

MICRO-REVIEW

**Review on Phytochemical and Pharmacological Aspects of
Cichorium intybus Linn.**

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Cichorium intybus Linn. (Compositae) is an important medicinal plant which finds use in Ayurveda and Unani systems of medicine, especially in inflammations. It is useful in thirst, headache, ophthalmia, throat inflammation, enlargement of the spleen, fever, vomiting and diarrhoea etc. An attempt has been made to review the phytochemical and pharmacological work done on *Cichorium intybus* Linn.

Key Words: Review, *Cichorium intybus* Linn., Phytochemical and pharmacological properties.

INTRODUCTION

Cichorium is a genus of thirteen species belonging to the family Compositae. Two species, viz., *C. endivia* and *C. intybus*, are of common occurrence in N.W. India up to 6,000 ft., Waziristan, Baluchistan, W. Asia and Europe. *C. intybus* Linn. has been described to be of great medicinal value. *C. intybus* is a perennial herb, 1–3 ft. high, with fleshy tap root up to 2½ ft. in length. The plant is commonly known in Hindi: Kasni; Punjabi: Hand; English: Chicory¹.

Morphology

An erect, usually rough and more or less glandular, perennial herb; stems 0.3–0.9 m, angled or grooved; branches tough, rigid, spreading; radical and lower leaves 7.5–15 cm, pinnatifid lobes toothed, pointing downwards; upper leaves alternate, small, entire, heads ligulate, 2.5–3.8 cm diam.; flowers bright blue; pappus of 1 or 2 series of short, blunt erect scales; ligules very long, spreading, 5-toothed; style-arms long; achenes smooth, angled, crowned with the ring of pappus scales.

The plant is a good tonic, cooling, useful in thirst, headache, ophthalmia, throat inflammation, enlargement of the spleen, fever, vomiting and diarrhoea. The root is stomachic and diuretic; enriches and purifies the blood; lessens inflammation and pain in the joints. The seeds are tonic to the brain, alexiteric, appetiser; useful in ophthalmia, biliousness, lumbago, troubles of the spleen and asthma. The leaves are applied topically to lessen pain in the joints and have also hypoglycaemic effect. The flowers are used in liver disorders.

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Photochemical Investigations

Seeds contain a bland oil, 4.5%; fresh roots contain moisture, 77%; gummy matter, 7.5%; glucose, 1.1%; bitter extractive, 4.0%; fat, 0.6%; cellulose, inulin and fibre, 9.0% and ash, 0.8%. The ash of the roots and also of the leaves is rich in potash. Betaine and choline are also present in small concentrations. Flowers contain a colourless crystalline glucoside; cichoriin, bitter substances lactucin and intybin¹⁻⁴.

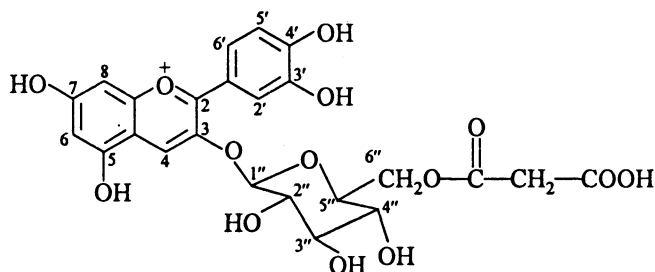
Barakat *et al.*⁵ reported average of ferric iron content 3.14 mg% and cupric copper content 0.17 mg% by ascorbimetry. Balbaa *et al.*⁶ reported the presence of flavonoids, catechol tannins, glycosides, carbohydrates, unsaturated sterols, triterpenoids and the absence of alkaloids, oxidase enzyme and saponins in the roots of each of eight varieties of *C. intybus* L.

