AYUSHDHARA
ISSN: 2393-9583 (P)/ 2393-9591 (O)
An International Journal of Research in AYUSH and Allied Systems

Review Article

KAKRA SINGHI - A POTENT UNANI DRUG FOR RESPIRATORY DISORDERS

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Article info
Article History:
Received: 21-01-2025
Accepted: 26-02-2025
Published: 20-03-2025

KEYWORDS:
Kakra Singhi, Pistacia integerrima, Unani, Respiratory, cough, Asthma, Bronchitis.

ABSTRACT

Kakra Singhi (*Pistacia integerrima* J.L.Stewart), commonly known as Crab's Claw, is a well-documented medicinal plant in Unani medicine, particularly valued for its effectiveness in managing respiratory disorders. Traditionally, it has been used in the treatment of cough, asthma, bronchitis, and other pulmonary conditions, owing to its potent *Muqawwi* (tonic), *Munaffis-e-Balgham* (expectorant), and *Muhallil-e-Waram* (anti-inflammatory) properties. The plant's galls, rich in flavonoids, tannins, alkaloids, and terpenoids, contribute to its bronchodilator, antihistaminic, and antitussive effects, making it a vital herbal remedy for respiratory ailments. Scientific studies have provided evidence for the anti-asthmatic, antihistaminic, and mast cell stabilizing activities of *Kakra Singhi*, demonstrating its ability to inhibit histamine release, suppress bronchospasms, and reduce inflammation in the airways. The methanolic extract of its galls has shown significant protection against histamine-induced bronchospasm, while the essential oil, containing alpha-pinene and beta-pinene, exhibits notable antibacterial and antioxidant properties, further supporting its role in respiratory health. Additionally, its anti-inflammatory action, mediated through cyclooxygenase and lipoxygenase inhibition, helps alleviate airway inflammation, making it a promising natural alternative in the management of chronic respiratory conditions. This review aims to present a comprehensive evaluation of the respiratory benefits of *Kakra Singhi*, bridging its traditional Unani applications with evidence-based scientific studies. By consolidating its phytochemical, pharmacological, and clinical findings, this article highlights its potential as a therapeutic Unani drug for respiratory disorders, encouraging further research and clinical validation.

INTRODUCTION

Kakra Singhi (Pistacia integerrima J.L.Stewart), a valuable medicinal plant from the Anacardiaceae family, is commonly referred to as Shani/Shringi in Hindi, Crab's Claw in English, and Kakra Singhi in Urdu. The genus name Pistacia originates from the Persian word *Pesteh*, meaning green almond[1]. *Pistacia integerrima* J.L.Stewart Stew ex. Brandis is a moderate-sized deciduous tree with a short, sturdy bole, found at elevations of 350–400 m in the sub-alpine regions of the Himalayas, stretching from Indus to Kumaun, and is also cultivated in plains.[2]

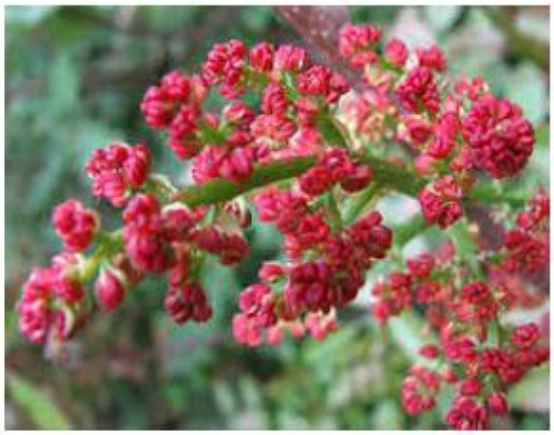
Access this article online
Quick Response Code
https://doi.org/10.47070/ayushdhara.v12i1.1915

Phytochemical analysis of *Pistacia integerrima* J.L.Stewart leaves has identified carotenoids, triterpenoids, and catechins, along with flavonoid glycosides[3]. Also characterized polyphenolic compounds in the leaves of this plant. The tree is particularly valued for its galls, which serve as a rich source of secondary metabolites, including steroids, flavonoids, tannins, saponins, and phenols. It is widely used in traditional medicinal systems such as Ayurveda, Unani, and Siddha, as well as in folkloric medicine, to treat various ailments, including cough, asthma, diarrhea, dysentery, fever, vomiting, skin diseases, respiratory conditions, psoriasis, appetite loss, hepatitis, liver disorders, oxidative stress, and hyperuricemia [4-8].

