INTERNATIONAL JOURNAL OF UNANI AND INTEGRATIVE MEDICINE

E-ISSN: 2616-4558
P-ISSN: 2616-454X
www.unanijournal.com
IJUIM 2025; 9(1): 01-07
Impact Factor (RJIF): 6.3
Peer Reviewed Journal
Received: 02-11-2024
Accepted: 06-12-2024

Rashmi Chauhan
PG Scholar Department of Ilmul Saidla, Ayurvedic & Unani Tibbia College and Hospital, Karol Bagh, New Delhi, Delhi, India

Sana Jameel
PG Scholar Department of Niswan wa Qabalat, Ajmal Khan Tibbiya College and Hospital, AMU, Aligarh, Uttar Pradesh, India

Mohammad Nauman Saleem
Assistant Professor, Department of Ilmul Saidla, Ayurvedic & Unani Tibbia College and Hospital, Karol Bagh, New Delhi, Delhi, India

Asif Iqbal Siddiqui
Associate Professor, Department of Ilmul Saidla, Ayurvedic & Unani Tibbia College and Hospital, Karol Bagh, New Delhi, Delhi, India

Corresponding Author:
Rashmi Chauhan
PG Scholar Department of Ilmul Saidla, Ayurvedic & Unani Tibbia College and Hospital, Karol Bagh, New Delhi, Delhi, India

An appraisal of medicinal properties of Choona (CAO) in Unani system of medicine

Rashmi Chauhan, Sana Jameel, Mohammad Nauman Saleem and Asif Iqbal Siddiqui

DOI: https://doi.org/10.33545/2616454X.2025.v9.i1a.314

Abstract
Choona is hard, white colored heavy lump which is produced after the calcination of various substances like *sange marmar*, conch, egg shells etc. *Gachh, kalas, ahak* are its various names which are used synonymously in Unani System of Medicine. It is widely consumed along with betel leaf as *Paan* in Asian countries like India and Pakistan. Lime, slaked lime, calcium oxide are its different forms mentioned in classical literature. In Unani classical literature, *bujha hua choona* (Slaked lime/calcium hydroxide) and *unbujha choona* (Calcium oxide) are its two forms having different medicinal properties. It has many beneficial effects in treating several diseases which can be used in the future for the preparation of different Unani formulations for oral as well as topical use and that will be a boon in treating wide range of diseases like dyspepsia, indigestion, jaundice, epistaxis, burn injuries, leucorrhoea, hirsutism etc.

Keywords: Choona, lime, limestone, calcium oxide, calcium hydroxide

Introduction
Choona is a mineral origin drug in Unani medicine which has got several therapeutic effects. The generic term lime includes slaked lime and quicklime, and is synonymous with the term lime products. Sometimes, lime is used incorrectly to describe limestone products and is a frequent cause of confusion. Limestone, quicklime, slaked lime are associated terms of lime [1]. Limestone has got eleven basic types and these types can be easily differentiated in labs and field [2]. Several sort of lime are used in Hindu medicine; thus we have lime from limestone (Sans. – churna); calcined cowries (Kapardaka bhasma; Conch shells (Shankha bhasma); bivalve shells (shukti bhasma); Snail shells (Shmbuka bhasma) [3]. *Choona* is a hard, white coloured heavy mass produced after the calcination (*Mukkallas*) of various stones like *sange mar mar* and many other specific stones. *Ahak*, *kalas*, *gachh*, etc. are some other names of it mentioned in Unani classical literature. *Choona* prepared by conch, *sange mar mar* and egg shells is considered to be better. Human body comprises 2% of it and 3.64% in upper layer of earth [4]. When these heavy masses are not extinguished in water, called as *anbhuja chuna* or *ahak aab na raseeda* and if extinguished in water called as *ahak aab raseed* or *bhujha hua chuna* [5]. Slaked lime is the English terminology for extinguished *choona* [4] and calcium hydroxide is its' chemical name.
Lime is the widely used and of very low cost. Over 200 million tonnes per annum (TPA) is observed to be the production of lime globally. Lime is one of the most heavily used chemicals. It is considered as the fifth largest selling chemical. Evidence for the use of lime has found to be as early as some 10,000 years back [1].
Limestone is the common types of rock found on earth's surface and about 10% of the land surface of our planet consists of limestone or similar types of rock [6]. Limestone is a naturally occurring sedimentary mineral that consists principally of calcium carbonate [1, 6]. The rock must contain at least 50 percent calcium carbonate to be classified as limestone. When the rock contains 30 to 45 percent magnesium carbonate, it is referred to as dolomite, or dolomitic limestone [7]. Commercial limestone is supposed to be entirely made of calcium carbonate [8]. It plays a very important role in the economy as it is a major raw material for the cement industry [6]. Limestone is found in many forms and classified in terms of its origin, chemical composition, structure and geological formation. Quicklime is produced by thermal dissociation of limestone.

