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Evaluation of Rice (*Oryza sativa* L.) Varieties and Promising Breeding Lines for Resistance against Brown Spot Disease Caused by *Bipolaris oryzae* in Low Country Wet Zone, Sri Lanka

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Abstract

Brown spot caused by *Bipolaris oryzae* is one of the destructive diseases of rice in Sri Lanka. Growing of susceptible varieties, bad management practices conducted by farmers and prevalent climatic changes leads to increased disease severity in the country. Identification of resistant varieties is essential to recommend for cultivation in endemic areas and also to use as resistant donors in plant breeding. Considering these facts, an experiment was designed to identify the sources of resistance against brown spot disease at Regional Rice Research and Development Centre, Bombuwela during 2020/21 Maha and 21 Yala. Forty five rice varieties/promising lines were evaluated under natural infection. Twenty one days old plants were transplanted in the field as rows with 2 replicates. Agronomic practices recommended by the department of Agriculture were followed throughout the season. One row was comprised with 50 plants. Twenty five plants from each planting row were selected randomly to assess disease severity. Severity was scored according to the standard evaluation system for rice (International Rice Research Institute, 2014) at the maturity stage. The results revealed that there was significant variation in brown spot severity among the varieties/lines tested in both seasons. During 2020/21 Maha, only one line (Bw16-1567) showed Moderately Resistant/Moderately Susceptible (MR/MS) reaction, 8 were Moderately Susceptible (MS), 26 were Susceptible (S) and 10 were Highly Susceptible (HS). Less disease severity was observed during 21 Yala season when compared to 2020/21 Maha. Mann-Whitney test was performed to identify any seasonal differences in disease severity. Results revealed that there was a significant difference in disease severities in Maha and Yala (p=0.000). During 21 Yala, 7 varieties/lines showed MR/MS reaction, 31 were MS, 7 were S. None of the varieties/lines showed HS reaction during 21 Yala. According to the study, almost all the popular varieties tested were S or HS during Maha season in Low Country Wet Zone (LCWZ). However, their severities were less in Yala season. It may be due to unfavourable weather condition prevailed in Yala season for *Bipolaris oryzae* than in Maha. There were no resistant varieties/lines found during this experiment. However, continuous evaluation is needed to identify brown spot resistant sources to cater to rice breeding program in Sri Lanka.

Keywords: *Bipolaris oryzae,* Brown spot*,* Low country wet zone