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D. P. Bhosale College, Koregaon

Department of Botany

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Green Corner Wallpaper



Special Issue On

Medicinal Plants: Role as Immuno-boosters in Covid -19

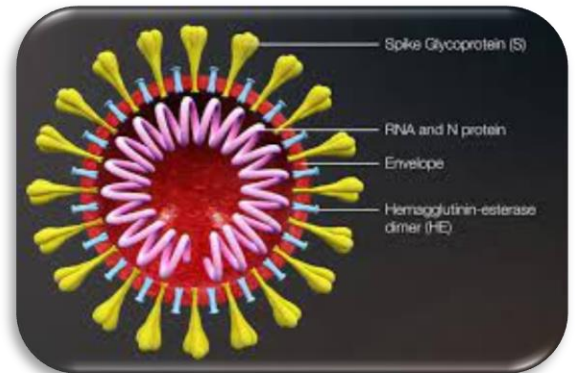
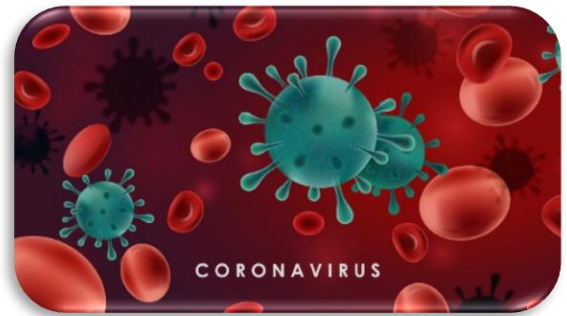
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Introduction

Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus. This virus has rapidly spread throughout the world leading to high mortality rates. People all over the world have become scared of this new normal and becoming victims of this virus both physically as well as psychologically.



Understanding the pathophysiology of this disease is rapidly advancing with the availability of new research data. Current evidence suggests that most individuals are asymptomatic or are suffering from mild symptoms. The patients who progress to severity develop pneumonia and ARDS and require hospitalization. The SARS-CoV-2 virus uses the **angiotensin-converting enzyme 2** (ACE2) receptor for cell entry and the transmembrane serine protease 2 (TMPRSS2) for spike protein priming. Upon entry into host cell it synthesizes structural proteins and enzymes essential for viral replication. The infected cells recruit immune cells for viral clearance, which release cytokines combatively that induce hyperinflammation leading to organ damage. Covid-19 infection is characterized by collapsed immune balance, hyperinflammation, cytokine storm and multiorgan failure.

The extremes of Covid-19 identified the gaps in healthcare management systems hence there is need of combined therapies of modern and traditional medicines to overcome this pandemic disease.

COVID-19 pandemic has impact in each family across the planet, the implications of its spread have become far more serious than imagined to be. At such times, it's important to follow the protocols of wearing a mask, using sanitizers, staying indoors and **strengthening immunity**. Wondering how to boost your immunity against the virus? Here we **"the wonder herbal medicines"** came to your help!!!!

According to the concept of Immunity - Vyadhikshamatva or Bala; the body's resistance is not only important for disease prevention but also for speedy recovery from illness. Immunity is our body's natural defence against disease. It can considerably reduce the chances of getting sick more often. It is only due to the weak immunity that people are getting affected with the widespread coronavirus and other such infections.

Ayurveda **"The Science of Life"** have given humanity a gift wonder herbs for healthy lifestyle. It is known as **Mother of all healing** as it is world's oldest (5000 years) holistic healing system. Ayurvedic herbs like Shatavari, Ashwagandha, Guduchi, Cinnamon etc. have shown there effectiveness as immunomodulators and adaptogens in corona virus pandemics.



Curcuma longa L.

Curcuma longa L. belongs to family Zingiberaceae commonly known as Turmeric or Haldi. It is integral spice in Indian kitchen. It is a well-documented medicinal herb in Ayurveda recognized as “Golden Spice” having several medicinal uses such as antiseptic, antiviral, anti-inflammatory, anti-bacterial, liver disorders, anorexia, rheumatism, diabetic wounds, runny nose, cough as well as cosmetics.



It is native to India, now extensively cultivated in the subtropical regions of South and Southeast Asia including China, Indonesia, some areas of Africa. It is a rhizomatous herb, grows to a height of 3-5 ft. Leaves are oblong, pointed; bears funnel-shaped yellow flowers, extruding out of large bracts.

