

NUTRITIVE VALUE AND ORGANOLEPTIC EVALUATION OF THAMARA VENDA GENOTYPES (*ABELMOSCHUS CAILLEI* L.)

K. Sona Thampi and V. Indira

College of Horticulture, Thrissur 680656, Kerala, India

Abstract: Nutritive value and organoleptic qualities of 20 genotypes of thamara venda were studied and compared with Pusa Sawani, the commonly cultivated variety. The mean values of fat, calcium, iron and vitamin C were found to be higher in *Abelmoschus caillei* genotypes than in Pusa Sawani. The mean moisture and protein contents of thamara venda genotypes were comparable with those of Pusa Sawani. Though the crude fibre content of the thamara venda genotypes was lower, the mucilage content was higher than the control variety. Thamara venda genotypes were found to have higher acceptability than Pusa Sawani.

Key words: Genotypes, okra, Pusa Sawani, thamara venda

INTRODUCTION

A balanced diet should have an adequate supply of vitamins and minerals in addition to proteins and calories. Vegetable is an essential component of balanced diet since they are good sources of different vitamins and minerals and also of dietary fibre. Okra (*Abelmoschus esculentus* [L.] Moench.), belonging to the family Malvaceae is valued for its young and immature pods in India and other countries. There are a large number of related species on which no systematic studies regarding their nutritive value have been done, one such being the Guinean type of okra (*Abelmoschus caillei*). Thamara venda, as it is locally known, adorns many remarkable traits like perennial nature, resistance to yellow vein mosaic virus, good cooking qualities etc. (Chacko, 1996). In this study, an attempt was made to analyse the nutritive value and organoleptic qualities of *A. caillei* genotypes.

MATERIALS AND METHODS

The crop was raised in the vegetable field of the Department of Olericulture, College of Horticulture, Vellanikkara, Thrissur. Twenty genotypes of *A. caillei* available and maintained in the Department were selected for the study. Okra variety, Pusa Sawani, was selected as the control variety. Different chemical constituents like moisture, protein, fat, crude fibre, calcium, iron, vitamin C and mucilage were estimated both in thamara venda genotypes and Pusa Sawani (AOAC, 1955; 1980; Jackson, 1958). The mucilage content of the samples was analysed by extracting the mucilage with ethyl alcohol. The sensory evaluation was carried out after sautéing pods with onion, pepper, salt and turmeric powder.

RESULTS AND DISCUSSION

The mean moisture content of the 20 genotypes of *A. caillei* varied from 90.16 to 92.04 per cent. The moisture content of the different genotypes did not have much variation among themselves and also from that of Pusa Sawani (Table 1).

The mean protein content of the thamara venda genotypes ranged from 14.19% (AM 4) to 17.65% (AM 5) on dry weight basis. The control variety had a mean protein content of 16.21 per cent which was found to be lesser than many of the genotypes of thamara venda except those of AM 2, AM 4, AM 18, AM 27 and AM 35. On the basis of Duncan's Multiple Range Test, the different genotypes were classified into three categories.

Fat values showed a variation ranging from 12.52 (AM 18) to 14.83 per cent (AM 23) in the thamara venda genotypes on dry weight basis. The control variety was found to have 10.45 per cent, which was lower than those of *A. caillei* genotypes. On the basis of fat content, the 20 genotypes were grouped statistically into 10 classes. Pusa Sawani was significantly different from thamara venda genotypes.

Fibre content in thamara venda genotypes varied from 9.28% to 15.17%. The genotype AM 35 was found to have the lowest quantity and AM 4, the highest. Pusa Sawani outweighed the genotypes in this aspect with 18.72 per cent for crude fibre. The genotypes were classified into 11 groups with Pusa Sawani into a separate group showing its significant difference (Duncan's Multiple Range Test).

