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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 oleraceae* Linn. is an important herbal drugs which have hypoglycemic activity, musakkin (sedative), munauwwim (hypnotic), mudirr-i-bawl (diuretic), antioxidant activity, hepatoprotective activity, anticonvulsant activity, anti-inflammatory activity; is recommended for the various disease like Dhayabitus (diabetes), hummiyate harra, sudae harra (headache), shiddate atash (excessive thirst), surfa harra (acute cough), sozish-i-mi'da (inflamation 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 oleraceae* Linn, Hypoglycemic, pharmacological activity, Unani system.

INTRODUCTION

In Unani medicine Khurfa is equated with *Portulaca oleraceae* Linn. and belongs to family Potulacaceae.[1-4] It is commonly known as purslane. The origin of *P. oleraceae* 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.[5] *Portulaca oleracea* is the bigger variety of purslane, smaller variety is equated with *Portulaca quadrifida.*[6] 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.[7]

Synonym

Portulaca pelvis Ham,
Portulaca suffruticosa,[1]
Portulaca neglecta,
Portulaca retusa.[8]

Scientific Classification

- Kingdom : Plantae
- Subkingdom : Tracheoboionta
- Division : Magnoliophyta
- Class : Magnoliopsida
- Subclass : Caryophyllidae
- Order : Caryophyllales
- Family : Portulacaceae
- Genus : *Portulaca*
- Species : *oleracea*[9]

Habitat and Distribution

Portulaca oleraceae is a common weed of cultivation. Native to the Old World tropics.[10] The plant is distributed all over the world and also profusely found in East and West Indies, China, Japan, England, and India.[11] In India it is found in wet places all over country and is also cultivated as vegetable. It is common in all warm countries.[1,11] In the plains purslane is cultivated from March to June and from middle of April to the middle of September in hills.[8] This plants ascending up to an elevation of 1,500 m in the Himalayas.[4,8,12,13] The plants are harvested in about 60 days from sowing.[8]

Vernacular Name

Unani: Rijla, Baqlatul labniya, Baqlatul Mubaraka, Baqlatur Zahra;[1] Arabic: Baqlat-ul-humqa;[4,14,15] Urdu: Khurfa, Kulfaa;[1,4,15,16] English: Garden Purslane, Common Indian Purslane, Common purslane;[3,4,11,13,15,16] Hindi: Khursa, Khulfa, Khurfa, Badi Lona;[4,5,12,14,15,16] Sanskrit: Lonika, Brihalloni, Kozuppa, Lonica, Lonamla, Luni, Ghotika, Lonaa, Loni, Gholika, Upodika;[7,11,12,14,15] Siddha: Pulitari;[7] Assami: Noniya;[11] Kannada: Dudagorai, Doddagoni Sappu, Lonika, Loni;[1,3,4,11] Persian:Khurfa, Cholz;[4,15,16] Tamil: Pasalai, Pulikkirai, Paruppukkeerai, Kozhuppu, Sarani;[4,5,13,16,17] Telugu: Pappukura, Peddapavila Kura, Payilidura, Pavilikura;[1,4,15,16] Marathi: Kurfah, Ghola, Bhuigholi, Ghol;[4,11] Oriya: Puruni-sag;[11] Panjabi: Lonak, Chhotalunia, Khurfa;[4] Malayalam: korichhira, Karie, Cheera;[4,11,15] Gujarati: Mhotiluni, Lui, Loni, Moti luni;[1,4] Pakistan: Tukhme khurfa;[10]

China:Machixian;[10] Egypt: Rigla, Shoi-bee-reum;[10] USA: Common purslane.[10]

Botanical Description

It is freshly, small, smooth succulent, prostrate, annual herb whose stem is green or reddish, growing up to 50 cm long.[8,11,15]

Leaves

Simple, sub-sessile, cuniform, obovate fleshy, shining, gabbros, 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.[8,11,15]

Flower

Clusters or axillary clusters, branches small, bright yellow, without stalks.[8,11,15]

Fruit

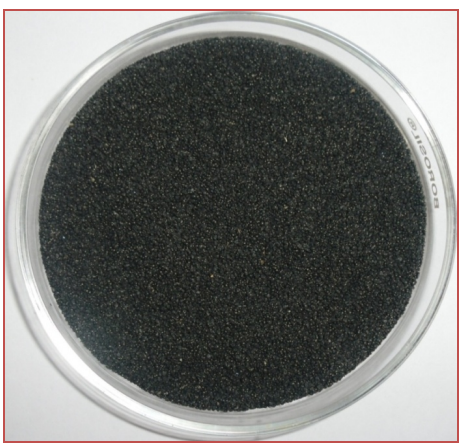
Capsular, globose or ovoid, opening transversely, 0.3 cm long.[4]

Seeds

Numerous, minute, black, reniform, concentrically striate and muricate.[4,11]

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 lye 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.[18] Small plants lye 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.[8]



Tukhme Khurfa (*Portulaca oleraceae* Linn.) (Seeds)

Mizaj (Temperament)

Sard (Cold) 3^{o} and Tar (Wet) 2^{o} [1,16,18]
Sard (Cold) 2^{o} and Tar (Wet) 2^{o} [14,16,19]

Hasase Mustamela (Parts Used)

Seeds, Leaves, Stem, Whole Plant.[1,8,16]

