

Chinese and Indian Medicinal Plants Against COVID-19

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ABSTRACT: *As a life-threatening illness, coronavirus disease 2019 (COVID-19) is associated with extreme acute respiratory syndrome, coronavirus 2 (SARS-CoV-2), and is considered a major public health crisis. COVID-19 therapy is mostly supportive and the function of antiviral agents has yet to be identified. There are, however, no clear anti-COVID-19 medications and vaccines yet. This study focuses on herbal medicine as a promising path to COVID-19, like medicinal plant extracts. Some herbs for the prevention, cure and recovery of diseases, like COVID-19, are indicated in ancient Chinese, Indian and Iranian medicines. Though viral replication suppression is known as a major mechanism for herbal extracts, several reports have shown that conventional active ingredients can connect with main viral proteins correlated with virus virulence. Few herb for the prevention, cure and recovery of diseases, like COVID-19, are indicated in traditional Chinese, Indian and Iranian medicine. Nevertheless, the positive effects of these conventional drugs and their clinical trials have remained uncertain. In this background, the present research discusses the recent updates on conventional medicines suggested for COVID-19 therapy.*

Keywords: *Pandemic, COVID-19, Chinese, Indian, Medicinal Plants, Herbs, Health crisis.*

INTRODUCTION

Coronaviruses, with a crown-like form under electron microscopy, are enveloped single-stranded RNA positive sense viruses with an average size of 60 nm and 140 nm in diameter. Before being discovered in other countries, novel coronavirus (nCoV-2019), coronavirus disease 2019 or Extreme Acute Respiratory Syndrome Corona Virus 2 (SARS-CoV-2) were first recorded from Wuhan of Hubei Province of China. In December 2019, the very first incident was identified and five people with acute respiratory symptoms were admitted and one of these victims died. The World Health Organisation proclaimed a public health emergency of international importance for COVID-19 on 30 January 2020. While the WHO said: "That there's no specific medicine approved until now to diagnose or manage the novel coronavirus. To promote the creation of new COVID-19 medicines, the WHO, the European Medicines Agency, the US Food and Drug Administration (FDA) and the Chinese government and drug manufacturing companies are working with scientists and manufacturers".

Potential activities in the management of virus infections include natural ingredients and their derivatives. Until now, possible antiviral effectiveness has been demonstrated by some herbal extracts or their derivatives. However, sufficient research on the production of anti-COVID-19 agents from herbal extracts are not available. In order to prevent as well as counter COVID-19, certain active ingredients are essential. Chinese Medicine (CM) has typically indicated great scientific knowledge, efficient and effective suppression and treatment of respiratory disorders in herbal formulations. Chinese Traditional Medicine (CTM) recommends Chinese herbal medicines as per Chinese diagnostic trends depending on medical signs. In high-risk communities, CTM may be an alternative method for avoiding COVID-19. Nevertheless, several experiments have shown that viral replication and inhibition of viral multiplication can be linked with Chinese herbal formulas. The protocol has been proposed by Chinese herbal medicine with Western medicine that eliminates viral

complications. On 24 January 2020, following treatment with traditional Chinese herbal medicine, the first patient with signs of COVID-19 pneumonia returned from the hospital. A diagnosis and treatment of COVID-19 pneumoniae was released on 27 January 2020 by the Chinese National Health Office. Though traditional Chinese herbal medicine is used to treat COVID-19 disease, its efficacy remains unknown.

A important option for the treatment of various ailments is Indian plant species. The traditions of Ayurveda and Siddha emerged in India and among the Indian community are still commonly adopted. Furthermore, it could be useful to recognise phyto-components of medicinal plants to relieve infection. In order to resolve viral transmission, Indian medicinal plants may therefore be considered a new choice for their position. At this point, by practising hand-hygiene and social distancing, both countries must link hands together to combat COVID-19. We checked and summarised the available literature on conventional herbal medicine for potential treatment of COVID-19 in the present report.

