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FROM SEED TO PASTA

DURUM AND BREAD WHEATS SHARE COMMON RESISTANCE GENES TO ZYMOSEPTORIA TRITICI

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DESCRIPTION RÉSUMÉE

Septoria tritici blotch (STB) is an economically important wheat disease caused by *Zymoseptoria tritici*. STB epidemics are frequent worldwide on both bread and durum wheats with strong specificity of *Z. tritici* populations towards different *Triticum* host species. For that reason, STB can be particularly severe on durum wheat (DW) in regions where its culture is predominant, such as south-west Europe or Maghreb. An ecologically friendly approach to reduce damages caused by diseases is the use of genetic resistances to improve cultivated varieties. However, elite DW germplasm is known to be highly depleted in effective resistance genes, and very few sources of resistance have been genetically characterized in this species. To progress in the genetic characterization of resistance genes to STB it is necessary to acquire concomitantly knowledge on resistance sources and on pathogenicity of *Z. tritici* populations infecting DW. We screened a panel of 200 south-west European elite varieties with 4 French and Tunisian *Z. tritici* isolates. Re-

sults of this screening allowed to complete a set of 15 DW genotypes with resistance differentially effective to the tested isolates. Then, we used those 15 septoria differential genotypes to characterize the virulence profile of 40 *Z. tritici* worldwide isolates. Finally, those isolates were used to genetically map resistance genes to STB through a GWAS approach on the 200 DW panel and through a QTL mapping approach in 2 recombinant inbred lines populations issued from this panel. The GWAS and QTL mapping approaches are highly complementary and together revealed that resistance to STB in DW is governed by multiple genes with quantitative effects. Several loci co-localize with the position of *Stb* resistance genes previously identified in bread wheat, and the presence of *Stb6* was confirmed in DW. Our work open novel possibilities for the construction of DW cultivars durably resistant to STB.

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