Its principal component is calcium oxide. As the most readily available and cost-effective alkali, quicklime plays an essential part in a wide range of industrial process. Slaked lime is produced by reacting or slaking quicklime with water and consists mainly of calcium hydroxide. The term includes hydrated lime (dry calcium hydroxide powder), milk of lime and lime putty (dispersion of calcium hydroxide particles in water) [1].

Fig 1: Limestone

Molecular formula
- **Limestone:** Calcium carbonate; $CaCO_3$ [1, 3]
- **Slaked lime:** Calcium hydroxide; $Ca(OH)_2$ [1, 3]
- **Quicklime:** Calcium oxide; CaO [1, 3]

Vernaculars
Calcium oxide
- **English:** quicklime [3, 5], burnt lime [3], caustic lime [3]
- **Urdu:** Choona [5]
- **Hindi:** Chuna [5], kalika-chuna [3]
- **Sanskrit:** Sudha [3], shudhakshara [3]
- **Arabi:** Noora or kalas [5]
- **Farsi:** Ahak/gachh [5]
- **Gujrati:** Chunu [5], kalichuno [3]
- **Bengali:** Chun [5], kalika chuna [3]
- **Sindhi:** Chonu [5]
- **Tamil and Telagu:** Chunnambu [3]

Calcium hydroxide
- **English:** Slaked lime [3]
- **Sanskrit:** Churna [3]
- **Hindi:** Chuna [3]
- **Bengali:** Chun [3]
- **Punjabi:** Kalai [3]
- **Gujrati:** Chuno [3]
- **Tamil:** Chunnambu [3]
- **Arab:** Kils [3]
- **Persian:** Nura [3]
- **Burma:** Thon-phiyu [3]

Limestone
- **English:** Chalk, marble [3]
- **Hindi:** Vilaiti chuna [3]
- **Bengali:** Karimatti [3]
- **Arab:** Kils [3]
- **Persian:** Gil safed [3]
- **Gujrati:** Chaka [3]
- **Tamil:** Seemaychunnambu [3]
- **Malayalam:** Kapur ingris [3]
- **Burma:** Tounghpyu [3]

Source: Limestone has been found to be originated from the biological deposition of shells and skeletons of plants and animals massive beds accumulated over millions of years [6]. Other sources may include coral, chalk, aragonite, marl, marine origin sedimentary deposits, and marble etc. [3].
Chemical composition of limestone [6]:
1. Calcium
2. Oxygen
3. Carbon

***Mizaj* (Temperament):** Unextinguished (*Unbujha choona*) hot (4°) and dry (2°) [5], hot (4°) and dry (4°) [4].

Decanted lime: Moderate in respect to heat and cold

***Af'al* (Actions)**
Muffare (Exhilarant) *wa muhharik* (Stimulant), *Muhallike sha'r* (Depilatory), *muhallil wa munzije awraam* [5], *Bujha choona*: *mussakin wa mubbarid* (Sedative and refrigerant), *mujjafife quruh* (Cicatrizant) [4, 5], *Habise khun* (Hemostatic), *qabiz* [4, 5], *Dafe hamuzate medi* (Antacid) [4], *Mudire bol* (Diuretic) [4].

