

SCREENING OF OKRA GENOTYPES BASED ON LEAF SHAPE INDEX

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Abstract: Okra [*Abelmoschus esculentus* (L.) Moench] is an important vegetable crop in the tropics and the subtropics. For characterization of diverse okra genotypes morphological characters play an important role.

Keywords: *Abelmoschus esculentus*, Genotypes, Okra

INTRODUCTION

Expression of leaf shape in okra is one of the important components and all varieties do not fall in one category. Bhutani *et al.* (1966) proposed a simplified index known as 'leaf lacinination index' in cotton, which expresses the leaf shape as recognizable as conventional leaf shape indices on the basis of the above results. Arumugam and Muthukrishnan (1977) found out lacinination indices by which okra cultivars can be classified broadly based on lacinination index. The association of lacinination index with Index 'C' (Sinus length / leaf length) and Index 'D' (lobe width / leaf length) are highly significant and negatively correlated while between Index 'C' and Index 'D', the co-relation coefficient is positively significant. Hence, it is enough that the 'lobe length' and 'leaf length' alone can be measured for determining the leaf shapes of different cultivars of Okra.

In the present investigation fifteen genotypes of okra were grown under two seasons viz. Summer and rainy during 2005 at the Agricultural Research farm, Baruipur of Calcutta University. The experimental layout was randomized Block Design having three replications of each genotype. The plot size was kept at 2 mt x 1.5 mt for both the seasons. Spacing of 30 cm x 30 cm for summer crop and 50 cm x 40 cm for rainy season crop was taken ensuring 24 plants and 20 plants per plot in the respective seasons. Twenty leaves from each genotype were taken at random and measured. The leaves on the main stem were sampled from ninth and eleventh node when the plants came into flowering as the leaves from 7th node onwards are representative of the shape and the size of the variety. The measurements included i) Lobe length (I) – length of the median lobe denoting the lobe exertion from the sinus, ii) Leaf length (L) – leaf length callus spot to leaf tip. The lacinination index (LI) was the ratio of lobe length (I) / leaf length (L). Based on LI, four types of leaf shapes are recognized in okra.

a) Broad leaves with LI values from 0.50 to 0.60.

b) Intermediate types with LI values from 0.61 to 0.70.

c) Narrow leaves with LI values from 0.71 to 0.81.

d) Lacininated leaves with LI values of 0.80 and above.

The lacinination index varied from 0.70 – 0.87 in the fifteen different cultivars (Table 1), out of these four were having lacininated leaves with LI values of 0.81 and above while six cultivars were having narrow leaves with LI values ranging from 0.72 – 0.79 under both the environments. Four cultivars viz. 'Parbhanikranti', 'Sagun', 'Makhmali' and 'Mahyco-10' were seen to have lacininated leaves during summer and narrow leaves during rainy season. Similarly, 'Pankaj' was having narrow leaves under summer environment and intermediate type of leaves under rainy environment. The variation may be due to the environmental effect, which masks the small differences among different genotypes resulting in variation in the character, which is usually discontinuous in nature. Leaf shape index is an oligogenic trait and here the genetic variability in the form of oligogenic complexes resulting from the linkage between major genes and polygenes can lead to variation in the segregating generations. Further that leaf shape in okra is having close association with resistance to major pests and diseases and photosynthetic activity of the plant as detailed out by Premnath and Dutta (1970). Those cultivars having higher lacinination index viz. 'Parbhani kranti', 'Bhendi hybrid No. – 18', 'Sagun', 'Makhmali', 'Shamali', and 'HR – 1' will be having higher photosynthetic activity and thus enhanced average fruit weight.

The leaf shape indices in okra should be given due importance while carrying out systemic breeding programme as this character is very much inter-linked to resistance towards major pests and diseases and should invariably be included in future biotic resistance programmes.

Table 1. Leaf Lacination Index for fifteen okra cultivars grown Under two environments.

Sl. No.	Varieties	Env.	Lacination Index	Leaf Shape Classification
1.	Parbhani Kranti	S R	0.87 0.79	Lacinated leaves Narrow leaves
2.	Bhindi hyb. No. 18	S R	0.86 0.81	Lacinated leaves Lacinated leaves
3.	Sagun	S R	0.84 0.79	Lacinated leaves Narrow leaves
4.	Satdhari Green	S R	0.73 0.77	Narrow leaves Narrow leaves
5.	Ankur - 40	S R	0.79 0.80	Narrow leaves Narrow leaves
6.	Makhmali (F ₁)	S R	0.82 0.80	Lacinated leaves Narrow leaves
7.	Arka Anamika	S R	0.75 0.76	Narrow leaves Narrow leaves
8.	Sel-11 (Pankaj)	S R	0.74 0.70	Narrow leaves Intermediate leaves
9.	Mahyco - 10	S R	0.81 0.80	Lacinated leaves Narrow leaves
10.	Shamali	S R	0.85 0.84	Lacinated leaves Lacinated leaves
11.	Bhindi Sel – 5	S R	0.82 0.82	Lacinated leaves Lacinated leaves
12.	Sresta	S R	0.78 0.75	Narrow leaves Narrow leaves
13.	Bhindi No. 101	S R	0.78 0.72	Narrow leaves Narrow leaves
14.	Harita	S R	0.76 0.73	Narrow leaves Narrow leaves
15.	HR - 1	S R	0.85 0.82	Lacinated leaves Lacinated leaves

Note : S – Summer environment

R – Rainy environment

- 1) Broad leaves with LI values from 0.50 to 0.60
- 2) Intermediate types with LI values from 0.61 to 0.70
- 3) Narrow leaves with LI values from 0.71 to 0.80
- 4) Lacinated leaves with LI values of 0.80 and above.

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