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Research Article

QUALITY EVALUATION OF SOME DESI AND KABULI (CICER ARIETINUM L) VARIETIES OF CHICKPEA

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A B S T R A C T

An experiment was conducted during 2011-12 in the laboratory of the department of Agricultural Biochemistry, Chandra Shekhar Azad University of Agriculture and Technology, Kanpur to study the quality evaluation of some desi and kabuli varieties of chickpea. The experimental material related to study are 10 different chickpea varieties i.e. four Kabuli viz., KAK-2, L-550, BG-1053 and JKG-1 and Desi varieties viz., DCP-92.3, JG-74, KWR-108, Vishal (Pule G-87207), BG-256 (Pusa-256) and Sadabahar were evaluated in Randomized Block Design with three replication. Results revealed that bolder seed was recorded in desi-type of chickpea variety-vishal and in kabuli type chickpea variety KAK-2. More soluble protein was recorded in desi-type chickpea variety KWR 108 and in Kabuli type of chickpea variety BG 1053. Desi type of chickpea varieties recorded lowest starch content than kabuli type of chickpea varieties. Lowest value of total phenol was recorded in one kabuli type variety-KAK2 and two desi type varieties-Sadabahar and KWR-108. Maximum value of total carbohydrate was recorded in desi type of chickpea variety of KWR 108 and Kabuli type variety of BG 1053.

INTRODUCTION

Among the pulses, the chickpea is an important winter season food that is extensively cultivated for human consumption. In India, chickpea is being grown in an area of about 6.7 million hectares and accounting for 37% of chickpea production of total pulse production. Chickpea rank first in area as well as production. Chickpea seeds varies in size, shape and colour. Based on these variation chickpea cultivars are classified into categories viz., Kabuli and desi. The chemical composition of chickpea cotyledons contain about 96% of the protein, 94% of the fat, 81% of the ash, 88% of the carbohydrate, 94% of the phosphors and 70% of the Iron. The seed coat contain most of the non digestible carbohydrates and a relatively higher portion of calcium. Although the embryo is rich in protein, fat and minerals, its contribution is meager as the basis of total seed weight (Salunkhe and Kadam, 1989). Chickpea has major constituents like carbohydrates, protein, crude fibres, polyphenols and also provides vitamins and minerals. Availability of nutrients in chickpea also varies due to genetic makeup of its varieties. Keeping this view in mind the present investigation was undertaken on quality evaluation of some desi and Kabuli varieties of chickpea.

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MATERIALS AND METHODS

An experiment was conducted during rabi season of 2011-12 in laboratory of the Department of Agricultural Biochemistry, Chandra Shekhar Azad University of Agriculture and Technology, Kanpur to study in quality evaluation of some desi and Kabuli varieties of chickpea. The experiment material related to study are 10 deferent chickpea varieties i.e. four Kabuli viz., KAK2, L550, BG1053 and JKG-1 and desi varieties viz., Dep 92-3, JG 74, KWR 108, Vishal (Phul G 87207), BG 256) (Pusa 256) and Sadabahar were evaluated in randomized block design with three replication. Teh chickpea crop was sown is the first week of November and harvested is last week of March. The observations were recorded like test weight, Total phenols, soluble protein, starch and total carbohydrates. The biochemical analysis of total phenols, soluble protein, starch and total carbohydrates were analysed as per standard procedure as prescribed by different workers. for determining the significant of difference caused by different treatment, data were subjected to statistical analysis. Critical differences have been worked out for comparison of mean value for various treatment and their effects. Standard error and critical difference values were calculated by the method suggested by Fisher (1947).

RESULTS AND DISCUSSION

Test weight

It is clear from the table 1 that test weight of seeds of desi and kabuli chickpea varieties differed significantly. In desi

chickpea varieties, the range of variation was 10.58 to 20.98g. Statistically, the maximum value was recorded in case of variety-vishal (20.69g) which was, however, not differ statistically from JG-74, BG-256 and KWR-108. In Kabuli chickpea varieties, the variability in test weight ranged from 15.84 to 30.63g except variety-L550, all varieties had, statistically significant higher value for test weight.

Among desi and Kabuli chickpea varieties, Kabuli type chickpea varieties showed significantly lower value of total phenol content as compared to desi chickpea varieties. The similar results have also been reported by Muzaffar and Khan (1985) and Sagar *et. al* (2010).

