Available online on 15.07.2026 at http://jddtonline.info

Journal of Drug Delivery and Therapeutics

Open Access to Pharmaceutical and Medical Research

Open Access Full Text Article

Review Article

Therapeutic Potential of *Roghan-e-Haft Barg* (A Polyherbal Unani Formulation) with Special Reference to Musculoskeletal Disorders

Rooshi Fareed [1], *Shaziya Begum [1*], Mohd Anwar [2], Fatima Khan [3], Sadaf Nawaz [1]

[1] PG Scholar, Department of Ilaj-Bit-Tadbeer, Ajmal Khan Tibbiya College, Aligarh Muslim University, Uttar Pradesh, India.

[2] Professor, Department of Ilaj-Bit-Tadbeer, Ajmal Khan Tibbiya College, Aligarh Muslim University, Uttar Pradesh, India.

[3] Assistant Professor, Department of Ilaj-Bit-Tadbeer, A&U Tibbia College & Hospital, Karol Bagh, New Delhi, India.

Article Info:

Article History:

Received 22 April 2026
Reviewed 10 June 2026
Accepted 29 June 2026
Published 15 July 2026

Cite this article as:

Fareed R, Begum S, Anwar M, Khan F, Nawaz S, Therapeutic Potential of *Roghan-e-Haft Barg* (A Polyherbal Unani Formulation) with Special Reference to Musculoskeletal Disorders, Journal of Drug Delivery and Therapeutics. 2026; 16(7):254-259 *DOI: https://doi.org/10.22270/jddt.v16i7.7864*

For Correspondence:

Shaziya Begum, PG Scholar, Department of Ilaj-Bit-Tadbeer, Ajmal Khan Tibbiya College, Aligarh Muslim University, Aligarh, Uttar Pradesh 202002, India.

Abstract

Background: Unani Medicine, an ancient medical system, focuses on both prevention and treatment of a variety of acute and chronic diseases. Its core therapeutic approaches include *Ilāj bi'l Taghdhiya* (diet therapy), *Ilāj bi'l Tadbīr* (regimenal therapy), *Ilāj bi'l Dawā'* (pharmacotherapy), and *Ilāj bi'l Yad* (surgery). Within this framework, the term *Waja' al-Mafāṣil* broadly encompasses musculoskeletal disorders (MSDs), including inflammatory, non-inflammatory, infectious, and metabolic conditions. Pain is the most prevalent and primary symptom associated with MSDs. Musculoskeletal (MSK) pain remains a complex and difficult issue for both patients and healthcare providers. Nearly everyone experiences MSK pain at some point in their life, regardless of age, gender, or socioeconomic background. Statistics show that around 47% of the global population suffers from MSK pain, with approximately 39% to 45% requiring consistent medical intervention.

Objective: This review aims to comprehensively explore the phytopharmacology of the constituents of RHB and their pharmacological effects.

Materials and Methods: PubMed, Google Scholar, and Science Direct were used to collect data, which was then thoroughly evaluated.

Results: When chronic MSK pain is inadequately treated, it can significantly impair quality of life and contribute to substantial socioeconomic burdens. *Roghan-e-Haft Barg* (RHB), a recognized Unani formulation, has shown promising analgesic and anti-inflammatory properties when used topically.

Conclusion: Existing research suggests that the active components of RHB have significant pain-relieving and anti-inflammatory properties, making it a valuable therapeutic alternative for MSD management and improving patients' overall quality of life.

Keywords: *Roghan-e-Haft Barg*, *Waja' al-Mafāṣil*, Musculoskeletal disorders, Musculoskeletal pain.

Introduction:

Musculoskeletal disorders (MSDs) are generally described as conditions or injuries that affect the joints, bones, muscles, nerves, tendons, ligaments, cartilage, spinal discs, and other supportive soft tissues [1].

The term "*Waja*'" is widely used in Unani literature to refer to pain. Avicenna defined '*Waja*' as 'one of the unnatural (abnormal) conditions that affect the body and that it is a 'feeling of incongruity'[2]. In Unani medicine, "*Waja' al-Mafāṣil*" refers to a range of joint-related illnesses, such as inflammatory, non-inflammatory, infectious, metabolic, and other musculoskeletal conditions [3].

