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A critical review of Millets with special reference to Ayurveda

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ABSTRACT

Millets are a traditional staple food of the dry land regions of the world. In India, millets are grown on about 17 million hectares with annual production of 18 million tones and it contributes 10 percent to the country's food grain basket. In a visionary move the government of India proposed to united nation to designed 2023 as the international year of millets as 72 countries rallied behind the passes the UN general assembly recognized 2023 as the year to celebrate this humble grains. The available cultivable plant-based food resources in developing tropical countries are inadequate to supply proteins for both human and animals. Millets are an important food crop at a global level with a significant economic impact on developing countries, Millets are considered as high-energy yielding nourishing foods which help in addressing malnutrition. Grains of these millet species are widely consumed as a source of traditional medicines and important food to preserve health. Choosing millets as part of diet is a small step with a big impact these grain often overlooked contribute to personal health and environmental sustainability. Rich in nutrients, gluten-free and resilient in diverse climates, millets offer a sustainable alternative that can make a significant difference in both individual well-being and global food systems.

Key words: Millets, Shree Anna, Siri Dhanya, Kudhanya, Trina Dhanya

INTRODUCTION

Millets are the oldest and most basic indigenous food grains used as a primary source of nourishment. Millets are a group of small seeded grasses that have been cultivated for thousand of year, serving as staple food in various regions globally. Eg.- sorghum pearl millet,

finger millet and foxtail millet. The Latin term Milium, which gave origin to the English word "Millet," refers to a little seed (Robert, 2000).^[1] Macdonell and Keith (1958) define millets as plants in the Poaceae family with smaller seeds compared to cereals.^[2] They differ from other dietary grains in that they are smaller yet more nutrient packed. The Rigveda was the first to mention them, followed by the *Yajurveda* and *Atharvaveda* (Bindu, 2010).^[3]

Millets are referred to as *Kudhanya* (Shastri, 2011) (4) and *Trina Dhanya* (Gupta, 2011).^[5] In *Ayurvedic* literature. *Dhanyavarga* in *Charak Samhita* mentions personalities such as *Shyamak* and *Koradusha*. In *Rasa*, these are *Kashay* and *Madhura*, with *Sheeta* as their *Veerya*. They are easy to digest, increase *Vata*, balance *Kapha*, *Pitta*, *Ruksha*, and *Grahian*, and help to regulate *Ruksha*.^[6] Millets appear in various subsequent *Samhitas*. Additionally, *Dhanya Varga* in *Bhavprakash*

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mentions millets such as *Kodo*, *Gavedhuka*, and *Yavanal*, as well as *Kshudradhanya* (*Kanguni*, *Cheenak*, and *Shyamak*). *Shudradhanya* is *Ushna*, has *Kashaya* and *Madhura Ras*, *Laghu*, *Lekhan*, *Vipakais Katu*, *Ruksha*, *Vatakaraka*, and *Grahi*, and reduces *Pitta* and *Kapha*, according to *Bhavprakash*.^[7]

Ayurveda provides detailed explanations of millets under *Dhanya Varga*. Millets are known by several names, including *Kudhanya* (inferior among cereals)^[12], *Kshudra Dhanya* (small sized cereals)^[13], and *Trina Dhanya* (grass-derived cereals).^[14]

These ancient grains are known for their resilience in diverse climates nutritional benefits and sustainability. Millets are rich in nutrients like fiber, vitamins and minerals making them a valuable addition to a balanced diet. Their adaptability to different ecosystems contributes to food security and agricultural sustainability. In a visionary move the government of India proposed to the united nation to designate 2023 year as the international year of millets (IYOM 2023).as 72 countries rallied behind the cause, the UN General Assemblies recognized 2023 as the year to celebrate these humble grains.

MATERIALS AND METHODS

A detailed assessment and analysis of ancient literature related to the millet was conducted, which included a thorough exploration of the texts within their historical and cultural contexts, using both manual and electronic methods. This thorough analysis has discovered important facts on millets. The material collected on millets has been rigorously organized and properly structured to build a cohesive and logical framework. This category is based on distinct historical eras, such as the Prehistoric, *Vedic*, *Puranic*, *Samhita*, and *Nighantu* periods. Each portion of this organized data reflects a different historical period, offering significant insights into the evolution and use of millets across time.

Benefits of Millets

Millets are significantly better to wheat and rice in terms of nutrition. Millets have more fibre and less minerals than wheat and rice. All other millets have at

least twice as much calcium as rice, with finger millet having 30 times the calcium amount.^[8] Millets include an abundance of beta carotene, vitamins, and minerals. Millets have a high concentration of linoleic, oleic, and palmitic acids, as well as monogalactosyl, diacylglycerols, digalactosyl diacylglycerols, phosphatidylethanolamine, and other essential fatty acids. Millets provide phosphorus and vitamin B components such as niacin, folacin, riboflavin, and thiamine, which help the body manufacture cellular energy.^[9]

Millets have been cultivated for centuries for several reasons, including their high nutritional value.

