

## Preventing adversities related to spices commonly used as self-medication

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**Date of Submission:** 12 Dec 2020 || **Date of Acceptance:** 21 Apr 2021

### Abstract

Spices are integral part of kitchen since ages and it also possesses medicinal values. For the administration of any medicine, Ayurveda delineates certain guidelines like examination of *Prakriti* (individual constitution), *Agni* (digestive capacity), *Dosha* (individual humors) etc., and also mentioned cautious use of certain medicines to ensure the optimum and safe use. Spices are being used as immune-boosting measures in today's pandemic scenario, but inadvertent use of spices as medicine may show an unintended impact on the body. In this review, an attempt is made to critically analyze the possible adverse effects mentioned for medicinal plants which are used as spices and decipher the concern of Ayurveda, to utilize these spices more appropriately. There are 52 spices listed as per the Spices Board India and identified total 31 medicinal plants which are used as spices in Indian kitchen as well as home remedies from 06 Nighantu. Collected data was again searched for reported adversities on different search engines and reports 26 plants with evidence of possible side effects. Furthermore, fundamental principles of Ayurveda were discussed to utilize these spices more appropriately, to get the maximum benefit from it and to avoid any possible side effect. This signifies the importance of cautious use of spices and need of seeking advice of the Ayurvedic physician prior to consume spices as medicine.

**Key Words:** Ayurveda, Nighantu, Adverse effect, Covid-19, Home remedies.

### How to cite the article

Kolhe Rasika, Bhide Bhargav, Rout Om Prakash, Acharya Rabinarayan, Preventing adversities related to spices commonly used as self-medication, Ann Ayurvedic Med. 2021; 10(3) 277-291 DOI:10.5455/AAM.28092

**Annals Ayurvedic Med. 2021; 10 (3) 277-291**

### Introduction

Ayurveda described natural sources as medicine. In Ayurveda pharmacopoeia, drugs of herbal origin play a major role. Many of these medicinally important plants are part of the Indian kitchen, used to enhance the taste and aroma of the food, in small quantities in culinary are known as spices. Turmeric, ginger, black pepper, cardamom, garlic, coriander, cinnamon etc. are commonly used spices in Indian delicacies.

Indian spices are well known across the world for their aroma and nutritional value. Since ancient times, Indian people are consuming spices in food, milk, tea, buttermilk

etc. Spices provide a useful source of medicine for many ailments like cough, cold, abdominal discomfort, along with the potent source of medicine for many viral and bacterial diseases.<sup>1</sup>

During Covid-19 pandemic, the consumption of spices like *Dalchini* (Cinnamon), *Kalimirch* (Black pepper), *Sonth* (Dry ginger), *Haldi* (turmeric powder), *Lahasun* (Garlic), *Laung* (Clove), etc. is recommended by Ministry of AYUSH.<sup>2</sup> Spices like *Sonth* (Dry ginger) and *Laung* (Clove), are also recommended for quarantined period, whereas certain spices are recommended for fumigation also.<sup>3</sup> Apart from this, several home remedies made of spices are also promoted through print, electronic and social media<sup>4</sup>. Unavailability of disease specific medicine

or vaccine and lockdown conditions in the initial stage of the pandemic has also prompted the use of home remedies for combating the situation. This has led to increase in the use of spices by the common people both for preventive and curative purpose.

Being part of the Indian kitchen, spices are easily available and familiar. Due to the situation of lockdown, and unavailability of medical consultation, people preferred to use kitchen spices for various ailments without seeking proper advice of Ayurveda physician, ignoring the fact that imprudent consumption can also lead to various health hazards. Reporting of side effects of overdoses of spices in the print media necessitate the concern of authorities for promoting spices as medicine.

There are 52 spices listed as per the Spices Board India.<sup>5</sup> Spices possess nutritive values and are proven for their antioxidant, antibacterial, antifungal, etc. activities.<sup>6-9</sup> They are also proven to be beneficial in many ailments.

Ayurveda proposes the potential of using any substance as a drug, subject to its appropriate formulation and judicious administration.<sup>10</sup> The same can be toxic if used improperly.<sup>11</sup> Ayurveda always emphasizes safe treatment which includes alleviating the disease without instigating other diseases.<sup>12</sup> Possible adverse effects of erroneous combination of food components i.e. *Viruddha Ahara* (opposing food) like *Veerya Viruddha* (potency incompatibility) are well explained.<sup>13</sup> Though the spices have the potential to improve metabolism, their improper or overuse singly or in combination may be harmful. Hence the application of *Yukti* (application of wisdom) is essential while using any medicine. In this review article, an attempt is made to critically analyze the possible adverse effects mentioned for medicinal plants which are used as spices and decipher the concern of Ayurveda, to utilize these spices more appropriately, to get the maximum benefit from it and to avoid any possible side effect. Available scientific evidence denoting proven side effects of certain spices in animal studies and clinical studies are also discussed.

