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Review Article

Phytochemistry, Pharmacology and Unani traditional uses of *Kasni* (*Cichorium intybus* Linn.): A Review

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Abstract

Kasni (*Cichorium intybus* Linn.) is highly praised in many traditional systems of medicine for medicinal properties of its leaves, seeds and roots. It is grown in Punjab, Kashmir, Andhra Pradesh, Karnataka and Maharashtra. In traditional medicine, all parts of the plant are used as diuretic, laxative, antibilious, antipyretic, blood purification, appetizer and strengthen of the stomach. It is also used in the treatment of hepatic failure, jaundice, intermittent fever and mild states of chronic skin diseases. It contains glycosides, flavonoids, saponins, caffeic acid derivatives, inulin, lactucin, sonchuside A, cichoriolide. The scientific analysis of *kasni* demonstrates many of the activities mentioned in Unani literature. Nevertheless, further research is needed to identify the mechanism, active constituent, and usefulness of *kasni* in clinical practice. Given the encouraging results against neurological disorders in the prefaces, this aspect should be thoroughly investigated to make it a standard medicine.

Keyword: *Kasni; Hepatoprotective; Unani medicine; esculatin*

1. Introduction

Kasni (*Cichorium intybus* Linn.) is a culinary as well as a medicinal herb highly praised in many traditional systems of medicine for medicinal properties of its leaves, seeds and roots. It is a member of the family Asteraceae. In Unani, Ayurveda and Siddha system of medicine it has been used for diseases of hepatobiliary system and renal system since ancient times.[1,2] Historically, chicory was grown by the ancient Egyptians as a medicinal plant, coffee substitute, and vegetable crop and was occasionally used for animal forage.[3] The plant grows almost on all types of soil and occurs throughout North West India up to 6000 feet. It is wild as well as grown in Punjab, Kashmir, Andhra Pradesh, Karnataka and Maharashtra. Other countries which produce chicory are Iran, Pakistan (Baluchistan and Waziristan), Belgium, Europe, France, Germany, Netherlands, Switzerland, South Africa, United Kingdom. Recent studies have found some of the important constituents in chicory such as caffeic acid derivatives, fructooligo saccharides, flavonoids, inulin.[1,2] It also grows around roadsides, railroads and waste grounds, flowering period lasts from June to October. In the 1970s, it was discovered that the root of *C. intybus* contained up to 40% inulin.[4] To date, *C. intybus* is grown for the production of inulin on an industrial scale.[5] In Europe many parts of the world its leaves are commonly used fresh as salad or cooked as vegetable.[3] Leaves of the plant contain salts such as sulphates and phosphates of sodium, magnesium and potassium as well as potassium nitrate. It also contains a bitter glycoside named cichorine. In traditional medicine, all parts of the plant specially root leaves and seeds are used as diuretic, laxative, anti-bilious, antipyretic, blood purification, appetizer and strengthen of the stomach. It is also used in the treatment of hepatic failure, jaundice, intermittent fever and mild states of chronic skin diseases.[1,2]

2. Materials and Methods

The information on chicory was obtained from online databases, including PubMed, Google Scholar, Web of Science, Science Direct, and a library search was conducted from classical Unani textbooks. The keywords used for the search were as follows *Kasni*, chicory, *Cichorium intybus*, *Tukhme kasmi*. This review mainly focuses on data collected from traditional uses in the Unani system, pharmacological activities, phytochemical constituents, toxicology, and beneficial information for future research perspectives.

3. Results and Discussion

3.1. Botanical classification

Kingdom:	Plantae
Phylum:	Spermatophyta
Subphylum:	Angiospermae
Class:	Dicotyledonae
Order:	Asterales

Family: Asteraceae

Genus: Cichorium

Species: Intybus[73]

3.2. Botanical name: *Cichorium intybus* Linn

The botanical name of the plant is derived from Greek and Latin. *Cichorium* means field and *intybus* is partly derived from the Greek "to cut", because of the leaves, and partly from the Latin tubus to indicate the hollow stem.[7]

