

## SHIMBHI DHANYA VARGA (GROUP OF LEGUMES AND PULSES): A PREVENTIVE AND CURATIVE PERSPECTIVE

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### ABSTRACT

In recent years there is a sharp increase in lifestyle disorders such as cardiovascular disease, diabetes mellitus etc. Therefore we ought to be more careful about food and our Life-style. Health promotion can be done by the pearls of knowledge from *Ayurveda* – the science for the achievement of long, happy and healthy life. *Charaka Samhita* describes about the twelve categories of naturally nourishing food. One among them is the varieties of pulses such as *Mudga* (green gram), *Masha* (Black gram), *Adhaki* (Red gram) and *Makushtha* (lentil), *Rajashimbi* (Soyabean), *Satina* (peas), etc., which have been described in *Shamidhanya Varga* and are also called *Vaidala* (dicotyledons). This category of pulses is main source of proteins for vegetarians. The dietary importance of legume seeds is expected to grow in the years, because of the growing need of proteins (and other nutrients) as a result of increasing world population. This article is an attempt to analyze the *Shimbhi Dhanya Varga* mentioned in *Ayurveda* on a scientific basis.

**Key words:** *Shimbi Dhanya*, Pulses, *Mudga*, Health promotion

### INTRODUCTION

“Let food be thy medicine and medicine be thy food.” - Hippocrates, the father of Greek medicine.

The fundamental principle for the positive health was expressed by Vagbhata as – "*Hitabhuk, Mitabhuk, Ritubhuk*". *Hitabhuk*: means to eat the food which is wholesome and nourishing to an individual and not merely for taste. *Mitabhuk*: means eat moderately (only that much which is essential for sustenance of the vitality and stamina of the body) or one third of the stomach capacity. *Ritubhuk*: means to eat the food prepared in a proper way suitable for a particular season. Even in modern day word

Nutraceutical is used which means “any food, or part of food, considered to provide health benefits, including the prevention and treatment of disease”.

Healthy and nutritional diet is always advisable in order to prevent the affliction of diseases as it is well known that "prevention is better than cure". *Ayurveda* emphasizes on preventive aspects rather than curative. Food (*Ahara*) is the foremost among the three sub pillars of life as per *Ayurvedic* classics, *Nidra* and *Abrahmacharya* being other two. Nutritious diet is the key to prevent many common health problems. *Acharya Charaka* advocates regular intake of food articles be-

longing to different groups like *Shasthika* (variety of rice), *Shali* (variety of rice), *Yava* (barley), *Mudga* (Green gram), *Saindhava* (rock salt), *Amalaka* (Indian gooseberry), *Jangala mamsa rasa* (meat of terrestrial animals), *Madhu* (honey), water, *Payah* (milk), *Sarpi*(ghee) for prevention of diseases and health promotion. These food groups have to be consumed in combination regularly. Among them *Shimbi Dhanya* or *Shami Dhanya* (Pulses) form an important group which supply the required proteins, one among the proximate principles and body building foods as per modern. Especially for the vegetarians pulses form the most important source of proteins and they are also called as poor man's beef.

In *Sushruta Samhita*, the category of pulses is known as *Mudgadi Varga*, *Vaidala* (dicotyledons) or *Shimbi Dhanya*. They are commonly used as food under the name of *Mudga* (Green gram), *Vanamudga* (wild variety of green gram), *Kalaya* (peas), *Makustha* (moth bean) *Masura* (Lentils), *Mangalaya*(a variety of *masura*), *Canaka* (Bengal gram), *Satina*(a variety of of pea), *triputa*(pea), *Harenu*(a variety of pea), *Adhaki*(red gram) etc.<sup>1</sup> They are *Kashaya* (Astringent), *Madhura* (sweet) in taste, cold in *Virya* (potency) and *Katu* (pungent) in *Vipaka*. They generate *vayu*, arrest the flow of urine and evacuation of stool and alleviate *Pitta* and *Kapha*. *Acharya Vagbhata* states *Mudga* (green gram), *Adhaki* (red gram), *Masura* (Lentils) and other varieties belong to the group called *Shimbi Dhanya* (those having pods/legumes). They are said to be *Vibandhakrut* (cause constipation), *Kashaya*, *Swadu* (astringent sweet in taste), *Grahi* (absorbent), *Katu vipaka* (pungent

after digestion), *Sheeta* (cold in potency), *Laghu* (easily digestible).<sup>2</sup>

