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# Medicinal plants of *Bhavaprakasha Nighantu* having *Jwarahara* (anti-pyretic), *Shwasahara* (anti-asthmatic) and *Kasahara* (anti-tussive) properties for the management of COVID 19 : A Review

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## ABSTRACT

**Aim:** To find out effective plants from *Bhavaprakasha Nighantu* in the management of COVID 19 and their analysis on the basis of pharmacodynamics attributes and reported pharmacological activities. **Background:** COVID 19 is declared as a pandemic by W.H.O. which is affecting 216 countries. The graph of confirmed cases and deaths is rising day by day. Due to lack of definitive treatment, anti-virals are choice of drug along with other antimicrobial and supportive treatment. High grade fever, sore throat and difficulty in breathing are cardinal signs of its early stage. In *Bhavaprakasha Nighantu* various plants has been mentioned which are having *Jwarahara* (anti-pyretic), *Shwasahara* (anti-asthmatic) and *Kasahara* (anti-tussive) properties. A complete review of these plants with pharmacodynamic attributes (*Rasa, Veerya, Vipaka*) has been done from *Bhavaprakasha Nighantu*. The plants were further reviewed from PubMed for anti-viral, anti-pyretic, anti-tussive/anti-asthmatic and immunomodulatory activities to make it more scientific. **Results:** 22 plants were found which are having all these properties. *Kutki* [*Picrorhiza kurroa* Royale ex. Benth], *Kiratatikta* [*Swertia chirayita* (Roxb.) Buch. Ham.ex C.B.Clarke] and *Guduchi* [*Tinospora sinensis* (Lour) Merr.] etc. were found to be having immunomodulatory action. *Kiratatikta*, *Guduchi*, and *Pippali* [*Piper longum* L.] etc. were found having anti-pyretic activity. *Kutki*, *Kiratatikta* and *Katphala* [*Myrica esculenta* Buch. Ham. ex D. Don] etc. were found having beneficial for respiratory illnesses. *Kutki*, *Kiratatikta*, *Haritaki*, *Aamalaki* and *Sariva* [*Hemidesmus indicus* (L.) R. Br. ex Schult] etc. were found having antiviral activities. **Conclusion:** 22 plants found to be effective in *Bhavaprakasha Nighantu* and they are also reported having pharmacological activities which are beneficial in COVID 19. **Clinical Significance:** Among these plants many are easily available and also in day-to-day practice. Thus, these plants and their combinations can be used in early stage of COVID 19 and also in later stages with minimised dose and drug interactions.

**Key words:** Anti-pyretic, Anti-tussive/Anti-asthmatic, Anti-viral, COVID 19, Immunomodulatory, Jwarahara, Kasahara, Shwasahara.

## INTRODUCTION

COVID 19 is an acute respiratory syndrome caused by novel Corona virus 2 (SARS-CoV-2).<sup>[1]</sup> According to World Health Organization (WHO) there are

2,30,57,288 confirmed cases in 216 countries with 8,00,906 deaths till August 2021.<sup>[2]</sup> Though it is reduced now and COVID is in control but it is going to be persist in community as cold and flu or waves are coming after a period of time. The virus has 2-14 days incubation period and patients may remain asymptomatic and can transmitted through human beings.<sup>[3]</sup> Further, fever and dry cough are the earliest, dominant and most common symptoms appear in SARS Cov 2 infected patients. COVID 19 infected patients having mild symptoms needs only supportive treatments at its early stage.<sup>[4]</sup> In early stage of COVID 19 controlling measures like social distancing, hand washing and use of masks can contribute very much. In supportive/symptomatic treatment antipyretic and analgesic drugs like paracetamol (acetaminophen) are drug of choice in the conventional system of medicine. But some concerns have been presented by French

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officials with the use of NSAIDs in patients with severe lung infections, such as those seen with COVID 19. Non-aspirin NSAIDs has been associated with an increase in cardiovascular risk; thus, the use of these drugs in patients with cardiovascular disease and COVID 19 should be evaluated on the basis of risk versus benefit.<sup>[5]</sup> Thus, there are certain limitations in the choice of drug and the definitive anti-viral drug or vaccine is not available for the treatment of COVID 19.

