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Description of Biskhapra (*Trianthema portulacastrum*) in Unani Medicine: An Overview

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ABSTRACT:

Herbs have been used for centuries in various cultures for their potential health benefits. Many herbs contain compounds that can have positive effects on the body, and they are often used in traditional medicine practices. According to World Health Organisation, over 80% of the world's population relies on the traditional medical system, which is mostly plant-based, to provide for their basic medical needs. In India AYUSH medicine is highly growing to solve many health-related issues. Unani is one of the unique systems of AYUSH medicine, which is based on humoral theory. Treatment approach is based on plants, mineral, and animal origin drugs. In Unani System of medicine, a well-known, common plant known as Biskhapra (*Trianthema portulacastrum* Linn.), which is a member of the Aizoaceae family. Whole plant is used for medicinal purposes. Main action of this plant is *Mudirr-e-Baul* (diuretic), *Muqavwi-e-Gurda* (nephroprotective), *Mudirr-e-Haiz* (emmenagogue), *Jali* (detergent), *Muqawwi-e-Baah* (aphrodiasic), *Musakkhin* (calorific), *Muqawwi-e-Kabid* (hepatoprotective) etc. This plant contains a number of bioactive chemicals that are frequently utilized to treat various ailments. Steroids, flavonoids, lipids, terpenes, carbohydrates, tannins, is punarnavine, and alkaloids are the main chemical components of this plant.Traditionally Biskhapra used as Analgesic, inflammation, diuretics, laxative, stomachic, treatment of blood disease, Anaemia, cancer, diabetes, hypothyroidism, dyslipidaemia, kidney disorders and night blindness etc.This plant can be used both orally as well as locally as per need.

Keywords: Biskhapra; Unani Medicine; Diuretics; Nephroprotective, Anti-inflammatory; Hepatoprotective.

Introductio

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Introduction:

According to World Health Organisation, over 80% of the world's population relies on the traditional medical system, which is mostly plant-based, to provide for their basic medical needs.[1] *Trianthema portulacastrum*, commonly known as "horse purslane" or "gaddi kutki," is a plant that belongs to the family Aizoaceae. It is a widespread weed found in tropical and subtropical regions and is used in traditional medicine systems in some parts of the world, including Unani and Ayurveda.[1,2] The drug Biskhapra is well known drug in the Unani system of medicine, for its extensive usage in the urinary system as a diuretic (*Mudirr-e-Baul*), in ascites, anasarca, cystitis in cases of dribbling urine, in dropsy, edema, and ascites.[2] This plant contains a number of bioactive chemicals that are frequently utilized to treat various ailments.[3] Steroids, flavonoids, lipids, terpenes, carbohydrates, tannins, and alkaloids are the main chemical components of this plant.[4] In Arabic, it is also known as *Hand Qooqi*, whereas in Persian it is known as *Dewasapt* and Horse in English as a purslane. [5, 6] Usually found in damp soil and close to rivers and pound, it is an annual plant that spreads on the ground in a circle and is not longer than 4-6 feet.[7] Even though the Unani medical system has been using the entire plant for medicinal purposes from ancient times; However, the leaves of this plant are more frequently utilized as a medicinal agent for a variety of clinical disorders., viz. as *Mudirr-e-Baul* (diuretic), *Muqavwwi-e-Gurda* (nephroprotective), *Mudirr-e-Haiz* (emmenagogue), *Jali* (detergent), *Muqawwi-e-Baah* (aphrodiasic), *Musakkhin* (calorific), *Muqawwi-e-Kabid* (hepatoprotective) etc. [2,5] At present scenario increasing global demand of traditional Unani medicine day by day, either alone or adjuvant therapy for promising effect of various disorders, which are challenging for the physicians as well as for scientist. In recent years, scientific research has been conducted to explore the potential health benefits of various herbs. Some herbs have been found to contain bioactive compounds that can have antioxidant, anti-inflammatory, antimicrobial, and other health-promoting properties. For example, Biskhaprais known for its potential nephroprotective, hepatoprotective, anticarcinogenic, anti-inflammatory benefits.[1,2]

Vernacular Names:

