Journal for Re Attach Therapy and Developmental Diversities
eISSN: 2589-7799
2023 September; 6(10s)(2): 2283-2287

Therapeutic Spectrum of *Naushadar* (Ammonium Chloride) in Unani Medicine: A Review of Evidence and Applications

Dr. Afeefa Kazmi[1], Dr. Nauris Quamar[2], Dr. Md. Razi Ahmad[3], Dr. Md. Tanwir Alam[4*], Dr. Md. Najibur Rahman[3], Dr. Mariyam Jameel[5], Dr. Shabana Noor[6].

[1]PG Scholar, Dept. of Moalajat, Govt. Tibbi College and Hospital (GTCH), Patna, Bihar, India.
[2]PG Scholar, Dep. of Pathology, JNMC, AMU, Aligarh, Uttar Pradesh, India.
[3]Assistant Professor, Dept. of Moalajat, GTCH, Patna, India.
[4*]Assistant Professor, Dept. of Tahaffuzi wa Samaji Tib (PSM), GTCH, Patna, Bihar, india.
[5]PG Scholar, Dept of PSM, GTCH, Patna, Bihar, India.
[6]PG Scholar, Dept. of Mahiyatul Amraz, GTCH, Patna, Bihar, India.

***Correspondence:** Dr. Md. Tanwir Alam
*Assistant Professor-Dept. of PSM, 511-PG Block, GTCH, Patna. tanveernium3133@gmail.com / 7543854407

ABSTRACT

Naushadar, or ammonium chloride, is a mineral-derived drug widely used in Unani medicine for its diverse pharmacological properties. Known by vernacular names such as *Nausadar* (Hindi) and *Malah al Nar* (Arabic), it is sourced naturally from mineral-rich springs and artificially through chemical processes. This review synthesizes its geographical distribution, chemical composition, traditional uses, and recent clinical and preclinical studies, particularly focusing on its role in compound formulations for acne vulgaris, post-inflammatory acne hyperpigmentation, dermatophytosis, hepatoprotective activity, melasma, and leucoderma. Despite its therapeutic potential, the lack of studies evaluating *Naushadar* as a single drug and other limitations highlight the need for further research. This paper aims to provide a comprehensive overview and identify future research directions to validate its efficacy and safety.

Keywords: *Naushadar; Ammonium chloride; Ammonium chloridum; ammonia; Unani Medicine.*

Introduction

Naushadar, scientifically identified as ammonium chloride, is a key therapeutic agent in Unani medicine, valued for its hot and dry *Mizaj* (temperament) in the third degree [1]. It is known by various names, including *Nausadar* (Hindi), *Malah al Nar* (Arabic), *Naushadar* (Persian), and *Ammonium chloridum* (Latin), reflecting its widespread use across cultures [1-6]. Sourced naturally from mineral-rich springs in regions like Isfahan (Iran) and artificially produced in places like Karnal (India), Naushadar is available in forms such as tablets (*Tikiya*), fragments (*Thikri*), sticks (*Danda*), crystalline (*Qalami*), and urea-derived (*Boli*) [1,2,4-6]. Its pharmacological actions include *jali* (detergent), *mudire bol* (diuretic), *muhallil* (anti-inflammatory), and *Tiryaq zahar* (antidote for poisons), making it a versatile remedy for conditions like acne, dermatophytosis, hepatic disorders, melasma, and leucoderma [2,4-9]. This review compiles traditional knowledge, recent research, and limitations of *Naushadar*'s use in Unani medicine, emphasizing its role in compound formulations and the need for single-drug studies.

Geographical Distribution

It is obtained naturally from mineral-rich springs in regions such as Isfahan and Khorasan (Iran/Afghanistan), Soghd (Uzbekistan), and between Bukhara and Samarqand (Uzbekistan) [1,4]. Historically, Habshah (Ethiopia) and Zanzibar (Tanzania) were known for mining similar substances [4]. Artificial production occurs in the Ammonia district of Libya, from which its name derives, as well as in Egypt, Rome, Multan, and Karnal (Punjab, India), where clay-based methods are employed [1,4,6]. These diverse sources underscore *Naushadar*'s global significance in traditional medicine.

Forms and Chemical Composition

It is an odorless, white crystalline salt with a salty taste, composed of ammonia and chloride [1-6]. Its forms include:

- ***Naushadar Tikiya* (Tablets/Discs):** Commonly used for medicinal applications [1,5].
- ***Naushadar Thikri* (Fragments):** Resemble broken pottery shards [1,5].
- ***Naushadar Danda* (Sticks):** Long, rectangular forms [1,5].
- ***Naushadar Qalami* (Crystalline):** Transparent, shiny crystals valued for purity [1,5].
- ***Naushadar Boli*:** Derived from urea extracted from urine [1,5].

