



E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2021; 10(5): 34-37
Received: 16-07-2021
Accepted: 18-08-2021

MHM Hafeel

Senior Lecturer, Institute of
Indigenous Medicine, University
of Colombo, Sri Lanka

Abdul Azeez Rizwana

Lecturer, Institute of Indigenous
Medicine, University of Colombo,
Sri Lanka

Medicinal uses of *Boswellia serrata* Roxb (*Kundur*) with special reference to its ulcer healing property

MHM Hafeel and Abdul Azeez Rizwana

DOI: <https://doi.org/10.22271/phyto.2021.v10.i5a.14205>

Abstract

Boswellia serrata is known as *Kundur* in Unani Medicine and the plant is found in Arabia, South Africa and west Asia. The white to yellow colored aromatic oleo resin gum is obtained from the stem bark of this plant and the main constituents of *Boswellia serrata* Roxb is Boswellic acid. This article was aimed to investigate and compile the pharmacological profile mentioned in Classical text of Unani medicine with special attention to its ulcer healing action and to scientifically recognize those pharmacological actions through the already published scientific studies. Pharmacological activities of *kundur* mentioned in Unani medicine are astringent, desiccative to the ulcer, antiseptic, haemostatic, cicatrizant, memory tonic, siccative to the secretion of phlegm, carminative, tissue formation and ulcer healing action. The active constituents of *Boswellia serrata* had proved effective in many experimental and clinical studies for various disease conditions.

Keywords: *Boswellia serrata* Roxb., *Kundur*; unani medicine, ulcer healing, medicinal uses

Introduction

Boswellia serrata (*Kundur*) is a medium to a large tree which grows up to 18 meters in height and 2.4 meters in girth. This is generally found in India, Yemen, Oman and Saudi Arabia. The suitable environment for the tree is dry, hot and rocky hill. Leaves are imparipinnate, 30-45 cm long; leaflets 2.6- 6.3 cm to 1.2-3.0 cm, ovate or ovate-lanceolate. Flowering occurs during January to April when the tree is almost leafless. The tree, on the injury, exudes an oleo gum resin. Oleo gum resin is secreted from cortex is transparent, fragrant, golden yellow and solidifies^[1, 2].

To obtain the oleo-gum-resin of *Kundur*, trees are tapped by shaving off a thin band of bark about 20 cm wide and 30 cm long or high, at the height of 15 cm from the base of the tree. Oleo gum resin burns with a clear flame and diffuses an agreeable odor. The therapeutic uses indicated in Unani system of medicine mainly for the treatment of inflammatory conditions (*waram*), cancerous diseases (*sartan*), non-healing ulcer (*quruhe khabisa*), skin disease (*amaze jild*) and blood disease (*amraze dam*)^[3, 4, 5]. Crude extracts of *Kundur* are used by traditional medicine practitioners and the identity of the constituents is not well recognized due to the availability of numerous grades of this drug^[6].

This review was carried out to study the active principles and to review the pharmacological activities with special reference to ulcer healing property of *Kundur* through previous study findings and published literatures.

Materials and Methods

Data were collected from various Unani texts namely; Al Qanoon fit tibb, Bustan ul Mufradat, Muheet-e-Azam, Kitab ul Mukhtarat fil tibb, Kitab al Kulliyat, Khazain ul Advia, Aljami Li Mufradat al Advia Wal Aghzia, Kitabal Mukhtarat Fil Tibb and Makhzanul Mufradat etc.

Indexed Journals were searched in various scientific databases like Scopus, Pubmed, Elsevier, Google scholar, Medline, Research scholar, Research Gate, Science direct, orchid etc. using terms like Medicinal uses of *Boswellia serrata*, Medicinal uses of *Kundur* and Ulcer healing property of *Boswellia serrata* and Ulcer healing property of *Kundur*. After a rigorous literature review, the collected data were organized in a logical sequence.

