SHORT COMMUNICATION

MORPHOLOGICAL CHARACRARIZATION OF GARLIC (*ALLIUM SATIVUM* L.) GERMPLASM

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Abstract: An experiment was conducted with 15 garlic cultivars at Horticultural Research Centre, SVPUAT, Meerut, UP, India during the year 2013-14. Results on different characteristics showed that cultivar Roshni Mota gave the maximum plant height and number of leaves per plant while cultivar CL Lamba exhibited maximum leaf length and leaf width. Maximum bulb weight was found in cultivar Chennia and cultivar Bhima gave maximum diameter of bulb. However, cultivar Roshni Mota gave maximum single clove weight and maximum number of cloves was found in cultivar BG 108.

Keywords: Garlic, Evaluation, Genotypes, Performance, Morphological Characterization

INTRODUCTION

Garlic is grown world-wide and is one of the most important ingredients of Indian cuisine. China is the leading producer of garlic which contributes 75% of world production [Panse *et al.*,(2013)]. Among the spices grown in India, garlic (*Allium sativum* L.) is the most important bulbous crop and widely cultivated *Allium* throughout country. It is consumed in many forms and valued highly for its characteristic flavour (Roy and Chakraborti, 2002). In India, the average productivity of garlic is 5 ton /ha which is quite low as compared to other garlic growing countries [Singh *et al.*, (2012)]. It has higher nutritive value as compared to other cultivated *Alliums*. It is rich in protein, phosphorus, potassium, calcium, magnesium and carbohydrates. It helps in digestion of food, reduces cholesterol level in human blood and lowers blood sugar. Garlic is mostly strong flavoured due to presence of sulphur containing compounds that impart their distinctive small and pungency. In order to make further improvement for the economic traits efforts are needed on the part of breeders to bring about variations in the garlic cultivars for the traits attributing to economic characters.

MATERIALS AND METHOD

The experiment was carried out during 2013-14 at Horticultural Research Centre (HRC) of SVPUAT, Meerut, UP, India. Before planting of cloves, well decomposed farm yard manure @ 25 t ha-1 was applied for the experimental plots uniformly as basal application. Recommended cultural operations were carried out to ensure a healthy crop growth and development.Healthy and uniform sized cloves were planted at 3-4 cm depth at a spacing of 10 cm × 10 cm in a randomized block design with three replications in Oct., 2013. Harvesting of bulbs were performed only when leaves turned into brown. The data were recorded on five randomly selected plants from each genotype in each replication on 08 characters i.e. Plant height (PH) at 30, 60 and 90 days after planting, number of leaves per plant (NLPP), at 30, 60 and 90 days after planting leaf length (LL), at 30, 60 and 90 days after planting leaf width (LW), at 30, 60 and 90 days after planting. Bulb weight, bulb diameter, single clove weight and clove per bulb was also recorded at the time of harvesting. The experimental data was analyzed statistically as proposed by (Gomez and Gomez, 1984) using MSTAT–C software to find the significance.

RESULT AND DISCUSSION

The observations recorded at the successive stage of the plant development were analysed statistically and presented in the Table 1. The experimental findings of the present investigation and discussion had been discussed with appropriate reference by different authors as co-authors with the different parameters. It is clear from the Table 1 that all the characters under present investigation were significantly differed from each other in terms of growth and yield characters, indicating more variation in plant growth and yield characters. Roshni Mota had maximum plant height (94.40 cm), followed by CL Lamba (85.23 cm) and minimum height of plant was recorded in cv. Bhima Purpule and Sukha-44 i.e. (64.97 and 65.20 cm respectively. The variation observed in plant height among the genotypes might be due to difference in genetically constituents as well as environmental effects. Wide variation in morphological characters amongst the genotypes of garlic was observed by Singh and Chand (2003 and 2004) The maximum number of leaves per plant was found in Roshni Mota (8.68 leaves) which was statistically at par with PG-35 followed by, and the minimum number of leaves per plant was found in cv. Sukha-44 (6.00) .The maximum leaves length were recorded in cultivars CL Lamba (55.73 cm) followed by Roshni Mota (54.83). The lowest leaf length was found in variety PG 9 (25.63 cm). Similarly CL Lamba (1.96