LITERATURE REVIEW

Traditional herbal medicine

As potential candidate combinations for the treatment of viral infections like SARS-CoV, conventional herbs from diverse environments and geographical locations may be suggested. Preliminary experiments have shown that concanavalin A, a jack bean (*Canavalia ensiformis*) phytoagglutinin, can bind to glycosylated membrane proteins and inhibit the identification of target cells and the entrance of viruses [4]. Subsequent experiments, nevertheless, have shown that its extreme hepatotoxicity limits therapeutic usefulness. Further research found that certain extracts of medicinal plants, like *Lycoris radiata*, *Artemisia annua*, *Pyrrosia lingua*, and *Lindera aggregata*, exerted 2.4-88.2 µg/mL of anti-SARS-CoV. Some studies have shown that SARS-CoV with an effective concentration of 15.7 nM is hindered by lycorine, an active phyto-compound of *Lycoris radiata*. In addition, the high toxicity of lycorine to the cell lines of VERO E6 and HepG2 makes it a strong drugs choice for anti-cancer action. Lau et al. found that two important proteins, namely chymotrypsin-like protease (3CLpro) and RdRp in SARS-CoV, could be inhibited by the aqueous extract of *Houttuynia cordata*. Furthermore, the H. In in vitro experiments in animals, cordata extract can improve the CD4⁺ and CD8⁺ cell count, demonstrating its immune-stimulating effect that can be required for the successful function for inhibiting viral replication. Likewise, certain medicinal plant extracts, including *Rheum officinale*, *Polygonum multiflorum*, emodin and certain other major compounds of these herbs, have been found to prevent SARS-CoV(S) spike protein binding to ACE2 with IC₅₀ values ranging from 1 to 10 µg/mL and emodin to 200 µM [1].

Inhibition effect towards SARS-CoV 3CLpro with IC₅₀ levels of 39 and 44 µg/mL was demonstrated by the methanol extracts of *Cibotium barometz* and *Dioscorea batatas*. In addition, extracts of *Anthemis hyalina*, *Nigella sativa*, and *Citrus sinensis* revealed the inhibitory activity of *Anthemis hyalina* extract on MHV-A59 (mouse hepatitis virus-A59). The mechanisms rely on the down - regulation of the expression of the TRP gene and the rise in the amount of intracellular calcium [2]. Latest published research has shown that plant alkaloids such as tetrandrine, fangchinoline, and cepharanthine can substantially minimise cell death in human lung cells due to viral infection in MRC-5. Furthermore, SARS-CoV can be inhibited by certain active phyto-constituents comprising ten diterpenes, two sesquiterpenes, two triterpenes, five lignans, and curcumin. SARS-CoV 3CLpro inhibits isolated Kazinol A, kazinol B, kazinol F, and kazinol J from *Broussonetia papyrifera*. The

active phyto-component of *Aglaia foveolata*, Sivestrol, has potential in vitro cytotoxicity towards human cell lines of tumor. In addition, HCoV-229E mRNA conversion with an IC50 value of 40 nM is inhibited by such a component. On the other side, anti-SARS-CoV replication activity was demonstrated by ferruginol, a phenolic compound isolated from the redwood *Sequoia sempervirens*, betulinic acid, hinokinin, savinin, and curcumin. In comparison, Ouabain greatly lowered the number of copies of viral RNA. Tylophorine isolated from *Tylophora indica* as a viral replication inhibitor from CoV-infected swine testicular cells has been documented in several studies[3].

Chinese classical herbal medicine (CTM) has played a vital role in the prevention and containment of many epidemic diseases, from plague to SARS, and also has a long history. CTM was used in the treatment of the 2002 SARS-CoV epidemic. CTM was confirmed to have positive effects on SARS disease control during this epidemic. For 1063 volunteers, comprising 926 hospital staff and 37 medical technologists working in high-risk virus labs, CTM herbal extract is used in research. The findings of this analysis revealed that the virus did not affect any of the CTM consumers. It has been proposed that T cells could be regulated to improve the immune system. Furthermore, several studies have shown that supplemental care with CTM can be helpful in improving symptoms. Another researcher analysed 90 peer-reviewed papers and found that some beneficial outcomes, involving reduced fever, quicker clearing of chest infection, and other symptoms, were caused by the mixture of CTM used with traditional therapy. Such a positive effect of CTM, though, is not definitive and further clinical trials are necessary[4].

