

Marjan (Coral): A Valuable Unani Medicine Having Multifarious Medicinal Uses

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Abstract

Busd-i-Ahmar or Marjan is also known as Munga in Unani Medicine. It is a valuable drug with multifarious medicinal uses. It is obtained from marine source *Corallium rubrum* L. of Corallidae family. It is a porous and hollow structure found in various colours e.g. white, dark red, and black. Mainly red colour is used for medicinal purpose in various forms like Ash, Calx, Tooth powder, Surma (corylum) etc. Internally it acts as astringent, styptic, antidiarrheal, diuretic, detoxificant and tonic for vital organs. It has been used since time immemorial to treat various ailments e.g. melancholia, epilepsy, paralysis, hemoptysis, renal calculi, nerve weakness, cardiac weakness, brain disorders etc. It is a great source of calcium and iron and some quantity of copper etc. which makes it valuable for iron and calcium deficiencies and general weakness. It is highly efficacious in cough, anemia, asthma, paralysis, anorexia etc. This review provides detail about the medicinal uses of Marjan in various systemic and non-systemic diseases in the light of classical literatures of Unani Medicine.

Keywords: Marjan; Busd-i-Ahmar; Coral; Paralysis; Anemia; Calcium Deficiency

Introduction

Every living organism is made up of certain chemical constituent with slight variation, therefore, in any illness of human being three sources of drug (Mawalid-i-Thalatha) are used either alone or in combined form for the treatment purpose. They are plant, mineral and animal substances. The substances from animal source are used in USM since long time, which provides essential requirements of the body like hormones, micronutrients such as iron, calcium, zinc, copper etc. [10]. So various drug substances like Jund Bedastar (castorium), Regmahi (sand fish lizard), Marjan

(coral), Lulu (pearl) [1,2], Lajward (Lapis lazuli), Zumurrud (emerald), Khubsul Hadeed [3-5] etc. are being used successfully in various forms like Ma'jun, Khamira, Kushta, Powder etc. [6]. As calcium is an essential element for the nutrition of tissues of heart and lungs, therefore various formulations containing calcium are used which are made from Marjan, Sadaf, Marwarid and many other natural sources of Unani Medicine. In USM the drugs containing calcium and iron are utilized as a whole in oxide form instead of extracting calcium form, it is considered as a safe mode of administration. Marjan is a renowned, animal origin drug of

Unani Medicine which is obtained from the colonies of calcareous skeleton of a mollusk namely *Corallium rubrum* L. It is dark red, porous and hollow structure comprises of calcium, iron, copper, zinc etc., therefore it is useful in general debility and weakness of heart and lung functions and also in organ dysfunction. It is a well-known fact that calcium is an essential element of the human body and involves in various biochemical functions of the body and tissues get nutrition from this element and is also an important component in blood to maintain pH of blood. So in the presence of these precious elements Marjan got special attention by Unani fraternity and that is why it is used in several form like Kushta (calx) and Sokhta (ash) of Bikh-i-Marjan and Shakh-i-Marjan etc. either alone or in various compound formulations e.g. Khamira, Ma'ajeen, Kushta, Qurs, Habb, Kohl, Safoof etc. [6-9].

Coral is purified by being boiled in a decoction of the T. myrobalans and then prepared for medicinal use by being calcined in covered crucible and then reduced into powder. Pravala Bhasma (coral ash) is also prepared by soaking coral for some time in lime juice, then putting it in fire and calcining and finally reducing into a fine powder [10]. Busd-i-Muharraq prepared by the method of calcination is described by Hakim Azam Khan, as follows: Marjan is crushed into pieces and reduced in powder and filled in between two crucibles of clay followed Gil-i-Hikmat then it kept in the Tanoor (manual oven) for whole night and obtained the powder in the morning.

