



MARJAN (CORAL) FOR CONTAINMENT OF COVID-19 IN UNANI MEDICINE

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ABSTRACT

COVID-19 pandemic has been propagating with high amplitude and paralyzing the healthcare system with powerful tentacles. Nonavailability of specific drug against the Corona virus disease-19 turned the world attention towards finding ways to strengthen the host defense, the most effective measure of containment of spread of pandemic. Coral has potential to be used as an immunomodulator for this purpose. This article is aimed to provide an overview of prophylactic role of coral in relevance with current pandemic. A manual literature survey of classical Unani texts was conducted to collect the information on *Marjān* (coral). In addition, electronic databases such as PubMed, Google Scholar and Science Direct were searched to identify researches conducted on Coral as well as to obtain recent information about COVID-19 outbreak. The keywords used were “*Marjān*”, “Coral”, “Containment”, “COVID-19”, and “Unani Medicine”. The literature review shows that Unani philosophers have emphasized the role of coral as source of calcium in enhancing the immunity of the host linking their action on vital organ. *Marjān* (coral) as described in classical Unani text seems to be much relevant in today's context. Arguably calcium is the most important mineral in enhancing the immunity to strengthen the host defense. Hence it is our opinion; it is worth assessing this animal origin drug may be used as prophylactic agent in current outbreak.

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INTRODUCTION

COVID-19 has emerged as the most dangerous pandemic threat throughout the globe since its outbreak during December 2019 (1). Rapidly spreading outbreak of COVID-19 when involved 26 countries then WHO declared a public health emergency of international concern on 30th January, 2020 (2). As of 28th July 2021, the World Health Organization (WHO) has reported 1, 95,266,156 confirmed cases and

4,180,161 deaths worldwide (3) and Government of India has reported 3, 15,28,114 confirmed cases and 4,22,662 deaths in India (4). According to the Unani treatise, the putrefied changes occurring in air, water, soil or environment lead to putrefaction in the humors of the body. When this abnormal changes affect large part of the population at particular time range, it is known as *Wabā'* 'Umūmī (epidemic) (5, 6, 7). When *Jawhār* (constituents) of the air is deviated from

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normal range, it is known as epidemic air. The factors which cause deviation in the normal range of the air include seasonal variation, setting and rising of the stars and proximity and distality from the sun, *Riyah* (air), variation in towns and *Bukhārāt* (vapours). The healthy state or disease condition is under the influence of *Mizāj Ṭabī 'Badani* (Normal body temperament) and the later is under the strong influence of air. The same air may be beneficial to someone and harmful to others (8). Unani scholars considered certain climatic changes as the predisposing factors for the occurrence of an epidemic (5, 9). In this regard, Hippocrates (460-370 BC) opined that hot and moist air is conducive to *Ufūnat* (infection). *Al-Rāzī* (865-925 AD) mentioned that *Bād-i-Junūbi* (southern wind) is associated with *Wabā* and is notoriously known to flare up infections. In his book, *Kitāb al-Ḥāwī fī 'l Ṭibb*, he specifies that the changes in the air increase during those summers which are afflicted by rainfall and cloudy weather, wherein *Bād-i-Junūbi* (southern wind) blows or in areas where it is trapped (5). Clinical pictures delineated by Unani scholars are as under of low grade fever, fatigue, dry cough, increased thirst, increased respiratory rate, dyspnoea, and halitosis. If a person develops bad breath, it indicates that infection has reached to cardiac tissues (6, 10). The clinical features of an infected person are strikingly similar to epidemics such as COVID-19. Due to lack of clinically proven prophylactic and therapeutic strategy, COVID-19 is surging inspite of worldwide efforts (11). This turned world attention towards strengthening the body defense force against disease causing agents (12). In order to treat the currently untreatable or to discover more efficient treatment modalities, all options and potential sources must be explored so that we can provide the best care to the patients, that is, proceed from forest and ocean ecosystem through the laboratory to the bedside (13). Marine natural products have now been acknowledged as most important source of bioactive substances and drug leads (14). Coral are the skeleton of minute marine organisms belonging to phylum Cnidaria (Coelentrata) of animal kingdom (15). Though they are tiny creations, their ability to secrete calcium carbonate (CaCO_3) within their tiny cells has given rise to a peculiar type of landform (16). It is available in two forms viz. root like structure *Bekh-i- Marjān* and slender branch like structure *Shakh-i-Marjān*. In the market root, is cheaper than branch and has higher % of calcium (17, 18).

