

## Association analysis for yield and related traits in rice (*Oryza sativa* L.)

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### SUMMARY

The genotypic and phenotypic correlations of grain yield with different components were estimated from seven different genotypes of rice (*Oryza sativa* L.). The genotypic and phenotypic correlations closely agreed with each other. Panicle length, spikelet fertility and days to 50 per cent flowering exhibited significantly positive correlation with grain yield. Their phenotypic correlations with grain yield were also high and positive. Amylose content, on the other hand registered low and negative association with grain yield both at phenotypic and genotypic levels. A few significantly positive interrelationships were found between the different components. Panicles per plant on the contrary, exhibited significantly negative correlation with amylose content, harvest index and spikelet fertility at genotypic level. The path coefficient analysis of grain yield showed that panicle length, spikelet fertility, amylose content and grains per panicle were the most important yield associated components because of highly positive direct effects. Contrarily 1000 grain weight registered high, negative direct effect to grain yield.

Key words : Correlation, Path analysis, Rice.

**Y**ield, a complex character is depending on a number of components. The knowledge of character association helps in determining the relative importance of component characters influencing grain yield where as path analysis provides an effective means of partitioning direct and indirect causes of association. Correlation and path analysis thus help in identifying suitable criteria for improving the yield. In view the huge information available on component analysis of rice, the present investigation was undertaken to assess the importance of various components of grain yield on which selection can be made for genetic improvement.

### MATERIALS AND METHODS

A total of seven parents and their 42 hybrids obtained through diallel mating design were evaluated in randomized block design with three replications at Agricultural College and Research Institute, Killikulam during 2002. Data were collected on five randomly selected plants for eleven characters *viz.*, plant height, days to 50 per cent flowering, panicle length, panicles per plant, grains per plant, spikelet fertility, 1000 grain weight, harvest index, protein content, amylose content and grain yield per plant.

Correlation coefficient for yield and other traits were worked out as suggested by Al-Ji bour *et al.*, (1958), the path coefficient was worked by the procedure suggested by Dewey and Lu (1959).

### RESULTS AND DISCUSSION

The genotypic correlations were generally higher than the phenotypic correlations, indicating the strong and inherent association between the traits governed largely by genetic factors (Table 1). Panicle length showed positive and significant association with grain yield followed by spikelet fertility and days to 50 per cent flowering. The inter correlations among the yield components revealed that the genotypic correlation coefficients of plant height with panicles per plant and spikelet fertility were negatively significant and with amylose content and harvest index were positively significant. Grains per panicle was positive and significantly correlated with days to 50 per cent flowering and panicles per plant. Days to 50 per cent flowering was significant and positively correlated with panicles per plant this trait had negative significant correlation with amylose content and harvest index. Panicles per plant was significant and negatively correlated with amylose content, harvest index and spikelet fertility. The characters protein content (with harvest index), amylose content (with harvest index and spikelet fertility) and harvest index (with spikelet fertility) were registered significant and positive correlation.

The same type of inter correlation among the yield components were already reported by Kalaimani and Kadambavanasundaram (1988), Ramalingam (1989), Ganesan *et al.*, (1996), Selvarani and Rangasamy (1998)

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