Habitat and Distribution

Pistacia integerrima, also known as zebra wood, is a tree native to Asia, particularly China and Japan. It is also found in England, Myanmar, Nepal,

Bhutan, Afghanistan, Pakistan, and India. This moderate-sized deciduous tree has multiple branches, reaching approximately 18 m in height and 2.7 m in width, with a sturdy trunk. It is commonly found in the Himalayan range, extending from Indus to Kumaun, at altitudes between 350 and 2400 m. Additionally, it is frequently cultivated in tropical climates [9-11].




Source: https://efloraofindia.com/efi/pistacia-integerrima.

Classification

Taxonomical classification	
Botanical name	*Pistacia integgerrima*
Family	Anacrdiaceae
Kingdom	Plantae
Phylum	Tracheophytes
Order	Sapindales
Family	Anacardiaceae
Genus	Pistacia
Species	integerrima

Vernacular names[8-10]

English: Crab's Claw/ Galls, Common name Kakra Singhi, Urdu: Kakrasinghi, Kakra, Punjabi: Kakar,Drek, Kakala, Kakkrangehe, Hindi: Kakdashingi, Kakra-singi, Kakra, Kakkatasingi, Telugu: Kakarashingi, Kakatakashrungi, Kakarasimga, Sanskrit: Karkatashringi, Bengali: Kakra, Kandashringi

Botanical Description

Pistacia integerrima J.L.Stewartis a moderately sized deciduous tree characterized by rough grey bark. Its leaves, which may or may not have a terminal leaflet, measure between 15 and 23cm in length and are dark green, turning bright red in autumn. The petiole is terete and puberulous. The leaflets are stalked, arranged in four or five sub-opposite pairs, lanceolate in shape, coriaceous, and arched. The tree produces dioecious flowers that are greenish-yellow or brownish, measuring 0.2cm in diameter, with a reddish hue and 5-7 stamens. It has four linear sepals and deciduous bracts. The fruit is a drupe that appears grey, glabrous, and rugose, with a shape longer than its width. Seeds are typically harvested between May and June [7-9].

Part Used: Bark, Stem Resin and fruit and Galls are used for medicinally purpose. [12-19]

***Mizaj* (Temperament)**

According to Hakim Najmul Ghani and Hakim Mohammad Azam Khan, *Kakra Singhi* has a temperament of Hot 1° and Dry 3°. However, other Unani scholars, including Hakim M. Kabiruddin assert that its temperament is Hot 1° and Dry 2° [12-19].


Source: https://efloraofindia.com/efi/pistaciaintegerrima.- Galls of Pistacia integerrima J.L. Stewart

Actions [10,14-26]

- *Mukhrij-i-Balgham Wa Munaffith-i-Balgham* (expectorant)
- *Muqawwi* (tonic)
- *Muqawwī-i-Harāra-e Gharīziyya* (tonic for innate heat)
- *Muharrik* (stimulant)
- *Mushtahi* (appetizer)
- *Mujaffif* (desiccant)
- *Qābiḍ wa Habis* (astringent)
- *Muqawwī-i-Mi'da* (stomachic)
- *Daf-i-Tap* (antipyretic)

Therapeutic Uses [12-19]

- *Su'āl* (cough)
- *Su'āl al-Atfal* (infantile cough).
- *Shahiqa* (whooping cough/pertussis)
- *Dāfi-i Diq al-Nafas* (bronchial asthma)
- *Ishal* (diarrhoea)
- *Lissa Damiya* (bleeding gums)
- *Waram al-Lissa* (gingivitis)
- *Ru'āf* (epistaxis)
- *Jarayān-al-Dam* (haemorrhage)
- *Sayalan al-Rahim* (leucorrhoea)
- *Fawaq* (hiccup)
- *Daf-i Qai* (vomiting)
- *Dāfi–i Tap-i Diq* (tuberculosis)
- *Bahaq-i Aswad* (black spots on the skin)

***Miqdar-i Khurak* (Dose):** The recommended dosage of *Pistacia integerrima* J.L.Stewart galls is 1-2gm in powdered form [17-20].

