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Unveiling the Healing Properties of Khurfa (Portulaca oleracea Linn.): A Comprehensive Unani Perspective

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ABSTRACT

The Unani system of medicine, originating from ancient Egypt & Mesopotamia, developing in Greece and enriched by Persian and Arab traditions, finds a fertile ground in India's diverse natural environment. India's varied climate and geographical features contribute to a rich biodiversity that supports a wide array of medicinal herbs and plants integral to Unani pharmacopeia. Among these medicinal plants, Khurfa (Portulaca oleracea Linn.), known as purslane in English, holds a prominent place in Unani medicine due to its multifaceted medicinal properties. Purslane has been traditionally used for centuries across different cultures for its therapeutic benefits. Its leaves, stems, and seeds are utilized in various formulations to treat a range of ailments. Khurfa (Portulaca oleracea L.) exemplifies the integration of natural remedies into the Unani system of medicine, leveraging India's rich biodiversity to harness the plant's therapeutic potential. Its widespread use across different cultures emphasizes its efficacy and safety in traditional medicinal practices. Purslane continues to be studied for its pharmacological properties, reinforcing its importance in contemporary herbal medicine and as a source of sustainable healthcare solutions. It has been extensively detailed in this article.

Key words: Ancient Egypt, Mesopotamia, Khurfa, Unani system of medicine

Introduction

The Unani system of medicine, which originated in ancient Greece, has evolved to become a comprehensive and universal system of healthcare. It has a significant presence in South Asian countries, particularly India, where it has been integrated into the cultural and medical p of the region. Unani medicine emphasizes the balance of the four humours: blood, phlegm, yellow bile, and black bile, which are believed to correspond with the elements of air, water, fire, and earth.

This traditional system is deeply rooted in natural remedies, with a considerable focus on the use of herbal medicines. India's vast and varied climate, along with its diverse geographical features, create an ideal environment for a rich biodiversity. This biodiversity includes a wide range of medicinal herbs and plants that are integral to the Unani pharmacopeia.

One of the noteworthy plants in Unani medicine is Khurfa (Portulaca oleracea Linn.), commonly known as purslane. This plant is highly valued for its extensive medicinal properties. Khurfa is known for its cooling and moistening effects and is used to treat a variety of ailments. It is rich in omega-3 fatty acids, vitamins, and minerals, which contribute to its health benefits.

In the Unani system, Khurfa is used to treat conditions such as fever, inflammation, and gastrointestinal issues. It is also employed for its diuretic and laxative properties. Recent research has highlighted its hypoglycaemic activity, which means it can help lower blood sugar levels. This makes it particularly beneficial for individuals with diabetes mellitus, a condition characterized by high blood sugar levels.

Studies have shown that Thukm-e-Khurfa can improve insulin sensitivity and reduce blood glucose levels, making it a valuable addition to the treatment regimen for diabetes. Its antioxidant properties also help in mitigating oxidative stress, which is often associated with diabetes and its complications.^{2, 3, 4}



Flower of Khurfa

Plant of Khurfa

Portulaca oleracea, commonly known as purslane, is a member of the *Portulacaceae* family. This plant is distributed worldwide, primarily thriving in tropical and subtropical regions, with its origins traced back to South America and Africa. The name "Portulaca" is derived from the Latin words 'porto' (to carry) and 'lac' (milk), referring to the plant's milky sap.

Purslane is highly regarded for its nutritional, medicinal, phytoremediation properties, and aesthetic value. Historically, it has been used in folk medicine and traditional diets across various cultures. Ethnobotanical studies show that indigenous communities have utilized purslane to treat numerous ailments, including diabetes, urinary infections, kidney and cardiovascular diseases, diarrhea, headaches, ulcers, and even snake and insect bites.

As a vegetable, purslane is an excellent source of omega-3 fatty acids and is rich in minerals and vitamins. The World Health Organization recognizes purslane as one of the most widely used medicinal plants, dubbing it a "Global Panacea." This title highlights purslane's significant potential as a pharmacological agent for both human and animal health and medical applications.^{5, 6, 7, 8}

Synonyms:

Portulaca sulfinlicosa, - *Portulaca pelivis* Ham, - *Portulaca neglecta*, - *Portulaca retusa*

Taxonomical Classification:

Subkingdom: Tracheobionta

Division: Magnoliophyta

Class: Magnoliopsida

Subclass: Caryophyllidae

Order: Caryophyllales

Family: Portulacaceae

Genus: *Portulaca*

Species: *Portulaca oleracea*

Habitat and Distribution:

