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Phytopharmacological Of An Important Unani Drug Khashkhash (Papaver Somniferum Seed) – Review

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Abstract:

Objective: Khashkhash (Papaver somniferum seed) is one of the important drug mentioned in Unani literature. The description of Poppy seeds is mentioned in various classical Unani books. Renowned Unani scholar Avicenna had also described poppy seeds in his famous book "The Canon of Medicine". According to Unani philosophy, Khashkhash is in the second-degree category according to its temperamental nature. Poppy seed oil is also a good source of essential fatty acids, especially linoleic acid, as compared to the other edible oilseeds. Pantothenic acid in poppy seeds was found in the greatest amount, followed by the vitamin's niacin and thiamin.

Methods: Unani classical literature was searched from recent to past available in different libraries. For phytochemistry, pharmacology and preclinical studies to prove the importance databases such as Library, Medline, PubMed, Google Scholar and Science-direct were searched. All the information of plant available in Urdu, Persian, Arabic and studies published abstract were included in the study.

Results: The action of Khashkhash mentioned in Unani classical literature are Mukhaddir (Anesthetic), Qābiḍ (Astringent), Munawwim (Sedative), Musakkin-i-Alam (Analgesic), Hābis-i-Dam (hemostyptic), Muqawwī-i-Dimāgh (Brain tonic), Munḍij (concoctive), Mudirr-i-Bawl (Diuretic), Muḥarrik (Stimulant), Hāḍim (Astringent), Mubarrid (Refrigerant) etc and useful in Sahar (Insomnia), Malankhūliya (Melancholia), Nafth al-Dam (Haemoptysis), Ishāl (Purgation), Zahīr (Dysentery), Nazla (Catarrh), Su'āl(Cough), Hirqatul Mathāna (Burning in bladder) etc. Papaver somniferum seed showed many pharmacological effects included Antitussive, Anti-diarrheal, Antibacterial activity, Hypoglycemic, Anticarcinogenic and Antiallodynic activities in different clinical and experimental studies.

Conclusion: This presentation is an attempt to showcase the action, uses mentioned in Unani literature, chemical constituent and pharmacological and toxicological effects in one place. It may also be observed that the drug has many actions which may be beneficial in diseases.

Index Terms - Khashkhash, Papaver somniferum seed, Unani medicine

INTRODUCTION

Medicinal plants are a one-of-a-kind gift from nature that is beneficial to all forms of life on the globe. Herbal medications originate from plants in whole or in part for medicinal purposes, such as roots, stems, bark, leaves, flowers, fruits and seeds.[1] During the recent decades, chemical side effects have been found and actions have been taken to overcome this problem. As a result, individuals began to turn back to natural products, particularly in the pharmaceutical industry.[2] Unani System of Medicine mention many herbal medications, one of which is Khashkhāsh (Papaver somniferum seed), which belongs to the Papaveraceae family. It is one of those traditional herbs that has a lengthy history of use as medicine. The term "opium" is of Unani (Greek) origin, coming from "opos" (juice) and "opion" (poppy juice). Opium is thoroughly mentioned in classical Unani literature for its ability to relieve pain and induce sleep.[3] The most essential component of this plant is the Papaver somniferum seed, which generates some of the most extensively used pharmaceutical alkaloids such as morphine, codeine, thebain and porphyroxine. Morphine was isolated from the dried milky exudates of Papaver somniferum capsules. The surgeon William Halstead successfully "treated" a debilitative addiction to cocaine by switching to morphine.[4]

On tracing the history of this drug, it was found that it was known to Greek in the beginning of the third century B.C. The poppy generally cultivated in India is the P. somniferum var. album, with white flowers and white seeds, but a red flowered and black seeded variety is found in the Himalayas.[5]

Methods

Unani classical literature was searched from recent to past available in different libraries. For phytochemical, pharmacological activities and clinical trials carried out to prove the importance of Khashkhash (Papaver somniferum seed), computerized databases such as Medline, PubMed, Google Scholar and Science-direct were searched. All the information of plant available in Urdu, Persian, Arabic and studies published abstract were included in the study.

