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Path analysis in okra [*Abelmoschus esculentus* (L.) Moench]

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ABSTRACT

In a path coefficient analysis conducted with 20 parents (17 lines × 3 testers) and their 51 F_1's, in two different seasons *i.e. Kharif* and summer season. Path coefficient analysis carried out at genotypic level revealed that number of fruit per plant exerted maximum positive direct effect on fruit yield per plant in *Kharif* parents, plant height in *Kharif* F_1's, number of fruits per plant in summer parent and summer F_1's exerted maximum positive direct effect on fruit yield per plant.

Key words : Path analysis, Line × tester, Okra

INTRODUCTION

Okra [*Abelmoschus esculentus* (L.) Monech] is an important vegetable crop grown for its tender and delicious fruits. It is widely cultivated in tropics, subtropics and warmer parts of temperate region. Now, India has emerged as the second largest producer of vegetables after China. The total area covered under vegetable crops is about 7.8 million hectare and the total production of vegetables has gone up from 58.5 to 125.89 million tonnes, over a period of 17 years from the year 1991-92 to 2007-08 (Anonymous, 2008).

Correlation studies coupled with path coefficient analysis are a powerful tool to study the character association and their final impact on yield, which help the selection procedure accordingly. Path coefficient analysis which determines the cause and effect relationship has been found useful in splitting the correlation into its direct and indirect effects contributing to yield. Path coefficient analysis is a tool to partition the observed correlation coefficient into direct as well as indirect effects of yield components or fruit yield per plant to provide clearer picture of character association for formulating efficient selection strategy. Path analysis differs from simple correlation in that it points out the causes and their relative importance.

MATERIALS AND METHODS

The present investigation was carried out at Institute of Agriculture Sciences, Banaras Hindu University, Varanasi, in a randomized block design with three replications during *Kharif* season, 2007 and summer season, 2008. All the recommended practices were followed during experimentation. The experimental material consisted of 51 F_1's, involving 17 lines (IC – 128883, VRO – 5, VRO-6, AC-108, IC – 45806, IC – 218877, IC – 218844, Arka Abhay, IC – 43720, IIVR – 342, IC – 140906, IIVR – 198, EC – 305612, IIVR – 435, IIVR – 401, SA – 2 and IC – 140934) and 3 testers (Arka Anamika, Pusa Sawani and Parbhani Kranti). Observations were recorded on fifteen characters *viz*., plant height (cm), stem diameter (cm), number of branches/plant, number of nodes/plant, internodal length (cm), days to first flowering, days to 50 per cent flowering, number of fruits/plant, single fruit weight (g), fruit length (cm), fruit diameter (cm), fruit yield/plant (g), number of seeds/fruit, number of ridges/fruit and ascorbic acid content (mg/100g). Path coefficients were obtained according to the procedure suggested by Dewey and Lu (1959) using phenotypic and genotypic correlation coefficients.

RESULTS AND DISCUSSION

The phenotypic and genotypic correlation coefficients between yield and other traits have been partitioned into direct and indirect effects by path coefficient analysis. The results are presented in Table 1 for *Kharif* parents, Table 2 for *Kharif* hybrids (F_1's), Table 3 for summer parents and Table 4 for summer hybrids (F_1's) are explained at genotypic level in the following paragraphs.

In *Kharif* parents, number of fruits per plant (1.114) had maximum positive direct effect on fruit yield per plant followed by plant height (0.704) and single fruit weight (0.628). Whereas, the highest negative direct effect was found in stem diameter (-0.644). However, high positive indirect effects were found in number of fruits per plant via. ascorbic acid content (0.728) followed by number of seeds per fruit (0.620), fruit length (0.496) and days to first flowering (0.491). While, the highest negative indirect effect was found in plant height (-0.445) via. single fruit weight.

Among *Kharif* hybrids, plant height (1.981) expressed maximum positive direct effect on fruit yield per plant followed by number of fruits per plant (1.651)

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