several tested organisms, while chloroform extracts also demonstrated antimicrobial effects. These findings may provide experimental support for the traditional Unani description of Murmakki as *Dāfiʿ-e-Taʿaffun* (antiseptic) and its use in wound-related conditions.[5]

8.4 Analgesic Activity

Experimental studies have demonstrated analgesic activity of *C. myrrha* extracts in acetic-acid-induced nociception and formalin-induced inflammatory pain models; however, no significant effect was observed in the hot-plate test in the study by Su et al.[18] A recent randomized clinical trial involving 102 patients with osteoarthritis compared *C. myrrha* (100 mg twice daily) with etoricoxib (90 mg once daily) for 30 days and reported improvements in pain and mobility. As this is a single recent clinical study, its findings require confirmation through larger, independently conducted trials before firm clinical conclusions can be drawn.[22]

8.5 Murmakki in Gynaecological Disorders

Commiphora myrrha (Murr/Murmakki) has traditionally been used in Unani medicine for a variety of gynaecological disorders. Tablets prepared from *Murr* and *Elwā* (Aloe) are traditionally used as *Mudirr-i-Ḥayḍ* (emmenagogue) to promote menstruation. A combination of *Murr (Commiphora myrrha)*, *Afsanteen* (Artemisia absinthium), *Turmus* (Lupinus albus), and *Usāra-i-Suddāb Ruta graveolens* (extract of *Suddāb*) is traditionally described as both *Mudirr-i-Ḥayḍ* (emmenagogue) and *Musqiṭ-i-Janīn* (abortifacient). A decoction of *Murr* is used in *ʿUsr-i-Bawl wa Ḥayḍ* (dysuria and dysmenorrhoea) and *Iḥtibās-i-Bawl wa Ḥayḍ* (urinary retention and amenorrhoea).

Murr is also administered as *Ḥamūl* (vaginal pessary) for foul-smelling vaginal discharge. *Ḥuqna* (enema) prepared with *Murr* and *Āb-i-Ḥulba* (fenugreek water) is traditionally indicated for *Ṣalāba al-Raḥim*, whereas its combination with *Bayḍa Neem Birisht* (half-boiled egg) is used in *Sayalān al-Raḥim* (leucorrhea), characterised by abnormal uterine discharge. *Ṭilā* (topical application) of *Murr* is traditionally employed for renal and bladder pain, tenesmus and uterine pain associated with dysmenorrhoea. A preparation containing *Murr (Commiphora myrrha)*, *Zīra Siyāh (Nigella sativa)* and *Roghan Gao* (cow-derived oil) is applied as *Ḍimād* (medicated poultice) in *Qurūḥ-i-Raṭba*, referring to moist or ulcerative lesions.

Murr is additionally used with *Sharāb* (alcohol) and *Shibb-i-Yamānī* (Alum) as *Lattūkh* (liniment) to reduce unpleasant odour from the axillary and inguinal regions. In amenorrhoea attributed to *Qillat-i-Dam* (deficiency of blood), *Murr* is combined with *Elwā* (Aloe) and an iron preparation to promote menstruation. For excessive menstrual bleeding, approximately 1.75 g of Murr is traditionally used with *Bayḍa Neem Birisht* (half-boiled egg) or *Roghan Kunjad* (sesame oil). *Murr* is further described for use in *Insidād Famm al-Raḥim* (cervical stenosis/obstruction) because of its *Muʾarkhī* (relaxant/softening) property. In addition, *Ḥamūl Jayyid*, a traditional vaginal preparation containing *Murmakki (Commiphora myrrha), Fotunj (Mentha spp), Mākū (Solanum nigrum L.), Abhal (Juniperus communis L.),*

Suddāb Khushk (Ruta graveolens L.) and *Zabīb (Vitis vinifera L.)*, is used in *Firzaja*(vaginal pessary) form to promote menstruation.[24]

8.6 Antidiabetic Activity

Mansouri et al. (2023) investigated an aqueous resin extract of *C. myrrha* in streptozotocin-induced diabetic female Sprague-Dawley rats to evaluate its antidiabetic, antioxidant and antimicrobial effects. The experimental design included normal control, diabetic control and myrrh-treated diabetic groups. The findings provide preclinical evidence supporting the traditional use of myrrh in metabolic disorders; however, clinical studies are required to establish its efficacy, safety and appropriate dosage in patients with diabetes.[23]

