

Boon of Small Millets in Our Life: An Introduction and Its Nutrition Quality

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Abstract

Millets are one of the cereals besides the major wheat, rice, and maize. Small millets are traditional staple food in dry land areas and are well known as Nutri-cereals due to high nutrient content. The group of minor millets is consisting mostly seven types of species, namely finger millet, kodo millet, little millet, foxtail millet, barnyard millet, proso millet, browntop millet. Minor millets are loaded with nutrients like Ca, Mg, Mn, Zn, Fe, phosphorous, fiber, B complex vitamins and proteins. Millets can be grown in a short period, can sustain drought condition crop and have long storage period without insect damage. Regular use of millet is very useful for postmenopausal females with indications of cardiovascular disease such as high blood pressure and high level of cholesterol. It includes huge quantity of antioxidants that help against oxidative stress and maintain glucose concentrations in type-2 diabetes.

Introduction

Millets are forage grasses, which belong to family *Poaceae*. Small millets are as cereal as major millets like wheat, rice, and maize. Millets are a powerhouse of nutrients. Millets is unique among the cereals because of their richness in calcium, dietary fibre, polyphenols and protein. Millets boost your health and improve weight loss, besides being gluten-free. Speak to any fitness enthusiast, and they will vouch for the miraculous benefits of eating millets. The population of central and southern India consumed millets daily until the green revolution made rice and wheat more accessible. Millets are suitable staples when focusing on the food and nutritional security of the common people (Tiwari *et al.*, 2022). Millets are short period crop and they can sustain even drought condition. They have long storage capacity without insect damage. Compared to major cereals (Rice, Wheat and Maize), small millets have better water use efficiency, nutrient use efficiency, lower global warming potential (GWP), better resistance to biotic and abiotic stresses and are nutritionally dense.

Introduction to small Millet: Definition

A number of different small grain grasses are called millets. Small millets are a traditional dry land staple meal and are well known as Nutri-cereals due to their high nutrient content. Millets are mainly divided in two groups first is major millets/coarse grain millets (Pearl millet, sorghum) and minor millets/small grain millets (finger millet, kodo millet, etc.). The sheer affordability of millets also tags them as “poor man’s food grain”. Minor millets are composed of seven different species: finger millet, kodo millet, small millet, foxtail millet, barnyard millet, proso millet, and browntop millet.

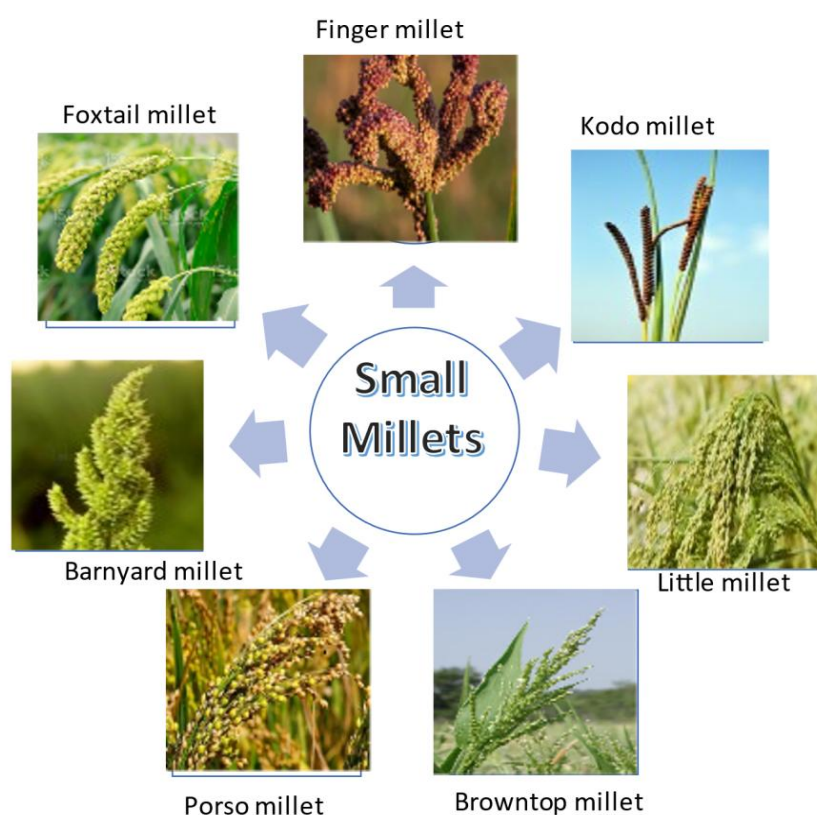


Fig. Different types of minor millets.

