

A REVIEW ON THE PHARMACOLOGICAL ACTIVITIES AND THERAPEUTIC POTENTIAL OF ANACYCLUS PYRETHRUM

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ABSTRACT

Anacyclus pyrethrum, known as Aqarqarha in Unani medicine, has been utilized since ancient times as a botanical remedy, predominantly employing its roots. This study aims to scrutinize its therapeutic role in managing Amrad Asab wa Dimag (nerve and brain diseases), Amrad Asnan (dental ailments), Amrad Bah (sexual disorders), and Amrad Khilt-i-balgham (phlegmatic disorders) as documented in Unani literature. Renowned Unani scholars have attributed various pharmacological actions to Aqarqarha, including abortifacient, anti-inflammatory, sialagogue, tonic, gastrosis, inflammation, lethargy, and stimulant, rubefacient, cordial, antidepressant, immunostimulating, memory-enhancing, and antioxidant effects, as well as interactions with hormones.

Unani medicine extols the efficacy of Aqarqarha and its formulations in managing the aforementioned ailments, modern scientific reports, albeit limited, also suggest potential pharmacological effects of this lesser-known botanical remedy. Hence, this review aims to unveil the scientific mechanisms underlying the actions of Anacyclus pyrethrum.

Keywords: Anacyclus Pyrethrum, Aqarqarha, Unani Medicine, Therapeutic Potential, Traditional Uses, Immunostimulating, Memory-Enhancing, Anti-Inflammatory

I. INTRODUCTION

Anacyclus pyrethrum, commonly referred to as Aqarqarha in Unani medicine, holds a significant place in traditional healing systems, particularly in the Unani system of medicine. With roots steeped in antiquity, Aqarqarha has been revered by Unani scholars for its therapeutic properties, with its roots being the most prominently utilized part. This botanical remedy finds mention in classical Unani literature for its purported efficacy in treating various ailments, including those related to the nervous system, dental health, sexual disorders, and phlegmatic conditions. Renowned Unani scholars have attributed a plethora of pharmacological actions to Aqarqarha, ranging from anti-inflammatory and tonic effects to immunostimulating and memory-enhancing properties.

Despite the rich traditional knowledge surrounding Aqarqarha, modern scientific research on its pharmacological actions and therapeutic potential remains relatively scarce. Nonetheless, the existing literature hints at the possibility of aligning traditional wisdom with contemporary scientific understanding, shedding light on the mechanisms underlying its purported effects.

In light of this, the present review endeavors to explore the traditional uses and pharmacological actions of Aqarqarha as documented in Unani literature. Through a comprehensive analysis of both ancient Unani texts and contemporary scientific reports, this review aims to bridge the gap between traditional knowledge and modern evidence, providing insights into the scientific basis of Anacyclus pyrethrum's medicinal properties. By elucidating the pharmacological mechanisms underlying its traditional uses, this review seeks to contribute to a deeper understanding of Aqarqarha and its potential applications in modern healthcare.



Fig 1: Anacyclus pyrethrum

Morphological Characteristics:

Anacyclus pyrethrum, a perennial member of the Asteraceae family, typically grows to a height ranging from 40 to 60 cm. It is characterized by numerous simple or slightly branching stems emerging from the base, adorned with finely cut, delicate, and pubescent leaves. The distinctive yellow-centered flowers feature white ray florets internally and purple exteriors. The roots of *A. pyrethrum* are notable for their length, thickness, fibrous texture, and bi-colored appearance—brown on the exterior and white internally. The fruits, known as achenes, are typically smooth or bear a subtle crown. *A. pyrethrum* blooms from May to August, gracing its surroundings with its vibrant flowers.

Ethnological studies conducted in Morocco reveal the profound significance of *A. pyrethrum* within local communities, esteemed for its medicinal attributes and socioeconomic importance. The root, in particular, holds paramount therapeutic value and sees widespread utilization, reflecting its prominence in traditional medicinal practices.

Taxonomical Classification of Anacyclus pyrethrum:

Kingdom: Plantae

Phylum: Angiosperms

Class: Eudicots

Order: Asterales

Family: Asteraceae

Genus: Anacyclus

Species: Anacyclus pyrethrum

Anacyclus pyrethrum belongs to the kingdom Plantae, which encompasses all plants. It is classified under the phylum Angiosperms, which includes flowering plants. Within the class Eudicots, Anacyclus pyrethrum falls under the order Asterales. The family Asteraceae, also known as the aster, daisy, or sunflower family, is where Anacyclus pyrethrum is situated. Anacyclus is the genus to which this plant belongs, and pyrethrum is its species name.