Weed 'Biskhapra' is known with different names. Its name vary due to various places, and various regional languages, due to its folk uses. It was well-known by the name Lotoos Aghryoos in Unani medicine, in Arabic, it is known as Hand Qooqi, in Persian it is known as Dewasapt, in Urdu it is called Biskhapra, In Hindi language it named as Salasabuni, Sabuni, Vishakhapara , Lal-sabuni, Santhi, in Punjabi- Biskhapra, Itsit, in Bengali known as Sabuni, in Sanskrit as Chiratika, Dhanpatra and Vishakha, in Tamil as Sharunnai, and in Telugu it is called Ambatimadu, in Kannada-Muchchugoni, in Spanish it is Verdolaga, in English it is Horse purslane, In Chinese it is named as Jia Hai Ma Chi.[1,2,5,7,8,9]

Scientific Classification:

Kingdom-Plantae, Phyllum -Tracheophyta, Class-Magnoliopsida, Subclass Caryophyllidae, Order-Caryophyllales, Family- Aizoacea , Genus -Trianthema Linnaeus, Botanical name- *Trianthema portulacastrum* Linn.[1,7,9,10]

Morphological description of Biskhapra in Unani literature:

It comes in two varieties: red and white, according to ancient Unani scholars. White varieties are more powerful than red ones. Between the branch and the leaf's origin, a flower appears. A pocket filled with tiny, spherical seeds is present at the node. The Biskhapra's leaves have an oval shape, blunt apices, and a spicy flavor. White variant has a stronger action than redish, so doctors frequently utilize it. It has a softer, broader, and slightly stronger stem that can reach a height of 4-6 feet before spreading out on the ground. It has bluish-colored flowers. Reddish stems are more robust than white ones. It is 4-6 feet long, surkh kaboodi (reddish), and spreads out on the ground. Compared to the seeds of the whitish variety, its seeds are smaller. It was categorized as Barri (wild) and Bustani (cultivated) by some Unani scholars. Barri has a 3-5 foot stem with several branches. It has bigger leaves than the Bustani. The leaves taste almost identical to Bustani's, but more pungent (baksapan), so it encroaches on the throat. The flowers are scarlet, and the fruits are wrapped in a tiny pocket with small seeds. In Vedic literature describes three types of biskhapra, which are distinguished by the color of their blossoms (white, red, or blue).[2,5,6,7,8]

Some images of Biskhapra (Trianthema portulacastrum)

Geographical distribution and occurrence of Biskhapra:

It is a native of tropical America and an exotic weed. It is expanding across the majority of tropical nations, including Baluchistan, Ceylon, and India. It has now become a part of nature all over India, including in farmed fields, river banks, waste areas, etc.[7] Its infestation is particularly prevalent, especially during the wet seasons, in a variety of agricultural and vegetable crops, including mustard, maize, pigeon pea, mung bean, potato, onion, cotton, soybean, pearl millet, and sugarcane.[9] There are two varieties of this plant that are known to exist: Lal Sabuni, which is red in color and has a crimson stem, leaf border, and flours, and Svet Sabuni, which is green in color and has white flowers.[7,8,9,10,11]

Habit and Habitat of Biskhapra:

A little perennial weed known as *Trianthema portulacastrum* can be found all over the world, including the Americas, Africa, India, and other places.[1] From the months of February to October, flowers are in blossom.[2] Alkaline flats, playa lakes, riverbank depressions, streams, roadside depressions, beaches, disturbed areas such as gardens, irrigated soils and ditches, fields, ballast, stockyards, walkways, and railroad tracks; 0-1000

m.[7,9,12,13,14] Habit and habitats also depends several factors in terms of climate, soil quality, seeds quality, exposure of sunlight, and involvement of natural phenomena etc.

- **Cultivation and Grow of Biskhapra:**

This plant is not commercially grown, but due to its infestation in plains, river banks, and wastelands, it is recognized as a tropical troublesome terrestrial weed throughout India.[1,9] Additionally, it develops naturally in fields that have been planted with agricultural and vegetable crops, particularly during the wet seasons.[1,2,9,10,11]

- **Temperament of Biskhapra:** Har **(2°)** &Yabis **(1°)**[5,15,16]