1. Drought resistant:^[10] Millets require less water for cultivation than other cereals, making them ideal for water-scarce locations and able to withstand drought conditions.
2. Millets are resistant to pests and illnesses, reducing farmers' burden and providing health benefits.^[11]
3. Millets have a short growth season, reaching maturity within 60-100 days.^[12]
4. Rich in phytochemicals and micronutrients, making them remarkable nutritional values.^[13]
5. Alkaline-forming grain: ^[14] Maintains PH equilibrium in body.
6. Gluten free:^[15] Millets being gluten free becomes a good choice for those who have Gluten intolerance which is one of the major Gastro intestinal disease in present era

Types of millets^[16]

Major Millets

- a) Pearl Millet (*Bajra*)
- b) Finger Millet (*Mandua/Ragi*)

Minor Millets

- a) Foxtail Millet (*Kangani*)
- b) Proso Millet (*Chena*)
- c) Little Millet (*Kutki*)

- d) *Kodo Millet (Kodon)*
- e) *Barnyard Millet (Sanwa)*

Pseudo Millets

- a) *Buckwheat (Kuttu)*
- b) *Amaranth (Rajgira)*

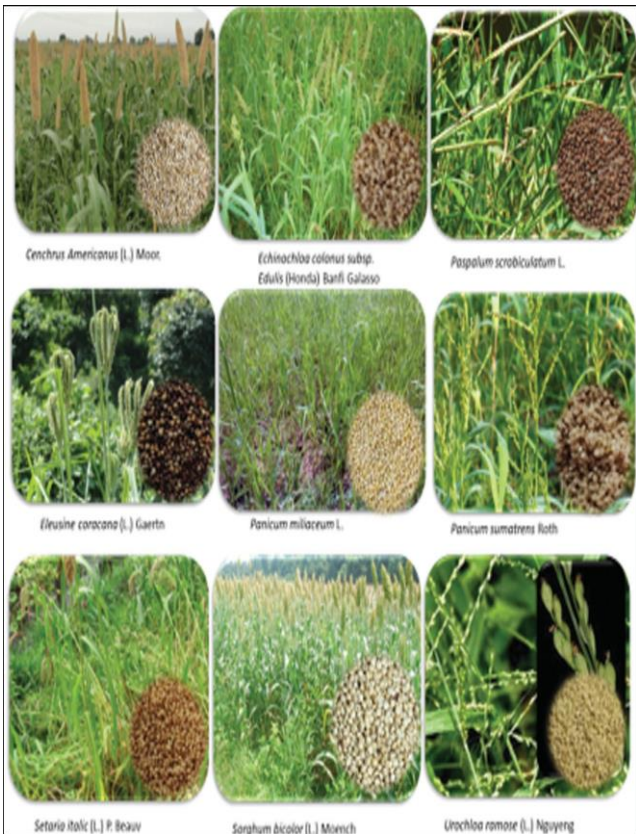
Structure of Millet grain:^[17]

1. **Bran** - The kernel's multi-layered outer skin protects the other two components from sunshine, pests, water, and disease. It includes essential antioxidants, iron, zinc, copper, magnesium, B vitamins, fibre, and phytonutrients.
2. **Germ** - The embryo, if fertilized by pollen, will grow into a new plant. It includes vitamins B and E, antioxidants, phytonutrients, and unsaturated fats.
3. **Endosperm** - It is the germ's food supply. If the grain were allowed to grow, it would provide essential energy to the young plant. The endosperm is the main part of the kernel, includes starchy carbohydrates, proteins, and trace quantities of vitamins and minerals.

List of millets in *Charak Samhita*^[18]

Millet	Botanical name	Synonyms	Rasa	Guna	Therapeutic Diseases
Shyamaka (Barnyard Millet)	<i>Echinochloa frumentacea</i> Linn,	Shyamak, Shyam, Tribeel, Rajdhanya, Trinbeel, Uttam (Shastri, 2011)	Madhur Kashaya	Sangrahi, Dhatu shoshaka Sheet, Snigdha, Laghu	Obesity, Rakta Pitta, Kasa, Urustambha Stanyadosha Jalodara
Koradusha / Kodo Millet	<i>Paspalum scrobiculatum</i> Linn.	Kodrav, Kordush, Kudyal, Uddalak Madanagraj	Madhur Tikta	Guru, Param Graahi, Vishahara, Avrishya, Pathya in Vrana, Ruksha	Obesity, Rakta Pitta Kasa, Visha Urustambha, Trishna Jalodara, Kustha Stanyadosha, Jalodara