#### **Mudga (Green gram/Vigna radiata Linn.)**

The word *Mudga* in Sanskrit means "that which brings joy, delight and gladness".<sup>3</sup>The pharmacodynamics of *Mudga* in *Ayurveda* has been explained to be that as *Madhura* (sweet), *Kashaya* (astringent) in taste, *Laghu* (light for digestion), *Ruksha* (dry), *Sheetviry*a (cold in potency), *Katu Vipaka* (post digestive transformation into pungency) and it exhibits *Kaphapittahara Vatakarat* (pacifies kapha and pitta whereas aggravates vata) property<sup>4</sup>. It is known to be *Drustiprasadaka* (improves quality of vision).<sup>5</sup> *Mudga* (green gram) is the best among *Shimbi Dhanya*. Moong dal is a dieter friendly dal rich in iron (3.9 mg/100gm) and potassium (1150mg/100gm)<sup>6</sup>. Iron helps maintain hemoglobin levels and potassium helps reduce blood pressure, a boon for hypertensive people. It is light and can be easily eaten during illness and pregnancy. Its soup can be given in *Jvara* and *Udara Roga*. Its *Payasa* form is beneficial externally as *Upanaha* in *Daha*, *Shool* And *Vatarakta*<sup>7</sup>. *Mudga Hima* is beneficial in *Raktapitta*<sup>8</sup> and with *Pippali* it cures thirst and vomiting<sup>9</sup>. *Kantakari* mixed *Mudga Yusha* is said to be *Shvasa Kasahara*. *Mudga Yusha* with *Amalaki* it is beneficial in *Prameha* and *Kushta*.<sup>10</sup>

#### **Masha (Black gram/Phaseolus mungo-Linn.)**

Black gram is *Snigdha* (unctuous), *Balya* (increases strength), increases *Kapha* and *Pitta*, *Malakara* (increases bulk of faeces), *Sara* (laxative), *Guru* (not easily digestible), *Ushna* (hot in potency), *Vatahara* (mitigate Vata), *Madhura* (sweet in taste), and *Shukra Vruddhikara*, *Virekakrut* (in-

creases semen and promotes ejaculation strength). The qualities of black gram are similar to the fruits of *Kakandola* and *Atmagupta* (*Mucuna pruriens*).

Black gram is known as *Urad Dal* in Hindi. In texts of *Ayurveda* it is known as “*Masha*”. Black gram is mainly grown in South Asia. It is store house of calcium, potassium, iron, magnesium, copper, manganese etc. *Urad dal* contains vitamins and dietary fibers. Due to high potassium content *Urad Dal* acts as an aphrodisiac. It produces excreta in large quantity and semen instantaneously and heavy to digest and increases the moistness of body tissues. High blood pressure occurs due to high sodium level and low potassium level. Black gram contains plenty of potassium. This helps to balance sodium potassium level and reduce hypertension or high blood pressure. There is a strong link between hypertension or high blood pressure and erectile dysfunction. As potassium helps to reduce high blood pressure, it also helps in erectile dysfunction<sup>11</sup>

Aggravated *Vata* leads to many diseases including problems like erectile dysfunction, premature ejaculation, low sperm count and motility etc. Hence *Ayurveda Acharyas* recommend use of “*Masha*” in such health conditions as the unctuous, heavy and strength promoting property along with hot potency helps to alleviate the *Vata*. “*Masha*” or *Urad Dal* is used in the form of hot poultice in inflammation of joints and muscle pain. Massaging with herbal oil processed with *Masha* reduces pain and inflammation and also brings about bulk in the muscles by its nourishing and strengthening nature. Hence *Acharyas* recommend it in nervous system problems like nervous debility, par-

tial paralysis, facial paralysis and other disorders. *Masha* brings about moistness along with increase in bulk of the faeces, hence it is recommended in conditions like constipation and piles.