Although in Ayurveda, spices are having very high medicinal value, it is high time to increase awareness of the public about appropriate consumption of spices to avoid any associated adversity.

### **Materials and Methods**

The review focuses on the effects due to excess use of medicinal plants used as spices searched through the Lexicons of Ayurveda. Commonly referred 06 Nighantus (Lexicons / Materia medica of Ayurveda) viz. Dhanvantari, Madanpala, Kaiyadeva, Bhavprakasha, Shodhala and Raja Nighantu were used as primary source material. These Nighantu were reviewed in their e Nighantu format.<sup>14</sup>

**Inclusion Criteria:** Total 31 medicinal plants which are used as spices in Indian kitchen as well as home remedies for different ailments and reported in Nighantu were selected.

**Exclusion Criteria:** Spices which are enlisted in Spices Board India, were reviewed and spices like Parsley-*Petroselinum crispum* Mill., Vanilla-*Vanilla planifolia* Andr., All Spice-*Pimentadioica* (L) Merr., Rosemary-*Rosmarinus officinalis* L., Oregano-*Origanum vulgare* L., Star Anise-*Illicium verum* Hook., Horse radish-*Armoracia rusticana* Gaertn., Tarragon-*Artemisia dracunculus* L. and Chilli-*Capsicum annum* L. which are not described in Ayurveda were excluded.

References of selected medicinal plants, based on available reported literature, were analysed for their effects on *Dosha*, *Dhatu* and *Mala*. The observations are presented in tabular form consisting of name of the plant, part used, botanical name, its *Rasadi Guna*, (attributes of *Dravya* viz., *Rasa*-Taste, *Guna*-Properties, *Virya*-Potency, *Vipaka*-Post digestive effect), its possible undesirable effects, contraindications and other specific adverse effects on system or organ. The English equivalents of the Ayurvedic terms were provided by

referring to the NAMASTE portal.<sup>15</sup> For words that were not recorded in NAMASTE portal, a standard dictionary and Ayurvedic Formulary of India were used as references.<sup>16,17</sup>

Different keywords viz. toxicological studies, adverse effects, side effects and pharmacovigilance were searched on Google scholar and PubMed for the selected spices to get the relevant scientific understanding of the undesired effects. Further, fundamental principles of Ayurveda are discussed which support the cautious use of spices.

## Results and Discussion

The observed data in relation to the possible undesirable effects of drugs mentioned in 06 *Nighantu* is depicted in Table 1. Review result represents, data from 31 Medicinal plants, being reported as spices belonging to 29 species, 26 genera and 14 families.

**Rasapanchaka (Importance of Pharmacological Properties):** According to Ayurveda, the drug exhibits its action either by its *Rasa* (Taste), *Guna* (Property), *Vipaka* (Post digestive effect), *Virya* (Potency), or *Prabhava* (exceptional activity).<sup>18</sup> It is evident from the table that most of the spices are having *Katu Rasa* (pungent taste), *Katu Vipaka* (Pungent-post digestive effect) and *Ushna Virya* (Hot potency). *Katu Rasa* has its beneficial effects like enhancing digestion, metabolism etc. and carries out various activities that are beneficial to the body. However excess use of *Katu Rasa* may lead to adversities like epigastric burning, constipation, breaks the clotting of the blood, loosening of joints, decreases breast milk, semen and fat, etc.<sup>19</sup> It is therefore advised to avoid it's over and prolonged consumption in summer specially in conditions of wound and fracture.<sup>20</sup>

**Doshaprakopa (Vitiating of Dosha):** Ayurveda practice revolves around *Tridosha* - *Vata*, *Pitta* and *Kapha* and maintaining their balance is the ultimate method to maintain the health. There is a vivid description of the effects of six *Rasa* on the functions of *Dosha*. So accordingly, more consumption of *Katu Rasa* predominant drugs vitiate *Pitta*

*dosha*, which may lead to symptoms like *Daha* (burning sensation), *Raga* (redness or red patches on the body), *Ushma* (feeling more heat in the body), *Paka* (suppuration), *Sweda* (increased sweating), *Amlaka* (hyperacidity), *Tvagdaha* (burning sensation in the skin), *Raktapitta* (bleeding disorders) etc. in certain conditions.

