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## Outlook of Ayurveda in recent COVID-19 Pandemic

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**Abstract: Background:** On January 30, 2020 the World Health Organization (WHO) declared the outbreak as a Public Health Emergency of International Concern. The principles described in Ayurveda are still the same as today's medical science. **Objective:** The objectives of such theoretical research stemmed out with this literature review were to an attempt to critically review the stance of Ayurveda in COVID-19 Pandemic and Interpret their significance in present era. **Methodology:** The present study is based on theoretic research using related research articles, standard textbooks of epidemiology and classical treatises of Ayurveda. **Discussion:** The concept of epidemic was well defined in Ayurveda under heading of *Janapadodhwansa*. It is observed that deaths in COVID-19 were because of the weak immunity. The *Rasayana* drug providing passive immunity which depends on the *ojas*, antagonizes the strength of disorders and prevent it. AYUSH ministry given many guidelines related to COVID-19 possible treatment, which need to be studied statistically. Along with fighting current condition, the scientific minds in the word are expected to start preparing approaches for future too. **Conclusion:** To overcome this pandemic situation, integrated approach of Public health with Ayurveda are most needed and for that more research is needed to make this generation old ancient medicinal system to prove its effectiveness.

**Keywords:** Malefic *Graha* induced diseases, *Dhatu dushtijanya* diseases

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**INTRODUCTION:**

In December 2019, an outbreak of COVID-19, caused by a novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection attacking mainly on the immune system of a body, occurred in Wuhan City, Hubei Province, China.<sup>[1]</sup> This potentially fatal disease spreading worldwide at an exponential rate making it a serious pandemic situation.<sup>[3]</sup> On January 30, 2020 the World Health Organization (WHO) declared the outbreak as a Public Health Emergency of International Concern.<sup>[4]</sup> There is no specific drug or targeted intervention is available yet, however, current therapy for Covid-19 involves only symptomatic treatment, supportive care and prevention of complications.<sup>[5]</sup> Research is ongoing in many countries to develop effective vaccines and drugs for the COVID-19. However, In Ayurvedic classics, *Acharya Charaka* explained the concept of an pandemic condition under the heading of *Janapadodhwans Adhayaya* and also described the three main principles to tackle pandemic contions are *Rasayana Chikitsa* (immune-modulators therapy), *Panchakarma* (five procedures of purification and *Sadvritta* (good conduct).<sup>[6]</sup> Especially, *Rasayana dravyas* (immuno modulators drugs) of Ayurveda can be used for health promotion,

immune-modulation, prevention and decrease disease burden from COVID-19.<sup>[7]</sup>

**Objective :**

The idea of such a theoretical research stemmed out with this literature review, and the specific objectives of this review were to: Summarize the current understanding of COVID-19 including Etiopathogenesis, Clinical manifestations, diagnosis and prevention and control strategies. Critically review the stance of Ayurveda in COVID-19 Pandemic and Interpret their significance in present era.

**MATERIAL & METHOD**

An initial phase of study was made to review related scholarly articles pertaining to the above-said subject by using systematic internet-based search engines. The present work is primarily based on theoretical research. Classical treatises of Ayurveda and AYUSH guidelines for COVID-19 were used for the study. The classical texts of Ayurveda do not use such modern terminology; hence, approximate corresponding terms were obtained from Central Council of Indian Medicine, India.

**DISCUSSION:****Etiopathogenesis:**

CORONA virus (SARS-CoV-2) is an enveloped, positive-sense single-stranded RNA (ssRNA) virus belonging to the

Coronaviridae family.<sup>[12]</sup> The source infection was related to seafood wholesale market in China. It appears that the infection was first transmitted through zoonotic agents (from animal to human). Furthermore; It spreads in human-to-human through respiratory droplets (related to human respiratory activities such as breathing, talking, coughing and sneezing) that typically travel less than two meters and direct contact are the most probable transmission routes, but some cases also showed other ways of transmission like; faecal-oral transmission, fomite transmission (transfer of a virus via an object), perinatal (intrauterine) transmission.<sup>[13,23]</sup> However; As per Ayurveda principles, COVID-19 can be categorized under *Agantuja vyadhi* (exogenous disease) by commencement, caused by *bhoota* (pathogenic microorganisms)<sup>[15,16]</sup> and transforming to *nija* (endogenous) causes disequilibrium of *kapha*, *vata* and *pitta doshas* (humors of body). The analysis of clinical manifestation and ongoing disease progression, the COVID-19 may be considered as *Vata-kapha pradhana tridoshaja vyadhi* that mainly involves *pranavaha*, *rasavaha*, *raktavaha strotas* and the disease located to the respiratory system.<sup>[17]</sup>

