



# How to Avoid Coronavirus (COVID-19) or Relief it is Symptoms by Natural Products

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## Abstract

The spread of coronaviruses (COVID-19) globally resulted in numerous deaths and hospitalizations. It causes respiratory tract disease and fatal lung disease in humans. Vitamin C can manage a variety of viral infections. Honey was reported to be effective against the respiratory syncytial virus. Moreover, Ginger was effective in blocking viral attachment and internalization. Furthermore, green tea epigallocatechin-3-gallate shows a vital role in the adaptable microenvironment of endosomes and lysosomes. Also, Egyptian chicken soup contains many nutritive values, so it should be taken for upper respiratory tract diseases. Moreover, curcumin considers having a wide range of antiviral activity against several distinct viruses. And finally, fenugreek has a wonderful biological activity as protection from cancer, malaria, allergies, bacteria, and viruses. This work is primarily addressed the antiviral potencies of some natural product that will help to overcome or relief bad symptoms of coronaviruses.

## Highlights

- Viral infections are one of the serious problems globally, as it affects health and economic burdens.
- A novel coronavirus disease (COVID-19), spread globally, affects many people, involved in an acute respiratory and cause death in some cases.
- There is no vaccination until now for this pandemic virus; so, natural antiviral compounds might overcome this pandemic virus.
- Daily eaten honeybees with Vitamin C as lemon may be very effective in relieving the symptoms of the virus and may kill the host of coronavirus in the individual body.
- Curcumin has the ability to cut off virus adhesion to the cell, which prevents virus spread.
- Dairy milk should be treated very well with sterilization before consumption to avoid the spread of virus corona.

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**Keywords:** Viruses; Coronaviruses; Vitamin C; Curcumin, Green tea; Honeybees.

**Abbreviations:** HCoV-229E: Human Coronavirus 229E; SARS-CoV: Severe Acute Respiratory Syndrome Coronavirus; ROS: Reactive oxygen species.

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## Introduction

Viral infections are one of the serious problems globally, as it affects health and economic burdens. Regardless, the availability of vaccines or antiviral drugs, individual hygiene is a very effective way against viral infections [1]. The spread of coronaviruses (COVID-19) globally resulted in numerous deaths and hospitalizations. There is no vaccination until now for this pandemic virus and they cause many side effects if exists, so, this review article aimed to illustrate some of natural antiviral compounds that might overcome this pandemic virus.

Viruses are composed of proteins and are enclosed by a lipid membrane, the diameter of viruses ranged from 16 nm to 300 nm, the small size of the viruses makes them ultra-filterable, Viruses have developed through long time duration and could adapt to definite organisms or their host cells. Viruses contain only one type of nucleic acid, DNA or RNA. Viruses do not replicate by division method, but they propagate in the living cells host. They can develop their genomic activity and reproduce the components from which they are synthesis. They can't encode their ribosomes or energy-generating metabolic pathways. So, viruses consider intracellular parasites. They can re-route and adjust cellular processes for their optimal execution reproduction. The genetic reference for any viruses is not dependent on encoding structural components only but they have many genes that coded various regulatory active proteins as transactivators and enzymes like proteases and polymerases [2].

## History

Until now, there is a diversity of human diseases with obscure etiology. A viral is one of these diseases. There are about four distinct types of coronaviruses that have been known. Coronaviruses have been identified in different animals like rodents, poultry, turkeys, pigs, dogs, cats, rabbits, horses, cattle, and humans; they can induce a variety of severe diseases as gastritis and respiratory tract illness [3]. The coronaviruses that have been studied in detail are, HCoV-229E and HCoV-OC43 were discovered in the mid-of1960s, and are known to cause the common cold [4], SARS-CoV causes life-threatening pneumonia, and is the most known pathogenic human coronavirus [15] and human coronavirus, HCoVNL63 which was isolated from a 7-month-old child with acute respiratory disease In January 2003 [6]. Both HCoV-HKU1 and HCoV-NL63 are coronaviruses affects the respiratory tract, they found in both lower and upper respiratory tract disease, they have spread globally, especially in the winter [7].

