

Research Article

Zumurrud (emerald): Medicinal Potential of a Gemstone from *Jawaharat-i-tis 'a* (navratan), in the Perspective of Unani Medicine

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A B S T R A C T

Emeralds are transparent and coloured varieties of beryl mineral. It is categorised as a precious and valuable stone. It has a beautiful, intense, and radiant green colour. Emerald is one of the most expensive gemstones due to its bright green colour, durability, and rare availability. A fine and top quality emerald is more valuable than diamonds. Basically, it is found in gold mines and takes a long period of 21 years to reach its complete formation. Emerald has been used for medicinal purpose from ancient time. In Babylon (the oldest gem market), the fine quality emerald crystal gem was dedicated to the goddess Venus. In the case of emerald, it is believed that it represents immortality and faith. In the Unani system of medicine, it is used as a vital organ tonic, cicatrizant, diuretic, lithotriptic, antidote, eye tonic, blood purifier etc. It is used in cases of anuria and some psychic conditions like stress and anxiety. It stimulates the use of greater mental capacity and enhances memory. No pharmacological studies on emerald have been done yet, so this article has been compiled for its medicinal uses in the perspective of Unani medicine to provide a lead for pharmacological studies on this precious gemstone.

Keywords: Unani Medicine, *Zumurrud*, Emerald. Gemstone, *Jawaharat-i-tis 'a*, Epilepsy, Palpitation

Introduction

The Unani System of Medicine provides health care by various natural sources like plants, minerals, and animal substances, called *Mawalid-i-Thalatha*.¹ Stones, particularly gemstones, have been a prized possession of human beings from time immemorial for their lustre as well as their presumed healing properties. It remains to be seen

whether such traditional medicinal uses can be validated by modern science. Emerald, ruby, and sapphire are all considered as precious gemstones which come under *Navratnas* and are used for medicinal purpose in Ayurvedic and Unani System of Medicine. *Zumurrud* or Emerald is a green colour stone. Its colour is due to the presence of trace amounts of the elements, chromium or vanadium.²

The word "EMERALD" is derived from the old French word "esmeralde" and the Middle English word "emeraude"; from the Vulgar Latin word "esmaralda/ esmaraldus", a variant of Latin "smaragdus", which originated in Ancient Greek (smaragdus means Green gem). Emeralds are the transparent and intense radiant green coloured varieties of beryl mineral and are much valued as precious stones. Commonly emerald is known as "Panna" in Hindi and "Zumurrud" in Arabic. One more stone is known as *Zabarjad* (peridot) is often confused with *Zumurrud* (emerald).³ *Zumurrud* or *Panna* of high quality is a dark green coloured, transparent stone with a velvety reflection.³ The top quality emerald is considered more valuable than diamonds due to its green colour, durability and rarity, while the old *Zumurrud* is black in colour and hard in nature. It is found under the earth and obtained from the gold mines in Western Asia, especially on *Jabl-i-Misr* near the Hills of *Maqtam* and *Bajat*, and also from Sudan.^{3,4} The mines which are found in Sudan are known as Cleopatra's mines. The description given in Unani classical books as the basic matter of *Zumurrud* is gold. The dryness and hardness of the mines convert gold into precious stones called *Zumurrud*. The formation of *Zumurrud* takes in goldmines 21 years.⁵ *Zumurrud* represents immortality and faith, hence in the ancient civilisations like Babylon (400 B.C.), fine quality *Zumurrud* was dedicated to the Goddess Venus. In the Indian civilisation, the *Panna* was one of the *Navagrah* stones (stones that represents the nine planets that have a cosmic influence on all earthlings). It represented Mercury which is related to business, communication, intelligence, and education. In Vedas, it is called Panna. It is described in Vedas that it evokes the desire of eating cold and sweet food. It is also used in piles, *Du'f Haqm*, and jaundice.



Figure 1. Various Forms of *Zumurrud* (Emerald)

Material and Methods

Numerous authentic publications, both printed and electronic, were searched for the collection of the data on types, therapeutic uses in Unani Medicine, mineralogy, and pharmacological studies, etc. on *Zumurrud* (emerald). All relevant articles up to 2020 were obtained from 14 Unani books, 02 review papers, and 01 English book. Genuine materials published in PubMed, Science Direct, Google Scholar, and Research Gate were referred to assemble all the latest data. Appropriate Unani terminologies were taken from the Standard Unani Medical Terminology published by the Central Council for Research in Unani Medicine in collaboration with the World Health Organization. The images were collected by the author from Rajasthan, India.

