

Wheat Dihaploid and Somaclonal Lines Screening for Resistance to *P. nodorum*

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Abstract : Glume and leaf blotch is a disease of wheat caused by necrotrophic fungus *Parastagonospora nodorum*. It is a serious pathogen in many wheat-growing areas throughout the world. Use of resistant cultivars is the most effective and economical means to control the above-mentioned disease. Plant breeders and pathologists have worked intensively to incorporate resistance to the pathogen in new cultivars. Conventional methods of breeding for resistance can be supported by using the biotechnological ones, i.e., somatic embryogenesis and androgenesis. Therefore, an effort was undertaken to compare genetic variation in *P. nodorum* resistance among winter wheat somaclones, dihaploids and conventional varieties. For the purpose, a population of 16 somaclonal and 4 dihaploid wheat lines from six crosses were used to assess their resistance to *P. nodorum* under field conditions. Lines were grown in disease-free (fungicide protected) and inoculated micro plots in 2 replications of a split-plot design in a single environment. The plant leaves were inoculated with a mixture of *P. nodorum* isolates three times. Spore concentrations were adjusted to 4×10^6 of viable spores per one milliliter. The disease severity was rated on a scale, where $> 90\%$ - susceptible, $< 10\%$ - resistant. Disease ratings of plant leaves showed statistically significant differences among all lines tested. Higher resistance to *P. nodorum* was observed more often on leaves of somaclonal lines than on dihaploid ones. On average, disease severity reached 15% on leaves of somaclones and 30% on leaves of dihaploids. Some of the genotypes were showing low leaf infection, e.g. dihaploid D-33 (disease severity 4%) and a somaclone S-1 (disease severity 2%). The results from this study prove that dihaploid and somaclonal variation might be successfully used as an additional source of wheat resistance to the pathogen and it could be recommended to use in commercial breeding programs. The reported results prove that biotechnological methods may effectively be used in breeding for disease resistance of wheat to fungal necrotrophic pathogens.

Keywords : glume and leaf blotch, somaclonal, androgenic variation, wheat, resistance breeding

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