Coronaviruses diseases in animals differently than humans, they produce gastritis, respiratory tract, and can affect the central nervous system in animals, whereas, in humans, the coronaviruses are affected the respiratory tract and in some cases cause lethal lung disease. SARS-CoV is the most known coronavirus that resulted in Severe Acute Respiratory Syndrome (SARS) [8]. SARS-CoV probably originated from a wild animal reservoir, as bats [9], and was transferred to humans by infected cats.

Nowadays by the end of December 2019, people with pneumonia of unknown etiology causes were reported in Wuhan. On the first of January 2020, China CDC reported a new coronavirus was reported and classified as SARS-CoV clade. The disease associated with the virus is referred to as novel coronavirus disease 2019 (COVID-19), this virus was spread globally, that affects many people and cause death in some cases. a coronavirus that involved in an acute respiratory disease known by coronavirus

disease 19 (COVID-19) or SARS CoV- 2 is the third spread virus from animal to humans in the last two decades that resulted in a major epidemic [10]. A genus of the Coronaviridae family, are enveloped viruses with a large plus-strand RNA genome. The genomic range of RNA is 27 to 32 kb in size, coated and polyadenylated. Viruses generally known in all groups by host range and genome sequence.

## Spread of coronaviruses

Coronaviruses can spread through direct or indirect contact; it can spread via large respiratory droplets and or small particle droplet nuclei, but the way of spread until unclear as influenza A viruses [11]. Although no one knows whether it can spread through the blood or not, people should avoid blood transfusion or come into contact with anyone's blood because it may be a reason to transmit this virus.

## How to avoid coronaviruses

Closed places should be avoided as possible; people with a cold should stay indoors and take plenty of rest. Mask should be put on the face, as well as safety glasses, hand gloves and change them every time, usage of a good sterilizer Personal hygiene is very effective in overcoming coronavirus, and finally, people should eat or drink food and drinks that increase their immunity.

## Natural food should be eating daily during coronavirus

- **L-Ascorbic acid (Vitamin C)**

L-Ascorbic acid is a found in abundant in vegetables, fruit foods it has an essential role in a several of cellular processes, it is an important product that can protect the body from oxidative damage which resulted from toxic free radicals and other reactive oxygen species (ROS) that are considered the main cause of several diseases. Vitamin C act as an antioxidant in physiological conditions and prooxidant under pathologic disease [12]. It can scavenge oxygen free radicals directly and restoring the tetrahydrobiopterin and  $\alpha$ -tocopherol antioxidants to normal value [13]. Vitamin C may, therefore, ameliorate viral-induced oxidative injury. Many infectious diseases cause the activation of phagocytes, and hence release reactive oxygen species. ROS has a role in the deactivation of the viruses. But, they are harmful to the host cells and can cause the pathogenesis of viral-induced host damage.

Respiratory syncytial virus respiratory tract disease which occurs in childhood leads, also may affect adults causing deaths [14], enhance ROS production and causes inhibition of lung antioxidant enzymes, this process leads to an imbalance between oxidant and oxidant balance and hence cause pulmonary poisoning [15]. The mechanism of Vitamin action C is different than traditional antiviral drugs in the human body; Vitamin C is thought to be working in a synergic way that combines with the virus and the body to preserve the body in a balance [16].

- **Honeybees**

Honeybees' products are natural products that have been used in ancient medicine. The importance of the biological properties of these products is related to the ingredients flavonoids they contain. They thought to have an antibacterial, anti-inflammatory, antioxidant, antifungal and antiviral role. Propolis is said to have a role in regenerative and antiviral in cold sores which result from herpes simplex virus [17]. Honey might be a novel antioxidant to relieve many diseases via di-