1. Finger millet

Finger millet (*Eleusine coracana L. Gaertn*) is an annual kharif crop and also known as mandua, ragi, african millet, nagli, ragulu and nachni etc. The finger millet grain has a high nutritional value since it contains 65-75% carbs, 2.5-3.5% minerals, 5-8% protein, and 15-20% dietary fibre. (Chetan and Malleshi, 2007). The grains of finger millet are rich in calcium 344 mg/100g (Shobana *et al.* 2013), fiber, protein, minerals have low glycemic index which helps to manage diabetes and blood pressure. Finger millet is generally referred to as

"nutritious millet" since the grains exceed many cereals in terms of protein, minerals, calcium, and vitamins. It is important to enhance the production and productivity of this millet. It is a low-water-use crop that can provide food security for those people living in harsh and tough territories (poorly fertilized and dry soils). A multitude of small farmers grow finger millet with limited water resources. This crop is commonly referred to as "poor people's crop" in several countries. The dried seeds of finger millet are used to make "Kodo ko jaanr," a popular alcoholic fermented beverage used in India's Darjeeling hills and Sikkim.

2. Kodo millet

Kodo millet (*paspalum scrobiculatum* L.) is an annual small grain that is grown in primarily in India. Kodo millet is also known as varagu, kodo, haraka, arakalu, ditch millet, rice grass, cow grass, native paspalum or Indian crown grass. Kodo millet is gaining importance due to dual reasons like nutritional properties and stress tolerance (Kumar *et al.*, 2016). It provides low priced protein, minerals and vitamins in form of sustainable food. Kodo millet is rich in vitamins, minerals, and phytochemicals containing sulfur, so it is called "nutria-cereals. It is also rich in essential amino acids, like lysine, threonine, valine, sulphur containing amino acids. Kodo millet is useful in curing asthma, migraine, blood pressure, heart attack and atherosclerosis, diabetic heart disease.

3. Foxtail millet

Foxtail millet (*Setaria italica*) is important staple food for millions of people in Southern Europe and Asia. Foxtail millet is commonly known in India as Kangni, Kang, Navane, Kaon, Kavalai, and Tenai. Foxtail millet is one of the earliest cultivated crops, extensively grown in the arid and semi-arid regions of Asia and Africa, as well as in some other economically developed countries of the world. It is more commonly used as bird feed in the different countries. Because of C4 type of photosynthesis, genetically closely related to biofuel grasses and abiotic stress tolerance, it is known as versatile crop. The main components of foxtail millet are starch, protein, dietary fibers, fat, vitamins, and minerals (Yang *et al.*, 2013).

4. Barnyard millet

Barnyard millet (*Echinochloa frumentacea*) is belonged to the family Poacea and it is self-pollinated crop. Barnyard millet is the oldest domesticated small millet. Barnyard millet is commonly known as sanwa, Jhangon, oodalu, udalu and shhyama in India. It is mainly

cultivated in Orissa, Maharashtra, Madhya Pradesh, Tamil Nadu, Bihar, Punjab, Gujarat and hills of Uttarakhand. Barnyard millet is a multi-reason crop. Nutritional composition of barnyard millet in per 100gm is; 10.1% protein, 8.7% moisture, 3.9% fat, 6.7% crude fiber, 2.0% total fat, 68.8% carbohydrate and 398 kcal/100 g energy. Nutritionally, it is a decent source of protein, which is profoundly absorbable and is an amazing source of dietary fibre. Total dietary fiber content was high (12.5%) including soluble (4.2%) and insoluble (8.4%) fractions was recorded. (Ugare *et al.*, 2014).

5. Little millet

Little millet (*Panicum sumatrense*) is a valuable and nutritional small seeded hardy cereal crop locally known as kutki, sava, same, samai. Tribals, poor and marginal farmers primarily grow the crops for their own consumption using poor management techniques. The crop is highly drought tolerant and nutritionally as well as medicinally superior to or on par with other cultivated cereals. Grains are recommended for diabetic and patients of cardiovascular diseases. The grain of little millet possesses excellent storage properties and can be stored for several years without fear of store grain pests under ordinary storage conditions. The little millet is an important millet crop, which has wide application in food processing; so, there is a need to study its various applications and its composition and nutraceutical value and safety for incorporation in food products.

6. Proso millet

Proso millet (*Panicum miliaceum*) is a warm season grass grown in 60-100 days. Proso millet, also called as the white millet, hog millet or Kashif millet is widely grown and consumed in India. Proso millet is a viable alternative income crop due to its distinct qualities, which include heat and drought resistance. Over marginal lands with low fertility, it is one of the best crops for sustaining agriculture and ensuring food security. The proximate nutritional composition of proso millet is similar to that of other millets. Its starch can vary from 62 to 68% and the amylose content expressed as percentage of the grain is about 17% on a dry basis (Yanez *et al.*, 1991).

7. Brown top millets

Brown top millets are widely grown in dry regions of Karnataka, Andhra Pradesh, and north-central India. These millets can be cultivated on hard soil with minimal water. They are drought and heat tolerant crops, and their ability to tolerate shadows differentiates them from

other crops. These tiny seeds are high in protein, healthy fats, carbohydrates, and dietary fibre. They also include a wealth of essential nutrients such as calcium, iron, phosphorus, potassium, magnesium, manganese, copper, sodium, and zinc. The regular consumption of this nutrient-dense grain reduces the chance of developing cardiovascular disease, diabetes, and digestive issues.

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