8.7 Neuroprotective Activity

Several furanosesquiterpenoids have been isolated from the resin of *C. myrrha*. Xu et al. isolated 18 furanosesquiterpenoids, including ten previously undescribed compounds designated myrrhterpenoids A–J. All isolated furanosesquiterpenoids demonstrated neuroprotective effects against MPP^+-induced neuronal cell death in SH-SY5Y cells, an experimental model commonly used to investigate neuronal injury. These findings suggest potential neuroprotective properties of *C. myrrha*, although the evidence remains cellular and preclinical rather than clinical.[25]

8.8 Anticancer/Cytotoxic Activity

Furanosesquiterpenoids isolated from *C. myrrha* have also been investigated for cytotoxic activity. Zhu et al. isolated six furanosesquiterpenoids from the gum exudate, of which one compound demonstrated weak cytotoxic activity against MCF-7 breast cancer cells, while the remaining compounds were inactive in the assay. Thus, the available evidence for anticancer activity remains preliminary laboratory evidence and does not establish Murmakki as a clinically proven anticancer treatment.[27]

8.9 Gastroprotective/Anti-ulcer Activity

Experimental studies summarized in the pharmacological literature have reported that myrrh hydro-suspension protected the gastric mucosa against experimentally induced ulceration in rats. These findings provide experimental support for the traditional use of Murmakki in gastrointestinal disorders. However, further studies using standardized preparations and clinical models are required to determine its therapeutic relevance in humans.[27]

9. Clinical Evidence

Although experimental evidence on *Commiphora myrrha* is relatively extensive, clinical evidence remains limited. One randomised, double-blind, placebo-controlled clinical trial evaluated the effect of myrrh oleo-gum-resin in 80 patients with incomplete abortion. Participants received 500 mg of myrrh three times daily for two weeks, and the myrrh-treated group showed a greater reduction in retained products of conception compared with the placebo group. However, this finding relates to a specific clinical condition and should not be extrapolated to other gynaecological indications or used as evidence of general clinical efficacy.[21]

A more recent 2026 randomised clinical study compared *C. myrrha* with etoricoxib in 102 patients with osteoarthritis. The myrrh group received 100 mg twice daily for 30 days, with assessment of pain relief and mobility. Although the reported findings are encouraging, this is a recent single clinical study and should be interpreted cautiously until its methodology, publication quality and findings are independently assessed and replicated.[22]

Overall, the available clinical evidence for Murmakki remains considerably smaller than the experimental literature. Further well-designed, adequately powered randomised controlled trials using authenticated and standardised *C. myrrha* preparations are required to establish its efficacy, safety, optimal dosage and therapeutic role in conditions relevant to its traditional Unani applications.

10. Safety and Adverse Effects

Although Murmakki has a long history of traditional use, its safety depends on the dose, preparation, route of administration and individual patient characteristics. Particular caution is required during pregnancy, as a published case report described abdominal pain following substantial consumption of myrrh during pregnancy and raised concern regarding a possible uterine-stimulant effect. Therefore, internal use during pregnancy should be avoided unless specifically supervised by a qualified healthcare professional. Avoid excessive internal administration, and prefer standardised preparations to unidentified crude material. Potential interactions between myrrh and conventional medicines remain insufficiently characterised and require further investigation.

Key Safety Considerations

- **Pregnancy:** Avoid unsupervised use because of the possible uterine-stimulant effect.
- **Excessive internal use:** Should be avoided.
- **Preparation quality:** Authenticated and standardised preparations are preferable to unidentified crude material.
- **Drug interactions:** Currently insufficiently characterised.
- **Botanical authentication:** Important because different *Commiphora* species may differ chemically and pharmacologically.

