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Review on Efficacy of Herbal Antiviral Drugs against COVID-19

Pooja P. Thakre¹, Vinod Ade¹, Shweta Parwe^{*2}¹Department of Kayachikitsa, Mahatma Gandhi Ayurved College, Hospital & Research Centre, Salod (H.), Datta Meghe Institute of Medical Sciences, Wardha, Nagpur, Maharashtra, India²Department of Panchakarma, Mahatma Gandhi Ayurved College, Hospital & Research Centre, Salod (H.), Datta Meghe Institute of Medical Sciences, Wardha, Nagpur, Maharashtra, India

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ABSTRACT

Coronavirus disease (CoViD-19) is an infection of the respiratory system caused due to various viruses affects the respiratory pathway, and it can spread from one person to another by coughing, sneezing or physical contact. Commonly include cough, cold, fever are the symptoms. Viral diseases increase worldwide concern, including emerging and chronic viruses. The invention of new anti-viral drugs from plants has implicit in the past. The Coronavirus disease 19 (COVID-19) caused due to severe acute respiratory syndrome, which is a transmittable and pathogenic viral infection. Several traditional medicines of plant origin having antimicrobial and anti-inflammatory properties some have been studied for their anti-viral properties and immunomodulating effects. Herbal drugs are now in massive requirement in the developing countries for primary health care not because of their economical but also for better civilising adequacy, improved compatibility with the human body and significantly fewer side effects. This review gives an overview of some critical traditionally used medicinal herbs with anti-viral properties—the literature regarding the drugs of this group, collected from Ayurveda classics. Research articles are collected from published material and discussed per therapeutic actions. Most of the Herbs are with *Katu Rasa* (pungent) and *Ushna Virya* (hot potency). They are indicated in diseases, viz. *Kasa* (cough), *Shwas* (asthma), *Krumi* (worm/ infection). *Krumihara* property drugs which are correlated with anti-viral action helps to prevent against Novel coronavirus infection.

*Corresponding Author

Name: Shweta Parwe
 Phone:
 Email: shweta.parwe@dmimsu.edu.in

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INTRODUCTION

The Coronavirus disease 19 (COVID-19), caused by severe acute respiratory syndrome Coronavirus 2 (SARS-CoV-2), is one of the transmittable viral infection. On the outer surface of coronavirus, there is crown-like spikes representation; thus named coronavirus. It is pathologically related to bat a virus which is a severe acute respiratory syndrome. The size of the coronavirus is 65-125mm in diameter and having nuclear material, single standard RNA (Shereen *et al.*, 2020). The corona virus-infected people experience respiratory illness from mild to moderate. Mainly it is spread through salivary droplets or nose discharge of infected person

while coughing or sneezing.

A viral disease increases worldwide concern, including emerging and chronic viruses. Due to the increase in viral infection globally, there is a need for effective anti-viral drugs. Nowadays, viral infections lead to danger and may cause death. Due to the metabolic properties of viruses, they become difficult to manage, and there is a lack of availability of drugs for the treatment of viral diseases (Salzberger, 2006). Common medications used against viral infections are often inadequate and create multiple side effects. In previous years, natural home remedies increase popularity in the field of medical science (Efferth, 2011). Due to trouble-free access, cost-effectiveness, lack of side effects and good tolerability, herbal drugs are admired. For the treatment and prevention from viral respiratory infections (VRI), herbal medicine is very much useful. The effects and benefits of anti-viral herbs are discussed in details. Herbal drugs are having immunostimulating and inflammation-modulating, which can help to prevent immune overreaction to infection. Herbal medicines continue to play an essential role in preventing and treating VRI. Because of the quick spreading of infection, treatment of coronavirus is done by using herbs. Due to lack of knowledge about the treatment and prevention regarding the infection, increased the worry about self protect from virus.

MATERIALS AND METHODS

Data source

The literature is collected from Ayurvedic text, new reference publication and Articles published for reviewing selected herbs. Published research works on individual herbs have been collected based on their therapeutic actions from net resources and reviewed.

Observation and result

Anti-viral

The term anti-viral is the substance regarding virus or vaccine against virus or specific antibodies which can produce protective as well as therapeutic effect to apparent virus-infected host (Abonyi et al., 2009).

