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Little Millet (*Panicum sumatrense*): A Comprehensive Overview of a Nutritious and Resilient Crop

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Abstract

Little millet (Panicum sumatrense) represents a remarkable yet underutilized agricultural resource with significant potential for addressing nutritional challenges and sustainable farming practices. This comprehensive exploration delves into the botanical, nutritional, agricultural, and socioeconomic dimensions of this extraordinary grain, highlighting its unique characteristics and promising future in global food systems.

Introduction

In an era of increasing food insecurity and environmental challenges, millets have emerged as a critical crop with extraordinary potential. Among these, little millet stands out as a particularly remarkable grain, offering a compelling solution to multiple agricultural and nutritional challenges. Traditionally cultivated in the semiarid tropical regions of Asia and Africa, this small-seeded grain has been a staple food for generations, yet remains largely unknown in global agricultural discourse.

Originating in Southeast Asia, little millet has demonstrated remarkable adaptability, thriving in environments where conventional crops struggle. Its ability to grow under harsh conditions, coupled with exceptional nutritional properties, positions it as a potential game-changer in sustainable agriculture and nutrition strategies.

Botanical Characteristics and Origin

Little millet is an annual grass typically growing 50-150 cm in height, characterized by slender stems and elongated leaves approximately 30 cm long and 5 mm wide. The seeds, measuring just 1-2 mm in diameter, are predominantly white, yellow, or grey, encased in a hard protective hull that must be removed before consumption.

Currently cultivated across India, China, Malaysia, Sri Lanka, Nepal, and Myanmar, the crop finds particular significance in the tribal regions of Eastern Ghats, Madhya Pradesh, Chhattisgarh, Jharkhand, and Andhra Pradesh. Its distribution reflects not just its agricultural versatility but also its deep cultural embedment in these regions.

Vermicular Names:

Hindi- Kutki, Shavan
Bengali- Sama
Punjabi- Swank
Telugu- Samalu
Oriya- Suan
Kannada- Sama, Same
Gujarati- Gajro, Kuri
Tamil- Samai
Marathi- Sava, Halvi, Vari

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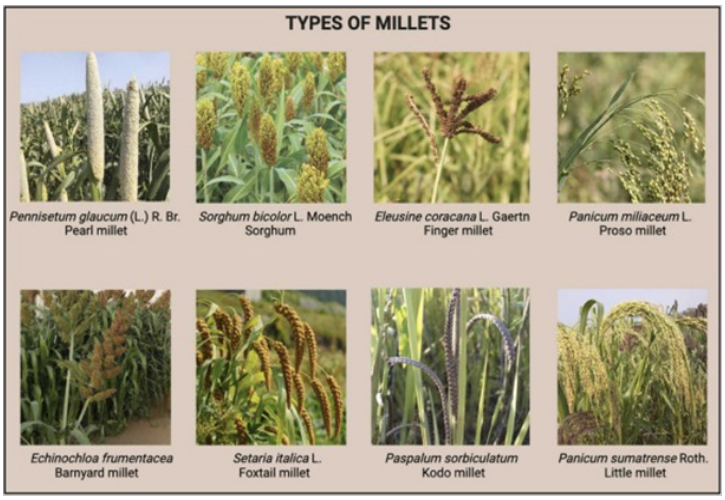

(Rashmi Raniet al., 2024)

Nutritional Profile: A Powerhouse of Health

The nutritional composition of little millet is nothing short of extraordinary. Its comprehensive nutrient profile includes:

- Carbohydrates: 65.55%
- Protein: 10.13%
- Fats: 3.78%
- Dietary Fiber: 7.72%

Mineral content is equally impressive, with notable concentrations of:

- Iron: 9.3 mg/100g
- Phosphorus: 130 mg/100g
- Zinc: 1.82 mg/100g
- Magnesium: 91.41 mg/100g

The grain's nutritional excellence extends beyond macronutrients. It is rich in vitamin B-complex, essential for maintaining healthy nervous, cardiac, and digestive systems. The high fiber content promotes digestive health, while its low glycemic index makes it an excellent choice for individuals managing diabetes.

Phytochemicals include phenolic acids, flavonoids, and tannins, which offer potent antioxidant properties. The presence of unique amino acids like methionine, cysteine, and lysine further enhances its nutritional value, making it especially beneficial for vegans seeking plant-based protein sources.

(Nutrient (per 100g	Little Millet	Rice	Wheat	Maize
(%) Carbohydrates	65.55	78.2	70.7	74.3
(%) Protein	10.13	6.8	11.8	9.2
(%) Dietary Fiber	7.72	0.4	1.2	2.7
(Iron (mg	9.3	0.8	3.5	2.7
(Magnesium (mg	91.41	25	126	127
(Zinc (mg	1.82	1.09	2.6	2.3

Table 1: Comparative Nutritional Profile of Little Millet with Other Cereals

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Cultivation and Agricultural Adaptability

Little millet's most distinctive feature is its extraordinary resilience. It thrives in environments that would challenge most crops, demonstrating remarkable adaptation to erratic climate conditions, inadequate moisture, and marginal soil qualities. Its low water requirement and drought tolerance make it an ideal crop for rainfed agricultural systems.