<sup>21</sup> So overconsumption of *Katu Rasa* and *Ushna Veerya* predominant medicines like *Trikatu*, *Panchakola*, *Chitrakadi Vati*, etc. along with spicy food (Spices with hot potency), by *Pitta* predominant *Prakriti* in *Ushna Kala* (Summer season) may be one of the causative factor of many diseases like *Amlapitta*-(hyperacidity), *Garbhapata*-(inducing abortion), *Netraroga*-(eye diseases), *Nasaroga*-(nasal diseases), *Ojakshaya*-(impaired immunity), *Raktapradara*-(menorrhagia), *Stanyadushti*-(vitiating breast milk), *Shoola*-(pain), *Trishna*-(polydipsia), *Udavarta*-(upward movement of *Vayu* with retention of stool and urine), *Vatarakta*-(gouty arthritis), and causes *Pitta dosha* predominant symptoms in *Shotha*-(inflammation), *Jvara*-(fever), *Unmada*-(insanity), *Arsha*-(haemorrhoids), and *Atisara*-(diarrhea).<sup>22</sup> Therefore too spicy food should be avoided for prolonged duration to maintain good health.

## Application of the fundamental principles of Ayurveda for the formulation

It was observed that, after the outbreak of the Covid-19, people are in quest of immune-booster medicines for the prevention of the disease. *AYUSH Kwatha* is a recommended combination of medicinal plant and spices consisting of *Tulasi* (*Ocimum sanctum* L.) leaf, *Dalchini* (*Cinnamomum zeylanicum* BL.) bark, *Sunthi* (*Zingiber officinalis* Rosc.) rhizome, and *Maricha* (*Piper nigrum* L.) fruit in the proportion of 4:2:2:1 respectively as prophylactic and immunity booster in the public interest. This combination of ingredients and its proportion in the formulation is based on attributed pharmacological properties, actions and available evidence-based pharmacological actions being recommended by a group of Ayurveda experts<sup>5</sup>. It contains all *Katu Rasa* predominant *Dravya*, but *Dalchini* is *Shita Virya* (cold potency) drug, *Sunthi* is having *Madhura Vipaka* (Sweet-

Post digestive effect) are taken in half quantity of *Tulasi* leave whereas *Maricha* having *Ushna Virya* (Hot potency) is taken as one part only. So, this combination has been made to minimize the undesirable effects of *Katu Rasa* and *Ushna Virya*

**Self medication of spices:** It was observed that people are consuming Ayurvedic medicine without taking proper advice from experts of Ayurveda. The use of spices like turmeric, ginger, garlic, clove, cinnamon, pepper, etc. for prevention of disease and self-medication as home remedies to combat certain ailments is increasing due to lockdown like situation.<sup>23</sup> Herbal tea, immune boosters and many commercial preparations are increasingly demanded as Over The Counter (OTC) drugs considering Ayurveda and natural remedies as safe. According to industry sources, the demand for turmeric and ginger for food supplements during pandemic increased by 300%.<sup>24</sup>

**Safety concern of Ayurveda:** In Ayurveda, the drug is extensively described with all its properties, actions, and possible undesirable effects, prone to specific *Prakriti* (constitution of person) and specific conditions. Many of its desired action could be harmful effects in certain conditions, e.g. *Grahi/Stambhana* (absorptive/constipation) action may be harmful in person already suffering from constipation. Hence, it is highly recommended to seek proper guidance from physicians of Ayurveda because selection of the drug is based on the tolerance and strength of the individual. There are shreds of reported evidences of contraindications, cautious use and possible side effects of medicinal plants cum spices, if not used judiciously.(Table 1).

Safety is given utmost importance in Ayurveda and individualized treatment is recommended for more precise benefit.<sup>25</sup> Hence, Ayurveda suggests to examine *Prakriti* (individual constitution), *Agni* (digestive capacity), *Dosha* (individual humors), *Bala* (physical endurance), *Avastha* (phase), etc. of the person before prescribing any medicine. *Ritu* (Season), *Kala* (time of drug administration), *Vaya* (age), *Desha* (location), *Satva* (mental status), *Satmya* (conduciveness of substance to

a person), etc. also influence the selection of medicine with desirable properties, dosage form, and dose.<sup>26-28</sup> Overdosing, improper dose administration schedule, improper selection of drug and its use are some of the common reasons for possible adversities in the Ayurveda.<sup>29</sup>