Rhizome is used to extract the compounds of medicinal potential. It is boiled, cleaned, and dried; yielding a yellow powder. The dried rhizome is source of the spice turmeric powder; ingredient that gives curry powder with characteristic yellow colour. Turmeric powder is used extensively in foods for both its flavour and colour.

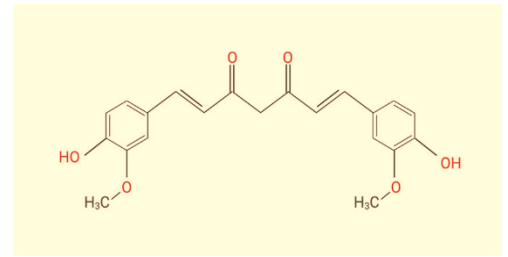
Fresh rhizome



Dried rhizome Powder



The rhizome yield polyphenolic compound *Curcumin* (C₂₁H₂₀O₆) a potential bioactive molecule used in different formulations. Curcumin aids in making our immunity stronger.



With new variants of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) emerging, the coronavirus disease 2019 (COVID-19) pandemic is far from over. While the global vaccine rollout has moved at an impressive speed, the search for new safe, effective, and targeted therapies is still on.

The use of turmeric is beneficial as it possesses properties such as anti-inflammatory, anticancer, and antioxidant, as well as antiviral. Curcumin has been suggested as a molecule with the potential to heal pulmonary edema (medical condition caused due to excess fluid in the lungs) and other injurious processes that lead to lung fibrosis following COVID-19.

Curcumin inhibits viral enzymes

Curcumin is supposed to have ability to inhibit the virus itself, as well as to modulate inflammatory pathways. It regulates viral transcription and regulation, binds with high potency to the viral main protease (M_{prot}) enzyme that is key to replication and inhibits viral attachment and entry into the host cell. Its range of antiviral targets includes the hepatitis C virus, the human immunodeficiency virus (HIV), the Epstein-Barr virus and the influenza A virus. It has been reported to

inhibit the 3C-like protease (3CLpro) more effectively than other natural products, including quercetin, or drugs like chloroquine and hydroxychloroquine.

It may help to reduce viral loads within the human cell much more rapidly than other less inhibitory drugs, and thus prevent disease progression to acute respiratory distress syndrome (ARDS).

Curcumin inhibits host cell receptor

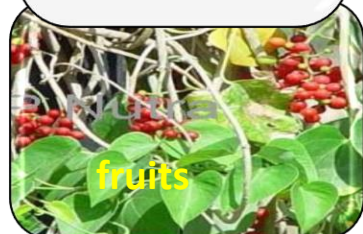
The virus attaches to the human host target cell receptor, the angiotensin-converting enzyme 2 (ACE2). Modeling studies have shown that curcumin inhibits this virus-receptor interaction in two ways, by inhibiting both the spike protein and the ACE2 receptor.

- Fine powder of roasted turmeric and honey with water drink it twice a day will help to get relief from sour throat and cough.
- Regular use of herbal tea prepared with turmeric powder and carom seeds with honey gives relief in sore throat.
- An equal amount of turmeric powder and black pepper powder in half cup of water with few Cinnamon sticks along with honey. Boil the solution for 2-3 minutes and drink daily.
- Add a tablespoon of turmeric powder in a glass of milk, add sugar or jaggery (optional) boil and drink before sleep.
- Make decoction of turmeric, ginger, tulsi, jaggery, clove and drink in the morning.

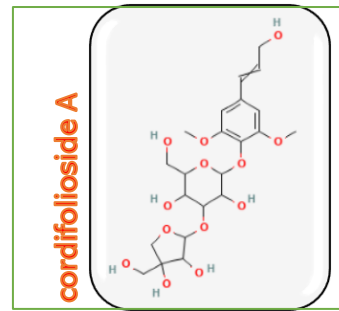
Tinospora cordifolia (Willd.) Miers ex Hook. f. & Thomson

Tinospora cordifolia (Willd.) Miers ex Hook. F. & Thomson belongs to family Menispermaceae. It is commonly known as Gulvel, Guduchi, Giloy, Amrita, Amritvalli, Indian Tinospora. It is a glabrous, liana native to India. The name *cordifolia* is from the cordate (heart shaped) leaf base. It climbs on the trunks of other large trees, the stem is characteristically grey-creamy with rosette lenticels. Leaves are simple, cordate, dark green; flowers small; fruits berry in aggregate, red, fleshy. Guduchi is mostly used Ayurvedic herb by folks and tribals to cure various diseases such as fever, diarrhoea, dysentery, cough, stomach tonic etc. The root and stem contain different alkaloids of medicinal potential. The major alkaloids are tembetarine, choline, magnoflorine, tinosporine etc.