- **Action in Unani Literature:**

Numerous pharmacological activities are mentioned by Unani scholars in classical Unani literature, including as *Mudirr-e-Baul* (Diuretic), *Mudirr-e-Haiz* (Emmenagogue), *Mudirr-e-labn* (Lactogogue)*Daf-e-Tap* (Antipyretic), *Daf-e-Zahar* (Antidote), *Jali* (Detergent), *Mohallil* (Resolvent), *Monaffis-e-Balgham* (Expectorant), *Musakkhin* (Calorific), and *Muqawwi-e-Baah* (Aphrodisiac), *Kasir-e-Reyah* (Carminative), *Habis-e-Shikam* (Astringent), *Muqawwi-e-Meda* (Stomach tonic), *Mushtahi* (Appetizer) and *Qabiz* (Astringent). [5,15,16,17,18]

- **Pharmacological uses mentioned in Unani text:**

Its decoction induces diuresis and menstruation, and it is also used to treat stomach pain from coolness, thoracic pain dominance of *Balgham*, and stomach pain from reyah (gas).[2,5] Its extract helps treat cholera and is *Habis Shikam* (constipating). In the early stages of ascites and anasarca, can be managed with after mixing of Biskhapra, Sirka, and Sonth (*Zingiber officinale*), to prepare a paste and which is administered locally. Joints problems can be effectively treated with its oil. Infants are bathed in its decoction to help them walk and grow more quickly, and its oil is also used for massage, beneficial for conditions like Balghami wa Saudavi, hepatitis, spleen and uterine inflammation, as well as cough. When used topically, crushed Biskhapra leaves and black pepper, which reduce inflammation of affected area.[2,5,15] When administered prior to the commencement of a fever (Tape Balghami or Tape Saudavi), 6-9 ratti (750-1125 mg) of root powder are particularly helpful in treating periodic attacks of fever.[2,5,15,16] Tukhme Khayar (*Cucumis sativus* seed) can be pounded alone, with wine, or both to relieve urinary bladder pain. When administered locally, fresh leaf juice helps treat *Kalaf* (melasma of the face). Eye conditions including cataracts and night blindness are treated using its decoction. Its extracted extract can be applied to the scorpion bite site to reduce itching and pain.[2,5,15,16,17,18]

- **Therapeutic Doses:**

Leaf: 6 to 12 gm, **Roots**: 3 to 5 gm, **Seeds:**2 to 3 gm [2,5,15,]

- **Side effects:**

Muzir for thorax.[15] Bustani- pain in pharynx and toxic to liver. Dashti- *Muzir* for hot temperament person and produce headache.

Corrective:

Corrective with the help of some specific drugs based on side-effects like Kahu (*Lactuca sativa*) and Kishneez (*Coriandrum sativum*) for pain in pharynx. Kasni (*Chicorium intybus*) for *Muzirrat* of liver. Kishneez (*Coriandrum sativum*) for headache and hot temperament persons and Kateera (*Astragalus gummifer*) for itching. [2, 5,15,16,17,18]

Alternative:

Choice of alternatives opted that time, when an original drug is not available, or its cost is high. According to author of *Khazainul Advia*, and *Bustanul Mufradat* leaves and seeds of pattharchatta (*Bryophylum pinnatum*). [2,5,17]

Major Bioactive Substances:

The presence of steroids, flavonoids, lipids, terpenes, carbohydrates, tannins, and alkaloids has been detected using photochemical screening. The phytochemical components found in the various plant sections are very important. The presence of different phytoconstituents, including steroids, alkaloids, terpenoids, glycosides, flavonoids, phenolic compounds, and carbohydrates, are reported for methonolic extract.[1,19,20] The major constituent of *Biskhapra* is ecdysterone, A C-methylflavone, trianthenol, tetrapenoid, is punarnavine, 3-acetylaleuritolic acid, 5,2'-dihydroxy-7-methoxy-6,8-dimethylflavone, leptorumol, 3,4-dimethoxy cinnamic acid, 5-hydroxy-2-methoxybenzaldehyde, p-methoxybenzoic acid, beta cyanin.[1,19,20,21,22,23,24,25,26]

Pharmacological studies:

- **Hepatoprotective Effect**:

Kumar G et al., reported that ethanolic extract of *Trianthema portulacastrum* L. revealed a significant dose dependent (100 mg, 200 mg/kg p.o. 10x) protective effect against paracetamol and thioacetamide induced hepatotoxicity in albino rats, Biochemical markers such as serum glutamate oxaloacetate transaminase (SGOT), serum glutamate pyruvate transaminase (SGPT), alkaline phosphatase (ALP), bilirubin (BRN), and total protein (TP) were used to assess the level of protection.[27] One another study carried out by Sharmila Banu G et al, who documented that, aflatoxin induced hepatic damage in rats were treated with ethanolic leaves extractof Biskhapra showed hepatoprotective effect, when it was orally administered 100 mg/kg for 7 days.[28] Some researcher also claimed that, ethanolic extract of Biskhara exhibit hepatoprotective effect against CCl4 induce liver damage in mice.[29]

