

**Research Note :****HERITABILITY AND GENETIC ADVANCE IN CABBAGE (*Brassica oleracea* var. *capitata* L.) UNDER LUCKNOW CONDITION****Shweta Soni*, Sanjay Kumar, Sutanu Maji and Awadhesh Kumar***Department of Applied Plant Science (Horticulture)**BabasahebBhimraoAmbedkar University, Vidya-Vihar, Rae Bareli Road, Lucknow***E-mail: supriyasoni.soni05@gmail.com*

ABSTRACT: The present study aimed at evaluation of heritability and genetic advance in sixteen genotypes of cabbage under Lucknow condition. Findings revealed that high heritability in broad sense were observed for vitamin C (99.50%), days to maturity (98.90%), core length (88.20%), head weight (87.30%), yield (87.20%), leaf width (83.40%) and leaf length (83.20%) whereas, moderate for plant height (78.20%), equitorial length (72.70%), head polar diameter (71.60%), stalk length (71.20%), plant spread (69.80%) and number of non-wrapper leaves (66.00%). Genetic advance as percentage of mean varied from 6.04 %-50.09% for plant spread and vitamin C content, respectively.

Keywords : Cabbage, genotypes, heritability, genetic advance.

Cabbage (*Brassica oleracea* var. *capitata*L.) is one of the most economically important member of genus *Brassica*. It is the most popular vegetable around the world in respect of area, production and availability almost round the year. In India, cabbage occupies 331 hectares area (5.4% of total vegetable crops' area) with the production and productivity of 7949 and 21.5 million tonnes per hectare, respectively (Anon, 2). The increase in area has been possible due to the introduction of heat tolerant varieties and F₁ hybrids which give more yields per unit area as compared to traditional cultivars in area of mild winter. The demand for this nutritious vegetable growing on increasing and its production is also increasing simultaneously.

The extent of genetic variability is of paramount importance for the improvement of a crop as greater is the genetic variability in the existing germplasm better would be the chances of selecting superior genotype (Vavilov, 9). The genetic improvement of cabbage depends upon the available genetic variability for important quantitative traits and its judicious exploitation through efficient breeding method. The heritability of characters determine how much the phenotype of a plant is a guideline to the genotype and thus, help the breeder to base his selection on the phenotypic

performance of the plant. The genetic advance fulfills more clear selection by taking into the account of scope and effectiveness of selection for improving a character conditions by genetic variability and transmissibility, respectively. Therefore, the present study was conceived with an objective to estimate the heritability and genetic advance studies in cabbage.

The experimental materials for the investigation consisted sixteen varieties of white cabbage namely Pusa Mukta, Green Express, KGMR-1, Golden Acre, Cabbage No. 1, Cabbage No. 2, Cabbage No. 3, Cabbage No. 4, Cabbage No. 5, Cabbage No. 10, Cabbage No. 12, Pride of India, Pusa Ageti, Pusa Sambandh, Green Boy and Pusa Synthetic. Each genotypes was planted in a plot having 2.4x1.8 m area in randomized block design (RBD) with three replications at Horticultural Research Farm, DAPS, BBAU, Lucknow during October 2011-February 2012. There were 16 plants in each plot planted a row and plant spacing of 60x45 cm. All the standard practices and plant protection measures were timely adopted to raise the crop successfully. Five randomly selected plants from each replication were utilized for recording observations viz. height of plant (cm), number of non -wrapper leaves (cm), plant spread

Table 1: Estimate of heritability and genetic advance for 13 characters in cabbage.

Characters	Heritability (%)	Genetic Advance	Genetic advance (% of mean)
Plant Height (cm)	78.20	2.82	8.74
Plant Spread (cm)	69.80	2.67	6.04
Number of Non Wrapper Leaves	66.00	3.48	17.41
Leaf Length (cm)	83.20	3.46	13.89
Leaf Width (cm)	83.40	3.91	18.63
Length of Stalk (cm)	71.20	1.47	24.40
Head Weight (Kg)	87.30	0.44	49.43
Head Polar Diameter (cm)	71.60	2.37	20.19
Equitorial Length (cm)	72.70	1.23	20.91
Core Length (cm)	88.20	2.12	40.26
Vitamin C (mg/100g fresh weight)	99.50	21.79	50.09
Days to maturity	98.90	33.25	38.87
Yield q/ha	87.20	166.72	49.57

(cm), leaf length (cm), leaf width (cm), length of stalk (cm), head weight (kg), head polar diameter (cm), equitorial length (cm), core length (cm), vitamin C (mg/100 g of fresh weight), days to maturity and yield (q/ha). The mean values obtained were used for estimating the analysis of variance, as per standard statistical procedure. Heritability (broad sense) and genetic advance were calculated as per formulae suggested by Johnson *et al.* (5).

Heritability estimates is as informative parameter to the breeder for selecting the varieties for further use. Higher magnitude of heritability suggested major role of genotypes factor in the expressing of characters. Allard (1) viewed that characters which have low heritability are dependable because their genotypic expression is superimposed by the environmental influences. Thus the degree of success in selection depends upon the magnitude of the heritability value furthermore; the progress in selection is also directly proportional to the amount of genetic advance. Therefore, the effect of selection is realized more quickly in those character which have high heritability as well as genetic advance.

High heritability in broad sense were observed for vitamin C (99.50 %), days to maturity (98.90

%), core length (88.20 %), head weight (87.30 %), yield (87.20 %), leaf width (83.40 %) and leaf length (83.20 %) whereas, moderate for plant height (78.20 %), equitorial length (72.70 %), head polar diameter (71.60 %), stalk length (71.20 %), plant spread (69.80 %) and number of non- wrapper leaves (66.00 %). Similar findings were also reported by Lal and Solanki (7) and Ghebramlak *et al.* (4). Genetic advance is still a more useful estimate because heritability value by itself does not have much significance as it fails to account for the magnitude of absolute variability. It is therefore, necessary to utilize heritability in conjunction with selection differential which would then indicate the expected genetic gain resulting from selection. Genetic advance as percentage of mean varied from 6.04 %-50.09 % for plant spread and vitamin C content. It was highest for vitamin C content (50.09 %) followed by yield (49.57 %), head weight (49.43 %), core length (40.26 %), days to maturity (38.87 %), stalk length (24.40 %), equitorial length (20.90 %), head polar diameter (20.19 %), leaf width (18.63 %), number of non -wrapper leaves (17.41 %), leaf length (13.89 %), plant height (8.74 %) and plant spread (6.04 %). Similar findings were also reported by Atter *et al.* (3), Meena *et al.* (8) and Kumar *et al.* (6). High heritability values coupled with high genetic advance were recorded

for vitamin C and yield which indicated more number of additive factor and thus, a high genetic gain is expected from selection for these traits.

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