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## Review Article on Herbal Medicinal Approach to Prevent Covid-19 Infection

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### ABSTRACT

In this pandemic time of COVID-19, where allopathy medicines are doing miracles and giving relief, our ancient treasure; Ayurveda, herbal medicines and Homeopathy are a bliss. Traditional herbs like Ashwagandha, Giloy/Guduchi, Tulsi, Curcumin, Amla, and Lemon are showing affective results in boosting immunity and mental trauma. This article states the importance of traditional medicines in COVID-19 pandemic with an effective preventive approach.

**KEY WORDS:** Herbal Medicinal plant, Ayurveda, COVID-19 outbreak, Indian/ ancient medicine

### INTRODUCTION

COVID-19, which also known as severe acute respiratory syndrome corona virus 2 i.e. (SARS-CoV-2) is an infectious disease. This pandemic is distinctive and unknown in several aspects and has challenged health care systems. This word (corona) was derived from the Latin term corona that means "Crown" like shape. SARS-CoV-2 transmission is via human-to-human, mainly through direct contact and/or by contact with the infected surface with touching of the face and y respiratory droplets. [1]

At initial stages Antibiotics like Hydroxychloroquine and Azithromycin, Doxycyclin was prescribed as front-line drug, but they have some severe side effects. In November 2020, FDA approved emergency use of Two Monoclonal antibody treatment that is Bamlanivimab, a combination of Casirivimab and Imdevimab antiviral drugs like Flabiflu, Remdesivir (medicine approved by FDA in Oct 2020). At this point there are total 135M cases worldwide. In which 76.7M cases have been recovered and 2.92M people died due to COVID-19 infection. [2-18]

Afterwards there are many tests are being conducted by government for COVID-19 testing. In which RT-PCR test, Rapid antibody test, Rapid antigen test, Tru-Nat test.

In the present circumstance, we need viable, deterrent, promotive, healing, and therapeutic ways to deal with deal with the surge of COVID-19. Current helpful methodology has next to no proposal to manage COVID-19 patients. Ayurveda and Yoga, ancient health systems have a lot to offer in this on-going pandemic of SARS-CoV-2 infection. Approximately, 2500 natural plant-based formulation have been used in Indian traditional medicine. Since a lot of Indian medicinal plants showed antiviral, antioxidant and anti-cancer activities that it may be important to consider their precise activities. This brings about us to study the hindrance of COVID-19 protease by Indian herbal plants. Due to the intrinsic side effects of the synthetic chemicals used in allopathic drugs, a sizeable population has alternative to the traditional system of medicine (herbal medicine) for their primary health care. [6,7]

Therefore, in this review article, we have chosen a profusion of Indian herbal plants such as, Ashwagandha (Withania somnifera), Giloy (Tinospora cordifolia), Tulsi

(Ocimum sanctum), Haldi (Curcuma longa), Amla (Embellica Officinalis Linn.), Nimbu (Citrus limon Linn.).

### Ashwagandha

Ashwagandha comprise of dried foundations of Withania Somnifera having a place with family Solanaceae [20]. Dynamic constituent: Withanone (Wi-N), saponin, alkaloids, and steroidal lactone, alkaloid. It is otherwise called Indian ginseng or winter cherry. A consolidated report from IIT Delhi's DAILAB and Japan's National Institute of Advanced Industrial Science and Technology (AIST) made the disclosure that Ashwagandha can end up being the significant medication in battling Covid and can be even utilized in the improvement of an immunization. [10]



Figure 1 Ashwagandha

#### Possible mechanism of withanone in COVID-19:

Withanone is very successful and helpful in impeding and debilitating the design of fundamental protease (Mpro) viz. a sort of protein fundamental for the multiplication of the Covid. Recently arose COVID-19 has been appeared to connect with the host cell ACE2 through its spike protein receptor restricting space (RBD). We have shown that normal phytochemical from Withania somnifera, effectsly affect viral RBD and host ACE2 receptor complex. It was discovered that W. somnifera compound, Withanone, docked very well in the limiting interface of AEC2-RBD complex, and was found to move marginally towards the interface community on recreation. Withanone altogether diminished electrostatic segment of restricting free energies of ACE2-RBD complex. Two salt extensions were likewise recognized at the interface; fuse of Withanone destabilized these salt scaffolds and diminished their inhabitances. We hypothesize, such an interference of electrostatic communications between the RBD and ACE2 would impede or debilitate COVID-19 passage and its

ensuing infectivity. It show that common phytochemicals could well be the feasible alternatives for controlling COVID-19 section into have cells, and W. somnifera might be the first selection of spices in quite a while to check the COVID-19 infectivity. This work is under peer-survey in Virology Journal, in SpringerNature, and accessible at their preprint worker. Restricting stances of withanolides (from W. somnifera) in ACE2-RBD complex. Withanone cooperations at the interface of ACE2-RBD complex has been zoomed into. Withanone is grounded in the pocket by two H-bonds - Y16 of ACE2, and Y175 (aa491) of RBD, notwithstanding alkyl communication. [3]