Description of drug in unani literature

It consists of colonies of calcareous skeleton of a mollusk *Corallium rubrum* L. it is a porous, and hollow structure of dark red in colour. It is found in Bahr-i-Ahmar (Red Sea), Bahr Al-Kahil (Mediterranean Sea), Bahr-i-Awqiyanus (Atlantic Ocean) [10,11]. West Indies, Panama, Japan, Taiwan and Australia. *Corallium rubrum* L. lays eggs in water which become larva and adhere on rocks in the sea. These larvas make polyp upon one by one and collectively these are look like tree under sea. When the animals left their house after giving birth to their off springs, the house become empty, then their house comes above the sea level, and form an Island. The world's largest coral island is Coral Barrier reef situated in Australia. There are three types of Marjan mentioned in Unani classical books e.g. red, white and black. Red colour is considered best, white is lower quality and black is of worst quality. Marjan is found in two parts,

one looks like branches (the upper part) and other like root which is found on the base [12]. In a raw state the stems and branches are covered with a cortical substance which is the habitation of soft and small polypi [10]. The branches are called Shakh-i-Marjan and root is called Beekh-i-Marjan. Both are used for medicinal purpose in Unani System of Medicine, in the form of Kushta (calx) or Sokhta (burnt). Apart from the red variety it is also found in white and black colours. White variety is softer than red and black is the hard and considered as bad (toxic) [13]. Greek legends thought that red coral having magical powers. Among the Romans, branches of coral were hung around children's necks to preserve them from danger. It has been a trade item in ancient Egypt and Rome.

Taba'i Khususiyat (Physical characteristics)

Shape: Shape of small leafless bushes

Color: Intensely red or pink colored by carotenoid pigments

Taste: Tasteless [14]

Odor: Odorless [14]

Consistency: Hard [14]

Fracture: It easily breaks with crackling sound [10].

Figure 1: Showing various forms of Marjan and coral in the ocean.

Mutaradifat (vernacular names)

Arabic: Bussad, Busd, Marjan, Shakh Marjan, Busd Ahmar, Nashif, Nashaf, Hajr-i-Shajari, Qarfad [1,2,11-14]

Bengali: Palamoonga [15]

Ceylon: Bobalu [15]

English: Coral [10], red coral

French: Corail [10]

German: Korallian, [10] Rote koralle

Greek: Faliyuchaj, Qomin, Qorliyun, Qoralan [12]

Gujrati: Parwala [10]

Hindi: Moonga, Moonge Ki Jad, Parvara, Prawal, Prabal [2,10,13], Angarak Mani, Prawal,

Italian: Corallo [10]

Kannad: Hawala [10]

Kashmiri: Marjan

Malayalam: Puwalam [10]

Marathi: Praval, [2], Povalay [10]

Persian: Bissad, Kama, Kharumak, Marjan [10,13]

Roman: Qoloriyun, Quburiyun [2]

Sanskrit: Vyoma Ratana, Raktanga, Vidruma, Raktangakur, Pravala, Parbala [2] Pravala, Vidruma [10] Praval Shakh, Praval mula;

Sinhalese: Bubalo [10]

Tamil: Pavalan [10]

Telugu: Pagadmu [10]

Urdu: Marjan.

Scientific classification

Kingdom: Animalia

Phylum: Cnidaria

Class: Anthozoa

Order: Gorgacea

Family: Corallidae

Genus: *Corallium*

Species: *Corallium rubrum* L.

Ajza-i-Must'amlā (parts used)

Kushta (calx) and Sokhta (ash) of Beekh-i-Marjan and Shakh-i-Marjan [1].

Mizaj (temperament)

Cold in 1st degree and dry in 3rd degree [16]; Cold in 1st degree and dry in 2nd degree [1]; cold and dry in 2nd degree [13].

Nafa Khas (main action)

Its main action is Muqawwi Aza-i-Raisa (tonic to vital organs).

Af'al (action)

It has Hābis (styptic), Qābid (astringent), Mujaffif (siccative, desiccant), Jāli (detergent) [1,12,16], Habis-i-Dam (hemostatic) [11], Mani' Nazfuddam (anti-hemorrhagic), Mudirr-i-Bawl (diuretic), Mufattih Sudad (deobstruent), Dāfi' Waswas (antianxiety), Fād-i-Zahar (antidote), Muqawwi-i-Dimagh (brain tonic), Muqawwi 'ām (general tonic), Dafi' Jaryan, Mumsik (retentive), Muqawwi-i-ishtiha (appetizer) and anticoagulant actions. Its main action is Muqawwi-i-Qalb (cardiac tonic), Mufarriḥ Qalb (exhilarant) and Habis-i-Dam (styptic), Muhafiz-i-Janin (fetus protective) [2,11,12,14].

