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## Therapeutic Arrays of Jeeraka in Bhaishajya Ratnavali

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### ABSTRACT

**Background:** Our ancient seers recognised the value of Aahara Aushadhi (medications in the form of diet) and adopted different cooking methods with addition of condiments to make our daily meal, our daily potion of health. Jeeraka is one of the herbs that has been well amalgamated in the daily food in Indian subcontinent. Though it is used regularly as a spice, its therapeutic benefits are not known to all. Besides, the same Jeeraka can be modified into different dosage forms and treat a number of diseases like Grahani (Irritable Bowel Syndrome), Agnimandya (loss of appetite), Jwara (fever) etc. Out of the countless formulations of Jeeraka, this research aims to see its potentials as mentioned in Bhaishajya Ratnavali.

**Materials and Methods:** The present review has compiled the formulations containing any of the Jeeraka Traya i.e. Krishna Jeeraka, Shveta Jeeraka and Kalaunji from Bhaishajya Ratnavali. Recent researches regarding the pharmaceutical benefits also have been screened.

**Results and Discussion:** Total 242 formulations contained Jeeraka. Out of these, maximum formulations are used in the treatment of Grahani.

**Conclusion:** The present work showed that Jeeraka had been used in different dosage forms in 44 diseases.

**Key Words:** Jeeraka, Traya, Kalaunji, Grahani

### INTRODUCTION

Ayurveda deals with a wide array of dietary, daily regimen for the acquisition of optimum health of an individual. It rekindles metabolism (Agni), rejuvenates the cells (Rasayana), boosts memory (Medha), balances the homeostasis of physical (Sharirika) and mental (Mansika) Dosha and overall strengthens the foundation of health. In the context of Ayurveda, any substance can be called as “Bheshaja” (drug) as it can mitigate the symptoms, chronicity or even complications of the disease. It is also called as “Aushadham” (medicine) meaning a substance having capability to alleviate pain. Kalpana means Yojana (planning) i.e. the skill of making use of even a single Dravya (substance) or different Dravya with their permutation and combinations to bring a final optimized product. Some of the drugs are even used as spices in food and incorporated into meals i.e. Ahara Aushadhi that help to replenish the body with important nutrients. The spices that are used in food, generally add flavour and taste to the food and contain high amount of trace elements. So, they prove their efficacy even when used in small quantities. The daily meals taken in the Indian subcontinent have been amalgamated with the condiments in such a manner that they provide nutrition with each morsel.

Among various spices used, *Jeeraka* is a common one used in routine food recipes since Vedic era. *Jeeraka* is an aromatic herb used to mostly improve digestion. These days, its use

has been limited in the use of digestive system only. It can be used in various proportions and in various dosage forms to alleviate various diseases. This work scans the various formulations of any form of *Jeeraka* mentioned in Bhaishajya Ratnavali. It also provides the recent researches regarding the phytoconstituents present in it. A slight uncertainty remains about the specificity of *Jeeraka* as other condiments also have similar synonyms. This work also addresses the concern and provides a precise information regarding the synonyms, types and contemporary taxonomy of each component of the *Jeeraka Traya*.

## MATERIALS AND METHODS

Bhaishajya Ratnavali is a classic treatise of Acharya Govindadasa Sen. The treatise was screened for the formulations containing any of the “*Jeeraka Traya*.” This is the first research that addresses all the three *Jeeraka* varieties. The formulations were further classified according to the type of *Jeeraka* and the varieties of *Jeeraka* contained in a single formulation, in a paired form, in *Bhrisata* (Fried) form or containing all three of *Jeeraka* were screened, classified and tabulated. The researches related to the pharmacologic actions were also screened through search engines like googlescholar, pubmed, google etc. and other allied databases covering fields of pharmacology and biomedicine to further support the therapeutic attributes of *Jeeraka*.