Over the last few years, the use and exploitation of invertebrate immune system has been pursued, most notably their humoral products to determine what effects their complex molecules exert on human, specifically their potential for therapeutic application. This endeavor called bioprospecting is an emerging necessity for biomedical research (13). It provides an opportunity to revisit the wisdom of traditional system of medicine for addressing the

challenges of COVID-19 pandemic through improved immunity in combination with the proposed advisories by Government authorities for hand hygiene, respiratory hygiene, physical distancing and the use of personal protective equipments. Consequently it becomes logical to explore the literature of Unani system of Medicine understanding the challenge (19). Hence the authors have attempted to highlight the knowledge and practice of Coral in Unani medicine in the current pandemic that might be assessed as prophylactic measure.

MATERIALS AND METHODS

A manual literature survey of classical Unani texts was conducted to collect the information available on *Marjān* (coral) and its relevant action as immunomodulator. In addition, a comprehensive search of electronic databases such as PubMed, Google Scholar and Science Direct was carried out to identify experimental and clinical studies conducted on drugs mentioned in the literature as well as to obtain the recent information about COVID-19. For electronic databases search, medical subject headings (MeSH) and the other relevant term to the topic were used as major constructs to build a search strategy. The MeSH or other relevant terms are related to Unani Medicine, Epidemic, Prophylaxis, containment and COVID-19 constructs. To combine these, Boolean Operators “AND” and “OR” were used appropriately. The keywords used were “*Marjān*”, “Coral”, “Containment” and “COVID-19”, “Unani Medicine”. Time restriction was not made to extract the most useful information.

Coral in Unani Medicine

Unani system of medicine is an ancient system being practiced since last 2500 years. It was originated in Greece (20). It is based on concept of *Ṭabī 'at* (Medicatrix Naturae), *Akhlāt* (Humours) and *Mizāj* (Temperament) put forward by *Buqrat* (Hippocrates, 460-370BC). It has holistic approach in preservation of health, alleviation of disease and preparation of medicine. The system focuses on *Asbāb Sitta Ḍarūriyya* (six essentials) for preservation of health and prevention of disease. For treatment of the disease, the system uses three modes of treatment viz. '*Ilāj bi'l-Tadbir wa -Ghidhā'* (Regimenal and Dietotherapy), '*Ilāj bi'l-Dawā'* (pharmacotherapy) and '*Ilāj bi'l-Yad* (Surgery) (21). In pharmacotherapy, 90% source drugs are herbal. The rest comprises of animal (4-5%) and mineral (5-6%) origin (22). In animal origin medicine, the diversity is of broad spectrum in context of morphology, habitat, texture and cost. It includes from tiny ants to giant elephant, flying birds in the sky to swimming whales in the ocean, soft silkworm to hard coral and from cheap wax to costly Amber. Generally marine animal origin drugs are costly but very effective due to

similarity with *Mizāj-i-Insaniyyah* (human temperament). For many decades there has been advocacy for the use of calcium supplements in prophylaxis. Several preparations of calcium supplements are available commercially, and because of their various rates of disintegration in-vitro and dissolution characteristics, it has been suggested that calcium absorption from different preparations can vary widely. Narayanan et al found that the bioavailability of a single dose of coral derived calcium carbonate was greater than that of a single dose of non-coral calcium carbonate and calcium citrate malate in healthy, adult, human volunteers (23). Unani scholars have given very elaborative descriptions of coral (*Collarium rubrum*) including its vernacular name, temperament, habitat, pharmacological action and therapeutic uses, important formulations, method of application. Chemical constituent has been added by modern scientists.