***Mawaqe istemal* (Therapeutic uses):** *Awram* (Inflammation), *Ru'af* (Epistaxis), *Ishal* (Loose motion), *Tanaqqubul asnan* (Dental cavities), *Judri* (Small pox), *Aatshak* (Syphilis), *Sailane uzn*
(Otorrhoea), *Darde sar* (Headache), *Amraze baul* (Diseases of urinary tract), *Quruh* (Ulcers) (Ghani N., 2009).

***Miqdaare khurak* (Dosage):** 1 *masha* (~1gm) [9]
2.5 *tola* – 10 *tola* [5] (1*tola*~12gm)
In infants: 2 *masha* – 5 *masha* [5]

***Musleh* (Corrective):** Roghaniyat (Oils), *Shorbe* (Soups) and Luabiyat (Mucilages) [10].

***Muzir* (Adverse effect):** harmful in excessive amount [10]

***Badal* (Substitute):** other varieties [10], *hartal* [9]
Ahak aab raseeda (Extinguished) is widely used in *Paan (Piper betle)* along with *Kath* (Acacia *catechu*) in India and Pakistan due to which roots of teeth get damaged [5].

Choona maghsul/ aahak maghsul (Decanted lime)
Dissolve the required amount of lime in water and filter by using a piece of cloth. Now keep the filtrate at rest for some time until whole of the lime gets sediment at the bottom of the vessel. Separate this sediment lime in another clean vessel and add more water to it and repeat the process as above for seven times. At last, dry the sediment *choona* to get *choona maghsul* [5].

Fig 2: Process of *Choona maghsul*

Aabe aahak

Slaked lime (1 *tola*~12gm) is mixed with distilled water (1 *ser* ~ 960gm) in a clean vessel a, make it stir several times. Now, allow to make it still by not disturbing the vessel for some time. Separate the water from the sediment part and this water will be called as "lime water" or *aabe aahak*. Store this in a green glass bottle followed by closing its' mouth with a cork [5].

Different forms of *Choona*

Calcium/ lime [3]

Lime is derived from limestone. It is calcined cowries, conch shells, snail shells etc.

Lime: calcium carbonate ($CaCO_3$) is heated to high temperature in a kiln, carbon dioxide gas (CO_2) is released into the atmosphere and a residue, calcium oxide (CaO) is formed. The calcium oxide is a powerful acid-neutralization agent. It is widely used as a soil treatment agent (faster acting than aglime) in agriculture and as an acid-neutralization agent by the chemical industry.

Method of preparation

Shells which are selected to made into lime, are firstly purified by being soaked in *Sirka* or lemon juice and are made to use by calcination by covered crucible.

Uses of lime

1. As caustics, it is also used for warts and tumors.
2. Eggshell limes composed by 97.0% calcium oxide, 2% magnesium oxide and by 89.6% calcium hydroxide and 5% calcium carbonate were found to have adequate physical–chemical-mineralogical characteristics for soil stabilization applications [11].

Calcium carbonate/ calcii carbonas

It is also called as vilati- choona in Hindi; chalk in English etc.it exists as limestone or white marble in nature. In kingdom plantae, it could be obtained by incinerating them into ahes. In animals, hard part of the corals and oyster shells are the sources. Miniscule shells that are mainly composed of calcium carbonate of lime contaminated with iron oxide, clay, organic matter etc. forms rocky beds and lobsters and crabs which are enveloped by the crusts do consists of carbonate of lime along with the phosphate of lime. Therefore it is considered to be the ordinary ingredient of minerals and common waters.

Creta praeparata/ prepared chalk (Hindi: khariya; Bengali: khari) is an aboriginal friable carbonate of lime which is made free from impurities by elutriation, means, powdered chalk is washed with water, decanted and allowed to subside, this sediment part is the pure form of carbonate of lime free from any kind of sandy matters and soluble saline.

