P71 *2nd IWWB: Session 1 – Wheat blast biology, genetics and genomics of resistance*

FINE PHENOTYPING UNLOCKS WHEAT MECHANISMS OF REACTION TO *Magnaporthe oryzae*

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Wheat blast is the most recent economically important disease in Brazil. Although the development of symptoms in all aboveground parts of the wheat plant is possible, spike infection causes the greatest losses of grain production. Infected spikes show characteristic bleaching. Despite the intense search for sources of wheat blast resistance in South America, little is known about the genetic of resistance. Since 2009, a Brazilian research initiative has been undertaken to identify and molecularly characterize wheat genotypes with contrasting blast resistance phenotypes. Dozens of resistant genotypes were identified in nurseries of wheat blast in Brazil. We selected twelve of these genotypes for a detailed phenotyping under controlled conditions. The wheat cultivar BRS 209 was used as susceptible control. It is the maternal parent of a doubled haploid population created at Embrapa Wheat for genetic studies of wheat blast resistance. Wheat plants were cultivated in pots until the adult plant stage. Spikes of adult wheat plants were inoculated at the heading stage with the isolate Py0925 at 2×10^5 conidia/mL. Control spikes were misted with solution without conidia (mock inoculation). Wheat spikes were inspected daily. The total number of spikelets per spike was counted. Disease severity (in percentage) was estimated by the ratio of number of spikelets with lesions, or bleached spikelets, in relation to the total number of spikelets over time until the plants attained physiological maturity. For each inoculated spike, the lesion type was also evaluated. After harvest, wheat rachises were searched for the infection point on the rachis (ipr), which corresponds to the penetration site of the pathogen. Previous results of our group identified variability in the number of ipr of wheat varieties. The data were analyzed using analysis of variance (ANOVA) and the genotypes were grouped according to Scott-Knott test at 5% significance. The Pearson's correlation coefficient was applied to evaluate the associations between the variables. There was no significant difference among the genotypes for blast severity, considering the percentage of spikelets with lesions, at five days post-inoculation (dpi). When we analysed bleaching severity at seven dpi, four groups of wheat genotypes were identified. Cultivars BRS 209 (susceptible control) and Shanghai showed the highest bleaching severities at seven dpi and the less total number of ipr. Under our experiment conditions, some genotypes had more than 30 ipr. A significant negative correlation (-0.58) occurred between bleaching severity at seven dpi and the total number of ipr. Scientific literature reports that susceptible genotypes commonly presented many ipr. We intend to conclude grain production evaluation of inoculated and mock-inoculated spikes to analyze the possible association between resistance and tolerance mechanisms of wheat faced with the blast pathogen. Acknowledgements: Thanks to CAPES-Embrapa and CNPq-PIBIC for fellowships supporting graduate and undergraduate research studies of the first and fifth author, respectively.

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