#### An immunity booster

Consistently consumption of Ashwagandha can likewise supercharge your resistance. Specialists really say that expanding the measurement of ashwagandha during an abrupt spike or beginning of a virus can function admirably in recuperating the body. The spice's common insusceptible boosting properties can likewise help you manage persistent pressure and weariness which can accompany viral diseases. It is otherwise called an Ayurveda vitalizer which is useful for the heart and the body. There's another way ashwagandha benefits you. Standard utilization of ashwagandha has been found to further down or control pressure and cortisol creation in the body and surprisingly cut down on irritation. [11]

#### How much Ashwagandha can be had daily?

People of all ages should ideally consuming ashwagandha and it is absolutely safe. Depending upon your usage, taking 250-300 mg daily, for one month can do plenty of benefits for your health and wellness. Pregnant lady should avoid using ashwagandha as it may causes early delivery.

#### Other Benefits of Ashwagandha:

Ashwagandha have many benefits rather than used in COVID-19; the Nagori Ashwagandha is the supreme among all Ashwagandha varieties.

- It mainly boosts immunity of the body.
- It also helps with chronic stress and fatigue of viral infections.
- Also good for heart and body.
- Effective on cortisol and ascorbic acid contents of adrenal.
- It gives anti ulcerogenic effect.
- It is effective on leucocytosis.
- It gives anabolic effects.

- The root in combination with other drugs is prescribed for snake venom as well as in scorpion-sting.
- It is also act as stimulant and increase sperm count.
- Also shows anti stress activities.

### Giloy/Guduchi

Guduchi consists of mature stem of *Tinospora Cordifolia*, belonging to family Menispermaceae. Active constituent: Tinocordioside, Cordifolioside A, Magnoflorine, and Syringin. In Ayurveda, it is known as Amritas (a root of immortality). [21]



Figure 2 Giloy/Guduchi

### Possible mechanism of Guduchi/ Giloy in COVID-19:

According to research by patanjali research institute they have found that phytochemical Tinocordioside from Giloy (*Tinospora cardifolia*), also binds in the ACE2-RBD complex with substantial binding affinities. Their research on the in-silico experiments is at the advanced stage, and being communicated for research publication. Dynamic constituent reported in Giloy (*Tinospora cordifolia*) are tinosporine, tinocordioside, diterpenoid furano lactone, tinosporaside, cordifolide, cordifol, syringin, clerodane furano diterpene, tinosporidine, columbin, heptacosanol, b-sitosterol and tinosporide. Cordifolioside A and syringin have immunomodulatory activity. Tinosporin, diterpenoid has been used specially for the treatment of the viruses including (retroviruses) (HIV-1, HIV-2) all subgroups, HTLV, Herpes simplex Virus (HSV) and another disease caused by other viruse. The entire test reported for phytochemicals of Giloy in their in-silico models. It was found that one of the Giloy compound, Tinocodioside, docks very well within the ACE2-RBD complex, akin to Withanone. The simulated state of Tinocordioside showed ideal restricting stances inside ACE2-RBD interface with a few interreacting locales ACE2-RBD interface with several interreacting sites. Therefore, it was recommended that Tinocordioside rich

extracts of Giloy would be one more practical choice for controlling COVID-19 entry into host cells and general immunomodulatory nature of Giloy would enhance insusceptibility against COVID-19 infections. [3,10]

### How much Guduchi can be had daily?

The spice when taken consistently can do wonders for your general wellbeing. Indeed, giloy has been affirmed by the Food and Drug Administration to be utilized as a therapeutic prescription. Giloy's root and stem both can be used for therapeutic advantages. As indicated by dose structure it very well may be shift with people weight, tallness and their normal eating routine.

### Other benefits:

It contains antioxidants which protects our body.

