

Little millets: Properties, functions and future prospects

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■ **Abstract :** In the current scenario where the world around is facing the severe problem of climate change it is greatly impacting the agricultural sector. The farmers have a great problem of irrigation because of depleting water layer. Thus millets which require less water and can easily grow in arid and semi-arid lands. Millets as a whole are highly nutritious, non-glutinous and non-acid forming foods (FAO, 2001). Hence, they are easy to digest. Among all the grains millets are considered to be the least allergenic and most digestible grains. Also millets have low glycemic index. Millets are particularly high in minerals like iron, magnesium, phosphorus and potassium (FAO, 2001). Little millets are good source of proteins, minerals and phytochemicals thus there is a great scope of it in combating nutritional issues and can be helpful in providing adequate nutrition to various sections of the society. Thus in the given review paper a consolidated information regarding little millet is presented.

■ **Key words :** Little millets

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The little millet (*Panicum sumatrense* Roth ex Roemer and Schultes) is minor millet which belongs to the family of Poaceae (Gramineae). The common name of the crop is kutki, sawa, samai, samalu (Padulosi *et al.*, 2009). It originated in the Indian subcontinent.

The crop is cultivated by tribal and poor farmers in low fertile soils with low or no cash input for food and feed. It has an excellent rejuvenating capacity compared to other cereal crops. In India, the crop is cultivated in an area of 291 thousand hectares with annual production of 102 thousand tones and productivity of 349 kg per hectare (Anonymous, 2011) which is very less as compared to other cereal crops. Andhra Pradesh, Chhattiishgarh, Madhya Pradesh, Odisha, Tamil Nadu, Karnataka, Jharkhand and Gujarat are major little millet growing states in the country. In Madhya Pradesh, the

crop is cultivated in 51.54 thousand hectare with productivity of 525.5 kg per hectare (www.landrecords.mp.gov.in). Dindori, Mandla, Chhindwara, Balaghat, Seoni, Anuppur, Betal, Singrauli, Umaria, Sidhi, Shahdol, Jabalpur, Narsinghpur, Raisen and Khandwa are major little millet growing districts of Madhya Pradesh. The crop is highly drought tolerant and nutritionally as well as medicinally superior or at par with other cultivated cereals. Grains are recommended for diabetic and patients of cardio-vascular diseases. The grain of little millet posses excellent storage properties and can be stored for several years without fear of store grain pests under ordinary storage conditions. Little millet is well known for its drought tolerance and is considered as one of the least water demanding crop. Being eco-friendly, the crop is suitable for fragile and vulnerable agro-ecosystems.



Fig. 1 : Little millet (*Panicum sumatrense* Roth ex Roemer and Schultes)

Origin and geographic distribution :

The plant originated in the Andes and is a hybrid of wild *Panicum sumatrense* L. subspecies *quitensis* (Kunth) Costea and Carretero and the cultivated *Panicum sumatrense* (Hu *et al.*, 2009).

It is one of Little millet is comparable with other cereal grains such as rice and wheat as a source of protein, fat, carbohydrates and crude fibre, apart from minerals and vitamins. It also contains phytochemicals, such as phenolic acids, flavonoids, tannins and phytate (ICRISAT).

Botanical description :

The plant is 5 – 2.5 m tall mostly reddish or purplish in colour; stout stems, partially branched with long hairs. Leaves arranged spirally, simple and entire; stipules are absent; petiole is upto 8 cm long; blade broadly ovate

Table 1 : Description of <i>Panicum sumatrense</i>		
Sr. No.	Classification	Scientific name
1.	Botanical name	<i>Panicum sumatrense</i>
2.	Kingdom	<i>Plantae</i>
	[Unranked]	<i>Angiosperms</i>
	[Unranked]	<i>Monocots</i>
	[Unranked]	<i>Commelinids</i>
3.	Order	<i>Poales</i>
4.	Family	<i>Poaceae</i>
5.	Subfamily	<i>Panicoideae</i>
6.	Tribe	<i>Paniceae</i>
7.	Genus	<i>Panicum</i>
8.	Species	<i>P. sumatrense</i>

rhomboid-ovate, Inflorescence large (upto 1.5 m) and complex, consisting of numerous agglomerated cymes a axillary and terminal spikes, the terminal one pendant to erect; bracts 3–4 mm long, membranous, pale, with a long awn. Flowers unisexual, sessile; with 5 mucronate tepals stamens c. 1 mm long; female flowers crowned by 3 stigmas. Fruit an ovoid long, circumscissile, almost smooth or slightly furrowed, abruptly narrowed to a short thick beak, 1-seeded.

Composition of *Panicum sumatrense* :

Table 2 shows composition of *Panicum sumatrense* per 100 g edible.

Table 2 : Composition of <i>Panicum sumatrense</i>		
Sr. No.	Ingredients	Quantity/100 g
1.	Water	9.8 g
2.	Protein	14.5 g
3.	Fat	6.5 g
4.	Carbohydrate	66.29 g
5.	Crude fibre	15.2 g
6.	Calcium	153 mg
7.	Magnesium	266 mg
8.	Phosphorus	455 mg
9.	Iron	7.6 mg
10.	Zinc	3.2 mg
11.	Thiamine	0.08 mg
12.	Riboflavin	0.21 mg
13.	Niacin	1.29 mg
14.	Vitamin B ₆	0.22 mg
15.	Folate	49 µg
16.	Ascorbic acid	3.7 mg
17.	Tryptophan	181 mg
18.	Lysine	747 mg
19.	Methionine	226 mg
20.	Phenylalanine	542 mg
21.	Threonine	558 mg
22.	Valine	679 mg
23.	Leucine	879 mg
24.	Isoleucine	582 mg
25.	Linoleic acid	2834 mg
26.	Oleic acid	1433 mg
27.	Palmitic acid	1284 mg
28.	Stearic acid	220 mg
29.	Energy	1565 kJ (374 kcal)

Edible uses :

Seeds of these millets are very small but easy to



Fig. 2 : Samai millet (*Panicum sumatrense*) with husk

harvest and very nutritious. They are eaten cooked or ground into a powder and used for making cakes etc. They can also be sprouted and used in salads. The seed can be cooked whole, and becomes very gelatinous, but it is rather difficult to crush all of the small seeds in the mouth and thus, some of the seed will pass right through the digestive system without being assimilated. The flowers are used as a food colouring in ceremonial maize bread.

Medicinal uses :

In South America grain amaranths are traditionally used in medicine, folk festivals, and as dye sources. In Ethiopia the root is used as a laxative, and the seed for expelling tapeworms and for treating eye diseases, amoebic dysentery, and breast complaints. In India the plant is taken as a diuretic and it is applied to sores (Alfonso and Brüggemann, 2012; Corral *et al.*, 2012 and Sivakumar *et al.*, 2006).

Conclusion :

The little millet is an important millet crops 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.

Apart from its use in food products it also has huge potential to being used up in medicinal purpose.

The high productivity of this millet in various parts of India has emphasized its use in various food products

and also non-food purpose because of its multi-nutritional value.

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