

Immune Boosting Functional Foods for Strengthening Host Defense Mechanism to Combat in Opposition to Covid-19 and *Unani* Guidelines of Ayush for Its Prevention

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Abstract

The Immune systems protect the host in opposition to infectious and poisonous diseases and guard from contagious agents present in the environment, such as viruses, fungi, bacteria, and parasites. Blood performs an essential position in enhancing immunity because of the arrival of white blood cells or tissues that combat in opposition to infectious diseases. Sometimes they are not able to understand those organisms. Due to this reason, we want to reinforce immunity with a balanced diet that consists of essential nutrients. Newly developed severe acute respiratory syndrome coronavirus 2 (SARS CoV-2) passed off in December 2019, referred to as coronavirus sickness seemed in Wuhan, Hubei Province, in China and later daily unfold everywhere in the international nearly 88 international locations suffering from this virus. Symptoms have ranged from moderate to extreme. Serious sign and symptoms are issue in respiratory lack of speech and chest ache or pressure, in addition to the detrimental impact at the immune system, that's why human beings with the weaker immune system can also additionally cause demise. Still, there is no vaccine in opposition to this sickness, however this could be managed with the aid of using eating wholesome diets to reinforce the immune system. Food has usually been a simple need of individual; however, it was understood only as a source of energy that is important for their survival. In the history of medicine, Unani medicine is one of the very first systems of medicine which emphasize the importance of food beyond the source for the maintenance of health and established the notion of akhlat and food. Increase dairy food intakes like colostrum, yogurt, and cheese or fermented dairy drinks; devour culmination and veggies, cereals, herbs and spices, functional and nutraceutical meals to bolster the immune system. Citrus culmination which are the richest supply of vitamin-C, performs a critical position in immune-boosting because of its antioxidant properties and combat in opposition to infectious diseases. Limit the quantity of salt, sugar, and fiber; devour masses of water to preserve hydrated, wash arms keep away from assembly or gatherings.

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INTRODUCTION

The immune systems guard the host towards infectious and poisonous diseases and shield from

contagious agents within the surroundings, consisting of parasites, fungi, bacteria, and viruses. The immune system acts to guard pathogens from viruses to parasitic worms and differentiate from their very own healthful organism's tissue. In immune improvement, blood performs a crucial position because of the presence of white blood cells in few tissues, and in blood have the capacity to save the unrecognized organisms. Some immune cells made blood plasma comprise antibodies that protect from any unrecognized protein or protein comparable material to such protein that form the antigen generator or antigen. Some work on precipitation those unrecognized proteins to split them, so that's why called precipitins, in addition to a few acts on agglomerate of microorganisms or red blood cells are called agglutinins in addition a few works on neutralizing of toxins called antitoxins. The immune system prevents diseases resulting from microorganisms, however from time to time it fails to shield from such diseases. A germ invades efficaciously and makes ill. During this situation, it is viable to protect towards such sorts of germs by boosting the immune system with weight loss plan, preserving your immune system healthful certainly with an adequate weight loss plan, some antioxidants contained from the diet, consisting of vitamin-E, vitamin-C, polyphenols, and carotenoids [1–4].

During 2019 an ongoing epidemic respiratory syndrome befell called newly located coronavirus disease specifically unfold through a sneeze, cough droplets of the infected individual, and unfold ratio became accelerated daily. Its symptoms variety from moderate to extreme. Firstly, located in animals than switch to humans. The first time this viral contamination located in Wuhan, Hubei province in China, with the passage of time, there has been no right remedy or vaccine for the treatment, they specifically have an affect on the immune system in human beings with susceptible immunity are much less capable of combat even can also additionally purpose loss of life. Symptoms seem moderate to extreme after 12 to 14 days, consisting of sore throat, chills, headache, fever, shortness of breath, muscle ache, cough, and lack of flavor or smell. COVID-19 specifically weakened or have an affect on the immune system. During this crucial situation, when there is no right vaccine is available, take an excellent nutritious diet that reinforces the immune system, that is the best single way to combat towards this virus. Coronavirus impacts the immune system specifically the ones human beings which have a susceptible immune system are at hazard and in the main cause loss of life. To combat towards this virus, enhance your immune system with a balanced diet that consists of crucial vitamins contains [5–7].

