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MONITORING DISEASE PROGRESSION IN RICE BLAST: INSIGHTS FROM SUBSEQUENT INFECTION CYCLES

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Rice blast caused by *Magnaporthe oryzae* is among the most destructive diseases that cause 20 to 30% of yield loss in various rice-growing regions worldwide. As a polycyclic pathogen, it is capable of producing several disease cycles within a single growing season, which accelerates epidemic development when susceptible plant hosts and conducive environments coexist. This study was aimed to investigate the rice blast pathosystem in Sri Lankan production environments by characterising disease progression. The pathogen *M. oryzae* was cultured on oatmeal agar and induced to sporulate. A conidial suspension (1×10^5 conidia per mL) was prepared and used to inoculate 3-week-old 'Pachchaperumal' (*Oryza sativa* L.) rice variety under controlled conditions, where the daily temperature ranged from 10.9 °C (minimum) to 32.2 °C (maximum). The experiment was conducted using a completely randomized block design with three replicates. Each replicate contained 20 rice plants. Inoculated plants were maintained under > 90% relative humidity to favor blast disease development. Daily observations were recorded starting from 3 days post-inoculation. For each day, the number of visible disease spots was counted in each plant. Data was analysed by regression spline models, and the rate of infection was estimated by numerically differentiating the fitted spline functions, yielding a continuous approximation of the daily rate of change in disease spots. Two distinct infection cycles were observed. The first peak in disease development occurred on day 16 (16.2 – 16.3 days), followed by a second, low peak at day 20 (20.3 – 20.5 days). Determination of disease progression rate in the first cycle provided early insight into epidemic potential enabling the optimal timing for control measures, and to predict subsequent infection cycles.

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