The spices are inevitable part of the food, but when they are taken as medicine its dose increases which makes it prone to produce adverse effects.<sup>30</sup> If any medicine is taken in excess or in long term in normal dose without considering above stated factors, it may lead to undesirable effects, and to avoid this, treatment based on the fundamental principles of Ayurveda should be prescribed, e.g. person having *Pitta* and *Vataprakriti*, *Pitta Dosha* predominant diseases, *Tikshnagni* (intense state of *Agni*), should take spices in minimum dose range, co-administer with *Sharkara* (sugar), *Ghrit* (clarified butter), *Draksha*, etc.<sup>31</sup> to neutralize the dominancy of *Ushna Virya* (Hot potency) of drugs specifically in summer season to avoid any undesirable effect and may opt drugs with *Shita Virya* (Cold Potency) like *Twak* (Cinnamon), *Dhanyaka* (Coriander), etc. based on the concept of *Hetuviparita Chikitsa* (cause opposing treatment).<sup>32</sup> Children, elderly people residing in dry and hot climatic conditions, weak person, pregnant and lactating women should use spices as per their suitability with a minimum range of dose.<sup>33</sup> Along with the above stated parameters, *Dinacharya* (proper daily regimen) and *Ritucharya* (seasonal regimen), exercise, diet, sleep should be followed to get the maximum benefit from spices, which are being used as home remedies.

Modern scientific data with various toxicity studies of some of the spices emphasize the use of spices with caution and under the supervision of the Ayurvedic physician.

#### **Safety studies of Indian spices conducted in animal models**

Safety studies of *Ardraka* (Ginger),<sup>34</sup> *Ajamoda* (Celery) extract,<sup>35</sup> *Amlika* (Tamarind),<sup>36,37</sup> *Hingu* (Asafoetida),<sup>38</sup>

*Jiraka* (Cumin) essential oil,<sup>39,40</sup> *Krishnajiraka* (Black cumin),<sup>41,42</sup> ethanolic extract of *Kesara* (Saffron),<sup>43</sup> *Marich* (Pepper),<sup>44</sup> *Lahsuna* (Garlic),<sup>45</sup> juice of *Mishreya* (Fennel),<sup>46</sup> *Pippali* (Long pepper),<sup>47</sup> *Twak* (Cinnamon),<sup>48</sup> *Dhanyaka* (Coriander),<sup>49</sup> have been carried out in suitable animal model with a very high dose of therapeutic levels, to ensure the safety at maximum dose level. Although these spices are found safe in the maximum dose levels this does not justify that it would be safe in high doses in human beings. Some of these spices are reported to have some adversities which support the classical claim of contraindications.

**Adverse effect of spices in clinical studies:** Spices like *Ardraka*, *Ela*, *Lavanga*, *Methika*, *Tulasi*, and *Yavani* have been reported to have some adverse effects clinically which are listed below. Though the adverse effects are less in the context of the number of subjects involved, they give the alarm to use drugs judiciously and also supports the textual references of Ayurveda regarding the cautious use of drugs.

**Ardraka (Ginger):** Large quantities cause heartburn, bleeding, cardiac arrhythmias, and CNS depression.<sup>50</sup> Headache, abdominal discomfort, diarrhoea, spontaneous abortion, intolerance, allergic reaction, dry retching, vomiting, belching, drowsiness, dizziness during pregnancy are reported.<sup>51</sup> It is recommended to avoid in patients with thrombocytopenia, platelet function defects or coagulopathy.<sup>52</sup>

**Ela (Cardamom):** Diarrhoea, mild inflammation of skin and glossitis are reported in few patient.<sup>53</sup>

**Hingu (Asafoetida):** Large dose can lead to swelling of the mouth, flatulence, diarrhoea, anxiety, and headache. It is prohibited during pregnancy.<sup>54</sup> Cases of methemoglobinemia in infants are also reported.<sup>55</sup>

**Jatiphala (Nutmeg):** A female ingested 15-24 g of nutmeg over a 3-hour period developed side effects.<sup>56</sup> Nutmeg also showed significant sedative property and symptoms similar to alcohol intoxication.<sup>57,58</sup>

**Lavanga (Clove):** A single case of ingestion of oil of cloves resulted in fits, and acute liver damage.<sup>59</sup>

**Lasuna (Garlic):** Heartburn, flatulence, and gastrointestinal upset, contact dermatitis, post-operative bleeding, occupational asthma have also been reported occasionally.<sup>60</sup> Overuse is not recommended during pregnancy, lactation<sup>61</sup> and surgery.<sup>62</sup>

**Methika (Fenugreek):** Nausea, vomiting, diarrhoea, and flatulence are reported along with allergic reactions, exacerbation of asthma, decrease in serum potassium is also reported with the use of seeds. Adverse effects are also recorded by 38 lactating mothers.<sup>63,64</sup>

**Tulasi (Basil):** Transient mild nausea was reported in 13 weeks clinical study conducted in 16 obese adults<sup>65</sup>