### Clinical manifestations:

Incubation period can take up to 14 days after exposure to virus.<sup>[23]</sup> Around 81% of patients develops mild infection around day four viz. fever, non-productive cough and sore muscles. At first people may complain of diarrhoea and nausea. A few days later, they develop fever. Fever is usually detected in patients but it is not the main symptom. Headache, dizziness, abdominal pain, diarrhoea, nausea, and vomiting are some of the less common symptoms.<sup>[5,7,13]</sup> About 14% patients develop severe form of illness around day nine with symptoms like shortness of breath, myalgia or fatigue, Lymphopenia and radiographic evidence of pneumonia. Corona virus infection result in massive alveolar damage and progressive respiratory failure.<sup>[6]</sup> Around 5% of patients develop respiratory failure or shock and multiorgan dysfunction leads to death, while some recovers. Older individuals with weak immunity and those with underlying medical complications like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness.<sup>[23]</sup>

**Diagnosis:** RT-PCR (Real Time Polymerase Chain Reaction) is the generally used method for analysis. Other precise tests like molecular methods, serology and viral culture. Lower

respiratory tract samples are better than upper ones because they have higher viral load.<sup>[11,13]</sup>

### **Prevention and control strategies:**

In Indian Medicine System, emphasize on preventive steps as well as screening, social distancing and use of mask are also mentioned like fumigation (doopan) and sanitization of natural herbs like *Hymenaea verrucosa Gaertn.*, *Azadirachta indica*, *Cinnamomum camphora (L.)*, *Lauraceae*, *Leguminosae*, *Santalum album L.*, *Santalaceae*, *Rosa damascena Herrm.*, *Rosaceae*, etc.<sup>[4]</sup>

### **Reasons for the Current Interest in Ayurveda:**

Till date, there is no vaccine or precise treatment is available for COVID-19 pandemic.<sup>[14]</sup> At present, treatment provided to the affected individuals are mainly symptom based, and the seriously ill individuals are provided with organ support.<sup>[28]</sup> As per recommendation, many countries are using Hydroxychloroquine(HCQ) and Azithromycin (AZD) as a treatment of COVID-19.<sup>[26]</sup> It is also proved that there are several side effects of HCQ on the heart, eye and gastro-intestinal tract. Without proper scientific evidence and alternative choice, the whole world is using this protocol. Some experts are advising to use reserved HIV treatment drugs – Lopinavir 200mg and Ritonavir 50mg in second option

which are highly toxic as compared to HCQ and AZD.<sup>[26]</sup> The whole world is looking for a medicine which is highly effective, well acceptable, easily available, time tested and less toxic.<sup>[26]</sup>

The best ways of preventing infection are breaking the chain, enhancing an individual's body immunity, identifying the infection early and timely medical care.<sup>[25]</sup> Along with modern medicines, China has used Traditional Chinese medicine (TCM) and was found to be beneficial and effective to treat severe acute respiratory syndrome associated coronavirus infection.<sup>[8,26]</sup> One study among the 701 confirmed COVID-19 cases treated by *Qingfei Paidu* decoction (QPD) showed that 130 cases were cured and discharged, clinical symptoms of 51 cases disappeared, 268 cases showed improvement in symptoms, and 212 cases had stable symptoms without aggravation. The effective cure rate of QPD against COVID-19 is over 90% and showed a new hope for the prevention and control of COVID-19 which is less toxic, highly effective and socially acceptable.<sup>[27]</sup>

Indian medicine system is more than 5000 years old and well documented system.<sup>[15]</sup> Also it is a very renowned and ancient traditional medicinal system of India which has being

practised over thousands of years. [26] In Ayurveda, There are three main principles to tackle pandemic conditions are *Rasayana Chikitsa* (immune-modulators therapy), *Panchakarma* (five procedures of purification and *Sadvritta* (good conduct). [1]

