Biskhapra (*Trianthema portulacastrum Linn*) and its medicinal utility mentioned in Unani System of Medicine–A Review

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ABSTRACT:

Biskhapra (*Trianthema portulacastrum* Linn.) belongs to the family Aizoacae. It is an annual herb found in tropical and sub tropical region and almost throughout the India as a weed in cultivated and wastelands. Biskhapra is a well notorious drug in Unani system of medicine for its extensive use in urinary system as diuretic (*Mudirre Baul)*, in ascites, anasarca, cystitis in case of dribbling of urine, in dropsy, edema and ascites. Decoction of herb is used as an antidote in alcohol poisoning, also used in rheumatism and as a vermifuge. It has action like aantipyretic, antidote, expectorant, detergent, carminative, resolvent, diuretic, appetizer and astringent. Major chemical constituents are alkaloids, trianthemine, punarnavin, ecdysterone, tetraterpenoid, 3, 4-Dimethoxycinnamic acid, β- cynin and saponins. It exhibits marked dose dependent protection against hepatotoxicity in mice and rat. It also reported nephroprotective, diuretic, anti-cancerous, antihelmintic, antipyretic, analgesic, and anti inflammatory activity in experimental and clinical aspect.

Keywords: Biskhapra, Nephroprotective, Antiinflammatory, Unani Medicine

INTRODUCTION:

Biskhapra (*Trianthema portulacastrum* Linn.) is a plant which belongs to the family Aizoacae. It is known as Hand Qooqi in Arabic, Dewasapt in Persian and Horse purslane in English. It is an annual herb which spreads on the ground in circle and not more than 4-6 ft. in length, commonly found in moist soil and near the river and pound. Though the whole plant is used medicinally from the ancient period of time in Unani system of medicine; however its leaves are more commonly used as therapeutic agent for divers pathological conditions, viz. as *Mudirre Baul* (diuretic), *Mudirre haiz* (emmenagogue) *jali* (detergent), *muqawwie baah* (aphrodisiac), *musakkhin* (calorific), used in colitis, jaundice and ascites. Its juice is used in corneal ulcer, night blindness and dribbling of urine. [1, 2, 3]

VERNACULAR NAMES:

Biskhapra is widely used herb found most of the countries and throughout in India. In Hindi it is called as Salasabuni, Sabuni, Vishakhapara , Lal-sabuni, Santhi, in Bengali known as Sabuni, in Kannada-Muchchugoni, in Punjabi- Biskhapra, Itsit, in Sanskrit as Chiratika, Dhanpatra and Vishakha, in Tamil as Sharunnai, and in Telugu it is called Ambatimadu. In Chinese it is named as Jia Hai Ma Chi, in Spanish it is Verdolaga, in Persian it is known as Dewasapt, in Arabic, it is known as Hand Qooqi, in English it is Horse purslane and in Urdu it is called Biskhapra. In Unani language it was famous with the name of Lotoos Aghryoos.[3, 4, 5, 6, 7]

SCIENTIFIC CLASSIFICATION:

Kingdom - Plantae
Phyllum - Tracheophyta
Class - Magnoliopsida
Subclass - Caryophyllidae
Order - Caryophyllales
Family - Aizoacea
Genus - Trianthema – Linnaeus
Botanical name- *Trianthema portulacastrum* Linn.[8]

MORPHOLOGY:

Macroscopic descriptions

It is a prostrate somewhat succulent herb; stem more or less angular, glabrous or pubescent, much branched. Leaves sub fleshy, obliquely opposite, unequal, broadly obovate, rounded and often epiculate at the apex, cuneate at the base, glabrous; petioles 6-13 mm long, much dilated and membranous at the base. Flowers are solitary, sessile, almost concealed by the pouch of the petiole. Calyx-lobes are ovate, and acute. Stamens 10-20. Ovary is truncate; style 1. Capsule small, almost concealed in the petiolar pouch, lid truncate, slightly concave, with 2 spreading teeth carrying away at least one seed, the lower part 3-5 seeded. Seeds are reniform, muriculate, and dull black in colour. [3]

Fig. 2: Plant of *Trianthema portulacastrum* Linn.

