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QUALITY EVALUATION OF WINGED BEAN SEEDS OF SELECTED GENOTYPES

Winged bean, scientifically known as *Psophocarpus tetragonolobus* L., a minor tropical legume has great potential to overcome protein malnutrition in the tropics. Winged bean seeds are similar to soybeans in composition and nutritive value and is considered as a duplicate of soyabeans (Janoria *et al.*, 1984). Recently, many genotypes of winged beans have been identified for cultivation and an attempt has been made in this study to evaluate the quality of five genotypes of winged bean seeds with respect to chemical composition and acceptability.

Fifty two winged bean genotypes maintained in the Department of Olericulture, College of Horticulture, Kerala Agricultural University, Vellanikkara, Thrissur were classified into five groups based on their mean yield for the previous two years. One genotype from each group was selected randomly and thus the five genotypes, namely PT-50-1, PT-52, PT-82, PT-92 and PT-98 were selected for the study. The crop was raised in the vegetable field of the Department of Olericulture during the month of July as per the package of practices recommendations of the Kerala Agricultural University (KAU, 1987). The dry pods were harvested when they were fully mature and the seeds were collected by pressing the pods. The seeds were subjected to analysis for different chemical constituents like moisture (AOAC, 1980, protein (AOAC, 1965), fat (AOAC, 1955) and crude fibre (Chopra and Kanwar, 1978). The energy content of the pods was estimated using bomb calorimeter.

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

Genotype	Moisture (%)	Protein (%)	Fat (%)	Energy (kcal/100g)	Fibre (%)	Calcium (mg/100g)	Iron (mg/lOOg)
PT-50-1	7.7	28.2	16.9	600	10.6	82	1.11
PTB-52	6.1	31.3	18	697	10.4	80.6	1.31
PT-82	9.9	31.8	16	509	10.5	76.3	0.85
PT-92	8.2	30.2	17.5	757	10.5	79.1	0.92
PT-98	7.9	27.6	16.9	556	10.9	86.3	1.15
Mean	7.96	29.82	17.02	623.8	10.58	80.86	1.07
CD	0.776	1.292	0.545	64.2	NS	4.799	0.097
F value	24.338**	16.906**	15.574**	24.955**	0.391	4.939**	31.961**

** Significant at 1% level NS = Not significant

Table 2. Tannin content of the winged bean seeds before and after cooking (g/100g)

Genotype	Before cooking	After cooking	Percentage decrease
PT-50-1	0.92	0.66	28.26
PT-52	0.65	0.46	29.33
PT-82	0.89	0.70	21.35
PT-92	0.81	0.69	14.81
PT-98	0.82	0.61	25.60
Mean	0.82	0.62	23.85
CD(0.05)	0.060	0.034	
F value	30.153**	55.727**	

** Significant at 1% level

To estimate the calcium and iron contents a di-acid extract of the sample was prepared and was estimated in an atomic absorption spectrophotometer (Perkin-Elmer, 1982). The tannin content of the seeds before and after cooking was annualized (AOAC, 1970). All analyses were conducted in triplicate samples. The acceptability of the seeds after cooking was assessed by a panel of 15 judges using five point hedonic scale for five quality attributes like colour, texture, doneness, taste and flavour. The mean moisture, protein, fat, energy and fibre contents of the seeds of the selected winged bean genotypes are given in Table 1. The moisture content varied from 6.1 g (PT-52) to 9.9 g (PT-82) with a mean value of 7.96 g per 100 g of seeds. The variation between the five genotypes was found to be

Table 3. Mean scores of the acceptability test

Genotype	Colour	Doneness	Texture	Flavour	Taste	Total
PT-50-1	3.4	4.7	4.1	3.3	4.2	19.7
PT-52	3.3	4.1	3.8	3.1	3.8	18.1
PT-82	3.3	4.0	3.3	3.4	3.8	17.8
PT-92	3.3.	4.7	4.2	3.3	4.3	19.8
PT-98	3.0	3.6	3.3	3.5	4.0	17.4

statistically significant at one per cent level. The seeds of winged beans were found to be rich in protein with the values ranging from 27.6 to 31.8 per cent. The seed of PT-82 had the maximum and PT-98 the minimum protein content. These values are in accordance with the values reported by NAS (1975) and Misra and Misra (1985). Statistical analysis showed that the variations in protein content of the seeds between the different genotypes were statistically significant.

The seeds of all the five genotypes were found to be rich in fat with significant variation 3 between the genotypes. The fat content varied from 16 to 18% with a mean fat content of 17.02% which was within the values reported by NAS (1975) and Misra *et al.* (987).

The calorific values of the seeds of different genotypes indicated that the values ranged from 509 (PT-82) to 757 kcal (PT-92) per 100 g with a mean value of 623.8 kcal per 100 g which was higher than the values reported by Janoria *et al.* (1984). The variations between the different genotypes were found to be statistically significant.

The mean fibre content was found to be 10.58% which agrees with the values reported by NAS (1975) and contradictory to the values (6.12 to 8.73%) reported by Rockland *et al.* (1979) and Misra *et al.* (1987). There was no significant variation in the fibre content of the seeds between the different genotypes.

The calcium and iron contents ranged from 76.3 to 86.3 mg/100g and 0.85 to 1.31 mg/100 g respectively. The mean calcium and iron contents were found to be 80.86 and 1.07 mg/lOOg respectively. Statistical analysis indicated significant variations in calcium and iron contents between the different genotypes.

Generally, the acceptability and utilization of food legumes are limited due to the presence of certain anti-nutritional factors. Hence the tannin content of the winged bean seeds was annualized and the results are given in Table 2. The tannin content of the raw seeds in different genotypes ranged from 0.65 (PT-52) to 0.92 g (PT-50-1) per 100 g with a mean value of 0.82 g/100g which was lower than the values reported by Kadam and Salunkhe (1984) and higher than the values reported by Kantha *et al.* (1986) in winged bean varieties. The tannin content of the soaked seeds after 30 minutes of cooking decreased considerably and the percentage decrease varied from 14.81 to 29.93 with the maximum decrease in PT-52 and the minimum degrease in PT-92. The tannin content in the different genotypes

varied significantly before and after cooking. There was a significant variation in the tannin content of the raw and cooked seeds between the different genotypes. The acceptability studies of the seeds conducted using a five point hedonic scale for different characteristics like colour, doneness, texture, flavour and taste (Table 3) indicated that genotype PT-92 had the highest total score (19.8) while the lowest score (17.4) was observed in the genotype PT-98. Statistical analysis by Friedman's two way analysis of variance by Ranks (Siegel, 1956) indicated that there were no significant variations in the quality attributes of the seeds between the different genotypes. Thus the results of the acceptability test revealed that the seeds of all the genotypes are equally acceptable.

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