In this scenario, Ayurveda, the traditional system of medicine can contribute in the treatment as well as prevention of COVID 19 as a stand-alone therapy and a supportive therapy. In Ayurveda, various single herbs have been described in *Nighantus*, the wealth of herbs/plants. In *Bhavaprakasha Nighantu* and other *Nighantus*, *Jwarahara* (anti-pyretic), *Shwasahara* (anti-asthmatic) and *Kasahara* (anti-tussive) herbs/plants are described, which can make useful contribution in the symptomatic management of COVID 19. To avoid the risk of drug interaction and multiple drug use for early symptomatic/supportive treatment in COVID 19 infection, single drugs which are having anti-pyretic and anti-asthmatic/anti-tussive effects can be used.

Keeping this fact in mind, a complete review of *Bhavaprakasha Nighantu* was done to find out the

herbs/plants which are having all these properties with their pharmacodynamics attributes (*Rasa*, *Veerya*, *Vipaka*). These plants are also reviewed for their pharmacological activities i.e., anti-viral, anti-pyretic, anti-tussive/anti-asthmatic and immunomodulatory activities from PubMed database for their rational use in COVID 19. Hence, this work will give a comprehensive knowledge of different medicinal plants described in *Bhavaprakasha Nighantu*, that can be used for the prophylactic and therapeutic intervention in the ongoing pandemic COVID 19. Modern pharmacological studies provided more evidence for substantiating the effects of these plants.

## REVIEW RESULTS

A total of 22 plants were found having *Jwarahara*, *Shwasahara* and *Kasahara* properties. All these are placed in Table 1 with their pharmacodynamics attributes. Among them maximum eight plants were having *Tikta Rasa* followed by five *Katu Rasa*, five *Madhura Rasa*, three *Kashaya Rasa* and one *Amla Rasa* plants. In *Veerya* aspect maximum of 12 plants were found having *Ushna Veerya*, nine having *Sheeta* and one having *Anushna Veerya*. In *Vipaka* aspect majority of plants (14) were found having *Katu Vipaka*, seven having *Madhura* and one having *Amla Vipaka*. (Table 1)

**Table 1: Herb/plant of *Bhavaprakasha Nighantu* having *Jwarahara*, *Shwasahara* and *Kashara* properties with their pharmacodynamics attributes.**

Drug Name	Rasa	Veerya	Vipaka	Reference
<i>Haritaki</i> [ <i>Terminalia chebula</i> Retz.]	<i>Kashaya</i> dominant, five <i>Rasa</i> except <i>Lavana</i>	<i>Ushna</i>	<i>Katu</i>	B.P.Ni. Haritkyadi varga, Verse 19, Pg. 5
<i>Aamalaki</i> [ <i>Phyllanthus emblica</i> L.]	<i>Amla</i> dominant, five <i>Rasa</i> except <i>Lavana</i>	<i>Sheeta</i>	<i>Amla</i>	B.P.Ni. Haritkyadi varga, Verse 39-40, Pg. 10
<i>Pippali</i> [ <i>Piper longum</i> L.]	<i>Katu</i>	<i>Anushna</i>	<i>Madhura</i>	B.P.Ni. Haritkyadi varga, Verse 54, Pg. 15
<i>Vanshlochana</i> [ <i>Bambusa arundinacea</i> (Retz.) Willd. shoot]	<i>Madhura</i> , <i>Kashaya</i>	<i>Sheeta</i>	<i>Madhura</i>	B.P.Ni. Haritkyadi varga, Verse 117, Pg. 56
<i>Kutki</i> [ <i>Picrorhiza kurroa</i> Royale ex. Benth]	<i>Tikta</i>	<i>Ushna</i>	<i>Katu</i>	B.P.Ni. Haritkyadi varga, Verse 151-52, Pg. 67