Afa´al (Function) as per Unani Literature

Seeds

Musakkin (sedative),[19-21] munauwwim (hypnotic),[18] mudirr-i-bawl (diuretic),[19] mubarrid (refrigerant),[19,21] qabiz (astringent) (fried),[18,20] mulaiyan (laxative) (without frying), muqawwi-i-baah (aphrodisiac),[18] musakkine atash,[18,21] mufattit-i-hisat (anti-lithiatic),[18] joshe khoon,[21] habis-i-dam (hemostyptic), muhallile waram (resolvent),[20] darde sar (headache).[22]

Leaves

Mubarrid (refrigerant)[19,21]

Other Parts

Habis-i-Dam (hemostyptic),[18,20] mohallil-i-waram-i- hadda (re-solvent of acute inflammation).[18]

Estemal (uses) as per Unani Literature

Seeds

Dhayabitus (diabetes),[14,18,22] hummiyate harra,[19] sudae harra (headache),[19,20,22] shiddate atash (excessive thirst),[4,19,20,22] joshe khoon,[19,21] surfa harra (acute cough),[20] sozish-i-mi'da (inflammation of stomach),[4,18,19] sozish-i-jigar (inflammation of liver),[18] sozish-i-bole (urinary tack infection),[4,18,19] sarsam (meningitis), haijaan-i-safra,[21] ziyadati-e-safra.[4]

Leaves

Sozish-i-Bole,[18,21] sarsam (meningitis), haijaan-i- safra.[21]

Afa´al (Function) as per Other Literature

Seeds

Antidysentric[2,8] anti-helmentic, antdiarrhoeal,[13] vermifuge,[12,23] anti-inflammatory, antibacterial,[3] diuretic,[23] demulcent,[13,23] astringent.[23]

Leaves

Diuretic,[16,23] anti-haemorrhagic,[8] anti-inflammatory,[3,16] antihelmentic,[3] cooling, analgesic, sedative,[16] skeletal muscle relaxant,[2] astringent,[16,23] refrigerant, emollient.[23]

Estehmal (uses) as per Other Literature

Seeds

Diseases of kidney and bladder, dysuria, haematuria, gonorrhoea, strangury, haematemesis, haemoptysis, tenesmus,[23] burn, scalds,[2,8,16] dysentery.[16]

Leaves

Burn, scald, swelling, erysipelas,[2] stomastitis,[3] abscesses, boil,[8,24] impetigo,[3] headache, stomatitis, piles,[15] dysentery,[15,16] dyuria.[3]

Juice of Stem

Prickly heat, burning sensation of hand and feet.[12]

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,[3,13] 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),[18-20,22] tihaal ke liye (for spleen),[22] beenai kharab karti hai (for eyes).[16,18]

Musleh (Correctives)

Qand Safaed (Cane sugar),[18-20,22] Podina Khushk (*Mentha piperita*),[16,20] Mastagi (*Pistacia lantiscum*), Karafs (*Apium graveolens* Linn.).[16]

Badal (Substitutes)

Tukhme Bartang (*Plantago lanceolata* Linn.),[20] Kaahu (leaves) (*Lactuca sativa* Linn.),[15] Isapgoole (seeds) (*Plantago ovate* Linn.),[16,18,22] Tukhme Kaddu Sheerein (*Cucumbita maxima duchesne*).[22]

Miqdare Khuraq (Dose)

Seeds: 6-7 Masha /g[18], Seeds: 3-7 Masha/ g[4,19], Juice of leaves: 35-60 g.[16]

Murakkabat (Compound Formulation)

Dawa-ul Misk,[20,21] Mufarrah Barid, Banadiqul bazoor,[4,20,21] Qurse Sartan[20,21] Qurse Dhayabitus, Qurse kaharba khas,[25] Qurse Tabasheer Qabiz,[20,25] Qurse Tabasheer afuni, Qurse Tabasheer kafoori mulaiyan,[26] Qurse Tabasheer.[27,28]

Chemical Composition

Seeds

Fatty acid (behnic acid, lauric acid, linoleic acid, linolenic acid (omega-3) palmatic acid myristic acid).[9]

Leaves and Stem

Protein, carbohydrate,[1,7] mucilage,[22] minerals (calcium, magnesium, phosphorus, potassium, iron, sodium, copper, sulphur, chlorine),[1,7] vitamins (vitamin a, b, and c),[8,11,13] omega-3 fatty acid, oxalic acid,[11,24] cinnamic acid,[10] dopamine,[11,13] L- dopa,[13] L-noradrenaline;[11,13] stem yield two red-violet pigments-oleracin 1 and II (acylated betacyanins) alkaline hydrolysis of the betacyanin fraction gives ferulic acid and two pigments identified as 5-o-beta-cel-lobiosides of betanidin and iso-betanidin; plants gives alanine, aspartic acid, caffeic acid, ferulic acid, malic acid; areal parts gives beta amyrin, palmatic acid, iso-palmatic acid, linoleic acid, myristic acid, stearic acid.[10]

Reported Pharmacological Activity

Hypoglycemic activity

Significant effect was observed when dried entire plant was administered intra-gastrical 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.[10]

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-peritoneally 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 histologicaly 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_4 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-mycrobial 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/kg^{-1}, Karber method 1875 mg/kg^{-1} and with Miller and Tainter method was 1853.5mg/kg^{-1}. These finding shows that the plant is moderately toxic.[5]

CONCLUSION

The present review summarizes some important pharmacological studies and phytochemical investigations on *Portulaca oleraceae* 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 oleraceae* 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.

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