Taxonomic classification [6]

Kingdom	:	Plantae
Division	:	Tracheophyta
Class	:	Magnoliopsida
Order	:	Ranunculates
Family	:	Papaveraceae
Genus	:	Papaver L
Species	:	Somniferum L

Habitat and Distribution:

It is an erect annual herb that grows to a height of 60-120 cm and is cultivated in main parts of the world, most notably in Turkey, Asia Minor, Persia, India, China and Southeastern Europe. Nepal, Assam and Barma also cultivate and produce it. It is manufactured in Bihar, Bengal, Central and Western India. [7, 8]

Cultivation:

An erect annual plant that is grown in Italy, Greece and Asia. It is also cultivated in India, Turkey and Russia and to some amount in Yugoslavia, Bulgaria, Afghanistan, Pakistan and Japan. The plant blooms from September to April.[10]

Māhiyat (Description of drug in Unani literature)

Poppy seeds, known as "Khashkhash" in Unani medicine have been mentioned in various classical Unani books, including the famous book "The Canon of Medicine" by Avicenna (Ibn Sina). According to him there are various kinds of poppy seeds.

- Khashkhāsh Safed or Bustānī (Garden poppy)
- Siyah or Jangli (Wild or black poppy seed)
- Khashkhāsh Zabdi
- Khashkhāsh Manshūr
- Khashkhāsh Muqarran (Horn poppy seed)

Tukhm-i-Khashkhāsh safed," which are small white seeds obtained from the capsule of the white poppy plant. It is called poppy because the seed of poppy is often white, round and it is better than black and suitable for eating. The seeds which are obtained before the incision of capsules for the extraction of opium are considered to be of best quality. Historically, it has been used for various medicinal purposes, including pain relief, sedation, diarrhea, dysentery, cough, premature ejaculation, chronic cough, insomnia and skin disorders as well as a nutritive food.[9]

Fig. Khashkhāsh (Papaver Somniferum seed L.) (source: market)

Mutrādifāt (Vernacular names) [10, 11]

Arabic	:	Abunom, Afyiun
Assammee	:	Posto Dana
Bengali	:	Pasto Dana Post
English	:	Bale-wort, Caranation poppy, Poppy.
Greek	:	Agria
Gujrati	:	Aphina, Khushus, Posta
Hindi	:	Afin, Khashkash, Afyun
Kahmiri	:	Khashkas
Kannada	:	Khasakhasi
Malyalam	:	Bungapion
Marathi	:	Aphu, Khushkus, Posta
Persian	:	Afiun, Khashkhāsh, Koknar, Tukhm-i- Anarkewa
Punjabi	:	Khashkhās, Khishk
Urdu	:	Khashkash safaid, Bazr-ul- Khashkhāsh

Temperament

The USM describes the general character of a drug in terms of its temperament. According to Unani philosophy, drugs are classified as per the specific Mizāj (temperament) and are graded in the first, second, third and fourth-degree according to their potency. In Unani literature, the temperament of Khashkhāsh seed is mentioned as cold and dry in 2nd degree. Whereas the temperament of white seed is cold in 2nd and moist in 1st degree. [12,13]

Ajzā-i-Must milā (Parts used):

In Unani medicine, commonly the seed of Khashkhāsh is therapeutically used. Fruits and latex are also usedas per indications. [12]

Af'āl (Pharmacological action):

The pharmacological action of Khashkhāsh are as follows: [10, 12,13,14, 15]
Mukhaddir (anesthetic), Qābiḍ (astringent), Munawwim (sedative) Musakkin-i-Alam (analgesic), Hābis-i-Dam (hemostyptic) Muqawwī-i-Dimāgh (brain tonic), Munḍij (concoctive). Muraṭṭab (humectant), Mudirr-i-Bawl(diuretic), Muḥarrik (stimulant), Hāḍim (astringent), Mubarrid (refrigerant).

Isti'mālāt (therapeutic uses): [12,13]
Therapeutically this drug is used for the treatment of following ailments:
Sahar (insomnia)**,** Malankhūliya (melancholia)**,** Nafth al-Dam (haemoptysis), Ishāl (purgation) Zahīr (dysentery), Nazla (catarrh), Su'āl (cough), Hirqatul masana (burning in bladder), Su'āl Yābis (dry cough).