- 1. Vernacular Name:** Coral in Unani texts is described as *Bekh-i-Marjān*, *Shakh-i-Marjān*, *Marjān* and *Busd Ahmar*, Praval, Moonga (24).
- 2. Temperament:** Its temperament is Cold 1° and Dry 2° (25, 26). All the forms of Marjān are dry in 3° (27).
- 3. Habitats:** It is under phylum Cnidaria also called Coelentrata having marine habitat (Jordan and Verma, 1999). It is mainly found in *Bahr al Kahil* (the Pacific Ocean) and *Bahr al Hind* (the Indian Ocean) (Leong, 1995).
- 4. Pharmacological actions and therapeutic uses of Marjān**
Marjān has been found to exhibit diverse pharmacological actions on a visible range of ailments. Unani philosophers have described its action exclusively in their treatises (Table-1).

Table 1: Pharmacological actions and therapeutic uses of Marjān.

S No.	Pharmacological Action	Therapeutic Uses	References
1.	<i>Mufarriḥ wa Muqawwiyāt-i Qalb</i> (exhilarant and Cardiac tonic)	<i>Khafaqān</i> (palpitation), <i>Du‘f al-Qalb</i> (cardiac insufficiencies), <i>Wahshat wa Karb</i> , <i>Waswās</i> (Insanity)	(24, 28)
2.	<i>Qābiḍ</i> (retentive)	<i>Du ‘f -i-Mi‘da</i> (weakness of stomach), <i>Du ‘f al-Ishtihā</i> (loss of appetite), <i>Nafakh-i-Shikam</i> (flatulence)	(17, 24)
3.	Hābis-i-Dam (Hemostyptic)	<i>Ishal Damwī</i> (malena), <i>Bawāsīr</i> (hemorrhoids) and <i>Sayalan-al-Rahim</i> (leucorrhoea)	(24, 28)
4.	<i>Mujaffif</i> (Desiccant)	<i>Suāl Ratab</i> (productive cough), <i>Diq al-Nafas</i> (bronchial asthma)	(24, 28)
5.	<i>Muqawwi ada-i-Raisa</i>	<i>Du ‘f al-Dimāgh</i> (<i>Cerebrasthenia</i>) and <i>Du ‘f -i- Am</i> (general weakness)	(24, 28)
6.	<i>Tiryāq</i> (antidote)	Antidote	(24, 28)
7.	<i>Jāli</i> (detergent)	<i>Qurūḥ</i> (wound) as <i>Dharūr</i> (Dusting powder) <i>Waja al Asnan</i> (toothache) as <i>Sanūn</i> (Tooth powder), <i>Amrāḍ al- ‘Ayn</i> (eye Diseases) as <i>Surma</i> , <i>Waja al-Udhun</i> (Earache) as ear drops with <i>Roghan Balsan</i>	(24, 28)

Important compound formulations

Compound formulations of *Marjān* have been found in broad spectrum eg. *Kushta*, *Dawā’*, *Mufarriḥ*, *Kuḥl*, Ear drops, *Maḥlūl*, *Khamīra*, *Qurṣ*, etc. Its purpose is to enhance the

potential of drug, facilitate the administration of drug up to target organ, make the odor pleasant etc. A list of compound formulations is as under: (table-2)

Table 2: Important compound formulations.

