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## *Kabīkaj (Ranunculus sceleratus L.): A review of medical benefits in Unani perspective and pharmacological studies*

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**Abstract**

Ranunculaceae is a family of over 2000 known species of flowering plants which is cosmopolitan in distribution with its main concentration in temperate and cool regions of both hemispheres. *Kabīkaj (Ranunculus sceleratus L.)* belongs to the family Ranunculaceae and is known for its medicinal properties from immemorial. Various renowned Unani scholars viz; Dioscorides, Avicenna and Ibn Baitar have mentioned the importance of the plant in treating various ailments like boils, scabies, *Alopecia areata*, psoriasis, leukoderma etc., but today it is not in use due to the lack of availability and improper identification. The present paper aims to review the comprehensive knowledge of the plant which covers almost all Unani classical literature data on its identifying characteristics, temperament, action, uses, toxicity, adverse effects and detoxifying methods or correctives along with its phytochemical and pharmacological activities.

**Keywords:** Kabīkaj, poisonous, *Ranunculaceae*, Unani medicine

**Introduction**

Unani System of Medicine has a rich source of herbal drugs; the plants of Greek, Europe, Spain, Arab, India, Pakistan, Iran etc provide a great drug collection in the treasure of herbal drugs of Unani System. Worldwide more than 10000 species of higher plants have been used for medicinal purpose<sup>[1]</sup>. In Unani System of Medicine there are about 1400 drugs used which provide medicinal importance either used orally or applied locally, single or in compound form<sup>[2]</sup>. Near about 80 percent of the world population is using herbs to cure various ailments<sup>[3]</sup>. Unani System has a broad range of herbs of different families which are used medicinally including toxic as well as nontoxic drug. In classical Unani literatures, poisonous drugs are described according to their temperament which have put in 4<sup>th</sup> Degree and some in 3<sup>rd</sup> degree having either Hot or Cold temperament. These types of drugs are used after detoxifying following different classical methods or adding some correctives or antidotes. Some common poisonous drugs which are used for medicinal purpose are *Bīsh (Aconitum nepalus)*, *Kuchla (Strychnos nuxvomica)*, *Afiyun (Papaver somniferum)*, *Mawīzaj (Ranunculus stafasagra)*, *Dhatūra (Datura Sp.)*, *Luffāh (Atropa belladonna)*, *Shawkran (Conium maculatum)*, *Farfiyūn (Euphorbia resinifera)*, *Kharbaq Siyāh (Helleborus niger)* etc. *Kabīkaj* is also such type of a toxic drug but has a lot of medicinal properties; the drug has been described by Dioscorides (40-90 AD), Galen (129-216 AD), Ibn Sina (980-1037 AD), Ibn Baitar (1197-1248 AD) and Najmul Ghani (1859 AD) in their classical books. Due to the lack of information the drug is not recorded in recent books of Unani medicine that is why, no studies are available regarding its identification, pharmacological effect and other aspects. So re-investigation and identification of such type of drug with the help of available scientific tools is necessary to introduce this type of very less known but effective drugs of Unani Medicine. The whole plant, leaves and dry roots (Fig 1) are used medicinally in Unani System of Medicine. Fresh plant is said to be highly acrid, vesicant, rubefacient, and toxic, so commonly has been used after drying till toxic properties are destroyed. Mostly it is used as a local application but sometimes used orally. It is very effective in skin diseases e.g. itching, scaling due to dryness of skin, warts, and scars on skin. When it is applied locally a sensation of cold and a specific pain like bite of bed bug has been felt<sup>[2]</sup>. The drug is said to be useful as diuretic, antispasmodic, vermifuge and anodyne, so used to cure sciatica, rheumatism, internal abscess, malaria, scrofula, snake or scorpion venom and acute icteric hepatitis, dysuria, asthma, pneumonia and gripe<sup>[1, 4]</sup>. The toxic properties are destroyed on drying or boiling, the boiled herb is said to be consumed as a vegetable<sup>[1]</sup>.

## Distribution

There are 400 species of this genus in temperate and cold regions and on tropical mountains<sup>5</sup>. *Ranunculus sceleratus* is thought to be native to northern Africa (i.e. northern Egypt, northern Algeria, Morocco and Tunisia), North America (i.e. most of the USA), Europe, Western and Northern Asia (i.e. Afghanistan, Iran, Iraq, Lebanon, Syria, Turkey, Armenia, Azerbaijan, Georgia, Russia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, Mongolia, China and Japan), and the Indian Sub-continent (i.e. Bhutan, northern India, Nepal and Pakistan). The plant is grown in plains of northern India, and the warm valleys of the Himalayas from Kashmir to Assam up to the altitude of 1500 m<sup>[6, 1]</sup>.

**Botanical Description:** *Ranunculus sceleratus* is an annual erect herb growing up to 20–60 and 90 cm in height branched frequently<sup>7,1</sup>. The leaves are more or less glabrous and have small blades each deeply lobed or divided. They are borne on long petioles. The flowers are 5-10mm across with five or fewer yellow petals a few millimeters long and reflexed sepals. The fruit is oblong, ovoid 6-9mm long, achene born in a cluster of several; The Stem is light green, robust, and smooth, and the aerial regions possess an abundance of trichomes<sup>[1, 8]</sup>.