<i>Kiratatikta</i> [ <i>Swertia chirayita</i> (Roxb.) Buch. Ham.ex C.B.Clarke]	<i>Tikta</i>	<i>Sheeta</i>	<i>Katu</i>	B.P.Ni. Haritkyadi varga, Verse 154-55, Pg. 70
<i>Rasna</i> [ <i>Pluchea lanceolate</i> (DC.) C.B. Clarke]	<i>Tikta</i>	<i>Ushna</i>	<i>Katu</i>	B.P.Ni. Haritkyadi varga, Verse 163-64, Pg. 76
<i>Karkatshringi</i> [ <i>Pistacia chinensis</i> subsp. <i>Integerrima</i> (J. L. Stewart ex Brandis) Rech. F.]	<i>Kashaya, Tikta</i>	<i>Ushna</i>	<i>Katu</i>	B.P.Ni. Haritkyadi varga, Verse 179, Pg. 95
<i>Katphala</i> [ <i>Myrica esculenta</i> Buch.-Ham. ex D. Don]	<i>Kashaya, Tikta</i>	<i>Ushna</i>	<i>Katu</i>	B.P.Ni. Haritkyadi varga, Verse 181, Pg. 97
<i>Bharangi</i> [ <i>Clerodendrum serratum</i> (L.) Moon.]	<i>Katu, Tikta, Kashaya</i>	<i>Ushna</i>	<i>Katu</i>	B.P.Ni. Haritkyadi varga, Verse 183, Pg. 98
<i>Bakuchi</i> [ <i>Psoralea corylifolia</i> L.]	<i>Madhura, Tikta</i>	<i>Sheeta</i>	<i>Madhura</i>	B.P.Ni. Haritkyadi varga, Verse 207-09, Pg. 119
<i>Rasona</i> [ <i>Allium sativum</i> L.]	<i>Katu, Madhura</i>	<i>Ushna</i>	<i>Katu</i>	B.P.Ni. Haritkyadi varga, Verse 221-23, Pg. 127
<i>Guduchi</i> [ <i>Tinospora sinensis</i> (Lour) Merr.]	<i>Tikta, Katu, Kashaya</i>	<i>Ushna</i>	<i>Madhura</i>	B.P.Ni. Guduchyadi varga, Verse 8-10, Pg. 257
<i>Vartaki</i> [ <i>Solanum indicum</i> L.]	<i>Katu, Tikta</i>	<i>Ushna</i>	<i>Katu</i>	B.P.Ni. Guduchyadi varga, Verse 37, Pg. 275
<i>Kantakari</i> [ <i>Solanum xanthocarpum</i> Schrad. & H. wendl.]	<i>Tikta, Katu</i>	<i>Ushna</i>	<i>Katu</i>	B.P.Ni. Guduchyadi varga, Verse 40-41, Pg. 277 B.P.Ni. Shaka varga, Verse 89, Pg. 679
<i>Vasa</i> [ <i>Justicia adhatoda</i> L.]	<i>Tikta, Kashaya</i>	<i>Sheeta</i>	<i>Katu</i>	B.P.Ni. Guduchyadi varga, Verse 90, Pg. 306
<i>Sharpunkha</i> [ <i>Tephrosia purpurea</i> (L.) Pers.]	<i>Tikta, Kashaya</i>	<i>Sheeta</i>	<i>Katu</i>	B.P.Ni. Guduchyadi varga, Verse 210, Pg. 393
<i>Sariva</i> [ <i>Hemidesmus indicus</i> (L.) R. Br. ex Schult]	<i>Madhura</i>	<i>Sheeta</i>	<i>Madhura</i>	B.P.Ni. Guduchyadi varga, Verse 238, Pg. 411
<i>Suvarchala</i> [ <i>Cleome gynandra</i> L.]	<i>Tikta, Kashaya, Katu</i>	<i>Ushna</i>	<i>Katu</i>	B.P.Ni. Guduchyadi varga, Verse 286, Pg. 450
<i>Kharjura</i> [ <i>Phoenix dactylifera</i> L.]	<i>Madhura</i>	<i>Sheeta</i>	<i>Madhura</i>	B.P.Ni. Aamradi varga, Verse 117-19, Pg. 574

<i>Rajkoshataki</i> [ <i>Luffa acutangula</i> (L.) roxb.]	<i>Madhura</i>	<i>Sheeta</i>	<i>Madhura</i>	B.P.Ni. Shaka varga, Verse 68, Pg. 671
<i>Karkoti</i> [ <i>Momordica dioica</i> Roxb. ex Willd.]	<i>Katu</i>	<i>Ushna</i>	<i>Katu</i>	B.P.Ni. Shaka varga, Verse 86, Pg. 677

\* B.P.Ni. – *Bhavaprakasha Nighantu*

For the consumption of these plants their useful parts, doses forms and doses are also described in *Bhavaprakasha Nighantu* all are summarized and placed in Table 2.