## RESULTS AND DISCUSSION

**Classification:** *Jeeraka Dwaya* include *Jeeraka* and *Krishna Jeeraka*. *Jeeraka Traya*, the most frequently used forms of *Jeeraka* include *Jeeraka* (*Cuminum cyminum* Linn.), *Krishna Jeeraka* (*Carum carvi* Linn.) and *Upakunchika* (*Nigella sativa* Linn.).<sup>1</sup> *Krishna Jeeraka* is not described among the *Varga* or *Gana* of *Brihatrayi*.<sup>2</sup> Some *Nighantu* (Ayurvedic texts) have mentioned six varieties of *Jeeraka*- *Shveta*, *Pita*, *Krishna*, *Sukshma*, *Sthula* and *Vanaja Jeeraka*. Ayurvedic text *Charaka Samhita* has mentioned 46 formulations, *Sushruta Samhita* 9, *Ashtanga Hridaya* 33 and *Sharangdhara Samhita* 6 formulations of *Kalajaji*. Likewise, *Charaka Samhita* has mentioned 12 formulations, *Sushruta Samhita* 1, *Ashtanga Hridaya* 7 and *Sharangdhara Samhita* 9 formulations of *Krishna Jeeraka*. 42 synonyms of *Kalajaji* and 29 of *Krishna Jeeraka* are found mentioned in Ayurvedic classics i.e. *Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*, *Bhavaprakasha Nighantu*, *Siddha Bhaishajya Manimala*, *Vaidyatatvaratnakara*, *Shankara Nighantu*, *Nighantu Ratnakara*, *Nighantu Kalpadruma*, *Nighantu Shiromani* and *Abhinava Nighantu*.<sup>3</sup>

**Controversy:** There have been a few controversies as to the nomenclature of the three species. The vernacular names and synonyms have been used in interchangeable forms by different seers and schools of thoughts. Acharya Chakrapani quoted *Kunchika* as *Sthula Jeerakam*. Bhavamishra used *Kalajaji*, *Brihat Jeeraka*, *Karvi* and *Prithveeka* as the synonyms for *Upakunchika*. Irrespective of these controversies, *N. sativa* is used traditionally as *Kalounji* or *Upakunchika*.<sup>4</sup> Vaidya PV Sharma, Vaidya Bapalal

and Prof K Nishteshwar considered *C. carvi* as *Karvi*. Vaidya PV Sharma considered *C. bulbocastanum* as *Krishna Jeeraka*. Vaidya Thakur quoted *C. cyminum* and *C. carvi* as *Shveta* and *Krishna* varieties of *Jeeraka*, *Prithveeka* as *C. bulbocastanum* and *N. sativa* as *Upakunchika*. This school appears to be more appropriate and relevant.<sup>5</sup> The true caraway for pharmaceutical purposes is represented by *Carum carvi*, however, the fruits of *Carum bulbocastanum*, *C. gracile*, *Cuminum cyminum*, *Bunium cylindricum* and *Bupleurum lanceolatum* are offered in commerce as caraway or *Jeera*.<sup>6</sup>

*Ajajee Kshupyamana*, *Kanajeeraka*, *Dirghaka*, *Jeeraka*, *Medhya*, *Pitaka* are the synonyms of *Shveta Jeeraka*. (Latin name – *Cuminum cyminum* Linn., Family- *Apiaceae*). *Utarapatha*, *Varnakali*, *Sugandha*, *Kalajeeraka*, *Jarana*, *Hridhya*, *UdgaraShodhana* are the synonyms of *Krishna Jeeraka*. (Latin name – *Carum carvi* Linn., Family- *Apiaceae*). *Kalika*, *Karvi*, *Mangrela*, *Prithvee*, *Prithvika*, *Sushvim Kunchi*, *Varakrishna*, *Upakalika*, *Vashpika* are the synonyms of *Kalajaji*. (Latin name – *Nigella sativa* Linn., Family- *Ranunculaceae*).<sup>7</sup>

*Asita Jeeraka*, Black Caraway, *Krishna Jeeraka*, consist of dried ripe fruits of *Carum carvi* Linn. *Sthula Jeeraka*, *Upakunchi*, *Susavi*, small fennel consists of seeds of *Nigella sativa* Linn.

*Ajaji*, *Safed Jeera*, *Shveta Jeeraka* consists of ripe fruits of *Cuminum cyminum*, Linn.

The Ayurvedic Pharmacopoeia of India has mentioned that in Bengali, *Upakunchi/Nigella* seeds are called *Mota Kalajeera* and *Kalajeera*. Likewise, black caraway seeds are called *Kala Jira* as well. The use of the same name for two different species may also be present in different other regions and the species may have been used interchangeably.

