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# SCIENTIFIC APPRAISAL OF *ROGHAN AHMAR JADEED* (UNANI PHARMACOEPIAL OIL) IN THE MANAGEMENT OF PAIN RELATED TO MUSCULOSKELETAL DISORDERS: A REVIEW

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**Keywords:**

Musculoskeletal disorder, Musculoskeletal pain, *Roghan Ahmar Jadeed*, Terpenes, Unani Medicine, *Waja' al-Mafasil*

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**ABSTRACT:** Unani Medicine is the ancient system of medicine that deals with prophylactic and therapeutic management of various acute and chronic illnesses. *Ilaj bilGhiza*, *Ilaj bit Tadbeer*, *Ilaj bid dawa* and *Ilaj bil yad* are the essential modes of treatment in Unani Medicine. A broad term *Waja'al-Mafāsil* covers entire Musculoskeletal disorders (MSDs) like inflammatory, non-inflammatory, infectious, metabolic, and other MSDs in Unani medicine. Pain is the most common and leading symptom of MSDs. Musculoskeletal pain (MSK) is the most complicated and challenging condition for both patients and medical experts. Almost all individuals experience one or more episodes of MSK pain in their whole life span, regardless of age, gender, or economic status. About 47% of the overall population is affected by MSK pain. Of those, between 39 and 45 percent have persistent issues that need medical attention. Chronic MSK pain which is not properly managed can have a negative impact on quality of life and poses significant socioeconomic problems. *Roghan Ahmar Jadeed* is an Unani pharmacopeial formulation, induces analgesic and anti-inflammatory effects when applied locally. The current review provides an inclusive understanding about phytopharmacology of RAJ constituents and their pharmacological activity. The data was collected from more than five databases such as WebMed, PubMed, Springer, Google Scholar, and ScienceDirect then subsequently analyzed. Based on a review of the research papers, it was found that RAJ poses potential chemical constituents that exert significant analgesic and anti-inflammatory effects and thereby reduce pain in MSD, thus improving the quality of life in patients.

**INTRODUCTION:** The Arabic word *Waja'* is used for pain in the Unani literature [1]. In Unani medicine, the broad term *Waja'al-Mafsil* refers to all joint problems, including inflammatory, non-inflammatory, infectious, metabolic, and other musculoskeletal disorders.

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Musculoskeletal disorders (MSDs) are illnesses or pain that affects the human musculoskeletal system, which consists of the joints, ligaments, muscles, nerves, tendons, and structures that support the limbs, neck, and back.

According to Arzani (1904), MSDs can be caused by sudden exertion (such as heavy weight lifting), repetitive strain from performing repeated movements, or exposure to force, vibration, or poor posture continually. "Acute or chronic pain that affects bones, ligaments, tendons, muscles, and nerves" is known as musculoskeletal pain (MSK). MSK pain is a widespread medical and

socioeconomic issue around the world [2]. It includes a variety of pain syndromes, ranging from neuropathic pain to local pain [3]. In patients with MSDs, chronic musculoskeletal pain is the primary cause of disability [4]. 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 [3]. Daily activities of life become more difficult as a result of chronic MSK pain, that severely lowers quality of life [5]. Chronic low back pain, neck pain, and pain from osteoarthritis and rheumatoid arthritis are the most prevalent forms of MSK pain. Musculoskeletal pain can strike at any age, although it is more likely occurs with ageing. Every individual experience MSK pain once in their whole life span [3, 6].

A large number of pharmacological and non-pharmacological interventions are being used to manage MSK pain. Pharmacological treatment with non-steroidal anti-inflammatory drugs (NSAIDs) are typically recommended as first-line therapy with or without adjuvant therapy in patients with chronic MSK pain who have had an unsatisfactory response to non-pharmacological therapy [7]. NSAIDs are the preferred medication for treating acute pain [8, 9]. The adverse effects on GI system which are linked with the use of NSAIDs are dyspepsia or vomiting to more severe injuries like gastroduodenal ulceration, bleeding and gastrointestinal lesions [10]. Some studies have also documented liver injury and hepatotoxicity [11-13]. Additional hazards include cardiovascular issues, peripheral edema, and hyperkalemia, particularly in diabetics and the elderly [14, 15]. Other modes of treatments such as surgical interventions etc. are highly expensive furthermore, associated with more irreversible complications. Due to the considerable adverse effects of steroidal and NSAID there is growing interest in natural substances, such as nutritional supplements and herbal therapies, which have been used for ages to relieve pain and inflammation [16].