**Twak (Cinnamon):** Reported with gastrointestinal disorders and allergic reactions in some cases reported in 5 clinical studies.<sup>66</sup> Hypoglycemia, tachycardia, and arrhythmia are reported with overdose in pregnancy.<sup>67</sup> Nausea, cold sweating, palpitations, trembling, were reported in a 76 years old lady.<sup>68</sup>

**Yavani (Ajowan):** It is reported for its use in abortion, therefore should be used with caution during pregnancy.<sup>69</sup>

### Herb-Drug interaction

**Ajmoda (Celery):** A patient taking celery tablets for Osteoarthritis showed reduced T4 levels, suggesting that it may reduce the level of thyroxine.<sup>70</sup>

**Ardraka (Ginger):** Reported with inhibition of platelet aggregation.<sup>71</sup> Effectiveness of antacid may be decreased by Ginger. Ginger with Phenprocoumon was reported with epistaxis.<sup>72</sup> With Warfarin it increases the risk of bleeding.<sup>73</sup> Ginger and Crizotinib reported hepatotoxicity.<sup>74</sup> Ginger and Nifedipine showed antiplatelet effect<sup>75</sup> therefore, should avoid in a person having bleeding tendency.

**Haridra (Turmeric):** *Curcuma longa* and Etoricoxib may potentiate adverse effects of the drug.<sup>76</sup> High dose of turmeric increased the drug level of Tacrolimus,<sup>77</sup> the

bioavailability of talinolol reduced by 300 mg/day curcuminoids.<sup>78</sup> It is also observed that drug induced mitochondrial toxicity is the effect of over ingestion of various Indian spices.<sup>79</sup>

**Lasuna(Garlic):** Garlic (*Allium sativum*) tablet with Clopidogrel reduced platelet hyperactivity in two patients.<sup>80</sup> Warfarin and garlic increased international normalized ratio and clotting time.<sup>81</sup> It reduced Atazanavir (HIV protease inhibitors) blood levels by more than 70%.<sup>82</sup> Garlic is also reported to cause a decrease in plasma levels of saquinavir.<sup>83</sup>

**Methika (Fenugreek):** It can also interact with warfarin to cause bleeding.<sup>84</sup>

**Other common adverse effects of spices:** Occupational contact dermatitis is the most frequent Type IV reaction with spices, while rhinitis, bronchial asthma, gastrointestinal symptoms, oral allergy syndrome, and anaphylactic shock are the consequences of IgE-mediated Type I reactions which may occur with spices. The best known cross-reactivity is the so-called celery-mugwort-spice syndrome.<sup>85</sup> Several case-control studies in India have observed that gastrointestinal cancer risk was higher with the consumption of spicy foods.<sup>86,87</sup> Spices may increase intestinal epithelial permeability through loosening cell contacts (eg. paprika, pepper,) or decrease permeability (eg. black pepper, nutmeg), possibly by cell swelling.<sup>88</sup> The studies mentioned above are mainly toxicity studies carried out in animal or *in Vitro* studies or safety studies in which a large dose is administered for a long duration. But it is the fact, that, animal experiments often do not translate into replications in human trials.<sup>89</sup> Few reported toxicity studies are for active components, essential oils, and extract of the plant, which is not practiced in the Ayurveda. Furthermore, many of the clinical studies or case studies reported with adverse effects are recorded in western countries, where the season, their ability to endure spices is different.

In day to day practice, neither active phytoconstituents, nor a high dose of spices is used. Spices being part of the

kitchen are suitable to Indian population and people are well versed about their dose in culinary. However, the studies which are carried out are suggestive of the fact, inappropriate use of spices may be harmful, in certain conditions.

Use of too spicy and oily foods, foods with the extra seasoning of spices (with hot potency) should be avoided while taking spices as medicine to maintain the balance of the *Dosha*. To evade any herb-drug interaction, proper history of the disease and ongoing medication should be given to doctors, before taking any additional medicine. Moreover, quality control of the drug should be considered before purchasing spices from a grocer. Herbal teas and some spices have been reported with detection of toxin, Pyrrolizidine Alkaloids (PAs) and there are different varieties of spices available in the market and all of them are not tested for its quality parameters.<sup>90</sup>

From all the above discussion, it is evident that the effect of any medicine or spice depends on its *Rasa*, *Virya*, *Vipaka* and/or *Guna*. When *Katu Rasa* and *Ushna Virya* spice is used in *Ushna Ritu* or *Ushna Desha*, (Tropical zone) it will enhance the effect of *Ushna Virya* and the person may suffer from ill effects of *Ushna Virya*. In the same way, when a person is taking spices in regular diet and simultaneously taking spices as immune boosters it may also lead to some adverse effects as mentioned earlier. Other factors like *Prakriti*, *Bala*, indications, and contraindications of individual spices, herb-herb, herb-drug interaction etc. should also be considered while taking these spices as medicine. Since the common public is unaware of these factors affecting the effect of a spice, an appropriate advice from an Ayurveda physician, is of utmost important. Hence, it may be stated that though Indian spices are a part of the kitchen from a long time and their efficacy in different ailments is time tested, its improper and overuse may hamper health.