All three types of *Jeeraka* are *Ruksha*, *Katu*, *Ushna Veerya*, *Agnidipaka*, *Laghu* in *Paripaka*, *Sangrahee Pittakaraka*, *Hitakara* for *Medha*, *Garbhasayashodhaka*, *Jwaranashaka*, *Pachaka*, *Vrishya*, *Balakaraka*, *Ruchijanaka*, *Kaphanashaka*, *Chakshushyam*, alleviate *Vayu*, *Adhmana*, *Gulma*, *Vamana* and *Atisara*.<sup>8</sup>

Bhaishajya Ratnavali contains compilation and systematic categorization of the different formulations according to the methods of preparation. Hence it can be called as the first Ayurvedic formulary.<sup>9</sup> This compendium was hence chosen to compile the broad spectrum of therapeutic potentials of *Jeeraka*. *Jeeraka* is an aromatic spice that has a very potent action on enhancing metabolism. The impact of *Jeeraka* and *Agni* (digestive fire) in terms of promoting metabolism and aiding excretion is well recognized.<sup>10</sup>

Total 242 formulations from text contained *Jeeraka* as an ingredient. 3 formulations have all the three *Jeeraka Traya*. 144 formulations have *Jeeraka*, 17 formulations have *Krishna Jeeraka* and 5 formulations have *Karvi* in them. 62 formulations have *Jeeraka Dwaya* i.e. *Krishna* and *Safeda Jeeraka*, 7 formulations

have *Karvi* and *Shveta Jeeraka*. Among all the 242 formulations, only 4 formulations included *Bhrishta Jeeraka* (fried *Jeeraka*).

Maximum number of formulations i.e. 33 formulations with *Jeeraka* are mentioned for *Grahani*. 17 of the formulations with *Jeeraka* are mentioned for *Jwara* and 14 for *Agnimandya* and *Shoola*. It has been listed as *Pathya* for diseases like *Grahani* and *Agnimandya*.

***Jeeraka (Cuminum cyminum Linn.):*** Cumin (*Cuminum cyminum* L.) seeds are a widely consumed aromatic food spice with reported antiglycative and antidiabetic effects based on in vitro and in vivo studies.<sup>11,12,13,14</sup> It contains 2.5-4% volatile oil, 10% fixed oil and protein. Volatile oil mainly consists of 30-50% cuminum aldehyde, small quantity of alpha pinene, beta pinene, phellandrene, cuminic alcohol, hydrated cuminaldehyde and hydrocuminine.<sup>15</sup> Cumin is recognized as a wound healing,<sup>16</sup> phytoestrogen-rich plant containing estrogenic components, such as beta-sitosterol, stigmasterol and the flavonoids luteolin and apigenin.<sup>17</sup> The cuminaldehyde presents antinociceptive, antineuropathic and anti-inflammatory effects.<sup>18,19</sup> The bioactive fraction of *C. cyminum* has also been reported to enhance the bioavailability of erythromycin, cephalexin, amoxycillin, fluconazole, ketoconazole, zidovudine, and 5-fluorouracil.<sup>20</sup> The recent studies suggest that cumin may be developed as a lead to recover the immunity of immunocompromised individuals.<sup>21</sup>

***Krishna Jeeraka (Carum carvi Linn.):*** Caraway was commonly used in phytomedicine as antibacterial, antiproliferative, laxative,<sup>22</sup> antioxidant,<sup>23</sup> antispasmodic,<sup>24,25</sup> and mitocidal drug.<sup>26</sup> The major constituents of seeds are carvone, flavonoids and limonene. Myrcene, beta caryophyllene, thujone, anethole and pinene are present as minor components.<sup>27</sup> The flavonoid constituents of caraway have constituents such as quercetin-3-glucuronides, isoquercitrin, quercetin 3-O caffeoylglucoside and kaempferol 3-glucoside.<sup>28</sup> In human trial studies, some herbal preparations consisting predominantly of caraway have shown efficacy in relieving dyspeptic symptoms.<sup>29</sup> Aqueous and solvent derived extracts of cumin increased amylase, protease, lipase and phytase activities.<sup>30</sup> Antiproliferative activity of the methanolic extract of fruits was demonstrated using the tumour cell lines (MK-1, HeLa and B16F10).<sup>31</sup> The seed extract showed antiulcerogenic activity in experimental models in rats.<sup>32</sup> The overall hypolipidemic effect is probably due to a counteraction of free radicals by its antioxidants i.e. Quercetin (flavonoids) and Carvone.<sup>33</sup>

***Jeeraka Dwaya:*** The oils exhibited high antioxidant activity which has been attributed to the presence of monoterpene alcohols, linalool, carvacrol, anethole, estragol, flavonoids and other polyphenolic compounds.<sup>34,35,36,37,38</sup> The attenuation of carcinogenicity by cumin and caraway has been attributed to their potential anti-oxidative action in the target tissues.<sup>39,40</sup> The adaptogenic and anti-stress activity of its aqueous extract, related to its antioxidant properties, is documented in normal

and stress induced rats.<sup>41</sup> The antidiabetic effects of cumin and caraway products are amply documented.<sup>42</sup> A significant pharmacokinetic interaction of some herbal products from cumin and caraway with anti-tubercular drugs has been revealed. This bio enhancing activity was found to be due to 3',5-dihydroxyflavone 7-O-β-d-galacturonide-4'-O-β-d-glucopyranoside. The altered bioavailability profile of anti-TB drugs could be attributed to a permeation enhancing effect of cumin and caraway.<sup>43,44</sup> It seems reasonable to assume that the synergy between and within a particular class of compound might be responsible for the remarkable bioactivity profile of this herb.<sup>45</sup>