Table 1. Comparison of moisture, protein, fat and crude fibre contents of *A. caillei* genotypes with Pusa Sawani

Genotypes	Moisture (%)	Protein (%)	Fat (%)	Crude fibre (%)
AM 2	90.76 ^{bcd}	15.85 *	13.17 ^{ede}	11.94 ^{ede}
AM 3	91.74 ^{ab}	16.42*	13.09 ^{ede}	10.78 ^{efg}
AM 4	90.83 ^{bcd}	14.19 ^b	14.55 *	15.17 ^b
AM 5	91.11 ^{abcd}	17.65 ^a	13.70 ^{bcd}	13.11 ^{bcde}
AM 11	91.33 ^{abc}	16.54 ^{ab}	13.66 ^{bcd}	12.83 ^{bcde}
AM 12	91.43 ^{abc}	17.12 ^{ab}	12.86 ^{de}	11.78 ^{def}
AM 14	91.12 ^{abcd}	17.03 *	13.21 ^{ede}	13.00 ^{bcde}
AM 18	91.36 ^{abc}	15.38 *	12.52 ^e	11.23 ^{defg}
AM 19	90.52 ^{cd}	16.82 ^{ab}	13.89 ^{abcd}	13.11 ^{bcde}
AM 20	91.62 ^{ab}	16.34 *	13.19 ^{ede}	10.89 ^{efg}
AM 21	90.73 ^{bcd}	17.28 ^a	13.25 ^{ede}	12.44 ^{ede}
AM 23	90.43 ^{cd}	17.31 ^a	14.83 ^a	14.89 ^b
AM 24	90.16 ^d	17.06 ^{ab}	14.00 ^{abc}	13.78 ^{bc}
AM 25	91.03 ^{abcd}	17.01 *	14.00 ^{abc}	12.06 ^{ede}
AM 27	90.27 ^d	14.73 ^{ab}	13.22 ^{ede}	13.78 ^{bc}
AM 31	90.46 ^{cd}	17.44 ^a	13.07 ^{ede}	13.61 ^{bcd}
AM 33	92.04 ^a	16.65 ^{ab}	13.38 ^{ede}	11.94 ^{ede}
AM 34	91.46 ^{abc}	17.53 ^a	14.55 ^{ab}	9.56 ^{fg}
AM 35	91.05 ^{abcd}	15.96 ^{ab}	13.41 ^{ede}	9.28 ^g
AM 36	91.64 ^{ab}	17.10 ^{ab}	13.56 ^{bcde}	12.05 ^{ede}
PS	91.08 ^{abcd}	16.21 *	10.45 ⁱ	18.72 ^a

PS = Pusa Sawani; Values having different superscripts differ significantly

In the case of calcium, the highest mean value was observed in AM 14 (1406 mg kg⁻¹) and the lowest in AM 23 (926 mg kg⁻¹) (Table 2). Pusa Sawani had a calcium content of 1107 mg kg⁻¹. Only three groups were formed by DMRT, two groups containing 10 genotypes each and the third one accommodating only one. Similar values were reported by Nehry *et al.* (1978) who reported a calcium content of 984.5 mg kg⁻¹.

The mean iron content of different genotypes ranged from 10 (AM 24) to 15.8 mg kg⁻¹ (AM 23). The control variety was found to have an iron content of 8.9 mg kg⁻¹ and this obviously was lower than those of *A. caillei* genotypes. Statistically, there were 12 categories into which the genotypes were classified.

Vitamin C was analysed on fresh weight basis and values for *A. caillei* genotypes were found in the range of 786.7 (AM 5) to 922.9 (AM 25) mg kg⁻¹. The vitamin C content was higher in *thamara vanda* genotypes compared to Pusa Sawani (631.3 mg kg⁻¹). There were eight categories of genotypes, the last contain-

ing only the control variety. The present finding is in conformity with the reports of Achinewhu (1983).

Mucilage is a typical characteristic of okra. The mean mucilage content of *thamara vanda* genotypes was much higher than the control variety. While the genotypes ranged in their mucilage content from 0.27 per cent (AM 35) to 0.49 per cent (AM 11), the control variety lagged behind with 0.24 per cent. There were 11 categories of the genotypes on the basis of mucilage content. Wolfe *et al.* (1977) also observed 0.2 to 0.3 per cent mucilage content in a typical *Ghanian* okra soup. Sensory evaluation scores were obtained by scoring the cooked dish by 10 judges for five quality attributes like colour, doneness, texture, flavour and taste. The total score was obtained out of 25. Though the mucilage content was more in *A. caillei* genotypes, they were found to have higher level of acceptability with their mean scores ranging from 15.60 to 21.07. AM 11 had the lowest score and AM 2 genotype had the highest. The control variety had a mean score of 17.30. There were 11 catego-