Musculoskeletal disorders (MSDs) can develop due to sudden physical strain—such as lifting heavy objects—or from repetitive movements, prolonged exposure to force or vibration, and poor posture maintained over time[4]. Musculoskeletal (MSK) pain refers to acute or chronic discomfort affecting the bones, muscles, ligaments, tendons, or nerves. Globally, MSK pain is a significant health concern with considerable medical and socioeconomic impact[5]. It encompasses a range of pain conditions, from localised pain to neuropathic pain[4]. Chronic musculoskeletal pain is the leading cause of disability in individuals with musculoskeletal disorders (MSDs)[6]. The prevalence rate of chronic musculoskeletal pain according to the World Health Organization (WHO) is 20–33% or 1.75 billion people of world's population[4].Chronic musculoskeletal (MSK) pain hinders the ability to perform daily activities, leading to a significant decline in quality of life[7].Chronic low back pain, neck pain, and pain associated with osteoarthritis, frozen shoulder, and rheumatoid arthritis are among the most common forms of musculoskeletal (MSK) pain. Although MSK pain can occur at any age, its likelihood increases with ageing. Nearly every

individual experiences some form of MSK pain at least once in their lifetime[4, 8]

A large number of pharmacological and non-pharmacological interventions are used to manage musculoskeletal (MSK) pain. Non-steroidal anti-inflammatory drugs (NSAIDs) are often recommended as a first-line treatment, either on their own or in combination with adjuvant therapies, particularly for patients with chronic musculoskeletal (MSK) pain who have not adequately responded to non-pharmacological interventions[9].The use of NSAIDs is associated with gastrointestinal side effects, ranging from mild symptoms such as dyspepsia or vomiting to more severe complications like gastroduodenal ulcers, bleeding, and other gastrointestinal lesions[10]. Some research studies have also found evidence of kidney damage and hepatotoxic consequences.[11,12,13] Moreover, other therapeutic options, such as surgical operations, are more expensive and have more irreversible effects. Because of the significant side effects of steroidal and nonsteroidal anti-inflammatory drugs, there is a growing interest in natural substances such as nutritional supplements and herbal remedies, which have long been used to relieve pain and inflammation [14].

The primary treatment approaches in the Unani system of medicine comprise *Ilāj bi'l Taghdhiya* (dietotherapy), *Ilāj bi'l Tadbīr* (regimenal therapy), and *Ilāj bi'l Dawā'* (pharmacotherapy), *Ilāj bi'l Yad* [15]. Among these, *Ilāj bi'l-Tadbīr* (regimenal therapy) is the most extensively employed therapeutic modality for the management of MSDs. There are various Regimenal modalities such as *Ḥijāma* (Cupping), *Dalk* (Massage), *Riyāḍat* (Exercise), *Ḍimād* (Poultice), *Inkibāb* (Vapour bath), *Ābzan* (Sitz bath), *Ḥammām* (Therapeutic bath), *Naṭūl* (Douche), and *Takmīd* (Fomentation) etc. mentioned in the Unani classical literature, reported to be effective in the management of MSK pain. Among these, *Dalk* holds an important position as a therapeutic modality in the management of various types of painful conditions. In the Unani medical system, *Dalk* (massage therapy) is a widely practiced and extensively used therapeutic regimen in the management of musculoskeletal disorders, serving both curative and preventive roles. It helps to dissolve and eliminate *Akhlāṭ-i-Fāsida* (morbid humor), produces *Laṭīf Ḥarārat* in the body, and strengthens tendons and ligaments similar to *Riyāḍat* [16, 17]. *Roghan* (medicated oils) are commonly used in massage therapy to alleviate joint pain and ease muscle stiffness, such as *Roghan-e-Qust, Roghan-e-Haft Barg, Roghan-e- Bed Anjeer, Roghan-e- Dhatura, Roghan-e-Babuna*[18]. *Roghan-e-Haft Barg* is a polyherbal pharmacopeial oil that is mentioned in Unani formularies, and books of compound formulation. As its name suggests, (*Haft* means seven and *Barg* means leaves), the formulation consists of seven leaves as main ingredient and therefore it is called *Roghan-e-Haft Barg*. Ingredients of RHB are *Barg-e-Aak (Calotropis procera* Ait. RBr.), *Barg-e-Bakayin (Melia azedarach* Linn.), *Barg-e-Bed Anjeer (Ricinus communis* Linn.), *Barg-e-Dhatura (Datura stramonium* Linn.), *Barg-e-Sambhalu (Vitex negundo* Linn.), *Barg-e-Sehjana (Moringa oleifera* Lam.), *Barg-e-Thuhar (Euphorbia neriifolia* Linn.*)* and *Roghan-e-Kunjad (Sesamum indicum* DC.*)*(Fig.1). It has been traditionally used for years in the management of both inflammatory and degenerative musculoskeletal conditions such as *Waja' al-Mafāṣil* (arthritis), *Fālij* (paralysis), and *Laqwa* (facial palsy). Its therapeutic effects are attributed to its *Musakkin-i-Alam* (pain-relieving) and *Muqawwī-i-A'ṣāb* (nervine tonic) properties[19, 20]. Information about ethno-pharmacological properties of ingredients of *Roghan-e-Haft Barg* are listed in Table 1.

