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REVIEW ON HERBAL REMEDIES FOR COVID-19

K. Priyanka Shinde* and N. Dattaprasad Vikhe

Department of Pharmacognosy, Pravara Rural College of Pharmacy, Loni - 413736, Maharashtra, India.

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Correspondence to Author:

K. Priyanka Shinde

Department of Pharmacognosy,
Pravara Rural College of Pharmacy,
Loni - 413736, Maharashtra, India.

E-mail: ps7848077@gmail.com

ABSTRACT: The unknown coronavirus has been unfolded all over the world. The primary case was declared in Dec 2019, and this coronavirus malady has become a virulent disease. Infection of this virus is directly attacked on the system of the flesh or animals. Nowadays, there's a deficiency of correct management or vaccinum out there to stop this malady that principally attacks the system of the body. Hindrance is healthier than cure. This term is extremely renowned to any or all people. Thus, currently, this time has come back to use for our savings of lives. Ayurveda is the ancient system of drugs which is originated in India. During this Covid -19 amount boosting of our system is the excellent thanks to fighting against this coronavirus. Many seasoning plants unit accessible in our shut that unit used for immunity-boosting throughout Covid 19. Some seasoning plants like *Tinospora-cordifolia*, *Withania somnifera* and *Nyctanthes arbortristis* are commonly used for immunity boosting. This herb contains compounds like glycosides, steroids, diterpenoid lactones, alkaloids, steroidal lactone etc. vary of research unit accessible on *Tinospora cordifolia*, *Ashwagandha*, and *Nyctanthes arbortristis* to prove its immunomodulatory activity, antioxidant activity, anti-inflammatory activity, antipyretic activity. Throughout this general review, we've a bent to target on the role, drugs activities of *Tinospora cordifolia*, *Ashwagandha*, *Nyctanthes arbortristis* to the prevention and treatment of Covid 19 or coronavirus infection.

INTRODUCTION: Coronavirus or covid 19 is a fairly infectious ailment because of the currently originated coronavirus SARS-COV-2, which could develop among people and animals. The explosion of the corona virus as begun in China, (Wuhan city), in December 2019. Then it's distended worldwide, and its coronavirus was appointed as a worldwide Pandemic by the World Health Organization in 2020 1. Infection of this virus primarily affected the immune system of the human body or animals.

Serious illness and respiratory distress may develop in old age persons and those already suffering from medical problems like hypertension, heart disease, or diabetes. The common symptoms of this coronavirus infection are fever, tiredness, dry cough, diarrhea, aching throat, aches, pain, and nasal congestion². At least 177 countries are affected through this pandemic, with approximately 154,000 fatalities³.

There are no therapeutic agents available for the treatment of covid -19 due to its broad clinical spectrum. Hence, it is very necessary to look over it through alternative science. Ayurveda is the historical gadget of medicine; it may control any disorder with none facet effects. There are few herbal and herbomineral formulations are defined withinside the oldest Ayurveda machine of

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medicine⁴. A number of herbs and medicines have come out as a doubtless treatment for the covid-19 virus, including some herbal plants like *Tinospora cordifolia*, *Withania somnifera*, Turmeric, Cinnamon bark Garlic, Tulsi.

The current review focuses on the efforts that have been made to illustrate the role of herbal plants or remedies for the prevention and treatment of Covid-19. *Tinospora cordifolia* is a herbaceous plant of the family Menispermaceae. Indigenous to the tropical region of the Indian subcontinent.

This plant is usually recognized as Guduchi, Amruta, or Heart-leaved moonseed. This plant shows several properties like antiallergic, anti-hyperglycemic, immunomodulatory, antioxidant,

anti-inflammatory. And this plant highly contains glycosides, steroids, alkaloids, aliphatic compounds, diterpenoid lactones, sesquiterpenoids⁵.



FIG. 1: PLANT OF *TINOSPORA CORDIFOLIA*

TABLE 1: TAXONOMICAL CLASSIFICATION OF *WITHANIA SOMNIFERA*

Botanical name	Kingdom	Order	Family	Genus	Species
<i>Tinospora cordifolia</i>	Plantae	Ranunculales	Menispermaceae	Tinospora	<i>T. cordifolia</i>

Pharmacological Activity of *Tinospora cordifolia*:

Immunomodulator activity of *Tinospora cordifolia*: From a few years *Tinospora cordifolia* is analysed within the read of its immunomodulatory properties. It has great immunomodulatory properties. Aqueous extract from the stem of *Tinospora cordifolia* has been shown to produce immunological activity⁶. Extract of *Tinospora cordifolia* has also been shown as an immunomodulatory effect in HIV patients. Hepatoprotective and immunomodulatory activity of *Tinospora cordifolia* in CCl₄ evoked rats⁷.

Anti- Inflammatory Activity of *Tinospora cordifolia*: Alcoholic extract of *Tinospora cordifolia* has been shown anti-inflammatory activity in the acute and sub-acute inflammation⁸.