The concept of treatment of Ayurveda for any sickness is to balance the three body humors (*Vata*, *pitta* and *Kapha*), to optimize the *Ojas* (immunity level) by correcting the *Agni* (metabolism) by which further enhancing the *Dhatu Sarata* (quality of body tissue at different level). As said by Acharya *Sushruta* without the *Prakopa* of any of three *Dosha* no disease can emerge so it is advised to treat the disease with the characteristic symptoms of the relevant *Dosha* (*Sushruta*). [15-20] The *Rasayana* drug is providing passive immunity (*yuktikrita-bala*). As postulated, *Vyadhikshamatwa* (immunity), which depends on the *ojas*, antagonizes the strength of disorders and prevent it. [25] It is observed that early deaths were in older people, probably because of the deprived immunity, which raises faster progress of COVID-19. Therefore, it is significant to enhancing our immune system. [15-20] *Rasayana dravyas* (immuno modulators drugs) can be used for health promotion,

immune-modulation, prevention and decrease disease burden from COVID-19. [1]

### ***Rasayana dravyas* (Immunity Enhancers - Single Drugs) [29]:**

1. *Amla*: Eating of fresh Amla fruit (*Embilica officinalis* L/ *Phyllanthus emblica* L).
2. *Guduchi* : taking 0.5g to 1g of aqueous extract of *Guduchi* (*Tinospora cordifolia* (Thunb.Miers).
3. *Haridra* :Gandush (Gargling) with warm water added with turmeric powder (*Curcuma longa* L) and a pinch of salt.
4. *Tulasi* :Regular drinking of water processed with *Tulsi* (basil leaves – *Ocimum tenuiflorum* L Merr (synonym *Ocimum sanctum* L).
5. *Ashwagandha* : root powder 3-5gm twice a day.

*Panchkarma* and *sadvrutta* are other two principles in Ayurveda gives focus on prevention through lifestyle modification, dietary management, prophylactic interventions for improving the immunity and simple remedies based on presentation of the symptoms. [25] AYUSH ministry given draft with the symptomatology in three stages in COVID -19 in Table 1.

**Table 1:** The draft deals with the symptomatology in three stages in COVID -19.<sup>[29]</sup>

Stages	COVID 19 patient with	Ayurvedic co-relation for treatment
1.	mild symptoms	Swasa-Kasa symptoms with Jwara
2.	specific symptoms at moderate level	Vata-Kapha pradhan Jwara (Fever)
3.	severe symptoms	Vata-Kaphaja Sannipatika Jwara (Fever)

To tackle the situation, therapeutic approach for COVID-19 suggested by Ministry of AYUSH is mentioned under Table 2.

**Table 2:** therapeutic approach for COVID-19 suggested by Ministry of AYUSH<sup>[29]</sup>

Uncomplicated Cases	Medicine
Fever ( <i>Jwara</i> )	1. <i>MahaSudarshanghan Vati (tab)</i> - 500 mg TDS with lukewarm water
	2. <i>Amritarista</i> liquid 15-20 ml tid with water after food
	3. <i>Vishamajwarantakalauha</i> with gold - 125 mg bid with water - High fever with debility
	4. <i>Mrityunjaya rasa</i> - 125 mg tid with water - Uncontrolled fever with myalgia
	5. <i>Samshamanivati (tab)</i> 500 mg. 2 tab BD after food
	6. <i>ArkaYavani</i> - 10 – 25 ml QID with water - <i>Deepanapachana Jwara, Aruchi</i>
	7. <i>Pathyadi Kashayam /Guduchyadi Kashayam / Bharangyadi Kwath</i> - freshly made 30 – 40 ml BD before food
	8. <i>Chaturthaka Jvaraharakwatha</i> ( <i>Guduchi Churna</i> -5gms+ <i>Amalaki</i> -Dry-5gms+ <i>Nagarmotha</i> -5gms decoction with 200ml of water and reduced it up to 100ml)
	9. <i>Tribhuvanakirti rasa</i> 125 mg BD after food with <i>shunthijala</i>
	10. <i>BilwadiVati</i> 1 TDS
1.2 Sore throat	1. <i>Vyoshadivati/ LavangadiVati/ Khadiradivati</i> -2 tab TDS
	2. <i>Laxmivilasa rasa</i> 125 mg tid with <i>tamboola swarasa</i> after food
1.3 Nasal congestion ( <i>Pratishyaya</i> )	1. <i>Haridrakhand (Powder)</i> - taking 3 - 5 gm BD with lukewarm water/ milk
	2. <i>Laxmivilasa rasa (tab)</i> 125 – 250 mg BD with <i>tamboolaswarasa</i> after food
1.4 Myalgia ( <i>Parshwa - shoola, Shirashoola, Angamarda</i> )	1. <i>Devadaryadi kwatha (liquid)</i> 30 - 40 ml BD before food
	2. <i>Dashamoolakwath (liquid)</i> 30 - 40 ml BD before food
	3. <i>Rasnasaptak- Kwath(liquid)</i> - 30 - 40ml BD before food
	4. <i>Ashwagandharista (liquid)</i> 15 – 20 ml BD with water
	5. <i>Balarishta liquid</i> 15 – 20 ml BD with water