S. N.	Formulations	Therapeutic uses	Doses	Mode of administration	Reference
1.	Dawā' al-Misk Barid Sada	Khafaqān (Palpitation), Wahshat (Insanity), Strengthens heart, brain and Rūh, Regulates Temperature of the heart	5-10 gm	Orally with 75ml 'Arq 'Gā'ozabān/35 ml Arq Bedmushk/20 ml Sharbat Anār Shirin/ water	(29)
2.	Dawā' al-Misk Barid Jawahārwalī	Khafaqān (Palpitation), Wahshat (Insanity), Strengthens Heart, brain and Rūh, Regulates Temperature of the heart	3-5 gm	Orally with 75ml 'Arq 'Gā'ozabān/35 ml Arq Bedmushk/20 ml Sharbat Anār Shirin/ water	(29)
3.	Dawā' al-Misk Hārr Sada	Strengthens heart, brain and Rūh, Relieves Khafaqān (Palpitation), Wahshat (Insanity) and MālanKhūliya (Melancholia), Amrāḍ-i- Balghamiyya (cold Phlegmatic disorders such as Fālij (hemiplegia), Laqwa (Bell's Palsy), Istirkhā' (atony or flaccidity), Kuzāz (Tetanus) etc, Strengthens stomach	3-5 gm	Orally with 75ml 'Arq 'Gā'ozabān/ 35 ml 'Arq Bedmushk/ 20 ml Sharbat Anār Shirin/ water	(29)
4.	Dawā' al-Misk Hārr Jawahārwalī	Same as above with stronger efficacy	3-5 gm	Orally with 75ml 'Arq 'Gā'ozabān / 35ml Arq Bedmushk/20 ml Sharbat Anār Shirin/ water	(29)
5.	Qurṣ Kuhruha	Jaryān al dam (haemostatic)	5-7 gm	Oral	(29)
6.	Kushta Marjān Sada	Ḍu 'f -al-Dimāgh (Cerebrasthenia), Nazla o Zukām (cold and catarrh), Su 'āl (cough), Ḍiq al-Nafas (bronchial asthma), Jarayān (spermatorrhoea), Ḍu 'f al-Ishtihā (loss of appetite)	60-250mg	Orally with appropriate Badriqa (vehicle) such as butter	(29)
7.	Kushta Marjān Jawahār wala	Ḍu'f al-Qalb (Cardiac insufficiencies), Ḍu 'f al-Dimāgh (Cerebrasthenia), Ḍu 'f al- Kabid (hepatic insufficiency), Chronic Cold, Jarayān al Mani (spermatorrhea)	30-60 mg	Oally with Khamīra 'Gā'ozabān	(29)
8.	Mufarriḥ barid	Mufarriḥ Qalb (Exlihirant of Heart), Khafaqān (palpitation), Ikhtilāj (fasciculation), Sadr-o-Duwār (vertigo and giddiness) Musakkin ḥarārat (antipyretic)	5-7 gm	Orally	(29)
9.	Mufarriḥ Sheikhur Rais	Ḍu 'f al -Qalb (Cardiac insufficiencies), Khafaqān (Palpitation), Ḥummā Diqqiyya (Hectic Fever), Ḍu 'f al- Am (General debility), Muqawwī-i-A'ḍā Ra 'īsa (tonic for vital organs)	3 gm	Orally	(29)
10.	Mufarriḥ Motadil	Muqawwī-i-A'ḍā Ra 'īsa (tonic for vital organs), Muhafiz Hārarat Ghāriziyya (Protector of innate heat), Tahrīk-i-Bāh	5-10 gm	Orally with plain water	(29)

		(Aphrodisiac), Mushtahi (appetizer), Naf-i-Ishāl (Antidiarrhial), Amrāḍ-i- Rahim (Uterine Disease)			
11	Mufarriḥ Yāqūtī	Mufarriḥ wa Muqawwi Adha-i-Raisa, (Exhilarant and tonic of vital organs), Du 'f wa naqahat (Weakness), Mushtahi (Appetizer), Naf-i-Ishāl (antidiarrhial), Amrāḍ-i- Rahim(Uterine Disease)	5-10 gm	Orally with water	(29)
12	Yāqūtī Bārid	Muqawwī-i-A'ḍā Ra 'īsa (Tonic of vital organs), Khafaqān (Palpitation), Wahshat (Insanity)	3-5 gm	Orally with water	(29)
13	Yāqūtī Sada	Mufarriḥ wa Muqawwi Qalb (exhilarant and tonic of heart), Khafaqān (Palpitation), Wahshat (insanity), Mālanḥūliya (Melancholia)	5-7 gm	Orally with water	(29)
14	Yāqūtī Lūlvi	Muqawwī-i-A'ḍā Ra 'īsa (tonic for Vital organs), Muqawwī-i-Bāh (Aphrodisiac)	5-7 gm	Orally with water	(29)