Types of *Zumurrud*

In the classical literature of Unani medicine, emerald is classified into seven types on the basis of its colour. They are mentioned as below:

1. *Zumurrud Zababi*: its colour resembles a green fly, so it is called *Zababi* (fly coloured).⁴ It is also called "*Sa'idi Zumurrud*" because it is obtained from Sa'id-i-Misr (Egyptian mines).⁶
2. *Zumurrud Rehani*: Its colour is similar to the leaf of a plant namely *Rehan* (*Ocimum sanctum*). It is also known as "*Zumurrud Nau*".⁴
3. *Zumurrud Fistaqi*: The colour is greenish-black like *Pista* or *Fistaq* (*Pistacia vera*). It is also known as "*Zumurrud Kohna*" meaning old emerald.^{4,6}
4. *Zumurrud Silqi*: The colour is the same as that of the leaf of *Chukandar* (*Beta vulgaris*).^{4,6}
5. *Zumurrud Zangari*: It seems like verdigris (*copper acetate*).⁴
6. *Zumurrud Kurrathi*: The colour seems like the leaf of *Gandana* or *Kurrath* (*Allium ascalonicum*).⁴
7. *Zumurrud Sabuni*: It is whitish-green in colour and is considered to be the worst quality.⁴

History: According to Azam Khan, "it produces blindness in snakes, if kept in front of snakes". Mughal king Humayun, on the basis of experiments, wrote in his book "Prototype of stones", that no such effect can be seen on snakes hence this hypothesis is not true.⁶ It is believed that if someone wears a *Zumurrud* stone set on gold plated ring on his/ her little finger, he/ she gains huge popularity in the world, because of this fact, royal families put *Zumurrud* ring on their beloved ones after birth. In ancient books, it is written that *Zumurrud* protects from plague and seizures. If *Zumurrud* is put on as a necklace in case of a seizure at the time of the episode, it not only stops them but also prevents further episodes throughout the course of life.^{5,6}

Distribution: The mines of *Zumurrud* are found in the Red Sea in Egypt. The preferred best quality is found in

Columbia. In India, it occurs in Bubani and Rajgarh mines in Ajmer, Kalaguman, Tekhi mines in Udaipur, and from Birmaharajapura to Patangarh in Kalahandi in Orissa. It is also found in Karnataka, Andhra Pradesh, Tamil Nadu, Bihar, and Jammu and Kashmir.

Mutaradifat (Vernacular Names)

- Arabic: *Hajr-i-Karim, Zumurrud*⁴
- Bengali: *Pana*⁴
- English: *Emerald*⁴
- Hindi: *Panna*^{5,8}
- Latin: *Smargadus*
- Persian: *Zumurrud*
- Sanskrit: *Harit Ratan, Harida Ratan, Marakatha Mani, Tarksiya*
- Sindhi: *Zumurrud*⁴
- Tamil: *Maragatham*

Mizaj (Temperament): According to the theory of Unani medicine, the drugs work in the body by their specific temperament, some of them are hot and some cold, associated with secondary functions like dryness or moistness. Aristotle, told that, *Zumurrud* acts with its cold and dry temperament,³ some physicians considered it cold in 2nd degree and dry in 3rd degree^{5,7} while some says it hot and dry in 1st degree,⁵ cold with intense dry; and hot and dry also.

Nafa' Khas (Main Action): *Muqawwi Qalb-wa-Dimāgh* (cardiac and brain tonic), *Muqawwi-i-Harārat-i-Ghariziya* (tonic of innate body heat).

Af'al (Functions): It has *Mufarriḥ Aza-i-Raisa* (exhilarant of vital organs), *Muqawwi-i-Aḍa-i-Rāis* (tonic to vital organs),^{4,9} *Muqawwi-i-Hararat Ghariziya* (tonic to innate heat), *Mun'ish-i-Harārat Ghariziya* (stimulant of innate heat), *Muqawwi-i-Mi'da* (stomachic), *Muqawwi-i-Jigar* (liver tonic), *Muqawwi-i-Gurda* (renal tonic),⁹ *Mujaffif* (siccative), *Mudirr-i-Bawl* (diuretic), *Mufattit-i-Hasāt* (lithotriptic), *Taryāq-i-Samoom* (antidote of poisons),^{3,4} *Muqawwi-i-Basar* (eye tonic), and *Musaffi-i-Khoon* (blood purifier)⁷ properties.

Forms and Method of Use: In compound formulations, emerald is used in various forms like *Zumurrud Sāeda*, *Zumurrud Mahlool* (fine powder), and *Kushta* (calx) for oral use and *Surma* (corylum) for local/topical use. It is also worn on the neck as a pendant for medicinal as well as ornamental purposes. Mostly its fine powder after *Sahaq-i-Baligh* (obtained from rubbing continuously for a long time) and *Kushta* (calx) prepared by a specific method are used medicinally in various compounds such as *Yaquti*, *Khamira* etc.⁴ The method of preparation of *Kushta* is as follows.

