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QUALITY EVALUATION OF WINGED BEAN GENOTYPES

Winged bean (*Psophocarpus tetragonolobus* Harder & Smartt) has gained much attention in recent years among the scientists because of its fast growth, high yield and nutritional quality. It is a multipurpose crop in which all the parts except the stem are edible, palatable and nutritious. Though, large number of germplasm collections have been evaluated in diverse climatic conditions to study the morphology, physiology, maturity and chemical composition, no systematic study on the nutritive value and acceptability of the edible parts of winged bean has been conducted in Kerala.

In the present study an attempt has been made to evaluate the nutritional quality and acceptability of winged bean genotypes maintained in the Department of Olericulture, College of Horticulture, Kerala Agricultural University, Vellanikkara, Thrissur. The 52 genotypes were classified into five groups based on their mean yield for the previous two years and one genotype was selected randomly from each group. The genotypes selected were PT-50-1, PT-52, PT-82, PT-92 and PT-98. The crop was raised in the field during the month of July as per the package of practices recommendations of the Kerala Agricultural University (KAU, 1987).

The fresh flowers, leaves and immature pods of the selected genotypes were analyzed for moisture (AOAC, 1980), protein (AOAC, 1965), fat and vitamin C (AOAC, 1955) and

Table 1. Mean moisture (FWB), protein, fat and fibre (DWB) contents of winged bean genotypes

Genotypes	Moisture %			Protein %			Fat %			Fibre %		
	F	L	P	F	L	P	F	L	P	F	L	P
PT-50-1	67.7	59.7	70.4	3.0	3.0	2.7	0.4	0.6	0.7	7.2	16.9	17.4
PT-52	70.4	61.1	72.0	3.0	4.0	3.0	0.5	0.6	0.5	8.4	19.4	18.2
PT-82	70.4	59.4	70.3	2.6	3.0	2.9	0.4	0.7	0.7	6.7	17.0	16.2
PT-92	70.9	59.9	70.4	3.1	3.2	2.9	0.5	0.7	0.6	6.5	16.8	17.6
PT-98	71.4	59.0	74.6	2.9	3.0	3.0	0.5	0.6	0.6	6.7	18.5	17.0
Mean	70.4	59.8	71.54	2.92	3.24	2.9	0.46	0.64	0.62	7.04	17.72	17.28
CD (0.05)	1.243	1.216	1.639	NS	0.484	NS	NS	NS	0.109	0.282	0.676	0.603

FWB = Fresh weight basis; DWB = Dry weight basis; F = Flowers; L = Leaves; P = Pods

Table 2. Mean calcium, iron (DWB) and vitamin C (FWB) of winged bean genotypes (mg $100g^{-1}$)

Genotypes	Calcium			Iron			Vitamin C		
	F	L	P	F	L	P	F	L	P
PT-50-1	146.6	256.7	249.4	1.74	2.32	0.56	9.7	9.6	14.6
PT-52	147.9	228.7	165.4	1.40	1.89	0.77	13.3	13.8	16.0
PT-82	113.0	229.9	211.1	1.49	3.06	1.35	11.5	13.9	14.8
PT-92	140.4	232.4	166.4	1.39	2.32	0.69	9.7	13.8	14.3
PT-98	142.3	209.6	212.7	1.36	1.40	1.41	11.5	9.7	17.2
Mean	138.04	245.46	201.0	1.48	2.20	0.96	11.14	12.16	15.2
CD (0.05)	8.489	13.818	16.318	0.129	0.109	0.109	1.241	0.415	1.598

FWB = Fresh weight basis; DWB = Dry weight basis; F = Flowers; L = Leaves; P = Pods

Table 3. Total scores of the acceptability test of the edible parts of winged bean genotypes

Genotypes	Flowers	Leaves	Pods	Total
PT-50-1	19.0	18.3	17.6	54.9
PT-52	18.6	18.2	18.9	55.7
PT-82	19.0	18.1	19.6	56.7
PT-92	19.0	18.3	19.3	56.6
PT-98	18.9	18.2	19.7	56.8

crude fibre (Chopra and Kanwar, 1978). Calcium and iron were analyzed using atomic absorption spectrophotometer. All the analyses were carried out in triplicate samples. The acceptability of the three edible parts after cooking was assessed by a panel of 15 judges using a five point hedonic scale for five quality attributes namely colour, doneness, texture, flavour and taste.

The mean moisture, protein, fat and fibre content of the flowers, leaves and immature pods of winged bean genotypes are given in Table 1. The crude protein content of the flowers, leaves and pods was found to be 2.92%, 3.24% and 2.9% respectively and it ranged from 2.6% in the flowers of PT-82 to 4 per cent in the leaves of PT-52. The protein content in immature pods was found to be in accordance with the values reported by NAS (1975), while the values for flowers and leaves were lower than the values reported by NAS (1975). The result of statistical analysis showed that variations in the protein content between the different genotypes was significant only in the case of leaves. The protein content of the flowers and pods varied insignificantly among the genotypes.

The fat content of different genotypes varied from 0.4% to 0.7% in different edible parts. This was in accordance with the general trend observed in most of the common vegetables used in Kerala. The variations in the fat content between the different genotypes were statistically insignificant in the case of leaves and flowers.

Among the three parts analyzed, the highest fibre content was found in the leaves with the genotype PT-52 having the maximum (19.4%) and PT-92 the minimum (16.8%). The statistical analysis revealed significant variations in the fibre content of the three parts of winged bean among the genotypes.

The mean calcium, iron and vitamin C content of the different genotypes are presented in Table 2. Among the different plant parts analyzed, leaves had maximum calcium and iron contents with the highest content of calcium in PT-50-1 and iron in PT-82. Variations in the calcium and iron contents were found to be statistically significant between the different genotypes in all the three edible parts.

The edible parts of winged beans were fair sources of vitamin C. The highest vitamin C content was found in the fresh pods while leaves and flowers contained almost similar amounts. Though, the fresh pods contained the highest vitamin C when compared to other parts, this was lower than the values reported by NAS (1975).

The acceptability of the edible parts of the genotypes was evaluated using a five point hedonic scale (Table 3). The results indicated that all the three edible parts of the five genotypes are highly acceptable. The statistical analysis by Friedman's two-way analysis of variance (Siegel, 1956) also revealed that there was no significant variation in the quality attributes of the three edible parts among the different genotypes.

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