The Andhra Agric. J 61(1):67-69, 2014

Variability Studies in Sesame (*Sesamum indicum* L.)

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ABSTRACT

An investigation was carried out to assess the variability, heritability and genetic advance for 10 characters viz., days to initial flowering, days to 50% flowering, days to maturity, Plant height, number branches / plant, number capsules / plant, 1000 seed weight (g), number of seeds/ capsules, oil content (%) and seed yield / plant in 50 sesame genotypes during rabi 2011 at Agricultural College, Naira, Srikakulam District during rabi 2011. High PCV and GCV were observed for number of branches / plant and seed yield / plant . High heritability couple with high genetic advance was observed for characters number of branches / plant, number of capsules / plant, number seeds/ capsule and seed yield/ plant, indicating the additive gene effect. High heritability and low genetic advance was observed for characters days to initial flowering, days to 50% flowering, days to maturity, plant height (cm) and 1000 seed weight indicating the role of non- additive gene action in thier inheritance.

Key words : Sesame, Variability studies

Sesame (*Sesamum indicum* L) is an important oil seed crop grown in India since ancient times. It possess 45-55% of oil and 25% of protein. The presence of antioxidants viz*., sesamin and sesomolin* in the oil increase the shelf life and no other vegetable oil possess this phenomenon, hence sesame is called as "Queen of oil seed crops." It also possess vitamin 'E' which is useful for skin. However, the productivity of the crop is low due to lack of suitable varieties coupled with management. Genetic variability is the key for any crop improvement and pre-requisite for initiating breeding programme, therefore knowledge on variability is important for effective selection of plant types. To know the nature and magnitude of variability present in the germplasm an attempt was made to estimate the genetic variability in 50 sesame genotypes received from Project Coordinator, Sesame and Niger, JNKVV, Jabalpur.

MATERIAL AND METHODS

The experiment was conducted at Agricultural College, Naira, Srikakulam District during *rabi*, 2011. Fifty sesame genotypes were evaluated in randomized block design replicated thrice. Each genotype was sown in two rows of three meters length with a spacing of 30cm between the rows and 15 cm between the plants. The packages of practices followed were as recommended by ANGRAU. Observations were recorded on ten randomly selected plants for 10 characters viz., Day to initial flowering, Days to 50% flowering, Days to maturity, plant height, Branches / Plant, Seeds/ Capsules, 1000 seed weight, oil % and seed yield. The Genotypic coefficient of variation and phenotypic coefficient of variation were worked out as per the formula suggested by Burton (1952). Broad sense heritability was computed according to formula given by Robinson (1966) and genetic advance was worked out based on the formula given by Johnson *et al.* (1955).

RESULTS AND DISCUSSIONS

Significant differences were present among the genotypes for all the characters studied. The GCV, PCV heritability and genetic advance were given in Table1.

GCV and PCV

In general, the GCV is lower than PCV due to the masking effect of environment . For characters days to initial flowering , days to 50% flowering, Days to maturity, plant height(cm), 1000 seed weight (g) and oil content (%), the PCV and GCV recorded were low. However, for number of

branches per plant and plant height both PCV & GCV were high.

For the character, capsules per plant, high PCV and moderate GCV was observed, while for seeds/capsule modevate PCV and GCV were recorded. For seed yield per plant both the GCV and PCV were high. High PCV and high GCV were observed by Valu and Shanmughavalli (2005) and Benarjee and Kole (2006) for plant height, Taminabegum and Das Gupta (2003) for branches per plant, Nayak *et al*. (2011) and Chandramohan (2011) for capsules per plant, Sudhakar *et al*. (2007) for seeds per capsule, Asokhavardhanareddy *et al*. (2001) for oil content and Sudhakar *et al*. (2007) for seed yield.

Heritability and genetic advance

Among the characters studied high heritability and high genetic advance was observed for the characters, branches per plant, capsules per plant, seeds per capsules and seed yield per plant indicating the additive gene action governing these characters and hence simple selection is useful for the improvement of these characters. However, high heritability coupled with low genetic advance as percent of mean was recorded for the characters, days to initial flowering, days to 50% flowering, days to maturity, plant height, and 1000 seed weight indicating the role of non- additive gene action in the inheritance of these characters, hence bi-parental crossing is useful for the improvement of these character. High heritability coupled with moderate for the character oil conent genetic advance was recorded as percent of mean indicating the influence of additive gene- action and hence simple selection is useful in improving the character. High heritability and low genetic advance was observed by Saravanan *et al* (2003) and high heritability and high genetic advance as percent of mean was reported by Babu *et al* (2005) for days to 50% flowering. For days to maturity, high heritability and low genetic advance as percent of mean was reported by Babu *et al*. (2005). High heritability and medium genetic advance as percent of mean was observed by Babu *et al*. (2005) for plant height. For number of branches per plant, high heritability and high genetic advance percent of mean was observed by Mubashir *et al*.(2007) while high heritability and low genetic advance as percent of mean was reported by Gangadhara Rao (2006) for number of branches per plant. For number of capsules per plant, high heritability and high genetic advance as percent of mean was reported by Nayak (2011) and Kumar and Solanki (2009). For number of seeds per capsule high heritability and high genetic advance as percent of mean as reported by Sudhakar *et al*. (2009) while high heritability and low genetic advance was reported by Ratnababu *et al*. (2005). For 1000 seed weight high heritability and high genetic advance as percent of mean was reported by Sreedhar *et al*. (2005) while high heritability and low genetic advance as percent was reported by Ratna Babu *et al*. (2005). Solanki and Deepak Gupta (2003) reported high heritability and high genetic advance as percent of mean for oil percent while Nayak *et al*. (2011) and Kumar and Solanki (2009) reported high heritability and high genetic advance for seed yield per plant.

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Table 1. Mean variability, heritability (broad sense) and genetic advance as per cent of mean for yield and yield components in Sesame (*Sesamum indicum* L.)

S.No	Characters	Coefficient of variation		Heritability (%) (Broad sense)	Genetic advance as per cent of mean (at 5% level)
		PCV (%)	GCV (%)		
1	Days to initial flowering	3.96	3.27	67.93	5.55
2	Days to 50% flowering	3.18	2.15	45.79	3.00
3	Days to maturity	1.61	1.32	68.06	2.25
4	Plant height (cm)	9.47	7.12	56.56	11.03
5	Number of branches	23.58	20.13	72.85	35.39
6	Capsules per plant	21.48	19.60	83.26	36.84
7	Seeds per capsule	14.09	14.07	99.70	28.94
8	1000-seed weight (g)	5.44	5.31	95.44	10.69
9	Oil content (%)	7.60	7.59	99.81	15.62
10	Seed yield per plant (g)	27.96	25.47	83.02	47.82

PCV: phenotypic coefficient of variation
GCV: Genotypic coefficient of variation

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(Received on 14.06.2012 and revised on 09.12.2012)