- **Anti-atherosclerotic Effect**:

As a result of cholesterol and fat buildup in the artery's inner lining, atherosclerosis is a serious cardiovascular disease that causes lumen constriction, plaque formation, and turbulent blood flow. According to Wu H et al., water extract of Biskhapra at the dose of 100 to 200 mg/kg body weigh showed effective against atherosclerosis in streptozotocin-induced diabetic rats. Rats treated with 100 and 200 mg/kg Extract of Biskhapra, also showed a decrease in GPR124 protein expression by 9.5% and 33.3%, respectively.[3]

- **Diabetic Effect Anti-**:

Significant antihyperglycemic action was produced by the methanolic extract of the entire entire Biskhapra in streptozotocin (STZ)-induced diabetic rats, which is comparable to glibenclamide (a common oral hypoglycemic medication). In STZ-induced diabetic rats, the 100 and 200 mg/kg suspension of methanolic extract had a significant antihyperglycemic effect (P 0.05) after 1 hour of administration. This antihyperglycemic effect was more prominent after 4 hours.[30] Rats with normal and alloxan-induced diabetes received doses of 100, 200, and 300 mg/kg of the methanolic extract of the entire plant of Biskhapra, over the course of seven days. In normal and diabetic rats, the extract, significantly (p=0.001) reduced blood glucose levels compared to glibenclamide.[31]

- **Anti-dyslipidemic Effect**:

A dose-dependent hypolipidemic action was established in rats by the methanolic extract of the whole plant. Lipid metabolism is inadequately controlled in diabetes mellitus. At the conclusion of the 7-day treatment period, 100, 200, and 300 mg/kg doses had positive impacts on both normal and alloxan-induced diabetic rats' lipid profiles.[1,31]

- **Analgesic Effect**:

The analgesic effectiveness of the ethanol extract of Biskhapra was examined using hot plate and acetic acid-induced writhing procedures. It was discovered that the extract had a dose-dependent inhibitory effect on the acetic acid-induced writhing response. Aspirin and a dosage of 250 mg/kg extract each had the ability to reduce the writhing response by 67.68% and 50.92%, respectively (P 0.001). Additionally, it was shown that the extract significantly reduced pain in mice using the hot plate response time method.[32]

- **Nephroprotective Effect**:

Karim et al, published one research article, in which they have reported that Biskhapra revealed nephroprotective as well as curative effect against adriamycin induced nephrotoxicity in rats at the dose of 450 and 900 mg/kg. The research drug also exhibits strong diuretic action. Diuretics raise the Glomerular Filtration Rate (GFR) and induce diuresis, which leads to an increase in urine production and an increased outflow of creatinine and urea from the kidney. [33]

- **Anti-carcinogenic Effect**:

Bhattacharya S et al, documented that, aqueous, ethanolic and chloroform fractions extract of Biskhapra showed anticarcinogenic effect against diethylnitrosoamine (DENA) induced hepatocarcinogenesis in rats model at a dose of 100 mg/kg body weight once daily. The anticarcinogenic potential of the plant extract in DENA-induced hepatocarcinogenesis seems to be shown by a decrease in the percentage of liver parenchyma occupied by foci.

Conclusion:

In Unani medicine, Biskhapra has been used since ancient times for several ailments. Currently, this herb is essential in both the prevention and treatment of numerous diseases. The plant's leaves contain a variety of phytochemicals, including punarnavine, steroid, alkaloid, terpene, flavonoid, phenolic, saponin, and

carbohydrate components. The prevention and treatment effects of the Biskhapra may be due to its diuretic, anti-inflammatory, hypolipidemic, cardioprotective, hepatoprotective, nephroprotective, antioxidant, immunomodulatory effect. To better understand Biskhapra's active principles, mode of action, and therapeutic applications Unani practitioners, more research is required. Such a comprehensive assessment will open up new possibilities for Unani practitioners and scientists.

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