Portulaca oleracea, commonly known as purslane, is a widespread weed native to the Old-World tropics. It has a global distribution, including regions such as the West Indies, China, Japan, England, and India. In India, purslane thrives in wet areas throughout the country and is also cultivated as a vegetable. It is prevalent in warm climates and is typically cultivated from March to June and again from September in hilly regions. The plant can grow up to an elevation of about 1500 meters in the Himalayan belt and is ready for harvest approximately 60 days after sowing. *P. oleracea* is commonly found in various environments such as fields, gardens, vineyards, lawns, driveways, dunes, beaches, salt marshes, waste areas, eroded slopes, bluffs, and riverbanks.^{9, 10, 11, 12}



Seeds of Khurfa

Vernacular Names:

1. Arabic: Baqla Humaqa, Rijla, Baqla Labniyya, Baqla Mubarak, Baqlatur Zahra
2. Urdu: Khurfa, Kulfaa
3. English: Garden Purslane, Common Indian Purslane, Common Purslane, Little Hogweed
4. Hindi: Khursa, Khulfa, Khurfa, Badi Lona, नोनीया साग
5. Sanskrit: Lonika, Brihalloni, Kozuppa, Lonica, Lonamla, Lun Loni, Gholika, Upodika
6. Siddha: Pulitari
7. Assamese: Noniya
8. Kannada: Dudagorai, Doddagoni Sappu, Lonkia, Loni
9. Persian: Khurfa, Cholz
10. Tamil: Pasalai, Pulikkirai, Paruppukkeerai, Kozhuppu, Sarani
11. Telugu: Pappukura, Peddapavila Kura, Payilidura, Pavilikura
12. Marathi: Kurfah, Ghol, Bhuigholi, Ghol
13. Oriya: Puruni-Sag
14. Punjabi: Lonak, Chhota lunia, Khurfa
15. Malayalam: Korichhira, Karie, Cheera
16. Gujarati: Mhoti Luni
17. Chinese: Ma-Chi-Xian
18. Egyptian: Rigla
19. Sri Lankan: Genda Kola ²¹

Botanical Description:

Portulaca oleracea L. (purslane) is an ancient, cosmopolitan species belonging to the genus *Portulaca* and the family *Portulacaceae*, which comprises 21 genera and 580 species. While it is mostly an annual plant, it can be perennial in tropical regions.

Stems: The plant features smooth, reddish, and primarily prostrate stems that can grow up to 30 cm long and 2-3 mm in diameter.

Leaves: The leaves are flat and fleshy, with variable shapes, typically obovate, ranging from 1–5 cm in length. They can be green or green with red margins and may be arranged alternately or oppositely, often clustering at stem joints and ends.

Flowers: Flowers can appear any time during the year, either singly or in clusters of two to five at the stem tips. They are small, with colors ranging from orange-yellow to purple or white-pink.

Fruit: The fruit consists of nearly round to egg-shaped capsules, usually about 4–8 mm long, that split around the middle to release the seeds.

Seeds: Numerous, minute, black, kidney-shaped (reniform), concentrically striated, and muricate seeds are formed in a tiny pod, which opens when the seeds are mature.

Root: Purslane has a taproot system with fibrous roots.

Characteristics:

Portulaca oleracea (Khurfa Plants) comes in two varieties:

1. Larger Variety:

- Height: Less than a hand in height, stems lie on the ground.
- Stem: Thick, as thick as a finger, red in color.
- Taste: Stems are tasteless.
- Flowers: White flowers.
- Leaves: Rounded.
- Seeds: Small and black.

2. Smaller Variety:

- Growth: Also lies on the ground. - Leaves: Significantly smaller compared to the larger variety. - Seeds: Smaller than those of the larger variety. ^{13, 14, 15, 16, 17, 18}

Description:

This plant variety is characterized by its edible leaves, consumed as a vegetable. The leaves are elongated, oval-shaped, and possess a fleshy texture. The flowers exhibit a vibrant deep yellow hue. The plant produces fruits that contain small black seeds. There are two distinct types of this plant: the smaller variant, known as "Khurfa Khurd" or "Baqla al-Humaqa," which typically grows wild, and the larger type that is intentionally cultivated.

Mizaj (Temperament): Barid (Cold): 3 Ratab (Wet): 2

Parts Used: - Seeds - Leaves - Stem - Whole plant

Here's the information formatted for clarity:

Actions of Purslane:

Leaves: Refrigerant, bile soothing, diuretic, astringent, laxative.