Tarkīb-i-Ist'mal (Method of use): [13,16]

- In Unani literature, insomnia is alleviated by roasting poppy seeds and smelling them. Applying ground poppy seeds with milk is beneficial for hair.
- Grinding white poppy seeds and applying them to the forehead relieves headaches caused by heat.
- Boil its root in water until half remains; it is beneficial for patients with heartburn and liver disease.
- Applying its flowers and leaves with olive oil cures poisonous boils.

Mudir Atharāt (Adverse effects)

According to Unani literature, it is harmful for lungs and brain. [12,13]

Muṣliḥ (Corrective)

In case of any adverse effect produced by Khashkhāsh either Bādyān (Foeniculum vulgare) or Asal (Honey) or Mastagi (Pistacia lentiscus) or Karfas (Pimpinella anisum) can be given to the patients. [12,13]

Badal (Substitute)

In case of non-availability of Khashkhāsh, Tukhm-i-Kahu (Lactuca sativa L.) may be used as a substitute. [12,13]

Miqdār-i-Khūrāk (Therapeutic dose): [12,13]

The therapeutic dose of Khashkhāsh for an adult is mentioned as:

- 6 g (White seed of Khashkhāsh)
- 1 g- 3 g.

Chemical constituents:

Opium is valued for its alkaloid content, which ranges from 5 to 25% (more commonly 20%). A great number of alkaloids have been identified from opium, the most well-known of which are as follows: morphine, codeine, thebain, papaverine, codamine, papaveramine and a few additional ingredients are used. Lactic (1-2%), meconic acid, (up to 10%) malic acid, tartaric acid, citric acid, acetic acid, succinic acid, sulphuric acid, phosphoric acid, protein, free amino acids, caoutchous (5-10%). Potassium and calcium are the most abundant components in the seeds, followed by sodium, magnesium and phosphorus. Plants contain more potassium than sodium. Poppy seeds have more salt than other grains.[17] Seven fatty acids were discovered, with linoleic acid being the most abundant, accounting for 75.9% of total fatty acids.[18] The seeds have a high protein content, with globulin accounting for 55% of the total nitrogen. The seeds contain thiamine 420, riboflavin 46, folic acid 30, pantothenic acid 2667 and niacin 1877 mcg/100 g. The seed oil contains gamma-tocopherol 220, alpha-tocopherol 40 and beta-tocopherol 20 mcg/100 g. [19]

Pharmacological studies

Hypoglycemic Activity

The aqueous extract of seeds showed marked hypoglycemic activity when administered to glucose loaded and alloxan diabetic rats.[19]

Antiallodynic activity:

The purpose of this study was to assess the effect of leflunomide on mechanical allodynia in mice models of inflammatory and neuropathic pain, as well as to investigate the mechanisms behind such effects. Leflunomide (25, 50 or 100 mg/kg) administered (p.o.) reduced the inflammatory edema and mechanical allodynia caused by intraplanar carrageenan. The antiallodynic effect was related to the activation of opioidergic receptors and ATP-sensitive potassium channels, as well as a decrease in inflammatory mediator production.[20]

Anticarcinogenic effects:

The effects of feeding the plant products on the induction of squamous cell carcinomas in the stomachs of Swiss mice by feeding benzo pyrene and on the induction of hepatomas in Wistar rats by feeding 3′-methyl-4- dimethyl amino azobenzene (3′MeDAB) were studied. Poppy seeds (Papaver somniferum L.) alone significantly prevented B[a]P-induced neoplasia, but asafetida, turmeric, drumstick leaves and solanum leaves were ineffective.[21] The seeds were found to increase the activity of carcinogen detoxifying enzyme, glutathione-S-transferase by more than 78% in stomach, liver and esophagus in mice.[19]

