

Available online on 15.08.2019 at <http://jddtonline.info>

Journal of Drug Delivery and Therapeutics

Open Access to Pharmaceutical and Medical Research

© 2011-18, publisher and licensee JDDT, This is an Open Access article which permits unrestricted non-commercial use, provided the original work is properly cited



Open Access

Review Article

Health Promoting Properties of Behman safed, a root of *Centaurea behen* Linn.-A Review

Gulnar Fatima¹, Aisha Siddiqui^{2*}, Anwar Jamal³, S.Chaudhary⁴¹M.D. Scholar Department of Ilmul Advia, SUMER, Jamia Hamdard New Delhi-62²Assistant Professor Department of Ilmul Advia, SUMER, Jamia Hamdard New Delhi-62³Research officer (Unani)-SLIII, RRIUM, Bhadrak, Odisha- 756100⁴Assistant Professor Department of Ilmul Saidla, SUMER, Jamia Hamdard New Delhi-62

ABSTRACT

Medicinal plants have been used since prehistoric period for the cure of various diseases. In many developing countries, a large proportion of the population relies on herbal medicine in order to meet health care needs. Although, other health care system exists side by side with modern medicine still, Unani medicine, is one of the alternate system maintained its popularity for historical and cultural reasons.¹ About 8,000 herbal drugs have been codified in Ayush systems.² One of them is *Centaurea behen* Linn., a member of (Asteraceae) family commonly known as safed behmen in Unani medicine.³ It possesses multiple pharmacological actions and medicinal activities such as *muqawwi bah* (aphrodisiac), *kasir riyah* (carminative), *muhallil auraam* (anti-inflammatory), *muqawwi qalb* (cardio tonic), *musakkin* (sedative), *Mudire-haiz* (emmenagogue) etc. It is used preferably to treat various diseases such as *yarqan*, (jaundice), *hasate kulliya* (kidney stone), *hasate masana* (urinary stone) etc⁴. *Centaurea* species have also shown the presence of flavonoids, sesquiterpene lactones, especially guaianolides, germacranolide type sesquiterpene lactones³ and an alkaloid behamine⁴. Hence, this review attempts to compile the information regarding the health promoting properties of *centaurea* roots in light of recent scientific advancement along with its pharmacological actions, therapeutic uses and pharmacological studies.

Keywords: Unani Medicine, Behman safed, *Centaurea behen* Linn. Pharmacological actions.

Article Info: Received 11 June 2019; Review Completed 18 July 2019; Accepted 26 July 2019; Available online 15 August 2019



Cite this article as:

Fatima G, Siddiqui A, Jamal A, Chaudhary S, Health Promoting Properties of Behman safed, a root of *Centaurea behen* Linn.-A Review, Journal of Drug Delivery and Therapeutics. 2019; 9(4-s):657-660
<http://dx.doi.org/10.22270/jddt.v9i4-s.3252>

*Address for Correspondence:

Dr Aisha Siddiqui, Assistant Professor Department of Ilmul Advia, SUMER, Jamia Hamdard New Delhi-62

INTRODUCTION

In developing countries a large number of population depend upon herbal medicine to meet their health needs.¹ Use of allopathic medicine is increased in the present time but the herbal medicine is still a desirable treatment due to its reduced side effects. It is also used by the people due to its effectiveness in chronic conditions and low cost.² As a herbal drugs are exponentially becoming more popular among the masses and consistently inspiring a search for new botanicals. In this regard, behman safed, root of *Centaurea behman* has been used since antiquity in Unani medicine.³ It is documented to possess following pharmacological actions such as *Mughalliz* (Concentrative), *Mufarreh* (Exhilarant),

(Aphrodisiac), *Muqawwi Qalb* (Cardiotonic), *Qabiz* (Astringent) and it is used to treat many disorders like *Nafkh shikam* (flatulence), *Amraze-qalb* (cardiovascular diseases) *Aahatabas haiz* (stimulate menstrual flow), *Yarkan* (jaundice), *Hasate kulliya* (kidney stone), *Iltehab* (inflammation) etc.⁴ Indian writers have identified two varieties of behman i.e behman safed and behman surkh. The paper discusses the health benefitting properties of behman safed mentioned in Unani classical literature and also through a light on its chemical constituents, therapeutic and pharmacological properties in the light of recent scientific advancements.