***Upakunchika (Nigella sativa Linn.):*** The seeds are carminative, stimulant, diuretic, emmenagogue, galactagogue and are used in the treatment of mild cases of puerperal fever.<sup>46</sup> Arabians believe that black seed (*Upakunchika*) *N. sativa* is the panacea for all diseases. Seed contains poisonous saponin malanthine, bitter alkaloid – nigellin, essential oil- cymine, nigellone, carvone, limonene and nigellimine.<sup>47</sup> Cell culture studies and animal models have indicated several therapeutic potentials, such as anti-cancer,<sup>48</sup> antimicrobial,<sup>49</sup> analgesic, anti-inflammatory,<sup>50</sup> antipyretic,<sup>51</sup> anti-nociceptive<sup>52</sup> actions contraceptive and anti-fertility, anti-oxytocic and anti-oxidant<sup>53</sup> potentials, for black seed and its active component thymoquinone. The seed extract and thymoquinone have shown anti-mutagenic property.<sup>54</sup> Nigellone, a carbonyl polymer of thymoquinone isolated from seeds, was highly effective in inhibiting histamine release.<sup>55</sup> It has been shown that the seed extract was effective against a variety of organisms (isolated from human patients suffering from septic arthritis), even those that were resistant to antibiotics.<sup>56</sup>

Methanolic and acetonetic seed extracts of *Kalaunji* and *Krishna Jeeraka* were able to neutralize free radicals and carried antioxidant properties.<sup>57</sup>

**Formulations containing *Jeeraka*:** *Pipalyadi Gana Kwatha*, *Bhaswanmuladi Kwatha*, *Saubhagya Vati*, *Jivanandabhra (Vati)*, *Amritarishta* and *Krishnadi Gana/Churna* have been mentioned for *Jwara*. *Kutajavaleha*, *Praneshwar Rasa*, *Mritasanjivana Rasa* and *Amritanarva Rasa* have been used for *JwarAtisaraa*. Similarly, *Kutajaleha*, *Jatiphaladi Churna*, *Jatiphala Rasa* and *Abhayanarsimha Rasa* have been mentioned for *Atisaraa*. *Jeeraka*, known for its action in metabolism has been mentioned in a lot of formulations for *Grahani* viz. *Dadimashtaka Churna*, *Kapitthashtaka Churna*, *Lavangadi Churna (Swalpa)*, *Lavangadi Churna (Brihat)*, *Jatipladi Churna*, *Jeerakadi Churna*, *Kalyana Guda*, *Kushmanda Guda*, *Grahanikapata Rasa-5*, *Grahanigajendra Vatika*, *Grahanishardula Vatika*, *Piyushavalli Rasa*, *NripatiVallabha Rasa*, *Bruhannripavallabha Rasa*, *Jatiphaladi Vati (Brihat)*, *Purnakala Vatika*, *Ajajyadi Churna*, *Chukra Sandhana (Brihat)*, *Grahanimihira Taila* and *Dadimadi Taila*. *Velajjadi Churna* and *Kankayana Modaka* are used in *Arsha*. *Agnimukha Churna (Brihat)*, *Agnitundi Vati*, *Bhaskara Rasa*, *Pashupata Rasa*, *Amrita Haritaki*, *Shardula Kanjikam* and *Mustakarishtha* are formulations mentioned for *Agnimandya*.



*Kamalantaka Lauha* has been specified for *Pandu* and *Kusmanda Khanda* for *Raktapitta*. *Lavangadi Churna*, *Brihad Vasavaleha-1*, *Chandramrita Rasa* and *Kumkumadi Ghrita* have been mentioned for *Rajyakshma*. *Chandramrita Rasa*, *Brihat Chandramrita Rasa*, *Chandramrita Lauha* and *Laxmi Vilasa Rasa* are used for *Kasa*. Single formulations have also been mentioned like *Bhargisharkara/ Avaleha* (for *Hikka-Shwasa*), *Jeeraka Ghrita* (for *Sadyovrana*), *Haridra Khanda-2*(for *Udardashitapittakotha*), *Ashtanga Lavana/ Churna* (for *Madatyaya*), *Kalyanaka Churna* (for *Apasmara*), *Jeerakadi Ghrita* (for *Amlapitta*), *Krishnadi Yoga/ Churna* (for *Mukharoga*) and *Taptaraja Taila-2* (for *Shiroroga*).