**Table 2: Herbs/plants of *Bhavaprakasha Nighantu* having *Jwarahara*, *Shwasahara* and *Kashara* properties with their Useful parts, dose and doses forms.**

Drug Name	Part used	Dose and form	Reference
<i>Haritaki</i> [ <i>Terminalia chebula</i> Retz.]	Fruit	3-6g, <i>Churna</i> (Powder)	B.P.Ni. Haritkyadi varga, Pg. 8
<i>Aamalaki</i> [ <i>Phyllanthus emblica</i> L.]	Fruit	3-10g <i>Churna</i>	B.P.Ni. Haritkyadi varga, Pg. 12
<i>Pippali</i> [ <i>Piper longum</i> L.]	Fruit	250-500mg <i>Churna</i>	B.P.Ni. Haritkyadi varga, Pg. 16
<i>Vanshlochana</i> [ <i>Bambusa arundinacea</i> (Retz.) Willd. shoot]	<i>Niryasa</i> (exudate)	0.5-2g <i>Niryasa</i>	B.P.Ni. Haritkyadi varga, Pg. 57
<i>Kutki</i> [ <i>Picrorhiza kurroa</i> Royale ex. Benth]	Rhizome	0.5-1g <i>Churna</i>	B.P.Ni. Haritkyadi varga, Pg. 68
<i>Kiratatikta</i> [ <i>Swertia chirayita</i> (Roxb.) Buch. Ham.ex C.B.Clarke]	Whole plant	0.5-1.5g <i>Churna</i>	B.P.Ni. Haritkyadi varga, Pg. 71
<i>Rasna</i> [ <i>Pluchea lanceolate</i> (DC.) C.B. Clarke]	Whole plant	30-125mg <i>Churna</i>	B.P.Ni. Haritkyadi varga, Pg. 79
<i>Karkatshringi</i> [ <i>Pistacia chinensis</i> subsp. <i>integerrima</i> (J. L. Stewart ex Brandis) Rech. F.]	Gall	0.5-2g <i>Churna</i>	B.P.Ni. Haritkyadi varga, Pg. 96
<i>Katphala</i> [ <i>Myrica esculenta</i> Buch.-Ham. ex D. Don]	Bark	1-3g <i>Churna</i>	B.P.Ni. Haritkyadi varga, Pg. 98
<i>Bharangi</i> [ <i>Clerodendrum serratum</i> (L.) Moon.]	Root	1.5-3g <i>Churna</i>	B.P.Ni. Haritkyadi varga, Pg. 99
<i>Bakuchi</i> [ <i>Psoralea corylifolia</i> L.]	Seed	1-3g, <i>Churna</i>	B.P.Ni. Haritkyadi varga, Pg. 121
<i>Rasona</i> [ <i>Allium sativum</i> L.]	Bulb	10-30 drops of <i>Swarasa</i> (expressed juice), 2-3g <i>Kalka</i> (Paste)	B.P.Ni. Haritkyadi varga, Pg. 130.

