



Kundur (*Boswellia serrata* Roxb)- A boon of nature in the world of Unani system of medicine

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ABSTRACT

Boswellia serrata Roxb is commonly known as Kundur in the Unani system of Medicine. Kundur is stem exudation, botanically known as *Boswellia serrata* Roxb. One of the main constituents of *Boswellia serrata* Roxb is Boswellic acid. It is also known as “Indian Frankincense” in English and “Shallaki” in Ayurveda. Oleo gum resin is used in medicine, perfume, air fresheners and for incense. It is used as a thickener in paints and varnishes. Its timber is used as cheap furniture, mica boxes, packing cases, match box, plywood and veneers. The gum is popularly used in the Indian system of medicine for the last several centuries in curing various ailments. Pharmacological activities of kundur includes Qabiz (astringent), Mujaffife wa mundammile quruh (siccative to the ulcer), Dafe taffun (antiseptic), Habisuddam (haemostatic), Mundammile qarha chashm (cicatrizant to corneal ulcer), Muqawwie zehan wa hifz (memory tonic), Mujaffife balgham (siccative to the secretion of phlegm), Mujaffife rutubate dimagh (siccative to the secretion of brain), Mumbite laham (healing action), Kasire riyah (carminative) etc. This review paper highlights a summary of the phytochemistry and pharmacological effects of this plant.

Keywords— Kundur, *Boswellia serrata* Roxb, Unani herbal medicine, Pharmacological activities

1. INTRODUCTION

Kundur is stem exudation, botanically known as *Boswellia serrata* Roxb. It is an oleo-gum resin of *Boswellia serrata*, belonging to the Burseraceae family and consists of 17 genera and 600 species⁽¹⁾. The gum is popularly used in the Indian system of medicine for the last several centuries in curing various ailments especially rheumatism and skin diseases.⁽²⁾ The word Olibanum (Indian frankincense tree) is derived from the Arabic word *al-luban* which means the milk. It has also been postulated that the name olibanum comes from the Arabic term for “Oil of Lebanon” since Lebanon was the place where the resin was sold and traded with Europeans. The English word is derived from old French “francencens” (i.e. high-quality incense) and is used in incense and perfumes.⁽¹⁾

Botanical name: *Boswellia serrata* Roxb⁽³⁻⁶⁾

Family: Burseraceae⁽³⁻⁶⁾

Synonyms: Indian frankincense, *Boswellia glabra* Roxb⁽⁴⁾

1.1 Scientific Classification:⁽⁷⁾

Kingdom	:	Plantae
Division	:	Tracheophyta
Class	:	Magnoliopsida
Order	:	Sapindales
Family	:	Burseraceae
Genus	:	<i>Boswellia</i>
Species	:	<i>Boswellia serrata</i>
Binomial name	:	<i>Boswellia serrata</i> Roxb

1.2 Habitat and Distribution

Boswellia serrata Roxb is commonly known as Kundur in the Unani system of Medicine. The tree is commonly found in the drier parts of peninsular India and in other parts of the world like West Asia, Oman, Yemen, South Africa and Southern Arabia^(2,6)

1.3 Vernacular Names:^(3-6, 8, 9)

Arabic	:	Kundur, Luban, Bastaj
Bengali	:	Kundur, Luban, Salai
English	:	Indian Frankincense, Indian Olibanum Tree
Hindi	:	Kundur, Luban, Salai, Salga, Salhe, Sali
Malayalam	:	Hladini, Kunturukkam, Mukundum

Marathi	:	Salaphali
Sanskrit	:	Shallaki, Ashvamutri, Asraphala, Gajapriya, Gajashana
Tamil	:	Kundur, Kungulu, Kundurukan
Telugu	:	Prangisambrani, Anduga, Dupamu, Guggilamu
Urdu	:	Kundur, Lubana
Unani	:	Kundur



Fig. 1: Kundur (Boswellia serrata Roxb)