Anti-viral substances in plants

Plants are having an ample variety of phytochemicals like alkaloids, tannins, saponins, flavonoids, terpenoids, lignans, coumarins, and many more components (Jassim and Najj, 2003; Ojo et al., 2009). The substances are multiple modes of actions and often not yet broadly explored. In this review, particularly tradition ayurvedic herbal drugs are

used—the number of a compound extracted from a various plant having anti-viral activity.

Herbal anti-viral drugs

For the treatment of viral infection, new search anti-viral activity compound is needed. The previously available anti-viral compound was not good enough with the problem of viral latency and contradictory effectiveness due to the problem of viral resistance in recurrent infection in immune-compromised patients (Sumitra et al., 2012). In India, *Rigveda* which is said written between 3500-1600 BC having references of use of the plant as medicine. Later the physician was studied in detail about the properties and therapeutic use of Medicinal plant and recorded in Ayurveda which is ancient medical science in India (Prakash and Gupta, 2005). Ethno-botanical text and other remedies have described the usage of plant extract, infusion and century of the disease known to be the viral origin (Vijayan et al., 2004). A potential plant has an anti-viral target [Table 1]. A list of anti-viral herbal drugs, its anti-viral activity and its properties are shown [Tables 2 and 3].

Herbs for the treatment of Coronavirus infection

In traditional Chinese medicine, 13 natural compounds were tested positive for the treatment of CoVid-19 infection. out of 125 Chinese herbs, only 13 were found, and other 26 herbs are used for the treatment of breathing problem caused due to virus [Table 4]. Reduction of MHV (mouse hepatitis virus) produced and the intracellular viral RNA and protein expression with EC50 (effective concentration) from 2.0 - 27.5 micron/ml due to *Cimicifuga rhizoma*, *Meliaecortex*, *Coptidis rhizoma*, *Phellodendron cortex* and *Sephorasubstrata radix*. The production of PEDV (porcine epidemic diarrhoea virus) and VSV (vesicular stomatitis virus) also get reduced, which can be used in coronavirus infection (Zhang et al., 2020).

Prevention measure from coronavirus

According to the World Health Organization, Coronavirus can be effectively prevented by using alcohol-based hand rub, using soap and water often clean your hands, use of mask and maintain a social distance.

According to Ayurveda, eat properly cooked veg food, do not split in a public place, and avoid close contact. Ayurveda experts have worried because people run to keep themselves protected. Daily intake of *Rasayan* like *Chywanprash* increases immunity power and it may help prevent spreading of infection, some of the medicinal herbs help to build the immunity and prevents from infection, "In

Table 1: The anti-viral target of Plant Species against Corona Virus

Virus	Potential target	Susceptible to
Corona Virus (HcoV, SARS CoV) (Coronaviridae)	Membrane Components	Echinacea (Asteraceae)

Table 2: Herbal Anti-viral drug and its action

Drug	Latin name	Taste	Attributes	Potenc	Biotrans-formation	Action of drugs
Tulsi	Ocimum Sanctum	Pungent, bitter	Light, dry	Hot	Pungent	Kru-mighna
Akhu-parni	Merremia emarginata Hall.f.	Tikta, Katu	Laghu, Ruksha, Tishna	Sheeta	Katu	Kru-mighna
Kirat-tikta	Swertia chirata Buch Ham	Tikta	Laghu, Ruksha	Shita	Katu	Kru-mighna
Haldi	Curcuma longa Linn.	Tikta, Katu	Ruksha, Laghu	Ushna	Katu	Kru-mighna
Vidanga	Embella ribes Burm f	Katu, Kashaya	Tishna	Ushna	Katu	Kru-mighna
Palash	Butea monosperma Kuntz.	Katu, Tikta, Kashaya	Laghu, Snigdha	Ushna	Katu	Kru-mighna
Ingudi	Balanitis aegyptiaca	Pungent, bitter	Light Snigdha	Hot	Bitter	Kru-mighna
Sunthi	Zingiber officinale	Bitter	Dry, Tishna	Hot	Sweet	Kru-mighna
Bhandira	Clerodendrum infortunatum Linn.	Pungent	Light, dry	Hot	Bitter	Kru-mighna
Kampil-lak	Mallotus philippensis	Katu	Laghu, Ruksha	Ushna	Katu	Kru-mighna
Yasthi-madhu	Glyzeria glabra	Madhur	Guru, Snigdha	Shita	Madhur	Visha-hara
Sugand-haka	Leucas cephalotes Spreng.	Katu, Lavan	Guru, Snigdha	Ushna	Madhura	Kru-mighna
Rajika	Brassica juncea	Pungent, bitter	Light, dry	Hot	Bitter	Kru-mighna
Kam-pala	Myrica nagi Thumb	Kashay, Katu, Tikta	Laghu, Tikshna	Ushna	Katu	Kru-mighna
Nir-gundi	Vitex negundo	Pungent	Light, dry	Hot	Bitter	Kru-mighna
Bha-rangi	Clerodendrum indicum	Pungent, bitter	Light, dry	Hot	Bitter	Kru-mighna
Kasamarda	Cassia occidentalis	Bitter, Madhur	Light, dry	Hot	Bitter	Kru-mighna

