



E-ISSN: 2321-2187

P-ISSN: 2394-0514

[www.florajournal.com](http://www.florajournal.com)

IJHM 2022; 10(5): 11-14

Received: 08-07-2022

Accepted: 14-08-2022

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## Analytical study of little millets and therapeutic effect of little millets based on its components in type 2 diabetes mellitus

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**DOI:** <https://doi.org/10.22271/flora.2022.v10.i5a.832>

### Abstract

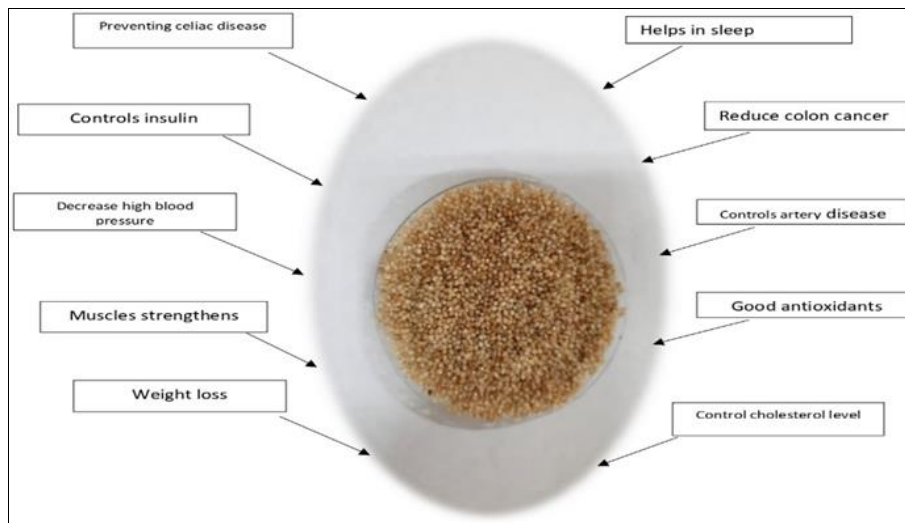
Many types of nutritional and medicinal properties are available in millet which helps in curing many types of diseases. Millet contains many types of antioxidant elements, like phenolic flavonoids which play an important role in controlling lifestyle diseases like heart disease, diabetes gastrointestinal disease, cancer, inflammation etc. The chemical composition of little millet grain was studied for its chemical composition of the little millet grain was determined using standard analytical methods. The result of the chemical composition indicated that the little millet contained considerable amount of protein ( $9.25 \pm 0.05$ ), while the mineral composition showed that it contained N (1400), P (250) K (114), Ca (70.89), Mg (118), Mn (13.0), Cu (2.9), Fe (92.0), Zn (35.0) mg / kg.

Little millet is nourishing our body and boosting our immunity. These are rich in nutrients like N, P, K, Ca, Mg and micronutrients Fe, Zn, Mn and Cu compare to other millet crops.

**Keywords:** Millets, nutrition value, ayurveda, little millet

### Introduction

The quality of nutrition in food is of paramount importance to keep humans healthy [1]. In order to maintain human health holistically, the quality of diet should be taken into account so that complex problems like malnutrition can be easily diagnosed [2]. Due to ignorance of the people some agricultural food items are not being used as human food millet, is one of them. According to the report of yang *et al.* [3] many types of nutritional and medicinal properties are available in millet which helps in curing many types of diseases. Millet contains many types of antioxidant elements, like phenolic flavonoids which play an important role in controlling lifestyle diseases like heart disease, diabetes gastrointestinal disease, cancer, inflammation etc [4]. Antioxidants contribute to keeping the body healthy, which improves the immune system, reduces metabolic syndrome, which leads to a healthy human body. There are many types of millet like Little Millet, Proso Millet, Finger Millet etc. In Ayurveda different types of millets are mentioned by following names *viz: kangu, Syamaka, Nivara, Koradusa, Makustaka* etc. Out of this little millet is one of the variety. Which are extensively used in present as diet for Diabetes mellitus, Obesity etc. conditions [5]. Little Millet is one of them. Little Millet is called *Kutki* in Hindi, *Samai* in Tamil, *sum Aloo* in Telugu. It is grown as a traditional crop in India. The seeds of Little Millet are very small they are consumed as rice [6]. Little Millet is nutritionally healthier and more versatile than cereals and is suitable for diet [7]. Little Millet helps prevent metabolic disorders and lifestyle disorders like obesity, diabetes etc [1] and is rich in antioxidant properties. Little Millet is a traditional crop in India which is widely famous among people who are health conscious as these tiny grains are packed with a great number of nutritious substances. Little millets are gluten-free, non-acid-forming, and a perfect addition to the diet of people who do yoga, workouts, cardio, etc. Moreover, its high nutritional value makes it a must-eat in a balanced diet. However, we should never eat an excess of something just because it is good because excess little millet usage in diet can lead to various side effects. (Figure 1).