Iste'malat (uses)

It is used for Du'f-i-Qalb (cardiac weakness), Khafqān (palpitation), Waswas (anxiety), Du'f-i-Dimagh (weakness of brain), Du'f-i-Mi'da (stomach weakness), Du'f-i-Ishtiha (loss of appetite), Tawahhush (fearfulness), Junun (Mania), Sara' (epilepsy), Nasiyān (amnesia), Nazla Muzmin (ch. catarrh); Amraz-i-Dandan wa Liththa (diseases of teeth and gums), Amraz-i-Chashm (eye diseases) e.g. Dam'a (epiphora), cataract, blepharitis and low vision, Zukam (coryza), Su'āl (cough), Naftud Dam (haemoptysis), Sil wa Diq (tuberculosis), Nazfud Dam (hemorrhage), Ishal-i-Damwi (bleeding dysentery), Quruh-i-Am'a (intestinal ulcers). Diq

al-Nafas (asthma), Kathrat-i-Hayd (menorrhagia), Sailanur Rahim (leucorrhoea), Sang gurda wa Mathāna (renal and vesical stone), Warm-i-Tihal (splenomegaly), Bawāsir Khuni (bleeding piles), etc. [1,14,16].

Method of administration in various systemic and non-systemic diseases

Amrad-i-Dimagh wa A'sab (Diseases of brain and nerves)

- Its preparation in honey is effective for the treatment of Falij (hemiplegia), Ra'sha (tremors), Laqwa (Bell's palsy) etc. [2].
- Taking Marjan Mahlool (prepared in Arq Gulab and Arq Bedmushk) or Kushta Marjan per orally in a dose of 500 mg - 1 gm is very effective in all diseases mentioned above.
- With reference to Sikandar (Alexander) Zakaria Razi has mentioned that, its neckless is hung around the neck. It is useful to cure epilepsy [12].

Amrad-i-'Ain (Diseases of eyes)

For improving eye vision and treatment of Bayaz-i-Chashm, Jarab and Salaq it is used as SURMA in the eyes [1].

Amrad-i-Uzun (Diseases of ear)

An ear drop prepared with *Corallium rubrum* in Roghan Balsan is used to cure otalgia [14] and to prevent loss of hearing.

Amrad-i-Dandan, Liththa wa Dahan (Diseases of teeth, gums and mouth cavity):

- Its powder, when applied on teeth daily, has been found to whiten the teeth and it removes the dental plaques [1,12].
- It is also beneficial when the powder is sprinkled on mouth ulcers [2]. Application of its powder with Arq Gulab (rose water) is also found effective and this is tested several times by Unani physicians [2].

Amrad-i-Riya (Diseases of lung)

- In the form of Kushta (calx) it is useful in Su'āl (cough) and Diq al-Nafas (asthma). Its powder with egg yolk is taken to ease cough, cold, sore throat, bronchitis, pneumonia, pleurisy, congestion and pain in chest, dyspnea, asthma etc. [17].
- As per Jalinus (Galen) 2 ½ gm Marjan mixed with half the weight of the Gum acacia and egg white when taken with Arq-i-Gulab, it is beneficial in management of hemoptysis.

Amrad-i-Qalb (Cardiac problem)

- As anticoagulant, Marjan Sokhta is useful for cardiac problem, as it resolves the coagulation in the heart. It is also known to possess anticoagulant property especially in cardiovascular blockage, as stated by Ibn Zohr [2,14].

Amrad-i-Mi'da wa Am'a (Gastrointestinal diseases)

- 3 ½ gm of calcinated *Corallium rubrum* when mixed with 14 gm Sharbat-i-Anjebar has been found to be effective in Qulanj Quruhi (ulcerative colitis) [12].
- 3 gm of calcinated *Corallium rubrum* mixed with Sandal Surkh (red sandal) and then sprinkled on the hemorrhoids has been found to stop bleeding and to resolve the inflammation.
- Marjan is used as Ta'leeq on abdomen to cure Amrad-i-Mi'da [13].