*Chavyadi Churna* and *Kalyanavaleha* are formulations for *Swarabheda*. *Kavalagraha-1*, *Kavalagraha-4*, *Yavanishadava Churna* and *Nagaradi Churna* have been mentioned for *Arochaka*. *Lajadi Yoga-2/Churna* and *Cchardisanhara Rasa* have been mentioned for *Cchardi*.

*Kalyanakaleha*, *Rasona Pinda/Churna*, *Brihat Cchagaladi Ghrita* (*Haritaki*), *Kanji* (*Shukta*) *Nirmana*, *Nakula Taila*, *Mahamasha Taila-7* and *Mahavishagarbha Taila* have been introduced for *Vatavyadhi*. *Nimbadi Churna* plus *Baladi Pralepa* for *Vatarakta* and *Pippalyadi Gana/Churna* as well as *Rasonadi Pralepa* for *Urusthambha*. *Hinvadhya Churna*, *Vatagajendra Simha/Vati*, *Vidangadi Lauha*, *Panchanana Lauha*, *Aamgaja Simha/Gutika*, *Maharasona Pinda/Asava* and *Rasona Sura* have been described for *Amavata*.

*Saurvachaladi Gutika*, *Shoolavajrini Vati*, *Dhatri Lauha-2*, *Shatavari Mandura*(*Brihata*), *Shatavari Mandura*, *Haritaki Khanda-1*, *Narikela Khanda Brihata*, *Dadhika Ghrita* and *Shoola Gajendra Taila* are to be used for *Shoola*.

*Pippalyadi Churna*, *Hingwadi Churna*, *Hingwadi Churna 1*, *Gulma Shardula Rasa* and *Rasonadya Ghrita* have been mentioned for *Gulma*. *Shukramatrika Vati*, *Mehavajra Rasa*, *Mehavajra Rasa*, *Meghanada Rasa*, *Dadimadya Ghrita-1* and *Dadimadya Ghrita-2* have been noted for *Prameha*. Formulations *Chavyadi Shaktu*, *Vyoshadi Shaktu* and *Loharishta* have been mentioned for *Meda*.

*Takra*, *Takra1*, *Kushthadi Churna* and *Mahavanhi Rasa* are to be used for *Udara*. Similarly, *Bhallatakadi Modaka* and *Rohitaka Ghrita-2* for *Plihayakrita*. *Ajajyadi Churna*, *Kshetrapala Rasa* for *Shotha*, *Ajajyadi Lepa* plus *Bhaktotara Rasa* for *Vridhhi* and *Panchatikta Ghrita Guggulu*, *Sindooradha Taila* plus *Shadbindu Taila* for *Vridhhi*.

Formulations for *Pradara* containing *Jeeraka* are *Vataja Pradara Chikitsa/Churna*, *Utpaladi Churna*, *Shitakalyanaka Ghrita*, *Ashoka Ghrita*, *Lakshmanarista*, *Patrangasava* plus *Aparapatana Upaya/Churna* has been indicated for *Garbhini*. *Shaubhagyashunthi-2*, *Panchajeeraka Guda* and *Jeerakadarista* for *Sutika*. *Amatisarahara Churna*, *Yamanipanchaka vati*, *Dadimadi Churna*, *Kutajavaleha* and *Kantakari Ghrita* are used in *Balaroga*. *Vrischikavisha Vedanahara/Churna* has been used for treatment of *Visha*. *Purnachandra Rasa* and *Purnachandra Rasa* have been mentioned as *Rasayana*. *Manmatha Rasa*, *Guda Kusmanda Khanda*, *Kamagni Sandipana Modaka/Avaleha* and

*Cchagaladi Ghrita* are used for *Vajikarana*.

The different dosage forms of *Jeeraka* have been shown in the form of a pie-chart. (Fig. 1 and 2) It shows that the maximum dosage form of *Jeeraka* is in the form of *Churna* (powder) that is 37 whereas the least number (1 each) were found in the form of *Guggulu* and *Haritaki*.

