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# **AYURVEDO AMRITANAM**

Ayurveda for One Health



**RASHTRIYA AYURVEDA VIDYAPEETH, NEW DELHI**  
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Sr. No.	Author	Title	Page No.
			1
1.	Dr. Manju Kaliramana <sup>1</sup> Dr. Virender K. Kori <sup>2</sup> Dr. Sagar M. Bhinde <sup>3</sup>	Critical Analysis of The Studies On <i>Swarnaprashna</i> , Carried Out At ITRA, Jamnagar, Gujarat	01-08
2.	Dr. Jitendra Varsakiya	Ayurveda And One Health Approach	09-17
3.	Dr. Harshika Bhardwaj	Potential Of Ayurveda in Post Covid Mental Health Management	18-24
4.	Dr. Satyaprakash Gupta	Ayurveda For One Health	25-31
5.	<sup>1</sup> Dr. Punam Sawarkar, <sup>2</sup> Dr. Gaurav Sawarkar	Critical Appraisal of Panchagvya Formulations and Their Utility for Maintenance of The Health	32-44
6.	Dr. E. M. Kashi <sup>1</sup> , Dr. Prakash L. Hegde <sup>2</sup>	Application Of Principles of Vrikshayurveda in Ayurvedic Groforestry to Achieve "One Health": A Systematic Review	45-49
7.	Dr. Srishti <sup>1</sup> , Dr. Renu Bala <sup>2</sup> , Dr Krishnapriya V K <sup>3</sup>	Ayurveda For One Health	50-56
8.	Dr.Sonam Jaguri <sup>1</sup> , Dr. Shilpy Gupta <sup>2</sup> , Dr.Ganjam Krishna Prasad <sup>3</sup>	Ayurveda Treatment Of Chronic Plaque Psoriasis :A Case Report	57-65
9.	Dr Samata <sup>1</sup> Dr Ananta S Desai <sup>2</sup>	Ayurvedic Management of Asthi-Majtagata Vata by Majja Basti W.S.R To Pott's Spine – A Single Case Study	66-73
10.	Prajakta Dhairyashil Sawant <sup>1</sup> , Swagata Dilip Tavhare <sup>2</sup>	Bridging One Health Through Ayurveda for Balanced Well-Being	71-80
11.	Dr. Sathyanarayana B	Role Of Bhasma (Ancient Indian Nanomedicine) In Immunomodulation-Scientific Evidences	81-88
12.	Dr. Arati Shamgonda Patil	Theoretical & Hypothetical Review of Immunomodulation in Athletes Through Ayurveda	89-95
13.	Dr. Poonam Dang	Unearthing Eminent Herbs as Spices & Excavating Their Mode of Action in Augmenting Immunity –A Review!	96-102
14.	Dr. Abhishek <sup>1</sup> Dr Sangeeta Nehra <sup>2</sup>	A Case Study of Post Covid Shirshool (Headache) Healed Through Integrative Medicine	103-109
15.	Dr. Yamini <sup>1</sup> , Dr. Manisha Khatri <sup>2</sup> , Dr. P.C. Mangal <sup>3</sup>	Role Of Ayurveda in Boosting Immunity in Cancer Patients	110-114
16.	Dr. Jhalak Gill <sup>1</sup> Dr. Tyagi Vidushi <sup>2</sup>	Ayurvedic Insights for Achieving One Health Equilibrium	115-118
17.	Dr. Sushil Kumar Jangid	Management Of Different Kinds of Post Covid Mental Illness Through <i>Trividha Chikitsa Upkrama</i> I.E., <i>Daivavyaprashraya</i> , <i>Yuktivyapashraya</i> and <i>Sattvavajaya</i> .	119-125
18.	Dr. Bhumika Bhardwaj	Role Of Ayurveda in Enhancing Immunity in Aids Patient	126-129