Seeds: Sedative, hypnotic, diuretic, refrigerant (when fried), astringent (when fried), laxative (without frying), aphrodisiac, thirst-alleviating, stone-breaking, blood purifier, hemostyptic, resolvent.

Uses of *Portulaca oleracea* (Purslane):

Leaves and Seeds:

- Used in acute conditions such as bilious and sanguine fevers.
- Beneficial for acute headaches, tuberculosis, and burns.
- Helps with thirst, acute cough, gastric and intestinal inflammation, and burning urination sensation.

Seeds:

Treats kidney and bladder disorders (dysuria, haematuria, gonorrhoea, strangury). - Effective for burns, scalds, dysentery, hemorrhagic conditions. Reduces body heat, increases urine output, reduces fever, acts as an antioxidant. Used for diabetes, gastric heat, headaches, excessive thirst, and organ inflammation. Exhibits antidysentery, antidiarrheal, antibacterial properties.

Leaves:

Diuretic, astringent, anti-hemorrhagic, anti-inflammatory, anthelmintic, cooling, analgesic, sedative, skeletal muscle relaxant, refrigerant, emollient. Treats burns, scalds, swelling, erysipelas. Helpful for dysuria, impetigo, stomatitis, abscesses, boils, fever. Provides relief for conditions like haemoptysis, stomatitis, thirst, and headache.

Herb: - Addresses scurvy, liver diseases.

Application: - Poultice for burns, headaches, and acute tuberculosis. - Leaf powder for mouth ulcers and extremity burns.

Notes on toxicity: It may cause flatulence, potentially weakens sexual strength, harmful effects on eyesight, adverse effects on stomach and spleen.

Harmfulness: It is harmful to the stomach.

Correctives (to mitigate adverse effects):

Cane sugar (Qand Safaed) Dried mint (Podina Khushk, *Mentha piperita*) Mastic (Mastagi, *Pistacia lentiscus*) Celery (Karafs, *Apium graveolens*)

Substitutes (Badal):

Plantain seeds (Tukhme Bartang, *Plantago lanceolata*) Lettuce leaves (Kaahu, *Lactuca sativa*) Psyllium seeds (Isapgoole, *Plantago ovata*) Sweet pumpkin seeds (Tukhme Kaddu Sheerein, *Cucurbita maxima*) These correctives and substitutes can be used to mitigate adverse effects or as alternatives to *Portulaca oleracea* (purslane) in various medicinal applications, as per traditional knowledge.

Dosage: Typically recommended dosage is 6-7 grams. ^{19, 20, 21, 22}

This compilation provides a comprehensive overview of the medicinal uses, toxicity, correctives, substitutes, and recommended dosage of *Portulaca oleracea* based on traditional and contemporary literature.

Chemical Composition

Khurfa Seeds:

Fatty Acids: - Behenic acid - Lauric acid - Linoleic acid - Linolenic acid (omega-3) - Palmitic acid - Myristic acid, Protein, Carbohydrate, Vit: C, Minerals, Sodium, Calcium, Potassium, Phosphorus, Copper, Sulfur, Chlorine, Thiamine, Riboflavin, Mucilage

Leaves and Stems: Edible Portion Composition (per 100g): - Moisture: 90.5% - Protein: 2.4% - Carbohydrates: 2.9% - Mineral Matter: 2.3% - Rich in Calcium, magnesium, phosphorus, iron, sodium, and potassium

Biologically Active Compounds: - Free oxalic acids - Alkaloids - Omega-3 fatty acids - Coumarins - Flavonoids - Cardiac glycosides - Anthraquinone glycosides *Portulaca oleracea* is not only a source of essential nutrients but also contains various biologically active compounds, contributing to its medicinal properties and health benefits. The seeds and edible parts of the plant are particularly rich in fatty acids, minerals, and a range of phytochemicals known for their therapeutic effects.^{23, 24, 25}

Reported Pharmacological Activity of Khurfa (*Portulaca oleracea*)

1. Hypoglycemic Activity:

Antihyperglycemic and Antihyperlipidemic Activity:

- Extract of *Qurs Tabasheer* demonstrated significant hypoglycemic and antihyperlipidemic effects in STZ-induced Wistar rats.
- The activity was more effective than the standard oral hypoglycemic drug Glimpiride.