It have antipyretic property.

It provides protection against bacterial and viral infections. Also effective in dengue fever by improving platelet counts. Also beneficial for heart disease, diabetes, jaundice, arthritis.

It possesses anti-inflammatory, anti-cancer and immunomodulatory properties.

It contains berberine is known for its antiviral property.

### Tulsi

Tulsi consists of dried whole plant of *Ocimum sanctum* linn, belonging to family lamiaceae. Also known as Holy basil. Active constituents: Essential oil, flavon (Scutellarein). [22]

In Indian practice, tulsi has a holy part as it is considered as a symbol of Shri Mahalakshmi. The Sanskrit meaning of Tulsi is "the incomparable one."



Figure 3 Tulsi

### Possible mechanism of Tulsi in COVID-19:

Tulsi (*Ocimum sanctum*) was mined for its rich phytochemicals. A study discovered that Scutellarein, a

natural flavone found in Tulsi, found to dock well into the enzyme cavity of RDRP enzyme of coronavirus. The central enzyme RDRP, RNA Dependent RNA Polymerase, is needed by coronavirus for its multiplication and growth. Therefore, inhibition of this enzyme provides a prepossessing means of controlling COVID-19 spread and its pathogenicity. Tulsi extracts possesses rich source of Flavones and flavonoids. Flavone's chemical a major class in the flavonoid family based on a 2-phenyl-1-benzopyran-4-one. Common flavones consist of apigenin, baicalein, chrysin, luteolin, scutellarein, tangeritin, wogonin and 6-hydroxyflavone. Scutellarein is a flavone that is found in Tulsi (*Ocimum sanctum*). The antiviral action of flavones is known since the 1990s, when it was showed that the contemporaneous utilization of apigenin with acyclovir brought about an improved impact on antiviral herpes simplex infection types 1 and 2 (HSV-1 and HSV-2) in cell culture. Naturally occurring phytochemicals are regarded as a great source of potential medications against various ailments. From Studies it was concluded that selected naturally occurring flavonoids possesses anti-viral activities. There are evidence that the myricetin and scutellarein are strong chemical inhibitors of SARS-CoV helicase and this effect is mediated through inhibition of ATPase activity. RNA-dependent RNA polymerase (RDRP), also called RNA replicase, catalyzes the replication of RNA from an RNA template and are essential proteins encoded in the genomes of all RNAcontaining viruses with no DNA stage. These are essential for the survival of viruses. In consequence, RNA-dependent RNA polymerase (RDRP) recently commences as a promising target, because of its key role in viral replication and its high sustentation among viral strains. The study also targeted RDRP of SARS-CoV in its in-silico study using Tulsi (*Ocimum sactum*) ingredients. The study shows that a few phytochemicals present in Tulsi may hit the catalytic cleft of the RDRP (Figure below). Scutellarein is one of them; binds RDRP with a docking score of -8.3 kcal/mol, and it may perturb Motif B, which is used by the coronavirus for its polymerization. The study suggests that Tulsi phytochemicals may inhibit the coronavirus replication and could control its growth and spread. This is a different dimension of Ayurvedic medicines to curb COVID-19. [3,11]

#### Clinical trials:

There exists a strong scientific evidence for the antiviral effects of Tulsi. Tulsi has been proven to be effective in inhibiting several deadly virus like Newcastle Disease virus, Vaccine virus and Infectious Bursal Disease virus. From the

Clinical trials conducted earlier in India, where the extract of tulsi leaves was used for patients with viral hepatitis and encephalitis. Impressively there was an increase in the survival and symptomatic improvement in the tulsi group when compared with controls. Whereas Another study demonstrated improvement in respiratory parameters and relief from symptoms of asthma with three days of utilization of tulsi. The striking feature in using Tulsi is that it not only restores physiological functions but also restores the psychological functions.in Tulsi, Phenolic compounds and antioxidant properties were reported to contribute its pharmacological effects. Utilization of Tulsi increases the antioxidant molecules and enzymes in the body and defends the cells and its membrane from being impaired by the toxic substances. Tulsi boosts the immunity of the body and helps to defence from toxic virus and bacteria. From animal studies it was observed that enhancement in humoral and cellular immunity after treatment with tulsi oil. Modulation of the GABA pathway could be the possible mechanism for improving in immunity. [3]

#### Other benefits of Tulsi:

Tulsi have such countless therapeutic properties.