Amrad-i-Jigar wa Tihal (Liver and Spleen disorders)

- As per Aminuddawla the intake of 2 gm corallium with Sikanjabeen for three days continuously has been found to be effective in resolving the inflammation and obstruction of spleen [13]. With water it is taken for the treatment of Waram-i-Tihal [16].
- With honey it is taken to detoxify the liver and spleen by removing the morbid matters [2].

Amrad-i-Atfal (Child diseases)

Marjan Mahlul is very effective in case of children having experience of fear and shouting in sleep. For the same effect it also used as Ta'leeq on the neck [2,13].

Amrad-i-Bawl wa Tanasul (Sexual disorders)

- Its Kushta (calx) is useful to cure Jaryān-i-Mani (spermatorrhoea) and Sur'at-i-Inzāl (premature ejaculation) [11].
- Its powder when mixed with Triphala and honey is taken daily after meal, it has been found to be effective in gonorrhoea.

Ilaj-i-Samoom (Treatment of poisoning)

According to Unani physicians if it is taken in the quantity of 3 ½ gm, it acts as an antidote of all the poisons [13].

Quruh wa Nazfuddam (Wounds and hemorrhagic conditions)

The powder is sprinkled on wound to remove the debris of tissues [14]. It gives beneficial effect in the management of external bleeding also. In the quantity of 1 ¼ gm along with Katira (*Sterculia urens* Roxb. gum) is taken to stop Nazfuddam (hemorrhage) [13].

Amrad-i-Mafasil wa Izzam (Joints and bone diseases)

Zakaria Razi has mentioned that, Marjan is useful to cure Niqris (gout), when tied on affected foot and it acts by Zulkhassa (specific characteristic) [12].

Miqdar Khurak (Dose)

Kushta Marjan 1/2-1 gm [1] (maximum 3 gm) with butter or Khamira Gaozaban Ambari 5 gm.

Mazarrat (Adverse effects and toxicity)

It causes nausea and harmful for kidney [1,14], throat [12] and urinary bladder [2]. According to some it causes harmful effect on nerves [12].

Musleh (Correctives)

For kidney and throat, Katira (*Sterculia urens* Roxb. gum) and Tabashir (*Bumboosa arundinacea*) are used as corrective [1] and for nausea Darchini (*Cinnamomum zeylanicum*) is used. Anisun (*Pimpinella anisum*), Katira and Samagh Arabi (*Cassia arabica*) are used as corrective for nerve [2,12,14], Sat-i-Gilo, [11] Juicy and wet things are also considered as corrective.

Badal (Substitute)

Kahruba (*Vateria indica* L.), and Dammul Akhwain (*Dracena cinnabari*) are used as substitute [1,2,12].

Murakkabat (Compound formulations)

Anushdaru Luluwi, Dawa-i-Marjan, Dawa-ul-Misk Barid Jawahar wali, Dawa-ul-Misk Har Sada, Dawa-ul-Misk Har Jawaharwali, Dawa-ul-Misk Barid Sada, Habb-i-Kabar [18], Habb-i-Jawahar, Jawahar Mohra, Khamira Abresham Hakim Arshadwala, Khamira Abresham Ood Mastagiwala, Kushta Marjan Sada, Kushta Marjan Qalbi, Kushta Marjan Jawaharwala, Majun Murawwahul Arwah, Majun Hamal Ambari, Mufarriḥ Barid, Mufarriḥ Yaquti, Mufarriḥ Yaquti Motadil, Mufarriḥ Seikhur Rais, Qurs Kahruba, Shayyaf Ahmar Layyin; Taryaqrur Rehm [6,15]. (See Table 1 for detail).