#### **Rajamasha (Vigna cylindrical Skeels)**

*Rajamasha* (Alsendra /big sized black gram/ *Vigna cylindrical Skeels*) is laxative and palatable. It reduces semen, alleviates *Kapha* and *Amlapitta* (acid dyspepsia).it aggravates *Vata*. It is unctuous, astringent, non slimy and heavy.<sup>12</sup>

#### **Chanaka (Cicer areietinum Linn)**

*Chanaka* (*Cicer areietinum* Linn), *Khandika* (a variety of kaly lathyrus sativus) and *Makustha* (*Phaseolus aconitifolius* Jacq.) are sweet in taste and *Vipaka*. It is sweet with accompanying astringent taste and unctuous. *Chanaka is Laghu, Ruksha, Shita, Vatavardhaka* in property. It is *Tridoshashamaka* when use with *Ghrita*<sup>13</sup>. In the form of soup and anointment, it is useful for the patient suffering from the vitiation of *Pitta* and *Kapha*. Bengal gram dal is rich in B-vitamins. It is full of fiber which helps diabetics to control their blood sugar levels. It also has potassium and folic acid. The fiber in it helps lower cholesterol levels thus helpful in preventing heart problems. .

In *Sushruta's* view *Makusthaka* (moth) is *Krimikara* (vermigenous), but according to *Acharya Charaka* it is beneficial in *Raktapitta, Jvara, Atisara, Yakshma*<sup>14</sup> as it is sweet in taste and *Vipaka* and cool in potency. Further *Acharya Sushruta* mentions it as alleviator of *Pitta* and *Kapha*, rectifier of deranged blood vessels and tends to bring on a loss of virile power and with *Ghrita*, it is best *Tridosha Shamana*.<sup>15</sup>

#### **Adhaki (red gram/Cajanus cajan Linn.)**

*Adhaki* (red gram) is *laghu*, *ruksha*, *kasaya madhura*, *shita varna grahi* and alleviates the vitiated *Kapha* and *Pitta*, but aggravates *Vata*. Contrary to that *Acharya Sushruta* opines that the *Adhaki* does not excessively agitate the *Vayu* in the organism.<sup>16</sup> Apart from protein and fiber, it contains folic acid which helps to prevent anemia and is also important for pregnant women as it is essential for foetal development and can prevent neural tube birth defects such as spina bifida. It is low in calories, so is good for people who are on weight loss diets. It also helps to control blood sugar levels. It is beneficial in obesity<sup>17</sup>. Its *Yusha* is useful in *Pittaatisara*<sup>18</sup>. *Dhoomvarti* of its leaves are beneficial in *Hikka*<sup>19</sup>. In *Vatarakta* its *Yusha* with *Ghrita* is advocated<sup>20</sup>.

But *Harenu* and *Satina* are *Ruksha*, *Madhura*, *Shita*, *Vatavardhaka*, *Raktapittashamaka* and tend to constipate bowel.<sup>21</sup>

#### **Masura (lentil, *Lens culinaris Medic*)**

*Masura* is *laghu*, *ruksha*, *madhura rasa*, *madhura vipaka*, *shita*, *vatal*, *kaphapitta shamak*, *raktapittahara*, *javaraghan* and *grahi*.<sup>22</sup> *Masura* induces constipation and *Kalaya* increases *Vata*. Masoor dal helps to reduce blood sugar levels in especially controlling the blood sugar that spikes after a meal, controls hypertension, prevents anemia and lowers cholesterol.

#### ***Kulattha* (Horse gram, *Dolichos biflours Linn.*)**

*Kulattha* (horse gram/ *Dolichos biflours Linn.*) is *Ushna* (hot in potency), *Kashaya* (astringent), *Amlapaka* (sour at the end of digestion). It reduces semen and alleviates the vitiated *Kapha* as well as *Vata*. It is constipative and is useful in urinary stones (*Shukrashmari*). *Acharya Sushruta* advocate a rare species

*Vanya Kulattha*, which pacifies the deranged *Kapha* and proves curative in cases of *Anaha*, obesity, piles, hiccough, *Shwasa* and dyspnoea. It may bring the episodes of haemoptysis and proves beneficial in eye disorder<sup>23</sup>. *Acharya Vagbhata* states that this pulse increases bleeding disorders and is not recommended in such conditions, like menorrhagia<sup>24</sup>.