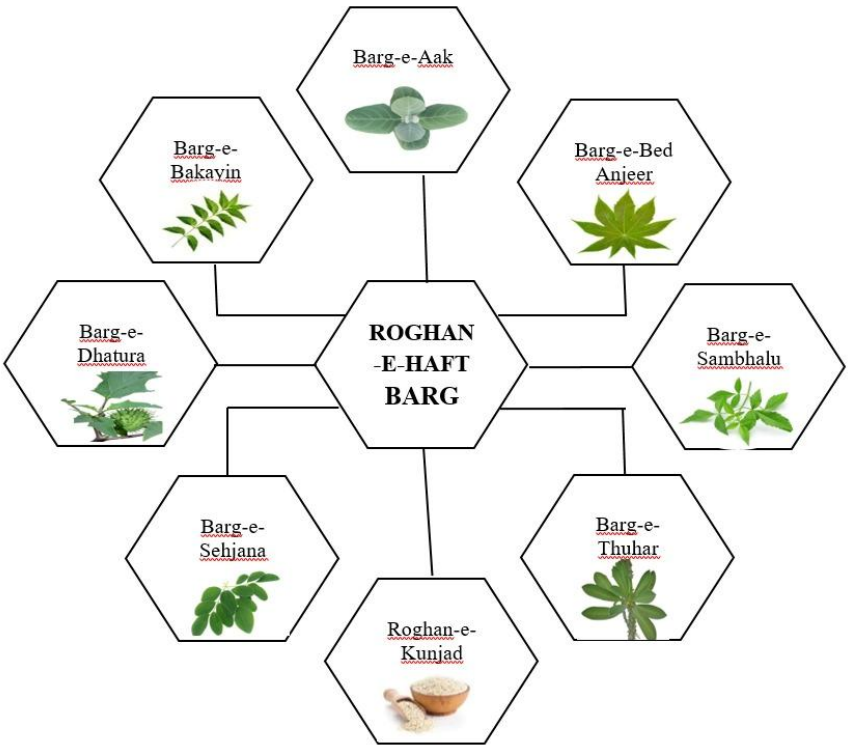

Figure 1: Ingredients of *Roghan-e-Haft Barg*

Materials and Methods:

The studies were conducted in accordance with the findings of recommended systematic reviews and research articles published in both national and international journals. A comprehensive literature search was carried out using databases, including Google Scholar, PubMed, Research Gate, and Science Direct. This search aimed to gather recent and relevant material for the study. The selected publications were then analyzed based on their citations to identify the pharmacological effects of various components of RHB, Shown in Table 1

Table 1: Ethnopharmacological Properties of Ingredients of *Roghan-e-Haft Barg*

Botanical names	**Unani names**	**Effects as per Unani Medicine**	**Chemical constituents**	**Associated Pharmacological activity**
Calotropis procera (Ait) R Br.	*Barg-e-Aak*	*Muḥallil-i- Awrām* (Anti-inflammatory), *Musakkin* (Analgesic) [21, 22, 23, 24, 25, 26]	Tannins, Flavonoids, Triterpenoids[27]	Anti-inflammatory and Analgesic activity[28]
Melia azedarach Linn.	*Barg-e-Bakayin*	*Musakkin* (Analgesic), *Muḥallil-i- Awrām* (Anti-inflammatory) [22, 23, 25, 26, 29, 30, 31]	Quercetin derivatives, Rutin, Flavonoids, Glycosides, Steroids and tannins [32, 33]	Anti-inflammatory activity, Analgesic and antioxidant activity. [32, 34, 35]
Ricinus communis Linn.	*Barg-e-Bed Anjeer*	*Muḥallil-i-Awrām* (Anti-inflammatory), *Musakkin* (Analgesic) [23, 25, 26, 36]	Saponin, Steroids and alkaloids [37]	Anti-inflammatory, Antinociceptive activity, Antiarthritic activity [37, 38, 39]
Datura stramonium Linn.	*Barg-e-Dhatura*	*Mukhaddir* (Anasthetic), *Munawwim* (Hypnotic agent) *Dāfi'-i-Tashannuj* (Antispasmodic), *Musakkin* (Analgesic), *Muḥallil-i-Awrām* (Anti-inflammatory) [22, 23, 26, 31, 36, 40]	Terpene, Daluralactone (D1), 12, deoxywithastramonolide (D23), and daturilin (D27) [41, 42]	Anti-inflammatory activity, Analgesic activity [42, 43]
Vitex negundo Linn.	*Barg-e-Sambhalu*	*Muḥallil-i- Awrām* (Anti-inflammatory), *Musakkin* (Analgesic) [22, 23, 26, 36, 44, 45]	Tannins and flavonoids [46]	Anti-inflammatory and Analgesic activity, Antiarthritic activity, Antinocioceptive activity [47, 48, 49]
Moringa oleifera Lam.	*Barg-e-Sehjana*	*Muḥallil-i-Awrām* (Anti-inflammatory), *Musakkin* (Analgesic) [22, 23, 26, 31, 36, 44, 50]	Flavonoids, Tannins and alkaloids [51]	Anti-inflammatory, Analgesic activity, Antiarthritic activity [51, 52, 53]
Euphorbia neriifolia Linn.	*Barg-e-Thuhar*	*Muḥallil-i- Awrām* (Anti-inflammatory) [22, 23, 29]	Flavonoids (Sultana *et al.*, 2022) [55]	Antiarthritic activity, Analgesic activity, Anti-inflammatory activity [55, 56, 57]
Sesamum indicum DC.	*Roghan-e-Kunjad*	*Muḥallil-i-Awrām* (Anti-inflammatory) [22, 23, 26, 31, 58]	Sesamin [59]	Anti-inflammatory, Antinociceptive activity, Antirheumatoid activity [59, 60]