Unani formulations

According to USM, the choice of drugs for treatment is governed by three laws: (i) Quality of drug in terms of temperament, (ii) quantity of drug in terms of its weight and potency, and (iii) time of administration. The selection of drug depends on the nature and type of the disease. To achieve the target, single and compound formulations were prescribed. The Unani Drugs are being manufactured mostly in the classical form. Modern instruments are used in the preparation of drugs. Sometimes, minor alterations are made in the dosage forms and due care is taken not to depart from the essence. The Unani Drug Industry is preparing and marketing two types of drugs: (i) Classical Unani formulations and (ii) Patent and proprietary products. Good manufacturing practices are followed to ensure quality control of these drugs. Some important classical Unani formulations in which Khashkhash is one of the ingredients mentioned in National Formulary of Unani Medicine and Hamdard Pharmacopoeia of Eastern Medicine such as Roghan-i-Kishnīz, Labūb bārid, Labūb Kabīr, Ḥabb-i-Jawāhar Kāfūrī, Ḥabb-i-Lubān Qawi, Ḥabb-i-Lubān Qawi, Ḥabb-i-Bāqla, Ḥabb-ul-Buzūr, Qurṣ-i-Labūb, Itrīfal Muqawwi-i-Dimāgh, Roghan-i-Naf-i-Waram-i-Niqris, Roghan-i-Bazr-ul-Banj. [22,23]

Sr. No.	Name of Compound Formulations	Dose and Method of Administration	Action and uses
1.	Roghan-i-Kishnīz	To be applied to the hair.	• Muqawwi-i-Shar (hair tonic)
2.	Labūb bārid	10 g. Before breakfast with 250 ml of milk	• Muqawwī-i-bāh (aphrodisiac)
3.	Labūb Kabīr	5 g. before breakfast with 250 ml of milk.	• Muqaww-i-Kabid (hepatotonic) • Muqaww-i-bāh (aphrodisiac)
4.	Ḥabb-i-Jawāhar Kāfūrī	125-250 mg	• Qābiḍ(astringent) • Dāfi‘-i-Hummā (antipyretic) • Sill (phthisis), • Diq (tuberculosis)
5.	Ḥabb-i-Lubān Qawi	500 mg-1 g.	• Musakkin-i-Su‘āl (cough relieving) • Su‘āl Nazlī (cold cough)
6.	Ḥabb-i-Bāqla	1-3 g.	• Dafi‘-i-Su‘āl () • Nazla (coryza) • Su‘āl (cough)
7.	Ḥabb-ul-Buzūr	3 g.	• Mudirr-i-Bawl (diuretic) • Qilla al-Bawl (oliguria) • Ihtibās al-Bawl (retention of urine)
8.	Qurṣ-i-Labūb	3 g.	• Muqawwi-i-Bāh (aphrodisiac_ • Mughalliz-i-Manī (viscous semen) • Du‘f al-Bāh (loss of libido) • Qilla al-Manī (oligospermia)
9.	Itrīfal Muqawwi-i-Dimāgh	5-10 g.	• Muqawwi-i-Dimāgh (brain tonic) • Du‘f al-Dimāgh (Weakness of brain) • Nazla-i-Muzmin (chronic coryza)
10.	Roghan-i-Naf-i-Waram-i-Niqris	For local use	• Muḥallil-i-Waram (anti-inflammatory), Dāfi‘-i-Alam (analgesic) • Niqris (gout)
11.	Roghan-i-Bazr-ul-Banj	For local use	• Musakkin (sedative), Dafi‘-i-Tashannuj (antispasmodic), Malankhūliya (melancholia). Waswās (insanity)

Conclusion

The present review emphasizes the action and uses mentioned in Unani classical literature, ethnopharmacological, photochemistry, pharmacological reports and toxicological information of Khashkhash (Papaver somniferum seed). It may be concluded that many pharmacological reports proved the claims of Unani scholars, for example, Analgesic activity [24] hypoglycemic activity [19] Antiallodynic activity,[20] Anticarcinogenic activity[21] etc., many more action mentioned in Unani literature are required still proved. It is suggested that the results of experimental studies may be taking up forward for clinical safety and efficacy studies at a large sample size. This review also guides to the scientist working in different fields of medicine, photochemistry, pharmacology may take up the steps to establish the efficacy of Khashkhash in better way for the services in mankind in the future.

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Authors' contribution

The authors were actively searched the data on the topic from libraries of council and other Unani colleges and internet and equally contributed to the preparation of this manuscript.

Conflict of interest

The author has no conflicts of interest to share.

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