- The restorative properties of Tulsi have been concentrated in many logical examinations remembering for vitro, creature and human trials.
- These considers uncover that Tulsi has an interesting blend of activities that incorporate; Antimicrobial (counting antibacterial, antiviral, antifungal, antiprotozoal, antimalarial, anthelmintic), against diarrheal, hostile to oxidant, calming, hepatoprotective, neuro-defensive, cardio-defensive, against diabetic, pain relieving, hostile to pyretic, hostile to hypersensitive, immunomodulatory, hostile to asthmatic, against tussive, adaptogenic, against stress exercises.
- Also have against ashthmatic action.
- It a generally excellent immunomodulator.
- It additionally utilized in pneumonic issues.
- Tulsi have been utilized in the administration of fever going from typical fever to intestinal sickness fever.

#### Turmeric

Haldi consists of dried and cured rhizome of *Curcuma Longa* linn. Belonging to family Zingiberaceae. Also known as haridra, haldi or turmeric. Active constituents: Essential oil, curcumin. [23]

Turmeric, a golden spice, has been utilized by the Indian people of subcontinent for a century with no known

reactions, as a part of food as well as to treat a broad array of illnesses to the extent achieved evidence. Also used in cooking spice, beautifying agent. It has been utilized in classical medication as a common household relief acts as first aid. [13]



Figure 4 Turmeric

#### Possible mechanism of Turmeric in COVID-19:

Curcumin is a characteristic bioactive polyphenolic compound secluded from the dried powder of *Curcuma longa* rhizomes. A variety of fundamental cell reinforcement properties has been ascribed to curcumin containing nutraceuticals. Curcumin has a set up history as an antiviral specialist against a few infections like Influenza Type A, Hepatitis A, Zika, HIV, and so on the method of activity of curcumin incorporates—hindrance of viral passage into cells, concealment of viral replication, incitement of interferons (IFNs) and different cytokines, and restraint of viral protein articulation. In silico contemplates have additionally uncovered that curcumin ties straightforwardly with the receptor-restricting area of the viral spike protein (associated with have cell restricting) and the related host cell receptor, angiotensin converting chemical 2 (fills in as a mode of viral section), of SARS-CoV-2 infection (Figure 1). Also, curcumin has been accounted for to restrain the delivery and smother various cytokines like IL-1 $\beta$ , IL-6, IL8, TNF $\alpha$ , MCP-1, and so on. At the point when examined in different viral contaminations arrangement, the method of cytokine concealment by curcumin can be connected with clinical improvement in conditions related with cytokine storm (Sordillo and Helson, 2015). Following the proposed communication with these vital segments of the viral lifecycle and safe framework, it is clear that curcumin could forestall the COVID-19 disease.

Curcumin hinders SARSCoV-2 section by restricting straightforwardly to the receptor-restricting space (RBD) of

spike (S) protein of the infection. Though, Zn<sup>2+</sup> causes restraint of RNA subordinate RNA polymerase (RdRp) and decrease in layout restricting. In addition, lately, blood coagulation properties of curcumin (by restraining platelet collection, cyclooxygenase pathway, and obstructing of calcium flagging) have been used in planning different materials and gadgets (Keihanian, Saeidinia, Bagheri, Johnston, and Sahebkar, 2018). As the SARS-CoV-2 Covid contamination can be related with a spread intravascular coagulopathy, henceforth curcumin can be a successful specialist against this obsessive condition. [13,14]

#### Other benefits of Turmeric:

There are many households uses of turmeric.

- Turmeric boosts our immunity and thus enhances our body's natural defense against disease-causing bacteria and viruses.
- It is mainly act as ant bacterial.
- It coagulates blood to improve immune system.
- It has a good ant-oxidant property due to curcumin.
- It exerts anti-inflammatory activity, like in arthritis.
- It is also used to reduce lipid level in cardiovascular related disease.
- Curcumin has antiviral activities and thus acts against several viruses like Influenza Type A, Hepatitis A, Zika, HIV, etc.
- Curcumin also used for different diseases, including cough, wound healing, hepatic issues, anorexia, and sinusitis.
- It has been applied the cheeks, foreheads, neck, hands, foot for better skin result.
- Turmeric helps the body naturally converse the respiratory tract.
- It is also used in bronchial asthma.
- It is used to reduce nose congestion.
- It is more affecting children, adults and old people, as haldi milk is very beneficial for sore throat, running nose, cough, etc.
- Haldi with honey is taken to treat cough, throat inflammation.
- Turmeric shows to good activity in peptic ulcer, Gastric disturbances formation occurred due to non-steroidal anti-inflammatory drugs like Indomethacin, alcohol automatically increasing gastric wall mucus in rats subjected to these GIT issues, therefore researchers has confirmed that turmeric acts as natural digestive properties.