Uses:

Internally

- Neutralises the gastric juices
- Effective in dyspepsia due to acidity of the stomach
- It checks on the sour blenching
- Helps in the treatment of gout and rickets
- Creta acts as an antidote for the poisoning by minerals

Externally

- It acts as an dessicant and absorbent
- Helpful in burns and slight abrasions
- Effective in intertrigo of children and in inflammations like erysipelous
- Application of chalk ointment is found to be useful in scalds
- A compound by mixing chalk with that of the linseed or olive oil and vinegar to the honey or sugar syrup like consistency is effective for burns
- Helps to lessen the discharge from ulcers

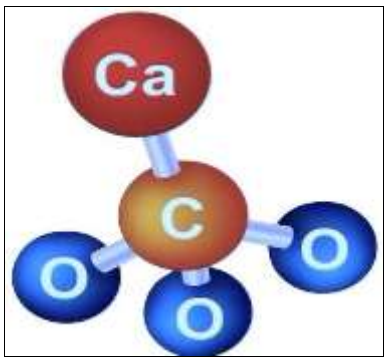

Fig 3: Structure of Calcium carbonate (CaCO3)

Calcii hydras

Calcii hydroxidum, calcium hydroxide [5], calci hydroxide and calcium hydrate are its other names.

In English it is known as slaked lime [2, 5], in Sanskrit *churna*, in hindi *chuna*, in Punjabi *kalai*, in Bengali *chun* etc.

Lime water is prepared by adding a gallon (about 4l) of water to 2 ounces of slaked lime. It is allowed to stay still for some time and the clear water is decanted.

Uses

- It is included in plentiful number of compounds which are used to cure dyspepsia. When children suffer from

dyspepsia, it is given with milk. A better formulation is adapted to administer it in infants and children called saccharated solution of lime by adding powdered white sugar.

- Lime water is given in dyspepsia, heart- burn, indigestion, belching.
- Lime water in dose of 1.5 to 2 ounces is given with milk when the urine is scanty and dark colored, belching and vomiting is there.
- It is effective in diarrhea when given along with the mucilages. If the results are unyielding then 10 drops of laudanum may be added to it to cure the condition. In chronic cases of dysentery, the same treatment is given along with the enema of lime water diluted with an equal amount of milk or mucilage. When vomiting and diarrhea occurs to children or infants which could be the result of artificial feeding, lime water (1 part) is made to dilute with the milk (4-6 parts) or the saccharated lime may also be the good option to treat the condition.
- Lime water (half ounce) along with milk if applied 3-4 times a day, is proved to be beneficial in curing the scrofula and the ulcers or abscesses which occur again and again and in warts of children.
- In diabetes, lime water and milk is advised for consumption as an ordinary beverage.
- Lime water in plentiful of milk act as an antidote for the arsenic poisoning and the poisoning caused by the minerals.
- When any inflammatory swelling, pruritus ani and pudeni is bathed with the tepid lime water 3-4 times a day, gives the relief.
- Injection of Lime water (1 part), diluted with 2-3 parts of water is injected to give the relief in leucorrheal and other vaginal discharges.
- Solution of lime water and calomel (mercurous chloride, Hg_2Cl_2), if applied continuously with help of lint to the syphilitic ulcers and chancres cures the condition.
- Lime water pure or mixed with some bland oil, if applied as an emollient to the skin diseases which are attended with the secretions, irritation or burning sensation, to burns and scalds and to the sore or crackled nipples, effectively treats the condition.
- Lime water diluted with the equal parts of water or milk is an effective injection to resolve the discharge from ear and nose.
- Enemas of it are effective in thread worms in children.
- Lime liniment which is called as Carron oil prepared by mixing equal parts of lime water and olive or sesame oil, preferably sesame oil and agitated to form a homogenous mixture, is applied to the scalded part with the help of lint, very helpful in resolving the condition. The same liniment is also helpful in preventing the pitting caused by the small pox.