TAXONOMICAL CLASSIFICATION²¹

Kingdom-	Plantae
Subkingdom-	Tracheobion
Superdivision-	Spermatophyta
Division-	Magnoliophyta
Class-	Magnoliopsida
Subclass-	Asteridae
Order-	Asterales
Family-	Asteraceae
Genus-	Centaurea
Species-	behen
Botanical name-	<i>Centaurea behen</i> Linn

**Figure 1****Figure 2****VERNICULAR NAMES****Arabic name:** Bahman aswad¹¹**English name:** White behen⁹**Hindi name:** Safed behman^{4, 11}, Asgandh vilayti^{11,12}**Latin name:** *Centaurea behen* Linn.^{4, 11}**Urdu name:** Behman safed^{9, 11}, Asgandh vilayti^{11,12}**Persian name:** Sufed Bahman²⁸**DISTRIBUTION^{17, 18}**

It is native to Iran^{17,18} commonly known as Cornflower or Star thistle distributed from Europe and North Africa to India and China and also occurs in Pakistan and Israel^{17,22}. About eleven species are met within India, out of which four have been introduced for ornament, one native species is also cultivated as ornament.²²

DESCRIPTION OF PLANT IN UNANI (MAHIYAT)

Centaurea behen Linn. (*Behman safed*) is an annual hardy^{4, 22} herb and it is considered as a source of the drug *safed*

behman or *bhamana-i-sufed*²², found in the hilly areas of Iran^{4, 22}. It looks like wood due to its toughness in dry form and white in colour⁴. It is characterized with a more or less starch like taste but no distinguished odour⁴. Flowers are usually not present but they may present in spring season. Hakeem Azam Khan, an author of *Moheet-e-Azam* has stated its two varieties *behmen safed* and *behman surkh*. *Behman surkh* is red from outside while *behman safed* is white from both the sides¹². Both the types of *behman* gives fragrance. On chewing, there is an exudate which is astringent in taste. The remarkable quality of *behman* is derived from hilly areas of Iran¹¹.

MORPHOLOGY OF PLANT

Centaurea Linn. is an annual^{4,13,22} or perennial herb²². Leaves are radical and alternate and they are entirely toothed and pinnatifid. The flower heads solitary corymbose or paniced, heterogamous, purple, violet, blue, white or yellow; Outer flowers seriate, neuter; disk flowers female, fertile, tube slender, limb straight or oblique. Involucre ovoid or globose; bracts many seriate, imbricate, appressed, margins scarious or coriaceous. Anther-bases sagittate auricles connate, tails long or short entire or lacerate. Style-arms with a thickened hairy basal ring, erect and connate or shortly spreading. Achenes oblong or obovoid, compressed or obtusely 4-angled, often shining, basal areole oblique or lateral. Stems are erect and glabrous attaining a height of 60-150cm^{14,22}

Macroscopic^{5, 13}

Centaurea behen Linn. is an annual or perennial herb. The drug procured from market, in the form of large (1.5-2.5 inches) hard woody pieces of squarish or irregular cubes. The drug when soaked in water becomes very soft and spongy but in dry form it often gives false impression of wood due to its toughness and white colour. The material is decorticated. Some brownish streaks and fibrous threads are clearly seen on the longitudinal surface. Its tastes resembles more or less with starch. It has no odour.

Microscopic^{5, 13}

Microscopic examination of cross section reveals that the whole mass is made up of thin walled, loosely arranged, considerably large parenchymatous cells. These cells are entirely filled with the rounded starch grains of varying sizes. Scattered in the parenchymatous ground tissue are found numerous collateral closed big vascular bundles. The radially arranged xylem constitutes about two third of each vascular bundle, the rest is occupied by phloem. The orientation of vascular bundle seems to be somewhat at random. Another important feature of the drug is presence of large schizogenous cavities which are lined by some small epithelial cells. The starch grains occurs in abundance but the calcium crystals are only few.

