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# Protective Foods to Develop Immunity of Individuals against COVID 19

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## Abstract

Corona virus Infectious Disease (COVID-19) is a viral disease which causes common symptoms including fever, cough, shortness of breath or difficulty breathing and other symptoms like tiredness, arches, chills, sore throat, loss of smell, loss of taste, headache, diarrhea and severe vomiting. In case of older persons it causes worsened symptoms, such as worsened shortness of breath, multi organ failure, respiratory failure, heart problems, acute kidney injury and pneumonia. At present, there is no vaccine available to prevent COVID-19 and preventive measures as recommended by WHO and CDC can be taken up to reduce the risk of infection. The most potent anti-viral food items such as garlic, ginger, turmeric, acid lime, aonla, spinach, broccoli etc. must be included in ones diet to boost up the immune system and protect body against infectious diseases.

## Introduction

Corona virus Infectious Disease (COVID-19) is a viral disease caused by a newly discovered corona virus. It is an enveloped virus with a positive-sense single-stranded RNA genome and a nucleocapsid of helical symmetry, wrapped in a icosahedral protein shell. This is one of the largest among RNA viruses. They have club-shaped spikes that project from their surface, which in electron micrographs create an image reminiscent of the solar corona, from which their name derives. At this time, there are no specific vaccines or curative treatments for COVID-19. However, there are many ongoing clinical trials evaluating potential treatments in the global level. World Health Organization has declared it a pandemic and according to their report more than 35 lakhs people from more than 200 countries got infected by COVID 19 which causes death of more than 2 lakhs people.

## Symptoms

Symptoms of corona virus disease 2019 may appear two to 14 days after exposure. This time after exposure and before having symptoms is called the incubation period. Common symptoms include fever, cough, shortness of breath or difficulty breathing and other symptoms can include tiredness, arches, chills, sore throat, loss of smell, loss of taste, headache, diarrhea and severe vomiting. Some people especially older persons may experience worsened symptoms, such as worsened shortness of breath, multi organ failure, respiratory failure, heart problems, acute kidney injury and pneumonia.

## Preventive Measures

At present, there is no vaccine available to prevent COVID-19 and preventive measures can be taken up to reduce the

risk of infection. WHO and CDC have recommended the following precautions for avoiding COVID-19:

- Avoid large events and mass gatherings.
- Avoid close contact (within about 6 feet, or 2 meters) with anyone who is sick or has symptoms.
- Stay home as much as possible and keep distance between yourself and others if COVID-19 is spreading in your community, especially if you have a higher risk of serious illness.
- Wash your hands often with soap and water for at least 20 seconds, or use an alcohol-based hand sanitizer containing at least 60% alcohol.
- Cover your face with a cloth face covering or masks in public spaces, such as the grocery store, vegetable or fruit markets where it is difficult to avoid close contact with others, especially if you're in an area with ongoing community spread.
- Cover your mouth and nose with your elbow or a tissue paper when you cough or sneeze. Throw away the used tissue.
- Avoid touching your eyes, nose and mouth.
- Avoid sharing dishes, glasses, bedding and other household items if you are sick.
- Clean and disinfect high-touch surfaces daily.
- Stay home from work, school and public areas if you are sick, unless you are going to get medical care. Avoid taking public transportation if you are sick.

## Protective Anti-viral Foods

While practicing hygiene are basic necessities it is also important to improve the immune system of an individual to function properly. The most potent anti-viral food items that must be included in ones diet to boost up the immune system and protect body against infectious diseases are listed below.

**Garlic (*Allium sativum*):** Garlic is used as flavouring agent. In China, young bulbs and in Russia, the shoots are pickled and used as appetizer (Plate 1). Garlic is reported to reduce the risk of heart disease including high cholesterol, high blood pressure and cancer. In modern medical science, garlic is used for the treatment of intestinal worms, infections, digestive disorders and fungal infections such as thrush. Garlic containing the sulphur compounds diallyl disulfide is believed to be anti-carcinogen. It is rich in 'allicin' a powerful anti-biotic and antifungal compound which help in enhancing immunity of individuals. In addition, it contains also alliin, ajoene, enzymes, vitamin B, minerals and flavonoids.

**Turmeric (*Curcuma longa*):** Turmeric rhizome contains 5% essential oils and up to 7.3% curcumin, a polyphenol (Plate 2). It is used as food colouring component for curry and as a preservative for food. Traditionally, it is used as a medical herb due to its antioxidant, anti-inflammatory, antimutagenic,

antimicrobial, antibacterial and anticancer properties. It is used in the treatment of stomachache, skin problems and arthritis. In China, it is used as analgesic and for colic, hepatitis, ringworms and chest pain. Otherwise, it is antiseptic for cuts, burns and bruises and is used for strengthening overall energy of the body.