Compound Formulation: *Habb-i Diq al-Nafas, Tiriyaq-i Sual, Safoof-i Kakra Singhi* [20,21].

Chemical Constituents: A key characteristic of *Pistacia integerrima* J.L.Stewart galls is their essential oil content, which includes several important phytochemicals such as α-pinene, camphene, di-limonene, 1:8-cineole, caprylic acid, α-terpineol, and aromadendrene. Additionally, the galls contain significant secondary metabolites, including steroids, flavonoids, tannins, saponins, and phenols. The galls are composed of 20-75% tannins, 5% resin (similar to gum mastic from *Pistacia lentiscus*), and essential oil. Petroleum ether extracts of the galls have led to the isolation of several compounds, including: Pistacienoic acid A, Pistacienoic acid B (m.p. 158-161°C), both identified as isomeric triterpenic acids, A triterpene alcohol likely *tirucallol*, β-sitosterol, A waxy compound and two ketocarboxylic triterpenic acids which appear to be α- and β-acids

Steam distillation of the galls yields: 1.3% essential oil, 3.4% crystalline hydrocarbon, 60.0% tannin substances & 5.0% gum mastic. The essential oil is initially colorless but turns yellow over time, with a characteristic odor. It has a specific gravity of 0.8885 at 15°C. The crystalline principle is insoluble in water but soluble in most organic solvents, with a sharp melting point of 146°C [9,27]. The composition of the essential oil includes α-pinene (25%), Camphene (27%), d-Limonene (4-5%), 1:8-Cineole (10%), α-Terpineol (20%), Aromadendrene (4-5%) & Caprylic acid [10].

Significant Evidence based scientific studies

Antibacterial Activity

The gall extracts of *Pistacia integerrima* exhibit stronger antibacterial properties compared to other plant parts. *Karkatshringi* has demonstrated inhibitory effects against *Escherichia coli* and *Vibrio cholerae* [2]. The antibacterial activity was evaluated using the agar diffusion method, where bacterial cultures were incubated in triplicates at 37°C for 24 to 72 hours. Following incubation, the diameter of the microbial inhibition zone was measured in millimeters (mm) on the culture plate [25].

Gold nanoparticles (*Au-NPs*) synthesized from *P. integerrima* were also assessed for antibacterial activity against *Klebsiella pneumoniae, Bacillus subtilis,* and *Staphylococcus aureus*, along with antifungal activity, using the agar well diffusion method [16]. The ethanolic gall extract at 200µL concentration produced a maximum inhibition zone of 25 mm against *Bacillus subtilis* and *Proteus vulgaris*. *B. subtilis*, a Gram-positive, spore-forming bacterium known for causing food spoilage, has highly resistant spores, yet *P. integerrima* completely inhibited its growth. The crude extract also exhibited potent antibacterial effects, inhibiting *Salmonella Setubal* by 69.6% and *Pseudomonas pickettii* by 65.5% [25].

Laboratory studies tested *P. integerrima* leaf gall extracts against both Gram-positive and Gram-negative bacteria. The study included four Gram-negative strains- *Escherichia coli, Klebsiella pneumoniae, Pseudomonas aeruginosa,* and *Salmonella Typhi*- and two Gram-positive strains- *Coagulase-negative Staphylococcus* and *Staphylococcus aureus*. Both aqueous and ethanolic extracts effectively inhibited bacterial growth, with Gram-positive bacteria being more susceptible than Gram-negative ones. Among the Gram-positive bacteria, *S. aureus* showed the highest vulnerability, while *K. pneumoniae* was the least sensitive among Gram-negative bacteria. The ethanol extract exhibited a stronger antibacterial effect compared to the aqueous extract. The inhibitory effects of *P. integerrima* extracts were compared to the standard antibiotic Ciprofloxacin. Chloroform, ethyl acetate, and methanol extracts of the galls displayed significant activity against two Gram-negative and one Gram-positive bacterial strain, with the highest inhibition zone of 28.0 mm at a concentration of 22 mg/ml. In another study, *Pseudomonas aeruginosa* was found to be susceptible to both aqueous and ethanolic gall extracts, though the ethanolic extract demonstrated greater potency in antibacterial activity than the aqueous extract [29-33].