Results and Discussion:

MSDs are one of the primary causes of disability worldwide. To treat MSDs, modern medicine uses a variety of targeted medicines. However, discontinuing these drugs might result in severe side effects or possibly a recurrence of the disease. Because of the various drawbacks of using existing NSAIDs, it is possible to begin searching for newer medications for MSDs that come from natural sources. RHB, a polyherbal Unani formulation, possesses analgesic and anti-inflammatory properties, making it an effective primary treatment for the management of MSDs. Each constituent of RHB is known for their therapeutic

potential in managing musculoskeletal conditions. The phytochemicals present in *Aak* (*Calotropis procera* (Ait) R Br. extract (CPE), including alkaloids, tannins, saponins, triterpenes, reducing sugars, sterols, amino acids, and glycosides, are considered significant contributors of anti-inflammatory effect. Notably, tannins and flavonoids are widely recognized for their role in reducing inflammation, with flavonoids acting through the inhibition of key enzymes involved in prostaglandin synthesis. Triterpenoids enhance anti-inflammatory activity by decreasing the expression of inducible nitric oxide synthase (iNOS) or reducing nitric oxide production. These synergistic actions of various phytochemicals emphasize the comprehensive anti-inflammatory potential of *Aak* [27]. Aoudia et al., (2013) reported that *Bakayin* (*Melia azedarach* Linn.) contained considerable amounts of quercetin derivatives and rutin and exerted strong anti-inflammatory effects by inhibiting human monoacylglycerol lipase (MAGL)[32]. Vekariya et al., (2016) reported that the presence of flavonoids, glycosides, steroids and tannins in the *Bakayin* extract may be responsible for the analgesic property[33]. According to Hossain et al. (2013), the analgesic effect of *Bakayin* may result from suppression of endogenous pain-mediating substances at peripheral nerve endings, indicating a mechanism of action similar to that of NSAIDs[35] . Taur et al., concluded that *Bed Anjeer* (*Ricinus communis* Linn.) possesses antinociceptive potential that may be due to saponin, steroids and alkaloids in it. It has antioxidant activities and is reported to contain flavonoids: rutin, quercetin, epicatechin and polyphenols (Gallic and ellagic acid) and gentesic acid. These compounds have been scientifically validated as potent antioxidant and anti-inflammatory agents[37]. A study conducted by Hussain et al., on antiarthritic activity in rats reported that *Bed Anjeer* leaves significantly reduced inflammation and improved overall health by modulating pro/anti-inflammatory cytokine expression and alleviating oxidative stress [39]. Terpene in *Dhatura* (*Datura stramonium* Linn.) has strong anti-inflammatory effect by inhibiting the COX1 and the leukotriene[41]. *Dhatura* contains phytochemicals that have anti-inflammatory and analgesic properties. These phytochemicals suppress the production of chemical mediators that cause pain and inflammation. According to Chandan et al., three steroidal lactones isolated from *Dhatura* leaves—daluralactone (D1), 12-deoxywithastramonolide (D23), and daturilin (D27)—showed marked inhibition of nitric oxide production and pro-inflammatory cytokine expression. The analysis showed that these three lactone compounds actively bind with COX-1, COX-2, validating the anti-inflammatory effects of the lactones [42].The pharmacological properties of *Sambhalu* (*Vitex negundo* Linn.) are attributed to its diverse bioactive constituents. Maniyar et al., reported that presence of phytochemical constituents like tannins and flavonoids could be attributed to the anti-inflammatory activity [46]. Dharmasiri et al.,revealed that the fresh leaves of *Sambhalu* have anti-inflammatory and pain suppressing activities possibly mediated via Prostaglandin (PG)synthesis inhibition, antihistamine, membrane stabilising and antioxidant activities [47]. The phytochemical ingredients found in leaf extract of *Sehjana* (*Moringa oleifera* Lam.) like flavonoids, which potently inhibit prostaglandins, especially the endoperoxidase, tannins, alkaloids, could also contribute to the anti-nociceptive action of *Sehjana*. The possible mechanism of *Sehjana* leaves could be due to its action on the central opioid receptors or promoted release of endogenous opioid peptides [51].The presence of flavonoids in *Thuhar* (*Euphorbia neriifolia* Linn.) is thought to be responsible for the anti-inflammatory and analgesic properties of *Thuhar* hydroalcoholic leaves extract [54]. Monteiro et al., reported that sesamin, an active constituent of *Kunjad* (*Sesamum indicum* Linn.), is responsible for the drug's antinociceptive and anti-inflammatory properties [59]. Sesamin had a chondroprotective effect via inhibition of PGs and collagen degradation. Sesamin suppresses MMP-1 expression, and together with sesamolin, demonstrates notable antioxidant properties [61].Overall, RHB exhibits potent anti-inflammatory and analgesic properties, and its ability to delay joint degeneration may be ascribed to the collective and synergistic effects of all its constituent ingredients. The anti-inflammatory and analgesic properties of its ingredients enhance the function of joints and the muscles that surround them. It has been proposed that RHB may be a complementary and alternative medicine for the treatment of MSD-related pain and inflammation, gradually reducing joint range of motion (ROM) restrictions and enhancing the quality of life for MSD patients. Various studies have shown that the components of RHB have various pharmacological properties. Clinical and experimental studies of this compound formulation (RHB) have not yet been conducted, despite several studies conducted by various researchers on its different ingredients. Clinical studies evaluating the topical analgesic and anti-inflammatory effects of RHB should be conducted on a larger sample population. Furthermore, randomized controlled trials with well-defined methodologies are needed to validate its efficacy and safety. Standardization of RHB in terms of dosage, formulation, and mode of application is also essential to ensure reproducible outcomes. In addition, pharmacological and toxicological investigations should be undertaken to establish its long-term safety profile and therapeutic potential in musculoskeletal disorders.