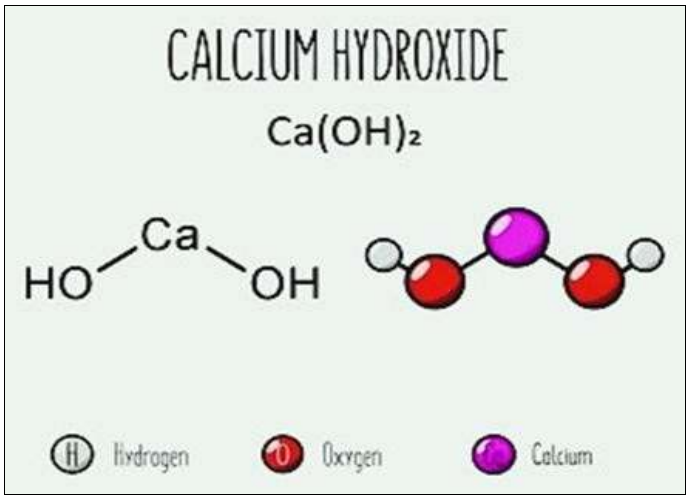

Fig 4: Structure of Calcium Hydroxide (Ca(OH)2)

Calcium oxide/ calx

Lime is derived from limestone. It is calcined cowries, conch shells, snail shells etc. Calcium Carbonate (CaCO3) is heated to high temperature in a kiln, carbon dioxide gas (CO2) is released into the atmosphere and a residue, calcium oxide (CaO) is formed. The calcium oxide is a powerful acid-neutralization agent. It is widely used as a soil treatment agent (faster acting than aglime) in agriculture and as an acid-neutralization agent by the chemical industry [3].

As a commercial product, lime frequently also contains silicon oxide (sand), magnesium oxide, and trace amounts of iron oxide and aluminum oxide. This is because "limestone" has these contaminants in it. It is primarily CaCO3 which when heated at high temperatures forms CaO:

$$CaCO3 + heat \rightarrow CaO + CO2$$

This is achieved by heating the substance to roughly 825 °C, a process known as "calcination" or "lime burning" which releases a CO2 molecule and leaves behind "quicklime". This process is reversible since the quicklime product instantly starts absorbing carbon dioxide from the atmosphere after cooling, eventually turning back into calcium carbonate [12].

It is obtained by calcination of chalk, marble and lime stone in a wind furnace or kiln with coal. It has been found to be occurring in mineral as well as plant kingdom. Carbonate, phosphate, silicate and biborate of lime are the combined forms of it in mineral kingdom. In plant kingdom, it is present as combination with vegetable acid [3].

In witlow, 3 parts of butter and 1 part of wet choona is mixed together to make an ointment, applied on effected

area twice, cures the condition [3].
A paste prepared with equal amount of quicklime and ash of the pearl is found to be effective formulation for removing the warts [3].
I ounce (~28.35 gms) of quicklime and 2 ounces of sulphur is boiled in 15 ounces of water untill it becomes 10 ounces. After decantation, when it is applied for 3 to 4 days at night, effectively cures the condition [3].
Sulphuret of sodium, barium and arsenic is combined in the proportion of 3 to 1 with the *choona*, helpful in removing the excessive unwanted hair. For the same, quicklime 4 parts, yellow orpiment 2 parts, *Butea frondosa* seeds 2 and *Calotropis gigentea* 3 parts is made into paste and used [3].
Similarly, when suphuret of arsenic is mixed with *choona*, is helpful in treating the indolent ulcers [3].
Quicklime (1 ounce) mixed with precipitated sulpher (2 ounces) boiled in 15 ounces of water until it becomes 10 ounces and decanted, applied in case of ringworm (Dhobie's itch) every night for 3 to 4 days, effectively cures the condition [3].
Unslaked lime or quicklime has been used as caustic [3].
Quicklime has been found to be useful in urinary trouble, acidosis, jaundice and enlarged glands [3].
Paste made of quicklime 2 parts and gum resin of Garcinia pictorial or Morella (Gamboge) 3 parts is used to treat and relieve the painful conditions like neuralgic head, gouty joints [3].
Calcined lime stone is found to be effective in removing the turbidity of palm oil [12].

