



Roots and leaves extract from *Ashwagandha* plant uses in influenza virus and Indian traditional system of medicine

R B Singh

Scientist 'C' UGC, Department of Zoology, School of Life Sciences, Dr Bhimrao Ambedkar University, Khandari Campus, Agra, Uttar Pradesh, India

Abstract

Withania somnifera Dunal (*Ashwagandha*) plant considered as an excellent Rasayana, health tonic and cure for a number of health complaints. Plants is a diuretic, sedative, anti-inflammatory, increasing energy and acts as an adaptogen that exerts a strong immunostimulatory and anti-stress agent. *Ashwagandha* plant taken for treating cold and coughs, ulcers, diabetes, leprosy, nervous disorders, rheumatism, arthritis, intestinal infections, bronchitis, asthma, anticancer, HIV-AIDS, Influenza virus, Corona virus, covid-19 and TB patients. According to Indian herbal system of medicine, it is considered one of the most important herbs and best adaptogenic properties. Leaves extract are contains cuscohydrine, anahygrine, tropine, anaferrine, aglycosides, withanolides, starch and amino acids. Withanolids alkaloids from roots and leaves consists of steroidal molecules to fight inflammation and stimulates the immune system, increases memory and helps maintain general health and wellness. Plant is known to increase the production of bone marrow and act anti-ageing, anti-tumor and anti-inflammatory agents. Its steroidal is much higher than that of hydrocortisone which is common treatment in cancer, TB, HIV, Influenza virus, Corona virus, Covid-19 and AIDS activity. It is also recognized as a blood tonic in gynecological disorders including anemia. Anxiety patients can also benefits from *Ashwagandha* roots and leaves extracts.

Keywords: *Ashwagandha*, withanolids, alkaloids, anti cancer, TB, HIV, AIDS, influenza virus, corona virus disease

Introduction

Withania somnifera Dunal (*Ashwagandha*) plant ^[1] belongs to Solanaceae-family and is commonly called as *Ashwagandha*, *winter cherry* or *Indian ginseng* and cultivated in drier parts of India, America, Pakistan, African & Asian Tropics, Europe, Bangladesh, Thailand and Sri Lanka ^[2]. Plants grows as a short shrub, herbs up to 35-75 cm in height. It is an important ancient medicinal plant and its leaves and roots of which have been employed in Indian Traditional system of medicine ^[3], Ayurveda and Unani. *Ashwagandha* plant is uses in Ayurvedic system of medicine for the treatment of anti-oxidant, anti-cancer, HIV, AIDS, TB, anti-inflammatory ^[4], leucoderma, influenza virus and corona virus, covid-19 disease. Root, leaves and bark from *Ashwagandha* plants ^[5] has a potential role in the cancer therapy for growth inhibitory of human tumor cell lines, anti-carcinogenic activity, abscisic acid in skin, carcinoma in rats, anti-granuloma, anti-oxidative properties ^[6] and chemoprotective activities. Roots and leaves extracts are used in tonic, abortifacient, nervine, mental problem improvement and also used in arthritis, depression, anti-stress ^[8], chronic diseases, infertility, memory loss and hormone imbalance. Medically the *Ashwagandha* plant have been used back over 3000-4000 years to the Bleaching Rishi Punarvasu Ariya. It has been described in sacred text of Ayurvedic include Charaka and Bhushruta Savahtita used as babies tonic. Plant is a best rejuvenative (Rashyana) that helps to maintain the proper nourishment of human tissues. In our earlier communications the nature of sugar ^[9], structure of seeds polysaccharide ^[10], Pharmacological and phytochemistry studies ^[11] and Rasayana Ayurvedic medicine ^[12] have already been studied from *Withania somnifera* Dunal (*Ashwagandha*) plant. *Ashwagandha* plant extracts increases haemoglobin (RBC) and hair melanin and it is also stabilizes