Fig. 3: Showing seeds containing pocket

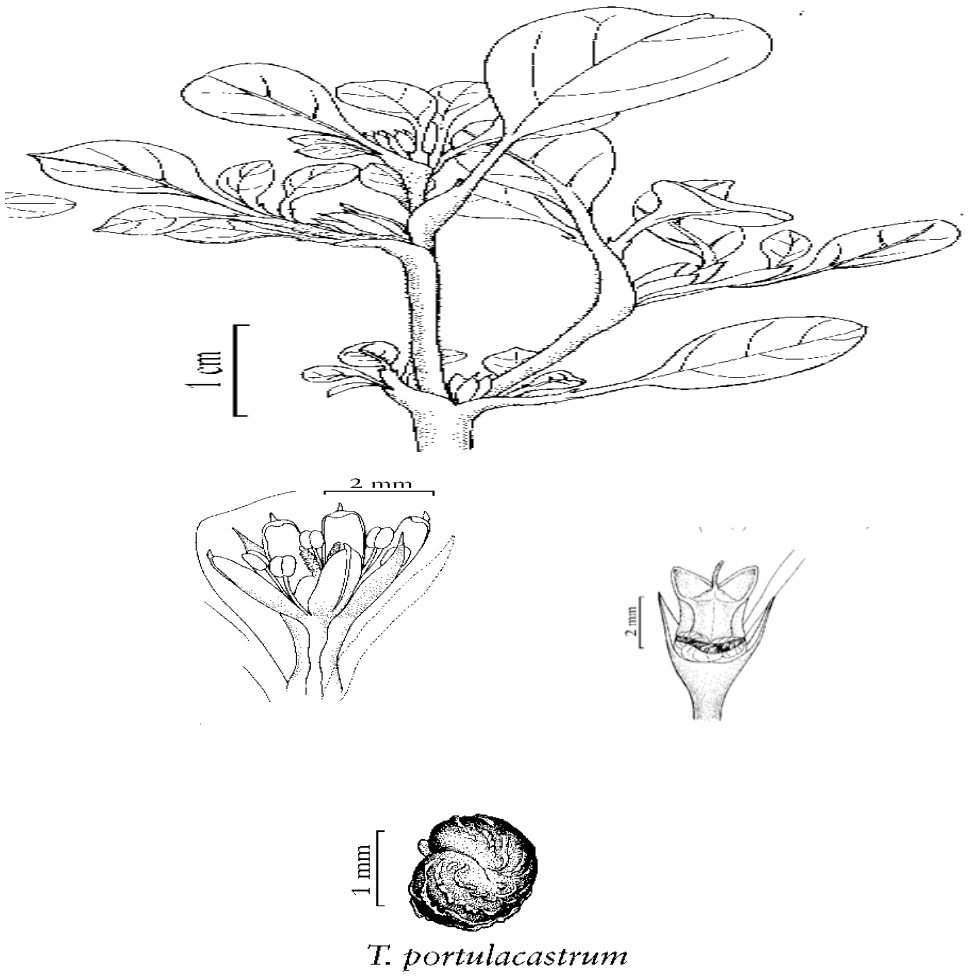

Fig. 4. Scheme representation of *Trianthema portulacastrum* Linn.

Microscopic description

Mature root shows anomalous secondary growth; cork 5 to 8 layered; secondary cortex narrow zone consisting of round to polygonal, tangentially elongated, thin-walled, parenchymatous cells, a few cells containing groups of prismatic crystals of calcium oxalate; below secondary cortex five concentric bands of vascular tissue; vessels of varying sizes occurring along with xylem fibres and phloem; phloem composed of thin walled cells having intercellular spaces, a few cells containing prismatic crystals of calcium oxalate; a few rows of polygonal, thin walled, parenchymatous cells occur in rings; medullary rays prominent in middle of the cortical region and in the second or third vascular bundle ring; centre mostly occupied by a single vascular bundle strand with two isolated groups of phloem.[7]

Morphology described in Unani text (*Mahiyat*):

It is a herb which is found on the ground in a circle and four to six ft. of length. According to ancient Unani Scholars it is of two varieties; white and red. The white variety is more potent than red one. Flower arises in between the branch and at the origin of leaves. At the node, there is a pocket which having small and rounded seeds. Leaves of the Biskhapra are oval shaped having blunt apices and pungent in taste. White variety posses stronger action than redish, so it is commonly used by the physicians. Its stem is slightly stronger, wider and soft, which grows up to 4-6 ft. but it spreads on the ground. Its flower is bluish in colour. Stem of reddish type is stronger than whitish one. Its colour is ***s**urkh kaboodi* (redish), 4-6 ft. long, spread on the ground. Its seeds are smaller than the seeds of whitish variety. Some Unani physicians classified it as *Barri* (wild) and *Bustani* (cultivated). The stem of *Barri* is 3-5 ft. long and has many branches. Its leaves are larger than the *Bustani*. Flowers are reddish and its fruits are enclosed in a small pocket in which small seeds are present, taste of seed is bad, taste of leaves is almost similar to *Bustani*, but more pungent (*baksapan*) and hence it encroaches to the throat. According to Veda, Biskhapra has three varieties, which is differentiated on the basis of colour of its flowers as white, red and blue. [1]