Results and Discussion**Taxonomical Classification**^[5, 6]

Kingdom: Plantae

Order: Sapindales

Corresponding Author:**MHM Hafeel**

Senior Lecturer, Institute of
Indigenous Medicine, University
of Colombo, Sri Lanka

Family: Burseraceae

Genus: Boswellia

Species: serrata

Vernacular Names ^[5, 6]

Arabic Luban

English - Indian frankincense tree / Indian olibanum tree

Hindi- Salai

Tamil - Parangisambrani

Persian -Kundur

Urdu - kundur

Sanskrit – Ashwamithra / Shallaki

Kannada- Chilakdhupa / Tallaki

Chemical Composition ^[5]

Chemical compositions found in oleo gum resin of *Kundur* are: Moisture-10-11%, volatile oil 8-9%, resins 55-57%, Gum 20-23%, Insoluble matter 4-5%. The constituents are fixed oil, Terpenoids and Gum, Boswellic acid.



Fig 1: Oleo gum resin of *Boswellia serrata*

Unani Medicinal description

Parts used (*Hasase Mustamela*): Gum, Bark ^[7, 8, 9, 10]

Temperament (Mizaj): Hot in 2^o and dry in 1^o ^[11]

Hot in 2^o and dry in 2^o ^[12, 13]

Hot in 3^o and dry in 2^o ^[14]

Pharmacological action (*Afa' al*)

Astringent (*Qabiz*) ^[7, 14]

Detergent (*Jali*) ^[10]

Siccative to the ulcer (*Mujjaffife wa mundammile quruh*) ^[7, 12, 15, 16]

Haemostatic (*Habisudam*) ^[7, 8, 12]

Tissue growth promoter (*Munbite Laham*) ^[11, 15]

Cicatrizant to a corneal ulcer (*Mundammile qarha chashm*) ^[7, 12]

Memory tonic (*Muqawwie zehan wa hifz*) ^[12, 14]

Siccative to the secretion of phlegm (*Mujjaffife balgham*) ^[11, 12, 14]

Siccative to the secretion of the brain (*Mujjaffife rutubate dimagh*) ^[12]

Carminative (*Kasire riyah*) ^[12]

Stomachic (*Muqawwie meda*) ^[7, 8, 10]

Antidote (*Triyaq samoom*) ^[14, 18]

Expectorant (*Munaffis e balgham*) ^[17]

Antiseptic (*DafeTauffun*) ^[17]

Therapeutic uses (*Mawaqe Istemal*)

Diarrhoea (*Ishaal*) ^[7]

Stomach and intestinal ulcer (*Quruhe meda wa ama'a*) ^[11, 15]

Insomnia (*Nisyan*) ^[10]

Vomiting (*Qai*) ^[11]

Epistaxis (*Nakseer*) ^[11, 12]

Syphilis (*Atishak*) ^[12]

Gonorrhoea (*Nafe Sozak*) ^[12]

Loss of libido (*Zofe Baah*) ^[12]

Brain disorders (*Dimaghi Amraz*) ^[12]

Skin diseases (*Amraze jild*) ^[12]

Stomach and intestinal ulcer (*Quruhe Meda wa Ama'a*) ^[11, 15]

Corneal ulcer (*Quruhe Chashm*) ^[7, 15]

Cough (*Suaal*) ^[14]

Harmful effects (*Muzir*) ^[10, 12]

Headache (*Darde sar*)

Haemodynamic agents (*Muharraq Dam*)

Correctives (*Musleh*) ^[12, 13]

Unnab

Shikanjabeen

Substitutes (*Badal*) ^[10, 12, 13]

Behman

Mastagi

Dose (*Miqdare Khurak*) ^[10, 12, 13]

3-4 gms

Compound formulations (*Murakkabaat*) ^[5, 19]