## Scientific Classification

Kingdom: Plantae  
Phylum: Tracheophyta  
Class: Magnoliopsida  
Order: Ranunculales  
Family: Ranunculaceae  
Genus: *Ranunculus*  
Species: *R. sceleratus*

## Description of the drug in Unani Literature

Ibn Baitar and Ibn Sina mentioned with reference to Dioscorides, that it has four varieties. The first one has leaves resembling coriander but comparatively wider and somewhat whitish; flowers are golden yellow but occasionally they may also be found purple, the flowers are located at the height of near about two to four arms from the ground; several thin and hairy branches start from the root; rhizome is white, small with tiny roots; taste is sharp and bitter. It grows mainly in wet places near flowing water (canal line or riverbank)<sup>[2, 9]</sup>. The second species is found in cold places, it is the bitterest type, and is called *Sālbīn Aghriyūn*; the third type is small in size having an unpleasant smell and a golden yellow coloured flower. The fourth species is similar to the *Sālbīn Aghriyūn* but the flower's colour is milky white (Fig. 1 c)<sup>[2, 9, 10]</sup>. It produces a blister if fresh leaves are applied to the skin-

## Vernacular name

The plant is known by different names according to its habitat, the language where it is found and based on its characteristic identifying features as follows:

Arabic: *Kaf al-Ḍab'*, *Shajr al-Ḍab'*, *Kaf al-Ḍab'*, *Kabikaj*<sup>[2, 9]</sup>. English: Celery-leaved Buttercup, Cursed Buttercup, Celery-leaved Crowfoot, Cursed crowfoot, Blister buttercup<sup>[1, 6]</sup>.

Egypt: *Bār-i-Illat*<sup>1</sup>

Folk: *Jal Dhaniya*<sup>[2]</sup>

Greek: *Batrahayun*, *Saltin agharyun*<sup>[2]</sup>

Hindi: *Aglaon*, *Latukari*, *Jalbel*, *Jaldhaniya*, *Bandhaniya*, *paalika*<sup>[2, 9]</sup>

Kumaun: Shim; Mundari: Bir Mani<sup>[1]</sup>

Persian: *Karafs Dashti*, *Mushak*<sup>[2]</sup>

Sanskrit: *Nasa samvedna*, *Toya Valli*, *Kandira*, *Kanda Katuka*, *Sokadka*, *Soladana*, *latukari*, *Jaldhariya*<sup>[2]</sup>

Manipuri: *Lalukaob*<sup>[12]</sup>.

Marathi: *Khajako*, *llathi*, *Kulaji*<sup>[12]</sup>;

Nepali: *Nakkore*, *Naakure*, *Shamphu Jhaar*, *Tharuni*

## Wajah Tasmiya (nomenclature)

The Genus name “*Ranunculus*” translates to “little frog” from the Latin word “*Rana*” meaning frog and “*unculus*” meaning little. It is believed that the name came from the species preferred growing regions near bodies of water and in the spring they were seen plentiful along streams-just like little frogs. Its Arabic *Shajr al-Ḍab'* *شجر الضبع* and *Kaf al-Ḍab'* *كف الضبع* are given due to its leaf structure which resembles the foot and fingers of Hyenas. The name “cursed crowfoot” is given due to the resemblance of its leaves with crowfoot and the stem oozes a sap that may cause blisters, which is probably where the name originated. The Hindi name “*Jaldhaniyā*” is given due to the resemblance of its leaves with coriander (*Dhaniyā*) leaves.

## Temperament (Mizāj)

Its temperament is hot and dry in 3<sup>rd</sup> degree<sup>[9]</sup>.

**Therapeutic action and uses (Af'al wa Khawās):** Orally it is attributed with hot, acrid, pungent quality, *Mushil*, *Mudirr-i-Shīr*; and locally it has *Mulattif* (demulcent), *Munaqqī-i-Mawād*, *Jāli* (detergent), *Muḥallil* (resolvent), *Munaffit* (vesicant), *Muḥammir* (rubefacient), *Muqarriḥ* (ulcerative), *Mudammil-i-Qurūḥ* (wound healing), *Mudirr-i-Hayḍ* (emmenagogue) properties. It is used in *Amrād-i-Jild* (skin disease); *Waja' al-Mafāsil* (arthritis), *Ihtibās Tamth* (amenorrhea), *Waja' -i-Dandān* (toothache), cracking of nails, whitening of nails, fungal infection of nail, leukoderma, spot on face and skin warts<sup>[2, 10, 9]</sup>.