1.4 Botanical Description

Boswellia serrata Roxb is a medium to large sized, deciduous tree, up to 18m in height and 2.4m in the girth; the bark of this plant is thin, greenish grey, yellow or reddish and finally turning to ash colour, peeling off in smooth, exfoliating papery flakes; blaze pinkish and exuding small drops of resin^(1,4,9). Leaves alternate, imparipinnate, 30-45cm long, ex-stipulate and crowded at the end of the branches. The leaflets are 2.5-6.3 cm long and 1.2-3.0 cm width, ovate or ovate-lanceolate, 8-15 in number, nearly sessile with short toothed, mostly pubescent. The flowers are bisexual, small, white in axillary racemes or panicles at the tip of the branches. The calyx is a small cupular and 5-6 lobed. The petals are 0.5-0.8 cm oblong-ovate with the basal disk. The fruits are cotyledons, trifid, 1.25 cm long, trigonous, splitting into three valves. Seeds are heart-shaped and attached to the inner angle of the fruit, compressed, pendulous^(4,9). Two varieties of kundur are usually distinguished; var. *Serrata* with pubescent leaves and var. *glabra* with entire, glabrous leaves. (Fig.1)⁽³⁾.

1.5 Mahiyat (Unani Morphology)

Kundur is a resinous product of a thorny tree, 2-3 meters in height; leaves are smaller than those of *Batam* leaf. The leaves and seeds resemble that of *Aas*. It is widely cultivated in India, Oman and Yamen. The Indian variety is golden brown, and semisolid initially, later solidifies. It is bitter in taste.⁽¹⁰⁾ Shaik ur Rayees stated that the fresh Indian *Kundur* is green in colour and becomes red or sometimes white as it matures. It is made round by art industry; for cutting it into cubes and throwing them into jars of clay they roll them up and down until they take a round form. *Kundur* is adulterated with the resin of pine (*sanober*) and gum (*Babool*), being artificially handled. Distinguishing is easy, the gum, when put into a fire, does not flame out, and the resin evaporates into smoke, but the *Kundur* is kindled and by its scent proves itself. (Fig.2)⁽¹¹⁾



Fig. 2: Kundur (Boswellia serrata Roxb) Resin

1.6 Mizaj (Temperament)

Haar (Hot)²⁰ and Yabis (Dry)^{10 (12-14)}

Haar (Hot)²⁰ and Yabis (Dry)^{20 (10, 15)}

Haar (Hot)³⁰ and Yabis (Dry)^{10 (8,16)}

1.7 Hasase Mustamela (Parts used)

Gum, Bark.^(11, 12)

1.8 Afa'al (functions according to the Unani system of medicine)

- Qabiz (astringent)^(8, 11, 13, 15)
- Mujjaffife wa mundammile quruh (siccative to the ulcer)^(10, 12, 15,16)
- Dafe taffun (antiseptic) (17)
- Habisuddam (haemostatic)⁽¹⁰⁻¹²⁾

- Mundammile qarha chashm (cicatrizant to a corneal ulcer) ^(11,12, 16)
- Muqawwie zehan wa hifz (memory tonic) ^(8, 10, 12, 16)
- Mujaffife balgham (siccative to the secretion of phlegm) ^(8,10, 13)
- Mujaffife rutubate dimagh (siccative to the secretion of the brain) ⁽¹⁰⁾
- Mumbite laham (healing action) ^(13, 16)
- Kasire riyah (carminative) ⁽¹⁰⁾
- Jali (detergent) ⁽¹⁸⁾
- Muqawwie meda (stomachic) ^(8, 11,12)
- Muqawwie baah (aphrodisiac) ⁽¹⁵⁾
- Triyaq samoom (antidote) ^(8, 14)
- Munaffis e balgham (expectorant) ⁽¹⁷⁾

1.9 Istemaal (Therapeutic uses according to the Unani system of medicine)

- Sayalan ur Rahim muzmin (chronic leucorrhoea) ⁽⁸⁾
- Sayalane rutubat (leucorrhoea) ⁽¹⁰⁾
- Quruhe Meda wa Ama (stomach and intestinal ulcer) ^(12, 13)
- Quruhe Chashm (corneal ulcer) ^(11, 12)
- Quruhe miqaad (a fissure in ano) ⁽¹²⁾
- Qai (vomiting) ⁽¹²⁾
- Amraze jild (skin diseases) ⁽¹⁰⁾
- Atishak (syphilis) ⁽¹⁰⁾
- Dimaghi Amraaz (brain disorders) ⁽¹⁰⁾
- Suaal (a cough) ⁽⁸⁾
- Ziabetes shakri (diabetes mellitus) ⁽¹⁵⁾
- Ishaal Kohna (diarrhoea) ⁽¹¹⁾
- Nafe Kasrate Bowl (polyuria) ^(11, 16)
- Nafe Sozak (gonorrhoea) ⁽¹⁰⁾
- Nakseer (epistaxis) ⁽¹⁰⁾
- Nafsuddam (haematemesis) ^(8, 11, 12, 13)
- Nazfuddam (haemoptysis) ⁽¹³⁾
- Nisyan (insomnia) ⁽¹⁸⁾
- Zofe Baah (loss of libido) ⁽¹⁰⁾