Majoon Kundur

Dawa-ul-kibrit

Habbe Sozak

Majoon Nisyan

Majoon Masikul Baul

Jawarish-e-Kundur

Action Mentioned in Ethnomedicine

Analgesic, anti-allergic, anti-alzheimer an, anti-arthritic, anti-asthmatic, anti-cancer, anti-complementary, anti-edemic, anti-inflammatory, antileukemic, antileukotriene, antipyretic, ^[20, 21, 22] hepatotonic, hypoglycemic, sedative, stomachic, tonic, anti-rheumatic, astringent, carminative, CNS depressant, collyrium, demulcent, ^[22] diuretic, antidysenteric, expectorant ^[22, 23] antiseptic ^[23]

Indications and Uses Mentioned in Ethnomedicine

Bark is used in diarrhea, piles and skin diseases; Bark mixed with butter applied as a poultice on bleeding and suppurating wounds ^[23]

Oleo-gum-resin is beneficial in urinary disorders, goiter, gout, piles, rheumatism, cutaneous and nervous diseases ^[24]

Gum-resin oil is used in gonorrhoea, and gum-resin is used with butter for syphilis ^[25]

Powdered flowers are used in colds and fever. ^[25]

Scientific studies

Antimicrobial Activity

A study conducted by Rajendra CE *et al.*, to evaluate the antimicrobial activity of *Boswellia serrata* revealed that methanolic extract of the drug had a potent antimicrobial activity ^[26].

Ismail *et al.*, reported that the resin extract of *Boswellia serrata* powder confirmed antimicrobial activity in different concentration against gram negative and gram-positive microbes. They observed the inhibition zone and compared with ciprofloxacin ^[27].

Ulcer healing property

A recent single blind compression clinical trial conducted in a Hospital setting of OPD/IPD revealed that using a poly herbal formula in which *Boswellia serrata* was one of the main ingredients and the trial concluded that the formulation was significantly effective in healing peptic ulcer^[28]

Shah Alam *et al.*, had tested with an Unani formulation with non-healing ulcers in which *Boswellia serrata* was a chief ingredient, and it was proved that the Unani formulation with *Boswellia serrata* was efficacious in curing non-healing ulcers in terms of decreasing the healing time and reducing the patient's discomfort^[29].

Zeeyauddin K *et al.*, described that petroleum ether and aqueous extracts of the bark of *Boswellia serrata* revealed significant antiulcer activity in aspirin induced Albino rats' model at the dose of 250 mg/kg body weight^[30]

Gupta I *et al.*, conducted a follow-up study in chronic colitis patients taking gum resin of *Boswellia* (900 mg daily in three divided doses for six weeks) and sulfasalazine (3 g daily in three divided doses for six weeks) had shown improvements. Furthermore, 14 out of 20 patients (70%) treated with *Boswellia serrata* gum resin went into remission compared to 4 out of 10 patients (40%) treated with sulfasalazine^[31].

Gupta I *et al.*, in another trail compared *Boswellia* extract (350 mg three times daily) to sulfasalazine (1 g three times daily) in ulcerative colitis patients. Patients on the *Boswellia serrata* extract showed better improvements than patients on sulfasalazine; 82 percent of *Boswellia* extract treated patients went into remission compared with 75 percent on sulfasalazine^[32].

Zhang P *et al.*, evaluate the wound healing activity of standardized extract of *Boswellia serrata* against the experimental model of diabetic foot ulcer. Zhang *et al.*, concluded that treatment with *B. serrata* (200 and 400 mg/kg) significantly increased the rate of wound contraction via modulation of oxido-nitrosative stress and elevated the hydroxyproline level at the wound area^[33].

Surjeet Singh *et al.*, evaluated the activity of boswellic acids derived from *Boswellia serrata* on animal models and study results discovered that boswellic acids possess a dose dependent antiulcer effect against different experimental models. It also showed different degree of inhibition of the ulcer score towards different ulcerogenic agent^[34].

Anti-inflammatory Activity

An animal study conducted by Siddiqui MZ *et al.*, observed that the mixture of boswellic acids of *Boswellia serrata* inhibited 25-46% paw oedema in rats, demonstrating the anti-inflammatory property of boswellic acids of *Boswellia serrata*^[35].