Yogurt performs an essential position in combating in opposition to infectious diseases and improves immunity. Cheese is an herbal supply of yeast, which reduces cholesterol, additionally will increase the quantity of beneficial microorganisms that beef up immunity. Fruits and veggies are an extraordinary supply to enhance the immune system, inclusive of citrus fruits, along with oranges, lemon, grapefruit, kiwi are the richest supply of Vitamins C, E, zinc, and selenium are extensively used to beautify immunity to combat in opposition to coronavirus. Vegetables like beetroot, cabbage, purple onion, garlic, ginger, carrot, and pumpkin are exact reasserts of enhancing immunity. Whole grains, legumes like oat, barley, millet, corn fortified with vitamin-C dur to the fact they have antioxidant properties to combat in opposition to infections and offer energy. Drink plenty of water to digest nicely or enhance immunity, additionally an herbal supply of minerals inclusive of calcium, magnesium, phosphorus, or different hint elements. Limit the quantity of salt, sugar, and fiber, wash palms with sanitizer, live far far from conferences or businesses [8].

CONCEPT OF NUTRITION AND IMMUNITY IN UNANI MEDICINE:

The concept of health in *Unani* medicine is a multifactorial entity and mainly regulated by many exogenous and endogenous factor. The two most important factors that are mainly responsible for the health of human being are *mizaj* and *Quwwat-e-Mudabbira Badan*, also called *Tabiat*. *Tabiat* is mainly responsible for the optimum temperament of an individual. As long as optimum temperament is maintained, the health of an individual is maintained [9].

LEVEL OF THE FUNCTIONING OF THE *QUWWAT_E_MUDABBIRA BADAN*

Tabiat functions in two ways

- In normal conditions, it maintains the *mutadil mizaj* in the internal environment of the body and thus helps in the proper functioning of the body systems.
- In the case of a disease, when *su-e-mizaj* established in the body, *tabiat* fights against the disease and *Etadal-e-mizaj* is regained [9].

According to *unani* medical concepts, each cell, tissue, and the entire body is bestowed upon with the power *tabiat*, which maintain the health through thousands of controlling system and mechanism. This power operates under *Quwa tabiyah*, *Quwa haywaniyah* and *Quwa Nafsaniyah*. Some of these functions work at the intracellular level and others operate through the entire body to maintain health [9].

The efficiency of *Quwwat-e-Mudabbira Badan* or *Tabiat* may be influenced by many exogenous and endogenous factors like food, physical, psychological stress, hormones, etc. resulting in either immunostimulation or immunosuppression. The maintenance of the health of an individual depends on how *Tabiat-e-insaniah* and its relationship with the factors mentioned above are maintained. *Tabiat-e-Insaniah* governs all the biochemical processes and physiological functions of the body and also maintains *Aetidal Mizaj* [10].

NUTRITION AND *QUWWAT-E-MUDABBIRA BADAN*

According to *Ibn-e-Sena*, *akhlal* is a fluid substance which is the initial product of the digestion of food, and it is capable of assimilation by and complete integration into the tissue. It is a material of wear and tear of the body. The food items taken by a man starts to digest from the mouth itself. After passing through different digestive processes at a different level of the alimentary canal, *kailoos* is formed. After absorption from the alimentary canal, it reaches the liver, where it passes through different processes, different types of the fluids are formed. These *Akhlal* have their temperaments as blood is warm and wet, phlegm is cold and warm, yellow bile is warm and dry and black bile is cold and dry. These are generated withinside the liver by the nutrient additives of the ingested meals and liquids. As lengthy as those *Akhlal* exist in everyday balance, everyday portions and suitable region of the body, the humour system will work in the normal way [9].

Thus, health is a state of the body in which there is equilibrium in the humours, and the body performs its function normally according to its own temperament and the external environment. In the condition of dystemperament, when the equilibrium of the *Akhlal* is disturbed, and the body functions abnormally. These abnormal functions are not as per with the temperament of the individual and persisting environment; this abnormal condition of the body is known as disease [9, 11].

IMPORTANT FOOD GROUPS THAT IMPROVE THE IMMUNE SYSTEM

1. Immune Enhancing Dairy Items

Dairy items like skimmed milk, fermented milk, turkey, and yogurt. Dairy items offer precise fitness blessings compared to animal meals or plant meals. Due to its precise fitness blessings, inclusive of lessen diabetes, blood pressure, and coronary heart disorder, enhance bone fitness medical research [hyperlink to dairy items](#). It is important for developing youngsters and teenagers for growth, improvement, and protection. Cheese is an herbal supply of yeast, decrease blood cholesterol, intestinal ulcers, malignant tumors, and will increase beneficial microorganisms that beef up the immune system [12, 13].

