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Ashwagandha: herbal pragmatic perspective treatment on COVID 19

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Abstract
In the present study, the Ashwagandha plant as a natural source has been extensively utilized for antimicrobial activity. *Withania somnifera* (L.) is a nontoxic popular medicinal plant in Ayurvedic medicine also used for antifungal activity, antibacterial activity and antiviral activity. The Principle active compounds include several withanolide-type compounds. Various plant parts, like roots and fewer, often leaves and fruits of Ashwagandha, are used as plant-derived medicines. The potent antimicrobial activity against the phytopathogenic fungi and bacteria tested. The protein designated WSG (*Withania somnifera* glycoprotein) which has seen possesses the antimicrobial activity. The inhibition of virus at a maximum of 99.9 was shown by the hydroalcoholic extract of *Withania somnifera* roots, studied of its highest nontoxic concentration, 25µg/ml in Cytopathic Effect Reduction Assay. By compiling the results indicated the antiviral property *Withania somnifera* root extract against Infectious Bursal Disease virus.

Keywords: antimicrobial activity, antifungal activity, ashwagandha, *Withania somnifera*

Introduction
Coronaviruses belong to an oversized family of viruses that may cause illness in animals or humans. In humans, several coronaviruses cause respiratory infections starting from respiratory disorder to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The foremost recently discovered coronavirus causes coronavirus disease COVID-19.

SARS-COV-2 shows most sensitivity to interferon especially the IFNβ subtype. Due to the special characteristics and anti-viral effects within the context of any emerging viral epidemics because the first line of detectors and defense, the type 1 interferons (IFN1) are taken into consideration. Now for installation of the medication, our goal is to

a. installing the interferon by following the interferon cascade mechanism as vaccination of healthy individuals
b. installation of interferon effectiveness by following the Liposome
mediated drug delivery system.

By approaching these two procedures our motive is to create it effective against COVID-19/20 [1]. Since ancient times, natural products had been utilized as conventional drugs in various parts of the world including Egypt, China, Greece, and India.

These botanical products had been used as prophylactic agents for the treatment of the many diseases including cancer, as they need an anticancer effect against different types of cancer. These natural products have different mechanisms of action including the inhibition of cell progression, alteration of cell differentiation, and induction of apoptosis [2].

Ashwagandha: a very important Medicinal Plant

Ashwagandha (*Withania somnifera*) is also a natural herb that has been investigated during a good selection of conditions including muscle strain [3]. Fatigue [4], aches, skin infections, rheumatoid joint inflammation [5], and as an anticancer agent [6].

Withania somnifera (L.) Dunal, commonly called Ashwagandha or Indian ginseng or winter cherry may be a renowned medicinal plant in Ayurvedic medicine [7]. The principle active compounds include several withanolide-type compounds [8, 9] because of the non-hazardous and great medicinal value, it's commonly used everywhere the world. Roots and fewer often leaves and fruits, are used as phytomedicines in the form of decoction, infusions, ointment, powder, and syrup [8, 10]. These days, it's cultivated as a crop to keep up the high demand for biomass and a sustainable eminence for the requirements of the pharmaceutical industry [11].

It's designated as an herbal tonic and food within the Vedas and is taken into account as 'Indian ginseng' within the conventional Indian medicine. It is utilized as a liver tonic, anti-inflammatory, antioxidant, antimicrobial agent, and cure for asthma [12].

Withaferin-A has been receiving a decent deal of attention thanks to its antibiotic and antitumor activity [13].

The chemical constituents of *W. somnifera* has always been of great interest to the scientific community. The biologically active chemical constituents are alkaloids (ashwagandha, anahygrine, cuscohygrine, tropine, etc), steroidal compounds i.e. withaferin A, withasomniferin A, ergostane-type steroidal lactones, withanolides A-Y, withasomniferols A-C, withasomidienone, withanone, etc [14]. Withaferin A and withanolide A are the chief withanolidal active components isolated from the plant. These compounds are chemically similar but varied in their chemical constituents [15].

Pharmacological Activities of Ashwagandha

W. somnifera possesses various pharmacological activities anti-inflammatory activity, antibacterial activity, antifungal activity, antiviral activity, antitumor activity, immunomodulatory activity, antistress/adaptogenic activity, anticonvulsant activity, neuropharmacological activity, musculotropic activity, anti-oxidant activity, anti-aging the effect, anti-hyperglycemic effect, macrophage-activating effect, hepatoprotective activity, morphine tolerance, and dependence-inhibiting effect [16].