Horse gram is a minor legume used in India having a good nutritional quality. The scientific studies have recently shown to prevent atherosclerosis in rats and may be a potential functional food for the prevention of hyper lipidaemic atherosclerosis. An  $\alpha$ -amylase inhibitor from horse gram seeds has recently been shown to have anti hyperglycemic potential. Extracts from horse gram plants have shown potential for treating several human infections.<sup>25</sup>

#### ***Shimbhi* - Double bean (*Phaseolus lunatus Linnlinn.*)**

According to *Acharya Charaka Shimbhi* are unctuous and astringent, aggravate *Vata* in the *Koshtha*. It is neither aphrodisiac nor conducive to eyes. It produces wind during the process of digestion .therefore they must be taken together with some unctuous substance by strong person. *Acharya Sushruta* advocates that they are antitoxic, reduce *Kapha* and power of sight. They are imperfectly digested and acquire a pungent taste in digestion.

#### **Rajashimbi(Soyabean/ *Glycine max MerriL.*)**

Soya bean is *guru*, *snigdha*, *madhura kashaya*, *usna*, *durjara*, *vatashamka*, *stnyajan* and *balya*.<sup>26</sup>

#### ***Nishpava* (a type of *Shimbi/ Doichous lablab Linn*)**

*Nishpava* (a type of *Shimbi*) is *guru,ruksha, sar, amla vipaka, usna virya,kaphaghna sukraghna* aggravates *Vata, Pitta*, bleeding disorders; it increases breast milk production and promotes urine formation.<sup>27</sup>

#### **Tila (Sesamum indicum Linn.)**

*Tila* (*Sesamum indicum* Linn.) in this group described by *Acharya Charaka* has *Ushna* (hot in potency), *Tvachya* (good for the skin), *Sheetasparsha* (cold on touch), *Keshya* (good for hairs), *Balya* (strengthening), *Guru* (hard to digest), *Alpamutra* (produces little quantity of urine), *Katu paka* (pungent at the end of digestion), *Medhakrut* (increases intelligence), *Agnikrut* (increases digestive function) property, and increases *Kapha* and *Pitta*.

The *Khandika (Khesari)* popularly known as *Lathyrus sativus* is *Ruksha, Madhura, Tikta, Kashaya, Shita, Vatavardhaka, Kaphapittahara* and *Vibandhakara*. It leads to development of lathyrism, on prolonged use due to the presence of toxin known as Beta oxalyl amino alanine<sup>28</sup>. The reference of this disease is found in *Bhava Prakash* by

the name *Kalaya Khanja* as spastic paraplegia<sup>29</sup>

#### **Tuvari (Phaseolous vulgaris)**

*Tuvari* (*Phaseolous vulgaris*) is having *Laghu, Tikshna, Ushna, Kaphahara, Dipana, Grahi, Krimighna* and *Kusthaghna* property<sup>30</sup>. The red kidney bean (*Phaseolus vulgaris*) has lectin, called phytohaemagglutinin (PHA), which is not digested this leads to a weight loss, atrophy of skeletal muscle and thymus. It also induces changes in the hormonal levels in the body and stimulates the blood cell mitosis. Lectins bind to the brush border epithelium of the digestive tract and can be endocytosed into the circulation. Puztai *et al.* showed that high doses of PHA (0.2-0.8 g/kg b.wt. per day) cause damage of the small intestine mucosa induce coliform bacteria overgrowth in the intestine lumen and increase lipid mobilization and glucose oxidation.