The essential modes of treatment in Unani system of medicine includes *'Ilaj bi'lGhiza'* (diet-therapy), *'Ilaj bitTadbir* (Regimenal therapy), *'Ilaj bi'd Dawa'* (pharmacotherapy). All the said principles are recommended for the treatment of *Waja'al-Mafāsil* [17]. *Roghan-e-Ahmar Jadeed* is a poly herbal pharmacopeial oil mentioned in important pharmacopoeias, formularies and books of compound drugs. It is being used since many years to manage the inflammatory as well as degenerative musculoskeletal disorders, such as *Waja' al-Mafasil* (arthritis), *Zof-i-Asab* (nervine weakness) etc as its actions are *Musakkin-i-Alam* (Analgesic), *Moharrik-i-Asab* (Nerve stimulant), *Muqawwi-i-Asab* (strengthens nerves) [18]. Information about ethnopharmacological properties of ingredients of *Roghan-e-Ahmar Jadeed* are listed in **Table 1.**

**MATERIALS AND METHODS:** The studies were carried out in accordance with the assertions from the recommended reported systematic reviews or research articles that had been published in national and international journal. For the purpose of choosing recent and important information for the study, the information was acquired through a prospective complete literature search using more than 5 databases, including Google Scholar, Springer, PubMed, WebMed, and Science Direct publishing from 1977 to 2023. The selected papers were reviewed on the basis of pertinent citations to enlist pharmacological properties of individual ingredients of RAJ and depicted in the **Table 1.**

**TABLE 1: ETHNOPHARMACOLOGICAL PROPERTIES OF INGREDIENTS OF RAJ**

| Botanical names | Unani names | Therapeutically active constituents | Effects as per Unani Medicine | Associated Pharmacological activity |
|---|---|---|---|---|
| *Usnialongissima* Linn | *Ushna* | Useanol, Lecanorin, 3-hydroxy-5-methylphenyl | *Muhallil (anti-inflammatory), Musakkin*(analgesic), Muqawwi-i-Asab(nervine tonic) [19, 20] | Antioxidants[21] |
| *Valeriana officinalis* Linn | *Sumbul utteeb* | Monoterpenes, Sesquiterpenes, Caffeic, Gamma-aminobutyric (GABA) | *Muhallil-e-Waram* (anti-inflammatory), *Musakkin*(analgesic)[20,22,25] | Analgesic[26] |
| *Cyperus rotundus* | *Saad kufi* | Mono- and Sesquiterpenes, Saponins | *Musakkin*(analgesic)[20,27-39] | Anti-inflammatory, Antioxidants[30,31] |
| *Alkanna* | *Ratan jot* | Lipophilic isohexenyl | *Musakkin*(analgesic) [20] | Anti-inflammatory[32] |

| | | | | |
|---|---|---|---|---|
| *tinctoria* | | naphthazarin | | |
| *Strychnosnux vomica* | *Kuchla Musallam* | Strychnine N-oxide, Brucine | *Muhallil*(anti-inflammatory)[23] | Anti-inflammatory, antioxidants[33,34] |
| *Brassica nigra* | *Khardal Banarsi* | Isothiocynate glycoside(sinigrin) (potassium myronate) and Myrosin | *Muhallil* (anti-inflammatory), *Musakkin*(analgesic)[20,29] | Analgesic, Anti-inflammatory' Anti-arrthritic[35.36] |
| *Psoralea corylifolia* | *Babchi* | Corylifols a–c (prenylfoavanoids) | *Muhallil-i-Auram* (anti inflammatory) [20] | Anti-inflammatory[37] |
| *Aloe barbadensis* | *Sibr e zard* | Anthraquinones, Chromones, Polysaccharides | *Mohallil-i-Auram* (anti inflammatory)[20,22] | Anti-inflammatory [25,38] |
| *Myrica nagi thumb* | *Kaifal* | Myricetin, Myricitrin, and Glycosides | *Muhallil* (anti-inflammatory), *Musakkin*(analgesic) [20,23] | Antioxidants, Anti-inflammatory[39,40] |
| *Curcuma amada* | *Amba Haldi* | Transhydroocimene, Ocimene, Myrcene | *Muhallil-i-Auram* (anti inflammatory), *Musakkin*(analgesic) [29] | Analgesic, Anti-inflammatory [41,42] |
| *Rubia cordifolia* Linn | *Majeeth (Foh)* | Alizarin, LucidinPrimeveroside, Ruberythric acid Anthraquinones | *Musakkhin*(analgesic)[24] | Anti-inflammatory, Antioxidants[43,44] |
| *Burberis aristate* | *Dar e hald* | Karachine, Aprotoberberine alkaloid, Oxyberberine, Oxyacanthine, Berbamine, and Berberine chloride | *Muhallil-i-Auram* (anti inflammatory), *Musakkin*(analgesic)[20,24] | Anti-inflammatory[45] |
| *Pterocarpus santalinus* Linn | *Sandal Surkh* | Anthocyanins, Saponins, tannins, Phenols, Triterpenoids, Flavonoids, Glycosides | *Muhallil-i-Auram* (anti inflammatory), *Musakkin*(analgesic)[20,25,29] | Anti-inflammatory[46] |
| *Curcuma zedoaria Rose* | *Zaranbad* | Curcumene, Curcumenone, Curdione, and Curcumenol. Curzerenone | *Muhalill-i-auram* (anti-inflammatory), *Musakkin*(analgesic) [20] | Analgesic, Anti-inflammatory, Antioxidants[47-49] |
| *Acorus calamus* | *Waj Turki* | Acorenone, Iso-acorone, Sesquilavandulol, and Dehydroxy Isocalamendiol | *Musakkin*(analgesic) [25] | Anti-inflammatory [50] |
| *Allium Sativum* Linn | *Lehsunkham* | Alliin (S-allyl-L-cysteine sulfoxide), Alliinase and S-methyl-L-cysteine sulfoxide | *Muhalill-i-auram*(anti-inflammatory), *Musakkin*(analgesic)[20,29,51] | Anti-inflammatory, antioxidants [52,53] |
| *Turpentine oil* | *Roghan e Tarpeen* | Terpenoids, Flavonoids, Tannins | *Musakkin*(analgesic) [20] | Antioxidants[54] |