Calcium as immunomodulator

In Unani Medicine, *Jawahārat* (Gems and Jewels), *Ma'daniyyāt* (minerals), *Ḥajariyyāt* (stones), animal shells and horns are used to strengthen the defense. *Yāqūt*, *Zamarrad*, *Marwārīd*, *Baiza Murg*, *Khar i- Mohra*, *Sadaf*, *Kuhruba*, *Yashab*, *Marjān* etc. are ingredient of the many formulations for this purpose (30). There are more than 50 chemical elements in our body which are required for growth, repair and regulation of vital functions of the body. It is a major mineral element of the body comprising 1.5-2% of body weight of adult human (31). Calcium is vital in the functioning of our immune system. Depletion of tissue calcium not only leads to bacterial and viral infection but can be a general indicator of susceptibility to severe illness with higher mortality rate. When we become feverish, this warning of body releases calcium making this mineral available to assist our body to protect itself from an assault. Calcium acts like a beacon for our immune system. It surrounds foreign matter, marking it for other immune system players, such as phagocytes, to come and destroy (32). Conversely, phagocytes as mentioned above are key players in our immune system's ability to fight infection, are inhibited by depleted blood calcium (33). Thus if we use up our calcium or interrupt its absorption or distribution, our immune suffers greatly (32). Calcium is instrumental in assisting our body to fight infectious diseases, as shown in multiple studies. The Department of Biochemistry, University of Toronto found that in several systems that preclude the stimulus-induced changes in $[Ca^{2+}]$ results in obliteration of the subsequent physiological response, suggesting a causal relationship. Thus, calcium seems to play a central role in the activation of cells of the immune system

(34). In another study, it is clear that vitamin D has important roles in addition to its classic effects on calcium and bone homeostasis. Deficiency in vitamin D is associated with increased autoimmunity and an increased susceptibility to infection (35). The Journal of Leukocyte Biology reported that the bone marrow induced macrophages (white blood cells that function as an integral part of our immune system) were increased and more active when there was sufficient blood calcium (36). In Science, the researchers noted that when more calcium was used in the therapy, the body was able to fight Epstein-Barr virus more effectively (37). Calcium helps to mark the foreign invaders and trigger our immune system to attack (32).

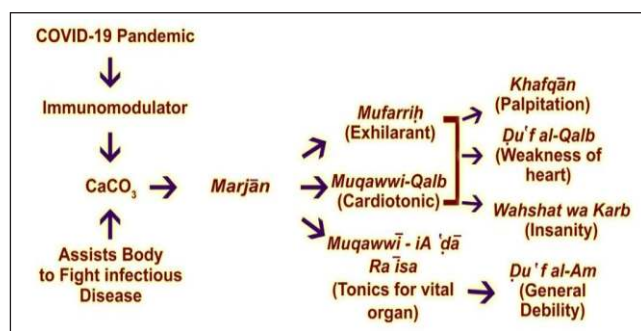


Fig. 1: Flowchart of Pharmacological actions of Marjān (Coral).