CHEMICAL COMPOSITION

Aerial parts of *Centaurea behen* Linn. afforded several sesquiterpene lactones, the guaianolides cyanraopicrin, augerin B, desacylcynaropicrin, grosshemin and traces of a ketone which is closely related to solstitialin A^{18,25}. The structure of root contains a crystalline alkaloid bahamine, taraxasterol and its acetate, myristate, inulin and a glucoside which on hydrolysis yields *centaurea sterol* A¹³. The essential oil of *Centaurea behen* Linn. contains hexadecanoic acid (32.7%) and phytol (12.3%) (detected as the main component in essential oil), high amount of germacrene D (14.8%) and low amount of spathulenol (0.6%). It shows a little different chemical behavior from the other *Centaurea* species.^{23,24}

MIZAJ (TEMPERAMENT)

The mizaj (temperament) of Behman safed is Hot 2⁰, Dry 2⁰.^{10,11,12,13}

HISSA MUSTAMELA (PART USED): Root^{4, 10,11,12,13}

MIQDARE KHURAK (THERAPEUTIC DOSE): 1-6g⁴

- 3-5g¹³.
- 5-7 g¹⁰

FORM USED: Powdered form^{12,13}

MUZIR ASRAAT (SIDE EFFECTS): Excessive dose of Behman safed is considered harmful as it causes headache and rectal diseases.

MUSLEH (CORRECTIVES): Unnab (*Ziziphus jujube* Gaertn.)⁶ and Katira. (*Cochlospermum religiosum* Linn.).⁹

BADAL (SUBSTITUTES): Musli siyah (*Curculigo orchioides* Gaertn.), Musli safed

(*Chlorophytum arundinaceum* Baker.)⁸ and Asgandh. (*Withania somnifera* Dunn.)⁷

TYPES OF BEHMAN

Two types^{10, 11, 12, 22} of behman are generally mentioned by Unani scholars.

Behman safed: It consists of dried root of *Centaurea behen* Linn. which is white in colour from both sides. It is considered as muqawwi bah (Aphrodisiac), kasir riyah (Carminative), muahllile auraam (Anti-inflammatory), muqawwi qalb (Cardio tonic), musakkin (Sedative), mudir haiz (Emmenagogue) etc.^{4,13}

Behman surkh: It consists of dried root of *Salvia haematodes* Linn. which is red in colour. It is considered as muqawwi bah (aphrodisiac), muqawwi aam (general toniofier) and muqawwi qalb (cardio tonic).^{4, 13}

PHARMACOLOGICAL ACTIONS

- Mughalliz (Concentrative)^{10,11,12,13}
- Mufarreah (Exhilarant)^{12,13}
- Mubahhi (Aphrodisiac)^{4,12,13,15,16,22}
- Muqawwie Qalb (Cardiotonic)^{10,11,12,13,22}
- Qabiz (Astringent)^{11,12}
- Muqawwie-Aam (General toniofier)⁴
- Mufattite-Hissat (Lithotriptic)⁴
- Kasir Riyah (Carminative)²²

THERAPEUTIC USES:

- *Zaufe Diamgh, Qalb wa Jigar* (Weakness of brain, heart and liver)^{13,22}
- *Khafkan* (Palpitation)^{11,12}
- *Warne Kabid* (Hepatitis)²⁰
- *Malenkolia* (Melancholia)²²
- *Zaufe Bah* (Sexual debility)^{4,10,11,13}
- *Yarkan* (Jaundice)²²
- *Hissate Gurda* (Renal stone)^{11,22}
- *Hissate Masana* (Urinary stone)^{11,22}

COMPOUNDS: Laboobe Kabeer^{4, 10}, Laboobe Sagheer⁴, Majoon Chobchini^{4, 10}, Habbe Jadwar^{4, 10}, Khamira Gaozaban Sada^{10, 13}, Dawaul Misk Motadil¹⁰.