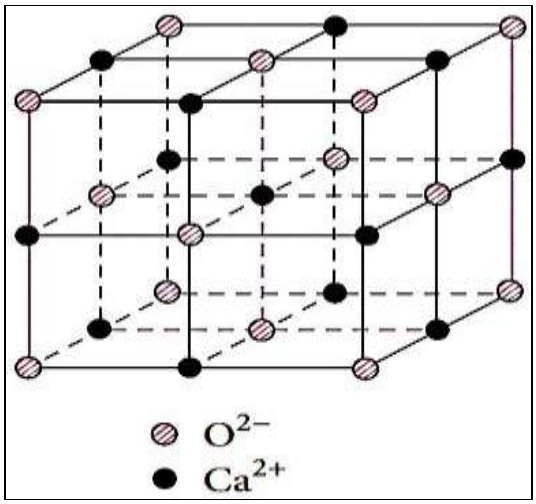

Fig 4: Structure of Calcium Oxide (CaO)

Therapeutic uses in Unani medicine

Skin diseases

It removes moles if applied along with *hartal* [5].
Extinguished *choona* is effective in treating the inflammatory conditions by augmenting its process [5].
Lime if applied along with *roghane alsi* (*Linum usitatissimus*) or *roghane til* (Sesame oil) by using a cotton ball is found to be effective in preventing pits caused due to small pox [4].
If there is itching and macule or discharging papules, then lime could be applied and removed with water followed by the application of *roghane gul* (*Rosa damascene* oil) or *karafs* (*Apium graveolens*) decoction [4].
If the skin becomes blistered due to the carminative effect lime then apply decoction of *khatmi* and *roghane badam* (*Prunus amygdalus*) or *dewdar* (*Cedrus deodara*) [4].
Ahak maghsul (Decanted *choona*) along with ghee if apllied on eroded skin and burnt skin, it gets improved quickly [4, 5].
It is must to wash *choona* several times (At least 7 times) before its application on the burnt skin [4]. *Hakeem Ali* in his *Risaalaye Mujarrabat* has mentioned the effectiveness of *choona* in burnt wounds (Weather by dry heat or wet heat). He mentions that if a piece of cloth smeared with 7 times washed *choona* is applied over the burnt area and changed several times, it is very effective in healing the wound [4].
If *Marham* (paste) prepared with equal amount of *choona* water and *alsi* oil applied on burnt area, is effective in resolving the condition and minimizing the burning sensations [5].
Effective in minimizing the bleeding if sprinkled on fresh injuries [5, 9].

GIT diseases

In cholera, *aabe aahak* (Lime water) and *aabe pyaaz* (Onion water) in equal amount along with honey is effective [5].

Lactose intolerance

Gaster of some children is not capable of digesting milk and they frequently vomit out the spoiled milk, *choona* is found to be very effective in resolving this problem. It can also be used in case of adults and olds for the same problem [5].
In gastriris and gastric carcinoma, *aabe zulale choona* along with milk in equivalent amount is found to be effective [4].
It is usually given in people whose stomach is not able to digest the milk. For this, *aabe zulaal choona* (1 part) is given with milk (4 parts or more) [4].
Its Pessary is responsible to treat the bleeding motions [4].
Lime, 4*jau*-8*jau* (1*jau*=4*chawal*~60mg) along with honey is helpful in bleeding due to hemorrhoids [4].
It improves loose motions if paste is applied on the anal region [4].

Cardiac activity

As per Unani physician's experiences, if *choona* is present in therapeutic amount in the body, it helps in the contractions of the heart [4].
It helps in enhancing the coagulation property of the blood [4].