Concept of Containment measures for susceptible host

In Unani literature it has been mentioned that *Ṭabī 'at* (medicatrix naturae) is solely responsible for the capacity of the body to resist the disease and pathogen (21, 38). A well known Unani scholar, *Rabban Tabri* in his treatise *Firdosul*

Hikmat, has mentioned that practically *Ṭabī'at* is regarded as an administrative power of the body. The function of administration of the body is accomplished by *Ṭabī'at* by many powers called *Quwā* of the body like *Quwā Ṭabīyya* (Natural Faculties), *Quwā Ḥaywāniyya* (Vital Power) and *Quwā Nafsāniyya* (Mental faculty), Thus the main role of the *Ṭabī'at* is to provide defense and immunity (*Quwwat-i-Manaat*) to the body (39). Each organ of the body works in coordination with each other to achieve the specific function of the body. This coordination between the organs is maintained by *Ṭabī'at* with the help of *Ala-i-Ṭabī'at* (their different tools). Here, the tool of *Ṭabī'at* implies the relation to channels without which the function and process of *Ṭabī'at* cannot occur. In relation to this statement *Abu Sahl Maseehi* in *Kitabul Miāh* says that *Ṭabī'at* depends on support for the performing their function and process of the body (40).

Unani Medicine specially places emphasis on the *Asbāb Sitta Daruriyya* (six essential factors) i.e., *Hawā* (air), *Mākūlāt-o-Mashrūbat* (food and drink), *Hārkat-o-Sukun Badani* (bodily movement and repose), *Hārkat-o-Sukun Nafsani* (psychic movement and repose), *Nawm-o-Yaqza* (sleep and wakefulness) and *Istifragh-o-Ihtibas* (evacuation and retention). The lifestyle disorders like Depression, Coronary Heart Disease, Obesity etc., which are the major health burden of present time, can be successfully, economically and safely prevented by following the instructions with regard to these essential factors (40, 41). The concept of using organ and system specific tonics is a unique feature of Unani system of medicine. Unani physicians have described a number of drugs to strengthen and tone up the vital organs of the body and protect them to save against the possible harmful substances (40). Unani physicians have recommended improving the body immunity and strengthening the *Ṭabī'at* by restoration of health and management of disease. For this purpose Unani scholars have mentioned various drugs under the headings of *Muqawwiyyāt* and *Mufarriḥat* such as *Muqawwī-i-A 'dā' Ra'ṣa* (tonics for vital organs), *Muqawwī-i-Mida wa Ama* (gastroahic and tonic for biliary tract), *Muqawwī-i-Ada Nafsaniyya* (tonics for organs of the nervous system), *Muqawwī-i-Qalb* (cardiac tonics), *Muqawwī-i-Jigar* (liver tonics) etc. (21, 42). In Unani classical literature, they strongly recommend use of *Muqawwiyyāt* and *Mufarriḥat* during illness and for prevention of disease (21, 38, 39) as well as in epidemics (42). *Muqawwiyyāt* is non-toxic substances that have the ability to improve and maintain the health of the human body when used regularly over a long period of time. They tone up the internal organs and improve the body functions (21, 38, 42). According to Unani Medicine, the disease doesn't occur in all individuals (44). The same air may be beneficial to someone and harmful to

others (8). The same factor may provoke to be immune to someone while the same factors may trigger to be susceptible to others. Individuals with *Hārr Ratab* (hot and moist) temperament are at higher risk to invasion during epidemic in comparison to *Bārid Yābis* (cold and dry) temperament (5). Similarly the persons whose bodies are full of morbid matter are more susceptible in comparison to the person devoid of it (8). Presence of morbid matter or the increase in the *Hārarat* or *Ruṭūbat* or lessening *Burūdat* and *Yubūsat* in the body tissues provides conducive environment for the proliferation of *Ufūnat* (infection) or in other words we can say it reduces the disease resisting capacity of the body. Hence the idea of *Hifz-i-Mā Taqaddam* advocated by Unani scholars during an epidemic is mainly centered around the axis of regimes rectifying the humoral imbalance and tries to keep the body in non-susceptible state (5, 46). Once the susceptibility of the disease no longer exists, either we don't contract the disease or even if contracted, the episode will be less virulent as the body is ready to counter any invasion of disease causing agents (19).

