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Review Article

TUKHME KHURFA (PORTULACA OLERACEAE LINN.) A PLANT ORIGIN DRUG OF UNANI MEDICINE: AN OVERVIEW

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ABSTRACT

Unani system of medicine has a long therapeutic history for treatment of a variety of diseases. This system comprises of various plant, animal and mineral origin drugs. Tukhme Khurfa, seeds of Portulaca oleracea Linn. is an important herbal drugs which have hypoglycemic activity, musakkin (sedative), munauwwim (hypnotic), mudirr-i-bawl (diuretic), antioxidant activity, hepatoprotective activity, anticomulvent activity, anti-inflammatory activity; is recommended for the various disease like Dhayabitus (diabetes), hummiyate harra, sudaa harra (headache), shiddate atash (excessive thirst), surfa harra (acute cough), sozish-i-m¨da (inflammation of stomach), sozish-i-jigar (inflammation of liver), sozish-i-bole (urinary tract infection), sarsam (meningitis) etc. The present article reviews the various classical information, chemicals and reported pharmacological activities of the drug and concluded that it is very promising drugs in respect to its traditional claim proven after contemporary research.

Keywords: Portulaca oleracea Linn, Hypoglycemic, pharmacological activity, Unani system.

INTRODUCTION

In Unani medicine Khurfa is equated with Portulaca oleracea Linn. and belongs to family Portulacaceae. It is commonly known as purslane. The origin of P. oleracea plant is uncertain; however it is very familiar at many prehistoric sites according to archeobotanical findings. Before this period it was used as food, but its use as medicinal herb dated back at least 2000 years. Portulaca oleracea is the bigger variety of purslane, smaller variety is equated with Portulaca quadrifida. The purslane family includes several fleshy plants. Oleraceae species is distinguished in two varieties. First one is common wild variety, Portulaca oleracea, variety sylvestris. Second is cultivated variety, var. sativa, this is known as kitchen garden purslane. Portulaca oleracea is an herbaceous, succulent annual growing plant. Purslane has been used as a vegetable source of omega-3 fatty acid and it is high in minerals and vitamins.

Synonym

Portulaca pelvis Ham,
Portulaca sufratricosa,1
Portulaca neglecta,
Portulaca retusa.2

Scientific Classification

- Family : Portulacaceae
- Genus : Portulaca
- Species : oleracea

Habitat and Distribution

Portulaca oleracea is a common weed of cultivation. Native to the Old World tropics. The plant is distributed all over the world and also profusely found in East and West Indies, China, Japan, England, and India. In India it is found in wet places all over country and is also cultivated as vegetable. It is common in all warm countries. In the plains purslane is cultivated from March to June and from middle of April to the middle of September in hills. This plants ascending up to an elevation of 1,500 m in the Himalayas. The plants are harvested in about 60 days from sowing.

Vernacular Name


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Botanical Description

It is freshly, small, smooth succulent, prostrate, annual herb whose stem is green or reddish in colour, growing up to 50 cm long. Seeds, leaves, stem, whole plant.

Leaves

Simple, sub-sessile, cuneiform, obovate fleshy, shining, gabbrous, alternate, variable, attenuate, apex truncated, nerves inconspicuous, light pink in color, oblong-ovate, wedge-shaped, stalked and clustered together, long up to 6-25 mm.

Flower

Clusters or axillary clusters, branches small, bright yellow, without stalks.

Fruit

Capsular, globose or ovoid, opening transversely, 0.3 cm long.

Seeds

Numerous, minute, black, reniform, concentrically striate and muricate.

Mahiyat (Unani Morphology)

The Plants of Khurfa are of two types one of big size and other of small size. Big plants are less than one hand in height, the stem of the plant ly on the ground. The thickness of the stem is same to thickness of finger and some time less, stem is red in color, tasteless and flowers are white in color. Leaves are rounded in shape. Seeds are small and black in colour. Small plants ly on ground. Leaves and seeds are very small in compression to big size plant. Better quality is that whose leaves are big and stems are red in colour.

