Vegetable Science (2012) 39 (1) : 83-85

Evaluation of genetic variability in bottle gourd genotypes

Anchal Sharma and SK Sengupta

Received : August, 2011 / Accepted : March, 2012

The bottle gourd (*Lageneria sicereria* (Mol.) Standl) is one of the most extensively cultivated cucurbitaceous vegetable crops throughout India. It is commonly grown in India for its immature edible fruits during summer and rainy season. This species also holds promise for its yet unexploited possible uses of oil and protein contents of seed. The seed kernels contain 45% oil, and about 35% protein. Total area under production of bottle gourd is about 1512 ha with total production of 16632 million *tonnes*.

The experiment was conducted on bottle gourd in a randomized block design with three replications during winter season 2008 at Vegetable Research Farm, Maharajpur, J.N.K.V.V., Jabalpur (M.P.) to the study on genetic variability in bottle gourd. The experiment was comprised of 16 genotypes [NS-421, Keten, Warad, Dharwad-1, Narendra Rashimi-1, Narendra Jyoti (NDBG-4), Narendra Dharidar -1, Narendra Dharidar-2 (NDBG-613-4), Narendra Sankar Lauki (NDBGH-4), Kashi Ganga, Samrat, Vardan-f-1, Narendra Shishir (round), Narendra Madhuri (round), Narendra Shivani (long) and Jabalpur Local] maintaining the spacing 2 m row to row and 1.5 m plant to plant under randomized block design with three replications. Observations were recorded for morphological character [growth habit (highly vigorous, moderate vigorous, less vigorous), vine length (cm), number of primary branches per vine, internodal length (cm), number of internode per vine, number of node per vine up to first male flower, number of node per vine up to first female flower, number of node per fruit set] and phenological characters (days to first appearance of male flower, days to first appearance of female flower, fruit set percentage, sex ratio),Yield parameters (number of fruit per vine, number of fruit per plot, length of fruit(cm),weight of fruit(kg), width of fruit (cm), yield per vine (kg), yield per plot (kg) and yield (q/ha) by selecting three vines randomly in each plot. The averaged data were submitted for statistical analysis.

The mean performance of the genotypes revealed a wide range of variability for all the traits. The variation was highest for vine length in Narendra Shivani (342.52cm), followed by Narendra Sankar Lauki (323.47cm) and Kashiganga (270.95cm) whereas the minimum vine length was recorded in Samrat (141.88cm). The variation for vine length in bottle gourd corroborated by various workers (Badade *et al*., 2001; Mathew *et al*., 2001 and Kumar *et al.*, 2007) in bottle gourd. The numbers of primary branches per vine was varied significantly over genotypes as regard the value of primary branches per vine with maximum number of primary branches per vine was in Narendra Shivani (58.34) and next to Narendra Shivani were Narendra Sankar Lauki (57.75), Kashiganga (54) and Narendra Madhuri (48.43) being the lowest in Narendra Rashmi-1 (17.71). Such variation was observed in bottle gourd by Tyagi (1972) and Singh *et al.* (2007). The lowest internodal length was noted in NS-421 (10.62cm) but it was increased upto the maximum extent by Narendra Jyoti (15.26 cm) and followed by Narendra Rashmi-1(14.08cm) and Samrat (13.59 cm) whereas, the maximum number of internodes per vine under NS-421 (19.32) then in Narendra Sankar Lauki (16.94) and Warad (16.72). The lowest number of internodes per vine noted in Narendra Dharidar-2 (12.31) Similar trends were observed in number of nodes per vine up to first male flower and female flower. This findings are closed to the findings of Tyagi (1972) and Sharma and Dhankar (1989) in bottle gourd. The traits *viz.,* number of nodes per fruit set was recorded significantly higher in Narendra Shishir, followed by Narendra Madhuri and NS-421 being the lowest number of nodes per fruit under Narendra Rashmi-1. Similar findings have also been reported by Singh and Kumar (2002) and Ram *et al*. (2007) in bottle gourd. The days to appearance of first female flower found significant differences being the maximum days to appearance of first female flower in Narendra Shishir (53.21 days) and gradually decreased in Narendra Rashmi-1 (48.88 days)