Conclusion:

Unani medicine has long employed various single and compound formulations for treating *Waja'al-Mafasil* (arthritis). Among these, *Roghan Haft Barg* (RHB) is a well-known polyherbal oil included in the Unani pharmacopeia, traditionally used to alleviate pain associated with musculoskeletal disorders. This review compiles data on the ethno-pharmacological properties of ingredients of RHB, revealing that they exhibit a range of therapeutic effects, including analgesic and anti-inflammatory activities. These findings support the traditional Unani practice of using RHB topically for managing pain in musculoskeletal conditions. Future prospects include conducting well-designed preclinical and clinical studies to establish its efficacy, safety, and mechanism of action, which could pave the way for its

wider acceptance and integration into modern healthcare practices.

Acknowledgement:

We sincerely thank all the authors for their valuable guidance, support, and encouragement throughout this work.

Conflict of Interest: The authors declare no conflict of interest.

References:

1. Chaudhari AJ, Raynor WY, Gholamrezanezhad A, Werner TJ, Rajapakse CS, Alavi A, Total-body PET imaging of musculoskeletal disorders, PET Clinics, 2021;16(1):99–117. DOI:10.1016/j.cpet.2020.09.012.

2. Tashani O, Johnson M, Avicenna's concept of pain, Libyan Journal of Medicine, 2010;5(1):5253. DOI:10.3402/ljm.v5i0.5253.

3. Ashraf R, Mohi-ud-din R, Unani aspect of arthritis (Waja ul Mafasil) and its management: A review, International Journal of Herbal Medicine, 2018; 6(3): 12–19.

4. World Health Organization. Musculoskeletal condition; 2019. Available at: https://www.who.int/news-room/factsheets/detail/musculoskeletal-conditions. Accessed March 20, 2026].

5. Smith E, Hoy DG, Cross M, Vos T, Naghavi M, Buchbinder R, The global burden of other musculoskeletal disorders: Estimates from the Global Burden of Disease 2010 study, Annals of the Rheumatic Diseases, 2014; 73(8):1462–1469. DOI:10.1136/annrheumdis-2013-204344.

6. Vos T, Abajobir AA, Abate KH, Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016, Lancet, 2017; 390(10100):1211-1259. DOI:10.1016/S0140-6736(17)32154-2.

7. Cimmino MA, Ferrone C, Cutolo M, Epidemiology of chronic musculoskeletal pain, Best Practice and Research in Clinical Rheumatology, 2011; 25(2):173-183. DOI: 10.1016/j.berh.2010.01.012.