<i>Guduchi</i> [ <i>Tinospora sinensis</i> (Lour) Merr.]	Stem	0.5- 2g <i>Satwa</i> , 1-3g, <i>Churna</i> , 40-80ml <i>Kwatha</i> (decoction)	B.P.Ni. Guduchyadi varga, Pg. 259
<i>Vartaki</i> [ <i>Solanum indicum</i> L.]	Fruit and root	1-2g <i>Churna</i>	B.P.Ni. Guduchyadi varga, Pg. 276
<i>Kantakari</i> [ <i>Solanum xanthocarpum</i> Schrad. & H. wendl.]	Fruit, root and leaves	1-2g <i>Mula Churna</i> (Root powder), 2.5-5ml <i>Patra Swarasa</i> (expressed juice of leaves), 20-40ml <i>Mula Kwatha</i> (Decoction of root)	B.P.Ni. Guduchyadi varga, Verse 40-41 Pg. 279 B.P.Ni. Shaka varga, Pg. 679
<i>Vasa</i> [ <i>Justicia adhatoda</i> L.]	Root, leaves and flower	0.5-1g <i>Mula Twak Churna</i> (Powder of root bark)/ <i>Pushpa Churna</i> (Powder of flower); <i>Patra Churna</i> (Powder of leaves) 1-2g; 5-15ml <i>Swarasa</i> , 10-20ml <i>Kwatha</i>	B.P.Ni. Guduchyadi varga, Pg. 308
<i>Sharpunkha</i> [ <i>Tephrosia purpurea</i> (L.) Pers.]	Root	3-6g <i>Mula Churna</i> , 10-20ml <i>Swarasa</i>	B.P.Ni. Guduchyadi varga, Pg. 394
<i>Sariva</i> [ <i>Hemidesmus indicus</i> (L.) R. Br. ex Schult]	Tuber	50-60g <i>Phanta</i> (Hot infusion), 3-6g <i>Kalka</i>	B.P.Ni. Guduchyadi varga, Pg. 414
<i>Suvarchala</i> [ <i>Cleome gynandra</i> L.]	Seed, leaves, and root	5-10ml <i>Swarasa</i>	B.P.Ni. Guduchyadi varga, Pg. 451
<i>Kharjura</i> [ <i>Phoenix dactylifera</i> L.]	Fruit		B.P.Ni. Aamradi varga, Pg. 574
<i>Rajkoshataki</i> [ <i>Luffa acutangula</i> (L.) roxb.]	Fruit	As a vegetable	B.P.Ni. Shaka varga, Pg. 671
<i>Karkoti</i> [ <i>Momordica dioica</i> Roxb. ex Willd.]	Fruit	As a vegetable	B.P.Ni. Shaka varga, Pg. 677

\* B.P.Ni. – *Bhavaprakasha Nighantu*

All the plants were also screened from PubMed database for anti-viral, anti-pyretic, anti-tussive/anti-asthmatic and immunomodulatory which can play important role in COVID 19 prevention and management. All these are mentioned in Table 3. Among them seven are reported having anti-viral activity, eight for anti-pyretic and anti-asthmatic/anti-tussive and ten are reported for immunomodulatory activity.



Table 3: Pharmacological activities of herbs/plants of *Bhavaprakasha Nighantu* having *Jwarahara, Shwasahara and Kashara* properties

Drug Name	Anti-viral activity	Anti-pyretic activity	Anti-tussive activity/ Anti-asthmatic activity	Immuno-modulatory Activity
<i>Haritaki</i>	+ (Kesharwani A et al. 2017, <sup>[6]</sup> Ajala OS 2014, <sup>[7]</sup> Mishra NN et al. 2018, <sup>[8]</sup> Oyuntsetseg N et al 2014, <sup>[9]</sup> Ahn MJ et al. 2002, <sup>[10]</sup> el-Mekkawy S et al. 1995, <sup>[11]</sup> Lin LT et al. 2011, <sup>[12]</sup> Badmaev V et al. 2000, <sup>[13]</sup> Yukawa TA et al. 1996, <sup>[14]</sup> Kurokawa M et al. 1995, <sup>[15]</sup> Loshi B et al. 2020. <sup>[16]</sup> )	-	-	+ (Nando Dulal Das et al. 2012, <sup>[17]</sup> Das ND et al. 2011, <sup>[18]</sup> Trinh TA et al. 2020. <sup>[19]</sup> )
<i>Aamalaki</i>	+ (Lv JJ et al. 2015, <sup>[20]</sup> Xiang Y et al. 2011, <sup>[21]</sup> Mishra NN et al. 2018, <sup>[22]</sup> Liu G et al. 2011, <sup>[23]</sup> Xiang YF et al. 2010. <sup>[24]</sup> )	+ (Perianayagam JB el al. 2004. <sup>[25]</sup> )	-	+ (Baliga MS et al. 2011, <sup>[26]</sup> Zeng Z et al. 2017, <sup>[27]</sup> Singh MK et al. 2013, <sup>[28]</sup> Chatterjee A et al. 2011, <sup>[29]</sup> Ganju L et al. 2003, <sup>[30]</sup> Sai Ram M et al. 2002. <sup>[31]</sup> )
<i>Pippali</i>	-	+ (Chuchawankul S et al. 2012, <sup>[32]</sup> Kim HG et al. 2012, <sup>[33]</sup> Pathak N 2006. <sup>[34]</sup> )	+ (Meghwal M et al. 2013, <sup>[35]</sup> Yadav V et al. 2020, <sup>[36]</sup> Nilani P et al. 2009, <sup>[37]</sup> Kumar S 2012, <sup>[38]</sup> Nilani P et al. 2010. <sup>[39]</sup> )	+ (Meghwal M et al. 2013, <sup>[35]</sup> Sunila ES et al. 2004, <sup>[40]</sup> Akram M et al. 2014. <sup>[41]</sup> )
<i>Vanshlochana</i>	-	-	-	-
<i>Kutaki</i>	+ (Win NN et. al. 2019, <sup>[42]</sup> Verma et. al. 2009, <sup>[43]</sup> )	-	+ (Dorsch W et.al. 1991, <sup>[45]</sup> )	+ (Kumar et.al.2016, <sup>[48]</sup> Hussain A et.al. 2013, <sup>[49]</sup> Gupta A