Dr. Ankur Kumar Tanwar <sup>1</sup> , Dr Meera K. Bhojani <sup>2</sup>	Role Of Panchakarma in Post Covid Mental Health Management	130-137
Dr. Sundar Singh Danga	A Randomised Clinical Trial to Determine the Effectiveness of Guduchi Ghanvati and Satwawayaj Chikitsa in The Management of Depression. (Vishad)	138-144
Dr Nimmy V S,	Exploring Ayurvedic Interventions in The Effective Management of Allergic Rhinitis	145-149
Dr Ravi Gogia, M.D.	A Clinical Study on Dyslipidaemia & Its Management with Arjun Chhala Kashaya	150-152
Dr Alisha Dhaaniya <sup>1</sup> , Dr Jonah Sandrepogu <sup>2</sup>	Effect Of Holistic Ayurvedic Treatment In <i>Pakshaghata</i> (Hemiplegia): A Case Report	153-159
Dr. Kishor Sathavara <sup>1*</sup> , Dr. Anamika Soni <sup>2</sup>	Ayurvedic Management of Chronic Kidney Disease: A Case Study	160-164
<sup>1</sup> Dr. Shivani Sharma <sup>2</sup> Dr. Surinder Kumar Sharma	Therapeutic Effects of Folklore Herbs in Arsha Roga - A Survey Study	165-169

## **Unearthing eminent herbs as spices & excavating their mode of action in augmenting immunity –A review!**

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### **Abstract**

**Introduction:** Food is consumed for sustenance of life and concept of food and nutrition in promoting health and recovery shouldn't be overlooked. Spices are traditional herbs used in cooking for centuries. Herbs are plant extracts used in *Ayurveda* for treating various ailments since time immemorial. Mindful eating, blending *Ayurveda* herbs as spices along with food & inculcating them in daily routines is an efficient way for active health promotion.

**Material & methods:** The current review examined a series of herbs used as spices that healthcare professionals can advise and inspire individuals to include in their regular eating patterns and their mode of action was perceived from classical and contemporary prospective considering different research articles, published journals & classical literature.

**Results & Discussion:** Various herbs can be included in our daily diets as spices such as *Haridra*, *Tulsi*, *Amalaki*, *Jeerak*, *Lahsun*, *Mulethi*, *Maricha* etc These depict qualities such as *Deepan*, *Pachan*, *Rasayan Balya*, *Tridoshshara* thereby rendering enhancement of the digestive fire, balancing vitiated *Doshas*, *Srotoshuddhi* and *Rasayana chikitsa*; henceforth creating an improved nutritional status & enhancing immunity by acting on levels of *Rasa*, *Agni*, *Srotas*. Contemporary science establishes its Antioxidant, Immunomodulatory, Cytoprotective, Immunity stimulant, Adaptogenic effects by various In vitro, In vivo & clinical studies.

**Conclusion:** Immunity booster herbs identified as spices identified in this review, should be mandatorily included in diet and appraised as a part of healthy dietary practice thereby reducing the predisposition to risk factors, supporting overall health and boosting immunity thereby preventing potential future diseases.

### **Material & Methods**

The immune system supporting herbs commonly used as spices are identified in this review, which when embraced as a part of healthy dietary practice may reduce the predisposition to risk factors and support overall health, wellbeing and recovery. Different research articles and published journals along with classical texts were referred for gathering the data and studying their mode of action.

### **Introduction**

The immune system depicts body's defensive mechanism against germs & foreign substances present on the skin, in body tissues & bodily fluids i.e. Blood. The immune system is made up of two parts: the innate, (general) immune system and the adaptive (specialized) immune system.<sup>1</sup> The Innate immunity provide first protection against pathogens, and then it will stimulate adaptive immunity to enhance the protection. Innate immunity is the most rapidly acting immunity. It mostly depends on neutrophils, macrophages, dendritic cells, and monocytes, while T and B cells are involved in adaptive immunity.