11. Quality Control and Standardisation

Quality control is particularly important for Murmakki because the term “myrrh” may refer to resins obtained from different *Commiphora* species, and their chemical composition can vary considerably. Such variation may arise from botanical species, geographical origin, climatic conditions, age of the plant, and the methods and timing of tapping, harvesting, storage, and processing. Commercial myrrh samples have shown

differences in the relative concentrations of characteristic furanosesquiterpenes, which may influence their pharmacological properties and reproducibility. Therefore, appropriate quality-control measures should include macroscopic and microscopic examination, physicochemical parameters, extractive values, moisture and ash values, chromatographic fingerprinting, GC–MS analysis of volatile constituents, HPLC-based chemical profiling and standardization using suitable marker compounds. Proper botanical authentication and chemical standardisation are essential to ensure the identity, consistency, quality, and reproducibility of Murmakki preparations used in pharmacological and clinical research.

12. Discussion

Murmakki (*Commiphora myrrha*) has a long history of use in Unani and other traditional systems, particularly for inflammatory, painful, gastrointestinal, respiratory, wound-related and gynaecological conditions. The present review indicates that several traditional applications have preclinical support, particularly anti-inflammatory, analgesic, antimicrobial and antioxidant activities; however, the strength of evidence varies considerably between indications.

The pharmacological findings are supported by myrrh's diverse phytochemical composition, particularly its furanosesquiterpenes and other terpenoid constituents. However, differences in species, geographical origin, extraction methods and chemical composition make comparison between studies difficult. Therefore, botanical authentication and standardised preparations are essential for reproducible research.

Clinical evidence remains limited compared with the extensive preclinical literature. The available randomised studies provide preliminary evidence for specific conditions, including incomplete abortion and osteoarthritis, but their findings should not be generalised to all traditional uses of Murmakki. Larger, well-designed and independently replicated randomised controlled trials are required to establish efficacy, optimal dosage, safety and clinical applicability.

The safety profile also requires further evaluation, particularly regarding pregnancy, long-term use and potential drug interactions. Future research should use authenticated and chemically standardised *C. myrrha* preparations and systematically report both therapeutic outcomes and adverse events.

Overall, Murmakki demonstrates promising pharmacological potential, but current evidence does not yet justify broad clinical claims. Further standardised preclinical and clinical research is necessary to determine which traditional Unani applications can be supported by modern scientific evidence.

13. Conclusion

Murmakki (*Commiphora myrrha*) is an important medicinal resin with a long history of use in Unani medicine and other traditional systems. Its diverse phytochemical composition and reported anti-inflammatory, analgesic, antimicrobial, antioxidant and other pharmacological activities provide scientific support for several of its traditional applications. However, the available evidence is predominantly preclinical, while clinical evidence remains limited. Differences in botanical source, chemical composition and preparation further emphasize the need for proper authentication and standardization. Well-designed clinical trials using standardised *C. myrrha* preparations are required to establish its efficacy, safety, dosage and therapeutic role. Overall, Murmakki represents a promising traditional medicinal drug that warrants further systematic pharmacological and clinical investigation.

14. Limitations of the Review

The available evidence on *Commiphora myrrha* is limited by substantial variation in botanical sources, extraction methods, chemical composition, experimental models and doses used across studies. Much of the pharmacological evidence remains preclinical, while clinical studies are relatively few and involve specific conditions and small study populations. Limited standardisation of myrrh preparations and insufficient long-term safety data further restrict comparison and clinical interpretation. Therefore, the findings of this review should be considered in the context of these limitations, and further standardised experimental and well-designed clinical studies are needed to establish the therapeutic efficacy and safety of Murmakki.

15. Future Perspectives and Research Gaps

Further research on Murmakki should focus on botanical authentication of commercially available *Commiphora myrrha* and the development of pharmacopoeial quality standards to ensure its identity, purity and consistency. Identification of suitable chemical marker compounds and standardisation of extracts and dosage forms are essential for reproducible research. Future investigations should clarify the molecular mechanisms underlying its anti-inflammatory activity, evaluate antimicrobial effects against clinically relevant pathogens, and conduct controlled studies on wound healing. Clinical research should assess its traditional Unani indications through well-designed randomised controlled trials, while particular attention should be given to herb–drug interactions, detailed toxicological evaluation, and reproductive and uterotonic effects. These investigations will help establish a stronger scientific basis for the safe, standardised, and rational therapeutic use of Murmakki.

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