3.3. Other botanical names:

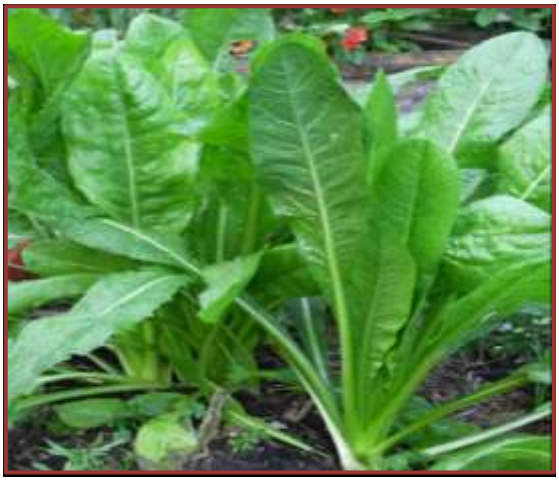
Cichorium balearicum Porta., *Cichorium byzantinum* Clementi., *Cichorium caeruleum* Gilib., *Cichorium cicorea* Dumort., *Cichorium commune* Pall., *Cichorium cosnia* Buch.-Ham., *Cichorium divaricatum* Heldr. ex Nyman, *Cichorium glabratum* C. Presl., *Cichorium glaucum* Hoffmanns. & Link, *Cichorium hirsutum* Gren., *Cichorium illyricum* borb., *Cichorium officinale* Gueldenst. ex Ledeb., *Cichorium perenne* Stokes, *Cichorium rigidum* Salisb., *Cichorium sylvestre* Garsault, *Cichorium sylvestre* (Tourn.) Lam.[8]

3.4. Vernacular names:

Urdu: *Kasni*; Arabic: *Bazrul heudyba*; Persian: *Tukhme kasmi*; Bengali: *Kasmi, Hinduba*; English: Endive, Wild Chicory, Chicory; Gujarati: *Kasmi, Himduba*; Hindi: *Kasmi*; Marathi: *Kachami*; Punjabi: *Hand, Gul, Suchal*; Tamil: *Karini Virai*; Telugu: *Kasini Vittulu*.[1,2]

3.5. Botanical description:

It is an erect, bushy perennial herb having rhizome which is light yellow from outside and white from within. Rhizome is about 8-10 cm long tapering fleshy somewhat branched and at the top about 1cm wide and densely covered by rootlets. It contains bitter milky juice which tastes sweetish and mucilaginous initially and then very bitter. Stems are 0.3–0.9 m in length, angled are grooved. The bark is rather thin, radially striate from the bark covered with vessels and separated by a brown cambium line from the finely porous wood. Branches are tough, rigid, and spreading. Radical and lower leaves are 7.5–15 cm. in length while upper leaves are alternate, small, entire, and their bases clasp the stem. Heads are ligulate 2.5-3.8 cm in diameter, terminal and solitary or axillary's and clustered, sessile or on short, thick stalks. Flowers are white to light blue and lavender, toothed at the ends. There are two rows of involucral bracts; the inner is longer and erect in comparison to the outer bracts which are shorter and spreading. Flowering occurs from July to October. Achenes are smooth, angled, crowned with the ring of pappus scales. Parts generally used are roots, seeds, and herb during blooming period.[9]



(A)

(B)

(C)

(D)

Figure1: *Kasni* (*Cichorium intybus*). (A) Whole plant of *kasni,* (B) Leaves, (C) Flower, (D) Seeds

3.6. Unani description:

According to Unani physician Hakim *Njamul Ghani*, *kasni* is a common plant which grows wild and also cultivated. Its cultivated variety is known as *bustani, hindbae shami* or *hashmi* or *balaqhi* and wild variety is known as *dashti*, *hindba*. Bustani type is of two varieties: One variety where leaves are long and broad similar as *kahu* leaves and slightly bitter in taste; flowers are bigger and colour resembles with *lajward*. This variety is also known as *hindbae shami o hashmi o balaqhi*. Another variety has smaller leaves and flowers, flowers are bluish/purple and taste is very bitter. This variety is also known as *hindbae baqhal*. The medicinal properties of the plant are mainly found on the surface of leaves; therefore, it is advised not to wash the leaves.[1,2]

3.7. *Mizaj* (Temperament):

The *mizaj* of *kasni* is cold in the last phase of the first degree. Its dry part is dry in first degree and moist part is moist in the last phase of first degree. The cultivated variety is relatively colder and moister while the wild *kasni* which is also known as *tarakhshaqaq* is less moist.[10]

3.8. Parts used:

Root, leaves and seeds are commonly used for medicinal purposes.[10]

3.9. *Afal* (Action):

Mufatteh sudud (deobstruent), *musaffi dam* (blood purifier), *muqawwi kabid* (hepatic tonic), *muqaiwwi meda* (tonic for stomach), *muskkine atash* (thirst reliever), *mushil* (laxative), *qabiz* (astringent), *habise dam* (styptic), *muddire baul* (diuretic) and *musakkin* (analgesic).[1,10,11]

3.10. *Istemal* (Use):