8. Babatunde OO, Jordan JL, van der Windt DA, Hill JC, Foster NE, Protheroe J, Effective treatment options for musculoskeletal pain in primary care: a systematic overview of current evidence, PLoS One, 2017;12(6):e0178621. DOI: 10.1371/journal.pone.0178621.

9. Qaseem A, Wilt TJ, McLean RM, Forciea MA; Clinical Guidelines Committee of the American College of Physicians, Noninvasive treatments for acute, sub acute, and chronic low back pain: a clinical practice guideline from the American College of Physicians, Annals of Internal Medicine, 2017;166(7):514-530. DOI: 10.7326/M16-2367.

10. Singh G, Ramey DR, NSAID-induced gastrointestinal complications: the ARAMIS perspective—1997, The Journal of Rheumatology and Supplements, 1998; 51:8-16.

11. Brun J, Jones R, Nonsteroidal anti-inflammatory drug–associated dyspepsia: the scale of the problem, The American Journal of Medicine, 2001;110(1):12-13. DOI: 10.1016/s0002-9343(00)00629-x.

12. Kearney PM, Baigent C, Godwin J, Halls H, Emberson JR, Patrono C, Do selective cyclo-oxygenase-2 inhibitors and traditional nonsteroidal anti-inflammatory drugs increase the risk of atherothrombosis? Meta-analysis of randomized trials, British Medical Journal, 2006; 332(7553):1302-1308. DOI: 10.1136/bmj.332.7553.1302.

13. Vonkeman HE, Brouwers JR, Van de Laar MA, Understanding the NSAID-related risk of vascular events, British Medical Journal, 2006; 332(7546):895-898. DOI: 10.1136/bmj.332.7546.895.

14. Reynolds JF, Noakes TD, Schwellnus MP, Van der Windt A, Bowerbank P, Nonsteroidal antiinflammatory drugs fail to enhance healing of acute hamstring injuries treated with physiotherapy, South African Medical Journal, 1995; 85(6):517-522.

15. Sina I. Tarjuma wa Sharah Kulliyāt-i-Qanoon. Urdu translation by Kabiruddin. New Delhi, India: Aijaz Publishing House; 2006. P.238-239.

16. Nayab M, Islam M, An overview of Waja-ur-Rukbah (knee osteoarthritis) with reference to Waja-ul-Mafasil and its regimenal management (Ilaj bit Tadbeer) in Unani system of medicine, Asian Journal of Traditional, Complementary and Alternative Medicines, 2021;4(1-2):19-29. DOI:10.22040/ATCAM.2021.242486.1008.

17. Ansari A, Nayab M, Ansari A, Saleem S, An analytical review on ancient regimen: Dalk (massage) therapy in Unani system of medicine, International Journal of Research and Analytical Reviews, 2020;7(2):872-878.

18. Khan A. Al-Iksir. Vol 2. Urdu translation by H Kabiruddin. New Delhi, India: Idara Kitab-ul-Shifa; 2011.P.1439-1442.

19. Anonymous. National Formulary of Unani Medicine. Part 1. New Delhi, India: Department of AYUSH, Ministry of Health & Family Welfare, Government of India; 1993.P. 269.

20. Anonymous. National Formulary of Unani Medicine. Part 1. New Delhi, India: Central Council for Research in Unani Medicine, Department of AYUSH, Ministry of Health & Family Welfare, Government of India; 2006.P.194.

21. Anonymous. The Unani Pharmacopoeia of India. Part 1, Vol 1. New Delhi, India: Central Council for Research in Unani Medicine, Dept of AYUSH, Ministry of Health & Family Welfare, Government of India; 2007.P.3–4.

22. Kabiruddin H. Makhzan-ul-Mufradat. Lahore, Pakistan: Siddiqui Publication; n.d. P.49–52, 131–132, 198, 206–207, 288–289, 358, 370.

23. Hakeem A. Bustan-ul-Mufradat. New Delhi, India: Idara Kitab-ul-Shifa; 2002. P.63, 78–79, 131–132, 196–197, 202–203, 280, 343–344, 363.

24. Anonymous. Standardization of Single Drugs of Unani Medicine. Part 2. New Delhi, India: Central Council for Research in Unani Medicine; 1992.P.68–72.

25. Khan A. Muheet-e-Azam. Vol 1. New Delhi, India: Central Council for Research in Unani Medicine; 2012. P. 201–204, 703–705, 869–871.

26. Ghani N. Khazain-ul-Advia. New Delhi, India: Idara Kitab ul Shifa; n.d. P. 175–178, 218–220, 379–380, 701–704, 835–836, 875–876.