1.10 Afa'al (Functions according to conventional medicine) ^(1, 4,6, 9)

- Analgesic
- Anti-allergic
- Anti-arthritis
- Stimulant
- Anti-inflammatory
- Hepatonic
- Diuretic
- Demulcent
- Astringent
- Diaphoretic
- Expectorant
- Anti-fungal
- Anti-pyretic
- Anti-dysenteric
- CNS depressant
- Sedative

1.11 Istemaal (Uses according to conventional medicine) ^(4,6,9)

- Obesity
- Diarrhoea
- Dysentery
- Piles
- Osteoarthritis
- Rheumatoid arthritis
- Asthma
- Bronchitis
- Mouth sores
- Vaginal discharges
- Syphilis

- Jaundice
- Stomatitis
- Convulsions

1.12 Muzir (Harmful effects) ^(10, 16,18)

- Darde sar (a headache)
- Junoon(insanity)
- Juzam (leprosy)
- Muharriqe Dam (haemodynamic agents)

1.13 Musleh (Correctives) ^(10, 16, 19)

- Unnab
- Shikanjabeen

1.14 Badal (Substitutes) ^(10, 16, 18, 19)

- Behman
- Mastagi

1.1.5 Miqdare Khurak (Dose) ^(10, 16, 19)

- 3-4 gms

1.16 Murakkabaat (Compound formulations) ⁽²⁰⁾

- *Majoon Kundur*
- *Majoon Murawwah-ul-Arwah*
- *Dawa-ul-kibrit*
- *Habbe Sozak*

1.17 Chemical Composition

The chemistry of *Kundur* (oleo gum resin) is now thoroughly worked out. A sample of *Kundur* analysed by Imperial Institute London showed the following composition:

Moisture-10-11%, volatile oil 8-9%, resins 55-57%, Gum 20-23%, Insoluble matter 4-5%. The constituents are fixed oil, Terpenoids (three triterpene acids α , β and γ boswellic acids using barium hydroxide as precipitant) and Gum. ⁽²⁾

2. PHARMACOLOGICAL STUDIES

- (a) **Anti-inflammatory and Anti-arthritis activity:** The in vivo effect of a herbal based, non-steroidal anti-inflammatory product *kundur*, prepared from the gum resin exudates of *Boswellia serrata* active principle "boswellic acids" on glycosaminoglycan metabolism has been studied in male albino rats. The biosynthesis of sulphated glycosaminoglycan was evaluated by the uptake of sulphate, and the content of glycosaminoglycan was measured in specimens of skin, liver, kidney and spleen. The degradation of glycosaminoglycan was found to be reduced markedly in all drug treated animals as compared to control (ketoprofen). ⁽²⁾
- (b) **Antidepressant Activity:** The drug *Boswellia serrata* in a dose of 100mg /kg in swiss albino mice rat significantly reduced immobility period in FST (Forced Swim Test) compared to the control group. Hence *Boswellia serrata* has significant antidepressant activity in the experimental animal model. ⁽²¹⁾
- (c) **Hepatoprotective Activity:** The aqueous bark extract 250mg /kg, aqueous leaves extract 500mg /kg and aqueous gum extract 250mg /kg of *Boswellia serrata* showed marked reduction in the elevated levels of ALT, AST, ALP, and bilirubin and increased membrane bound enzymes and total proteins in paracetamol induced liver injury. ⁽²²⁾
- (d) **Nephroprotective Activity:** A study revealed significant nephroprotective activity against Gentamicin induced nephrotoxicity in the experimental model. ⁽²⁰⁾
- (e) **Antimicrobial Activity:** A study conducted to evaluate the antimicrobial activity of *Curcuma longa* and *Boswellia serrata* revealed that methanolic extract of the two drugs has a potent antimicrobial activity. ⁽²³⁾