Geographical distribution:

It is found in tropical and sub tropical countries of the world and indigenous to South Africa. It is widely distributed in India, Srilanka, Baluchistan, West Asia, Africa and Tropical America. [3, 9]

Habit and Habitat:

Flowers are bloom in the month of February to October. Moist or seasonally dry, usually open, wetlands including alkaline flats, playa lakes , banks of rivers , creeks , roadside depressions , beaches, disturbed areas including gardens, irrigated soils and ditches, fields , ballast , stockyards, sidewalks, railroad tracks; 0-1000 m. [10]

Temperament (*Mizaj*):

Leaves and seeds are hot in second and dry in first degree [2]

Action:

Leaves of the white variety are diuretic. The plant is bitter, hot, alexiteric, analgesic, stomachic and laxative. [3, 11]

Action in Unani text (*Afaa'l*):

In Unani literature various actions are mentioned by *Unani Attiba* such as *Dafe tap* (Antipyretic), *Dafe zahar* (Antidote), *Jali* (Detergent), *Mohallil* (Resolvent), *Monaffis balgham* (Expectorant), *Musakkhin* (Calorific), *Mudirre Baul* (Diuretic), *Mudirre haiz* (Emmenagogue), *Mudirre labn* (Lactogogue) and *Muqawwie baah* (Aphrodisiac). It has very good action on stomach as *Kasire reyah* (Carminative), *Habise shikam* (Astringent), *Muqawwie med'a* (Stomach tonic), *Mushtahi* (Appetizer) and *Qabiz* (Astringent). [1, 2, 12, 13]

Pharmacological use:

Leaves are used in dropsy, edema and ascites. Decoction of herb is used as an antidote in alcohol poisoning, also used in rheumatism and as a vermifuge. It is also used as an alternative cure for bronchitis, heart disease, anaemia, inflammation and piles. [3, 6]

Pharmacological uses mentioned in Unani text:

Its decoction induces diuresis and menstruation, and also used in thoracic pain (due to *balgham*), stomach pain (due to coldness) and in expulsion of *reyah* (gas) from stomach. Its extract is *habis shikam* (constipating) and useful in cholera. A *zemad* (paste) made from its oil with sirka and sonth (*Zingiber officinale*) and applied locally in the early stage of ascites and anasarca. Its oil is very effective in case of joint pain. Its decoction is used for bathing the infants to grow and walk earlier, massage of its oil has the same effect. Beneficial in *balghami wa saudavi* diseases, hepatitis, inflammation of spleen and uterus and also useful in cough. Leaves of Biskhapra pounded along with black pepper subsides inflammation when applied over the affected part. 6-9 ratti (750-1125 mg) of root powder is very useful in periodic attack of fever (*tape balghami* or *tape saudavi*) used before the onset of fever, it subsides fever within 2-3 days. Pounded alone or with wine or *Tukhme Khayar* (seed of *Cucumis sativus*) is useful in pain of urinary bladder. Fresh juice of the leaves is useful in *kalaf* (black spot), when applied locally. Its decoction is used in eye diseases like cataract and night blindness. Application of its expressed extract over the site of scorpion bite relieves from pain and irritation. [1, 2, 12, 14]

Doses (*Miqdare Khurak*):

Leaf- 1 tola, approximately 12 gm[1]

Side effects (*Muzirrat*):[1, 12]

Bustani- pain in pharynx and toxic to liver. Dashti- *muzir* for hot temperament person and produce headache.

Corrective (*Muslehat*):

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. [1, 13]

Alternative (*Badal*):

Leaves and seeds of pattharchatta (*Bryophylum pinnatum*) [13]

Phytochemical Studies:

A lot of data have been obtained by the phytochemical studies of the plant *Trianthema portulacastrum* L. which is described below.

