



Resistance of European winter wheat cultivars to *Zymoseptoria tritici* isolate IPO86036

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Objective

Septoria tritici blotch (STB) of wheat (*Triticum aestivum*), caused by the fungal pathogen *Mycosphaerella graminicola* (anamorph: *Zymoseptoria tritici*, syn. *Septoria tritici*), is present in most wheat-growing areas worldwide. Host resistance is the most economical and safest method of controlling the disease and information on resistance loci is crucial for effective breeding for resistance programs.

Methods

In the study we used a set of 83 wheat cultivars registered in the Descriptive List of Agricultural Plant Varieties (COBORU 2012), 92 cultivars from other European countries and 25 cultivars/lines with identified STB resistance loci. The wheat genotypes were tested on adult plant stage under polytunnel conditions with watering system. Fully expanded flag leaves were sprayed with spore suspension of IPO86036 *Z. tritici* isolate. After incubation period, the percentage leaf area covered by necrosis (NEC) and covered by pycnidia (PYC) were measured (computer assisted image analysis, fig. 2) on flag leaf of each wheat cultivar/line. The agglomerative hierarchical clustering (AHC) analysis with UPGA algorithm (unweighted pair-group average) was used to dissect groups of wheat cultivars/lines with different resistance levels.

Results

Large variation was detected for both disease parameters: NEC 19.67-94.7% and PYC 0.15-50.29%. The AHC method revealed six groups of wheat cultivars/lines (fig. 1) and the largest group comprised 130 genotypes with NEC ranged from 19.67% to 70.71% and PYC ranged from 0.15% to 20.9%. Within this group, a set of 11 highly resistant wheat cultivars were identified (NEC<30% and PYC<10%): Kranich, Desamo, Lear, Tuareg, Jenga, Zappa, Intro, Glaucus, Erasmus, M3 synthetic (W-7976) [identified STB resistance loci *Stb16q(3DL)* + *Stb17(5AL)*] and Solitar (QTLs on 5A, 6D and 7D) (fig. 1, red type) The broad range of disease resistance parameters values may suggest that resistance to STB in European cultivars is contributed mainly by quantitative loci and those with main effects. Presented work (phenotyping data) is a part of larger project aiming at identification of resistance genes (*Stb*) to *Septoria tritici* blotch in winter wheat and will be used in near future in association mapping approach.

Acknowledgments

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Fig. 1. Dendrogram based on AHC analysis.

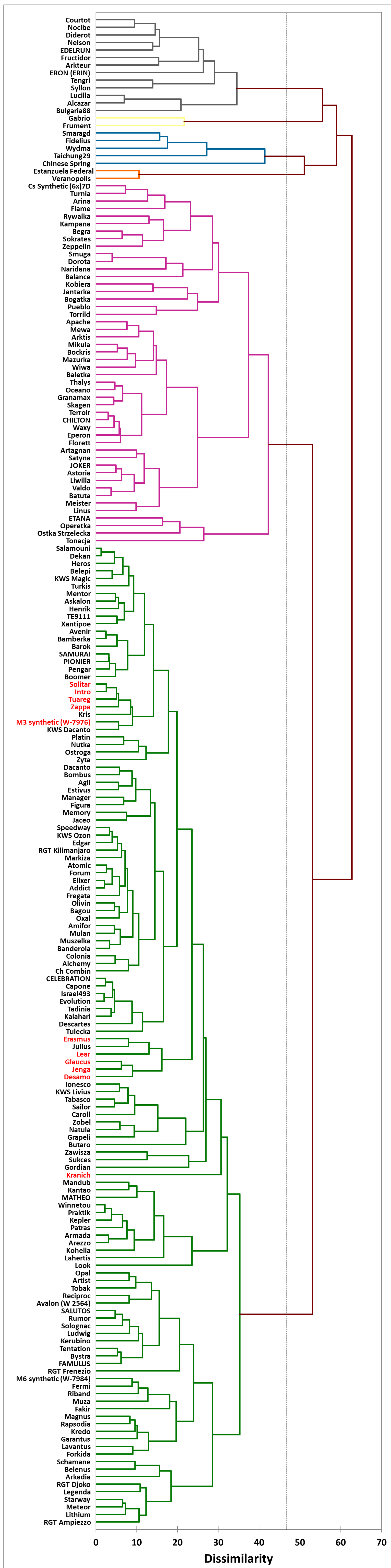


Fig. 2. Computer assisted image analysis of *Septoria tritici* blotch (STB): necrosis and pycnidia leaf coverage.