	6. <i>Godantibhasma</i> powder 500 mg – 1 gm BD/TDS daily with ghee, sugar, warm milk or water
1.5 Cough ( <i>Vataja Kasa</i> )	1. <i>Talisadi Churna</i> (4 g)+ <i>Madhuyashtichurna</i> (2 g) BD with honey/ lukewarm water
	2. <i>Sitopaladichurna</i> (powder)3-6 gm with honey BD/ TDS or as required
	3. <i>Tankanabhasma</i> (powder)– 250 – 500 mg BD
	4. <i>Dashamoolakatutrayadi Kashaya</i> 20 – 30 ml TDS before food
1.6 Dehydration features ( <i>Trishana</i> due to <i>Jwara</i> )	<i>Shadangapaneeya</i> 40 ml tid/as per requirement
2. Pneumonia – <i>Shwasapradhanakasa</i>	
1. <i>Pushkaramoolasava liquid</i> 15 – 20 ml BD/TDS with equal water	
2. <i>Agastya Haritaki/Vyaghriharitaki/Chitrakaharitaki Avaleha</i> – 10 to 12 gm BD after food	
3. <i>Kantakariavaleha</i> 10 – 12 gm BD after food	
4. <i>Dashamoolakatutrayadi Kashaya(liquid)</i> 20 – 30 ml TDS with water before food	
5. <i>Bharangyadikwatha (liquid)</i> 30 - 40 ml BD before food	
6. <i>Vasakasava (liquid)</i> 15 – 20 ml TDS with water after food	
7. <i>Chandramrita rasa</i> – 250mg	
8. <i>Sanjeevanivati</i> - 125mg TDS/ <i>Gorochanadivati</i> - 125 mg TDS with luke warm water	
9. <i>Somasav/Pushkaramoolasava (liquid)</i> - 10 – 20 ml with equal amount of water BD	
10. <i>Talisadi (4g)+Madhuyashtichurna (2gms) + Sameerapannaga rasa</i> 125 mg BD with honey / luke warm water	
3. Acute Respiratory Distress Syndrome – <i>Shwasa</i>	
1. Inhalation with <i>Karpoora</i> and <i>Nilgiritaila</i>	
2. <i>ShwasKuthar Rasa</i> tablet (125 - 250 mg) with <i>Kantakari</i> (2 g) and <i>Pippali churna</i> (1 gm) given with mustard oil and jaggery	
3. <i>Mallasindoora</i> 125 mg + <i>Talisadichurna</i> 3gms + <i>Shringabhasma</i> 125 mg+ <i>Abhrakabhasma</i> 125 mg, with honey BD after food	
4. <i>Saindhavadi taila</i> to chest followed by <i>Nadiswedana</i> - Local application	

Ministry of AYUSH also mentioned stages wise possible medications in GUIDELINES for AYURVEDA PRACTITIONERS for COVID 19.<sup>[29]</sup> But these all are just possible medications which are mentioned in Ayurvedic classics.

There Global acceptance depend on their proven scientific data.<sup>[30]</sup>

#### **Focusing on future:**

Ayurveda guidelines offers a way to get possible safety in current situation but these



guidelines promise much more safety in prevention of similar pandemic in future. Along with fighting present situation, the scientific minds in the world are expected to start preparing strategies for future too. Ayurveda can play significant role in future strategies because most of the preventive strategies for COVID-19 has clearly showed that the ancient scholars of Ayurveda had already provided those guidelines and few more too which are yet to be accepted and recommended by world scientific committees.<sup>[31]</sup>

#### CONCLUSIONS:

The world-wide spread of COVID-19 has become a critical health issue concern. Future prospective COVID-19 is an extremely new challenge to medical science. The modern medicine is trying to manage only on symptomatic base line of treatment with