Immunomodulators are naturally derived compounds and metabolites produced by healthy immune systems that maintain the equilibrium of the body; these can stimulate, inhibit, or regulate the components of the immune system.<sup>2</sup> Immunomodulators can be broadly classified into immunostimulants and immunosuppressants. Immunostimulants enhance the defense mechanisms and are used to prevent infections and cancer while immunosuppressants suppress the immune system and are used to treat autoimmune diseases. Immunomodulators of plant origin are a promising field of research and many potential candidates have been identified.<sup>3</sup>

The concept of immunomodulation is being practiced in Ayurveda treatment modality for centuries thereby enhancing the body's overall resistance to disease causing agent rather than directly neutralizing the agent itself. It is understood by the term *Vyadhi-ksamatwa*, in *Ayurveda* depicting much wider implications than the term "Immunity" used in modern science. *Chakrapanidatta* has interpreted the term *Vyadhi-ksamatwa* as *Vyadhi bala Virodhitwa* i.e., antagonistic to the strength and virulence of the disease and *Vyadhyutpada Pratibandhakatwa* i.e., the capacity to inhibit and bind the causes and factors of the disease. *Vyadhikshamatva* refers to the capability of resisting diseases which is described by the terms *Bala*, *Oja* *Kapha* etc. in *classics*. *Acharya Charaka* described *Bala* as the factor, destroying the disease, further classifying it of 3 types i.e. *Sahaja* (constitutional), *Kalaja* (temporal) and *Yuktikrita* (acquired). *Sahaja bala* (inherent characteristic property of an individual present since birth) may be correlated to Innate immunity. *Kalaja* (dependent on season and age) and *Yuktikrita bala* (dependent on healthy practices related to diet, activities etc.) may be correlated to acquired immunity. *Oja* is another concept in *Ayurveda* that is believed to be responsible for the body's strength & immunity. *Oja* is regarded as the essence of the seven *Dhatus* and is referred to as *Bala* by *Acharya Sushruta*. The *Kapha* in its *Prakrita avastha* (normal state) promotes strength, lubrication, virility, immunity, resistance, and stability in the form of *Oja* is advocated by *Acharya Charaka*.<sup>4</sup>

Currently, individuals with contemporary eating patterns depict deficiency in the essential nutrients needed for optimal health.<sup>5</sup> Deficiencies lead to lack of immunity, intellectual impairment, poor growth, degenerative diseases associated with aging and higher morbidity and mortality. Hence preventing macro and micronutrient deficiency is crucial and this could be achieved through supplementation and food-based approaches.<sup>6</sup> Spices and herbs have been in use for centuries both for culinary and medicinal purposes. Spices not only enhance the flavor, aroma, and color of food and beverages, but they can also protect from acute and chronic diseases.<sup>7</sup> These provide substantial benefits to overall nutrition due to their high concentration of phytonutrients and other bioactive compounds.<sup>8</sup> Apart from these they possess antioxidant, anti-inflammatory, ant tumorigenic, ant carcinogenic, and glucose- and cholesterol-lowering activities as well.<sup>9</sup> Therefore there is a strong need to consume them in our daily regimen.

Whereas *Ayurveda* considers equilibrium state of *Doshas*, *Dhatu*, normalcy of *Agni*, patency of *Srotas* etc as contributory factors in achieving health thereby promoting *vyadhikshamatva*. Herbs play an indigenous role in maintaining health. Hence herbs used as spices are reviewed in the article, which can be comfortably included in our daily diets for maintaining the equilibrium state of all physiological parameters thereby acting as natural immunity booster.

In Today's era majority diseases occur owing to "oxidative stress" produced as a result of free radicals. *Rasayana Chikitsa* (rejuvenation therapy) is practiced in *Ayurveda* treatment modality for attaining excellent *Rasadi Dhatus*<sup>10</sup> thereby enhancing Immunity.