Oral problems

Effective in treating the dental carries if *zuft* along with lime is mixed by putting it on fire and applied to the dental carries [4].
Gargle of lime water is helpful in mouth ulcers [4].

ENT: Enema of lime water is found to be effective in treating the otorrhoea [4].
A tampon smeared with egg white and sprinkled with extinguished *choona*, if kept in nasal cavity, is effective in epistaxis [4, 5].

Depilatory effect

Extinguished *choona* along with *hartaal* mixed with warm water is used to remove the hairs after doing its *tila* on skin [5].
Extinguish lime (~5 gm) in a vessel, once it becomes cool, mix it with *hartaal* (~20 gm) and apply on area from where the hair are intended to remove. This formulation in Unani is called as *Noora*. When hairs are removed, wash the area

with warm water followed by the application of sesame oil [4]. *Hakeem Ali* has mentioned another method of preparing *Noora* as: grind unextinguished lime (2 tola), *hartaal* (~69gm), *elwa* (*Aloe barbadensis)* (4 gm) separately and mix them well together by adding adequate amount of water. Add an egg and *roghane gul* (*Rosa damascene* oil) (69 ml) to make a highly potent depilatory [4]. (To remove the obnoxious smell of *noora*, addition of *mehndi* (*Lawsonia inermis*), *gule surkh* (*Rosa damascene* oil), *gule chameli* (*Jasminum officinale*), *kapad kachri* is advised.
Lime (4 *jau*-8 *jau*) along with honey is helpful in bleeding due to hemorrhoids [4].

STDs
1.5l of lime water mixed with 15 *ratti* (1 *Ratti*~125mg) *raskapoor* (*Mercuric chloride*) is beneficial in syphilis [5] and in those sores which are hard to treat [5].
Enema of lime water is found to be effective in treating the vaginal white discharge, and gonorrhea [4].

Antihelminthic effect: Lime if given with the milk is found to eliminate the worms in case of children [4].

Antidote: Lime water is advised to drink in case of *sankhya* (Arsenic) poisoning [4].

Formulations of lime mentioned in Ayurvedic literature [3]

Lime is included in many different compositions for dyspepsia e.g.

- *Amrita Vati* mentioned in *Bhaishajyaratnavali* is used for loss of appetite and indigestion.
- *Agnikumara ras* increases appetite and also found to be effective in indigestion.

In *Bhavaprakash* calcined conch shell is recommended to be taken with lime juice in enlarged spleen.
Shankha bhasm (Calcined conch) is one of the ingredients in *Krimi-dhulijalapraba Rasa* which is effective in jaundice, urinary trouble and acidosis.
Recommendation by *Chakradatta*, lime is used as caustics in various amalgamations for application to enlarged glands and tumors.
In *Sharangadhara*, a paste in which conch shell lime is one of the ingredients is used as a depilatory cream. This paste is applied to the part for seven times from where the hairs are supposed to be removed.

Clinical trial
Calcium oxide (CaO) nanoparticles (Nps) were produced biosynthetically in a work by Maringgal B. *et al*., 2020 [12] by depositing and precipitating calcium carbonate ($CaCO_3$) in Trigona sp. honey. While the photos from atomic force microscopy revealed an average height of 2.3 nm, the images from field emission scanning electron microscopy revealed a spherical morphology with an average nominal pipe size (Nps) below 100 nm. Sharper peaks from the X-ray diffraction pattern analysis were suggestive of well-crystallized CaO Nps. The Debye-Scherrer equation was used to calculate the average particle size, which came out to be 51.64 nm. In contrast, the Fourier Transform Infrared Spectroscopy (FTIR) spectrum revealed the intense peaks of amines, amides, and hydroxyl and carboxylic groups. Thus, these biosynthesized CaO Nps produced at a 15% concentration showed the highest level of inhibition against the anthracnose illness. When they were tested for cytotoxicity against MRC 5 and VERO cells, they were determined to be harmless [13].