2. Immune Enhancement Fruits and Vegetables

Fruits and veggies offer crucial vitamins that play an essential position in maintaining a wholesome immune system inclusive of vitamin E, C, D, selenium, zinc omega-3 fatty acid. Citrus fruits inclusive of grapefruit, oranges, clementines, tangerines, lemons, and limes, which comprise vitamin C,

facilitates to accumulate the immune system additionally boom the blood white blood cell, which is prime to combat in opposition to infections. Broccoli is the healthiest meals that gives nutrients (A, C, and E) and minerals, in addition to fiber or different antioxidants. Garlic is the healthiest herbal meals supply that gives energy to the immune system due to the fact they comprise sulfur-containing compounds along with allicin, decrease blood pressure, and combat in opposition to infections. Ginger facilitates to lower cholesterol, persistent pain, sore throat, and inflammatory illnesses. Spinach is wealthy in antioxidants, vitamin C, and beta carotene that could increase the immune system. Papaya has digestive enzyme papain, which has an anti-inflammatory impact additionally incorporates folate, potassium, and magnesium beneficial for average fitness. Kiwi incorporates vital vitamins along with potassium, vitamin C, and K and folate. Vitamin-C increases white blood cells to combat in opposition to infections and increase the immune system. Further fruits and green veggies that increase immune system encompass beetroot, cauliflower, carrot, pepper, radish, watermelon, parsley, celery, purple onion, pumpkin, eggplant, tomatoes, green beans, potatoes, peach, dates, apricot, avocado, strawberry, orange [12, 14–21].

3. Immune Enhancing Cereals and Legumes

Cereals like oats, that are known as the queen of cereals because of its excessive nutritive properties encompass carbohydrates, protein, phosphorus, trace elements, iron, minerals, and vitamins assist to hold blood sugar degree withinside the blood, anti-carcinogenic, useful for coronary heart diseases, enhance the immune system. Barley has an excessive quantity of fiber, a good supply of phosphorus, potassium, magnesium, vitamin K, folic acid, vitamin-B, trace elements (chromium, sulfur, iron, iodine, copper, selenium, and molybdenum). Quinoa is a wealthy supply of protein in comparison to barley and rice, excessive fiber content, and includes 11 amino acids. It additionally has anti-cancer, anti-inflammatory, and antioxidant properties. Flaxseed, chickpeas, lentils, barley, oats, sesame, red beans, non-peeled brown rice, fennel, corn, soybeans, and wheat are a wealthy supply of micronutrients, fiber, protein, carbohydrates, a good source of unsaturated fats together with omega-3 fatty acid [14–16].

4. Immune Enhancing Green Foods

Juice from natural cauliflower, natural oats grass extract, natural wheat plant Chlorella, natural barley leaf extract, organic parsley, organic green dandelion, marine Green Algae, sea dulse, spirulina, Marine Vegetables, green broccoli, organic kale, and sea kelp [19, 20].

5. Immune Enhancing Functional Foods

Mushroom, fermented soybean, turmeric, fiber, black tea, oligosaccharides, fermented dairy items, fish oils, wheat germ, flaxseed oil, green tea, olive oil, corn oil, garlic, raspberries, ginger, lignin, lycopene, seafood wealthy in omega-3 which improve the immune system, in addition to vitamins, enhance immune capabilities and shield in opposition to infections together with vitamins E, D, C, A, Folic acid, B12 and B6 [14, 18, 21].

6. Immune Enhancing Mineral Elements

Minerals and vitamins play a crucial position in enhancing the immune system, together with copper, iron, phosphorus, selenium, and zinc. Vitamin B complex, Pantothenic acid, Riboflavin, Thiamine, Niacin, and vitamin E, C [22].

7. IMMUNE ENHANCING NUTS:

Nuts together with almonds, cashew nuts, hazelnuts, peanuts are a terrific supply of minerals and vitamins like copper, vitamin B6, zinc, selenium, iron and vitamin E, those have antioxidant properties and additionally enhance the immune system [23, 24].