**Table 1:** The drug is avoided orally due to its toxic effect and is mostly used in local application in different ways for the treatment of various diseases mentioned in:

S. No	Diseases	Method of application
1	<i>Bālkhora</i> ( <i>Alopecia areata</i> )	It removes <i>Bālkhora</i> and grows hair after using it locally for some days <sup>[2, 9]</sup> .
2	<i>Baras</i> (Leukoderma)	A paste of fresh leaves is applied on white patches in leukoderma and found very effective in white discoloration of nails and alopecia also <sup>[9]</sup> .
3	Cracked Skin	Taping with warm decoction of the plant is very useful for softening the cracked skin which occurs due to cold <sup>[2]</sup>
4	Nasal Blockage	The snuff of the root powder is Errhine and removes nasal blockage following sneezing <sup>[2]</sup> .
5	Toothache	The root powder is useful in throbbing toothache <sup>[10, 9]</sup> .
6	Weakness of male Genital Organ	The juice of the plant is used locally applying on the male genitalia to remove the collected morbid matter by forming blisters on the skin, which are produced due to masturbation in young people <sup>[10]</sup> .
7	Ulcer	The powder used to remove the flesh of non-healing ulcer <sup>[10]</sup> .

**Maḍarrat (Toxic or adverse effect):** Harmful for the person having a hot temperament, its dry root causes severe thirst if taken orally<sup>[2]</sup>.

**Precaution:** As this drug is Hot and dry in the third degree and comes under the toxic drugs so use with caution, and self-medication is not recommended.

**Musleh (Correctives):** Ghee and milk are used along with Kabikaj-*Ranunculus sceleratus* L. to avoid the toxic or adverse effects of the drug [10].

#### **Badal (Alternative or substitute)**

*Jalnīm*, and *Shūr-i-Zaqūm* (milky exudates of *Euphorbia resinifera*) are used as alternatives of Kabikaj (*R. sceleratus*) [11]

#### **Miqdār Khūrāk (Dose)**

Mostly it is applied for local application, internal use should be avoided [6].



**Fig 1:** Shows *a.* fresh plant of Kabikaj (*Ranunculus sceleratus*); *b. & c* plant with yellow and white flowers; and roots *d.* (Images collected from Srinagar J&K)

**Bioactive compounds:** The plant contains glycoside ranunculine, dimeric anemonin, and aglycon protoanemonin [6]. Serotonin and other tryptamine derivatives are also found in it [13]. The plant contains also the base choline, an unidentified alkaloid, as well as unsaturated sterols, pyrogallol tannins and flavonoid compounds [1]. Stigmasta-4-ene-3, 6-dione, stigmasterol, isoscopoletin, scoparone, protocatechuic aldehyde, rotocatechuic acid are isolated from the plant [1]. Buttercups are toxic due to the presence of the substance called protoanemonin (anemonol or ranunculin), which is present in all parts of the plant except seeds [1]. Seeds contain about 18 percent protein and 26 percent fatty oil [13]. *R. sceleratus* is the most toxic buttercup and contains protoanemonin 5-hydroxy tryptamine (17)21, apigenin (18), apigenin 4'-O- $\alpha$ -rhamnopyranoside, apigenin 7-O- $\beta$ -glucopyranosyl-4'-O- $\alpha$ -rhamnopyranoside, tricin 7-O- $\beta$ -glucopyranoside, isoscopoletin (19), tricin(20), Protocatechuyaldehyde 17, Protoanemonin (21) 23 [15].

#### **Pharmacological Studies**

Different pharmacological studies done for the various activities which validates the properties of drug described in Unani Literature as follows:

##### **Antifungal Activity**

Leaf extract of *R. sceleratus* L. possessed quick fungicidal action, tolerance against heavy fungal inoculums, activity on broad pH range, broad fungicidal spectrum, non-phytotoxicity and non-systemic activity. The extract was lethal at 1:40 dilution and its volatile vapours were also fungi toxic [16].

##### **Antibacterial Activity**

Antibacterial activity against *E. coli*, *Salmonella typhi*, *Klebsiella pneumoniae*, *Enterobacter aerogenes*, *Pseudomonas aeruginosa* and *Agrobacterium tumefaciens* has been evaluated b [17],

**Antioxidant Activity:** According to study of chloroform, ethyl acetate, butanol and aqueous fractions of *R. Sceleratus* L. it is reported to have antioxidant property [18].

##### **Antiviral Activity**

In a study against Hepatitis B and Herpes simplex viruses, the results showed that apigenin 4'- O- $\alpha$ -rhamnopyranoside, apigenin 7- O- beta-glucopyranosyl-4'- O- $\alpha$ -rhamnopyranoside, tricin 7- O- beta-glucopyranoside, tricin, and isoscopoletin possessed inhibitory activity against HBV and HSV replication [19].

##### **Anti-inflammatory Activity**

Different extracts from the aerial parts of the plant were when tested *in vivo* on several models of acute inflammation induced by different chemical methods, all the extract showed anti-inflammatory activity [5].

#### **Conclusion**

The multiple uses and its scientific reports available in this study indicate that scientific investigations are useful in the validation of Unani Medicinal plants for the development of new therapeutic agents. This is the most comprehensive review to date and may provide a base for further endeavors

knowledge related to Medicinal Plants of Unani Medicine. It is hoped through these review drugs of plant origin, which may be very specific to combat certain ailments, may be discovered.

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### Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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