Anti-asthmatic activities

Pistacia integerrima shows anti-asthmatic activity, inhibition of histamine release, and 5-lipoxygenase activity. Bronchial asthma is due to the contraction of smooth muscle in response to multiple stimuli resulting in the release of chemical mediators like ACh and citric acid. *Pistacia integerrima* acts as an expectorant and helps in the clearance of mucus from airways, lungs, bronchi, and trachea. It is also used quite well in whooping cough in children. It also manages the hiccough. The aqueous extract of galls exhibits anti-asthmatic and antiallergic properties by stabilizing mast cells, preventing histamine release, and inhibiting leukotriene formation. Antihistaminic activity was assessed in guinea pigs using histamine-induced bronchospasm, with pre-convulsive dyspnea (PCD) as the endpoint, while spasmolytic activity was evaluated on isolated guinea pig tracheal chains by measuring inhibition of histamine-induced contractions. In albino Wistar rats, the extract demonstrated dose-dependent mast cell stabilization when challenged with an antigen. A 10-day treatment significantly protected guinea pigs against histamine aerosol-induced bronchospasm and exhibited spasmolytic effects. The anti-asthmatic action is likely attributed to membrane stabilization, antibody suppression, and inhibition of antigen-induced histamine release.[34]

Anti-inflammatory Activity

The chloroform fraction of *Pistacia integerrima* J.L. Stewart galls is rich in flavonoids, which exhibit significant anti-inflammatory properties. Research findings indicate that the methanolic extract of these galls plays a crucial role in alleviating inflammation in both acute and chronic phases. The anti-inflammatory efficacy was evaluated using a carrageenan-induced paw edema model in Wistar albino rats, where the extract demonstrated a remarkable reduction in inflammation. Additionally, the extract provided dose-dependent protection against thermal-induced pain, further reinforcing its analgesic potential.

The underlying mechanism of its anti-inflammatory activity is attributed to the inhibition of cyclooxygenase (COX) and lipoxygenase (LOX) enzymes, which are key mediators of the inflammatory response. The presence of bioactive compounds such as terpenoids and flavonoids is believed to be responsible for this inhibitory effect. Notably, treatment with methanolic gall extracts at doses of 100 and 200mg/kg body weight resulted in a significant reduction in paw edema, highlighting its therapeutic potential in managing inflammatory conditions. These findings support the traditional use of *Pistacia integerrima* galls in herbal medicine and suggest its potential as a natural anti-inflammatory agent. [35,36]

Antifungal Activity

A laboratory study assessed the antifungal properties of aqueous, ethanolic, and methanolic extracts derived from the leaves, bark, and galls of *Pistacia integerrima*. The antifungal efficacy was evaluated using the agar well diffusion method, which demonstrated significant inhibitory effects against various fungal strains, including *Aspergillus niger, Alternaria alternata, Fusarium chlamydosporum,* and *Rhizoctonia bataticola*. These findings suggest that *P. integerrima* extracts possess broad-spectrum antifungal potential, making them a promising natural alternative for fungal infections [37].