	Thyagarajan SP et.al. 2002. <sup>[44]</sup> )		Dorsch W et.al. 1994. <sup>[46]</sup> Pfuhrer S et.al. 1995. <sup>[47]</sup> )	et.al. 2006, <sup>[50]</sup> Labadie RP et.al.1989, <sup>[51]</sup> Sane SA et.al. 2011, <sup>[52]</sup> Sidiq T et.al. 2011, <sup>[53]</sup> Russo A et.al. 2001. <sup>[54]</sup> )
<i>Kiratatikta</i>	+ (Woo SY et.al.2019. <sup>[55]</sup> )	+ (Pal T et.al. 2018. <sup>[56]</sup> )	+ (Wang YL et. al. 2013. <sup>[57]</sup> )	+ (Lad H et.al. 2016. <sup>[58]</sup> )
<i>Rasna</i>	-	+ (Mohanty S et.al. 2013. <sup>[59]</sup> )	-	-
<i>Karkatshringi</i>	-	+ (Rauf A et.al.2014. <sup>[60]</sup> )	+ (Rana S et.al.2016, <sup>[61]</sup> Shirole RL 2014. <sup>[62]</sup> )	-
<i>Katphala</i>	-	-	+ (Patel K et.al. 2010. <sup>[63]</sup> )	-
<i>Bharangi</i>	+ (Joshi B et.al. 2020. <sup>[64]</sup> )	-	+ (Patel JJ et.al.2014, <sup>[65]</sup> Kajaria D et.al. 2012. <sup>[66]</sup> )	-
<i>Bakuchi</i>	-	-	-	-
<i>Rasona</i>	+ (Sahoo M. et al. 2016, <sup>[67]</sup> Guo NL et al. 1993, <sup>[68]</sup> Zhang J et al. 2013. <sup>[69]</sup> )	-	-	+ (Foroutan-Rad M. et al. 2017. <sup>[70]</sup> Oosthuizen C et al. 2017. <sup>[71]</sup> )
<i>Guduchi</i>	-	+ (Hussain L. et al. 2015. <sup>[72]</sup> )	-	+ (Sharma U et al. 2012, <sup>[73]</sup> Haque MA et al. 2017, <sup>[74]</sup> Sachdeva H et al. 2014, <sup>[75]</sup> Bala M et al. 2015, <sup>[76]</sup> Aher V et al. 2012, <sup>[77]</sup> Narkhede AN et al. 2014, <sup>[78]</sup> Aranha I et al. 2012, <sup>[79]</sup> Singh N et al. 2004, <sup>[80]</sup> Desai VR et al. 2007, <sup>[81]</sup> Aranha I et al. 2020, <sup>[82]</sup> Singh



				N et al. 2004, <sup>[83]</sup> Desai VR et al. 2007, <sup>[84]</sup> Anaha I et al. 2020. <sup>[85]</sup>
<i>Vartaki</i>	-	-	-	-
<i>Kantakari</i>	-	-	+	-
			(Kajaria DK et al. 2012. <sup>[86]</sup> )	
<i>Vasa</i>	-	+	-	-
		(Sridhar N et al. 2015. <sup>[87]</sup> )		
<i>Sharpunkha</i>	-	-	+	+
			(Janbaz KH et al. 2013. <sup>[88]</sup> )	(Damre AS et al. 2003. <sup>[89]</sup> )
<i>Sariva</i>	+	+	-	+
	(Bonvicini F et al. 2018. <sup>[90]</sup> )	(Das S et al. 2013. <sup>[91]</sup> )		(Das S et al. 2013. <sup>[91]</sup> )
<i>Suvarchala</i>	-	-	-	-
<i>Kharjura</i>	-	-	-	-
<i>Rajkoshataki</i>	-	-	-	+
				(Shendge PN et al. 2018. <sup>[92]</sup> )
<i>Karkoti</i>	-	-	-	-