Therefore, it is always advisable to use spices, after proper advice of Ayurveda physician when they are used as medicine. Being natural is not always a reason to be safe specially when used in large quantities and for prolonged

duration. As already mentioned in this article, Ayurveda has always advised eating every substance in proper quantity. The excess and improper use is responsible for adverse effects.<sup>91</sup>

### Conclusion

Spices are being used as immune-boosting measures in today's pandemic scenario, but inadvertent use of spices as medicine may show an unintended impact on the body. Ayurveda recommends considering the factors like *Dosha* (individual humours), *Prakriti* (individual constitution), *Desha* (Location), *Kala* (time), *Vaya* (age), *Agni* (digestive capacity), etc. while consuming any drug. As an Ayurveda physician is expected to be well versed with the application of fundamental principles for the flexibility of selection of drug as per the individual, any consumption of spice as medicine for alleviating any symptoms and Covid-19 should have an advice from Ayurvedic physician to minimize possible adversities related to spices.

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**Source of Funding:** None declared

**Conflict of Interest:** The authors have declared no conflict of Interest

Table 1: Possible undesirable effects of spices as per Ayurveda Nighantu

No	Name	English Name	Latin name	Part used	Rasa	Guna	Vipaka	Virya	Adversity	Referer
1.	Dhanyaka	Coriander	<i>Coriandrum sativum</i> L. Apiaceae	Whole Plant, fruit	Tikta, Madhura Kashaya	Laghu, Snigdha	Madhura	Ushna	Avrishya (Impotence)	1197/A KN; 87, H/ BPN
									Baddhavitak (Constipative)	1197/A KN
2.	Ela	Cardamom (Small)	<i>Elettaria cardamomum</i> Maton Zingiberaceae	Fruit	Katu, Madhura	Ruksha, Laghu	Madhura	Shita (Cold)	-	63/K/B
3.	Haridra	Turmeric	<i>Curcuma longa</i> L. Zingiberaceae	Rhizome	Katu, Tikta	Ruksha	Katu	Ushna	-	197/BP H -111
4.	Hingu	Asafoetida	<i>Ferula narthex</i> Boiss Apiaceae	Niryasa/ Olcogum resin from rhizome and root	Katu	Laghu, Snigdha	Katu	Ushna	Pitta vardhana (aggravate pitta)	111/H/ BPN
5.	Jatiphala	Nutmeg	<i>Myristica fragrans</i> Houtt Myristicaceae	Seed	Tikta	Laghu, Tikshna	Katu	Ushna	Grahi (absorptive)	54/K/ BPN
6.	Javitri	Mace		Aril	Tikta, Katu	Laghu, Tikshna	Katu, Madhura	Ushna	-	57/K/B
7.	Jiraka	Cumin	<i>Cuminum cyminum</i> Linn Apiaceae	Fruit	Katu	Laghu, Ruksha	Katu	Ushna	Pittala (vitiate pitta), Sangrahi (absorptive)	74/Sp/ 32/Sb/ N; 299/Sp/ N; 84/H/B
8.	Keshara	Saffron	<i>Crocus sativus</i> Linn. Iridaceae	Stigma	Katu, Tikta	Snigdha	Katu	Ushna	-	78/ K/ BPN
9.	Krishna Jiraka	Caraway	<i>Carum carvi</i> L. Apiaceae	Fruit	Katu	Tikshna	Katu	Ushna	Vaantikrut (induce vomiting)	84/H/B
10.	Lashuna	Garlic	<i>Allium sativum</i> Linn. Liliaceae	Bulb	Katu	Tikshna, Snigdha, Laghu	Katu	Ushna	Pitta and Raktavrudhi (aggravate pitta and rakta)	1221/A KN; 416 r/SoN;
									Should avoid during Vyayam (exercise), Aatap (sun exposure), Krodha (anger), and should not consume milk, jiggery and excess water.	225/H /BPN
									Should avoid by person of Pitta Prakriti, having cyc discases, diarrhoea, emaciation .	418/Kr/ N
11.	Lavanga	Clove	<i>Syzygium aromaticum</i> (L.) Merr. & L.M. Perry Myrtaceae	Unopened Flower bud	Tikta, Katu	Snigdha, Laghu, Tikshna	Katu	Shita	-	59/K/B
12.	Maricha / Kali Mirch	Black Pepper	<i>Piper nigrum</i> L. Piperaceae	Fruit	Katu	Ruksha, Tikshna, Laghu	Katu	Ushna	Pittakara (Vitiates pitta),	1163/A KN; 94/ /DN; 10, h/MN; 60/H /BPN
									Avrishya (impotence)	1165/A KN; 60/H /BPN

