



## MILLETS- A granules for the health of Sensory organs

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**ABSTRACT:** Millets are the small sided cereal grains which are sustainable food source and having tremendous amount of health benefits. They play an important role in providing adequate nutrition and possess beneficial effect on lifestyle disorders. several studies have shown different effects of millets like antioxidant, antimicrobial, antihypertensive, anticancer, and antidiabetic activity as they are rich in micronutrients like calcium, iron, zinc, magnesium, flavonoids, phenols and mainly they are gluten free in nature. Thus the aim of this review is to discuss the properties of millets which are helpful in nourishing the sensory organs and help to relieve them from different disorders.

**KEY WORDS:** Millet properties, antidiabetic, antihypertensive, sensory organs

### INTRODUCTION

Millets are a group of small seeded grains usually referred as “nutritious cereals”. They are widely cultivated globally but more in Asia and Africa, and serve as a staple food in many cultures. India is a major millet growing hub with a rich history of millet cultivation. Millets are the cereal grains belongs to Poaceae[grass] Family. And according to ayurveda they possess Kashaya Madhura rasa and vatapradhana kapha pitta shamaka in nature.[1]

Millets are predominantly classified in to two groups- Major millets and Minor millets

Major millets are- Sorghum [Jowar], Pearl millet [Bajra], and Finger millet [Ragi]. Minor millets are- Foxtail millets [Kagri], Kodo millet [Kodra], Proso millets [Cheena], Barayard millet [Sama], little millet [Kutki], Browntop millet [Hari kagri] [2].

Millets are not only having potential health benefits but also have nutritional value, Versatile in cooking, sustainable agriculture and Therapeutic properties, hence millets should be incorporated in our daily meals in a required quantity.

Therapeutic properties of millets can be viewed in two ways-

- 1] Supplementary nutrition through minerals, vitamins and gluten free property.
- 2]Therapeutic value through the presence of phytochemicals and special compounds that includes flavonoids, phenols, anthocyanidins, and antioxidant potential [3].

**Contents of Millets-[4]**

Grain	Carbo	Protei	Fa	Energ	Dietar	Ca	Zn	Fe	Mg	T	R	N	F
	Hydrates(g)	n (g)	t g	y k.cal	y fibre	mg	Mg	mg	mg			mg	ug
Sorghum	67.7	10.0	1.7	334.1	10.6	27.6	2.0	4.0	133.0	0.3	0.1	2.1	39.4
Pearl millet	61.8	11.0	5.4	348.0	11.5	27.4	2.8	6.4	124.0	0.4	0.2	0.9	36.1
Finger millet	66.8	7.2	1.9	320.7	11.2	364.0	2.5	4.6	146.0	0.3	0.2	1.3	34.7
Kodo millet	66.2	8.9	2.6	331.7	6.4	15.3	1.7	2.3	122.0	0.4	0.2	1.5	39.5
Proso millet	70.4	12.5	1.1	341.1	-	14.0	1.4	0.8	153.0	0.6	0.3	4.5	-
Foxtail millet	60.1	12.3	4.3	331.0	-	31.0	2.4	2.8	81.0	0.3	0.1	3.2	15.0
Little millet	65.6	10.1	3.9	345.3	7.7	16.1	1.8	1.3	91.4	0.3	0.1	1.3	36.2
Barnyard millet	65.6	6.2	2.2	307.1	-	20.0	3.0	5.0	82.0	0.5	0.1	4.2	-
Wheat	64.7	10.6	1.5	321.9	11.2	39.4	2.9	4.0	125.0	0.5	0.2	2.7	30.1
Rice	78.2	7.9	0.5	356.4	2.8	7.5	1.2	0.7	19.3	0.1	0.1	1.7	9.3

T= Thiamin, R=Riboflavin, N=Niacin, F=Folic acid

Apart from these millets also contains flavonoids, phenolics, anthocyanidins

Hence the millets possess antioxidant property, gluten free character aids low glycaemic index leading to antidiabetic property (high resistant starch and slowly digestible starch causes low post prandial blood sugar), phytochemicals aid in correction of lifestyle disorders, prevention of ailments like carcinogenesis, prolamin in millet increases digestibility of proteins, mitigates atherosclerotic Cardiovascular diseases by reducing BMI, proanthocyanidins causes antiobesity effect hence they are called “Nutricereals” [5]

And also called “Nutritional powerhouse” [6].

**Millets in oral health-**

Along with other health benefits millets also play a role in maintaining oral health. Millets are rich in calcium and phosphorous which helps in good dentition [7]. Pearl millet, finger millet and Kedomillet are high in calcium and iron and helps in remineralization of teeth and also prevent teeth sensitivity. Little millet is rich in magnesium helps to strengthen tooth enamel and combats gum inflammation. Browntop millet has rich antioxidant property and prevents plaque buildup on teeth. Foxtail millet is rich in iron and protein reduces risk of infection and helps for healthy gum. Barnyard millet has a detoxifying property helps to eliminate toxins that harm oral health [8].