Anchal Sharma and SK Sengupta
Department of Horticulture, JNKVV, Jabalpur-482004
E-mail: anchal03jnkvv@gmail.com

and Narendra Jyoti (48 days). The less number of days were noticed for first appearance of female flower in Samart (43.30 days). The early and late female flower appearance help in the occurrence of early/late flush of the yield which is advantageous for market to fetch the higher price in bottle gourd (Sharma and Dhankar, 1989 and Ram *et al*., 2007).

Significant differences were found among the genotypes with regard to fruit set percentage. The higher fruit set percentage was noticed in Narendra Shivani (87.71%), and next were Narendra Sankar Lauki (83.09%), Narendra Dharidar-2 (76.09%), Narendra Shishir (75.36%), Narendra Madhuri (74.4%), Ketan (72.3%), Vardan-f-1 (71.08%), Narendra Rashmi-1 (69.77) and Narendra Dharidar-1 (68.66%). The higher fruit set percentage might be due to receptiveness of stigma for a longer time or the longer time pollen viability and the fruit set owing to effective pollination (Mathew *et al.*,2001 and Kumar and Singh, 2007). Width of fruit amongst genotypes was the maximum in Narendra Shishir (54.87 cm) being significantly superior over other the genotypes and Narendra Madhuri (54.82 cm) was at par with Narendra Dharidar-2 (35.12cm). The lowest fruit width was recorded in Narendra Shivani (20.17cm), Narendra Jyoti (25.53cm), Warad (25.56 cm), Vardan-f-1 (26.22cm) and Ketan (28.16cm), respectively.

Significant differences were recorded with reference to fruit length amongst genotypes and the highest fruit length was in Narendra Shivani (89.05cm) being significantly superior over rest of the genotypes. The close views were peered by Mathew *et al*. (2001), Singh and Kumar (2002), Islam (2004) and Ram *et al*. (2007).

The genotypes differed significantly over yield per vine and the maximum yield per vine was recorded in Narendra Shivani (16.35kg) which were found significantly superior over the remaining genotypes followed by NS-421 (12.49kg), Narendra Sankar Lauki (12.37kg) and Narendra Shishir (12.26kg). The lowest yield was in Narendra Jyoti (5.34kg), Narendra Rashmi-1 (6.28kg), Samrat (7.25kg) and Ketan (8.34kg) and similar trends was recorded in case of yield (q/ha). The significantly higher yield in Narendra Shivani (311.53q/ha) might be due to higher values of yield attributes (fruit set percentage, fruit length, number of fruit per vine, fruit weight and fruit width). Whereas, the lower yield was found in case of Narendra Jyoti (101.86q), Narendra Rashmi-1 (119.67q), Samart (138.21q) and Ketan (158.95q), respectively due to lower yield attributes. The findings were similarly with findings of Badade *et al*.(2001), Kumar and Singh (2007) and Ram *et al*.(2007) with bottle gourd.

Table 1. Direct and indirect effect of yield traits on yield in of bottle gourd genotypes

Character	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	X17
X1	0.54	-0.34*	0.13	0.60	0.59	0.60	-0.11	-0.13	0.67	0.67	0.51	0.26	-0.02	0.76*	0.78*	0.76*
X2		-0.45*	-0.06	0.50	0.51	0.58	-0.26	-0.27	0.68	0.68	0.28	0.30	0.11	0.81*	0.81*	0.81*
X3			-0.08	-0.35	0.33	-0.25	0.09	0.06	-0.41	-0.38	-0.12	-0.35	-0.30	-0.46	-0.49*	-0.47
X4				0.17	0.22	0.31	0.09	0.14	0.11	0.11	-0.03	0.66*	-0.58*	0.18	0.18	0.18
X5					0.99*	0.94*	0.23	0.25	0.48	0.48	-0.03	0.55	0.31	0.71	0.72	0.71
X6						0.99*	0.23	0.24	0.46	0.46	-0.03	0.52	0.30	0.67*	0.67*	0.67*
X7							0.5	0.62	0.17	0.52	-0.02	0.67*	0.64*	0.26	0.75	0.76
X8								0.97*	-0.01	-0.61	-0.23	0.14	0.03	-0.13	0.10	-0.11
X9									-0.19	-0.19	-0.24	-0.42	0.58*	-0.07	-0.07	-0.07
X10										0.99*	0.76	-0.08	-0.35	0.86	0.87*	0.87*
X11											0.76*	-0.06	-0.39	0.88*	0.87	0.88*
X12												-0.53	-0.68*	.52*	0.42	0.52*
X13													0.23	0.39	0.43*	0.39
X14														-0.03	-0.31	-0.02
X15															0.98*	0.59
X16																0.99*