#### Amla, Nimbu

**Amla** consists of fresh fruit pulp and dried pericarp of dried mature fruit of *Emblica officinalis* linn. (*Phyllanthus officinalis*) belonging to family Euphorbiaceae. It is also known as Indian gooseberry. [24]

**Nimbu** consist of fresh fruit of *Citrus limon* linn. Belonging to family Rutaceae. Active constituents: vitamin c, free radicals. [25]

Amla and Nimbu both are rich source of Vitamin C, and it is proven that Vitamin C plays important role to boosting immunity.



Figure 5 Nimbu



Figure 6 Amla

#### Possible mechanism of Vitamin C in COVID-19:

As previously COVID-19 was declared as pandemic and the finding of effective therapy against this pandemic would take a lot of time, so the world is seeking to find an alternative to protect them from this pandemic. Amla is a very good source of vitamin C and contain free radical. Thus, Vitamin C is considered as one of the possible therapies for COVID-19 because vitamin C has a promising role in maintaining proper body functions and helps in removing damaged ROS and protect cell from oxidative damage. Vitamin C is required in larger amount for proper immune function. The main benefit of vitamin C in SARS-

Cov-2 and other viral infections is clear from the fact the level of vitamin C inhibits during infection and body needs more of it to fight. To inhibit ARDS, cytokine storms, neutrophils damage, oxidative stress, alveolar damage, acute respiratory failure, and mortality caused due to SARS-Cov-2 vitamin C is suggested drug. From report of 29 patients with COVID-19 pneumonia, 27 (93%) showed increased hsCRP, a marker of inflammation and oxidative stress. Transcription factor, nuclear factor erythroid 2 (nfe2)-related factor 2 (nrf2), is a major regulator of antioxidant response element (ARE)-driven cytoprotective protein expression. Activation of Nrf2 signaling plays an essential role in preventing cells and tissues from injury induced by oxidative stress. Vitamin C is important part of cellular antioxidant system". Vitamin C is very efficacious in intensive care management. Vitamin C is an advised therapy in COVID-19 because it reduces the effect of oxidative stress and cytokine, and this promising role was also observed in 146 COVID-19 patients. It has been reported that consuming high intravenous dose of 200mg/kg body weight can minimize clinical symptoms in viral infected. And this reduction was also observed in patients infect with influenza virus. Using antioxidants in nutrients reduces inflammatory response syndrome occurred due to SARS-Cov-2. Oral dosage vitamin C up to 6g per day can reduce the risk of many viral infections and helps to improve health conditions. In China upto 50 COVID-19 patients were treated using vitamin C by giving 10g to 20g dose per day. For several decades consuming high intravenous dosage of vitamin C is used to treat various viral infections. [15]

#### Vitamin C Involvement in Immune Modulation and Proper Immune Function:

Primarily nutrient C is aggregated in bigger amount by 50 to 100 folds in leukocytes which add to its ordinary working. For ordinary insusceptible cell work an individual requirement to take 100mg each day nutrient C. When contrasted with insusceptible cells another cell requires high nutrient C. Neutrophils the principal cell to go at the site of contamination aggregate nutrient C at 1mM focus inside the cell. Nutrient C is extremely useful in rummaging movement of dead cell, ordinary neutrophils work, balance of flagging pathways, initiation of flagging course, guideline of incendiary goes between, phagocytosis, quality guideline and flagging pathways in T-cells, expands neutrophils motility so it might reach to the site of contamination, nutrient c has additionally a promising part

in insusceptible tweak and appropriate invulnerable capacities.