27. Obese E, Ameyaw EO, Biney RP, Henneh IT, Edzeamey FJ, Woode E, Phytochemical screening and anti-inflammatory properties of the hydroethanolic leaf extract of *Calotropis procera* (Ait.) R Br (Apocynaceae), Journal of Pharmaceutical Research International, 2018; 23(1):1–11.DOI: 10.9734/jpri/2018/42529.

28. Saba AB, Oguntoke PC, Oridupa O, Anti-inflammatory and analgesic activities of ethanolic leaf extract of *Calotropis procera*, African Journal of Biomedical Research, 2011;14(3):203–208. DOI:http://doi.org/10.4314/.

29. Anonymous. The Unani Pharmacopoeia of India. Part 1, Vol 3. New Delhi, India: Central Council for Research in Unani Medicine, Dept of AYUSH, Ministry of Health & Family Welfare, Government of India; 2007.P.8–9, 115–116.

30. Anonymous. Standardization of Single Drugs of Unani Medicine. Part 5. New Delhi, India: Central Council for Research in Unani Medicine; 2006.P.26–28.

31. Nabi MG. Makhzan-e-Mufradat wa Murakkabat. New Delhi, India: Central Council for Research in Unani Medicine, Ministry of Health and Family Welfare, Government of India; 2007.P.32, 37, 66, 96, 128, 147, 155.

32. Aoudia H, Oomah BD, Zaidi F, Yahiaoui R, Drover JCG, Harrison JE, Phenolics, antioxidant, and anti-inflammatory activities of *Melia azedarach* extracts, International Journal of Applied Research in Natural Products, 2013;6(2):19–29.

33. Vekariya S, Nishteswar K, Patel BR, Nariya M, Evaluation of analgesic and antipyretic activities of Mahanimba (*Melia azedarach* Linn.) leaf and root powder, An International Quarterly Journal of

Research in Ayurveda, 2016;37(2):140–144. DOI: 10.4103/ayu.AYU 69 15.

34. Akacha M, Lahbib K, Boughanmi NG, Phytochemical evaluation and net antioxidant activity of Tunisian *Melia azedarach* leaves extract using ProAntidex parameter, Bangladesh Journal of Pharmacology, 2016;11(2):301–307. DOI: 10.3329/bjp.v11i2.25981.

35. Hossain MS, Saed A, Karmakar UK, et al. Assessment of phytochemical, analgesic, and antioxidant profile of *Melia azedarach* L leaves (family Meliaceae), The Pharma Innovation Journal, 2013;2(7):64–69.

36. Khare CP. Indian Medicinal Plants: An Illustrated Dictionary. Berlin/Heidelberg, Germany: Springer-Verlag; 2007. P.203–204, 551–552, 710–711, 764, 765, 767.

37. Taur DJ, Waghmare MG, Bandal RS, Patil RY, Antinociceptive activity of *Ricinus communis* L leaves, Asian Pacific Journal of Tropical Biomedicine, 2011;1(2):139–141. DOI: 10.1016/S2221-1691(11)60012-9.

38. Saini AK, Goyal R, Gauttam VK, Kalia AN, Evaluation of anti-inflammatory potential of *Ricinus communis* Linn leaves extracts and its flavonoids content in Wistar rats, Journal of Chemical and Pharmaceutical Research, 2010;2(5):690–695.

39. Hussain A, Aslam B, Muhammad F, et al. Anti-arthritic activity of *Ricinus communis* L and *Withania somnifera* L extracts in adjuvant-induced arthritic rats via modulating inflammatory mediators and subsiding oxidative stress, Iranian Journal of Basic Medical Sciences, 2021; 24(7):951–961. DOI: 10.22038/ijbms.2021.55145.12355.

40. Khan A. Muheet-e-Azam. Vol 2. New Delhi, India: Central Council for Research in Unani Medicine; 2013. P.611–612.

41. Aboluwodi AS, Avoseh ON, Lawal OA, Ogunwande IA, Giwa AA, Chemical constituents and anti-inflammatory activity of essential oils of *Datura stramonium* L, Journal of Medicinal Plants Studies, 2017;5(1):21–25.

42. Chandan G, Kumar C, Chibber P, et al. Evaluation of analgesic and anti-inflammatory activities and molecular docking analysis of steroidal lactones from *Datura stramonium* L, Phytomedicine, 2021;89: 153621. DOI: 10.1016/j.phymed.2021.153621.

43. Sonika G, Manubala R, Deepak J, Comparative studies on anti-inflammatory activity of *Coriandrum sativum*, *Datura stramonium*, and *Azadirachta indica*, Asian journal of Experimental Biological Sciences, 2010;1(1):151–159.

44. Anonymous. The Unani Pharmacopoeia of India. Part 1, Vol 5. New Delhi, India: Central Council for Research in Unani Medicine, Dept of AYUSH, Ministry of Health & Family Welfare, Government of India; 2008. P.78–79, 88–89.