## DISCUSSION

Manifestation of COVID 19 shows variations in clinical presentation ranging from asymptomatic to fever, dry cough, rhinitis, fatigue and severe Acute Respiratory Distress Syndrome (ARDS) and death.<sup>[93]</sup> and the disease course including the short-term as well as long term complications are yet to understand more. Moreover, the diagnostic protocol, treatment guidelines are keep changing on time. In the present scenario, there is no effective cure or prophylactic measure for COVID 19 in the conventional system of

medicines, rather than the symptomatic and supportive care.

Being a novel disease, the exact reference is not available in Ayurveda textbooks. Clinical profile of COVID 19 have similarities with diseases like *Vata-Kapha* predominant *Sannipatika Jwara*.<sup>[94]</sup> Symptomatic management in Ayurveda include the logical implementation of the treatment of *Jwara, Kasa, Pratishyaya* etc. Apart from the cure of the disease, Ayurveda can do wonders in preventing the infection, reducing the disease burden and also in rehabilitation of the patients.<sup>[95]</sup>

All the herbs/plants of *Bhavaprakasha Nighantu* having *Jwarahara*, *Shwasahara* and *Kasahara* properties can be divided in to two categories *Aushadha* and *Aahara*. (Table 1) Maximum are *Aushadha* while *Rajakoshataki* and *Karkoti* are vegetables and *Kharjura* is fruit. *Rasona* can be included in both *Ahara* and *Aushadha*.

Ayurveda believed that a strong body itself is most effective warrior in fighting against the diseases and maintain Health. So, Ayurveda gives the utmost priority to improve the strength of the body and enhancing the immunity thus the resistance against various ailments.<sup>[96]</sup> The drugs like *Kutki*, *Kiratatikata*, *Rasona*, *Guduchi*, *Haritaki*, *Aamalaki*, *Rajakoshataki*, *Pippali*, *Sharapunkha*, and *Sariva* are found to have immunomodulatory action. (Table 3)

For symptoms like fever, cough, dyspnoea having mild to moderate severity the certain Ayurvedic herbs can be used. In case of fever, *Kiratatikata*, *Guduchi*, *Karakatakashringi*, *Vasa* and *Pippali* (Table 3) are especially beneficial as their anti-pyretic activity was proven experimentally and these are used widely in clinical practice from ancient times. Similarly, the drugs *Kutki*, *Kiratatikta*, *Karakatakashringi*, *Katphala*, *Bharngi*, *Pippali*, *Kantakari* and *Sharapunkha* (Table 3) are useful in respiratory pathologies like *Shwasa*, *Kasa* etc. Moreover, the herbs *Kutki*, *Kiratatikta*, *Bharngi*, *Rasona*, *Haritaki*, *Aamalaki* and *Sariva* have antiviral activities also (Table 3). Thus, use of single herb or in combination can be administered according to the clinical presentation of the COVID 19. *Kiratatikta* is reported for anti-viral, anti-pyretic, anti-asthmatic/anti-tussive and immunomodulatory activities. Thus, *Kiratatikta* may be the best choice among all of these plants. To resolve the difficulty of use, the useful part of these plants, their doses forms and doses are also described in *Bhavaprakasha Nighantu* (Table 2) among them suitable doses forms can be adopted as per clinical manifestation or age and *Prakruti* of patients.

## CONCLUSION

Total 22 plants were found in *Bhavaprakasha Nighantu* which are having *Jwarahara*, *Shwasahara* and

*Kasahara* properties. Among them many are reported for having pharmacological activities like anti-pyretic, anti-tussive / anti-asthmatic, anti-viral and immunomodulatory which are beneficial in COVID 19.

## Clinical Significance

Among these plants many are easily available and also in day-to-day practice. Thus, these plants and their combinations can be used in early stage of COVID 19 and also in later stages. Use of these plants or their combinations may be helpful in minimising the dose and drug interactions. These drugs also can pave a path to the researchers for development of effective remedy for COVID 19.

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