**Ginger (*Zingiber officinale*):** The oleoresin from the rhizomes of ginger contains many bioactive components, such as gingerol that is believed to exert a variety of remarkable pharmacological and physiological activities (Plate 3). Ginger has been used for thousands of years for the treatment of numerous ailments, such as colds, nausea, arthritis, migraines, hypertension, indigestion, flu, pain, cancer, heart diseases and overall sickness of the body.

**Acid Lime (*Citrus aurantifolia*):** Limes are acidic in nature and are rich source of vitamin C, citric acid, sugar, certain minerals like calcium and phosphorus. Lime pericarp contains essential oil (7%) whose main constituents are citral limonene, beta pinene and fenchone (15%). Other aromatic compounds are terpinol, basabolence and some terpenoids. Limes are used for preparation of refreshing drink, juice, cordial, flavouring food (Plate 4). The peels are used for extraction of essential oils. Juice is used for making of citric acid and cosmetics. Essential oils are extracted from the peel and are mainly used in confectionery, pharmaceuticals and toilet preparations. It develops the resistance of individuals to several diseases; cures wound healing and increase the health of eyes. It improves the maintenance of good dentition and keeps away toothache, dental caries, swollen gums, fragility of bones and bleeding of the gums. Lime is vital in the treatment of gastric disorders like indigestion, constipation and peptic ulcer (Ganguly, 2013).

**Aonla / Amalaki / Amla / Indian Goose Berry (*Embllica officinalis*):** Aonla is a native deciduous fruiting plant grown in many states of India. Amla is the most concentrated form of vitamin C (500-600mg/100g) found in the plant kingdom, and the whole fruit has been found to have great antioxidant properties (Plate 5). It also contains proteins and minerals like calcium, phosphorus and iron. The high vitamin C content of fruit makes its wide use in Ayurvedic medicine. It is used as a rejuvenative to promote longevity, enhance digestion, treat constipation, reduce fever, purify the blood, reduce cough, alleviate asthma, strengthen the heart, benefit the eyes, stimulate hair growth, enliven the body, and enhance intellect. In Ayurvedic poly-herbal formulations, Amla is a common constituent, and most notably is the primary ingredient in Chyawanprash, triphala. It is used for making chutney, murrabba, candies, pickles, powder, etc.

**Lai Sag (*Brassica juncea*):** It is also known as Indian mustard, Chinese mustard, oriental mustard, leaf mustard, or mustard green, is a species of mustard family of Brassicaceae plants. It is originated from Central Asia

with secondary centers in central and western China, eastern India, Burma, and through Iran to the Near East. The leaves are used in a range of folk medicines as stimulants, diuretics and expectorants as well as a spice (Plate 6). The major pungent chemical constituent of such commercialized oils is allyl isothiocyanate is now considered to be the most important cancer chemopreventive phytochemical with other potential health benefits. *Brassica juncea* is known to produce several other classes of bioactive phytochemicals including glycosides, flavonoids, phenolic compounds, sterols and triterpene alcohols, proteins and carbohydrates.

**Vegetable Banana (*Musa paradisiaca*):** It is an herbaceous perennial tropical herb, 1-10m tall with large leaves of which the overlapping bases so called pseudostem. Flowers develop from the centre of the crown. Only female flowers develop into banana fruit. Banana is a rich source of energy, carbohydrate, fat, protein, vitamin A, vitamin B, and vitamin C, K, P, Ca and Fe. Used as a staple food in different countries. Green bananas are used in cooking. Banana flower is a good anti-oxidant and cooked in soups and curries. Besides, flower cures infection, slows the aging process, promotes heart health, improves digestion, promotes mental relaxation, supports menstrual health, regulates blood sugar and cures anaemia (Plate 7). The juice extract from tender core is used to remove stones from kidney, gall bladder and prostate. Pseudostem juice is a well-known remedy for urinary disorders, diarrhoea, dysentery and flatulence.

**Local Garden Egg / Bitter Brinjal (*Solanum incanum*) :** It is a

native to South Africa. It grows well in tropical climate. It is a prickly shrub with broad elliptic leaves. Fruits are berries, ovoid or subglobose (Plate 8). It grows well in tropical climate under full sun. Fruits contain 1.4% protein, 0.7-1% fat, 5% carbohydrate, 1.9% fibre, 103mg/100g Ca and 45mg/100g P. The berries are eaten raw or pickled. It is used against sore throat, angina, stomach-ache, colic, headache, painful menstruation, liver pain, pleurisy, pneumonia and rheumatism (Demisse and Guadie, 2016).

**Pepino (*Solanum muricatum*):** A native to South America. It is a branched perennial mini shrub, 1-1.5m tall with lanceolate leaves. The fruits are rich in minerals and vitamin C, low in starch and soluble sugars. These are used as cooked vegetables, fresh fruit, fruit salad, delicious fruit juice, squash etc (Plate 9). It aids in liver disease, lowers blood pressure, helps those that suffer from strokes to heal faster, and promotes cardiovascular health. Pepino can also help prevent cancer and lower cholesterol. Besides, Pepino is anti-inflammatory in action helping to sooth away your aches and pains. Fruits have lots of vitamin A, C, K and also B Vitamins, protein, plus Fe and Cu, which are essential for a healthy immune system and Ca for bones, K which is needed for relaxing and lowering blood pressure and Pepino is a good diuretic.