Conclusion

This review enlightens that *Boswellia serrata* is useful in ailments such as ulcer, diarrhea, cough, arthritis, inflammation, skin diseases, chronic bronchitis, depression, hematemesis, and other bleeding conditions. In aforementioned disorders *Boswellia serrata* (*Kundur*) had been pharmacologically and clinically proven as it has anti-ulcer, anti-diarrhoeal, anti-inflammatory, antimicrobial properties and useful in inflammatory bowel diseases. These activities are attributed to its phyto-chemical constituents such as boswellic acid, tannin, phenol, β -sitosterol, etc. Thus, this comprehensive review significantly acclaims that the traditional herb, *Boswellia serrata* (*Kundur*) has versatile pharmacological properties, especially its ulcer healing

property as claimed in classical manuscripts of Unani Medicine.

Acknowledgment

Authors acknowledge the scholars whose articles are cited and included in references of this manuscript. The authors are also grateful to authors/editors/publishers of all those articles, journals and books from where the literature for this manuscript has been reviewed and discussed.

References

1. Upaganlawar A. Pharmacological activities of *Boswellia serrata* Roxb. - Mini review. *Ethnobotanical Leaflets* 2009;13:766-774.
2. Shamim Ahmed, Md. Anzar Alam, Mohd. Shahabuddin, Md. Imran Khan, Hamid Ali. Versatile Pharmacological Action and Compound Formulation of *Kundur* in Unani Medicine: A Review. *International Journal of Pharmacognosy* 2014;1(10):627-31.
3. Sultana A. *Boswellia serrata* roxb. A traditional herb with versatile pharmacological activity: a review. *IJPSR* 2013;4(6):2106-2117.
4. Azam Khan. Muheet-e-Azam. Vol. 4, Part-2, Darmataba Nizami, Kanpur (1314 H.) 129-132.
5. Mahe Alam, Hakimuddin Khan, Samiullah L, Siddique KM. A review on Phytochemical and Pharmacological studies of *Kundur* (*Boswellia serrata* Roxb ex Colebr.) - A Unani drug. *Journal of Applied Pharmaceutical Science* 2012;02(03):148-156.
6. Handa SS, Kaul MK. Supplement to cultivation and utilization of medicinal plant. Regional Research Laboratory Council of Scientific and Industrial Research Jammu-Tawi 1996, 525-536.
7. Ibne S. Al Qanoon Fit Tibb (Urdu Translation by Shah HM) Deoband: Faisal Publication 2002, 473-474.
8. Hubal I. *Kitab ul Mukhtarat fil Tibb*. 1st ed. New Delhi: CRUM: Ministry of H& FW, Govt. of India 2004;1(2&3):121-122,126,129,168-169,178,187,268,235.
9. Ibrahim ASB. *Kitab al Ftah Fi al Tadawi*. 1st ed. New Delhi: CCRUM 2007, 98-99, 102-103,126-127,208.
10. Hakeem MH. *Bustan ul Mufradat*. New Delhi: Idara Kitabus Shifa 2002,60,122-123,450-451,455,482-483.
11. Ibn Rushd. *Kitab al Kulliyat*. 2nd ed. New Delhi: CCRUM: Ministry of H& FW, Govt. of India 1987,260,278,289,292,294.
12. Ghani N. *Khazain ul Advia*. New Delhi: Idara kitabul Shifa; YNM: 706,869,1061-1062,1069-1070
13. Ghulam Nabi M. *Makhzane Mufradat W Amurakkabaat Khwas Advia*. 2nd ed. New Delhi: CCRUM: Ministry of H& FW, Govt. of India 2007,128,152,188,190.
14. Baitar I. *Aljami Li Mufradat al Advia Wal Aghzia*. New Delhi: CCRUM: Ministry of H& FW, Govt. of India 2003;2(3&4):156-158,165-172,201-206,349,412-414.
15. Ibn Hubal. *Kitabul Mukhtarat Fil Tibb*. Vol. II. New Delhi: CCRUM 2005, 168-169.
16. Haleem HMA. *Mufradat -e- Azeezi*. New Delhi: CCRUM 2009, 75.
17. Kabiruddin H. *Makhzanul Mufradat*. New Delhi: Idara Kitabus Shifa 2007,333,462.
18. Rahman HSZ. *Kitabul Ain al Hayat*. International Printing press, Aligarh: Ibn Sina Academy 2007,39,43,179.
19. Aisha Anjum A, Tabassum K, Ambar Siddiqui. *Kundur* (*Boswellia serrata* Roxb): A boon of nature in the world