**Fig 1:** Schematic diagram showing in health benefits of little millets

**Materials and methods**

Little millets collected from South India are get Authenticated in Department of *Dravyaguna* (related with Ayurvedic Pharmacognosy) and Museum Accession No - DG/22-23/562.

**Nitrogen content**

The grain and straw samples collected at the time of harvest from each plot were grounded to fine powder and utilized for determination of N content as per the procedures adopted. The analysis was carried out with the help of Kjeldahl's method Jackson (1971) [8] and then content (%) was determined separately in seed and straw of each plot in the crop.

**Phosphorus content**

Oven dried grain and straw samples from each plot of the crop were digested in mixture of HNO<sub>3</sub>: HClO<sub>4</sub> (3:1) separately, as per standard procedure (Jackson, 1971) [8]. Vando-molybdo-phosphoric yellow colour method was followed. The colour intensity was read with spectrophotometer at 470 mu (u). Thereafter, a standard curve was prepared with a series of standard solution. Phosphorus content (%) was worked out from the standard curve.

**Potassium content**

The potassium content (%) in grain and straw of the crop were estimated in the laboratory as per standard procedure (Jackson, 1971) [8].

**Protein content (%)**

Total protein content of mung bean seed was estimated by determining total nitrogen by Kjeldahl's method of Jackson (1971) [8]. The crude protein was calculated by multiplying the percentage of total nitrogen with a factor of 6.25.

**Estimation of Ca**

10 ml of aliquot was taken in China clay and add 0.25 ml of 4 normality of NaOH and add 4-5 drops of Calcon and literate against 0.01 normal EDTA [9].

**Estimation of Ca<sup>++</sup> Mg**

10 ml of aliquot was taken in China clay and added 50 ml of distilled water and. 5 ml of buffer solution (Ammonium Chloride + Ammonium hydroxide) add the 3-4 drop of Eri chrome Black T Indicator and titrate against 0.01 normal EDTA [9].

**Estimation of Fe, Zn, Mn, and Cu**

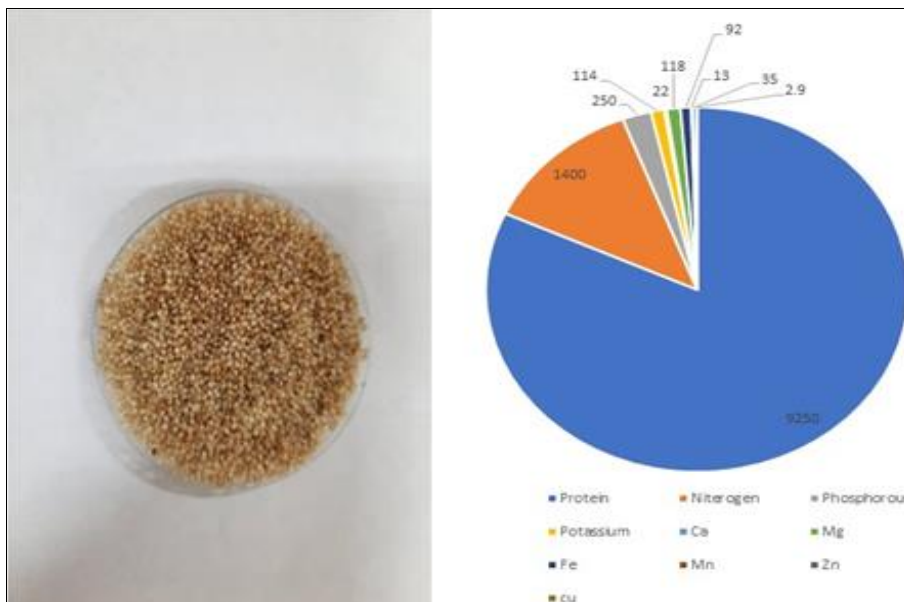
The content of Fe, Zn, Mn, and Cu in the grain digest was determined by using atomic absorption spectrophotometer (UNICAM - 969) as per procedure outlined by Tandon (2001).