#### Other benefits of Amla:

- Every part of Amla tree like bark, fruits, and leaves and flowers have medicinal properties.
- Amla is one of the main ingredients in almost all Ayurvedic medicines and tonics.
- Amla is a rich source of Vitamin C and ascorbic acid.
- Amla helps fight the common cold.
- It also improves eye sight.
- Amla helps in indigestion.
- It is also used in obesity, as it helps to improve metabolism.
- Also, amla is useful to control cholesterol.
- Vitamin C in Amla is known to increase the activity of natural killer cells leading to toxicity and breakdown of the cancerous cells.
- Amla helps to control blood sugar level by regulating carbohydrate metabolism.
- Amla helps to control diarrhoea.
- The vitamin C in Indian gooseberry has been clinically proven to promote hair growth and improve hair.
- The Indian gooseberry also contains strong anti-oxidative properties that fight cell aging and degeneration.
- Amla is very useful for skin like; an anti-ageing property, treats acne, improves skin tone, remove dead cells, also treat skin pigmentation.

#### Other benefits of Nimbu:

- Lemons are an excellent source of vitamin C and flavonoids, which are antioxidants.
- Antioxidants help remove free radicals that can damage cells from the body.
- According to study, the flavonoids in citrus fruits may help lower the risk of ischemic stroke in women.
- Consumption of lemon every day had lower blood pressure than those who did not.
- People having asthma who consume higher amounts of vitamin C and other nutrients when they have a cold may experience fewer asthma attacks.
- It also helps in fat loss.
- It is a very good immunity booster.
- It is also used in asthma, anaemia, as cancer prevention.

#### CONCLUSION

As discussed above, during COVID 19 herbal medicinal plant plays an important role as a preventive approach.

These herbal medicinal plants do not have any side effects and are long term effective.

These Indian herbal plants are easily available and are in different dosage form.

**Ashwagandha** is used as routine remedy by Indians, who consider it as the best tonic for old people and children, and as aphrodisiac by young people. The available scientific data support the conclusion that Ashwagandha is a real potent regenerative tonic (Rasayana of Ayurveda), due to its multiple pharmacological actions. It is one of the best nervine tonics of Ayurveda, the most ancient system of Medical Sciences. It is also useful for different types of diseases like Parkinson, dementia, memory loss, stress induced diseases, malignoma and others. Clinical data shows that, brain strokes causing paralysis and neuronal deficit also improve in the long-term treatment with Ashwagandha. It is projected as one of the six essential medicinal herbs. Thus, the above findings clearly indicate that the traditional use of Ashwagandha to prevent COVID-19 infection has a logical and scientific basis with no side effects. Large scale clinical studies are needed to prove the clinical efficacy of this herb.

**Guduchi** is the source of various type of bioactive compounds. The docking and MD simulation results and interpreting the various thermodynamics parameters and interaction energies for non- bonded interactions like hydrogen bonding, hydrophobic interactions, short range interactions with their analysis plots helps us to identify the best inhibitor potential drug for SARS CoV-2. Molecular docking and MD analysis have revealed that berberine having less binding energy and higher nonbonded interaction capability as compared to other molecules with its good binding mode of interactions. All the reported phytochemical compounds in the present work are natural and commercially available as drugs. Thus, the above description suggests using of Guduchi as a preventing approach in COVID with no side effects and more benefit to improve immune system of the body.

**Tulsi** extracts are rich source of Flavones and flavonoids, In which flavone found to dock well in to the enzyme cavity of RDRP enzyme of coronavirus. According to research myricetin and scutellarein are strong chemical inhibitors of SARS-CoV helicase and this effect is mediated through inhibition of ATPase activity. Another study proved improvement in respiratory parameters and relief from

symptoms of asthma with three days of consumption of tulsi.

Thus, from the literature review, it is proved that consumption of Tulsi during this COVID-19 pandemic and another viral infections or respiratory related problem it will help to boost one's immunity.

**Turmeric** is broadly used in Ayurvedic, home remedies having antiseptic, antiviral, immunity booster potential, one of the significant concerns with developing Curcumin for clinical adequacy in novel methodologies but lack of standard formulations limits its use. This is the need of time to begin with translational research to give scientific proof the efficacy and build up standard formulations of turmeric in the management and treatment of high infections and deadly viral infections. Thus, having many pharmacological activities and with no side effects turmeric can be advisable to prevent from COVID-19 infection.

**Amla and Nimbu** are the rich source of Vitamin C and it is clear that vit.c is essential to boost immunity. Vitamin C in SARS-Cov-2 and other viral infections is clear from the fact the level of vitamin C decreases during infection and body needs more of it to fight. Amla has promising role to maintain proper body functions. Amla increases neutrophils motility so that it may reach to the site of infection and cure the infections. Thus, by reviewing Amla has many pharmacological activities and is easily available and has safe use it can be advice to consume to prevent from infection.

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