blood sugar and lowers cholesterol. *Ashwagandha* is a well known medicinal plant used in Traditional system of medicines for more than 3,000 years. This plant extract and its bioactive compounds are used in the prevention and treatment of many diseases such as neurodegenerative, cardiovascular, cancer, anemia, TB, HIV, AIDS, Influenza virus, corona virus, covid-19 disease. Ayurvedic treatment has become an alternative to conventional medicines due to easily availability, no side effects and less cost. We have chosen a multitude of Indian herbal plants as: Harsingar (*Nyctanthes arbor-tristis*), Giloy (*Tinospora cordifolia*), Aloe-vera (*Aloe barbadensis*), Turmeric (*Curcuma longa*) Neem (*Azadirachta indica*), *Ashwagandha* (*Withania somnifera*), Ginger (*Zingiber officinale*), Red onion (*Allium cepa*), Tulsi (*Ocimum sanctum*), Cannabis (*Cannabis sativa*), Black pepper (*Piper nigrum*), the pharmacological importances of these plants is well documents in present literature.

The Corona virus are virus which is related to sub-family-Coronovirinae in the group of coronaviridae. This virus is a single stranded virus with a positive sense single standard RNA genome with nucleocapsid of helical order. Corona virus are known to circulate in animal and birds, already suggested by scientists that covid-19 originally came from Bats.

Materials and Methods

Chemical constituents of *Ashwagandha* plant

The chemical extracts were isolated from both roots and leaves of *Ashwagandha* plant with methanol, hexane and diethyl ether as withanolides alkaloids are found in 0.13-0.3% in roots while 0.15-0.38% in leaves. The roots are alternative, aphrodisiac, diuretic, narcotic, sedative and restorative in nature,

Pharmaceutical activity from leaves and roots are attributed to the alkaloids and steroidal lactones. Many biochemical heterogeneous alkaloids and several other steroidal lactones, 12-alkaloids, 35- withanolids and several saponosides have been isolated from roots. Withanolide ($C_{25}H_{38}O_6$) and withaferin-A ($C_{28}H_{38}O_6$) are steroidal constituents of *Ashwagandha*. The saponoside is a biologically active constituents known as withanolids containing a glucose molecules at carbon C²⁷ position. Pharmaceutical activities of plant has been attributed to two main withanolids are as withaferin-A and withanolide-D. The withanolids-A is therapeutically active withanolids which reported to be present in plant leaves. In addition to the withanolids alkaloids from roots of *Ashwagandha* are reported to contain starch, reducing sugar glycosides, dulcitol withancil acid and neutral compounds. The amino acids are reported from the roots includes aspartic acid, glycine, tryosine, alanine, glutamic acid and lystcine. Some others biochemical compounds were also extracted from the plants as resin, fat, reducing sugar, colouring matter, phytosterol and a mixture of saturated and unsaturated acids. It can also reduce inflammation which may be in overweight people's and has rich in iron which can help build RBC and improve the blood circulation. The newly emerged corona virus, covid-19 has been shown to engage the host cell ACE-2 through its spike protein receptor binding domen (RBD). We have shown that the natural phytochemical have distinct effects on vital RBD and host ACE 2 receptor complex. Withanone compound is very well in the binding interface of ACE-2 & RBD complex and found to move towards the interface centre on stimulation. Withanone compound is significantly decreased electrostatic complant of binding free energies of ACE 2- RBD complex. *Ashwagandha* plant may be first choice of herbs for controlling Corona virus covid-19 infectively. The extract of Turmeric, Neem, *Ashwagandha* and Ginger have longer inhibition than that of chloroquine. The compound extracted from other plants also possess certain inhibition properties against Covid-19 protease.

