Salinity induced morpho-physiological characters and yield attributes in rice genotypes

ABSTRACT

The pot experiment was conducted at the glasshouse of University Putra Malaysia, Serdang, Selangor, Malaysia, during July to November 2012 to investigate the effect of different salinity levels on morpho-physiological characters, yield attributes and yield in five saline tolerant rice genotypes viz., SAL656, SAL614, SAL730, SAL613 and Pokkali. The four levels of sodium chloride induced salinity levels, 0, 6, 9 and 12 dSm-1, were imposedat 25 days after planting. Results indicated that morpho-physiological characters such as plant height, tiller number, leaf number, root volume and weight, straw yield, harvest index, chlorophyll content, photosynthesis and stomatal conductance in leaves, yield attributes such as number of grains panicle-1 and 1000-grain weight, mineral ions in shoots, such as potassium and calcium, were decreased with gradual increasing of salinity levels while grain sterility and Na+ content of shoot were increased with increasing soil salinity. The highest value of the above parameters was observed in control and the lowest values of them were observed at 12 dSm-1. Generally genotypes having ability to exclude Na from shoot were found salt tolerant in respect of grain yield and vice versa. Among the genotypes, the yield loss due to salinity was less in SAL656 and Pokkali than that in the others, which further revealed that SAL656 and Pokkali had a greater tolerance to salinity than SAL614, SAL760 and SAL613. The rank of salinity tolerance was: PB SAL656 > Pokkali > PB SAL730 > PB SAL613 > PB SAL614.

Keyword: Salinity; Morphological characters; Physiological attributes; Mineral ions; Rice