The crop grows optimally in deep, loamy soils rich in organic matter, with cultivation ranging from sea level to altitudes of 2000 meters. Sowing periods vary by region, typically during the Kharif season (first fortnight of July) or Rabi season (September to October), depending on local climatic conditions.

Climate:

Little Millet is also highly adaptable to different environments, and can grow in a wide range of soil types and climatic conditions. It is particularly well-suited to dryland agriculture, as it has a low water requirement and can tolerate drought conditions. Hence it is a good catch crop under rainfed condition. Its cultivation is restricted to hilly regions upto an altitude of 2000m. It cannot withstand colder temperatures below 10 °C.

Soils:

Little millet is described as a quick growing, short duration cereal which can withstand both drought and water logging. Deep, loamy, fertile soils rich in organic matter are preferred for satisfactory growth.

Time of Sowing:

Kharif- first fortnight of July with the onset of monsoon.
Rabi- September to October in Tamil Nadu and Andhra Pradesh.
Mid-March - mid May in the states of Bihar and Uttar Pradesh as irrigated catch crop.

State- wise varieties of little millet:

STATE	VARIETY
Odisha	OLM 203, OLM 208 and OLM 217
Madhya Pradesh	JK 4, JK 8 and JK 36
Andhra Pradesh	OLM 203 and JK 8
Tamil Nadu	Paiyur 2, TNAU 63, CO-3, CO-4, K1, OLM 203, OLM 20
Chhattisgarh	JK 8, BL 6, BL-4, JK 36
Karnataka	OLM 203, JK 8
Gujarat	GV 2, GV 1, OLM 203, JK 8
Maharashtra	Phule Ekadashi, JK 8, OLM 20

CLMV 1 is a high yielding variety released in 2020, rich in protein (14.4%), Fe (59 mg/kg) and Zn (35 mg/kg).

Spacing:

25-30 cm (row to row), 8 – 10 cm (plant to plant). The seed should be planted 2-3 cm in depth.
Seed rate: 8-10 kg/ha for line sowing 12- 15 kg/ha for broadcasting.

Manuring and fertilization:

Farmyard manure @ 5-10 tonnes/ha is applied about a month before sowing. Generally fertilizer recommended to get a good crop are 40 kg N (split dozes), 20 kg P and 20 kg K per ha.

Krishi Netra
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Weeding and Intercultural Operation:
Two inter cultivations and one hand weeding in line sown crop and two hand weeding in broadcast crop In broadcast crop (1st weeding after 15 – 20 days after emergence of seedling and 2nd weeding 15-20 days after 1st weeding) is necessary for effective growth. Intercultural operation using a tyne-harrow when crop is 30 days old is also recommended.

Irrigation:
1st irrigation at25- 30 DAS and 2nd irrigation after 45- 50 DAS.
Cropping systems
Intercropping

Orissa: Little millet +Black gram (2:1 row ratio).
Madhya Pradesh: Little millet + Sesame/ soybean/ pigeon pea (2:1 ratio).
Southern Bihar: Little millet + pigeon pea (2:1 ratio).

Harvesting:
Kharif Season Crop: September- October.
Rabi Season Crop: January- February

Yield:
Grain: 12- 15 q/ha
Straw: 20- 25 q/ha

Traditional and Modern Culinary Applications
Traditionally consumed as a rice substitute, little millet's culinary versatility is remarkable. It can be transformed into various dishes including dosa, upma, khichdi, porridge, and numerous traditional recipes across different Indian states. Its smaller grain size ensures faster cooking compared to rice, adding to its practical appeal.

Economic and Sustainability Perspectives
Despite its numerous advantages, little millet remains an underutilized crop. The current agricultural landscape presents an opportunity to develop value-added products that can enhance farmer incomes and contribute to sustainable food systems. By promoting little millet, we can address multiple challenges simultaneously: nutritional security, agricultural sustainability, and economic empowerment.

Conclusion
Little millet represents more than just a grain—it is a potential solution to complex challenges in nutrition, agriculture, and sustainable development. As global populations confront increasing food insecurity and nutritional challenges, crops like little millet offer a beacon of hope.The future of little millet lies not just in its cultivation but in comprehensive research, product development, and strategic agricultural policies that recognize and leverage its extraordinary potential. Continued investment in research, farmer support, and market development could transform this modest grain into a global nutritional powerhouse.

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