Table 1 Test weight, Protein, Starch, Phenol and carbohydrate in different variety of Desi and Kabuli chickpea

Treatment	Test weight (g)	Protein (%)	Starch (%)	Total phenol (%)	Total carbohydrates (%)
Chickpea varieties(Desi)					
DCP 92-3	12.62	22.40	41.68	75.92	56.96
JG 74	15.43	22.54	41.99	61.12	54.99
BG 256	14.92	23.76	42.05	57.91	57.02
Vishal	20.69	23.85	43.12	45.16	54.23
Sadabahar	10.58	23.50	38.41	45.16	51.74
KWR 108	14.50	24.10	44.01	45.16	65.05
Chickpea variety (Kabuli)					
BG 1053	27.63	24.528	44.79	50.16	65.03
KAK 2	30.63	22.97	42.01	50.06	61.70
JKG 1	28.73	23.87	46.12	56.66	62.87
L 550	15.84	23.66	48.32	54.67	62.00
S.E. (d) +	1.274	0.089	1.180	1.697	0.235
C.D. at 5%	0.615	0.797	2.480	3.541	0.486

Similar results have also been reported by Yadav and Sharma (1999), Khan *et.al* (1995) and Lokhare *et.al* (2007).

Protein Content

All desi type chickpea varieties varied significantly in soluble protein content. The variability ranges of six desi types chickpea were 22.40-24.10% However, the range of variability of four Kabuli types chickpea were from 22.97 to 24.28%. On comparison with desi and Kabuli Chikpea varities, Kabuli chickpea verities gave slightly higher soluble protein content as compared to desi type chickpea verities. Similar results in protein content in desi and Kabuli chickpea varieties have also been reported by Amjad *et al* (2006), Amir *et al* (2007) and Atul etal (2012).

Starch Content

It is obvious from the Table-1 that the varieties of chikcpea exhibited significant difference in starch content which ranged from 38.41 to 48.32%, statistically, the maximum value was recorded in case of chickpea variety-L 550 (48.32%) which was, however at par with JKG-1 (46.12%), BG-256 (44.79%), KWR 108 (44.10%) and vishal (43.12%). Among the Kabuli chickpea varieties, all varieties had significantly higher value except variety-KAK2 (42.10%) while in desi type chickpea varieties, KWR 108 gave The significantly maximum value (44.01%) and the variety-Sadabahar chickpea had lowest value (38.41%) of starch content. Similar findings has also been reported by Srivastava and Ali (2004).

Phenol content

The total phenol content among the desi and Kabuli chickpea varieties were found to be significant which ranged from 45.16 to 75.16%. Statistically the lowest content required for nutrition purpose, the best value of 45.16% was exhibited by variety KAK2, KWR 108 and Sadahabar and highest value required for insect resistant purpose, the best value was recorded in variety DCP 92-3 (75.95%).

Carbohydrate content

Data per training to total carbohydrates differed significantly and the range of variation was from 51.74-65.05%. Statstically. The highest value of total carbohydrates was recorded in varieties-KWR 108 (65.05%) Followed numerically by BG 1053 (65.03%) and the variety-Sadabahar exhibited significantly lowest value (51.74%) of total carbohydrates. Among different Kabuli varieties, BG 1053 gave significantly maximum value of total carbohydrates, while, lowest value of total carbohydrates was recorded in KAK-2. The variation range 51.74 to 65.05% was found within desi type chickpea varieties. The mximum value was recorded in case of desi chickpea variety KWR 108 (65.05%) which was, however, not differ statistically, from varieties BG 256 (57.02%) and Dep 92.3 (56.96%). These finding showed almost confermily with the results recorded by Shad *et.al* (2009) and Atul etal (2012).

Corelation Studies

A critical perusal of data shown in Table-2 revealed that seed weight of desi chickpea exhibited a positive but non-significant with total phenols, soluble protein, starch and total carbohydrates. However, the seed weight of Kabuli, chickpea showed a negative but non-significant with total phenol and soluble protein and significant with starch. The total phenols of desi chickpea exhibited significantly negative correlation with soluble protein and non-significantly positive correlation with starch and total carbohydrates. However, the total phenols of Kabuli chickpea showed negative association but it was non-significant with soluble protein and significant with total carbohydrates. Soluble protein was found positively correlated with starch and total carbohydrate but it was non-significant in case of desi type of chickpea varieties.

Table 2 Correlation coefficient between various parameters of desi and Kabuli types chickpea varieties

Character	Kabuli				Desi			
	Total pheno	Soluble protein	Starch	Total carbohydrate	Total pheno	Soluble protein	Starch	Total carbohydrate
Test weight	0.0998	0.2897	0.6705*	0.0214	-0.4073	-0.1459	-0.8424*	0.2315
Total phenol	-	-06229*	0.4427	0.2775	-	-0.4651	0.4341	-0.8342*
Soluble protein	-	-	0.2685	0.3564	-	-	0.4922	0.8654*
Starch	-	-	-	0.7267*	-	-	-	0.0095

In Kabuli type of chickpea varieties, the soluble protein showed positive non significant association with starch but significant association was to recorded in total carbohydrates. Starch content of desi chickpea was significant and positive association with total carbohydrate. However, non-significant and positive association was found in case of Kabuli chickpea.

CONCLUSION

It may be concluded that among Kabili and Desi chickpea varieties, variety KWR-108 (desi) and variety JKG-1 (Kabuli) appeared superior most from the nutrientional point of view since higher value of proteins, starch, carbohydrate and lower value of polyphenol with medium test weight.

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