S.N	Name of compound	Dose and mode of administration	Action and uses
1	Anushdaru Luluwi [8]	5-10 g/orally	It has cardiac stimulant, nerve tonic, digestive activities, so used in stomach weakness, cardiac weakness, loss of appetite, general weakness
2	Dawa-ul-Misk Barid Jawahar wali [18]	5g in the morning	It is cardiac tonic and brain tonic and used in palpitation.
3	Dawa-ul-Misk Barid sada [8]	5g in the morning	It is cardiac tonic and brain tonic and used in palpitation.
4	Dawa-ul-Misk Har Jawahar wali [8]	5g in th morning	It is cardiac tonic and brain tonic and used in palpitation and all melancholic and phlegmatic disorders
5	Dawa-ul-Misk Har Sada [8]	5g in the morning	It is cardiac tonic and brain tonic and used in palpitation and all melancholic and phlegmatic disorders
6	Habb-e-Jawahar [7]	One pill (each 36mg) at morning/orally	It is tonic of Vital organs and used for weakness of vital organs
7	Jawahar mohra [8]	60-120mg	It is a general tonic and analgesic, used for the weakness of vital organs, general weakness, epilepsy etc.
8	Khamira Abresham Hakim Arshadwala [8]	3-6g	It is a general tonic and used for melancholia, Khafaqan, weakness of vital organs and general weakness
9	Khamira Abresham Ood mastagiwala [19]	7-10g early morning	It is a cardiac tonic, Stomachic and used for melancholia, fearfulness, external hemorrhoid.

10	Kohlul Jawahar [8]	Q.S. for local application in eyes only	It has visio improving effect so useful in low eye vision.	20	Qurs Jiryan [9]	2 tablets twice a day/orally	It has astringent, retentive, aphrodisiac properties and used in spermatorrhoea, excessive nocturnal emission, premature ejaculation, less viscosity of semen, sexual debility.
11	Kushta Marjan Jawaharwala [8]	Orally	Being as general tonic it is used in general body weakness, stomach weakness cardiac weakness and chronic coryza	21	Qurs Kahruba [19]	5-7g	It has anti-hemorhagic, so useful for hemorrhagic diseases
12	Kushta Marjan Sada [8]	Orally	Being as general tonic it is used in general weakness, cardiac weakness, chronic coryza and spermatorrhoea	22	Qurs Tabasheer Kafuri Luluvi [8]	3-5g	It has febrifuge Murattib Exhilarant Analgesic Astringent Styptic properties and used for Fever Tuberculosis Palpitation
13	Kushta Marjan Qalbi [19]	125 mg with butter, used orally	-	23	Qurs-i-Sozak [9]	4 tablets/orally	It has ciccatrizant and diuretic ptoperties and useful for burning micturition, retention of urine, urethral ulcer, urethritis
14	Majun Hamal Ambari [8]	5-10g	It is an uterine tonic so very effective in weakness of uterus and habitual abortion.		Sadri [9]	3 g with lukewarm water twice a day	It is analgesic to chest and has expectorant properties, hence used in cough and asthma.
15	Majun Murawwahul Arwah [19]	5-10g	It is a general tonic, aphrodisiac, so used for cardiac weakness general weakness and sexual weakness.	24	Shayyaf Ahmar Layyin [19]	Local application	Being an anti-inflammatory drug it is applied to treat conjunctivitis
16	Mufarrih Barid [8]	5-10g	It is a nerve tonic and useful for cardiac weakness, palpitation, nerve weakness	25	Surma-e-Noorani [9]	Q.S. for local application in eyes only	It is an Eye toner and detergent so useful in night blindness, pterygium, corneal opacity, cataract, weak eyesight.
17	Mufarrih Seikhur Rais [8]	3g	It is a general tonic and useful for cardiac weakness, palpitation, and tuberculosis	26	Taryaqur Rahim [9]	2g powder/orally	Being a Habis Ratubat-i-rehm drug it is used in leucorrhoea.
18	Mufarrih Yaquti [8]	3-5g	It is a cardiac tonic so useful for cardiac weakness and general weakness				
19	Mufarrih Yaquti Motadil [8]	5-10g	It is a general tonic and useful for the weakness of vital organ, general weakness, palpitation, loss of appetite				

Table 1: Showing compound formulations of *Marjan*, form/parts used, mode of administration, action and indication.