Warame meda (gastritis), *sual* (cough), *khafqan* (palpitaion), *sudda har* (headache), *khunaq* (diptheria), *amraze kabid* (liver disorders), *istisqa* (ascites), *ghisyan* (nausea and vomiting), *amraze kulliya* (kidney diseases), *ishal* (diarrhoea) and *muzmin humma* (chronic fevers). [1,2,10,11]

3.11. *Nafa khas*: *Musakkine hararat wa tashangi, dafe hiddate khoon wa safra* [10]

3.12. *Muzir*: *Muzir* for *sual* (cough) [11]

3.13. *Musleh*: *Shakkar safaid* and *sharbat banafsha* [1,10,11,12]

3.14. *Badal*: *Aabe bbrge khatmi and khubazi taza* [10,11]

3.15. *Miqdare khoorak* (Dose): 7-9 *gm* [11], Seeds: 3-6gm, leaves juice:10-20ml, root juice: 50-100ml[13]

3.16. *Murakkabat*: *Murawwaqain, arq kasni, Arqe biranjasif, itrifale sana, sharbat kasni, majoone dabeedul ward.*[1,14,15,16]

4. Chemical constituents:

It contains glycosides, flavonoids, saponins, gums, caffeic acid derivatives, esculatin, fructooligosaccharides, inulin, lactucin, sonchuside A, cichoriolide, chlorogenic acid, 3,5-Dicaffeolyquinic acid, 4,5, dicaffeolyquinic acid, crepidiaside A, cichoralexin, malic acid, caffeic acid, 3-caffeoylquinic acid, 5-caffeoylquinic acid, 4-caffeoylquinic acid, dicaffeoyltartaric acid, (chicoric acid), cyanidin, glucoside.[13,17,18] A recent study has shown that root of chicory consists of high alkaloids, and the root extract of this plant revealed anticancer, antitumor and immunomodulator properties.[19] Chicory is used as an adulterant in coffee so as to reduce gastrointestinal problems like gastritis. The sesquiterpene lactones like lactucin and lactucopicrin were used for antibacterial and antimalarial activity, antifungal activity[20]. Chicory also has antibacterial and nematocidal effect. Even though it has antibacterial effect but still little is known on human pathogenic bacteria. Inulin is a dietary fiber which is a starch which is not digestible by the humans but can be used as an artificial sweetener. Dried root is used as a diuretic, jaundice tonic, stomachic, liver enlargement, gout, used as a tonic in fevers, rheumatic complaints vomiting, diarrhea, and enlargement of the spleen.[21]

5. Pharmacological activities

5.1. Hepatoprotective activity:

The aqueous-methanolic extract of the seeds of C. intybus has been investigated for the hepatoprotective activity against acetaminophen and CCl_4-induced liver damage in mice, and it was found to decrease both the death rate and the serum levels of alkaline phosphatase, glutamyl oxaloacetate transaminase, and glutamyl pyruvate transaminase.[22]

5.2. Antimicrobial Effect:

The leaf extract of *C. intybus* also showed moderate activity against multi drug resistant *S. typhi*. Guaianolides-rich root extracts of *C. intybus* have shown antifungal properties against anthropophilic fungi Trichophyton tonsurans, T. rubrum, and T. violaceum.[20]

5.3. Antioxidant Effect:

The flavonoids and phenolic acids present in leaves of C. intybus are known to possess antioxidant activities due to the presence of hydroxyl groups in their structures and their contribution to defense system against the oxidative damage due to endogenous free radicals are extremely important.[23]

6. Conclusion

Kasni has a long record of its traditional use globally. Historically, *Kasni* was grown by the ancient Egyptians as a medicinal plant, coffee substitute, and vegetable crop. Inulin from chicory roots is considered a functional food ingredient as it affects physiological and biochemical processes resulting in better health and decreasing the risk of many diseases. Till date, chicory remains an extremely versatile plant, open to genetic management, and there is interest shown in genetically engineered chicory to obtain higher yields and create new potentials. The documented indigenous knowledge relating to the various medicinal uses of chicory has been supported by phytochemical isolation and investigations into biological activity. Nonetheless, many of its constituents have not been explored for their pharmacological potential, and further research is necessary to gain a better understanding of the phytochemicals against various diseases. Studies about the toxic effect of *C. intybus* are limited; however, considering that the Asteraceae family is a known source of allergic problems, a contraindication for hypersensitivity should be included in the safety data. Therefore, it's alleged that *Kasni* is a propitious traditional medicinal herb which could be of a great benefit to mankind if investigated properly.

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Conflict of Interest

The authors declare no conflict of interests

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