rect or indirect way [18]. It can improve immune status [19]. It can lower the acute respiratory symptoms in individuals who eat honey daily [20]. Antiviral effect of honey is attributed to its ingredients components, for example, copper can deactivate a virus. Moreover, vitamin c, flavonoids, and H<sub>2</sub>O<sub>2</sub> production by honey cause inhibition of viral growth through cut off viral transcription and translation [21]. Honey products are said to have antiviral activity against several types of viruses, for example, measles, herpes, and zoster viruses [22]. Nitric oxide metabolites, nitrite, and nitrate have been recognized in the salivary glands [23]. Nitric oxide can produce host defense against viruses, both DNA and RNA viruses, nitric oxide acts by slowing down the development of viral lesions also hinder their replication [23]. Nitric oxide represses replication by interfering with viral polymerase, nucleic acid, and/or viral capsid proteins. The flavonoid content of honey has also been reported to inhibit viral transcription and replication [24]. Moreover, the mechanism of the antiviral activity of royal jelly has been ascribed to the impact of 10-Hydroxy-2-Decanoic Acid. This fatty acid drives leukocytes, causing the leukocyte cells to attach to viruses, for example, HSV and hepatitis, causing their destruction [22]. Also, Feás and Estevinho [25] mentioned that honeybees provide antiviral activity against the respiratory system Dry mucus led to frequent long-term infection [26]. In order for viruses to survive, they need a host cell to spread, so the idea of killing the virus kills the host cell. Honey has been shown to have antiviral activity against respiratory syncytial virus and promotes inhibition of viral reproduction [14].

- **Ginger (*Zingiber officinale*)**

Ginger has been reported to show antibacterial, antifungal, and antiviral activities [27]. It is used to warm the body for promoting circulation and decrease high blood pressure. The warming effect of ginger makes it a potent antiviral for the treatment of common cold and flu [28]. Ginger can suppress plaque formation induced by a human respiratory syncytial virus in the respiratory tract in vitro. Ginger was said to have a potential role in blocking viral attachment and internalization [29]. Ginger was supplemented to the patient with the hepatitis C virus in Egypt; it resulted in lowering  $\alpha$ -fetoprotein level, both liver enzymatic marker aspartate aminotransferase (AST) and alanine aminotransferase (ALT) [30].

- **Green Tea**

Infectious viruses have extremely threatened human health globally. Viruses are responsible for both acute and chronic infectious diseases. Green tea catechins (GTCs) are polyphenolic compounds extracted from *Camellia sinensis* leaves. GTCs were known for their action against various health benefits against numerous diseases. GTCs, particularly epigallocatechin-3-gallate (EGCG), was said to have a potent antiviral effect alongside numerous viruses [31]. EGCG is the most ingredient of the catechins as its individual structure and the presence of both pyrogallol and galloyl moieties [32]. Furthermore, Xu [33] reported that the existence of phenolic hydroxyl and the galloyl group in GTCs have a significant different action on the different viral. EGCG can be considered a nucleophilic reagent, the presence of hydroxyl groups in the pyrogallol and galloyl moieties supply extra lone pair electrons as compared to other catechins, this allows EGCG to combine with various molecules under suitable conditions. GTCs have the ability to work in different stages of nuclear and cytoplasmic RNA viruses. The inhibition belongings of EGCG on multiple viruses indicated that the green tea EGCG is a potential alternative agent for viral dis-

eases [31]. It has been reported that EGCG binds strongly to numerous molecules in the cells, particularly proteins, and then influence their original activities and functions [34]. EGCG can suppress the interaction of the virus or receptors and the host. EGCG provides a principle role in adjusting both of endosomes and lysosome in the cell, the acidification process is critical for viral invasion. Viral genome replication or viral protein expression can also be repressed because of the inactivation of viral replicates or regulation of host factors. Although some authors reported the inhibition ability of EGCG on the stages of virus and genome synthesis, a few results were mention on antiviral effects on viral protein translation and assembly and budding [31]. In vitro study, it has been reported that EGCG exhibits antiviral activity against a diverse number of viruses as Retroviridae, Orthomyxoviridae, and Flaviviridae, including important human infectious pathogens such as human immunodeficiency virus, influenza A virus, and hepatitis C virus [35], and inhibition of influenza virus replication [36], hinders the entry of HCV entry [37], it can inactivate both Herpes simplex virus 1,2 at neutral or acidic medium [38], also, it has been used in the prevention or curative of infections resulted by Zikavirus [39]. Besides, it has the ability to suppress the activity of enzymatic of reversing HIV-1 [40]. The mechanisms action of green tea EGCG in viral, EGCG is oxidized to form EGCG quinone by autoxidation, thus it can combine with the nucleophilic thiol group of a cysteine residue to form EGCG-protein complex [41], else, the autoxidation of green tea catechins comprise oxygen radicals and molecular oxygen [42].

