



Biochemical evaluation of different Varieties /germplasm of finger millet (*Eleusine coracana L.*)

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ABSTRACT

The present investigation was carried out to study the Nutritional component in finger millet. Biochemical characteristics such as protein, Total mineral content carbohydrate content, Total sugar content and reducing sugar content were studied in present investigation in finger millet varieties. Ten germplasm such as namely VL- 175, VL-149, VL-101, VL-201, VL-204, VL-315, VL-324, VL-347, VL-124 and VL-146 were selected for present investigation and were analyzed for biochemical parameters the variation in . Protein content ranged from 7.60 – 9.20%, total mineral from 2.50 to 3.50%, total carbohydrate content from 69.70 to 74.80 %. Total sugar from 1.40 to 2.90 % and reducing sugar 0.50-0.90 % these parameters were effective for selection of better germplasm in finger millet.

Key word- Finger millet, Protein, Total mineral, carbohydrate, Total sugar and reducing sugar.

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INTRODUCTION

Finger millet (*Eleusine coracana*) belongs to family Poaceae. Which is also known as 'ragi' in India is an important staple food for people belong to the low socio-economic group. It is the third most important minor millet in India. It is also known as African millet. . As nutritional supplement, the food products are fed to pregnant and lactating mothers, babies and the sick persons. Finger millet is primarily consumed in developing countries and it is often referred to as a "crop for the poor" or a "famine food", because of and high nutritional and medicinal properties it has proved to be a "super cereal". Rich source of phytochemicals and dietary fibre which offer several health benefits. The hyperglycemic activity of ragi millet has evidence the hypoglycemic, hypocholesterolaemic, nephroprotective and anticataractogenic properties of finger millet, suggesting its utility as a functional ingredient in diets for diabetics. The women with signs of cardiovascular disease like high blood pressure, increased cholesterol content. It also forms an essential part of nervous system and cell membranes. The body metabolism linoleic acid into arachidonic acid and docosahexaenoic acid, respectively, which are essential to the normal development of the central nervous system (Brich *et al.* 2007).

Brown varieties contained (1.2–2.3%) higher proportions of polyphenols than white (0.3–0.5%) varieties of this minor millet. The main polyphenols in this minor millet are phenolic acid and tannin, while flavonoids are present in small quantities. Ragi had highest phytic acid (685 mg/100g) total polyphenols 298 mg/100g, and tannins (18.75mg/100g), flavonoids (23.68 mg/100g) and trypsin inhibitors (102.6mg/100g) (Kumar *et al* 2013). Most of the Indian diet is deficient in one or two nutritional component so this millet is helpful in providing protein, vitamin and minerals. Considering the importance ragi millet the present study was conducted to estimate various nutritional content.

METHODS AND MATERIALS

Experimental Materials:

Ten germplasm of Finger millet (Ragi) namely VL- 175, VL-149, VL-101, VL-201, VL-204, VL-315, VL-324, VL-347, VL-124, VL-146 were collected from different parts of country Kosi, Uttarakhand, Almora, Uttarakhand, Patna, Bihar, and Rachi Jharkhand were used as experimental materials in the field trail.

Seeds were harvested threshed and their husk were removed through the traditional methods .Finally kernel were collected powdered and analyzed for various biochemical parameters.

Experimental Details

The seeds of Ragi millet germplasm were sown in Randomized Block Design with three replications. Besides this, all other recommended agronomical practices were adopted to achieve a good crop. Protein content in grain was determined by Lowry's method (1951). The method depends on quantitative of the colour obtained from the reaction of protein and reduction of phosphomolybdate and phosphotungstate by tyrosine and tryptophan amino acids present in protein The calculation was done on the basis of standard curve prepared from standard BSA solution and results were expressed on per cent basis. Total mineral content was determined by the method as described by Hart and Fisher, (1971). Total carbohydrate content was determined by the methods of Yemm and Willis (1954). Reducing sugar content in grain was determined by the method of Miller (1959). Total sugar was determined by the method of Dubois *et al.*, (1956) using phenol reagent. The content of crude fibre in dried grains of finger millet was analyses by the method as described by Hart and Fisher (1971). Total free amino acid was estimated according to Jayraman (1981).