8. Immune Enhancing Volatile Oils

Essential oils to enhance immune systems together with oregano, niaouli, peppermint, lavender, eucalyptus, coconut oil, chamomile, and lemon crucial oil antibacterial characteristic [25, 26].

9. Immune Enhancing Fruit and Vegetable Juices

Peach, carrot juice, pineapple juice, cranberry juice, orange juice, cucumber with lemon juice, apricot juice and lemon juice, pear juice, pomegranate juice, strawberry juice, grapefruit with lemon juice and raspberry juice, clean apple juice, celery juice, asparagus juice, Beet juice, black grape juice and fresh cabbage juice [27, 28].

10. Immune Enhancing Food Items

Beet and cabbage kraut, water kefir, fermented pickles, beet kvas, curtido, fermented warm sauce, turmeric sauer kraut, apple cider vinegar, uncooked apple cider dressing, sweet potatoes with miso, ginger and scallions, crimson cabbage salad, coconut milk, carrot soup, vegan broccoli [29, 30]

11. Drinking-Water Improves the Immune System

Water is crucial a part of life; it has extremely good benefits. Water includes crucial nutrients, i.e., vitamins and minerals to enhance the immune system, decreases toxins and germs, help digestion, decrease blood pressure, boom white blood cells, assist to hold oxygen to frame cells that carry out sure capabilities [31].

PREVENTION OF CORONAVIRUS

People have to live privy to the contemporary records at the COVID-19 outbreak supplied via away of means of WHO and Follow the guidelines of your nearby fitness authority and save you secondary infections, interrupt human-to-human transmission on your near contacts, fitness care people and save you in addition global unfold. Most of the people who infected, revel in moderate infection and get better it, however its contamination may be extra extreme for different individual. To take care of your health and protect others take the subsequent steps: [32, 33]

Take steps to shield yourself

- Wash your palms often and thoroughly with soap and water for at least 20 seconds or with an alcohol- based hand rub (hand sanitizer that includes as a minimum 60% alcohol) absolutely cowl your palms and rub them collectively till they do now no longer dry in particular after you have been visited a public place, or after blowing your nostril, sneezing or coughing.
- Hands touch many surfaces and pick up viruses and these contaminated hands, can transfer the virus to your nose, eyes, or mouth So, avoid touching these organs with unwashed hands. Because from there, the virus can enter the body and may cause persons to sick.
- Maintain social distancing (maintain at least 1 meter or 3 feet distance between yourself and anyone) and avoid close contact with people who are sick (who is coughing or sneezing).
- Avoid large events and mass gatherings.

Take steps to defend others

- Stay home if you are not feel well, unless are going to medical care.
- If you have a cough, fever and difficulty breathing, seek medical attention and consult to your doctor.
- If you are unwell keep away from taking public transportation.
- Whenever you cough, or sneeze cowl your mouth and nostril with a tissue paper.
- Throw used tissues withinside the trash and wash your fingers right now with antiseptic cleaning soap and water.
- If you are unwell, keep away from sharing bedding, dishes, glasses, and different family items.
- Avoid direct physical contact (including physical examination and exposure) to respiratory and other body secretions.

Ministry of AYUSH recommends the subsequent self-care tips for preventive fitness measures and boosting immunity with unique connection with respiratory health: [34]

- Drink heat water all through the day.

- Spices like *Haldi* (Turmeric), *Jeera* (Cumin), *Dhaniya* (Coriander) and *Lahsun* (Garlic) are recommended in cooking.
- Take Chyavanprash 10gm (1 teaspoon) withinside the morning. Diabetics have to take sugar free Chyavanprash.
- Drink natural tea / decoction (Kadha) made from *Tulsi* (Basil), *Dalchini* (Cinnamon), *Kalimirch* (Black pepper), *Shunthi* (Dry Ginger) and *Munakka* (Raisin) - once or twice a day. Add jaggery (natural sugar) and / or sparkling lemon juice to your flavor, if needed.
- Golden Milk- Half teaspoon *Haldi* (turmeric) powder in 150 ml warm milk - a few times a day.

Prophylactic method via *Unani* medicine: [35]

In *Unani* Medicine, prevention has been preferred to treatment. Its classical literature mentions that *Quwall of the wat-i-Mudabbira-i-Badan / Tabi'at* (Medicatrix naturae) is the very best energy, which controls all of the physiological capabilities of the body and gives immunity in opposition to diseases. The ailment situations are taken into consideration to arise because of weakened medicatrix naturae and can be cured by its strengthening (inclusive of immunomodulation). Drugs for dry cough, sore throat, fever and difficulty in breathing may be used for supportive symptomatic relief.