The *T. cordifolia* plant which grows on *Azadirachta indica* plant for the study conducted on water extract prepared from stem of *T. cordifolia*. The study of this extract significantly shows inhibition of acute inflammatory response induced by carrageenan, which is given intra-peritoneally and orally⁹.



FIG. 2: STEM OF *TINOSPORA CORDIFOLIA*



FIG. 3: PICTURE OF ASHWAGANDHA PLANT

It also shows the Antipyretic activity. In albino rats formulation of *T. cordifolia* 'Guduchighrita' shows significant activity¹⁰. *Tinospora cordifolia* have enough therapeutic allocate such as immunomodulator, antioxidant, antipyretic, antiviral, an anti-inflammatory which are to be

employed for the treatment and prevention of Covid-19.

Botanical Description: *Withania somnifera* is commonly called Ashwagandha, Indian ginseng, winter cherry, or poison gooseberry.

Ashwagandha is a small shrub belongs to the family Solanaceae. The height of this plant grows up to two feet in drier parts of India. Mainly roots of Ashwagandha are used as therapeutically. The color of Ashwagandha fruit is bright red. Dried

seeds are used for cultivating as a medicinal plant. All parts of plants like roots, leaves, stem, green berries, fruits, seeds, bark, **Fig. 1**. Picture of Ashwagandha plant used in medicine and all parts show different activity¹¹.

TABLE 2: TAXONOMICAL CLASSIFICATION OF WITHANIA SOMNIFERA

Botanical name	Kingdom	Order	Family	Genus	Species
<i>Withania somnifera</i>	Plantae	Solanales	Solanaceae	Withania	<i>W. somnifera</i>

Immunomodulator Activity of Ashwagandha:

Withania somnifera is a very attractive medicinal plant with many relief properties. In other words, Ashwagandha is a god grace plant for human life. *Withania somnifera* is awfully helpful on the bone marrow physiological condition and a- esterase positive cell, current super molecule titer, super molecule producing cells, and somatic cell action of membrane macrophages. The extraction of *Withania somnifera* is discovered that it grows the circulation of supermolecule titer cells that kind antibodies. It is also demonstrated that by treating animals with withania, there is an excellent growth of bone-marrow cells¹². Withania includes much pursuit like anti-inflammatory and analgesic because of cyclooxygenase 2 unassertiveness behavior. The use of this plant also increases the nitric oxide synthetase activity of the macrophages. That increases the cell-mediated immune response owing to enhancement of the microbial demolishing ability of the immune cells.



FIG. 4: PICTURE OF PARTS OF ASHWAGANDHA PLANT

W. somnifera is a glycol protein called Glycowithanolides is also liable for anti-microbial activities¹³. According to Charak-Sahmita *Withania somnifera* has immunomodulatory, anti-inflammatory, antistress, anti-rheumatic properties¹⁴. Recently the researchers attacked the leading SARS-COV-2 enzymes for breaking up proteins, identified as the main protease (Mpro). Mpro plays an important role in moderating viral replication.

Withania is achieved from *Withania somnifera* and caffeic acid phenethyl ester, an active constituent of new Zealand propolis, which has the probability to interconnected with and block the activity Mpro.

Anti-viral Effect of Ashwagandha: They assess in their study by forward a procedure approach, a natural chemical constituent of Ashwagandha to look at a potential matter against the main enzyme of SARS-COV-2¹⁵.

Pharmacological Activity of Ashwagandha:

Centennial of ayurvedic clinical experience, the use of *Withania somnifera* have reveal it to have pharmacological cost as asadaptogenic, antibiotic, aboritifacient, aphrosidiac, diuretic, narcotic, sedative, and tonic. Ashwagandha has been observed to offer mighty antioxidant protection^{16, 17}.

Pharmacological Action of Withanolides:

The roots of *Withania somnifera* consist typically of compounds named withanolides, which measuring unit is believed to account for its fantastic healthful properties. Withanolides are steroidal and endure a resemblance, each of their movement and appearance, to the energetic elements of Asian ginseng called ginsenosides. Ashwagandha's withanolides had been analyzed the terribly very type of animal analysis examining their impact on severa conditions, including immune choices or even cancer¹⁸. The withanolides have a C28 steroidal nucleus with a C9 facet chain and a six-membered lactone ring. Twelve alkaloids, 35 withanolides and diverse sitoindosides units of measurement were emoted and studied. A sitoindosides may well be a withanolide containing an aldose molecule at carbon twenty-seven; a lot of Ashwagandha medication interest has been attributed to a try of necessary withanolides withaferin A, D and withanolide G.

Structure of Withanolides A and B: The withanolides function as necessary endocrine precursors that may convert into human physiological hormones as required. It can also regulate important physiologic processes¹⁹.