#### REFERENCES

1. NIRAJ, Srivastava; VARSHA, Saxena. A review on scope of immuno-modulatory drugs in Ayurveda for prevention and treatment of Covid-19. **Plant Science Today**, v. 7, n. 3, p. 417-423, July 2020. ISSN 2348-1900.
2. Acharya YT. Charaka Samhita of Agnivesha with 'Ayurveda-Dipika' commentary by Chakrapanidatta, Repr. ed. Varanasi. Chaukhamba Surbharati Prakashan. 2000. Sutrasthana, chapter 11, verse 45. p.76.
3. Vimal K. Maurya et al. Structure-based drug designing for potential antiviral activity of selected natural products from Ayurveda against SARS-CoV-2 spike glycoprotein and its cellular receptor. *Virus*

available antiviral drugs having life threatening side effects. To overcome this situation, integrated approach of Public health with Ayurveda where Indian Medicine System have to contribute lot as more cases are due to weak immunity system of patients, which seems to be the best approach in the current situation. The therapeutic role of Ayurveda needs to be scientifically studied and the scientific minds in the world are expected to start preparing plans for future too. More research is certainly needed to make generation old Ayurvedic medicinal system to prove its effectiveness.

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#### Conflicts of interest

Nil.

- Dis. (April-June 2020) 31(2):179-193. [DOI: <https://doi.org/10.1007/s13337-020-00598-8>]
4. Acharya YT. Charaka Samhita of Agnivesha with Ayurveda-Deepika Commentary by Chakrapanidatta, edited by Dr. Brahmanand Tripathi, Varanasi, Chaukhamba Surbharati Prakashan, Reprinted 2011, Vimana sthana chapter 3, verse 13-18, Pg. 241.
  5. Xiang, Y.-T., Li, W., Zhang, Q., Jin, Y., Rao, W.-W., Zeng, L.-N., Lok, G. K. I., Chow, I. H. I., Cheung, T., Hall, B. J. 2020. Timely research papers about COVID-19 in China. *The Lancet*, 395(10225):684-685.

6. Shuvrodeb Roy and Pradip Bhattacharyya, Possible role of traditional medicinal plant Neem (*Azadirachta indica*) for the management of COVID-19 infection. *Int. J. Res. Pharm. Sci.*, 2020, 11(SPL)(2), 122-125 [DOI: <https://doi.org/10.26452/ijrps.v11iSPL1.2256>]
7. Chan, J. F., Yuan, . W., Kok, S., To, K. H., K, K., Chu, . W., Yang, H., Xing, J., Liu, F., Yip, J., Poon, C. C.- Y., W, R., Tsoi, . S., Lo, H. W., K, S., Chan, . F., Poon, K. H., K, V., Chan, . M., Ip, W. M., Cai, J. D., Cheng, J. P., Chen, V. C.-C., Yuen, H., Y, K. 2020. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to person transmission: a study of a family cluster. *The Lancet*, 395(10223):30154–30163.5
8. Li, S., Chen, C., Zhang, H., Guo, H., Wang, H., Wang, L., Zhang, X., Hua, S., Yu, J., Xiao, P. 2005. Identification of natural compounds with antiviral activities against SARS-associated coronavirus. *Antiviral Research*, 67(1):18–23.
9. hai Zhang, D., lun Wu, K., Zhang, X., qiong Deng, S., Peng, B. 2020. In silico screening of Chinese herbal medicines with the potential to directly inhibit 2019 novel coronavirus. *Journal of Integrative Medicine*, 18(2):152–158.
10. Chaturvedi S, Kumar N, Tillu G, Deshpande S, Patwardhan B. AYUSH, modern medicine and the Covid-19 pandemic. *Indian J Med Ethics* Published online on May 13, 2020. DOI:10.20529/IJME.2020.058
11. I. Ali, O.M.L. Alharbi. COVID-19: Disease, management, treatment, and social impact. *Science of the Total Environment* 728 (2020) 138861 [DOI: <https://doi.org/10.1016/j.scitotenv.2020.138861>]
12. Mittal B, Chand T. Global care through ayurveda in pandemic of COVID-19. *Int J Health Sci Res.* 2020; 10(6):165-172.
13. Naserghandi et al. COVID-19 in brief. *New Microbes and New Infections*, Volume 35 Number C, May 2020
14. D.H. Zhang, K.L. Wu, X. Zhang, S.Q. Deng, B. Peng, In silico screening of Chinese herbal medicines with the potential to directly inhibit 2019 novel coronavirus, *J. Integr. Med.* 18 (2020) 152–158, [DOI: <https://doi.org/10.1016/j.joim.2020.02.005> ]
15. V.K. Joshi, A. Joshi, K.S. Dhiman, The ayurvedic pharmacopoeia of India, development and perspectives, *J. Ethnopharmacol.* 197 (2017) 32–38, [DOI: <https://doi.org/10.1016/j.jep.2016.07.030>]
16. K.M. John, G. Enkhtaivan, M. Ayyanar, K. Jin, J.B. Yeon, D.H. Kim, Screening of ethnic medicinal plants of South India against influenza (H1N1) and their antioxidant activity, *Saudi J. Biol. Sci.* 22 (2015) 191–197, [DOI: <https://doi.org/10.1016/j.sjbs.2014.09.009>.]
17. V.K. Joshi, A. Joshi, K.S. Dhiman, The ayurvedic pharmacopoeia of India, development and perspectives, *J. Ethnopharmacol.* 197 (2017) 32–38, [DOI: <https://doi.org/10.1016/j.jep.2016.07.030>.]
18. J.F.T.K. Akoachere, R.N. Ndip, E.B. Chenwi, L.M. Ndip, T.E. Njock, D.N. Anong, Antibacterial effects of *Zingiber officinale* and *Garcinia kola* on respiratory tract pathogens, *East Afr. Med. J.* 79 (2002) 588–592, [DOI: <https://doi.org/10.4314/eamj.v79i11.8804>.]
19. A.K. Panda, A.K. Dixit, S. Rout, B. Mishra, U.V. Purad, S. Kar, Ayurveda practitioners consensus to develop strategies for prevention and treatment of corona virus disease (COVID-19), *J. Ayurveda Integr. Med. Sci.* 5 (2020) 98–106.
20. S. Parasuraman, G.S. Thing, S.A. Dhanaraj, Polyherbal formulation: concept of Ayurveda, *Pharmacogn. Rev.* 8 (2014) 73–86, [DOI: <https://doi.org/10.4103/0973-7847>.]
21. Barge SS, Shashilekha HK, Textbook of Swasthritta. 1st ed. Reprint, Chaukhambha publications, New Delhi; 2018. Pg. 415-419, 508-5-10.
22. H. Harapan et al. Coronavirus disease 2019 (COVID-19): A literature review. *Journal of Infection*

