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Correlation and Path Coefficient Analysis For Some Yield-Related Traits in Rice (Oryza Sativa L.) Under Thrace Conditions

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Abstract: The associations among yield components, and their direct and indirect influence on the grain yield of rice were investigated. For this purpose, 80 breeding lines derived from 11 different cross populations in the F_6 generation and their 10 parents were tested in a randomised complete block experiment design with two replications at the Thrace Agricultural Research Institute in 1995. According to the results from the first year, 49 breeding lines were selected, and they and their 10 parents were tested in a randomised complete block experiment design with three replications in the same institute in 1996. The phenotypic correlations among the traits and their path coefficient were estimated in both years. Grain yield was significantly correlated with its component characters like the number of productive tillers per square metre (r = 0.241** and r = 0.274**), biological yield (r = 0.803** and r = 0.312**), harvest index (r = 0.250** and r = 0.677**), and the number of filled grains per panicle (r = 0.495** and r = 0.633**) in both years. Path coefficient analysis revealed that biological yield (0.748 and 0.481) and harvest index (0.413 and 0.704) had the highest positive direct effects on grain yield in both years. In addition, the yield components had positive direct effects on grain yield. According to the magnitude of the direct effects on grain yield, the order of yield components was the number of filled grain per panicle (0.297 and 0.285 > the number of productive tillers per square metre (0.233 and 0.197) > 1000-grain weight (0.165 and 0.136). The improvement in grain yield will be efficient, if the selection is based on the biological yield, the harvest index, the number of productive tillers per square metre and the number of filled grains per panicle under temperate conditions. These traits may also be utilised for pure line selection in late generations. However, both high biological yield and high harvest index should be taken into account together in this selection due to their negative correlations and indirect effects each other.

Key Words: Rice (Oryza sativa L.), path coefficient, phenotypic correlation, yield components

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