* Significant at 5 percent level of significance

X1= Vine length, X2= No. of primary branches per vine, X3= Internodal length (cm), X4= No. of Internode per vine, X5= Number of nodes per vine up to 1st male flower, X6= Number of nodes per vine up to 1st female flower, X7= No. of node per fruit set, X8= Days of first appearance of male flower, X9= Days of first appearance of female flower, X10= Number of fruit per vine, X11= Number of fruit per plot, X12= Fruit length, X13= Fruit weight, X14= Fruit width, X15= Yield per plot, X16= Yield per hectare, X17= Yield per vine (kg).

The information regarding the components on which the selection pressure can be exercised most effectively for effective crop improvement were vine length (0.76), primary branches per vine (0.81), nodes per vine upto first male flower (0.67), fruit yield per plant (0.88) and fruit length (0.52) and yield per vine length (0.78), primary branches per vine (0.81), nodes per vine upto first female flower (0.67), fruit weight (0.48) and yield per plot (0.98) which expressed significant correlation. Yield per vine was also exhibited significantly positive correlation with vine length (0.76), primary branches per vine (0.81), and nodes per vine upto 1st female flower (0.67), fruits per vine (0.87), fruits per plant (0.88), fruit length (0.52) and yield per vine (0.99) which were directly contributed to yield per vine. Whereas, negative correlation of yield per plot was noticed with intermodal length (-0.46), days to first appearance of female flower (0.13), days to first appearance of female flower (-0.07), fruit length (-0.03) and yield per hectare with intermodal length (-0.49), days to appearance of female flower (-0.07), fruit width (-0.07) and fruit width (-0.02) *i.e.* reduced the yield component with increasingly values of these traits.

References

Badade DS Warade SD and Gaikwad SK (2001) Correlation studies in bottle gourd (*Lageneria sicereria* (Mol.) Stand). J. Maharashtra Agric Univ, 26(1):20-22.

Badade DS, Warade SD and Gaikwad SK (2001) Correlation studies in bottle gourd *(Lageneria sicereria* (Mol.) Standl). J. Maharashtra Agric Univ, 26(1): 20-22.

Islam MT (2004) Genetic divergence in bottle gourd (*Lageneria sicereria* (Mol.) Standl). Bulletin of the institute of Tropical Agriculture, Kyushu Univ 27: 19-24.

Mathew A, Markose BL, Rajan S and Devi SN (2001) Genetic divergence in bottle gourd (*Lageneria sicereria* (Mol.) Standl).Vegetable Science 28(2): 121-123.

Ram D, Rai M and Yadav DS (2007) Characterization and evaluation of winter fruited bottle gourd (*Lageneria sicereria* (Mol.) Standl). Acta Hort 752: 231-237.

Sharma NK and Dhankar BS (1989) Performance of bottle gourd genotypes. Haryana Agric Univ J Res 19(3): 246 248.

Singh DK and Kumar R (2002) Studies on the genetic variability in bottle gourd (*Lageneria sicereria* (Mol.) Standl). Progressive Hort 34(1): 99-101.

Tyagi ID (1972) Variability and Correlation studies in bottle gourd (*Lageneria sicereria* (Mol.) Standl). Indian J Hort 29(2): 219-222.