Path analysis of different yield attributes on seed yield in sesame (*Sesamum indicum* L.)

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ABSTRACT

A core collection of 100 sesame (*Sesamum indicum* L.) genotypes (half of them were eastablished varieties and other half were germplasm lines) studied to the association of yield and attributes in rabi summer and Kharif seasons (with two dates of sowing in each season) at AICRP on sesame and niger, research farm, Jabalpur. Study of path analysis revealed that an early, dwarf genotype with bold seeded and high oil content would be suitable for *rabi* summer cultivation. A late tall genotype with more number of branches and capsules yield higher in *kharif* cultivation. An average genotype of height and earliness with more number of capsules with higher yield but with moderate seed size and oil content can only be suitable for cultivation in both the seasons.

Key words : Sesame, Path analysis, Rabi summer, Kharif.

INTRODUCTION

Sesame being the oldest and quality oilseed crop it is necessary to study its inheritance and genetics for any crop improvement to fulfill the oilseed production of the country. Sesame is a crop, grown around the year in the country, So it is needful to identify the most suitable genotype for different crop growing season. Path coefficient is standardized partial regression coefficient. In a biological system, the relationships may exist in a very complex form and the correlation coefficients are, only the indications of simple associations between variables. The magnitude of association between two variables is always proved to affect the simultaneous variability in other related characters. It is therefore, essential to study the relationships among the variables in a comprehensive way.

MATERIALS AND METHODS

The study of 6584 germplasm accessions showed the presence of wide range of variability in yield and other yield attributes. On the basis of above study, one hundred genotypes differing in morphological attributes, were chosen for detailed analysis, which was carried out in 2001 in two seasons (*rabi* summer and *kharif*) at two dates of sowing each (total four environments). These were observed for eight characters viz. days to 50% flowering, days to maturity, plan height (cm), number of branches per plant, number of capsules per plant, seed yield per plant (g), 1000-seed weight (g) and percent oil content.

The path coefficients analysis suggested by Wright (1921) is a powerful tool, which enables partitioning of the given relationship in its further components, which helps in understanding the underlying causes of a given effect. Following this method, a combined correlation (genotypic, phenotypic and environmental) between a component and seed yield can be partitioned into the direct effect of this character on dependent character and its indirect effects which it exerts through other components with which it is related. There are three main aspects of path analysis, which are used to understand the cause correlation and to identify the characters responsible for brining improvement of traits.

I. If the correlation coefficients between causal factors and the effect is almost equal to its direct effect then, correlation explains the true relationship and direct selection through this trait will be effective.

II. If the correlation coefficient is positive but the direct effect is negative or negligible, the indirect effects appear to be the cause of correlation. In such situation, the indirect causal factors are to be considered simultaneously.

III. Correlation coefficient may be negative but the direct effect is positive and high. Under these circumstances, a restricted simultaneous selection model is to be followed, i.e. restriction is to be imposed to nullify the undesirable indirect effects in order to make use of direct effects.

RESULTS AND DISCUSSION

To measure the direct as well as indirect association of one variable (cause) through another as the end product