- **Chicken soup antivirus**

Egyptian Balady chicken soup was known for its effective action against the influenza cold symptomatic upper respiratory tract; this soup has medical value components and can alleviate the inflammation of the virus cold [43]. Chicken soup may have several beneficial effects for an individual with influenza cold. These could include actions as diverse as improving hydration and nutritional status [44] and accelerating mucosal clearance.

- **Olive oil**

Olive oil contains numerous polyphenolic compounds that consider bioactive compounds against the virus [45]. Polyphenols are characteristic by their antibacterial, antioxidants, anti-inflammatory, antiviral, and antiallergic action [46]. Oleuropein, tyrosol, hydroxytyrosol, verboscoside, ligustroide, demethyleuropein were all considered a potent antimicrobial and antiviral agent [47]. Oleuropein has a potent antiviral against many different viruses, for example, herpes, hepatitis, rota, bovine rhino, canine parvo, and feline leukemia virus [48]. Also, it can manage respiratory syncytial and influenza type 3 viruses [49]. The olive leaf extracts were effective in control infection or replication in many diverse viruses as in viral hemorrhagic septicemia, salmonid rhabdovirus, and HIV-1[50]. Oleuropein olive extract targets the action of HIV-1 gp41, which is a way of HIV login into the normal host [51].

- **Curcumin (diferuloylmethane)**

Curcumin is a natural polyphenol extracted from turmeric; it is used in a wide range as food additives [52,53]. Curcumin has the ability to cut off virus adhesion to the cell, which prevents virus spread (Chen et al., 2010). It plays a biological role against several viruses such as influenza, hepatitis C and HIV viruses [54]. Daily eating only a small amount of curcumin per day has the potential to suppress the activity of the monophosphate

dehydrogenase enzyme [55] and Integrase enzyme (necessary for HIV-1 recurrence) curcumin may react with the catalytic core of the enzyme and bind acidic remnant in the integrases catalytic core and forbid it from binding with its substrates [56]. Curcumin also showed a potential role against the human respiratory syncytial virus, it hinders the replication of the virus and increased the epithelial barrier role [57]. Moreover, Yang [58] stated that curcumin nanoparticles present biocompatibility and prevent RSV infection.

- **Fenugreek (*Trigonella foenum-graecum* L.)**

Fenugreek possesses pharmacological properties, for example, it can fight bacteria, carcinogenic, inflammatory and virus [59]. Moreover, it controls various enzymatic activities, relieves fever, and reduces body pain. Moreover, Fenugreek contains many compounds that possess biological activity in various diseases as protection from cancer, malaria, allergies, bacteria, and viruses [60].

- **Food should be control before eat**

The spread of rota and coronavirus in Egypt last year had a great effect on public health and economic loss in animals and its milk products. Dairy milk may be the main role in infecting a human with both rota or coronavirus and cause the spread of these viruses. Manufacture of Kareish white cheese and Balady yogurt in the home cannot eliminate this rota or coronavirus when infected milk is used due to deficient heat treatment and poor hygiene [61]. Dairy milk should be treated with sterilization before consumption [62].

### Conclusion

Vitamin C has the ability to relieve the symptoms of coronavirus. Vitamin C acts as an antioxidant in physiological status and prooxidant in pathologic disease as it can scavenge oxygen free radicals and restoring tetrahydrobiopterin and  $\alpha$ -tocopherol to normal value. Daily eaten honeybees with Vitamin C as lemon may be very effective in relieving the symptoms of the virus and may kill the host of coronavirus in the individual body. Moreover, ginger was able to prevent plaque forming which results in respiratory syncytial virus infection. Also, green tea has the ability to suppress the activity of enzymatic HIV-1 reverse transcriptase. Furthermore, Egyptian chicken soup with lemon as a source of vitamin C can produce several beneficial effects for individuals with a cold. Their action is various, they can improve hydration and nutritional condition and fasten mucosal rescue. Finally, Fenugreek possesses more pharmacological action as antimicrobial, anti-inflammatory, antiviral. All of the natural components in this article review should be taken daily to overcome coronavirus and raise the immunity of individuals. On the other hand, Dairy milk should be treated very well with sterilization before consumption to avoid the spread of virus corona.

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