Gavedhuk (Job's tear)	<i>Coix lacryma jobi</i> Linn.	Vaijyanti	Katu Madhur	Ruksha, Guru, Param Graahi, Vishahara, Avrishya, Pathya in Vrana	Obesity, Kaphaj, Chardi
Kangu / Priyangu (Foxtail Millet)	<i>Setaria italica</i> Linn., Beauv	Kanguni, Pitatandula, Vatal, Sukumar, Priyangu	Madhur Kashaya	Guru, Sangrahi, Brumhana, Shoshana, Bhagnasandhanakrit, Durjara, Vrishya, Ruksha	Kustha, Vatrakta Pitta Daha Nashak, Bhagna Asthi Sandhan
Cheena (Proso Millet)	<i>Panicum milaceum</i> Linn.	Varak, Sthulkangu, Sthul Priyangu, Kngubhed, Marha	Madhur Kashaya	Guru, Durjara, Brumhana, Bhagnasandhanakara,	Brihana
Jwar/Yavanaala (Great Millet)	<i>Sorghum vulgare</i> pers,	Jurnahwa, Yavnal, Raktika, Krostupuccaha, Sugandhika	Madhur	Avrishya, Ruchya, Trishghna, Kledaghna Guru, Sheet	Brihana, Malrodhak, Ruchikarak, Viryavardhak, Rakta Vikar
Bajra (Pearl Millet)	<i>Pennisetum typhoides</i> Burm.f.St apf. & Habbard	Bajranna, Sajak, Nalika, Neelkaran, Agraydhanaya	Madhur	Rukshaushana	Balya, Agnideepak, Strikamodpada, Punsatvahar Durjara (Nighantu Ratnakar)
Neewar	<i>Hygroryza aristata</i> Nees.	Tini, Aranyadhanya, Munidhanaya, Trinodbhava	Madhur	Laghu Snigdha, Sheet	Raktapitta, Vatarakta, Pathya, Kaphakarak, Malmutroddhak
Ragi/Nartaki (Finger Millet)	<i>Eleusine coracana</i> Linn.	Madhuli, Ragika, Nartak, Madua	Madhur Tikta Kashaya	Laghu, Sheet	Brihana, Triptikark Balakarak, Rakta Pitta



Nali - Pearl millet
(*Pennisetum glaucum* (L.) R. Br.)



Kodrava - Kodo millet
(*Paspalum scrobiculatum* L.)



Yavanal - Sorghum
(*Sorghum bicolor* (L.) Moench)



Chinaka - Proso millet
(*Panicum miliaceum* L.)



Ragi - Finger millet
(*Eleusine coracana* (L.) Gaertn.)



Kangu - Foxtail millet
(*Setaria italica* (L.) P. Beauv.)



Little millet

(*Panicum sumatrense* Roth. ex Roem. & Schult.).



Shyamaka - Barnyard millet

(*Echinochloa frumentacea* L.).



Gavedhuk - Job's tear

Coix lacryma jobi Linn.

DISCUSSION

The majority of the health benefits of millet are due to the inclusion of phytochemicals such as dietary fibre, polyphenols, tocopherols, and phytosterols, as well as an abundance of specific minerals, vitamins, trace elements, essential fatty acids, and amino acids. According to *Ayurvedic* texts, Millets often have properties that qualify them for *Kaphaj*, *Pittaj*, and *Raktaj Vyadhi*. Millets should not be administered to

Vataj Vyadhi patients since they increase *Vata Dosha*. Although particular markers for each millet are not provided, they can be determined by examining its *Guna* (properties) and *Karma* (actions).^[19]

Millets are the least allergenic and most readily digestive meals, and they are considered one of the best foods for persons who are gluten sensitive. Millets are key crops in semiarid and tropical parts of the world because of their short growing seasons, tolerance to pests and diseases, and productivity in hot and dry settings where main cereals cannot be depended on to produce sustainable yields. They are commonly consumed by the least fortunate elements of society as foods that improve health and vitality. Millets offer similar nutritional potential to common cereals such as rice, wheat, and barley in terms of protein, carbohydrate, and calorie content.

Millets are difficult to digest due to their high fiber, protein, and low carbohydrate content, so it's crucial to recommend them based on an individual's *Agni Bala* (digestive capacity).^{[20],[21]} These properties provide long-lasting fullness, as well as *Lekhana* (scraping) and *Kledashoshana* (drying out excess moisture), making them effective in treating *Santarpanjanya Vyadhi* (diseases caused by overnutrition of single or numerous tissues). Millets, while being heavy to digest, are referred to as *Laghu* (Lightness) in general attributes. Proper digestion of millets results in a sense of lightness in the body.

CONCLUSION

Millets can play a big role in Indian food due to their diverse range of nutrition, including pearl millet, foxtail millet, and finger millet. Millets provide several health advantages, including energy, fiber, protein, and important minerals. Their flexibility in culinary uses makes them a key ingredient in many traditional cuisines. Millets serve a crucial part in fostering better living in India and abroad since people prioritize nutrition in their meals.

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