2. Hepatoprotective Activity:

Hepatoprotective Activity:

- Suspension of methanolic and petroleum ether extract of the entire plant of *P. oleracea* exhibited hepatoprotective activity in Wistar albino rats.
- The study induced hepatic injury with D-galactosamine and evaluated altered biochemical parameters.
- Extracts administered at doses of 200 and 400 mg/kg significantly restored biochemical parameters compared to the D-galactosamine and Silymarin treated groups.
- Histological analysis showed prevention of D-galactosamine toxicity, with hepatic cells exhibiting well-preserved cellular architecture.
- These findings confirm the hepatoprotective activity of *Portulaca oleracea*, supported by both histological and biochemical data.

These studies underscore the potential pharmacological benefits of *Portulaca oleracea*, particularly in the management of diabetes and liver-related disorders.³

Toxicity Study of Khurfa (*Portulaca oleracea*)

Methodology:

Preliminary Phytochemical Screening:

- Conducted following standard procedures to identify chemical constituents.

Acute Oral Toxicity Study:

- Conducted according to OECD 423 guidelines and the method of Babu.
- Doses Administered: 500 mg/kg, 1000 mg/kg, 1500 mg/kg, and 2000 mg/kg body weight, given once.
- Observations: Made for 72 hours, assessing various behavioral parameters including grooming, hyperactivity, sedation, respiratory arrest, convulsions, increased and decreased motor activity, and mortality.

Hypoglycemic Activity Study:

- Evaluation of the 50% ethanolic extract.
- Doses Administered: 200 mg/kg and 400 mg/kg body weight once daily for 14 days.
- Assessment: Hypoglycemic activity assessed by estimating serum glucose levels.
- Both studies compared with Normal Control groups to determine effects.

This comprehensive toxicity study aimed to assess the safety profile of *Portulaca oleracea*, examining acute oral toxicity and potential hypoglycemic effects. The study followed internationally recognized guidelines and methods to ensure rigorous evaluation of the plant's safety and pharmacological activities.

Anti-ulcer Activity:

Portulaca oleracea extracts (aqueous and ethanolic) were evaluated in mice for their ability to inhibit gastric lesions induced by HCl or absolute ethanol.

Effects on Gastric Lesions:

- Both extracts showed a dose-dependent reduction in the severity of ulcers.
- At the highest doses, the extracts exhibited activity comparable to sucralfate, a standard anti-ulcer medication.

Effects on Gastric Acid Secretion:

- Oral and intraperitoneal administration of the extracts decreased gastric acidity in pylorus-ligated mice.³

Anti-convulsant Activity:

Aqueous Extract of *Portulaca oleracea* Leaves:

- Investigated for anticonvulsant activity in healthy albino mice.
- In the maximal electroshock test, the extract significantly reduced the duration of tonic hind limb extension.

These studies highlight the potential therapeutic benefits of *Portulaca oleracea* in treating gastric ulcers and its neuroprotective effects against convulsions, as observed in experimental animal models.³

Nutrition of Purslane (*Portulaca oleracea*) Composition:

Water Content: High, comprising 93% of raw purslane. Macronutrients (per 100g): - Carbohydrates: 3g - Protein: 2g - Negligible fat content Caloric Value: Provides 20 calories per 100 grams. Micronutrients: Vitamin E: Provides 81% of the Daily Value (DV). Vitamin C: Provides 25% DV. Dietary Minerals: Contains moderate amounts (11–19% DV) of various minerals. Omega-3 Fatty Acid: Significant source of alpha-linolenic acid, an essential omega-3 fatty acid, contributing to its nutritional and health benefits.¹

Unani Compound Formulations:

Banadiq al-Buzur, Dawa al-Musk, Arq-e-Sheer Murakkab, Qurs Diabetes, Qurs Anjbar, Mufarrih Barid, Qurs Sartan, Qurs Tabasheer

These compound formulations are documented in various sources and incorporate *Portulaca oleracea* as one of the ingredients. Each formulation may serve different medicinal purposes and is traditionally used in herbal medicine practices.^{4, 25}

Conclusion:

The Unani system of medicine, widely practiced in South Asia, particularly in India, advocates a holistic approach to health using natural remedies and herbal medicines. *Portulaca oleracea* (Purslane), a prominent herb in this system, showcases the therapeutic efficacy of Unani medicine, particularly in addressing conditions like diabetes mellitus through its hypoglycaemic properties and other beneficial attributes. It demonstrates promising potential in managing health issues such as diabetes, acute fevers, and acute headaches. These health benefits are bolstered by its nutrient-rich composition and bioactive compounds, highlighting purslane's value as a beneficial dietary supplement for enhancing health and addressing specific medical conditions.

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