### **Millet in ear health-**

Believe it or not what we eat can help our ears stay healthy and reduce tinnitus. Few studies have shown lower intake of fruit fibre and cereal fibre was significantly associated with 55-65% of risk of developing tinnitus over 10 years. Improved intake of fruits, vegetables rich in Vit D, Vit B12 and magnesium will improve the ear function [9]. Vit A, C, E, zinc and magnesium can protect our ears from damage. Omega 3 fatty acids help to reduce inflammation and improve the blood flow to ears [10]. As millets contain all these, regular intake of millets in a required quantity will definitely improve ear functioning.

### **Millet in Nasal health-**

In Ayurveda diet is critical for maintaining dosha balance with overall health. A proper diet can help manage and prevent sinus infection by regulating kapha dosha and strengthening the immune system. To pacify kapha it is recommended to eat warm, light and dry food such as barley, millets and roasted grains [11]. Millets are known for their immune boosting properties which can help prevent infections and reduce severity of nasal diseases. Finger millet has anti-inflammatory properties that can help reduce inflammation in respiratory tract. In ayurveda millets are believed to help balance kapha dosha which is associated with mucous congestion [12].

### **Millet in eye health-**

Various ophthalmological disorders occur due to nutritional deficiency. Millets are the miracle grains as they can grow under draught conditions providing nutritional benefits comparing to other cereals. Antioxidants including beta carotene and tocopherol which are precursor to vit A present in millets converts to Vit A which is crucial for vision and retinal health, it may also protect against Glaucoma and macular degeneration. Few research also suggest that finger millet polyphenols may have aldose reductase inhibitory activity which could help to prevent formation of cataracts [13]. Antioxidants like polyphenols and carotenoids protect retina and blood vessels in the eye. Magnesium present in millets help to regulate nerve and muscle function. Also, antioxidants fight off harmful substances called free radicals which can damage the cells including cells in the eyes. They also reduce oxidative stress and keeps eye healthy. Millets also have low glycaemic index which releases the sugar in the blood stream slowly which helps to maintain steady blood sugar level through out the day hence reducing the risk of diabetic complications like diabetic retinopathy [14]. So, adding millets into daily routine will be helpful in adding nutrition to the individual's eye.

### **Millet in skin health-**

Millets are rich in amino acids like L-lysine and L proline help to create collagen in the body, a substance which gives structure to skin tissue, it fortifies the collagen level to improve skin elasticity and make it less prone to wrinkles [15]

### **Side effects and allergies-**

Even though millets are consumed as staple food by millions of people from past thousands of years, there are few cases reported with side effects not major but minor. Excess consumption might cause adverse effects. Millets contain goitrogen a substance that interferes with production of thyroid hormone and inhibits iodine uptake and utilization by thyroid gland leading to goitre hence people with thyroid problems need to restrict consumption of millets [15]

## Millets and Ayurveda-

Ayurveda is a science which tells “Swasthasya swasthya rakshanam, Aturasya vikara prashamanam” means it promotes the maintenance of health before treating a disease. Hence, we will get numerous references about ahara, vihara, dinacharya, ritucharya regimens to maintain once perfect health. In ayurveda we get number of ahara Dravya ganas with high nutritional benefits one among them are kudhanyas or kshudradhanyas. These are mentioned in bhavaprakasha, Kaiyyadeva Nighantu and in Charaka Samhita.

Sushruta in 46<sup>th</sup> chapter of sutrasthana-nAnnapanavidhi Adhyaya has mentioned about kshudra dhanyas kudhanya. Sushruta has mentioned 16 types of kudhanya- Kodrava, Shyamaka, Nivaara, Shantanu, Varaka, Uddlaka, Priyangu, Madhulika, nandimukhi, Kuruvinda, Gavedhuka, Sara, Varuka, Todaparni, Mukundaka, Venuyava [16].

Acharya Charaka in the sutrasthana 26<sup>th</sup> chapter has mentioned kshudra dravyas and mentioned some varieties like Hastishyamaka, Neerava, Toyaparni, Anu, Priyangu, Mukjundha, Prashantika, Jhinti, Garmuti, Varuka, Varaka, Shimbira and jurna [17].

Bhavaprakasha Nighantu, Dhanyavarga chapter we get explanation about kudhanya, also called trinadhanya and kshudra Dravya having Ushna, Laghu, Ruksha gunas, Madhura rasa, Katu vipaka, Vatahara, Lekhana and Kleda shoshana karma. Excess consumption will lead to Vit Bhandas [18]

In Kaiyyadeva Nighantu also we get almost similar explanation as that of Bhava Prakasha Nighantu [19]. Even in Astanga Hridaya also we get similar explanation in Annaswaroopa vijñaniya adhyaya [20].

## CONCLUSION

In today era most of the population is suffering with many nutritional, noncommunicable lifestyle diseases due to their eating habits. Which in return affecting our sense organs and their functioning. So, it is very important to awake and get aware about the food habits and nutritional health not only combat the systemic diseases but also the diseases of sense organs and protecting their proper functioning. Both according to modern and Ayurvedic science millets possess all the nutritional value which not only help to cure the disease condition but also help to maintain the health of sensory organs.

All the research points towards the immense potential that millets have to be explored as Neutricereals, still there is a need for more systemic researches to be carried out to find out the effect of millets over sensory organs and functioning of sensory organs and identify the active molecules which are responsible for these effects.

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