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13.	Methi	Fenugreek	<i>Trigonella foenum-graecum</i> L. Fabaceae	Seeds	<i>Katu</i>	<i>Laghu, Snigdha</i>	<i>Katu</i>	<i>Ushna</i>	<i>Raktapittaprakopini</i> (Vitiated raktapitta)	105/Su/N;169/ERN
14.	Mishreya	Fennel	<i>Foeniculum vulgare</i> Mill Apiaceae	Fruits	<i>Madhura, Katu</i>	<i>Laghu, Snigdha</i>	<i>Katu</i>	<i>Shita</i>	<i>Shukranut</i> (Oligospermia)	26/Sh/N;92/H/BN
15.	Parasikayavani	Henbane	<i>Hyoscyamus niger</i> Linn. Solanaceae	Seeds	<i>Tikta, Katu</i>	<i>Ruksha</i>	<i>Katu</i>	<i>Ushna</i>	<i>Grahini</i> (absorb fluid / constipative) <i>Madini</i> (Slight intoxication/delirifacients)	80/H/BN
									<i>Pittaladhika</i> (Vitiated Pitta Dosh)	313/Sp/N
16.	Rajika	Mustard	<i>Brassica juncea</i> (L.) Czern Brassicaceae	Seeds	<i>Katu</i>	<i>Laghu, Ati-Tikshna, Ruksha</i>	<i>Katu</i>	<i>Ushna</i>	<i>Raktapittakrut</i> (Aggravated Rakta and Pitta)	64/Au/F;73/D/BN
									<i>Drushtibastipradushini</i> (Hamper the vision and urinary bladder)	44/Kr/L
17.	Sarshapa	Saraso	<i>Brassica campestris</i> Linn Brassicaceae	Seeds	<i>Katu</i>	<i>Laghu, Snigdha</i>	<i>Katu</i>	<i>Ushna</i>	<i>Raktapittavardhana</i> (Aggravated Rakta and Pitta)	91/D/KN;56, MN;70/D/BN
									<i>Dahaprado</i> (Induce burning sensation)	122/SI/I
18.	Shatapushpa	Dill	<i>Anethum graveolens</i> L. Apiaceae	Fruit	<i>Katu, Tikta</i>	<i>Laghu, Tikshna</i>	<i>Katu</i>	<i>Ushna</i>	<i>Pittakrut</i> (Aggravated Pitta)	1192/A-KN;125/Sh/N;259/S-SoN;90/H/BN
19.	Shushka-Pippali	Long pepper	<i>Piper longum</i> Linn Piperaceae	Fruit	<i>Katu</i>	<i>Laghu, Snigdha, Tikshna</i>	<i>Katu</i>	<i>Ushna</i>	<i>Pittaprakopini</i> ((Aggravated Pitta), <i>Rechana</i> (therapeutic purgation)	1168/A-KN;14/ MN;56 H/ BPN
									<i>Atyushna</i> (very hot potency),	56/ H/ BPN
20.	Sthula Ela	Large Cardamom	<i>Amomum subulatum</i> Roxb. Zingiberaceae	Fruit, seed	<i>Katu, Tikta</i>	<i>Laghu, Ruksha</i>	<i>Katu</i>	<i>Ushna</i>	<i>Pittakrut</i>	1343/A-KN
21.	Sunthi	Dry Ginger	<i>Zingiber officinalis</i> Rosc. Zingiberaceae	Rhizome	<i>Katu</i>	<i>Laghu, Snigdha</i>	<i>Madhura</i>	<i>Ushna</i>	<i>Grahi</i> (absorptive)	1152/A-KN;47/H/BN
22.	Tulasi	Basil	<i>Ocimum sanctum</i> Linn Labiateae	Flower	<i>Katu, Tikta</i>	<i>Laghu, Ruksha</i>	<i>Katu</i>	<i>Ushna</i>	<i>Daha</i> (burning sensation) <i>Pittakruta</i> , (aggravated pitta),	1555/A-KN;107/K/BN;63/P/BN
23.	Twakpatara	Tejpat	<i>Cinnamomum tamala</i> ( Buch Ham) Nees&Eberum-Lauraceae	Leaf	<i>Madhura</i>	<i>Tikshna, Picchila</i> (sliminess), <i>Laghu</i>	<i>Katu</i>	<i>Ushna</i>	<i>Pittal</i> (Vitiated pitta), <i>Shukrahat</i> (antispermatic)	65/K/BN
24.	Twakpatara/ Darusita	Cinnamon	<i>Cinnamomum zeylanicum</i> BL. Lauraceae	Stem Bark	<i>Katu, Tikta, Madhura</i>	<i>Laghu, Ruksha, Tikshna</i>	<i>Katu</i>	<i>Ushna</i>	<i>Pittal</i> (Vitiated pitta),	67/K/BN
25.	Vrikshamla	Kokum Butter	<i>Garcinia indica</i> Chois. Clusiaceae	Ripe fruit	<i>Amla</i>	<i>Ruksha, Laghu</i>	<i>Amla</i>	<i>Ushna</i>	<i>Samgrahi</i> -(Absorptive) Ripe Fruit	102/Sp/N;88/Ph/N