Epidemic containment measures mentioned by Unani scholars can be broadly divided into cause-centric and host-centric. Host-centric method is applicable at individual level. It is aimed to strengthen the host defense. Rāzī mentioned that temperamentally *Bārid Yābis* (cold and dry) individuals rejoicing the advantage of health, when the danger of epidemic lurks around provided that appropriate preventive measures are taken to retain their *Burūdat* and *Yubūsat* (coldness and dryness). He also mentioned that *Tajfīf* (desiccation) is an excellent approach to take care of temperamentally *Hārr Ratab* (hot and moist) individuals who often affected during epidemics (5, 45). Based on the perspective of susceptible host, several measures have been recommended to strengthen the host defense and to reduce the susceptibility towards the disease. It includes both pharmacological and non-pharmacological interventions. Based on concept of *Tajfīf* (desiccation), drug having *Bārid Yābis* (cold and dry) property such as coral may be recommended. According to *Baghdadi* and *Baytār*, *Marjān* has intense property of desiccation (26, 27).

DISCUSSION

It is interesting to note that Unani physicians have emphasized the use of *Marjān* (Coral) as *Mufarriḥ Qalb* (Cardiac exhilarant) (24, 26, 27). Avicenna (*Ibn Sīnā*) says that it exhilarates the cardiac tissues *Bil Khāṣṣa* (characteristically) and *Bil Ṭab'* (naturally) through its *Quwwat-i-Qabiza* (retentive power) and *Quwwat-i-Habisa* (haemostatic power) (Sīnā, 1956). Coral is a source of Ca^{++} ions (18). Metal ions such as Ca in the body are used to provide structural component, to serve as enzymatic co-factors and to mediate

electron transportation. It also critically implicated in regulating both innate immune sensing of T-cells and host defense against invading pathogens. Nevertheless we are still in a primary stage of discovering immunological functions of ions and mechanistically understanding the role of these ions in immune regulation (47). Use of *Marjān* in Unani Medicine suggests that pioneers of the system were well aware about the importance of metal ions, its source and its role in immunity. According to *Baghdādī*, it has intense property of desiccation. *Al Rāzī* has mentioned that individuals with *Bārid Yābis Mizāj* (cold and dry temperament) may rejoice the more advantage of health, when the danger of epidemic lurks around provided that appropriate preventive measures are taken to retain their *Burūdat* and *Yubūsat*. He also mentioned that *Tajfīf* (desiccation) in an excellent prophylactic approach for the individuals having *Hārr Raṭab Mizāji* (hot and moist temperamental) obligations who often suffer during epidemics (42, 45). As *Marjān* has intense property of desiccation, its use as prophylactic drug may be recommended to reduce the susceptibility of higher risk group having *Hārr Raṭab Mizāj* (hot and moist temperament). The susceptibility of the disease may be lessened by employing the regimes such as desiccation of host by use of *Marjān* including all those which checks the humoral imbalance and keep the body in non-susceptible state. This may help to counter the strong waves of pandemic.

Considering calcium arguably the most important immunomodulator; *Marjān* as its principal source may be used as future medicine cabinet. Coral is an important source of new medicines being developed to treat cancer, arthritis, human bacterial infections, Alzheimer's disease, heart disease, viruses and other diseases (48). Since coral is stationary animals, may have evolved chemical defenses to protect themselves from predators. Scientists continue to research the medicinal potential of these substances. In the future, coral reef ecosystem could represent an increasingly important source of medicinal treatment, nutritional supplement, pesticides and other commercial products.

CONCLUSION

An effective measure of containment of spread of infection is to strengthen the host defense. Assessing calcium in the form of compound formulations of *Marjān* may help to strengthen the cardiac tissues by its desiccating nature. Its use in compound formulation form is epidemiologically relevant, immunologically effective, operationally feasible and socially acceptable. As coral, the tiny creatures adopt to thrive in oceanic waves; it gives human beings a lesson to design containment measures to survive in pandemic waves.

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CONFLICT OF INTEREST

Nil

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