Synonyms of Anacyclus pyrethrum:

1. English: Pellitory, Spanish Pellitory, Mount Atlas daisy
2. Hindi: Akarkara, Akkar Karha
3. French: Pyrèthre de montagne
4. Spanish: Piretro montano
5. Italian: Pirètro delle montagne
6. German: Bertramblättriger Fieberklee

Geographic distribution of Anacyclus pyrethrum:-

1. Europe: Anacyclus pyrethrum is native to parts of Southern Europe, particularly the Mediterranean region. Countries such as Spain, Italy, Greece, and France are known to harbor natural populations of this plant species.
2. Asia: It is also found in several regions of Asia, including the Middle East, Central Asia, and the Indian subcontinent. Countries such as Turkey, Iran, Afghanistan, Pakistan, and India are among the areas where Anacyclus pyrethrum can be found growing in the wild.
3. Africa: Anacyclus pyrethrum is distributed across North Africa, with countries like Morocco, Algeria, Tunisia, and Libya being notable regions where this plant is indigenous. It is also found in parts of East Africa.
4. Cultivation: In addition to its native range, Anacyclus pyrethrum is cultivated in other parts of the world, including North America and Australia, for its medicinal and ornamental purposes.

Table 1: Chemical constituents of Anacyclus pyrethrum with their uses

Sr. No.	Chemical Constituents	Uses
1	Alkylamides	It has analgesic and anti-inflammatory properties, making them useful in the management of pain and inflammation.
2	Pyrethrins	They are commonly used as insecticides in agriculture and pest control.
3	Pellitorine	It possesses antimicrobial properties, making it useful in the treatment of microbial infections.
4	Sesquiterpene lactones	In the management of inflammatory conditions and immune-related disorders.
5	Polyacetylenes	It possess anticancer properties and may have potential applications in cancer therapy.
6	Volatile oils	In the treatment of microbial infections and as natural insect repellents.

Traditional uses of Anacyclus pyrethrum:

1. Medicinal Purposes: Anacyclus pyrethrum has been used traditionally in various traditional medicine systems, including Ayurveda, Unani, and Traditional Chinese Medicine, for its medicinal properties. It is believed to have diverse therapeutic effects, including as an aphrodisiac, stimulant, digestive aid, and for improving oral health.
2. Dental Health: In traditional medicine, Anacyclus pyrethrum has been used to promote dental health. It is believed to have antimicrobial properties that help in maintaining oral hygiene and treating dental issues such as toothaches and gum diseases.
3. Aphrodisiac: Anacyclus pyrethrum has been traditionally used as an aphrodisiac to enhance libido and sexual performance in both men and women. It is believed to have stimulating effects on the reproductive system.
4. Digestive Disorders: Traditional medicine systems have employed Anacyclus pyrethrum for the treatment of digestive disorders such as indigestion, flatulence, and stomachache. It is believed to have carminative and digestive stimulant properties.
5. Respiratory Conditions: Anacyclus pyrethrum has been used traditionally to alleviate respiratory conditions such as coughs, colds, and bronchitis. It is believed to have expectorant properties that help in clearing mucus from the respiratory tract and relieving cough symptoms.
6. Rheumatic Conditions: Traditionally, Anacyclus pyrethrum has been used to alleviate rheumatic conditions such as arthritis and joint pain. It is believed to have anti-inflammatory and analgesic properties that help in reducing inflammation and pain.

7. Topical Applications: Anacyclus pyrethrum has been used topically in traditional medicine for its rubefacient properties, which help in improving blood circulation and relieving pain when applied to the skin.

Contribution of Anacyclus pyrethrum to cough syrup:

1. Expectorant: Anacyclus pyrethrum has expectorant properties, which help in expelling mucus from the respiratory tract. This action can help alleviate cough symptoms by clearing the airways.
2. Antitussive: While Anacyclus pyrethrum can promote mucus expulsion, it also possesses antitussive properties, meaning it can help suppress cough reflexes. This dual action makes it valuable in cough syrup formulations for both productive and non-productive coughs.
3. Anti-inflammatory: Anacyclus pyrethrum exhibits anti-inflammatory properties, which can help reduce inflammation in the respiratory tract caused by coughing, thereby providing relief from cough symptoms.
4. Antimicrobial: Some constituents of Anacyclus pyrethrum possess antimicrobial properties, which can help combat respiratory infections caused by bacteria or viruses, contributing to the effectiveness of cough syrup in treating infections underlying coughs.
5. Soothing: Anacyclus pyrethrum can have a soothing effect on the throat, reducing irritation and discomfort associated with coughing. This soothing action can provide symptomatic relief and improve overall comfort during cough episodes.