#### **Mineral and trace elements contents of different pulses<sup>31</sup>**

**(All values are mg. per 100 gm of edible portion)**

Name	Mg	Na	K	Cu	Mn	Mo	Zn	Cr	S	Cl
<b>Green Gram whole</b>	127	28	843	0.39	2.47	0.304	3	0.014	188	12
<b>Green Gram Dal</b>	122	27.2	1150	0.39	1.02	0.446	2.8	0.01	214	25
<b>Black Gram whole</b>	154	-	-	1.05	1.01	0.81	3.3	0.012	-	-
<b>Black Gram Dal</b>	130	39.8	800	0.93	0.96	0.425	3.0	0.029	174	9
<b>Red Gram whole</b>	86	-	-	1.23	0.96	0.222	3.1	0.01	-	-
<b>Red Gram Dal</b>	90	28.5	1104	1.2	0.69	0.283	0.9	0.001	177	5
<b>Bengal gram whole</b>	169	-	-	1.01	0.74	-	2.9	0.032	-	-
<b>Bengal gram Dal</b>	130	73.2	720	1.34	1.05	0.195	1.7	0.001	160	39
<b>Horse gram</b>	156	11.5	762	1.81	1.57	0.749	2.8	0.024	181	8
<b>Kheari, dhal</b>	92	37.7	644	0.77	-	-	-	-	144	36

<b>Lentil, whole</b>	80	40.1	629	1.87	1.04	0.171	2.8	0.024	104	19
<b>Lentil,dhal</b>	74	-	-	1.37	0.81	-	3.1	0.020	-	-
<b>Moth beans</b>	225	29.5	1096	0.85	-	-	-	-	180	9
<b>Peas green</b>	34	7.8	79	0.23	-	-	-	-	95	20
<b>Peas dry</b>	100	20.4	725	1.29	0.58	0.638	2.3	0.032	189	59
<b>Rajmah</b>	184	-	-	1.45	1.60	-	4.5	0.029	-	-
<b>Red gram, whole</b>	86	-	-	1.23	0.96	0.222	3.1	0.010	-	-
<b>Red gram dhal</b>	90	28.5	1104	1.20	0.69	0.283	0.9	0.001	177	5
<b>Soyabean(black)</b>	238	-	-	1.12	2.11	-	3.4	0.028	-	-
<b>Soyabean (white)</b>	175	-	-	1.12						

## DISCUSSION

The term "pulse", as used by the United Nations' Food and Agricultural Organization (FAO), is reserved for crops harvested solely for the dry seed. FAO recognizes 11 primary pulses. This excludes green beans and green peas, which are considered vegetable crops. Also excluded are crops that are mainly grown for oil extraction (oil-seeds like soybeans and peanuts)

Legumes contain a number of bioactive substances including enzyme inhibitors, lectins, phytates, oligosaccharides, and phenolic compounds that play metabolic roles in humans. Enzyme inhibitors and lectins can reduce protein digestibility and nutrient absorption, respectively, but both have little effect after cooking<sup>32</sup>. Phytic acid can diminish mineral bioavailability<sup>33</sup>. Some phenolic compounds can also reduce protein digestibility<sup>34</sup> and mineral bioavailability, while galacto-oligosaccharides may induce flatulence<sup>35</sup>. These are scientific evidences for the general properties of *Shimbi Dhanya*. On the other hand, these same compounds may have protective effects against cancer<sup>36</sup>. Phytic acid has antioxidant and DNA protective effects<sup>37</sup>, phenolic compounds such as flavonoids and phenolic acids exhibit anti-

oxidant and other specific properties<sup>38</sup> and galacto-oligosaccharides may exert probiotic activity.<sup>39</sup>

### *Pulses for healthy complete diet*

Pulses provide protein, complex carbohydrates, and several vitamins and minerals. Like other plant-based foods, they contain no cholesterol and little fat or sodium. Pulses are good source of thiamine, riboflavin, niacin, pyridoxamine, pyridoxal and pyridoxine. Pulses also provide iron, magnesium, phosphorus, zinc and other minerals, which play a variety of roles in maintaining good health.<sup>40</sup> Pulses like pea and beans contain about 20% (dry weight) while soyabean upto 38–40%. The legume seeds are among the richest food sources of proteins and amino acids for human and animals. All legumes are relatively low in sulphur-containing amino acids, like methionine, cysteine and tryptophan, but the amounts of another essential amino acid, lysine are much greater than in the cereal grains. The cereal are rich in amino acid like methionine, thus when consumed daily together they supplement each other.