PHARMACOLOGICAL STUDIES:

- **Antianxiety activity**¹⁷⁻ The ethanol, chloroform, petroleum ether, and water extractives of *Centaurea behen* and *Elaeocarpus ganitrus* were prepared and evaluated for antianxiety activity in mice using elevated plus maize model. The results compared with standard drug diazepam. The ethanol extractive of *Cenaturea behen* (200mg/kg) and chloroform and ethanol extractives of *Elaeocarpus ganitrus* (200 and 400mg/kg) increased the time spent and percentage of the open arm entries in the elevated plus maize model and hence, exhibited anti-anxiety activity.
- **Hepatoprotective activity**²⁰⁻ This paper reveals the hepatoprotective activity of ethanolic extract of root of *Centaurea behen* Linn. in Wistar rats with liver damage induced by carbon tetrachloride (CCl₄). Administration of *Centaurea behen* Linn. (250mg/kg, 500mg/kg s.c) significantly prevented carbon tetrachloride induced elevation of serum ALT, AST, ALP and bilirubin level. The histological examination of the liver section revealed hepatic regeneration, after administration of various doses of *centaurea behen* Linn.
- **Anti-angiogenic and antimicrobial activity**²⁷⁻ This study was conducted to appraise the in vitro cytotoxic, in vitro and in vivo antimicrobial activity and anti-angiogenic effects of sesquiterpene lactones (SLs) from two plants *Centaurea behen* Linn. and *Rhaponticum repens* Linn. Five SLs, containing aguerin B (3), cebellin E (5), cynaropicrin (1), 4β,15-dehydro-3 dehydro-solstitialin A (2) and a flavone hispidulin (6) were secluded. *C. behen* (compounds 1-3) and *R. repens* (compound 4-6) respectively. It is observed that Cynaropicrin (1) and aguerin B (3) were characterised by a cytotoxic activities against A2780 cells with IC50 values of 1.15 and 1.62 μg mL⁻¹, respectively as compare to doxorubicin (IC50 = 1.17 μg mL⁻¹). The anti-angiogenic study revealed the notable inhibitory effect of cynaropicrin (1) and aguerin B (3) on the migration and proliferation of HUVECs. In addition, aguerin B and cynaropyssscrin presented significant angioinhibitory effects in CAM assay. The above findings may be valuable for the development of innovative chemotherapeutic agents for the treatment of cancer.

CONCLUSION

In the present scenario as the lifestyle diseases becoming the global concern, a health benefitting properties of behman safed can help to improve community health at a very economical basis. It is used by Unani physicians since antiquity, in various diseases. The extensive review on its pharmacological and therapeutic effects is not reported yet. Understanding its multi-utility health benefits, based on the detailed literature survey available in Unani classical text and the scientific reports documented on its chemical constituents holds the key to realize its commercial potential as a source of a new generation of botanicals.

REFERENCES

- 1-Some Traditional Herbal Medicines, Some Mycotoxins, Naphthalene and Styrene: International Agency for Research on Cancer: 2002.