Anticancer Potential

An isolated bioactive compound, 3-oxo-6-β-hydroxy-β-amyrin, obtained from the chloroform fraction of *P. integerrima*, was investigated for its anticancer properties. The study revealed that this compound exhibited anti-tumor effects by significantly reducing the expression of early tumor antigens. The observed cytotoxicity highlights the potential role of *P. integerrima* in cancer therapeutics, warranting further exploration of its mechanism in inhibiting tumor progression. [27,38]

Antioxidant Properties

The antioxidant activity of *P. integerrima* was extensively evaluated using various solvent fractions, including ethyl acetate, n-hexane, chloroform, and methanol, along with two isolated bioactive compounds. These were tested through the 2,2-diphenyl-1-picrylhydrazyl (DPPH) assay, which measures radical scavenging potential. Among the different fractions and compounds, the ethyl acetate fraction and isolated compound 1 demonstrated the highest antioxidant efficacy, with inhibition rates of 82.53% and 94.51% at a concentration of 100µg/ml, respectively. Additionally, aqueous and ethanolic extracts of leaf galls were tested using DPPH, hydroxyl radical scavenging, and ferric reducing power (FRAP) assays. The study found that the ethanol extract exhibited superior antioxidant activity due to its higher total phenolic and flavonoid content, confirming the role of polyphenols in oxidative stress mitigation.[39]

Gastro-protective

The crude methanolic extract of *P. integerrima* demonstrated notable gastroprotective activity by significantly reducing gastrointestinal (GIT) motility. Administered at a dose of 100mg/kg, the extract exhibited a potent anti-motility effect in an experimental charcoal propulsion model, comparable to atropine sulfate, a known muscarinic receptor antagonist. Since muscarinic receptor blockade reduces intestinal smooth muscle contractions, it is suggested that the extract's action is linked to the inhibition of muscarinic receptors in the GIT. This gastroprotective effect is likely attributed to the presence of bioactive phytoconstituents, including tannins, sterols, alkaloids, and saponins, which contribute to its therapeutic efficacy in gastrointestinal disorders. [40,41]

CONCLUSION

Kakra Singhi is widely utilized in traditional medicine for the treatment of ailments such as cold, cough, fever, vomiting, and diarrhea. The essential oil extracted from *P. integerrima* exhibits potent antioxidant and antibacterial properties, making it effective against various bacterial infections. The presence of key essential oil components, alpha-pinene and beta-pinene, contributes to its anticonvulsant activity, further expanding its therapeutic applications. Additionally, the methanolic extract of *P. integerrima* galls has demonstrated significant anti-inflammatory activity in in-vivo animal models, reinforcing its role in inflammation management. The plant, commonly known as *Kakrasingi*, is frequently incorporated into various marketed herbal formulations, such as *Habb-i Diq al-Nafas, Tiriyaq-i Sual, Safoof-i Kakra Singhi* which is traditionally used for respiratory and digestive ailments. This article aims to provide a comprehensive scientific overview of the phytochemistry, traditional applications, and pharmacological significance of different extracts of *Pistacia integerrima*, offering valuable insights into its medicinal potential.

REFERENCES

1. Shamim Ahmad, Mohammed Ali, Shahid H. Ansari, Faheem Ahmed, Phytoconstituents from the galls of Pistacia integerrima Stewart, Journal of Saudi Chemical Society, Volume 14, Issue 4, 2010, Pages 409-412. https://doi.org/10.1016/j.jscs.2010.05.003.
2. R.N. Chopra, I.C. Chopra, K.L. Handa, L.D. Kapoor, Indigenous Drugs of India, (second ed.), Academic Publishers, Delhi (1982). p. 377.
3. Bibi Y, Zia M and Qayyum A: An Overview of Pistacia integerrima a medicinal plant species: Ethnobotany, biological activities and phytochemistry. Pakistan Journal of Pharmaceutical Sciences 2015; (3): 1009-1013.
4. Anonymous. The Unani Pharmacopoeia of India. New Delhi: Govt. of India Ministry of Health & Family Welfare Dept. of AYUSH; 2010. Part-II, Volume II; Pp. xi, 196
5. Mayer D. Essential evidence-based medicine. 2nd ed. Cambridge university press. 2010; 3.
6. Siddiqui K. Unani Medicine in India New Delhi: CCRUM 2009.
7. Anonymous. Unani System of Medicine, The Science of Health and Healing Department of AYUSH Ministry of Health & Family Welfare, Government of India New Delhi; 2013Grover M. Pistacia integerrima (Shringi)- A plant with significant pharmacological activities. The Journal of Phytopharmacology. 2021; 10(5): 323-30.
8. Anonymous. The Wealth of India. Vol. III, VIII, XI. Publications and Information Directorate Council of Scientific & Industrial Research, New Delhi, 2005; 12-13, 120-21, 96-98, 89-105
9. Anonymous. The Wealth of India. Vol. IV. Publications and Information Directorate Council of Scientific & Industrial Research, New Delhi, 2005; 12-13, 120-21, 96-98, 89-105