An analysis of the leafy vegetable from South India gave the following values; moisture content 91.3; protein 2.0; fat 0.4; carbohydrate 3.2; crude fibre 0.9; ash 2.2 gm; calcium 100; phosphorous 30; iron 38.5; ascorbic acid 70 mg/100 gm of the edible matter. Carotene has also been reported 2-3 mg/100 gm. An analysis of the leaves of the plant from Kanpur gave (dry basis); ash 17.0; oxalate, total 9.99 and soluble 8.64; calcium 0.73 and phosphorous 0.36%. The plant also contains large amount of potassium nitrate- white variety, 1.71% and red variety- 2.64%.[10] Karim S 2011, add the information of the extractive values by successive Soxhlet's extraction

in petroleum ether, diethyl ether, chloroform, benzene, methyl alcohol and water were found to 1.76±0.009, 1.38±0.017, 1.15±0.006, 0.43±0.001, 12.83±0.093 and 18.07±0.069 respectively. Total ash, 19.69±0.065%, acid insoluble, 2.05±0.2% and water soluble ash 14.4±0.3%. Moisture content by loss on drying method and by toluene distillation method was found to be 5.56±0.06, and 6±0.01 respectively. The mean of the pH value of 1% and 10% w/v aqueous solution showed 5.02 and 5.04, respectively. The results of phytochemical studies confirmed the presence of alkaloids, saponins, flavonoids, tannins, phenolic compounds, protein and reducing sugar.[15]

Karnick 1970, reported that the plant contains an alkaloid Trianthemine ($C_{32}H_{46}O_6N_2$; MP-127º) and ecdysterone (0.01 gm/ kg) which is a potential chemosterilant.[16, 17, 18] A tetraterpenoid named trianthol-1, isolated from the chloroform extract of the plant, showed antifungal activity and the structure of trianthenol-1 was established.[19] It also contains 3, 4-Dimethoxycinnamic acid and β- cynin,[20] saponin,[21] and alkaloid "punarnavin" up to 0.01% calculated on air dry sample[22] yields a new alkaloid

$C_{32}H_{36}O_6N_2$[11]. Extraction of *Trianthema portulacastrum* Linn. with dichloromethane has led to the isolation of a new flavonoid, 5, 2′-dihydroxy-7-methoxy-6, 8-dimethylflavone, along with 5, 7-dihydroxy-6, 8-dimethylchromone (leptorumol).[23]

Pharmaocological studies:

Many studies regarding hepatoprotective effect of Biskhapra has been carried out by different researchers like Mandal *et al.*, Kumar G *et al.* and they found that the ethanolic leaves extract of *Trianthema portulacastrum* Linn exhibit a significant dose dependent protective effect in rats and mice.[24, 25, 26, 27]. Similarly methanolic extract of Biskhapra also play an important role in nephroprotection.[27] Karim *et al.* also evaluated that the drug has effect in adriamycin induced nephrotic syndrome in rats.[28] Anothor study regarding diuretic effect of Biskhapra was found significant result like standard drug frusemide.[29] The remarkable effect of chloroform extracts of *Trianthema portulacastrum* Linn. were seen in DENA induced rat hepatocarcinogenesis.[30] The ethanolic extract was also evaluated for analgesic activity and was found that, the extract has significant antinociceptive action in hot plate reaction time method in mice and this effect was comparable to that of standard drug aspirin treated controls, suggesting the central activity of EETP.[31] Ethanolic extract of the whole plant of *Trianthema portulacastrum* Linn. showed the antipyretic activity (against yeast pyrexia in rat), analgesic activity (against chemical and electrical stimuli) anti-inflammatory activity (against formaldehyde induced arthritis in rat), *in vitro* antibacterial activity (against gram positive bacteria) and CNS depressant activity.[32] Anthelmintic study of *Trianthema portulacastrum* Linn and *Musa paradisiaca* Linn. was done against gastrointestinal worms of sheep and was found to be effective.[33]

Conclusion:

Efficacy of Biskhapra was known from the very past of Discoridoos era (In *Kitab Al-Hashaish*), and it is frequently used by the physicians for different medicinal purpose. The scientific analysis of Biskhapra also proves many of the activities mentioned in Unani literature viz; diuretic, nephroprotective, antiseptic, anti-inflammatory, lithotrpsic, antidiabetic, anticancer, antipyretic, antidyslipidemic activity etc. This herb is playing a very imperative role in preventing and curing many disorders especially renal disease. Further researches are needed to explore the hidden active principles, mechanism of action and utility of Biskhapra in clinical practice for the physician. Such type of compiled review will be new vistas for the researcher of AYUSH system.

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