Table 2. Comparison of calcium, iron, vitamin C, and mucilage contents of *A. caillei* genotypes with Pusa Sawani

Genotypes	Calcium (mg kg ⁻¹)	Iron (mg kg ⁻¹)	Vitamin C (mg kg ⁻¹)	Mucilage (%)
AM 2	1138 ^{ab}	12.3 ^{bcd^{ef}}	920.5 *	0.47 *
AM 3	1176 ^{ab}	11.7 ^{defg}	790.4 ^d	0.33 *
AM 4	1285 ^a	14.4 ^{abcde}	848.5 ^{abcd}	0.36 ^{de}
AM 5	1137 ^{ab}	14.8 ^{abcd}	786.7 ^d	0.46 *
AM 11	1399 ^a	11.1 ^{efg}	885.6 ^{abc}	0.49 ^a
AM 12	1252 ^a	13.2 ^{abcd^{ef}}	869.1 ^{abe}	0.39 ^{bcd}
AM 14	1406 ^a	13.3 ^{abcd^{ef}}	845.4 ^{bcd}	0.31 ^{def}
AM 18	1188 ^{ab}	11.7 ^{defg}	834.6 ^{cd}	0.37 ^{cd}
AM 19	1371 ^a	14.4 ^{abcde}	831.2 ^{cd}	0.37 ^{cd}
AM 20	1209 ^{ab}	11.7 ^{defg}	899.9 ^{abc}	0.40 ^{bcd}
AM 21	1372 ^a	13.2 ^{abcd^{ef}}	871.8 ^{abe}	0.36 ^{cde}
AM 23	926 ^b	15.8 ^a	840.2 ^{cd}	0.28 ^{ef}
AM 24	1183 ^{ab}	10.0 ^{fg}	847.8 ^{abcd}	0.36 ^{cde}
AM 25	1196 ^{ab}	13.5 ^{abcde}	922.9 ^a	0.44 ^{abc}
AM 27	1171 ^{ab}	15.4 ^{ab}	832.5 ^{cd}	0.32 ^{def}
AM 31	1212 ^{ab}	15.2 ^{abc}	850.0 ^{abcd}	0.33 ^{de}
AM 33	1291 ^a	15.3 ^{ab}	890.7 ^{abc}	0.47 *
AM 34	1281 ^a	11.6 ^{defg}	793.5 ^d	0.33 ^{de}
AM 35	1321 ^a	13.6 ^{abcde}	890.5 ^{abc}	0.27 ^{ef}
AM 36	1393 ^a	11.9 ^{cdefg}	861.9 ^{abcd}	0.28 ^{ef}
PS	1107 ^{ab}	8.9 ^g	631.3 ^e	0.24 ^f

PS = Pusa Sawani; Values having different superscripts differ significantly

Table 3. Comparison of sensory evaluation scores of *A. caillei* genotypes with Pusa Sawani

Genotypes	Scores	Genotypes	Scores
AM 2	21.07 ^a	AM 21	19.07 ^{cde}
AM 3	19.93 ^{bc}	AM 23	19.50 ^{bcd^e}
AM 4	19.53 ^{bcd^e}	AM 24	19.43 ^{bcd^e}
AM 5	18.73 ^{def}	AM 25	20.30 ^{ab}
AM 11	15.60 ^h	AM 27	15.97 ^h
AM 12	19.40 ^{bcd^e}	AM 31	17.80 ^{fg}
AM 14	19.70 ^{bcd}	AM 33	19.80 ^{bcd}
AM 18	19.37 ^{bcd^e}	AM 34	18.47 ^{ef}
AM 19	20.43 *	AM 35	17.37 ^g
AM 20	17.40 ^g	AM 36	18.73 ^{def}
		PS	17.30 ^g

PS = Pusa Sawani; Values having different superscripts differ significantly

ries of genotypes on statistical basis. Only two genotypes had lower score than Pusa Sawani (Table 3). The present study brings into light many of the appreciable characteristics of the crop *thamara vanda*.

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