Antiviral Activity of Ashwagandha

Progressive accumulation of cells within the G_0/G_1phase that correlated with a decrease within the proportion of cells within the S phase and G_2/M phase HepG_2 cells treated with Ashwagandha extract. Apoptosis will have resulted from self-sufficiency in growth signaling, alteration of cellular bioenergetics, evasion of immune detection, and tissue invasion and metastasis is described. Genome instability and mutations are essential for tumour progression and facilitate the acquisition of those hallmarks. Coordinated processes like cell proliferation, differentiation, and apoptosis are modified, producing altered cellular phenotypes with these specific characteristics [17] employing a model of partial hepatectomy several factors which including cytokines and growth factors that regulate, a protein was identified to specifically support liver regeneration and thus was named ALR (Augmenter of Liver Regeneration). ALR protein is encoded by GFER (growth factor erv1-like) gene and may be regulated by various stimuli. ALR is expressed in several tissues in three isoforms which are associated with multiple functions: The long types of ALR were found within the inner mitochondrial space (IMS) and thus the cytosol. Mitochondrial ALR (23kDa) was shown to cooperate with Mia40 to ensure adequate folding during import into IMS. On the other hand, short-form ALR, located mainly within the cytosol, was attributed to anti-apoptotic and anti-oxidative properties also because of its inflammation and metabolism modulating effect [17].

The role of ALR for cellular functions, many studies have explored the effect of ALR silencing (all isoforms) as a possible therapy in the liver, kidney and other cytological disorders even the viral infections, the most interesting aspects to handle is that the actual mechanism of how different isoforms of ALR are formed: (i) through "selective" mRNA expression at different ATGs or (ii) as "post-translational modifications "products of the longest form (23 kDa). Furthermore, the mechanism by which ALR (most likely cytosolic /nuclear) alters gene expression, still requires further exploration. and monitoring the result of its absence on the development of various diseases [18].

Another important target for the design of antiviral formulations had been the viral nucleic acids [19]. The virus specific antivirals target virus-encoded activities (enzymes) like viral polymerase or protease, and these agents usually possess high (100 – 1000) therapeutic indices (TI) [20]. This approach leads to the formation of virus progeny with defective nucleic acids which will be either unstable or give nonsense coding for viral proteins/enzymes, and thus the virulence of the resulting virus can be restrained [19].

Advantages of Herbal Drugs

The wide prescription of herbal drugs is mainly due to their effectiveness, less side effects and relatively low cost [21]. Therapeutic uses of medicinal plants in various ailments also have an additional important advantage of their easy availability and thus the traditional medical practitioners widely use medicinal plants in their day to day practice. According to a survey (1993) of World Health Organization (WHO), the practitioners of traditional system of medicine treat about 80% of patients in India, 85% in Burma and 90% in Bangladesh. The Indian medicinal plants used in the traditional systems of medicine proves to be useful in successful management of various disease conditions like bronchial asthma, chronic fever, cold, cough, malaria, dysentery, convulsions, diabetes, diarrhoea, arthritis, emetic syndrome, skin diseases, insect bite and also in treating gastric, hepatic, cardiovascular & immunological disorders [22].

Conclusion

Withania somnifera (Ashwagandha) features a tremendous amount of medicinal properties including antiviral activity. Many test microorganisms are used for the assessment of the antiviral activity of extracts and purified compounds of varied plant parts of Ashwagandha. The Antiviral activity of Ashwagandha studied by Wafaa Ahmed and Dina Mofed about the antioxidant activity & apoptotic induction as a mechanism of its action against hepatoma. The alteration of an organic phenomenon through ALR is the formation of mRNA at different ATGs or post-translational modifications. The mechanism of its gene alteration has several areas of research where still need the exploration to isolate the identity of Ashwagandha as antiviral. The modulation of genetic character can be effective on the nucleic acid of virus affecting the nonsense coding for viral proteins/enzymes, and thus the virulence of the resulting virus can be restrained. This is the main target to achieve in the Covid -19 treatment. Still, there are many scopes of the research or the identification and isolation of antiviral agents from Ashwagandha. Still tons of workers has got to be done to further investigation into its actual potential for human use. This review has revealed an upscale source of medicinal and potential targets of many plant extracts.

In addition to lacking the adverse side effects of pharmaceutical drugs, advanced herbal formulas tend to be inherently safer, simpler, and fewer expensive than their synthetic counterparts. Within the present scenario, a variety of synthetic antiviral drugs are available which proves to be effective against viruses but in a specific manner. But the matter of anti-viral resistance makes most of the antiviral drugs ineffective.

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