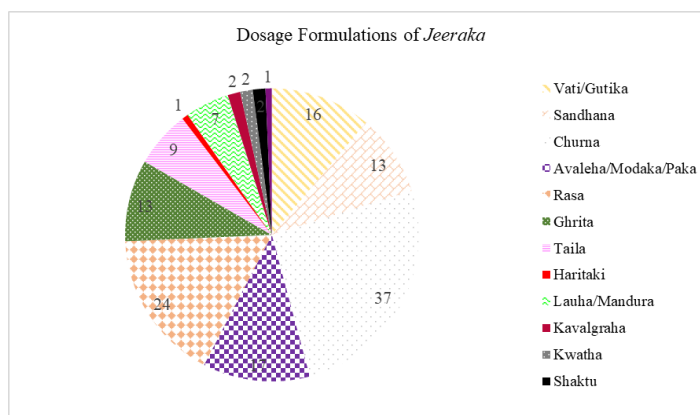


Fig 1: shows pie-chart of dosage formulations of *Jeeraka*

#### Formulations containing *Krishna Jeeraka*

*Shitangahara Udvartana/Churna*, *Shringyadi Kwatha*, *Ajaji Guda Yoga* and *Katu Taila Murchhana* have been noted for *Jwara*. Single formulations like *Kankoladi Churna* (for *Arsha*), *Bhaktavipaka Vati*(for *Agnimandya*), *Haridra Khanda*(for *Krimi*), *Pandu Panchananarasa*(for *Pandu*), *Pippalyadi Kwatha*(for *Kasa*), *Brihat Yograja Guggulu*(for *Amavata*), *Amlaki Khanda*(for *Shoola*), *Gudapippali Yoga* (*Brihata*)/*Modaka*(for *Plihayakrita*), *Takra Vati*(for *Shotha*), *Rudra Taila*(for *Shiroroga*), *Garbhapala Rasa*(for *Garbhini*), *Devdarvadi Kwatha*(for *Sutika*) and *Dashamoolarishta*(for *Vajikarana*) have also been mentioned.

*Krishna Jeeraka* has been used in the maximum amount in the form of *Khanda*, *Modaka* and *Guda* and least in the form of *Guggulu* and *Arista* (fermented preparations).

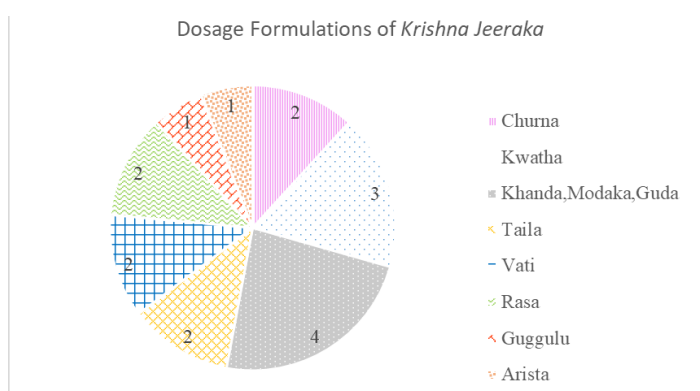


Fig 2: shows pie-chart of dosage formulations of *Krishna Jeeraka*

Formulations containing *Karvi*: *Sannipata Bhairava Rasa*

(Dwitiya) has been mentioned for *Jwara*. *Sushkamulakadya Taila-3* and *Punarnavadi Taila* for *Shotha*. *Amlapittantaka Modaka* has been mentioned for *Amlapitta* and *Dashamoola Taila-6* for *Shiroroga*.

**Formulations containing *Bhrista Jeeraka*:** *Jeerakadi Modaka* has been mentioned for *Grahani*. *Takra Prayoga* has been indicated for *Arochaka*. *Lavangachatuhsama Churna* and *Dadimachatuhsama Churna* has been noted for *Balaroga*.

**Formulations containing *Jeeraka Dwaya*:** *Jwaranagamayura Churna*, *Jwarantaka Lauha*, *Shleshmashailendra rasa*, *Mritasanjivani Sura* and *Brihat Kiratadi Taila* have been mentioned for *Jwara* and *Siddha Praneshwar Rasa* for *JwarAtisaraa*. *Lavangadi Churna (Mahat)*, *Shreekameshwar Modaka*, *Madan Modaka*, *Methi Modaka*, *Brihata Methi Modaka*, *Mustakadi Modaka*, *Kameshwara Modaka*, *Mustakadha Modaka*, *Agnikumara Modaka*, *Panchamrita Mandura* and *Mahashatapala Ghrita* have been mentioned for *Grahani*.