Table 1: Nutritional characteristics of finger millet varieties.

S.N.	Germplasm	Protein content (%)	Total minerals (%)	Carbohydrae (%)	Total sugar (%)	Reducing sugar (%)	Crude fibre (%)	Total free amino acid (mg/g protein)
1	VL-175	9.20	3.40	74.80	2.20	0.70	4.00	25.50
2	VL-149	7.80	2.60	73.00	2.80	0.60	3.90	37.46
3	VL-201	7.70	2.40	72.80	2.00	0.80	3.90	37.66
4	VL-204	7.90	2.70	69.70	2.40	0.60	3.50	42.46
5	VL-101	7.70	2.60	74.30	2.30	0.90	3.50	24.36
6	VL-315	8.00	2.70	71.70	2.50	0.80	3.90	35.20
7	VL-324	7.60	3.20	73.70	2.00	0.50	3.80	42.33
8	VL-347	9.00	2.90	71.40	2.90	0.70	3.60	39.83
9	VL-124	8.70	2.80	70.25	2.00	0.70	3.30	36.2
10	VL-146	8.00	2.80	72.70	1.40	0.80	3.70	36.8
	S.Em.+	0.39	0.12	1.42	0.27	0.08	0.14	1.64
	C.D. at 5% at level of significance	1.17	0.37	4.26	0.81	0.23	0.40	4.82

RESULTS AND DISCUSSION

Protein content in various germplasm ragi millets was obtained between 7.64 to 9.20 per cent. All the germplasm regarding the protein content were observed significant. Verma and Patel (2013). Malleshi (2011) also studied the protein quality parameters and showed that the protein content is influenced by the parameters mainly biological value, net protein utilization. The carbohydrate content in different germplasm of Ragi millet was recorded in the range of the 69.70 -74.80 %. Ragi millet germplasm and observed similar range of carbohydrate. Veenu and Patel (2012) studied the seed carbohydrate content of Ragi millet and found similar range carbohydrate. The total sugar content in different germplasm of Ragi millet was recorded in the range of the (1.40 – 2.90% .). Studied the nutritional quality of some Ragi millet germplasm and observed similar range of total sugar. Chethan *et al.*(2008) studied the seed total sugar content of Ragi millet and found similar range total sugar. The reducing sugar content in different germplasm of Ragi millet. was recorded in the range of the 0.50 – 0.90%. Studied the nutritional quality of some Ragi millet germplasm and observed similar range of reducing sugar. Singh *et al.* (2010) studied the seed reducing sugar content of Ragi millet and found similar range reducing sugar. The mineral content of Ragi millet germplasm varied between 2.50-3.40 per cent. Total mineral content among all the Ragi millet germplasm varied significantly. Similar range of total mineral content in Ragi germplasm was also reported Saldivar (2003) studied on several genotypes of minor millets regarding total mineral content and found its highest proportion in Ragi millet. Crude fibre is one of the important nutraceutical components with wide range of health benefits. The crude fibre content of Ragi millet germplasm varied from 3.30 - 4.00%. Malleshi *et al.* (2011). Observed nutrient composition and crude fibre content in ragi millet which is an important parameter for determining the quality component. High crude fibre content in ragi millet was also reported by Veenu *et. al.* (2013).The total free amino acid content in different germplasm of Ragi millet was recorded in the range of the 24.36 – 42.33mg/100g protein. Studied the

nutritional quality of some Ragi millet germplasm and observed similar range of total free amino acid. Jandik *et al.* (1999) studied the seed total free amino acid content of Ragi millet and found similar range.

CONCLUSION

On the basis of biochemical observations it can be concluded that the variety VL-175 are very useful because these are good source of protein (9.20%), mineral (3.40%), crude fiber (4.00%), carbohydrate (74.80%), methionine (27.50mg/g protein), lysine (38.00 mg/g protein) reducing sugar (0.70%) and minimum antinutrients such as total phenol and tannin content are rated superior among the all varieties/germplasm.

On the basis of overall observation variety VL-175 was found superior in physical and biochemical parameters followed by VL-347 were utilized in further research work.

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