Mineralogy of marjan (Coral)

Calcium carbonate is the main ingredient found in Marjan (coral), it contains approximately 80-90% of calcium as CaCO_3 [10]. Other constituents are magnesium (as MgO), Silica (as SiO_2), Phosphorus (as P_2O_3), Alumina (as Al_2O_3), Ferric Oxide (as Fe_2O_3), Sulphur (S), Potassium peroxide (K_2O) etc. [20] the red colour is due to the presence of Iron [10].

Conclusion

On the basis of above findings it is concluded that Marjan can be use in a vast range of diseases single as well as in compound formulation. Due to presence of Ca and Iron Marjan is very beneficial for whole the body. It provides nutrition for the muscles, especially cardiac muscles and also increases hemoglobin level in case of anemia. It also dissolves clotted blood from heart and brain that is why it is used as main ingredient in various Unani compound formulation which may be useful for the treatment of several diseases especially vital organs.

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Bibliography

- Kabiruddin HM. "Makhzanul Mufradat". New Delhi: Idara Kitabus Shifa. (2014): 109, 110
- Ghani Najmul H. "Khazainul Advia". New Delhi: Central Council for Research in Unani Medicine 1 (2018).
- Kalam MA., et al. "Khubs Al-Hadid (Iron Rust): Mineral Origin Drug of a High Value of Medicinal Properties". *World Journal of Pharmacy and Pharmaceutical Sciences* 7.12 (2018): 624-631.
- Kalam MA and Shafiqur Rahman. "Lajward (Lapis lazuli): Medicinal Potential of a high-value gemstone in the light of Unani Medicine". *Ijppr. Human* 20.1 (2020): 389-399.
- Kalam MA., et al. "Zumurrud (emerald): Medicinal Potential of a Gemstone from Jawaharat-i-tis 'a (navratan), in the Perspective of Unani Medicine". *Journal of Advanced Research in Ayurveda, Yoga, Unani, Sidhha & Homeopathy* 8.1&2 (2011a): 5-9.
- Kabiruddin HM. "Bayaze Kabir". New Delhi: Idara Kitabus Shifa 1 (1935).
- Anonymous. National Formulary of Unani Medicine-Part V. New Delhi: Central Council for Research in Unani Medicine (2008): 10, 11, 45.
- Anonymous. National Formulary of Unani Medicine-Part IV. New Delhi: Central Council for Research in Unani Medicine (2006): 44, 60,72,108,127,146,151,231
- Anonymous. National Formulary of Unani Medicine-Part VI. New Delhi: Central Council for Research in Unani Medicine (2011): 32, 35, 49, 67, 68.
- Nadkarni K. "Indian Materia Medica". Panvel: Dhootpapeshwar Prakashan Ltd: 156-158.
- Rafiquddin HM. "Kanzul Advia Mufrada". Aligarh: University Publication Unit. (1985): 166,167.
- Khan Azam HM. Muheet-i-Azam". New Delhi: Central Council for Research in Unani Medicine 4 (2012).
- Khan Azam HM. "Muheet-i-Azam". New Delhi: Central Council for Research in Unani Medicine 4 (2018): 569.
- Abdul Hakim M. "Bustanul Mufradat". New Delhi: Idara Kitabus Shifa. (2011): 92.
- Kalam MA. "Advia Haiwani wa Ma'dani: Animal and Mineral Origin Drugs". New Delhi: Hidayat Publishers and Distributors (2021): 22-27.
- Ibn Sina. "Al-Qanoon Fil Tib". New Delhi: Aijaz Publishing House (2010): 301.
- Vohra SB and Khan SY. "Animal Origin drugs used in Unani Medicine". New Delhi: Vikas Publishing House Pvt. Ltd. (1978): 46,49,65,67, 69, 78,82,86,93,96,101,107,109,111,124.
- Anonymous. National Formulary of Unani Medicine-Part I. New Delhi; Central Council for Research in Unani Medicine (2006).
- Kabiruddin HM. "Bayaze Kabir". New Delhi; Idara Kitabus Shifa. 2 (1938): 11,72,88,118,140, 151.
- Anonymous. "Wealth of India". New Delhi: National Institute of Science Communication and Information Resources (CSIR). 2 (2007): 193.