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cm) fallowed by AVTG I (1.92 cm), whereas lowest leaf width was found in cv. PG-9 (1.12 cm).This variation in leaf characters might be due to genotype as well as some known and/or unknown environmental factors. It has been reported that plant produces food materials through the process of photosynthesis. With the increasing number of leaves, photosynthesis generally increases, and plant can produce more food that influences the growth and development of the plant. So, genotypes that can produce more leaves have more plant growth leading to higher yield. Similar findings have been reported (Sanggeta *et.al, 2006*). The wide variation was observed in bulb characters among the cultivars. The maximum bulb weight was recorded in cultivars Cheenia (43.3 gm), followed by Roshni Mota (38.0 gm), while the lowest bulb weight was found in variety GG-I (17.0 gm). Bhima Purpule (53.1 mm) showed maximum diameter followed by, Cheenia (52.2 mm) , while lowest bulb diameter was found in cv. Phule Basant (30.7 mm). Roshnee Mota (1.10 gm) produced maximum single clove weight followed by CL Lamba (1.030 gm) , whereas the lowest single clove weight was found in cv. GG I (2.29 gm). Maximum number of cloves was found in cultivars BG 108 (32.8), followed by Cheenia (32.67) and it was minimum found in cultivars Phule Basant (20.3). (Sanggeta *et.al, 2006*),who had reported that the average weight of clove, number of cloves per bulb and weight of bulb exhibiting high genetic variation among the genotypes.

Table 1. Mean performance of garlic (*Allium sativum L.*) genotypes for eight characters.

S. No.	Character	Plant height (cm)	Leaves per plant	Leaf Length (cm)	Leaf Width (cm)	Bulb Weight (gm)	Bulb Diameter (mm)	Single Clove Weight (gm)	Cloves/ Bulb
1	Cl Lamba	85.23	7.67	55.73	1.96	32.67	42.27	1.030	22.33
2	Roshni Mota	94.40	8.68	54.83	1.74	38.00	43.57	1.100	22.00
3	Cheeniaa	68.43	6.33	47.43	1.90	43.33	52.20	0.953	32.67
4	Sukha -44	65.20	6.00	41.77	1.71	23.00	36.63	0.810	21.00
5	Desi Lasan	71.53	8.33	48.47	1.69	37.00	40.40	1.003	24.00
6	G -50	78.87	7.33	40.60	1.14	31.33	44.83	0.750	30.33
7	GG- 1	66.23	8.33	37.43	1.85	17.00	31.37	0.290	22.33
8	Bhima Purpule	64.97	8.33	37.33	1.78	36.00	53.17	0.423	21.67
9	Phule Basant	75.00	7.67	41.40	1.70	17.67	30.73	0.500	20.33
10	Godawari	67.60	8.00	32.40	1.77	17.33	33.67	0.590	22.00
11	PG -9	70.80	8.33	35.73	1.12	26.33	46.00	0.923	20.67
12	PG- 17	66.77	7.00	34.33	1.27	20.33	33.03	0.543	31.67
13	PG -35	67.20	8.67	38.80	1.57	28.00	44.10	0.730	24.67
14	BG -108	70.63	7.67	40.67	1.72	19.00	40.97	0.387	32.67
15	AVTG -1	70.90	8.33	35.43	1.92	34.67	40.50	0.833	31.00
16	Mean	72.25	7.78	41.49	1.66	28.11	40.90	0.724	25.29
17	Range	64.97	6.00	32.40	1.12	17.00	30.73	0.290	20.33
18	SE	94.40	8.68	55.73	1.96	43.33	53.17	1.100	32.67
19	C.V	1.64	0.76	1.40	.02	3.94	2.17	0.07	3.90

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