*Hingwastaka Churna*, *Lavanabhaskara Churna*, *Lavangadi Vati-2*, *Agnisandipana Rasa*, *Bhaktavipaka Vati-2* and *Lavangadha Modaka* have been mentioned for *Agnimandya*. Single formulations like *Panchamrita Lauha Mandura* (for *Panduroga*), *Brihada Vasavaleha-3* (for *Rajyakshma*), *Saraswata Churna* (for *Unmada*), *Yograja Guggulu Vati* (for *Vatavyadhi*), *Dwadashayasa/Vati* (for *Vatarakta*), *Vidangadi Lauha* (for *Prameha*) and *Pushkara Leha* (for *Pradara*).

*Jeeraka Dwaya* have been mentioned as an ingredient in formulations for *Shoola* like *Puga Khanda-1*, *Narikela Khanda*, *Narikelamrita/Paka* as well as *Bijapuradi Ghrita* and *Kankayana Gutika*, *Rasayanamrita Rasa* have been mentioned for *Gulma*. *Manadi Gutika* and *Chitraka Ghrita* have been mentioned for *Plihayakrita*. *Ekadashayasa Rasa* and *Shatpushpadhya Ghrita* have been mentioned for *Vridhhi*. Formulations like *Panchanana Gutika*, *Kshudhavati Gutika-1*, *Kshudhavati Gutika-2*, *Kshudhavati Gutika-3*, *Saubhagyashunthi Modaka*, *Pippali Khanda-1* and *Pippali Khanda-2* have been mentioned for the treatment of *Amlapitta*. *Sneha Kalpana* like *Dashamoola Taila-5*, *Dashamoola Taila-7* and *Taptaraja Taila-1* have been mentioned for the treatment of *Shiroroga*. As for *Sutika*, *Vajrakanjika/Paka*, *Shaubhagyashunthi-1*, *Shaubhagyashunthi-3*, *Jeerakadi Modaka* and *Bhadroukatada Ghrita* have been mentioned.

*Vajikarana* formulations include *Khandabhraka/Paka*, *Kameshwara Modaka-1*, *Kameshwara Modaka-2*, *Mahakameshwara Modaka*, *Shrimadananda Modaka*, *Rativallabha Modaka* and *Mrita Sanjivani Sura*.

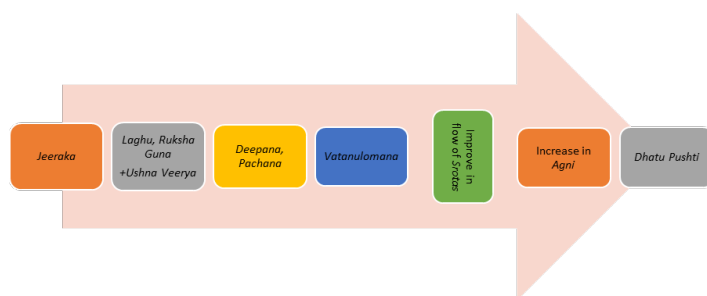
**Formulations containing *Mangrela+Shveta Jeeraka*:** Single formulation of the combination of *Mangrela* and *Shveta Jeeraka* has been mentioned for different diseases like *Praneshwar Rasa* (for *Jwara*), *Karvyadi Vati* (for *Arochaka*), *Yograja Guggulu* (for *Amavata*), *Hapushadi Ghrita* (for *Gulma*), *Ekavishantika Guggulu* (for *Kushtha*), *Shunthi Khanda* (for *Amlapitta*) and *Vachadi Churna* (for *Yonivyapada*).

**Formulations containing *Jeeraka Traya*:** *Aayama Kanji* has been mentioned for *Grahani*, *Takrarishta* for *Arsha* and *Narayana Churna* for *Udara*.

**Mode of Action:** *Grahani* and *Agni* have *Adhara-Adheya-Sambandha* and *Parasparya Upakaraka Bhava*. i.e. they are interdependent. *Mandagni* (deficient digestive power) causes improper digestion which is the principal cause of *Ama Dosha* and it is the crucial factor causing diseases. In children, the beginning of *Annada Avastha* (weaning period) and the characteristics of *Balyavastha* (childhood period) are described as *Aparipakva Dhātu*(immature tissues), *Asampurna Balam*(inadequate strength), *Aniyata Agni*(irregular metabolism) etc. During this period, any mild etiological factor can impair *Agni* easily and disturb the digestive system.<sup>58</sup> Hence, *Jeeraka* has been used accordingly in some of the paediatric formulations in this pharmaceutical lexicon. *N. sativa* oil, given intraperitoneally, has been shown to exhibit a potent action against murine cytomegalovirus infection in mice. The action was suggested to be related to the potentiating action of the oil on innate immunity.<sup>59</sup>