### Observations & Results

A few commonly available herbs depicting potent immunity booster effects which can be fostered in daily diets as spices are summarized in the Table1:

Table:1

S. No.	Name	Botanical Name	Part Used	Action	Pharmacological activity
1	<i>Haridra</i> <sup>11</sup>	<i>Curcuma longa</i>	Rhizome	<i>Deepan,, Krmighna,, Kapha hara, Vatahara, Vishaghna, Raktashodhak</i>	Adaptogenic effects <sup>24</sup>
2	<i>Tulsi</i> <sup>12</sup>	<i>Ocimum sanctum</i>	Leaf	<i>Deepan, Krmighna, Vatahara, Kaphanisarak</i>	Immunomodulatory Activity <sup>25</sup>
3	<i>Amla</i> <sup>13</sup>	<i>Emblica officinalis</i>	Fruit	<i>Raktapitta nashak, Deepana Rasayana</i>	Cytoprotective, Immunomodulatory Activity <sup>26</sup>
4	<i>Jeeraka</i> <sup>14</sup>	<i>Cuminum cyminum</i>	Fruit	<i>Deepan, Pachana, Balya, vatakapha hara</i>	Immunomodulatory Activity <sup>27</sup>
5	<i>Mulethi</i> <sup>15</sup>	<i>Glycyrrhiza glabra</i>	Root & Stolon	<i>Balya, Rsasayana, Kaphahara</i>	Immunostimulant activity <sup>28</sup>
6	<i>Lavanga</i> <sup>16</sup>	<i>Syzygium aromaticum</i>	Flower Bud	<i>Agnideepak, Pachak, Vatanulomak, Kaphaghna, Krmighna</i>	Antioxidant properties, Boosts lymphocyte production <sup>29</sup>
7	<i>Ginger</i> <sup>17</sup>	<i>Zingiber officinale</i>	Rhizome	<i>Agnideepak. Vatakaphanashak, Krimihara, Ruchikara, Raktapitta nashaka</i>	Antioxidant activity <sup>30</sup>
8	<i>Lehsun</i> <sup>18</sup>	<i>Allium sativum</i>	Bulb	<i>Deepan, Pachana, Balya, Kaphanisaraka, Rasayana</i>	Immune potentiating effect <sup>31</sup>
9	<i>Dalchini</i> <sup>19</sup>	<i>Cinnamomum zeylanicum</i>	Stem Bark	<i>Deepan,Pachana,Vatanulomak, Krimighna</i>	Antioxidant activity <sup>32</sup>
10	<i>Methi</i> <sup>20</sup>	<i>Trigonella foenum-graecum</i>	Seed	<i>Deepan,Vatanulomaka,Balya, Kaphahara</i>	Immunomodulatory effects and regulates markers of macrophage polarization <sup>33</sup>
11	<i>Saunf</i> <sup>21</sup>	<i>Foeniculum vulgare</i>	Seed	<i>Deepan, Pachan, Vatanulomana</i>	Antioxidant properties & improves immunity <sup>34</sup>
12	<i>Imli</i> <sup>22</sup>	<i>Tamarindus indica</i>	Fruit Pulp	<i>Deepan, Raktapitta shamaka</i>	Antioxidant activity <sup>35</sup>
13	<i>Marich</i> <sup>23</sup>	<i>Piper nigrum</i>	Fruit	<i>Agnideepak, Pachaka, Krimihara, Kaphavatahara</i>	Antioxidant activity <sup>36</sup>

## Discussion

WHO aims for health for all.<sup>37</sup> A well-functioning immune system is critical for the same.<sup>38</sup> Therapeutic properties of herbs strengthening the body's immune system against diseases is observed since ages. An increased interest has risen in general public to learn more about the use of herbs due to their vast effects in health promotion.<sup>39, 40</sup> Henceforth herbs incorporated in diet on daily basis will depict par excellence in promoting health thereby keeping an individual disease free. The above review highlights the regularly consumed spices as immunity boosters