Unani scholars have prescribed numerous single drugs in additions to compound formulations for the prevention and remedy of infectious diseases in general. They have emphasised extra on the usage of positive certain drugs which can be recognized to enhance host immunity at some point of the outbreak of epidemics, endemics, and pandemics. *Ismail Jurjani* (1041-1136 CE) mentioned that use of *Tiryaaqs* during epidemics strengthens the heart and keeps the body faculties strong [36]. Single and compound *Unani* drugs mentioned here under, may prove to be beneficial and can be used under the supervision of qualified *Unani* physicians for viable immune boosting / symptomatic alleviation in upper respiratory tract infections.

1. ***Behi dana (Cydonia oblonga)***: Antioxidant, immune modulator, antiallergic [37] and anti-influenza [38] (Dose is 3-5 gm)
2. ***Unnab (Zizyphus jujuba)***: Anti-influenza, immune-modulator, and antioxidant [39, 40] (Dose is 5 pcs.)
3. ***Sapistan (Cordia myxa)***: Immuno-modulator, tracheal smooth muscle relaxant⁷ and antioxidant [41-44] (Dose is 9 pcs.)
4. ***Karanjwa (Caesalpinia bonducella)***: Antipyretic, antimicrobial, anti-inflammatory and immunomodulator. (Dose is 3 to 5 gm) [45, 46]
5. ***Tiryaaq-e-Arba*** has the properties of *Dafae Sumoom* (antidote) and *Dafae Tashannuj* (anti-spasmodic) and used withinside the dose of 3-5 gm with lukewarm water. (Not recommended for diabetics) [36, 47].

In case of respiratory discomfort, local application of ***Roghan-e-Babuna Sada*** on chest is advocated (in quantity sufficient) [47, 48].

Arq-e-Ajeeb 2-5 drops for inhalation [48].

Immunity Inahancer:[48] *Khameera Marwareed* 3-5 g, (Not recommended for diabetics) **Asgandh** (Safoof): 5 g

CONCLUSION

To manage this newly evolved ailment whilst there may be no vaccine to deal with on this vital situation in addition to, they unfold daily or human being with susceptible immunity might also additionally result in loss of life handiest only single way to combat in opposition to this viral infection to enhance immunity with an adequate diet inclusive of dairy ingredients, fruits, and veggies, cereals and legumes, nutrients, minerals, useful meals or drinking water, nuts). Specially eat

diet with vitamin C in a plentiful quantity to combat in opposition to infectious diseases along with coronavirus or fortify the immune system. These meals groups offer vital vitamins to address this case to enhance immunity. *Unani* medicine recognizes the concept of immunity strongly, and its concept of immunity is more comprehensive than in modern medicine. In this way, *Unani* medicine may be helpful in better understanding of the phenomenon of nutrition and immunity. Follow preventive measures along with washing fingers time and again with a sanitizer, keep away from grouping or gathering, live far from everyone to hold distance as a minimum 6 toes.