### *Pulses as Antioxidant*

Legume seed proteins exhibit free radical scavenging capacities. Horse gram (brown and black), cowpea (brown), com-

mon bean and *Masura* (moth bean) showed high protein content and also exhibited good DPPH scavenging activity, ferric reducing and reducing power activity. Comparatively, pea (white and green) and chick pea (white, green, brown) showed less antioxidant activity<sup>41</sup>. As the legumes are rich in antioxidants they can be considered as *Ajasrika Rasayanas* that have to be consumed daily.

As legumes have high protein content with high antioxidant activity they can be used as a food supplement and natural antioxidants. Therefore play a crucial role in the prevention of chronic diseases such as cancer and heart disease, cancer, diabetes, and Alzheimer's disease which are due to oxidative stress in body.

#### **Pulses and cardiovascular diseases**

Many pulses have *Kaphamedohara* Property hence are *Pathya* in cardiovascular disease and obesity which are proven through modern researches. Consumption of legumes has been associated with reduced risk of coronary heart disease and cardiovascular disease (CVD); legume consumption of four times or more per week compared with less than once a week, was associated with 22% lower risk of CHD, and 11% lower risk of CVD<sup>42</sup>. The study, led by Dr Peter Zahradka from the University of Manitoba, also suggested that consuming pulses like beans, peas, lentils and chickpeas can reverse the changes that happen in blood vessels due to high blood pressure.<sup>43</sup> In October 1999, the U.S. Food and Drug Administration (FDA) approved a health claim that  $\geq 6.25$  g of soya bean protein per serving reduces risk of heart disease. In particular, a daily soya bean protein intake of 25 g was considered beneficial, based on a number of previous clinical

observations. They also reduce total and LDL cholesterol levels<sup>44</sup> blood pressure<sup>45</sup>

#### **Pulses and diabetes**

Pulses like green gram and horse gram are *Kaphahara*, hence *Pathya* in diabetes. A substantial increase in dietary intake of legumes as replacement food for more rapidly digested carbohydrate might therefore be expected to improve glycaemic control and thus reduce incident diabetes<sup>46</sup>. Mung bean (*Vigna radiata*) is an excellent source of vitamins, minerals and protein with its essential amino acid profile comparable to that of soybean and kidney bean making it an attractive option for diabetic patients<sup>47</sup> It is also well documented that certain proteins in green gram exert both antifungal and antibacterial activity<sup>48</sup>

#### **Pulses and cancer**

An inverse association between vegetables, particularly dark green/dark yellow vegetables, legumes, and allium vegetables, with endometrial cancer risk had been evident. Dark green/dark yellow vegetables contain high levels of carotenoids, folates (with beans as an excellent dietary source) vitamin C, and riboflavin. Carotenoids and vitamin C may inhibit endometrial carcinogenesis via antioxidant effects, while folate influences DNA stability via its important role in the synthesis of nucleotides and DNA methylation. Folate also could affect carcinogenesis in numerous specific cancers (Kim et al., 2000 and Lucock, 2000)<sup>49</sup>

#### **Pulses and obesity**

The pulses when consumed in whole grain form are *Guru* and *Ruksha* hence *Pathya* in obesity. Study suggest person consuming whole grains, beans, and legumes, had the lower BMI, small waist circumference (WC), and the small mean annual increase in

BMI<sup>50</sup> One small trial performed in Mexico compared a low- and a high-GI diet, providing 63 g vs. 55 g, respectively, of carbohydrate from cereals and legumes. The low-GI diet (high in whole-grain bread and beans and with less white bread and rice) resulted in improved glycemic control and greater weight loss<sup>51</sup>

## CONCLUSION

The pulses should be consumed daily in the form of diet for health promotion and disease prevention. Even Acharya Charaka emphasizes on the daily intake of green gram and other pulses for the maintenance of health along with *Shuka Dhanyas*, *Phala* and *Shaka varga*. The pulses help in body building, stimulation of the immune system, regulation of lipid and hormone metabolism and detoxification of enzymes. They are beneficial in variety of diseases like Diabetes mellitus, hypertension, carcinoma etc.

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