1 *tola* (10 g) *Zumurrud* is taken along with *Arq-i-Gulāb* (rose water) and made into tablet form by rubbing it in *kharal* (mortar and pestle). Then the tablets are put in between

Maghz Gheekawār (*Aloe vera*) into a *buta* (two clay pots). Now the *buta* is covered and enclosed with the help of soil and cloth, for which a special term is used known as *Kapdawti*. Now the *buta* is put into a pit and is heated with the help of 12 ser UPLE. Once it cools down, the drug is collected from the *buta* in oxide form called *Kushta*.⁹

Iste 'malat (Therapeutic Uses)

It is used to treat several ailments like *Yaraqan* (Jaundice), *Khafaqan* (palpitation), *Naftud Dam* (hemoptysis), *Dātul Janb* (pleurisy), *Dātur Riya* (pneumonia), *Ishāl-i-Damwi* (bloody diarrhoea), *Istisqā* (ascites), *Du'f Mi'da* (stomach weakness), *Du'f Jigar* (hepatargia), and *Du'f Gurda* (renal weakness).⁴ *Zumurrud* is effective against psychiatric conditions like anxiety and stress. It has lithotriptic action hence used in renal and bladder stones. It is used for the purification of blood and in urinary diseases, and also for some kinds of cardiovascular diseases. It is effective against pulmonary tuberculosis and gives corroboration to the heart, brain, liver, and kidneys. It is effective in *Ihtibas-i-Bawl* (anuria). Emerald is also useful in the treatment of deafness and dumbness. It is reported that emerald can be used to enhance memory and stimulate the use of greater mental capacity. It helps combine intelligence with discernment, allowing for the choice of right action. It is very useful in cases of bites of poisonous insects and animals.^{3,7} Its uses in various ailments for the treatment purpose are described below:

Sar' (Epilepsy): Wearing it as a pendant or a ring before the onset of seizure prevents epileptic fits.^{3,7}

Intishar Shā'r (Hair loss): Fine powder of *Zumurrud* mixed with other drugs (creams and ointments) produces good results in *Ganj* (chronic baldness), and *Huzāz* (dandruff).^{3,6}

Du'f Basar (Low eye vision): The *Kohl* (Surma) of *Zumurrud* acts as *Muqawwi-i-Basar* (eye tonic) and is useful in *Sabal* (pannus).^{6,7,10}

Amrad-i-Qalb: Taking orally and/ or wearing as a ring or pendant is useful for strengthening the heart, its powder is very useful for the treatment of palpitation.⁶

Amrad-i-Riya (Diseases of the lung): Taking powder orally and/ or wearing it as a ring or pendant is useful for lung diseases, e.g. *Naftud Dam* (haemoptysis), *Dātul Janb* (pleurisy), *Dātur Riya* (pneumonia) etc.⁶ *IbnBaitar* has mentioned that it is very useful to cure haemoptysis if taken orally.³ According to *Ibn Masoya*, its pendant is applied to cure haemoptysis.

Amrad-i-Mi'da wa Am'a (Gastrointestinal diseases): With reference to *Ibn Masoya*, *IbnBaitar* has mentioned its usefulness in case of bloody diarrhoea, if taken orally.³ Taking powder orally and wearing a ring or pendant is useful for strengthening the stomach and liver.⁶

Amrad-i-Bawl (Diseases of Urinary System): *Zumurrud* is taken as a powder to cure cholelithiasis, vesical stone, and retention of urine etc.⁶

Quruh, Juruh wa Buthur (Wound, ulcer, and boils) etc.: A fine powder of *Zumurrud* mixed with creams and ointments produces good results in chronic wounds.³

Juzam (Leprosy): A fine powder of *Zumurrud* mixed with creams and ointments produces good results in leprosy. The powder is also used orally for the same cause.⁶ A similar stone called *Zabarjad* (peridot) is also useful in *Juzam* (leprosy).³

Poisoning: 60 mg of powder acts as an antidote in cases of poisoning if used before the poison reaches up to the heart. The dose of 500 mg of *Zumurrud* prevents the harmful effects of poison.⁶

Miqdar Khurak (Dose): The dose is 250 mg - 3.5 gm in the form of powder. In the case of poisoning, 500 mg is used as an antidote; in cases of *Nafthud Dam*, 250 mg is taken orally.⁶