45. Anonymous. Standardization of Single Drugs of Unani Medicine. Part 3. New Delhi, India: Central Council for Research in Unani Medicine; 1997. P.65–70.

46. Maniyar YA, Dasari S, Evaluation of anti-inflammatory activity of ethanolic extract of *Vitex negundo* flowers in experimental animals, Indian Journal of Pharmacy and Pharmacology, 2017; 4(4):172–175. DOI: 10.18231/2393-9087.2017.0037.

47. Dharmasiri MG, Jayakody JR, Galhena G, et al. Anti-inflammatory and analgesic activities of mature fresh leaves of *Vitex negundo*, Journal of Ethnopharmacology, 2003; 87(2–3):199–206. DOI: 10.1016/s0378-8741(03)00159-4.

48. Ahirrao RA, Patel MR, Anti-arthritic activity of *Vitex negundo* Linn. Leaves, Asian Journal of Research in Chemistry, 2012; 5(7):843–845.

49. Gupta RK, Tandon VR, Antinociceptive activity of *Vitex negundo* Linn. leaf extract, Indian Journal of Physiology and Pharmacology, 2005; 49(2):163–170.

50. Khan A. Muheet-e-Azam. Vol 3. New Delhi, India: Central Council for Research in Unani Medicine; 2014. P. 223–225.

51. Bhattacharya A, Agrawal D, Sahu P, Kumar S, Mishra S, Patnaik S, Analgesic effect of ethanolic leaf extract of *Moringa oleifera* on albino mice, Indian Journal of Pain, 2014; 28(2):89–94. DOI:10.4103/0970-5333.132846.

52. Caceres A, Saravia A, Rizzo S, Zabala L, De Leon E, Nave F, Pharmacologic properties of *Moringa oleifera*. II: Screening for antispasmodic, anti-inflammatory, and diuretic activity, Journal of Ethnopharmacology, 1992; 36(3):233–237. DOI: 10.1016/0378-8741(92)90049-w.

53. Mahajan SG, Mali RG, Mehta AA, Protective effect of ethanolic extract of seeds of *Moringa oleifera* Lam. against inflammation associated with development of arthritis in rats, Journal of Immunotoxicology, 2007; 4(1):39–47. DOI: 10.1080/15476910601115184.

54. Sultana A, Hossain MJ, Kuddus MR, Rashid MA, Zahan MS, Mitra S, et al. Ethnobotanical uses, phytochemistry, toxicology, and pharmacological properties of *Euphorbia neriifolia* Linn. against infectious diseases: a comprehensive review, Molecules, 2022;27(14):4374. DOI: 10.3390/molecules27144374.

55. Ilyas M, Parveen M, Muhaisen H, Basudan O, A novel triterpene (Neriifolione): a potent anti-inflammatory and antiarthritic agent from *Euphorbia neriifolia*, Hamdard Medicus, 2003;46 (2):97–102.

56. Gaur K, Rana AC, Nema RK, Kori ML, Sharma CS, Anti-inflammatory and analgesic activity of hydro-alcoholic leaves extract of *Euphorbia neriifolia* Linn, Asian Journal of Pharmaceutical and Clinical Research, 2009; 2(1):26–29.

57. Bigoniya P, Rana AC, Pharmacological screening of *Euphorbia neriifolia* leaf hydro-alcoholic extract, Journal of Applied Pharmacy, 2010;1(1):1–17. DOI:10.21065/19204159.2.1.

58. Anonymous. The Unani Pharmacopoeia of India. Part 1, Vol 2. New Delhi, India: Central Council for Research in Unani Medicine, Dept of AYUSH, Ministry of Health & Family Welfare, Government of India; 2007. P.71–72.

59. Monteiro EM, Chibli LA, Yamamoto CH, Pereira MC, Vilela FM, Rodarte MP, et al. Antinociceptive and anti-inflammatory activities of sesame oil and sesamin, Nutrients. 2014; 6(5):1931–1944. DOI: 10.3390/nu6051931.

60. Ruckmani A, Meti V, Vijayashree R, Arunkumar R, Konda VR, Prabhu L, et al. Anti-rheumatoid activity of ethanolic extract of *Sesamum indicum* seed extract in Freund's complete adjuvant–induced arthritis in Wistar albino rats, Journal of Traditional and Complementary Medicine, 2017;8(3):377–386. DOI: 10.1016/j.jtcme.2017.06.003.

61. Phitak T, Pothacharoen P, Settakorn J, Poompimol W, Caterson B, Kongtawelert P, Chondroprotective and anti-inflammatory effects of sesamin, Phytochemistry, 2012; 80 :77–88. DOI: 10.1016/j.phytochem.2012.05.016