- and Public Health 13 (2020) 667–673 [DOI: <https://doi.org/10.1016/j.jiph.2020.03.019>]
23. World Health Organization (WHO). 8th May. 2020. Current Outbreak on Coronavirus (COVID-19) Disease. [https://www.who.int/healthtopics/coronavirus#tab=tab\\_1](https://www.who.int/healthtopics/coronavirus#tab=tab_1).
24. Binay Sen. Potentiality and possibility of Medicinal Plants on Ayurvedic Principle in prevention and treatment of COVID-19. J. Ayu. Herb. Med. 2020; 6(2): 100-107 [DOI: 10.31254/jahm.2020.6216]
25. Nesari TM. Ayurveda: The promising shelter for the mankind in the wake of COVID-19 pandemic. J Ayurveda Case Rep 2020;3:1-3. [DOI: 10.4103/JACR.JACR\_18\_20]
26. Amitava Acharyya. Prospect of Ayurveda System of Medicine in recent Covid-19 Pandemic in India. IJATM.2020;2(2):26-29.
27. Ren JL, Zhang AH, Wang AH. Traditional Chinese medicine for COVID-19 treatment. Pharmacological Research. 2020 Mar 4;155: 104743-104768 [DOI: <https://doi.org/10.1016/j.phrs.2020.104743>]
28. Wu, C., Liu, Y., Yang, Y., Zhang, P., Zhong, W., Wang, Y., Wang, Q., Xu, Y., Li, M., Li, X., 2020b. Analysis of therapeutic targets for SARS-CoV-2 and discovery of potential drugs by computational methods. Acta Pharm. Sin. B [DOI: 10.1016/j.apsb.2020.02.008]
29. GUIDELINES for AYURVEDA PRACTITIONERS for COVID 19, MINISTRY OF AYUSH, AYUSH BHAWAN, NEW DELHI – 110023. <https://www.ayush.gov.in/docs/ayurveda.pdf>
30. Delamater, P. L., Street, E. J., Leslie, T. F., Yang, Y., & Jacobsen, K. H. (2019). Complexity of the Basic Reproduction Number (R0). *Emerging Infectious Diseases*, 25(1), 1-4. [DOI: <https://dx.doi.org/10.3201/eid2501.171901>.]
31. Rajput DS, Evolution, Ayurveda, immunity, and preventive aspects for emerging infectious diseases such as COVID-19. Int. J. Res. Pharm. Sci., 2020, 11(SPL)(1), 86-93. [DOI: <https://doi.org/10.26452/ijrps.v11iSPL1.2227> ]

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