**RESULTS AND DISCUSSION:** MSDs are one of the leading causes of disability worldwide. Many targeted therapies in modern medicine are employed to cure MSDs. However, these medications are associated with serious adverse effects or even relapse of disease occurs if discontinued. Due to the several limitations associated with the use of existing NSAIDs, the search for newer drugs for MSDs from natural sources can be approached. RAJ is a polyherbal Unani formulation provide an effective primary care for the management of MSDs *via* exerting therapeutic value as analgesic and anti-inflammatory properties. RAJ comprises variety of ingredients which are beneficial in the management of pain and local inflammation. Nizam R & Ansari MS (2022) reported that topical application of *Aloe barbadensis Mill.* appeared to be effective in the treatment of anal fissure due to its anti-inflammatory activity [55]. *Brassica nigra* acted as anti-inflammatory and analgesic in one such study [56]. Panwar NS *et al* (2023) explored the anti-

inflammatory activity of *Curcuma amada* and found effective in inhibiting albumin denaturation which is responsible for inflammation in his study [57]. Topical anti-inflammatory effects of *C. rotundus* extract were evaluated in ear oedema of mice models [58]. Susanto A *et al* (2018) documented that topical application of *Curcuma zedoaria* exerts an anti-inflammatory activity when used as an adjunctive therapy was proven to be effective in decreasing the Interleukin-6 levels in chronic periodontitis in mice [59]. The study conducted by Obi IM et al (2022) to evaluate the topical anti-inflammatory effect of ethanol extract of *Allium sativum* on xylene- induced ear oedema in mice showed positive results [60]. Hence it can be said that RAJ can be used as a potent suppressor of inflammation and pain results in degeneration of joints. Its constituents exert anti-inflammatory and analgesic actions which results in strengthen the function of joint and muscles related with joint.

It can be suggested that RAJ can be an alternative and complimentary drug in the management of pain and inflammation related with MSDs, which progressively reduce restriction of the range of motion (ROM) of joints and thus improve the quality of life in patients of MSDs. It is evident from various studies that ingredients of RAJ pose diverse pharmacological properties. Several studies have been carried out on individual ingredient of RAJ by different investigators but clinical and experimental studies of this compound formulation (RAJ) have not been carried out so far. Therefore, it is suggested that the clinical studies on the topical analgesic and anti-inflammatory effects of *Roghan Ahmar Jadeed* should be conducted on large sample size.

**CONCLUSION:** In Unani Medicine several single and compound formulations are successfully used for the treatment of *Waja' al-Mafasil* (Arthritis) since ages. *Roghan Ahmar Jadeed* (RAJ) is one of the Unani pharmacopeial polyherbal oil which has been recommended in the management of pain related to musculoskeletal disorders. The current review provides data regarding ethno-pharmacological properties of ingredients of RAJ and it is found that the ingredients of RAJ pose diverse pharmacological properties such as analgesic and anti-inflammatory activities. Thus, this review validates the traditional practice of Unani physicians for the topical use of RAJ in the management of pain in the musculoskeletal disorders.

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