REFERENCES

1. Rasoul, M., Rokhsareh, M., Mohammad, S. M., Sajad, K., & Ahmadreza, M. (2019). The Human Immune System against *Staphylococcus epidermidis*. *Critical Reviews™ in Immunology*, 39(3).
2. Rich, R. R., & Chaplin, D. D. (2019). The human immune response. In *Clinical Immunology* (pp. 3-17).
3. Segerstrom, S. C., & Miller, G. E. (2004). Psychological stress and the human immune system: a meta-analytic study of 30 years of inquiry. *Psychological bulletin*, 130(4): 601.
4. Sompayrac, L. M. (2019). How the immune system works. John Wiley & Sons.
5. Song, F., Shi, N., Shan, F., Zhang, Z., Shen, J., Lu, H., ... & Shi, Y. (2020). Emerging 2019 novel coronavirus (2019-nCoV) pneumonia. *Radiology*, 295(1): 210-217.
6. Huang, C., Wang, Y., Li, X., Ren, L., Zhao, J., Hu, Y., ... & Cheng, Z. (2020). Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *The lancet*, 395(10223): 497-506.
7. Lai, C. C., Shih, T. P., Ko, W. C., Tang, H. J., & Hsueh, P. R. (2020). Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): the epidemic and the challenges. *International journal of antimicrobial agents*, 105924.
8. Team, B. E. (2019). Key Foods to Boost the Immune System. *Biotics Research Blog*, 15.
9. Ahmad HSI, Introduction to *Al Ummore lil Tabiyaah CCRUM New Delhi*. 1980: 1st Ed: 16-17, 32-34, 36- 37,75-82.
10. Nasiruddin M et al. The Concept of *Tabiat* in Unani System of Medicine Hippocratic. *Journal of Unani Medicine* 2017; 12: 1-5.
11. Majoosi AIA. *Kamilussana* (Urdu Translation) Idara Kitabul Shifa New Delhi. 2010: 11,24.
12. Cong, L., Miroso, M., Kaye-Blake, W., & Bremer, P. (2020). Immune-boosting functional foods: A potential remedy for Chinese consumers living under polluted air. *Business and Management Studies*, 6(1), 12-27.
13. Godhia, M. L., & Patel, N. (2013). Colostrum—its Composition, Benefits as a Nutraceutical—A Review. *Current Research in Nutrition and Food Science Journal*, 1(1):37-47.
14. Ohr, L. M. (2005). Nutraceuticals & functional foods. *Immunity*, 59(1). Young, D., Schreuder, M., & Chao, S. (2005). U.S. Patent Application No. 11/061: 472.
15. Kamboj, A., Jain, A., Singh, T. Shaikh, A., & Gupta, A. (2020). β -glucan: Immune boosting potential and antioxidant candidate. *International Journal of Research in Pharmaceutical Sciences*, 11(1): 491-496.
16. Sanderson, S. (2020). Immune System Defence with Vitamin C and Magnesium.
17. Kalantar-Zadeh, K., & Moore, L. W. (2020). Impact of Nutrition and Diet on COVID-19 Infection and Implications for Kidney Health and Kidney Disease Management. *Journal of Renal Nutrition*, 30(3): 179-181.
18. Cong, L., Bremer, P., Kaye-Blake, W., & Miroso, M. (2020). Chinese consumers perceptions of immune health and immune-boosting remedies including functional foods. *Journal of Food Products Marketing*, 26(1): 55-78.
19. Radha, S. (2020). Increasing Fruits and Vegetable Consumption to Protect Against Viral Diseases.
20. Kisangau, D. P. (2017). Indigenous leafy vegetables with potential medicinal and immune boosting properties
21. Platel, K. (2020). Functional foods in Indian tradition and their significance for health. In *Nutritional and Health Aspects of Food in South Asian Countries* (pp. 87-98). Academic Press.