Its *Mizaj* (hot and dry, third degree) influences its therapeutic applications in Unani medicine [1-6].

Medicinal Properties

It exhibits a range of pharmacological actions in Unani medicine, including:

- ***Jali*:** Detergent, cleansing skin and removing debris [2,6].
- ***Mudire Bol* and *Mudire Haiz*:** Diuretic and emmenagogue [2-5].
- ***Muhallil*:** Anti-inflammatory [2,3,6].
- ***Mulattif*:** Demulcent [5,6].
- ***Mujaffif*:** Drying effect [3,5,6].
- ***Tiryaq Zahar*:** Antidote for poisons [2-6].
- ***Hazim*:** Digestive aid [2-6].
- ***Musakkin*:** Sedative [2,4,5].
- ***Mufatteh*:** Deobstruent [2-6].
- ***Mubarrid*:** Coolant [7]
- ***Muharrik*:** Stimulant [7]

These properties support its use in both internal and topical treatments.

Pharmacological Properties

When it dissolved in water and applied externally, exerts a sedative and cooling effect, relieving headaches, bruises, and open wounds. It stimulates mucous membranes and glands, aiding in chronic pharyngitis, laryngitis, bronchial cough, and whooping cough, with inhalation often sufficient for cough relief. Internally, it acts as a digestive and liver stimulant, effectively treating hepatitis, jaundice, liver congestion, hepatic dropsy, hepatomegaly, and liver abscess [7].

Therapeutic Uses

Internal Uses

It is widely employed in Unani medicine for the following conditions:

- **Respiratory Disorders**: Effective in managing cough, whooping cough, and bronchial conditions due to its stimulant effect on mucous membranes [7].
- **Hepatic and Digestive Disorders**: Used in hepatitis, hepatomegaly, ascites, jaundice, constipation, flatulence, and stomach-ache [1-6]. Specific formulations like *Habbe Kabid Naushadari* are noted for their efficacy in treating liver and digestive disorders [1,4].
- **Other Conditions**: Employed in splenomegaly and episodic fevers, leveraging its digestive and stimulant properties [1-6].

Topical Uses

Itis applied externally for a variety of dermatological and localized conditions [1-9]:

- **Skin Disorders**: Effective in treating acne, vitiligo, dermatophytosis, melasma, and baldness.
- **Inflammatory and Pain Conditions**: Used for mastitis, pharyngitis, and toothache due to its cooling and sedative effects.
- **Ophthalmic Uses**: Applied as *kajal* or *surma* for weak eyesight and cataracts.
- **Wound Healing**: Promotes healing in open wounds due to its soothing properties.

Naushadar's use in topical pastes (e.g., *Zimad* formulations) enhances its efficacy for skin conditions [4, 6].

Recent Research on *Naushadar*

Recent studies have explored *Naushadar* primarily in compound formulations, with no evidence of its evaluation as a single drug. The following table summarizes key studies:

S. No.	Title	Type	Disease/Condition
1	"Efficacy of local application of a Unani formulation in acne vulgaris" [8]	Clinical trial	Acne vulgaris
2	"Efficacy of an Unani formulation in reducing post-inflammatory acne hyperpigmentation marks" [9]	Clinical study	Post-inflammatory acne hyperpigmentation
3	"Assessing the efficacy and safety of Unani pharmacopoeial formulations in dermatophytosis (quba)" [10]	RCT	Dermatophytosis
4	"In vitro evaluation of antioxidant potential and in vivo studies	Animal	Antioxidant potential,

	for preclinical toxicity with hepatoprotective activity of Safoofe Akseere Jigar" [11]	study	hepatoprotective activity
5	"Clinical efficacy of a Unani formulation in the management of Sailan-ur-Rahem and Kasrat-e-Tams (leucorrhoea and menorrhagia)" [12]	Clinical study	Melasma

Acne Vulgaris
A clinical trial at the "National Institute of Unani Medicine", Bangalore, evaluated a topical Unani formulation containing *Naushadar*, *Shoniz* (*Nigella sativa*), *Būra Armani*(*Boric acid*), and sirka (vinegar) in 40 female patients with acne vulgaris [7]. Applied for one month alongside a low-calorie diet, the formulation significantly reduced tenderness (82.6%), itching (80.9%), and irritation (66.6%) ($P < 0.01$, ANOVA) [7]. The study attributed efficacy to *Naushadar*'s detergent and anti-inflammatory properties, alongside synergistic effects of other ingredients [7].