- of Unani system of medicine. International Journal of Advance Research and Development 4(2), 10-14.
20. Prajapati ND, Kumar U. Agro's Dictionary of Medicinal Plants. Agrobios, India, 2005, 52.
 21. Karnick CR. Pharmacology of Ayurvedic Medicinal Plants. Sri Satguru Publications, Delhi 1996, 17.
 22. Duke JA. Handbook of Medicinal Herbs. CRC Press, New York, Edition 2002;2:113-4.
 23. Chatterjee A, Pakrashi SC. The editor. The Treatise on Indian Medicinal Plants. National Institute of Science Communication, New Delhi 2003, 63-65.
 24. Dymock W, Warden CJH, Hooper D. Pharmacy Graphical Indica. A History of the Principal Drugs. Srishti book distributors, New Delhi 2005;1:302-3.
 25. Anonymous. The Wealth of India. Council of Scientific and Industrial Research, New Delhi 1988;2:203-9.
 26. 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.
 27. Ismai SM, Aluru AS, Sambasivarao KR, Matcha B. Antimicrobial activity of frankincense of Boswellia serrata. Int J Curr Microbiol Appl Sci 2014;3:1095-101.
 28. MHM Hafeel, Mobeen A, Abdul Azeez Rizwana, Mohammad Yasir. Therapeutic Evaluation of Unani Formulation in Peptic Ulcer Single Blind, Before and After Comparison Clinical Trial', International Journal of Current Advanced Research 2020;09(08):23019-23027.
 29. Dr. Shah Alam S, Dr. Suhail Y Sahibole, Dr. Waseem A, Dr. Zaid A, Dr. Ghulamuddin S. Non-healing ulcers treated with Unani formulation: A case series. International Journal of Medical and Health Research 2016;2(6):27-30.
 30. Zeeyauddin K, Narsu ML, Abid M, Ibrahim M. Evaluation of antiulcer activity of Boswellia serrata bark extracts using aspirin-induced ulcer model in Albino rats. Journal of Medical and Allied Sciences 2011;1(1):14-20.
 31. Gupta I, Parihar A, Malhotra P *et al.* Effects of *Boswellia serrata* Gum Resin in Patients with Ulcerative Colitis. Eur J Med Res 1997;2:37-43.
 32. Gupta I, Parihar A, Malhotra P *et al.* Effects of Gum Resin of *Boswellia serrata* in Patients with Chronic Colitis. Planta Med 2001;67:391-395.
 33. Zhang Pengzong, Li Yuanmin, Xiong Xiaoming, Deng Shang, Xiong Wei, Lang Zhigang *et al.* Wound Healing Potential of the Standardized Extract of Boswellia serrata on Experimental Diabetic Foot Ulcer via Inhibition of Inflammatory, Angiogenetic and Apoptotic Markers. Planta Med 2019;85(08):657-669.
 34. Surjeet Singh A, Khajuria Subhash, Taneja Subhash, Taneja Show, Ghulam Nabi, Qazi Ghulam Nabi Qazi. The gastric ulcer protective effect of boswellic acids, a leukotriene Inhibitor from Boswellia serrata, in rats. Phytomedicine 2008;15(6-7):408-15.
 35. Siddiqui MZ. Boswellia serrata, A Potential Anti-inflammatory Agent: An Overview. Indian J of Pharmaceutical Sciences 2011;73(3):255-261.