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											148/A/EN
26.	Yavani	Ajowan	<i>Trachyspermum ammi</i> Linn. Apiaceae	Fruit	<i>Katu, Tikta</i>	<i>Tikshna, Ruksha, Laghu</i>	<i>Katu</i>	<i>Ushna</i>	<i>Pittala</i> (vitiatc pitta), <i>Shukrahat</i> (antispermatogenic)		77/H/BI
27.	Aardrak	Ginger	<i>Zingiber officinale</i> Rosc.-Zingiberaceae	Rhizome	<i>Katu-Pungent</i>	<i>Snigdha</i> , (unctuous), <i>Guru</i> (Heavy to get digest)	<i>Katu</i>	<i>Ushna</i> (Hot)	Avoid in <i>Kushtha</i> (skin disease), <i>Pandu</i> (anemia), <i>Mutrakruchha</i> (dysuria), <i>Raktapitta</i> (bleeding disorder), <i>Vrana</i> (wound), <i>Jwara</i> (fever), <i>Daha</i> (burning sensation). Should not consume in <i>Grishma</i> (summer) and <i>Sharad Ritu</i> (autumn season)		52/H/BI
28.	Ajamoda	Celery	<i>Apium graveollens</i> L. Apiaceae	Fruit [Leaf and Stem-Indian Spice bord]	<i>Katu, Tikta</i> (bitter)	<i>Laghu</i> (Light), <i>Ruksha</i> dryness, <i>Tikshna</i> (Sharp)	<i>Katu</i>	<i>Ushna</i>	<i>Vidahini</i> (acidity due to indigestion),	1202/AKN;29/MN;79/H/BI	
									<i>Pittakopana</i> (Vitiation of pitta)	79/H/BI	
									<i>Baddhamala</i> (Constipative)	29/Sl/Λ	
29.	Amlika	Tamarind	<i>Tamarindus indica</i> Linn Caesalpiniaceae	Unripe fruit	<i>Amla</i> (Sour)	<i>Laghu</i>	<i>Amla</i>	<i>Ushna</i>	<i>Pittakaphasrakrut</i> (vitiation of pitta,kapha and rakta-blood)	143/A/IN;34/AN;164/ERN	
									<i>Vishtambhi</i> (Constipative)	34/A/D164/A/F	
30.	Ardra Pippali	Long Pepper (Fresh)	<i>Piper longum</i> L. Piperaceae	Fruit	<i>Katu, Madhura</i> (Sweet)	<i>Snigdha, Laghu</i>	<i>Madhura</i>	<i>Anushna</i>	<i>Kaphaprada</i> (increases <i>Kapha</i> )		56/H/BI
31.	Dadima	Pomegranate	<i>Punica granatum</i> Linn. Lythraceae	Fruit	<i>Madhura, Kashay</i> (Astringent), <i>Amla</i>	<i>Laghu, Snigdha</i>	<i>Madhura</i>	<i>Anushna</i>	<i>Pittajanakam</i> -(Vitiatc pitta)Sour Fruit	311/AUN; 104/BPN/	
									<i>Grahi</i> (absorptive)	26/Ph/Λ;75/A/R	

\*\*DN-Dhanvantari Nighantu, KN -Kaiyadvca Nighantu, MN-Madanpal Nighantu, RN -Raj Nighantu, BPN - Bhavaprakash Nighantu, SoN - Shodhal Nighantu

A – Amradi PhalaVarga; Au-Aushadhi varga; D – Dhanya Varga; H – Haritakyadi Varga; K – KarpuradiVarga; Kr-Karveeradi Varga; P – Pushpa Varga, Ph-Phaladi varga, Pi-Pippalyadi Varga, Sh-Shunthyadi varga, SI-Shalyadi Varga, Sp-Shatapushpadi Varga; Su-Suvarnadi Varga