Afa’al (Function) as per Unani Literature

Seeds

Musakkin (sedative), munauwvim (hypnotic), mudadir-i-bawal (diuretic), mubarrid (refrigerant), qabiz (astringent) (fried), mulaiyan (laxative) (without frying), muqawwi-i-baah (aphrodisiac), musakke atash, mufattit-i-hasat (antilithiatic), joshe khoon, habis-i-dam (hemostyptic), mualallile waram (resolvent), darde sar (headache).

Leaves

Mubarrid (refrigerant)

Other Parts

Habis-i-Dam (hemostyptic), mohallil-i-waram-i-hadda (resolvent of acute inflammation).

Estemal (uses) as per Unani Literature

Seeds

Dhayabitus (diabetes), hummiyate harra, sudie harra (headache), shidate atash (excessive thirst), joshe khoon, surfa harra (acute cough), sozish-i-mi’da (inflammation of stomach), sozish-i-jigar (inflammation of liver), sozish-i-bole (urinary tact infection), sarsam (mentingitis), haijaan-i-safa, ziyadati-safa.

Leaves

Sozish-i-Bole, sarsam (mentingitis), haijaan-i-safa.

Afa’al (Function) as per Other Literature

Seeds

Antidysentric, anti-helmentic, antidiarrhoecal, vermifuge, anti-inflammatory, antibacterial, diuretic, demulcent, astringent.

Leaves

Diuretic, anti-haemorrhagic, anti-inflammatory, antihelmentic, cooling, analgesic, sedative, skeletal muscle relaxant, astringent, refrigerant, emollient.

Estemal (uses) as per Other Literature

Seeds

Diseases of kidney and bladder, dysuria, haematuria, gonorrhoea, strangury, haematemesis, haemoptysis, tenesmus, burn, scalds, dysertery.

Leaves

Burn, scald, swelling, erysipelas, stomatitis, abscesses, boil, impetigo, headache, stomatitis, piles, dysentery, dyuria.

Juice of Stem

Prickly heat, burning sensation of hand and feet.
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**Herb**
Scurvy, liver disease,12 Aqueous and ether extract of herbs showed activity against Gram-negative bacteria.7

**Leaf**
Fever,15 swelling, burns, scalds, spasticity,2 mastitis, impetigo,3 boils,5,13 scald,13 haemoptysis,16 stomatitis,15,16 allay thirst and headache.15

**Mazarrat (Toxicity)**
Moalide Riyah,20 qwate baah ko kamzore karti hai,16,18 meda ke liye (for stomach),16-20 tihalal ke liye (for spleen),22 beenaai kharab karti hai (for eyes).16,18

**Musleh (Correctives)**
Qand Safaed (Cane sugar),18-20,22 Pedina Khushk (Mentha piperita),16,20 Mastagi (Pistacia lantiscum), Karafs (Apium graveolens Linn.).26

**Badal (Substitutes)**
Tukhme Bartang (Plantago lanceolata Linn.),20 Kaahu (leaves) (Lactuca sativa Linn.),16,18 Isagpoole (seeds) (Plantago ovate Linn.),16,18,22 Tukhme Kaddu Sheerein (Cucumbita maxima duchesnei).22

**Miqdare Khuraq (Dose)**
Seeds: 6-7 Masha/ g,18 Seeds: 3-7 Masha/ g,5,19 Juice of leaves: 35-60 g,19

**Murakkabat (Compound Formulation)**
Dawa-ul Misk,20,21 Mufarraah Barid, Banadiqul bazoor,4,20,21 Qurse Sartan20,21 Qurse Dhayabitus, Qurse kaharba khas,25 Qurse Tabasheer Qabiz,20,25 Qurse Tabasheer afuni, Qurse Tabasheer kaffeeri mulaiyaa,26 Qurse Tabasheer.27,28

