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Association analysis and path analysis for yield and its contributing traits in rice (*Oryza sativa* L.)

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SUMMARY

The present investigation aimed to study the association among yield components and their direct and indirect influence on grain yield in 46 genotype of rice. Grain yield per plant had significant positive association with total number of tillers per plant, number of productive tillers per plant and grain breadth. Path coefficient analysis revealed that grain breadth, grain L/B ratio and total number of tillers per plant had the highest direct effect on grain yield per plant. Suggesting that the improvement in grain yield could be efficient, if the selection is based on these component characters.

Key words : Correlation, Path analysis, Rice.

The expression of grain yield depends upon the interplay of a number of complex component attributes. Knowledge of correlation between grain yield and other characters is helpful in selection of suitable plant type. When, more characters are included in correlation study the association become complex. In such situations, selection on the basis of direct and indirect effects is much more useful than selection for yield *per se*. Hence, the present investigation was undertaken to study the association among grain yield and its component characters along with the nature and extent of direct and indirect effects of yield components on the grain yield in rice.

MATERIALS AND METHODS

Field experiments were conducted at Plant Breeding Farm, Department of Agricultural Botany, Annamalai University during Kuruvai (July - October, 2005). 46 saline tolerance rice genotypes were sown in three replications, with spacing of 20 cm x 15 cm. The observations were recorded on randomly ten plants in each replication at maturity for recording observations on fourteen traits *viz.*, days to first flower, plant height, total number of tillers per plant, number of productive tillers per plant, panicle length, number of filled grains per panicle, hundred grain weight, grain yield per plant, grain length, grain breadth, grain L/B ratio, kernel length, kernel breadth and kernel L/B ratio.

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The association between yield and components traits and among themselves was computed based on genotypic correlation coefficient (Goulden, 1952). Path coefficient analysis was used to partition the genotypic correlation coefficient into components of direct and indirect effects (Dewey and Lu, 1959). The direct and indirect effect was classified as follows based on the scale given by Lenka and Misra (1973).

More than 1.0	very high
0.33 to 0.99	high moderate
0.20 to 0.29	moderate
0.10 to 0.19	low
0.01 to 0.09	negligible

RESULTS AND DISCUSSION

In the present study, the correlation coefficients among 14 characters studied are presented in Table 1. Total number of tillers per plant, number of productive tillers per plant, grairt length and grain breadth had highly significant positive genotypic correlation with grain yield per plant. The characters days to first flower, plant height, hundred grain weight and grain L/B ratio were negatively and significantly correlated with grain yield per plant. However, the characters *viz.*, panicle length, number of filled grain per panicle, kernel length, kernel breadth and kernel L/B ratio had non significant correlation with grain yield per plant. Similar findings were earlier reported by Murthy *et al.* (1991), Sundaram and Palanisamy (1994) and Panwar and Mashiat A1i (2007) for grain yield per plant. Padhi and Singh (1991) and Meenakshi et *al.* (1999) for grains per panicle and Surek *et al.* (1998) and Khedikar *et al.* (2004) for number of panicles per plant.

Regarding inter - correlation of the yield components, days to first flower had significantly positive correlation with hundred grain weight, grain length, grain L/B ratio,