Commonly used, cost effective and easily available herbs which can be used as spices and can be easily be incorporated in daily diets , strengthening the immune system have been compiled and further in detail their mode of action is delineated such as *Haridra* depicts adaptogenic effects increasing the catalase (CAT) levels in the brains. Its derivative curcumin increases the function of effector T-cells.<sup>41</sup> *Tulsi* depicts immunomodulatory effects , scavenges free radicals thereby reducing the oxidative cellular damage<sup>42</sup> *Tulsi* aqueous leaf extract intramammary infusion has also showed promising effect on improving the immune response in bovine models<sup>43</sup> *Amalaki* depicts cytoprotective properties thereby boosting white blood cells production, thus strengthening our immune army .Ethyl acetate extract of *Amla* has strong free radical scavenging activity associated with its antioxidant potential thereby reducing oxidative stress.<sup>44</sup> *Jeerak* depicts immunomodulatory activity through modulation of T lymphocytes expression. In restraint stress induced immune-suppressed animals it countered the depleted T lymphocytes, decreased the elevated corticosterone levels and size of adrenal glands and increased the weight of thymus and spleen. Thereby proving it as a potent immunomodulator and may develop as a lead to recover the immunity of immuno-compromised individuals<sup>27</sup> *Mulethi* acts as an immunomodulatory agent & can effectively boost the immune system. Liquorice extract as a feed additive can enhance innate immune responses rainbow trout, it effectively improved the leukocyte count, serum, and mucus immune responses as well as some immune-mediated genes thereby increasing the resistance of fish to *Y. ruckeri* infection.<sup>28</sup> *Lavanga* depicts strong antioxidant effects thereby reducing the number of free radicals due to the presence of eugenol , eugenol acetate & phenolic compounds <sup>45,46</sup> Eugenol boosts lymphocyte production.<sup>47</sup> Data from FRAP, oxygen radical absorbance capacity, and cellular antioxidant activity assays prove the fact that *Ginger* has abundant of polyphenols depicting high antioxidant activity.<sup>30</sup> *Garlic* exerts immune potentiating effect by stimulating natural killer cell activity.<sup>31</sup> *Cinnamon* contains antioxidants like proanthocyanidins and polyphenols that boosts the immune system.<sup>32</sup> Invivo studies depicted immunomodulatory effect of the ethanolic extract *Fenugreek* exhibiting a significant increase in phagocytic index and antibody titre , indicating the stimulation of humoral immunity. In vitro study of methanolic *Fenugreek* extract exerted its influence on macrophage polarisation . The studies concluded that the extract regulates the expression of the pro-inflammatory marker and immunoregulator marker M1 and M2, respectively, in the THP-1 macrophages cells<sup>48,49</sup> *Fennel* depicts antioxidant properties. The use of *fennel* in poultry diets improves appetite, digestion, nutrient absorption and immunity. It demonstrated that broilers fed diets containing various levels of fennel seed showed improved weight gain and feed efficiency.<sup>34</sup> *Tamarind* contains high amounts of vitamin C, which is a known antioxidant .thereby eliminates the free radicals. Its fruit is rich in organic acid, pectin,

vitamin, mineral content, polyphenol and flavonoid content. Rich polyphenol content depicts regulatory effect on neutrophils. <sup>35</sup>Maricha contains piperine, which can enhance the bioavailability of other nutrients, making them more effective. In vitro studies depict that it protects against oxidative damage by quenching free radicals and reactive oxygen species.<sup>36</sup>

*Classics* clearly promulgate the concept of immunity by maintaining equilibrium of *Doshas*, *Dhatu*, normalcy of *Agni*, patency of *Srotas* etc. Mentioned Herbs accomplishes the above said by virtue of their *Deepen* ,*Pachan*, *Rasayan*, *Krimighna* , *Tridoshahara* & *Balya* qualities.

## Conclusion

There is a dire need to involve “herbs as spices” in nutritional dynamics appraising them as a part of healthy dietary practice so as to supplement the body with the regular dose of immunity boosters thereby reducing the predisposition to risk factors, supporting overall health and immunity thereby preventing potential future diseases.

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