**Chemical Composition**

**Seeds**
Fatty acid (bhenic, lauric acid, linoleic acid, linolenic acid (omega-3) palmitic acid myristic acid).9

**Leaves and Stem**
Protein, carbohydrate,17 mucilage,22 minerals (calcium, magnesium, phosphorus, potassium, iron, sodium, copper, sulphur, chlorine),1,3 vitamins (vitamin a, b, and c),8,11,13 omega-3 fatty acid, oxalic acid,10,24 cinnamic acid,10 dopamine,11,13 L- dopa,13 L- noradrenaline;11,13 stem yield two red-violet pigments-oleracin I and II (acylated betacainins) alkaline hydrolysis of the betacain fraction gives furalic acid and two pigments identified as 5-o-beta-cellobiosides of betadin and iso-betadin; plants gives alanine, aspartic acid, caffeic acid, ferulic acid, malic acid; areal parts gives beta amyrin, palmitic acid, iso-palmitic acid, linoleic acid, myristic acid, stearic acid.10

**Reported Pharmacological Activity**

**Hypoglycemic activity**
Significant effect was observed when dried entire plant was administered intra-gastrically to rabbits at dose of 1.5 and 2.0 g/ kg after 8 and 12 hours respectively. Seeds, in a mixture with 7 other plants, administered orally to male rats at a dose of 4.0 g/ animal, were active.10

**Antioxidant activity**
In-vitro anti-oxidant activity of the methanolic extract of P. oleracea investigated by 1,1-diphenyl-2-picryl-hydrazyl (DPPH) free radical scavenging activity, reducing power by FeCl, nitric oxide free radical scavenging activity and super oxide scavenging activity by alkaline DMSO method.29

**Anti-spermatogenic activity**
Ethanolic (95 %) extract of dried seeds, administered subcutaneously to mice at a dose of 50.0 mg/animal, was active.30

**Anticonvulsant activity**
Anticonvulsant activity of aqueous extract of leaves of P. oleracea was trailed in healthy albino mice. In Maximal electroshock extract significantly reduced the duration of tonic hind limb extension.30

**Anti-androgenic effect**
Ethanol (95 %) extract of dried seeds, administered subcutaneously to mice at a dose of 50.0 g / animal, was active.10

**Anti-Inflammatory Activity**
Ethanol (10 %) extract of the aerial parts (dried leaves and stem) administered intra-peritonically and topically, produced significant activity when compared with the synthetic drug diclofenac sodium as positive control.10

**Hepatoprotective Activity**
Hepatoprotective activity of suspension of methanolic and petroleum ether extract of entire plant of P. oleracea in carboxy methyl cellulose were evaluated in Wister albino rats by inducing hepatic injury with D-galactosamine (400 mg/kg). Altered biochemical parameters were considerably restored at the dose of 200 and 400 mg/kg when compared to D-galactosamine and Silymarin treated groups. Albino rats also showed histologically significantly prevent the D- galactosamine toxicity as revealed by hepatic cells with well preserved cellular architecture. Hepatoprotective activity of plant extract confirmed by Histological and biochemical data.5

Elicits liver wound in rats by administration of CCl, intra-peritoneal, which notably up-regulates the levels of total bilirubin and serum hepatic marker enzymes, including glutamate pyruvate transaminase (GPT) and glutamate oxaloacetate transaminase (GOT). A considerably reverses the increase in hepatic marker enzymes and total bilirubin levels, by administration of 70 % alcohol extract of Portulaca oleracea. This changes confirming the hepatoprotective activity of Portulaca oleracea.31

**Anti-mycobrial Activity**
Leaf juice, on agar plate produced weak activity on mycobacterium tuberculosis, MIC < 1:40.10
Anti-nematodal Activity
Ethanol (95 %) extract of entire plant was active on Meloidogyne incognita.10

Toxicity study
Musa et al. carried out this study on mice by given intra-peritoneally methanolic extract of P. oleracea. The LD 50 with Reed and Muench method 1871 mg/kg1, Karber method 1875 mg/kg1 and with Miller and Tainter method was 1853.5mg/kg1. These finding shows that the plant is moderately toxic.5

CONCLUSION
The present review summarizes some important pharmacological studies and phytochemical investigations on Portulaca oleracea Linn., preliminary investigation shows potential for Dhayabitus (diabetes), hummiyate harra, sudae harra (headache), which can be investigated further to find out the mechanism of action, active principles and utility of Portulaca oleracea Linn; so that it can be further validated as a standard drug for these actions. In view of the findings of the review it can be concluded that it is very promising drugs in respect to its traditional claim proven after contemporary research.

REFERENCES

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