Because of its *Laghu*(light), *Ruksha* (dry) and *Katu*(pungent) *Guna* (quality), *Tikta*(bitter) *Rasa* (dominant with *Agni*, *Vayu* and *Akasha Mahabhuta*), it subsides the aggravated *Kapha*. *Ushna Veerya* (warm potency), counteracts *Vata*, brings about *Vatanulomana* (re-directing the normal course of *Vata Dosha*) and stimulates *Jatharagni* (principal digestive power), which in turn stimulates all other *Agni* (digestive power) and brings about the *Pushti* (nourishment) of *Saptadhatu* (seven basic tissues). Due to its *Laghu*, *Ruksha* and *Ushna Veerya*, it removes *Strotorodha* (occlusion of channels) as it penetrates minute *Strotas* (channels) in fig 3.

*Jeeraka* has been used in the diseases which require *Deepana* (increases appetite), *Pachana* (kindles digestive fire) and which have *Ama* as an aetiological factor. The Ayurvedic treatise states that, *Mandagni* is the root cause of all diseases which arises from indigestion, contaminated food and accumulation of *Mala* (*Dosha* and waste products). The aggravated *Dhatu* occlude the flow of fluid (lymph, blood, water, enzymes) in their *Urdhwa* and *AdhoGamana* (upward and downward movement). This in turn brings about abnormalities in *Prana* (life energy that performs respiration, oxygenation and circulation), *Agni*(digestive power) and *Apana* (energy related to excretion) resulting in accumulation of water in between *Twacha* (skin), muscles (*Mamsa*) and joints (*Sandhi*).<sup>60</sup> Hence, *Jeeraka* which acts at different *Dhatu* levels to increase *Agni* and bring about *Vatanulomana* has a myriad of uses that benefit human health (Fig.3). The usage of *Jeeraka* in any form may have been done to enhance the potential of the formulation. The synergistic potential of *Jeeraka* with other drugs to increase the therapeutic potential of the formulation as a whole cannot be denied. However, further studies are required to be conducted in this light to confirm and support the biological effects of these indigenous drugs.



**Fig 3:** Probable mode of action of *Jeeraka*

**Future Scope:** All the three components of the *Jeeraka Traya* should be studied extensively in both healthy and diseased individuals. The classical references should be tested in both Ayurvedic and contemporary parameters to ascertain the mode of action and assess the true dose relationship. Its role as a major and minor ingredient of a formulation should also be ascertained with clinical trials. Present review strongly recommends the new research works regarding the traditional use of the condiment.

**Table 1:** Number of formulations containing Jeeraka according to different diseases

S.No.	Number of Formulations	Rogadhikara
1	33	Grahani
2	17	Jwara
3	14	Agnimandya, Shoola
4	12	Vajikarana
5	10	Amlapitta
6	9	Sutika, Amavata
7	8	Gulma, Vatavyadhi
8	7	Bala, Pradara
9	6	Prameha, Arochaka, Shiroroga
10	5	JwarAtisaraa, Rajyakshma, Kasa, Udara, Plihayakrita, Shotha,
11	4	Atisaraa, Kushtha, Arsha, Vriddhi
12	3	Pandu, Vatarakta, Meda
13	2	Cchardi, Urustambha, Swarabheda, Garbhini, Rasayana
14	1	Krimi, Raktapitta, Hikkashwasa, Madatyaya, Unmada, Apasmara, Sadhyovrana, Mukharoga, Udardshitapitta, Yonivyapada, Visha
Total	242	44 (total number of diseases)

## CONCLUSION

Although the use of a single compendium are limits the potentialities of *Jeeraka* in treating other diseases not mentioned in the text, its ability to heal 44 diseases in itself is remarkable. It has

been mentioned as a *Pathya* (congenial) in some diseases as well. It can be concluded that when *Jeeraka* is formulated with other herbo-mineral substances and given along with different *Anupana* (adjuvant) it has the potential to synergistically cure wide array of diseases like *Jwara* (fever), *Agnimandya* (digestive impairment), *Rajyakshma* (tuberculosis), *Vatavyadhi* (diseases due to *Vata Dosh*), *YakritPleeharoga* (Liver and Spleen disorders), *Udara* (ascites), *Gulma* (Lump in abdomen), *Kushtha* (Skin diseases), *Hridroga* (cardiac disorders), *Amlapitta* (dyspepsia), *Medoroga* (lipid disorders), *Shiroroga* (diseases of head), etc. This also emphasizes the recent research works that further strengthens the therapeutic diversity which aromatic *Jeeraka* has to cater to humans.

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