10. Nadkarni KA. Indian Materia Medica, Vol-1, popular Prakashan, Mumbai, 1976; pp. 965-66, 1062-63, 1308-09.
11. Shuaib M, Ali K, Zeb U, Hussain F, Zeb MA, Hussain S, Hussain F. Evaluation of Pistacia integrrima; an important plant. Inter J of Biosciences. 2017; 11(5): 412-2.
12. Khān HMA. Muhīt-i A'zam, (Urdu translation) Vol.2nd &, 4th. Central Council for Research in Unani Medicine, New Delhi, 2018, pp.33, 536-37, 793-95.
13. Ghani HN. Khazāīn-ul Advia, Vol. 1 to 4th, Idāra Kitab-ush Shifa, New Delhi, 2011; pp. 1005.
14. The Plant List, 2010. Version 1. Published on the internet. http://www.theplantlist.org/.
15. Pullaiah T. Encyclopaedia of World Medicinal Plants, Vol. 3, 4. New Delhi, Regency Publications; 2006. 1543-44, 1551-52, 2094-95.
16. Bibi Y, Zia M, Qayyum A. An overview of Pistacia integerrima J.L. Stewarta medicinal plant species: Ethnobotany, biological activities and Phytochemistry. Pakistan journal of pharmaceutical sciences. 2015 May 1; 28(3):1009-13.
17. Kabiruddin H.M. Makhzan-ul-Mufradat. New Delhi: Idara Kitab-us-Shifa; 2014. 145-46, 271, 309.
18. Tarique A.N. Tajul Mufradaat (Khawasul Advia). New Delhi: Idara Kitab-us-Shifa; 2010. 39-40,189-90, 522-23.
19. Abdul Hakeem MH. Bust'n-ul Mufradāt jadid. New Delhi: Idara Kitab-us-Shifa; 2002. 60, 180,418.
20. Usmānī MI. Tanqīḥ-ul Mufradāt. Famous offset press, New Delhi, 2008, pp. 191-192,
21. Ram Lobhaya H.G. Bayan ul Advia. New Delhi: Idara Kitab-us-Shifa; 2019. 379-378,
22. Hussain S.A. Afzal ul Mufradat. Vol. 3rd New Delhi: Idara Kitab-us-Shifa; 2022. 21-22,
23. Nabi MG. Makhzan-i Mufradāt wa Murakkabāt (khawas-ul-adwiya), 2nd Ed. New Delhi: CCRUM;
24. Khare CP. Indian Med Plants. 2nd Ed. New Delhi: Springer (India) Private Limited; 2008. 491-92, 494-95, 733-34.
25. Pullaiah T. Encyclopaedia of World Medicinal Plants, Vol. 3, 4. New Delhi, Regency Publications; 2006. 1543-44, 1551-52, 2094-95.
26. Kirtikar K.R, Basu B.D. Indian Medicinal Plants with Illustrations, 2nd Ed. Vol.1,3,4. Dehradun: Oriental Enterprises; 2012. 650-51, 2128-30, 2435-38.
27. Grover M. Pistacia integerrima (Shringi)-a plant with significant pharmacological activities. The Journal of Phytopharmacology. 2021; 10(5): 323-30.
28. The Plant List, 2010. Version 1. Published on the internet. http://www.theplantlist.org/.
29. Ramachandra YL, Ravi Shankara BE, Sujan Ganapathy S, Sundar Rajan S. In-vitro antimicrobial activity of Pistacia integerrima J.L. Stewart leaf gall extracts. Pharmacophore. 2010; 1(2): 149-54.
30. Sharma B, Rasool S, Pant S. Pistacia integrrima Stewart ex Brandis: A less known high value Stewart ex Brandis: International Journal of Phytomedicine 9 (2017) 390-393
31. Kanade ML and Awalaskar A: The comparative antimicrobial activity of karkatshringi. National Journal of Research in Ayurved Science 2021; 9(3): 1-12
32. Islam NU, Jalil K, Shahid M, Muhammad N and Rauf A: Pistacia integerrima gall extract mediated green synthesis of gold nanoparticles and their biological activities. Arabian Journal of Chemistry 2015; 12: 2310-2319.
33. Rani W, Maqbool F, Bhatti ZA, Iqbal J, Siddiqui MF, Sidra P, Umm-e-Kalsoom and Khan I: Antibacterial and anticancer Efficacy of different parts of Pistacia integerrima plant extract. Research Square 2021; 1-13.
34. Shirole RL, Kshatriya AA, Kulkarni R, Shirole NL, Saraf MN: Investigation into the mechanism of action of essential oil of *Pistacia integerrima* for its Anti-asthmatic activity. J of Ethnopharmacology 2014; 153(3): 541-551.
35. Thakur V, Guleria R, Singh R. Anti-Inflammatory activities of metanolic extract of galls of Pistacia integerrima. Journal of Pharmacognosy and Phytochemistry. 2017; 6(6): 2144-6.
36. Adusumalli SU, Ranjit PM, Harish MS. Antiasthmatic activity of aqueous extract of Pistacia inte70. Rana S, Shahzad M, Shabbir A. Pistacia integerrima ameliorates airway inflammation by attenuation of TNF-α, IL-4, and IL-5 expression levels, and pulmonary edema by elevation of AQP1 and AQP5 expression levels in mouse model of ovalbumin induced allergic asthma. Phytomedicine 2016; 23(8): 838-45.
37. Bibi Y, Nisa S, Zia M, Waheed A, Ahmed S, Chaudhary MF. The study of anticancer and antifungal activities of Pistacia integerrima J.L. Stewart extract in vitro. Indian journal of pharmaceutical sciences. 2012 Jul;74(4): 375.
38. Mukherjee AK, Basu S, Sarkar N, Ghosh AC. Advances in cancer therapy with plant based natural products. Curr Med Chem. 2001; 8: 1467–86. doi: 10.2174/0929867013372094
39. Rauf A, Bawazeer S, Raza M, El-Sharkawy E, Rahman H, ElEsawy M, Uddin G, Siddiqui BS, Kihalil