Table 3: Drugs and its property

Sl.No	Drugs	Properties
1.	Tulsi	It has antibacterial, antifungal, anti-viral, abortifacient, antispasmodic, anti-cataract, antipyretic, gastric antiulcer activity, anti-inflammatory, anti-mutagenic, anti-tumour, anti-genotoxic, anti-coagulase, nematicidal, larvicidal, antioxidant, anticancer, hypotensive properties [29]
2.	Sugandhaka	It has antipyretic, expectorant, depurative, anthelmintic, carminative, digestive action [30].
3.	Katphala	It is indicated in fever, asthma, bronchitis, urinary discharge, chronic dysentery, ulcer, carminative, eye diseases [31].
4.	Undurukarnika	Krumighna dashemani, useful in the kidney, bladder, lungs, uterus, abdomen diseases, helminthiasis, and fever [32]
5.	Nirgundi	It has antibacterial, antifungal, anti-viral, abortifacient, antispasmodic, anti-cataract, antipyretic, gastric antiulcer activity, anti-inflammatory, anti-mutagenic, anti-tumour, anti-genotoxic, anti-coagulase, nematicidal, larvicidal, antioxidant, anticancer, hypotensive properties [33]
6.	Vishmushtika	Useful in the skin, reproductive, respiratory tract diseases, worm infestation and gum in splenic enlargement [34]
7.	Vidanga	Useful in psychological disorders, fever, dental caries, asthma, bronchitis [35]
8.	Kakamachi	Useful in rheumatisms, cough, asthma, bronchitis, wounds, ulcers, flatulence, and dyspepsia [36]
9.	Bharangi	Indicated in helminthiasis, cough, asthma, bronchitis, flatulence, and dyspepsia [37]
10.	Rajika	Useful in urinary discharge, helminthiasis, skin disease, fever [38]
11.	Kulahala	Used as intelligence promoter and indicated in dysurea, helminthiasis/infection, Filariasis, cough, fever, haemorrhoids [39]
12.	Surasi	Useful in diarrhoea, cholera, fever, haemorrhages, hepatopathy and cardiac disorders [40]
13.	Arjaka	Useful in diabetes, dyspnoea and fever [41]
14.	Kasamarda	Kasaghna (eliminate cough) [42]

Ayurveda, good digestion or strong digestive fire plays a significant role in fighting diseases. Eat a piece of fresh ginger or drink ginger tea. Mint tea, cinnamon tea, and fennel tea are also good”.

Discussion

In this review, numerous step selection processes directly inhibit the novel coronavirus (2019-nCoV), which helps in prevention and treatment. Viral infection currently spreading and has affect persons worldwide, especially in China.