Toxic effects of Anacyclus pyrethrum:

Anacyclus pyrethrum, while possessing medicinal properties, also has the potential for toxicity if used improperly or in excessive amounts.

1. Contact Dermatitis: Direct contact with the plant or its extracts may cause skin irritation or allergic reactions in sensitive individuals.
2. Gastrointestinal Irritation: Ingestion of large quantities of Anacyclus pyrethrum or its extracts may irritate the gastrointestinal tract, leading to symptoms such as nausea, vomiting, and abdominal pain.
3. Abortifacient Effects: Anacyclus pyrethrum has been traditionally used as an abortifacient, meaning it may induce abortion or miscarriage if consumed by pregnant women. Pregnant women should avoid using Anacyclus pyrethrum due to this potential risk.
4. Neurological Effects: Excessive consumption of Anacyclus pyrethrum may lead to neurological symptoms such as dizziness, confusion, and convulsions.
5. Drug Interactions: Anacyclus pyrethrum may interact with certain medications, including anticoagulants and antiplatelet drugs, leading to increased risk of bleeding. It is important to consult a healthcare professional before using Anacyclus pyrethrum, especially if taking other medications.
6. Hepatotoxicity: Some studies suggest that high doses of Anacyclus pyrethrum may have hepatotoxic effects, causing liver damage. Individuals with liver conditions or those at risk of liver damage should avoid using Anacyclus pyrethrum.
7. Renal Toxicity: There is limited information available on the potential renal toxicity of Anacyclus pyrethrum. Further research is needed to assess its effects on kidney function.

Here are several potential areas of research in Anacyclus pyrethrum:

1. Phytochemistry: Investigating the chemical composition of Anacyclus pyrethrum to identify and characterize its bioactive compounds, such as alkylamides, pyrethrins, and sesquiterpene lactones.
2. Pharmacology: Conducting pharmacological studies to understand the mechanisms of action and therapeutic potential of Anacyclus pyrethrum, including its anti-inflammatory, analgesic, antimicrobial, and immunomodulatory properties.
3. Traditional Medicine: Exploring the traditional uses of Anacyclus pyrethrum in various traditional medicine systems, such as Ayurveda, Unani, and Traditional Chinese Medicine, and validating its efficacy through modern scientific research.
4. Clinical Research: Designing and conducting clinical trials to evaluate the safety and efficacy of Anacyclus pyrethrum-based treatments for specific health conditions, such as pain management, respiratory disorders, and sexual dysfunction.

5. Pharmacokinetics: Investigating the absorption, distribution, metabolism, and excretion of bioactive compounds from *Anacyclus pyrethrum* to optimize dosage regimens and ensure therapeutic efficacy.
6. Toxicology: Assessing the safety profile of *Anacyclus pyrethrum* through toxicological studies to determine potential adverse effects and establish safe usage guidelines.
7. Antimicrobial Activity: Examining the antimicrobial properties of *Anacyclus pyrethrum* against various pathogens, including bacteria, fungi, and viruses, to explore its potential as a natural antimicrobial agent.
8. Antioxidant Activity: Investigating the antioxidant properties of *Anacyclus pyrethrum* and its potential role in protecting against oxidative stress-related diseases, such as cardiovascular disorders and neurodegenerative diseases.
9. Phytopharmacovigilance: Monitoring the safety and efficacy of *Anacyclus pyrethrum*-based products through post-market surveillance to identify and manage any potential adverse effects or drug interactions.
10. Industrial Applications: Exploring the industrial applications of *Anacyclus pyrethrum*, such as its use in pharmaceuticals, nutraceuticals, cosmetics, and food additives, to develop novel products and formulations.

II. CONCLUSION

Anacyclus pyrethrum, or Akarkara, is a botanical gem with a rich history in traditional medicine. This review paper delves into its botanical, phytochemical, and pharmacological aspects, revealing its diverse therapeutic potential. Traditional uses across cultures highlight its efficacy in treating dental, respiratory, and sexual health issues. While modern research validates its traditional uses, caution is warranted due to potential toxicity and interactions. Overall, *Anacyclus pyrethrum* emerges as a promising candidate in the realm of natural medicine, bridging ancient wisdom with modern science for holistic health.

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