3. REFERENCES

- [1] Sultana A, Rahman K, Padmaja AR, *Boswellia serrata* Roxb. A traditional herb with versatile pharmacological activity: A review. *IJPSR* 2013;4(6):2106-2117.
- [2] Alam M, Khan H, Samiullah L, Siddique KM. A review on phytochemical and pharmacological studies of *Kundur* (*Boswellia serrata* Roxb ex Colebr.)- An Unani drug. *Journal of Applied Pharmaceutical Science*. 2012 Mar;2(3):148-56.
- [3] Chopra R N, Nayar S L, Chopra I C. *Glossary of Indian Medicinal Plants*. NISCAIR, Delhi: CSIR; 2009: 39.
- [4] Prajapati ND, Purohit SS, Sharma AK, Kumar T. *A Hand Book of Medicinal Plants*. 1st ed. Jodhpur: Agrobios; 2009: 96
- [5] Nadkarni KM, *Indian Materia Medica*, Vol. 1st. Bombay, Popular Prakashan Private Limited; 2009: 212.
- [6] Khare CP. *Indian Medicinal plants-An Illustrated Dictionary*. Delhi: Rajkamal Electric press; 2007: 98.
- [7] Scientific classification of plant *Boswellia serrata* Roxb. ex Colebr. <http://www.itis.gov/servlet/SingleRpt/SingleRpt?searchvalue=506410>(accessed on 02 Jan 2019).
- [8] Ibn Baitar. *Al Jamiul Mufradatul Advia wal Aghzia* (Urdu translation). Vol. 4th. New Delhi: CCRUM; 2003: 201-206.

- [9] Kirtikar KR, Basu BD. Indian Medicinal Plants. Vol I. International Book Distributors. Dehradun; 1956: 520-523.
- [10] Ghani N. Khazainul Advia. New Delhi: Idara Kitabus Shifa; YNM: 1069-1070.
- [11] IbnSina. Al Qanoon Fil Tib (Urdu trans. by Kantoori GH). Vol. II. New Delhi: Idarae KitabulShifa; 2007: 360-361.
- [12] Ibn Hubal. Kitabul Mukhtarat Fil Tibb. Vol. II. New Delhi: CCRUM; 2005: 168-169.
- [13] Ibn Rushd. Kitabul Kulliyat. 2nd ed. New Delhi: CCRUM; 1987: 292.
- [14] Rahman HSZ. Kitabul Ain al Hayat. International Printing press, Aligarh: Ibn Sina Academy; 2007: 39, 43,179.
- [15] Haleem HMA. Mufradat –e- Azeezi. New Delhi: CCRUM; 2009: 75.
- [16] Ibrahim AS. Kitab al fath fi al-Tadawi (Urdu translation), 1st ed: Nov. 2007,126-27
- [17] Kabiruddin H. Makhzanul Mufradat. New Delhi: Idara Kitabus Shifa; 2007: 333,462.
- [18] Hakeem MA, Bustan Al Mufradat. New Delhi: Idara Kitabus Shifa; 2002: 455-457
- [19] Nabi.MG. Makhzanul Mufradat Wa Murakkabat Khwas Advia. New Delhi: CCRUM; 2007: 190.
- [20] Alam M, Javed K, Jafri MA. Effect of oleo-gum-resin of *Boswellia serrata* (Kundur) on renal functions in Albino rats. Indian Journal of Traditional Knowledge. October 2011;10(4):736-740.
- [21] Adake P, Chandrashekar R, Rao SN. Evaluation of the antidepressant activity of *Boswellia Serrata* in swiss albino mice by forced swim test. International journal of universal Pharmacy and Biosciences. June 2013; 2(3):417-424.
- [22] Ibrahim M, Zeeyauddin K, Narasu ML. Hepatoprotective activity of *Boswellia serrata* extracts: in vitro and in vivo studies. International Journal of Pharmaceutical Applications. 2011;2(1):89-98.
- [23] Rajendra CE, Kumar DH, Yeshoda SV, Nadaf MA, Hanumanthraju N. Comparative evaluation of antimicrobial activity of methanolic extract of *curcuma longa* along with *Boswellia serrata*. IJRPC 2013;3(3);534-536.