AA, Molnár J, Csonka Á. Reversal of multidrug resistance and antitumor promoting activity of 3-oxo-6β-hydroxy-β-amyrin isolated from Pistacia integerrima. Biocell 2021; 45(1): 139-47

40. Bawazeer S, Rauf A, Shah SU, Ullah N, Uddin G, Khan H, Hadda TB. Antioxidant and Enzyme inhibitory activities of extracts and phytochemicals isolated from Pistacia integerrima. Journal of Medicinal and Spice Plants 2019 Jan 1; 23(2): 55-8.
41. Ismail M, Rahman S, Zada A, Abbas M, Ali T, Niaz U. Analgesic, anti GIT motility and toxicological activities of Pistacia integerrima J.L.Stewart Stewart ex Brandis bark in mice. J. Med. Plants Res. 2012 Apr 16; 6(14): 2827-31. 73. Ashalatha M, Rekha B, Sannapannawar B. A review article on pippali (Piper longum Linn). Int Ayurvedic Med J. 2015; 3:1-9.

Cite this article as:
Asema Mahveen, Shaik Mohammed Hussain. Kakra Singhi- A Potent Unani Drug for Respiratory Disorders. AYUSHDHARA, 2025;12(1):338-344.
https://doi.org/10.47070/ayushdhara.v12i1.1915
Source of support: Nil, Conflict of interest: None Declared

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