Hakim Najmul Ghani has mentioned the dose as 6 Ratti (750mg) in the case of poisoning and in the case of *Nazfud Dam*, it can be taken as 4 Jaw (barley).⁵ According to Kabiruddin, 500 mg-1 gm as powder and 1-2 Ratti (125 mg-250 mg) as *Kushta* can be used.⁴

Mazarrat (Adverse effect and toxicity): It is harmful for urinary bladder and for the individual having cold

temperament,^{7,11} it also causes dryness in the stomach.⁸

Musleh (Corrective): *Mushk* (*Moschus moscatus*), *Gulab* (*Rosa damascena*) or *Arq Kewra* (*Pandanus tinctorius*) can be used to counter its adverse or harmful effects.^{4,7}

Badal (Substitute): *Zabarjad* (peridot) can be used as a substitute in case of poisoning and *Gil-e-Makhtoom* or *Marjan* (coral) for diarrhoea.^{6,7,8,10}

Specifications of Emerald

The chemical formula of emerald is $3\text{BeO} \cdot \text{Al}_2\text{O}_3 \cdot 6\text{SiO}_2$. It possesses 12-13% Be with a specific gravity of 2.6-2.8, Mohs hardness of 7.5-8, and refractive index of 1.57- 1.58.¹² The most common treatment to enhance the quality of the stone is oiling filler along with oil. Scientists have synthesised this gemstone many times in the laboratory but the first commercial synthetic emerald was synthesised by Carroll Chatum in 1940.

Purification of Emerald

The purified form of emerald for the treatment purpose is obtained by putting in a poultice of *Gmelina asiatica* in an earthen shell sealed with a mud smeared cloth and by giving heat of 10 cow dung cakes.¹³

Compound Formulation: *Kushta Zumurrud*, *Khamira Gaozaban Ambari Jawharwala*, *Jawarish Aamla Lulvi* etc (Table 1).

Table 1. Compound Formulation of Emerald (Zumurrud), their Dosage and Indications

S. No.	Compound Formulation	Form of Zumurrud Used	Dosage/ Route of Administration	Indication
1.	Habb-i-Jawahar Muwallif ¹⁴	Zumurrud	2-5 g/orally	It has tonic, astringent, expectorant, wound healing properties and is used for tuberculosis and diarrhoea
2.	Jawaharmohra ¹⁵	Zumurrud	60-120 gm	It is a general tonic and has analgesic property. It is used for the treatment of weakness of vital organs, epilepsy etc.
3.	Jawarish Aamla Lulvi ¹⁶	Zumurrud Mahlool	6 g after meal/orally	Bilious diarrhoea, hepatargia, stomach weakness, cardiac weakness, palpitation etc.
4.	Kushta Zumurrud ^{15,17,18}	Calx	30 mg; 60-125 mg	It has heptatonic, cardiac tonic and is used for hepatargia, renal weakness, vesical weakness, frequency of urination, excessive urination.
5.	Kushta Marjan Jawahar wala ⁹	Zumurrud	60 mg/ orally	It is used to cure weakness of the brain, cardiac weakness, cough, coryza, catarrh, and headache.
06	Khamira Gaozaban Ambari Jawhar wala ¹⁵	Zumurrud	3-5 g/ orally	It is used to cure weakness of the brain, cardiac weakness, palpitation, restlessness, melancholia, nerve weakness, chronic catarrh
07	Khamira Zumurrud ¹⁹	Zumurrud Saeda	5 g orally	Cardiotonic, exhilarant, antianxiety, and palpitation

08	Kushta Marjan Jawaharwala ^{9,15}	Zumurrud powder	60-120 mg	It is a general tonic and is used for weakness of the brain, cardiac weakness, restlessness, and chronic catarrh.
09	Kushta Zumurrud ¹⁵	Zumurrud powder	30 mg/ orally	It is used for hepatargia, cardiac weakness, cough, and excessive micturition.
10	Majun Murawweh al Arwah ⁹		1 g with ma'ul laham 60 ml/ orally	It is used for sexual weakness and weakness of vital organs.
11	Ma'jun Tila ⁹	Zumurrud Fine powder	3 g orally with vehicle	Cardiac tonic, mood creator and used for palpitation and faintness
12	Qurs Dhayabitus Khas ¹⁵	Calx	1-2 g	Diabetes

Conclusion

Zumurrud (emerald) is a precious gemstone known under Navratnas. It is used as a medicine since time immemorial. It is one of the preferred drugs of Unani physicians to treat cardiac, brain, and liver diseases. However, there are no scientific studies regarding its pharmacological properties, so this paper is compiled for highlighting the hidden medicinal uses of the stone and further necessary pharmacological researches to validate its medicinal properties as mentioned by various Unani physicians.

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Conflict of Interest: None

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