**Broccoli (*Brassica oleracea italica*):** A native to Europe. A biennial cruciferous vegetable crop with compact growth habit, 45cm tall bearing stalks and flower buds. The mass of flower heads is usually surrounded by lavish leaves (Plate 10). There are two types of broccoli, heading broccoli forms curd like cauliflower whereas sprouting broccoli contains a group of



Plate 1: Garlic



Plate 2: Turmeric

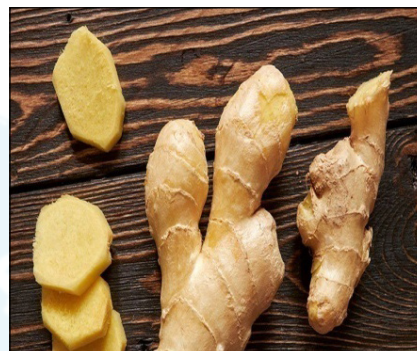


Plate 3: Ginger



Plate 4: Acid lime



Plate 5: Aonla

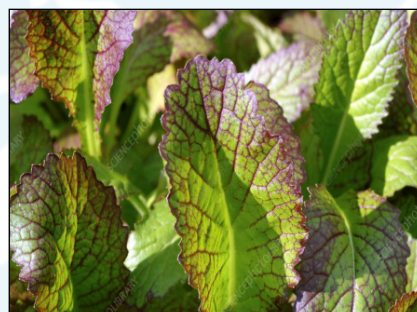


Plate 6: Lai sag



Plate 7: Banana flower



Plate 8: Bitter brinjal



Plate 9: Pepino



Plate 10: Sprouting broccoli



Plate 11: Spinach



Plate 12: Giloe

green immature buds and thick fleshy flower stalk forming a head. It is a cool season crop and a temperature of 15-20°C is ideal for head formation. The heads become ready for harvest when its bud clusters are green and compact. Broccoli is rich in vitamins C, K and A as well as dietary fibre. It is high with potent anti-cancer properties such as diindolyl methane and small amounts of selenium. The 3,3'-Diindolylmethane is a potent modulator of the innate immune system with anti-viral, anti-bacterial and anti-cancer activity (De and Bhattacharjee, 2010). Broccoli is used for cooked, soups and salad purposes. It aids in protection of aggressive prostate cancer and heart diseases.

**Spinach** (*Spinacea oleracea*): It is a very common green leafy vegetable, native to south-western Asia. Spinach is full of vitamins (vitamin C, vitamin A and vitamin E), minerals (magnesium, manganese, iron, and calcium), folic acid and protein (Plate 11). It is good for the digestive and urinary system, helps to improve haemoglobin level, has digestive and diuretic properties. It improves appetite and assimilation of nutrients, stimulates digestion, and cures constipation. Spinach lowers cholesterol level in the body and gives protection from heart diseases. Spinach improves body immunity to fight infections. It is mild laxative and helps to clear bowel. Spinach prevents bone loss in osteoporosis. It has anti-inflammatory properties and gives relief in pain of arthritis. Spinach is cooked and eaten as vegetable. It is bitter, pungent, and astringent. Spinach has alterative, refrigerant, demulcent, diuretic and

laxative activities. It is good to eat spinach in the fever, cough, intestinal tract disorders, haemorrhoids, anemia, vitamin deficiencies and constipation.

**Giloe** (*Tinospora cordifolia*): This is a gregarious glabrous, twinner grown well in tropical and subtropical climate (Plate 12). The stems are rich in bitter substances, tinosporine. Other compounds include gilonin, gilosterol, gilenin, and furanoditerpenes. It is a tonic and has alterative, diuretic, and aphrodisiac properties. It is a febrifuge useful in malarial and chronic fever. It is also used as a liver tonic. The plant is used in general debility, loss of appetite, fevers, urinary disorders, diabetes, rheumatism, and dyspepsia. Fresh plant is more efficacious than dried plant.

## References

- De, L.C., Bhattacharjee, S.K., 2010. 'Handbook of Vegetable Crops', Published by Pointer Publisher, Jaipur, Rajasthan, 508.
- Dakone, D., Awoke, G., 2016. A review on ethnomedicinal use, nutritional value, phytochemistry and pharmacological characteristics of *Solanum incanum* L. An important medicinal plant. International Journal of Scientific and Technology Research 5(6), 350-354.
- Ganguly, S., 2013. Medicinal Properties of Lime and its Traditional Food Value. Research Journal of Pharmaceutical Sciences 2(4), 19-20.