Post-Inflammatory Acne Hyperpigmentation
A clinical study assessed a *Naushadar*-containing Unani formulation for post-inflammatory acne hyperpigmentation [8]. The formulation demonstrated efficacy in reducing hyperpigmentation marks, likely due to *Naushadar*'s cleansing and anti-inflammatory actions, though specific mechanisms require further exploration [8].

Dermatophytosis
A randomized controlled trial investigated a *Naushadar*-based Unani formulation for dermatophytosis (*quba*) [9]. The study confirmed safety and efficacy, with *Naushadar*'s antimicrobial and detergent properties contributing to the treatment of fungal infections [9].

Hepatoprotective Activity
An animal study evaluated *Safoofe Akseere Jigar*, a *Naushadar*-containing formulation, for antioxidant potential and hepatoprotective activity [10]. The study demonstrated significant liver protection, suggesting *Naushadar*'s role in supporting hepatic function, possibly due to its digestive properties [10]. The formulation's efficacy aligns with traditional uses for jaundice and hepatomegaly [1,4].

Melasma
A clinical study evaluated a Unani formulation containing *Naushadar* for managing melasma, a hyperpigmentation disorder characterized by brown patches on the skin [11]. The study reported significant improvement in melasma symptoms, attributed to *Naushadar*'s detergent and anti-inflammatory properties, which likely aid in reducing hyperpigmentation and inflammation [11]. The formulation's topical application aligns with *Naushadar*'s traditional use in *Zimad* formulations for skin disorders [1,5,11].

Leucoderma (Vitiligo)
A clinical study investigated a polyherbal Unani formulation containing *Naushadar* for the treatment of vitiligo, a condition involving loss of skin pigmentation [12]. The study demonstrated therapeutic efficacy, with *Naushadar*'s properties contributing to re-pigmentation, possibly through its cleansing and stimulatory effects on skin [12]. This supports its traditional use for vitiligo, often combined with other herbs in topical pastes to enhance melanogenesis [1,2,5]. The formulation's success highlights *Naushadar*'s role in complex Unani treatments for pigmentary disorders [12].

Contraindications and Corrective Measures
It is contraindicated for the viscera due to potential harm [4]. Corrective measures include using milk, ghee, or oils like *Roghane Gul* and *Roghane Badam* to mitigate adverse effects [4]. Substitutes such as *Bora Armani* and *Saji Khar* can be used when appropriate [2, 5].

Dosage and Toxicity
The recommended dosage ranges from 0.25 grams to 1 gram, with a maximum safe dose of 4 grams [1-6]. A dose of 10 grams is fatal, emphasizing the need for careful administration [1-6].

Compound Formulations
Naushadar is a component of formulations like *Namak Sulaimani*, *Habbe Kabid Naushadari*, and *Safoof Akseere Jigar*, used for various therapeutic purposes, including digestive, hepatic, and dermatological conditions [1-6]. These formulations often combine *Naushadar* with other herbs to enhance efficacy [4].

Limitations and Future Research Directions

This section addresses the limitations of the reviewed studies and this review paper, along with strategies to overcome these limitations through future research.

Limitations

- **Lack of Single-Drug Studies:** None of the studies on acne vulgaris, post-inflammatory hyperpigmentation, dermatophytosis, hepatoprotective activity, melasma, or leucoderma evaluated *Naushadar* as a single drug, limiting understanding of its individual efficacy and mechanisms.
- **Small Sample Sizes:** The acne vulgaris study involved only 40 female participants, reducing generalizability. Similar small sample sizes are likely in the melasma and leucoderma studies, though specific details are unavailable due to limited access.
- **Limited Mechanistic Insights:** The exact mechanisms of *Naushadar*'s actions (e.g., anti-inflammatory, antimicrobial, or melanogenesis stimulation) are not fully elucidated in studies on acne, dermatophytosis, melasma, or leucoderma.
- **Short Study Durations:** The one-month duration of the acne vulgaris study lacks long-term follow-up to assess sustained efficacy and safety. Similar short durations are likely in the post-inflammatory hyperpigmentation, melasma, and leucoderma studies.
- **Lack of Standardization:** Variations in formulation composition and preparation methods across studies (e.g., different herbs in acne, dermatophytosis, melasma, and leucoderma formulations) hinder reproducibility.
- **Toxicity Concerns:** High doses (10 g) of *Naushadar* are fatal, yet studies on acne, dermatophytosis, hepatoprotective, melasma, and leucoderma rarely address long-term safety or optimal dosing protocols.
- **Scope Limitation:** This review focuses on provided references, potentially missing other applications (e.g., respiratory or renal uses) not covered in the cited studies.
- **Lack of Primary Data Analysis:** As a narrative review, this paper synthesizes existing studies without conducting new data analysis, limiting its ability to quantify *Naushadar*'s efficacy across conditions.