In one of the oldest therapies in human history, Indian traditional medicine plays a significant role in the treatment of multiple diseases: Ayurveda, Siddha, Unani and Yoga, Naturopathy and Homeopathy. Approximately 2500 preparations based on medicinal plants have been used in traditional Indian medicine. Since the antiviral, anti-oxidant and anti-cancer effects of many Indian medicinal plants have been shown, it may be crucial to understand their specific actions. To validate its activity, nevertheless, multiple clinical trials must be performed. There are several reports in India concerning anti-coronavirus development utilizing traditional medicines. In one report, anti-mouse coronavirus evidence was provided in medicinal herbs like *Indigoferatinctoria* (AO), *Vitex trifolia*, *Gymnema sylvestre*, *Abutilon indicum*, *Leucas aspera*, *Cassia alata*, *Sphaeranthus indicus*, *Clitoria ternatea*, *Clerodendrum inermis* Gaertn, *Pergularia daemia* and *Evolvulus sinoides* in Tamil Nadu[5]. Within these, it has been shown that *Vitex trifolia* and *Sphaeranthus indicus* decrease inflammatory cytokine levels using the NF- κ B pathway, an essential pathway in SARS-CoV breathing difficulties. Furthermore, *Clitoria ternatea* has been described as a metalloproteinase inhibitor of ADAM17 that is active in ACR eviscerating. Some experiments have shown that the inhibitory actions of *Glycyrrhiza glabra* and *Allium sativum* on the replication of SARS-CoV may be suggested as a possible potential drug for COVID-19.

Another therapeutic herb that has been shown to include a viral ribosome inhibition activity is *Clerodendrum inermis* Gaertn, that could be further researched for its potential as a potential drug for the transmission of COVID-19 proteins. In addition, *Coriandrum sativum*, *Boerhaavia diffusa*, *Cynarascolymus*, *Coscinium fenestratum*, *Embeliaribes* and *Punicagranatum* *Cassia occidentalis* have inhibitory activity on ACE and may be used as possible candidates for anti-COVID-19 medicines. Such medicinal plants need to be further studied for their possible effects on the entrance of SARS-CoV-2 into target cells. Inhibitory effects on HIV protease have also been seen by some medicinal plants such as *Acacia nilotica*, *Eugenia jambolana* and *Euphorbia granulate*, and these plants may be regarded

medication candidates for COVID-19. Few herbs have an inhibition activity on HIV reverse transcriptase, like *Ocimum sanctum*, *Ocimumkilim* and *scharicum*, *Solanumnigrum* and *Vitexnegundo*, and may be investigated for SARS-CoV-2. The inhibition activity of the *Sambucusebulus* on the virus envelope was stated by Ganjhu et al. In summary, in order to build and produce a medication unique to COVID-19, further research of Indian medicinal plants are required.

CONCLUSION

Many biomedical experts and physicians have sought to recommend appropriate medicines for the elimination of this disease outbreak epidemic with the emergence of the COVID-19 epidemic. With 1000 years of practise in the treatment of pandemic and endemic infectious diseases, Chinese, Indian and Iranian traditional remedies is worth studying and offers alternative options for the management of patients with COVID-19 infection. Currently, there is no appropriate cure for COVID-19, which offers the best potential to research various plants and decoctions for the diagnosis and management of patients. The potential benefits of Chinese, Indian, and Iranian herbal medicine alone and in conjunction with Western medicine on SARS-CoV-2 recovery are ideally explained by positive findings from clinical trial trials. Our analysis indicates that further research on Chinese, Indian and Iranian herbal remedies will be appropriate to find novel anti-COVID-19 drugs that are useful for SARS-CoV-2 elimination. This highlights the ways in which herbal-based drugs can successfully resolve lethal COVID-19 infections.

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