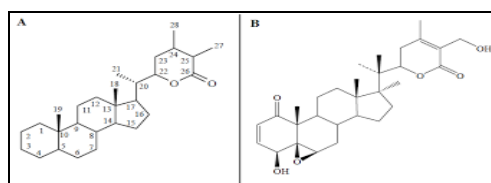
















TABLE 3: SOME MEDICINAL PLANT FOR TREATING COVID -19

India medicinal plant	Trade name	Effective against	Image
<i>Tinospora cordifolia</i>	Samshamani Vati	Chronic fever	
<i>Andrographis paniculata</i>	Nilaverbu kudineer	Fever, and cold	
<i>Cydonia oblonga</i>	Unnab sapistan	Antioxidant, immunomodulatory, antiallergic	
<i>Arsenicum album</i>	Arsenium abbum 30	SARA-COV-2 acts as an immune modulare	
<i>Agastya haritaki</i>	Agasthya rasayanam	Upper respiratory infection	
<i>Anuthila</i>	Sesame oil	Respiratory infection	
<i>Andhthodai manapagu</i>	<i>Adathodai manapagu</i>	Fever	
<i>Bryonia alba</i>	Bryonia	lung infection	
<i>Atropa belladonna</i>	Belladonna	Asthma and chronic lung disease	
<i>Bignonia sempervirens</i>	Gelsemium	Asthma	
<i>Rhus toxicodendron</i>	Rhustox	Viral infection	
<i>Eupatorium perfoliatum</i>	Eupatorium perfoliatum	Respiratory Symptoms	
<i>Visa sura kudineer</i>	Polyherbal formulation	Fever	
<i>Kaba sura kudineer</i>	Polyherbal formulation	Fever, cough, sore throat, shortness of breath	

Nyctanthes arbor-tristis L. (Parijatak): In many regions of India, mankind is the usage of *Nyctanthes arbor-tristis* L. leaf to heal a huge quantity of ailments like diabetes, flu, even for malaria, fever, cancer, and HIV.

Many researchers were done to grasp the welfare and boost of immunity power by an intense leaf of *Nyctanthes arbor-tristis* L.²⁰.



FIG. 5: PLANT OF NYCTANTHES ARBORTRISTIS L.

TABLE 4: TAXONOMICAL CLASSIFICATION

Botanical name	Kingdom	Eudicots division	Family	Genus	Species
<i>Nyctanthes arbor-tristis</i> L.	Plantae	Angiosperm	Oleaceae	Nyctanthes	<i>N. arbor-tristis</i>

Immunomodulator Activities of *Nyctanthes arbor-tristis* L: *Nyctanthes arbor-tristis* L. is a medicinal plant that has anticancer²¹, immunostimulant²², hepatoprotective²³, antiviral²³, antimicrobial and antifungal²⁴, anti-allergy²⁵, anti-diabetic²⁶, anticholinesterase²⁷ residence in opposition to numerous diseases. *Nyctanthes arbor-tristis* L. has the potential to stimulate the immune system, pretends each humoral and cell-mediated immunities as had been analysed its impact withinside the oblique hemagglutination test and serum immunoglobulin²⁸.

The leaf juice of this plant is used to heal many diseases like to kill roundworms and threadworms, to treat loss of appetite and nausea, liver and bile duct related diseases, piles chronic disorders and fever like malarial, obstinate the irritation of the sciatic nerve, rheumatoid arthritis disease. Garden fresh leaf-juice, honey and normal salt mixed doses have been recommended to be secure laxatives for infants. Two-ounce infusion doses are favorable in fever and rheumatic diseases as a diuretic and medicinal drug. For snakebite and bronchitis treatment the bark of *Nyctanthes arbor-tristis* is very useful. The Asian nation social group human utilize many components of *Nyctanthes arbor-tristis* to induce a cure from cough, hiccup, dysentery, snakebite, and sores. To damage parasitic worms, this plant is generally used in Nepal. Along with the above activities, *Nyctanthes arbor-tristis* is additionally used as immunotoxic, antiallergic antihistaminic, purgative, antibacterial and ulcerogenic activities²⁹.

Pharmacological Activities: It shows the following activities, Hepatoprotective activity and antihistaminic activity, anti-tryptagenic and anti-

bacterial, antiviral activity, Anti-cholinesterase, and anti-inflammatory activity, Anti-filarial and antioxidant activity.

CONCLUSION: Ayurvedic herbal products is may be helpful to pick out as an associate risk and lined approach to decrease the morbidity and mortality associated with novel coronavirus infection and enhance host immunity within the direction of infectious agents. So, those herbal formulations are a great way to improve immunity power. These herbal drugs have high therapeutic capabilities with high efficacy, low toxicity and cost-effectiveness. Ashwagandha, *Tinospora cordifolia*, and *Nyctanthes arbor-tristis* have the greatest immunomodulatory, antioxidant, anticancer, adaptogenic; anti-inflammatory activities have been reported. The immunomodulatory drugs in Ayurveda have enough attributes to be utilized both to prevent and treat Covid-19.

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