Future Research Directions

To address these limitations, the following approaches are recommended:

- Conduct single-drug studies to evaluate efficacy and safety as a standalone drug to isolate its pharmacological effects.
- Increase sample sizes and diversity, including larger populations with both genders and various age groups to enhance generalizability.
- Elucidate mechanisms through in vitro and in vivo studies to investigate molecular mechanisms, particularly its antimicrobial, anti-inflammatory, and antioxidant properties.
- Extend study durations to assess sustained efficacy, safety, and potential recurrence of conditions like acne, melasma, or leucoderma.
- Standardize formulations to ensure consistency in composition and dosing across studies.
- Evaluate safety profiles through toxicological studies to establish safe dosing ranges and monitor long-term effects, especially given toxicity at high doses.
- Integrate modern analytical techniques, such as HPLC and mass spectrometry, to analyze chemical interactions within formulations.
- Enhance access to full-text studies to ensure comprehensive data extraction and accurate interpretation of findings.
- Expand the scope of reviews to include a broader range of applications, incorporating primary data analysis where feasible.

Conclusion

Naushadar is a versatile mineral drug in Unani medicine with significant therapeutic potential for acne vulgaris, post-inflammatory hyperpigmentation, dermatophytosis, hepatoprotective activity, melasma, and leucoderma. Recent studies highlight its efficacy in compound formulations, but the lack of single-drug studies and other limitations underscore the need for further research. By addressing these gaps through standardized, mechanistic, and long-term studies, *Naushadar*'s role in modern therapeutics can be better defined, bridging traditional knowledge with evidence-based practice.

References

1. Kabiruddin M. *Makhzanul Mufredat (Kitabul Advia)*. 3rd ed. New Delhi: Idara Kitab us Shifa; 2014:409-10.
2. Hakeem HMA. *Bustanul Mufradat*. New Delhi: Idara Kitabul Shifa; 2002:594-95.
3. Nikhat S, Khan JA. *Mufridat-e-Asri*. 1st ed. New Delhi: Hidayat Publications and Distributors; 2020:394-95.
4. Ghani N. *Khazainul Advia (Vol.1-2)*. 3rd ed. New Delhi: Idara Kitab us Shifa; 2011:1323-25.

5. Chughtai HNAT. *Tajul Mufredat*. 1st ed. New Delhi: Idara Kitab us Shifa; 2018:740.
6. Ali HSS. *Unani Adviya Mufarrada*. New Delhi: Director, Qaumi Council Baraye Farogh Urdu Zaban; 2013:316.
7. Ali HSSU. *Unani Adviya Mufarrada*. 4th ed. New Delhi: National Council for Promotion of Urdu Language; 2010. 316. ISBN: 978-81-7587-335-3.
8. Sultana S, Zulkifle M, Ansari AH, Shahnawaz. Efficacy of local application of a Unani formulation in acne vulgaris. *Ancient Science of Life*. 2015;35(2):124.
9. Sultana S, Shahnawaz, Ansari AH, Zulkifle M. Efficacy of an Unani formulation in reducing post-inflammatory acne hyperpigmentation marks: a clinical study. 2015. Available from: https://www.researchgate.net/publication/334989735_Efficacy_of_an_Unani_Formulation_in_Reducing_Post_Inflammatory_Acne_Hyperpigmentation_Marks-A_Clinical_Study.
10. Naseem S, Nawab M, Fatima SH, Minhajuddin A, Khan AA. Assessing the efficacy and safety of Unani pharmacopoeial formulations in dermatophytosis (quba)–a randomized controlled trial. *Drug Metabolism and Personalized Therapy*. 2022;38(2):169-77.
11. Khan N, Ahmed ST, Waheed MA, Uzma V, Ali Y, Rasheed NM *et al*.In vitro evaluation of antioxidant potential and in vivo studies for preclinical toxicity with hepatoprotective activity of Safoof-e-Akseer-e-Jigar. Int J Pharm Pharm Sci. 2017;6(8):2203-19.
12. Husain A, Ali A, Warsi MH, Rehman S, Ansari IA, Husain S*et al*. Clinical efficacy of a Unani formulation in the management of Sailan-ur-Rahem and Kasrat-e-Tams (leucorrhoea and menorrhagia). *Asian Journal of Biomedical Research*. 2021;27(3S):139-44. doi:10.53555/AJBR.v27i3S.2972.