Based on two principles, the first one is to give absorbable via oral prescription containing anti-corona virus (2019-nCoV) components. For this biologically established anti-corona virus (2019-nCoV) ingredient requires for oral bioavailability evaluations. This is biologically confirmed that the selected compounds are effective as anti-corona virus effects and the inherent similarities between coronavirus (2019-nCoV) and SARS or MERS coronavirus. The novel coronavirus compared to SARS coronavirus, there is slight alteration, so in present new virus,

Table 4: The 26 Chinese herbals screened and the possible time for usage

Sl. No	Herbs	Standards	Time is taken
1	Forsythia Fructus	Antipyretic detoxifying	Complete course
2	Glycyrrhiza glabra	Qi-reinforcing	Full course
3	Mori Cortex	Antitussive antiasthmatics	Full course
4	Flos Chrysanthemi Indici	Pungent, cool diaphoretics	Full course
5	Tussilago farfara L.	Antitussive antiasthmatics	Full course
6	Lonicera japonica	Antipyretic detoxifying drug	Full course
7	Chrysanthemum morifolium	Pungent, cool diaphoretics	Full course
8	Peucedani radix	Phlegm-resolving medicine	Full course
9	Rhizoma fagopyri cymose	Antipyretic detoxifying	Full course
10	Cacumen Tamaricis	Pungent-warm exterior-releasing medicine	Early
11	Erigeron breviscapinus	Pungent-warm exterior-releasing medicine	Early
12	Radix bupleuri	Pungent, cool diaphoretics	Early
13	Coptidis rhizome	Heat-clearing and dampness drying medicine	Middle
14	Houttuynia herba	Antipyretic detoxifying	Middle
15	Hovnanian dulcis semen	Antipyretic detoxifying	Middle
16	Inulae flos	Phlegm resolving medicinal	Middle and later
17	Eriobotrya folium	Antitussive antiasthmatics	centre and later on
18	Hedysarum multijugum maxim.	Qi-reinforcing	centre and later on
19	Lepidii semen descurainiae semen	Antitussive antiasthmatics	centre and later on
20	Ardisiae japonicae herba	Antitussive antiasthmatics	centre and later on
21	Asteris radix et rhizome	Antitussive antiasthmatics	Middle and later
22	Euphorbiae helioscopiae herba	Diuretic dampness-excreting	centre and later on
23	Ginkgo semen	Antitussive antiasthmatics	Middle and later
24	Anemarrhenae rhizome	flames removal	Later on
25	Epimrdii herba	Yang-reinforcing	Later on
26	Fortunes bossfern	Warming internal	preclusion

the natural herbal compounds are not very much effective as these two previous coronaviruses. Clinically, SARS-CoV-2 infection immune response is categorised in two-phased. An immune response is required to eliminate the virus and to prevent disease development to severe stages in the incubation and non-severe stages. So at this stage, the strategies to anti-viral responses (anti-sera or pegylated IFN α) are important. At the incubation and non-severe stages, for the development of an endogenous protective immune response, the congregation should be in good physical health and suitable genetic conditions (e.g. HLA) that elicits spe-

cific anti-viral immunity. Genetic differences are well-known to contribute to person variations in the immune response to pathogens. However, when the impairment of protective immune response, the virus will increase, and huge destruction of the affected tissues will occur, especially high ACE2 expression organs, such as intestine and kidney. The damage cells induce largely mediated by pro-inflammatory macrophages and granulocytes innate inflammation in the lungs. The major cause of life-threatening respiratory disorders is lung inflammation at a severe stage (Xu *et al.*, 2020).

According to Ayurveda, anti-viral are correlated

with *Krumighna* action. All drugs which are herbal anti-viral are *Krumighna* in nature and *Ushna Viryatmaka*. Most of the drug has *Ushna Veerya* so it can be used in *Vata Kapha Janya Dushta Vyadhi*. *Madhur Rasa* reduces the action of *Visha* so act as *Vishaghna* and *Balya*. Some of the drugs have *Sheeta Veerya*, so it acts on *Visha*. Due to its *Krumighna* action, it acts against coronavirus and prevents to spread infection in the body.

CONCLUSION

Nowadays and in the past viral infections caused due to the global disease burden, and there is a need for traditional compounds with anti-viral properties. For the improvement of public health, especially in developing countries, medicinal herbs might be used. Majority of the population has not the economic strength to financial credit for pricey anti-viral drugs. Hence, *Krumihara* property drugs which are correlated with anti-viral action helps to prevent against Novel coronavirus infection.

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Conflict of Interest

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