Medical benefits of *Ashwagandha* herb

Ashwagandha herb is considered to be one of the best Rejuvenating (Rasayana) agents in Ayurveda. Its roots, leaves and seeds are used in the Ayurvedic and Unani system of medicine. Roots extracts are used as tonic for the treatment of cold, cough, sedative. Ulcers, rheumatic pain and nervous disorders. Leaves juice is useful in conjunctivities inflammation and swelling. Bark extract is used in the preparation of herbal tea, powder and syrups. The pharmaceutical studies and research so far have indicated that plant has antitumors, anti-stress^[13], anti-oxidant, haemopoetic and rejuvenating properties. *Ashwagandha* roots and leaves extracts does not have any significant side effects reported in the medical literature. Medically the roots and leaves of plants is useful in addressing the health problems as diabetes, cancer, anti-oxidant, anti-stress, cardiovascular, HIV, AIDS, TB, influenza and corona virus diseases due to its strong immunostimulatory activities^[14]. The *Ashwagandha* plant extracts are effects on human cartilage and found that the herb may help protect against inflammation and cartilage damage associated with osteo orthiritis. It had an anti-anxiety effect similar to that of lorazepam and also appeared to ease depression. Plant may help normalize high blood sugar and improve insulin sensitivity. The cancer tests on human tumor cell

lines revealed that the *Ashwagandha* plant roots and leaves extracts may slow the growth of lung, breast and colon cancer cells^[15]. On human cells shows that these herb may inhibit the tumor growth without having normal cells. *Ashwagandha* plant extracts of roots and leaves are used as an anti-oxidant activities have shown that it can eliminate free radicals from your immune system. Free radicals are the agents that cause the breakdown of your bodies tissues alternatively known as ageing. Plant extracts can provide the energy needed to get enough long work outs while also allowing for maximum recovery and cell regrowth. *Ashwagandha* root extracts is a tonic given in the rural areas to the tauberclosis (TB) patients. It is also increases the iron content in the blood.

Ashwagandha roots and leaves extract does not have any significant side effects reported in the medical literature. Plant has been usecl as as aphrodisiac, liver tonic, anti-inflammatory agent^[16] and recently to treat asthma, ulcers, sensile domontia and radiation therapy^[17]. Incorporation of the *Ashwagandha* roots and leaves extracts are also used in the diet' may prevent or decreases the growth of tumors in human^[18]. The extract from *Ashwagandha* were mixed with Turmeric, Neem, and Ginger have larger inhibition potentials than that of chloroquine possess certain inhabitation properties against covid-19 protease.

Results and Discussion

Withania somnifera Dunal plant is commonly known as *Ashwagandha* or *Winter cherry* and it has been used for the centuries for the treatment of vivid health disorders. The multiple health benefits features in this herbal supplement makes it acts as a perfect rejuvenator of physical and psychological health. This medicinal herb is mainly found in the region of North America and India. The powerful anti-oxidant compounds are enriched in this herb scavenges free radical and reduces ageing impact on human. Apart from consuming this plant extract were isolate from the roots and leaves, than it taken in diet by person plays and important role in increasing the level of anti-oxidant activities in the human body^[8]. In order to plant obtained as good level of anti-oxidants and it is advised to include surplus amount of fruits and vegetables in diet. *Ashwagandha* roots and leaves extracts are medically used for the treatment of AIDS, HIV, TB, influenza, corona virus, diabetes, cancer, ageing, memory loss, blood pressure, ulcer, cardiovascular problem, anti-stress, anti-oxidant activities and mental health problems^[13]. *Ashwagandha* extract would work well in tandom as effective prophylactics and would also strenthen the innate immunity to fight off corona virus covid-19 infections. Corona virus COVID-19 causes lower respiratory tract infection in humans. The most commons symptoms are dry cough, shortness of breath, coughing up sputums and presence of thick mucus in the lungs which lead to reduces ventilation and subsequent pneumonia. As per the Traditional Ayurvedic practice of Nasya therapy as nasal drops is also recommended to help in mucus discharges and other corona virus covid-19 relative diseases. More than 5000 year ago, Maharishi Charak has describes the medicinal importance of Arun Taila in healing nasal congestions and has advised the use of Anutaila in ENT related ailments^[19]. The inhibition potential of *Ashwagandha*, Neem, Turmeric and Ginger plants extracts are found to be larger than that of chloroquinone and hydroxychloroquine. These two anti- malarial drug compounds are already reported to inhibited the covid-19 protease *in vitro*.

Our finding become very interesting towards the development of herbal medicines have no side effects.

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