- 2-Introduction and Importance of Medicinal Plants and Herbs: National Health Portal of India: Gateway of authentic health information.2018.
- 3-Seed germination and seedling growth of wheat (*Triticum aestivum*) as influenced by safed behman (*Centaurea behen*) water extract.Biharean Biologist 11 (2):98-101.
- 4- Anonymous. Standardization of single drugs of Unani medicine, part V. CCRUM, Ministry of Health and Family Welfare, Govt. of India, New Delhi; 2006: 39-42.
- 5-Anonymous. Standardization of single drugs of Unani medicine, part V. CCRUM, Ministry of Health and Family Welfare, Govt. of India, New Delhi; 2006:39-45.
- 6- Anonymous. Standardization of single drugs of Unani medicine, part V. CCRUM, Ministry of Health and Family Welfare, Govt. of India, New Delhi; 2006: 47-52.
- 7- Anonymous. Standardization of single drugs of Unani medicine, part III. CCRUM, Ministry of Health and Family Welfare, Govt. of India, New Delhi; 1997: 9-14.
- 8- Anonymous. Standardization of single drugs of Unani medicine, part II. CCRUM, Ministry of Health and Family Welfare, Govt. of India, New Delhi; 1992: 226-239.
- 9-Anonymous. The Unani Pharmacopoeia of India, part I Vol VI. Government of India, Ministry of Health and Family Welfare Department of AYUSH, New Delhi; 2009:38-39.
- 10-Kabiruddin, M. H, *Makhzanul Mufradat Al Maroof Khawasul Advia*. Deoband: Faisal Publication, 2000; 141.
- 11- Ibn Baitar.-*Al jamai ul Mufaridat ul Advia wa Aghziya* part I, CCRUM, Ministry of Health and Family welfare, Govt of India, New Delhi: 304-305.
- 12-Azam.H.M. *Moheete Azam* Part I, CCRUM, Ministry Of Health and Family Welfare, Govt of India, New Delhi; 2012: 831-832.
- 13- Anonymous. The Unani Pharmacopoeia of India, part I Vol III. Government of India, Ministry of Health and Family Welfare Department of AYUSH, New Delhi; 2009:21-22.
- 14-Kirtikar K, and Basu B.*Indian Medicinal Plants, Vol.II*. Dehradun; 1988; 1427-1428.
- 15- Chopra .R.N, Nayar S.L, Chopra I.C.Glossary of Indian Medicinal Plants, Council Of Scientific and Industrial Research, New Delhi: 1956; 57-58.
- 16- Nadkarni K, The Indian Materia Medica vol.1.Bombay: A.K Nadkarni Publishers 1989; 299
- 17-Balbir Sing *et.al* Antianxiety Investigations of *Centaurea behen* Linn. and *Elaeocarpus ganitrus* Roxb.Journal of Pharmacy Research 2012, 5(3),1483-1486.
- 18-Rustaiyan. A et al. A Guaianolide from *Centaurea behen* Linn.Phytochemistry, vol.20, No.10, 2427-2429, 1981.
- 19-Naseer Mursaleen et.al.Cardioprotective Drugs with especial reference to Kitab Al- Adwiyah Al- Qalbiyah: A review. World Journal of Pharmacy and Pharmaceutical sciences Vol 5(9), 2453-2462.
- 20-Pushplata C et.al. Protective effect of ethanol extract of *Centaurea behen* Linn. in Carbon tetra chloride- Induced Hepatitits in rats, International Journal of Pharmacy and Parmaceutical Sciences vol 6 (8), 2014.
- 21- GBIF-<https://www.gbif.org/species/3128193/metrics>.
- 22- Anonymous The Wealth of India 1992 Publications and information directorate council of scientific and industrial research, New Delhi. Raw materials vol III -424-425.
- 23- Erdogan1T et.al, Essential Oil Composition of Three *Centaurea* Species from Turkey: *Centaurea aggregata* Fisch. & Mey. ex. DC. subsp. *aggregata*, *C. balsamita* Lam. and *C. behen* L. ACG publications 2008 Rec. Nat. Prod. 11:1 (2017) 69-73.
- 24- Esmaeili1 A et.al. Volatile compounds of essential oil *Centaurea behen* L. grown in Iran Spring 2012 Vol.3, No.2.
- 25- Mosaddegh M et.al.CONSTITUENTS OF THE AERIAL PARTS OF *Centaurea behen*. Chemistry of Natural Compounds, Vol. 54, No. 5, September, 2018.
- 26- M Razzaghi-Abyaneh *et.al*; Antifungal plants of Iran: An insight into ecology, chemistry, and Molecular biology. July 2013.
- 27- Shakeri A H et.al; Screening of several biological activities induced by different sesquiterpene lactones isolated from *Centaurea behen* L. and *Rhaponticum repens* (L.) June 2018
- 28-A history of the principal drugs of vegetable origin- Pharmacographia Indica, Srishti book distributors Vol II,- 303,304,305,306.