22. Van Schoor, R. (2019). Boosting your immune system: supplements. *SA Pharmacist's Assistant*, 19(3): 31-32.
23. Mohammed, S. G., & Qoronfleh, M. W. (2020). Nuts. In *Personalized Food Intervention and Therapy for Autism Spectrum Disorder Management* (pp. 395-419). Springer, Cham.
24. Costa, J., Silva, I., Vicente, A. A., Oliveira, M. B. P., & Mafra, I. (2019). Pistachio nut allergy: An updated overview. *Critical reviews in food science and nutrition*, 59(4): 546-562.
25. Sonali, S G. Antiviral and Immunity modulating National Herbs in the prevention of COVID-19. *Journal of pharmacognosy and phytochemistry*, 13 (2), 2021. DOI. 10.52711//0975-4385.2021.00014
26. Irshad, M., Subhani, M. A., Ali, S., & Hussain, A. (2019). Biological Importance of Essential Oils. In *Essential Oils-Oils of Nature*. IntechOpen.
27. Chauhan, M., Garg, V., Zia, G., & Dutt, R. (2020). Potential Role of Phytochemicals of Fruits and Vegetables in Human Diet. *Research Journal of Pharmacy and Technology*, 13(3): 1587-1591.
28. Nettleton, B. (2020). The 8 Best Foods for Juicing. *cancer*, 2, 7.
29. Ayed, L., Mhir, S., & Hamdi, M. (2020). Microbiological, Biochemical, and Functional Aspects of Fermented Vegetable and Fruit Beverages. *Journal of Chemistry*, 2020.
30. Platel, K. (2020). Functional foods in Indian tradition and their significance for health. In *Nutritional and Health Aspects of Food in South Asian Countries* (pp. 87-98). Academic Press.
31. Mhlongo, N. T., Tekere, M., & Sibanda, T. (2019). Prevalence and public health implications of mycotoxigenic fungi in treated drinking water systems. *Journal of water and health*, 17(4): 517-531.
32. WHO Coronavirus disease 2019 (COVID-19) Situation Report – 53, MARCH 2020 https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200313-sitrep-53-covid-19.pdf?sfvrsn=adb3f72_2
33. WHO Coronavirus disease (COVID-19) advice for the public. <https://www.who.int/emergencies/diseases/novel-coronavi-rus-2019/advice-for-public>
34. Ministry of AYUSH recommends the following self-care guidelines for preventive health measures and boosting immunity. [https:// www.ayush.gov.in/docs/123.pdf](https://www.ayush.gov.in/docs/123.pdf)
35. Guidelines for unani practitioners for Covid 19. Government of india ministry of Ayush
36. Ahmad al-Hasan Jurjani. *Zakhira Khwar zam Shahi Vol. 3 (Part-10)*. Urdu Translation by Hakim Hadi Husain Khan. Munshi Nawal Kishore, Lucknow. 1878. p. 1796.
37. The medical importance of Cydonia oblonga- A review Prof Dr Ali Esmail Al- Snafi Department of Pharmacology, College of Medicine, Thi qar University, Nasiriyah, P O Box, 42, Iraq IOSR *Journal of Pharmacy*. www.iosrphr.org (e)-ISSN: 2250-3013, (p)-ISSN: 2319-4219 Volume 6, Issue 6 Version. 2 (June 2016), PP. 87-99
38. Hamazu Y, Yasui H, Inno T, Kume C, Omanyuda M. Phenolic profile, antioxidant property, and anti-influenza viral activity of Chinese quince (*Pseudocydonia sinensis* Schneid.), quince (*Cydonia oblonga* Mill.), and apple (*Malus domestica* Mill.) fruits. *J Agric Food Chem*. 2005 Feb 23;53(4):928-34.
39. Hong EH, Song JH, Kang KB, et al. Anti-influenza activity of betulinic acid from on influenza A/PR/8 virus. *Biomol Ther*. 2015;23(4):345–349. doi:10.4062/biomolther.2015.019
40. Chi A, Kang C, Zhang Y, Tang L, Guo H, Li H, Zhang K. Immunomodulating and antioxidant effects of polysaccharide conjugates from the fruits of *Ziziphus Jujube* on Chronic Fatigue Syndrome rats. *Carbohydr Polym*. 2015 May 20; 122:189-96. doi: 10.1016/j.carbpol.2014.12.082. Epub 2015 Jan 14.
41. Ali WR, Al-Asady ZT and Ibrahim AA. Immunomodulatory of *Cordia myxa* (L.) aqueous extract fruit in immunized mice with hydatid cyst fluid. *Journal of NaturalScience Research* 2015; 5(10): 75-83.
42. Ad-Dahhan HAA. Detection of Immunomodulatory activity of alcoholic extractof *Cordia myxa* (L.) fruit. *AL-Qadisiya Journal of Applied Sciences* 2010; 15(4): 1-8.
43. Al-Bayaty MAA and Al-Tahan FJ. Mechanism of the tracheal smooth muscle relaxant activity of the *Cordia myxa* plant extract in sheep. *Iraqi Journal of Veterinary Medicine*, 2008; 32(2): 214-226.

44. Afzal M, Obuekwe C, Khan AR and Barakat H. Antioxidant activity of *Cordia myxa* L. and its hepatoprotective potential. *EJEAF Chem* 2007; 8(6): 2236-2242.
45. Subbiah V, Nagaraja P, Narayan P, Nagendra HGR. Evaluation of Pharmacological Properties of *Caesalpinia bonducella* Seed and Shell Extract. *Pharmacogn J*. 2019; 11(1):150-154
46. Archana P, Tandan SK, Chandra S, Lal J, Antipyretic and Analgesic Activities of *Caesalpinia Bonducella* Seed Kernel Extract, *Phytother Res*, 2005, 19 (5), 376-81.
47. Anonymous, 2013, Essential Drugs List-Unani Medicine, Ministry of AYUSH, New Delhi, 2-4.
48. National Formulary of Unani Medicine, Part-1. New Delhi: MOHFW. 2006, p-190.