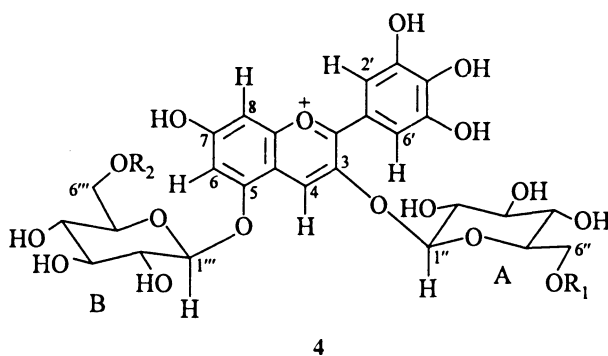
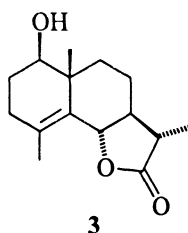
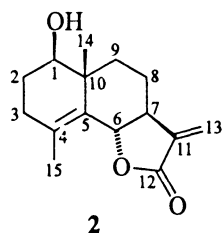
Wight *et al.*⁷ determined reducing sugars, sucrose and inulin content in roots of *C. intybus* L. Bridle *et al.*⁸ identified that major anthocyanin is cyanidin 3-O- β -(6-O-malonyl)-D-glucopyranoside (1) by fast atom bombardment mass spectrometry and NMR spectroscopy in red leaves of *C. intybus* L.

Takeda *et al.*⁹ identified a pigment, delphinidin 3-(6-malonylglucoside)-5-malonylglucoside, in blue flowers of *C. intybus* L. Saleem *et al.*¹⁰ examined the seed oil from *C. intybus* for its physico-chemical values and fatty acid composition by gas chromatography. Grayer *et al.*¹¹ reported an antifungal compound, cichoralexin, in leaves of *C. intybus* L.

Park *et al.*¹² isolated two known eudesmanolides, magnolialide and artesin from the roots of *C. intybus* and their structures were identified as magnolialide [1β -hydroxyeudesma-4,13-dien-6,12-olide (2)] and its 11β -13-dihydro derivative (3) respectively. The known eudesmanolide magnolialide and the known guainolide ixeriside-D reported from *C. intybus*; along with the previously known sesquiterpene lactones, have also been isolated and identified by Kisiel *et al.*¹³

Four anthocyanin pigments were isolated from flowers of *C. intybus* and identified as delphinidin 3,5-di-O-(6-O-malonyl- β -D-glucoside) (1) and delphinidin 3-O-(6-O-malonyl- β -D-glucoside)-5-O- β -D-glucoside (2) and the known compounds were delphinidin 3-O- β -D-glucoside-5-O-(6-O-malonyl- β -D-glucoside) 3. and delphinidin 3,5-di-O- β -D-glucoside. (4) as shown in Fig. 1. in addition, 3-O-*p*-coumaroyl quinic acid has been identified by Norbeck *et al.*¹⁴





	R ₁	R ₂
1	malonyl	malonyl
2	malonyl	H
3	H	malonyl
4	H	H

Pharmacological Screening

Balboa *et al.*⁵ observed quinidine like action on isolated toads's heart in roots of each of eight varieties of *C. intybus* L. Prakash *et al.*¹⁵ observed 84% resorptive activity at a dose of 200 mg/kg body weight in 50% ethanolic extract of *C. intybus* L.

Panday¹⁶ observed bradycardia in normal and hypodynamic heart of frog and a fall in B.P. with a corresponding increase in respiratory rates in dog treated with alcoholic extract of seeds of *C. intybus* L. Handa *et al.*¹⁷ reported cholagogue activity in alcoholic extract of the *C. intybus* L.

A significant decrease in the triglyceride level of liver, plasma and heart coupled with decreased cholesterol level in plasma was observed in rats, fed with high level of saturated fat supplemented with 5% roots of *C. intybus* L. as compared to high fat fed group, by Kaur *et al.*¹⁸. Misra, *et al.*¹⁹ found antimalarial activity against erythrocytic stages of *Plasmodium berghei* only *in vitro* in alcoholic extract of seeds of *C. intybus* L.

Gadgoli *et al.*²⁰ found hepatoprotective activity against carbon tetrachloride and paracetamol induced toxicity in rats, treated each with chloroform, methanol and water extract of seeds of *Cichorium intybus* L.

Zafar *et al.*²¹ reported better antihepatotoxic effect against carbon tetrachloride induced hepatocellular damage in albino rats, treated with root callus extract as compared to the natural root extract of *Cichorium intybus* L.

Antimicrobial Activity

Abou-Jawdah *et al.*²² found antimycotic activity against phytopathogenic fungi in petroleum ether extract of *C. intybus* L.

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(Received: 27 May 2004; Accepted: 6 July 2004)

AJC-3489