Conclusion
Choona (lime) has been in use since times immemorial to treat a wide range of indications, but due to the lack of scientific studies, it is devoid of recognition, and its therapeutic properties are still in veil. Unani classical literature has ample evidence which describes the efficacious role of *Choona* in dermatological, gastro-intestinal, cardiac, oral diseases. It exhibits significant potential in the field of medicine due to its antimicrobial, anti-inflammatory, and tissue-regenerative properties. Its ability to neutralize acidity, absorb moisture, and act as a sterilizing agent has made it valuable in applications such as wound care, dental treatments, and pharmaceutical formulations. CaO-based materials are being explored for drug delivery systems and bone regeneration due to their biocompatibility and osteoconductive properties. Additionally, its role in promoting disinfection has shown promise in controlling microbial infections, particularly in healthcare settings.
Despite these advantages, challenges remain regarding its potential toxicity, precise dosage control, and reactivity with biological tissues. Future research should focus on mitigating these limitations by developing safer formulations and exploring CaO-based nanomaterials for enhanced therapeutic efficacy. With ongoing advancements, calcium oxide is poised to play an increasingly important role in medical innovations, particularly in areas like wound healing, implantology, and infection control.
Therefore, it is worthwhile to conduct more robust pharmacological, pharmaceutical and clinical studies to establish its potentialities in treating various diseases.

Conflict of Interest
Not available

Financial Support
Not available

References
1. Oates JAH. Lime and limestone: chemistry and technology, production and uses. Weinheim; New York: Wiley-VCH; 1998.
2. Folk RL. Practical petrographic classification of limestones. AAPG Bulletin [Internet]. 1959 Jan 1;43. Available from: https://doi.org/10.1306/0bda5c36-16bd-11d7-8645000102c1865d.
3. Nadkarni KM, Nadkarni AK. India materia medica. Vol. 2. 3rd revised and enlarged edition. Mumbai: Popular Prakashan Private Limited; 2009. p. 40-45.
4. Ghani N. Khazainul Advia. New Delhi: Idarae Kitabul Shifa; YNM. p. 621–624.
5. Kabeeruddin M. Makhzanul Mufradat. New Delhi: Ejaz Publication House; 2007. p. 246-248.
6. Muhammad UL. Limestone as solid mineral to develop national economy. American Journal of Physical Chemistry. 2018 Jan 1;7(2):23-33. DOI:10.11648/j.ajpc.20180702.13.
7. Arkhurst EK, Andoh P. Examining the economic benefits of oyster shells in lime production in Ghana.

International Journal of Innovative Research and Studies. 2016 Oct, 3(11).
8. Bowles O, Banks DM. Limestone: general information. Part 1. US Bureau of Mines. Scott Turner, Director; 1933 Jun. p. 2.
9. Nabi MG. Makhzanul Mufradaat wa Murakkabat. 2nd ed. New Delhi: Central Council for Research in Unani Medicine; c2007. p. 118 Urdu.
10. Hakeem MAH. Bustan ul Mufradat. New Delhi: Idarae Kitabul Shifa; 2002.
11. Saldanha RB, da Rocha CG, Caicedo AML, Consoli NC. Technical and environmental performance of eggshell lime for soil stabilization. Construction and Building Materials. 2021 Sep;298:123648. Available from: https://doi.org/10.1016/j.conbuildmat.2021.123648.
12. Ropp RC. Encyclopedia of the alkaline earth compounds. Elsevier; 2013.
13. Maringgal B, Hashim N, Tawakkal ISMA, Hamzah MH, Mohamed MTM. Biosynthesis of CaO nanoparticles using *Trigona* sp. honey: physicochemical characterization, antifungal activity, and cytotoxicity properties. Journal of Materials Research and Technology. 2020 Sep;9(5):11756–11768.

How to Cite This Article
Chauhan R, Jameel S, Saleem MN, Siddiqui AI. An appraisal of medicinal properties of Choona (CAO) in Unani system of medicine. International Journal of Unani and Integrative Medicine. 2025; 9(1): 01-07.