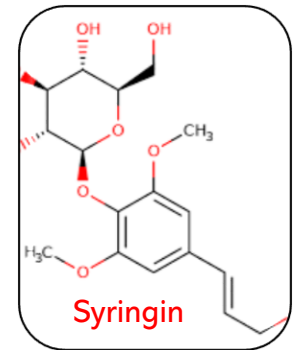
Covid -19 has hazardous effects on overall humanity; research fraternity around the world is trying to find solution against this virus. Ayurveda has many plants which can help to prevent the fatal effects of corona virus. Guduchi contains seven immunomodulatory compounds of which *Cordifolioside A* and *Syringin* reported to possess



immunomodulatory activity. Other five compounds showed significant enhancement in phagocytic activity and increase in nitric oxide and reactive oxygen species generation at concentration 0.1-2.5 µg/ml.



Gudich is reported to have significant immunomodulatory effect because of these active biomolecules. Various herbal formulations are available in market with prior clinical trails with various names like Giloy, Guduchi, Giloy Ghanwati, Samshamani vati, Giloy Capsules, Giloy Satva etc.



- Traditionally Giloy leaves are chewed directly or are boiled in water then taken to cure fever, bronchitis, diabetes etc.
- Tender Giloy stem is also chewed or it is made into *Arka* with ginger, Tulasi, Turmeric and then taken orally.
- Stem powder (2 gms.) is taken with a tablespoon of honey for improving immunity.
- Chop the Giloy stem and blend; add a glass of water and drink.

Withania somnifera (L.) Dunal

Withania somnifera (L.) Dunal belongs to family Solanaceae commonly known as Ashwagandha, Indian Ginseng or Poison Gooseberry. It is an important commercial medicinal crop, considered as similar to *Panax ginseng* in Chinese medicine. according to the Ayurveda it is considered as ***Rasayana* (Rejuvenator)** means the herbs helps for lengthening life span.



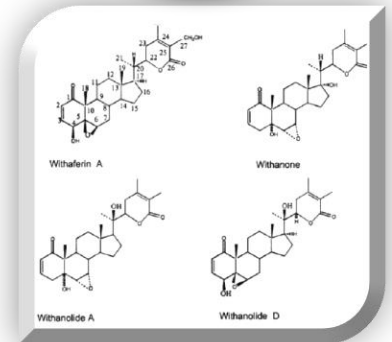
Ashwagandha, is native to drier parts of India. It is an erect perennial shrub, grey-pubescent with dendritic hairs all over the plant body. Inflorescence a congested cluster of 4–6 flowers; berry globular, shining red, surrounded by urn-shaped inflated calyx, seeds more or less disc-shaped, light brown.

During these unusually challenging times of a global pandemic, having robust immunity and a well-functioning respiratory system is of paramount importance. To maintain this Ashwagandha is a best remedy in Ayurveda.

All parts of the **Ashwagandha** i. e. roots, bark, leaves, fruits, and seeds are used for their medicinal properties but the root is mostly used in different medicines. This herb has traditionally been prescribed to strengthen immunity after illness.



The root contains *Withanolides* as active principle compound now believed to be an immune-booster against covid -19.



It is one of the most important herb of Ayurveda (the traditional system of medicine in India) used for millennia as a rejuvenator for its wide ranging health benefits. Rejuvenator a herbal or metallic preparation that promotes a youthful state of physical and mental health and expands happiness.

This herb has proven its efficacy in nervous system disorders. It has shown to improve brain cell function, nervous exhaustion, anxiety and depression. It also refreshes the body by relieving fatigue. Researchers are exploring the role of ashwagandha in degenerative conditions like Alzheimer's and Parkinson's. It is ideally recommended to be had with warm sweetened milk.

The experimental literature indicates that Ashwagandha has the potential for

- 1) maintaining immune homeostasis
- 2) regulating inflammation
- 3) suppressing pro-inflammatory cytokines

- 4) organ protection (nervous system, heart, lung, liver, and kidney)
- 5) anti-stress, antihypertensive, and antidiabetic activities.

Ashwagandha can be a potential therapeutic adjuvant for various stages of COVID-19 management. It may also have beneficial effects on comorbidities associated with the COVID-19. For about two years due to lockdown everyone is at home for much of the time than ever in the past, some people lost their jobs, many people especially teenagers, students are under stress or depression here the Ashwagandha can become a solution to them!!!!