**Results**

**Nutritional Composition of little millet**

**Table 1:** Given below is the nutritional value of 100g serving of millets

Protein	9.25g
Nitrogen	1400 mg
Phosphorous	250 mg
Potassium	11 4 mg
Ca	22 mg
Mg	118 mg
Fe	92 mg / kg
Mn	13 mg / kg
Zn	35 mg / kg
Cu	2.9 mg / kg



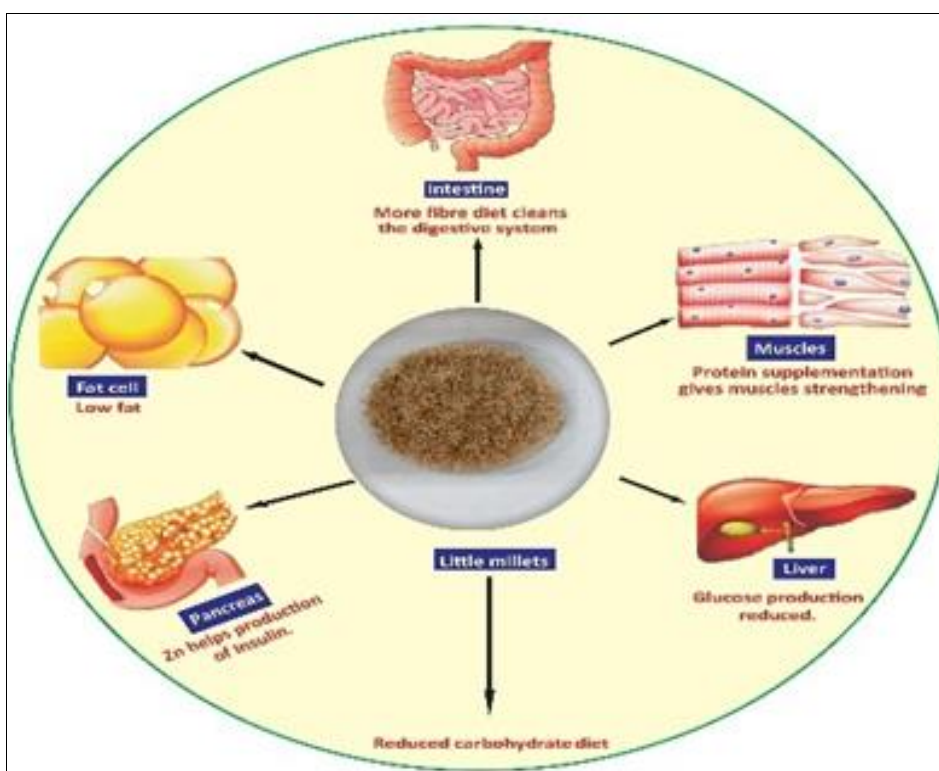
**Fig 2:** Nutritional composition of little millet - out of 100g of little millets

Little millet is nourishing our body and boosting our immunity. These are rich in nutrients like N, P, K, Ca, Mg and micronutrients Fe, Zn, Mn and Cu compare to other millet crops, these nutritional values are given in table that estimated. Recent studies undertaken by Proceedings of the Nutrition Society, 2017, have found out that unprocessed millet grains are richer in nutritious value than millet flours or millet flakes. (Figure 2).

**Discussions**

Due to the quality and medicinal properties of millets, it is very important to consume it as a diet. It is rich in many types

of anti-oxidant properties and protects humans from many types of diseases. Due to which many types of metabolic and lifestyle disorders are relieved. There are many types of millets mentioned in ayurveda, which also work in different ways in different types of diseases according to their different properties and make the immune system strong. Little Millet is one of them, it is consumed in the form of rice, it is rich in many types of properties. In which many nutrient properties are found, in which important elements like protein, phosphorus, carbohydrate, niacin, magnesium, phosphorus, fibres are found. Which helps in getting rid of diseases like diabetes, obesity, heart disease etc. (Figure 3).



**Fig 3:** Schematic diagram showing in therapeutic effects of little millets

**Conclusions**

Moreover, being suitable for all age groups, little millet usage

can be incorporated in baby foods, snacks, processed food items, etc.

**Acknowledgment**

We acknowledge Banaras Hindu University for the facilities provided by them.

**Conflict of interest**

Authors declare no conflicts of interest.

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