

Antiviral Herbs that can be a game changer in Medical Science

Plants have been used as medicine from the primordial period of civilization and as per information, currently, 35000 plants are being used for medicinal purposes all over the world. The World Health Organization (WHO) cited that herbal medicine can be an important element to reach health goals, as it is economic and have fewer side effects than other manufactured medicine. Global health is being challenged since the burden of viral diseases is increasing continuously, and we need more potential antiviral drugs to prevent this. Herbal extracts have been shown to have a positive effect as an antiviral agent when used as a prophylactic drug or remedy. Herbs are safe and cheap and also can be used to reduce the occurrence of drug resistance. Research findings exhibited that herbs can subdue viral replication and also diminish the severity of clinical signs.

As the metabolic properties of viruses are very different from that of other pathogens, it is very difficult to treat viral diseases. The major problem in viral disease remedy is that these pathogens adapt to the host body rapidly, make the new hybrid viruses, and can also produce drug resistance in short order. In such cases, the herbal drug, with its bioactive compounds can be used to deal with the virus and it is a more practical medication for the people of the unprivileged county try as they can not pay for the expensive synthetic medicines. Moreover, there is less chance to produce drug resistance. The geographic location of Bangladesh is blessed with a favourable environment row a variety of herbs, and each one has the potential to be used as an antiviral. Among these vast ranges of plants, I am going to focus on only three species.

Garlic (*Allium sativum* L.) has been a part of the daily cuisine of the people from the Indian subcontinent since ancient time. Besides, it has acquired a reputation for prophylaxis and therapeutics in Indian folk medicine. It has been being used to treat digestive problems, parasitic infestations, breathing problems, arthritis, toothache, chronic cough, constipation and also to treat many infectious diseases. Garlic has tremendous antiviral properties, especially against the Influenza virus¹ and against the Herpes simplex virus-1 & 2². Garlic shows a good effect against Marek's disease virus in poultry and feline calici virus, too. The bioactive compound that is responsible for the antiviral activity of garlic is allicin (allyl 2-propenethiosulphinate or diallyl thiosulphinate). Allinase enzymes become activated and produce allicin from alliin. It also contains diallyl disulfide, diallyl trisulfide, various types of enzymes, glucosinolates and different vitamins, minerals, protein in low amounts. These chemical compounds are seen to induce the activity of natural killer cells of the body, which destroys the infected cells of the body. Studies have shown that garlic can lessen the incidence of catching a cold. Garlic also seems to show an effect on the common cold, a study showed that garlic consumers catch a cold 61-63% lower than other people who didn't take garlic³. It also lessens the severity of the symptoms if the patient is caught by cold^{4,5}. Recently, people have been being suggested seen to take garlic as a symptomatic treatment for Coronavirus infection. As it helps to cure a cold and flu and Covid-19 has almost similar symptoms like cold and flu, people are using garlic and people are responded to noticed some improvement in Covid-19 after using it. Moreover, there are some pharmaceutical preparations in our country that is formulated with garlic compounds and are being prescribed for viral disease treatment in both human and animal. Garlicap and Garlin are human drug preparations applied in

case of hyperlipidaemia, atherosclerosis and mild hypertension. On the other hand, Eucamen-vet and Respocare are the preparations for animals, found to be effective in Chronic respiratory disease, Infectious Coryza, Infectious Bronchitis, Avian Influenza, New Castle Disease, and seem to have good results in mycoplasmosis and post-vaccination respiratory distress. Effective antiviral drugs that can be used as an alternative to garlic are abacavir, atazanavir, didanosin, doravirine, efavirenz, indinavir, maraviroc, ritonavir, tenofovir, zidovudin etc, but as mentioned before these drugs are costly and can have side effects, which make garlic as a good contender to be used as herbal medicine against the virus.

The next one is the black seed- *Nigella sativa*, which is described in the Holy Quran as the prevention of every disease except death. So, the Muslim community has been using this as potent phototherapy since the medieval period, as well as a food preservative and spice from the ancient period. Thymoquinone is the main active bio compound that is responsible for the therapeutic effect of black seed. Other phytochemicals found in black seed are dithymoquinone, carvone, limonine, trans anethol, p-cymene, nigellidine, nigellicine, nigellicimine, nigellicimine-N-oxide etc. It possesses antiviral, antioxidant, anti-inflammatory, anticoagulant, bronchodilator, immunomodulatory properties and has seen to work well on asthma, common cold, headache, nasal congestion, wart etc. Recently it has been found to be effective against cancer, diabetes, obesity, cardiovascular disturbance, etc. It has virucidal activity against the Herpes simplex virus and hepatitis A virus, and shows in vitro effect in opposite to the influenza virus, H5N1. Another two animal viral diseases that can be cured by black seed are PPR and FMD. It has been reported to regress the replication of HIV and long-term treatment can even cause sero-reversion in HIV patients ⁶. Moreover, black seeds are prescribed to reduce the viral load of SARS-CoV-2 infection, but there is no clinical trial occurred on it. An investigation should be done to reveal the effect of black seed against Coronavirus as it would be helpful to draw out a treatment protocol for the COVID-19 infection. Another important use of *Nigella* can be on the Asian strain of Chikungunya, though further study should be done on this. Alikisir, Nilagel, Black seed oil are some pharmaceutical preparations of black seed and black seed oil. Pharmaceutical preparations are available as alternatives to black seed are acyclovir, famciclovir, valacyclovir etc.

Another herb that contains great phytochemical properties is *Centella asiatica*, the local name of this herb is Thankuni. Its origin is in Southeast Asia and South Africa. A major chemical compound of this plant is triterpene saponosides. Flavouring agents quercetin, rutin, apigenin, patuletin, castillicetin, castilliferol, myricetine are found in Thankuni. This herb is recommended for skin disorder (eczemas, ulcer, leprosy, lupus, psoriasis), and also to treat diarrhoea, fever, amenorrhoea, female genitourinary infection and to improve cognition. Its appropriate effects have been shown on the herpes virus. A recent study on the effects of phytochemicals on Herpes virus-2 has recommended that *C. asiatica* shows the effect on this virus both in-vitro and in-vivo ⁷. This study shows that the Herpes virus was the main cause of increased morbidity in HIV affected people in the USA, as it causes immunosuppression. This pathogen can be treated by Acyclovir, a potent antiviral drug; but recently it reported to show resistance against acyclovir and a new antiviral drug was obligatory. The researchers found surprising result by using various herbs, one of these

was *C. asiatica*. It also shows the potency against the poliovirus. Besides, it improves memory and promotes antioxidative signalling. As studies on *C. asiatica* is still going on, it is still being used in convenient form and the pharmaceutical preparation of this herb is not available.

Low-cost intervention, like the herbal drug, is being popular day by day as prediction says that health care costs are going to be double in the next 10 years. So, if we can use available herbs common in a certain geographic area, it can reduce the use of synthetic drug having much high cost. Moreover, the likelihood of the adverse effects of these synthetic medicines can be avoided. However, more studies and trials are needed to find out new potential antiviral drugs from herbs for future use in both human and animal medicine.

Citations :

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