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Stripe rust resistance and dough quality of new wheat - *Dasypyrum villosum* translocation lines T1DL•1V#3S and T1DS•1V#3L and the location of HMW-GS genes

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ABSTRACT. The transfer of agronomically useful genes from wild wheat species into cultivated wheat is one of the most effective approaches to improvement of wheat varieties. To evaluate the transfer of genes from *Dasypyrum villosum* into *Triticum aestivum*, wheat quality and disease resistance was evaluated in two new translocation lines, T1DL•1V#3S and T1DS•1V#3L. We examined the levels of stripe rust resistance and dough quality in the two lines, and identified and located the stripe rust resistant genes and high molecular weight glutenin subunit (HMW-GS) genes *Glu-V1* of *D. villosum*. Compared to the Chinese Spring (CS) variety, T1DL•1V#3S plants showed moderate resistance to moderate susceptibility to the stripe rust races CYR33 and Su11-4. However, T1DS•1V#3L plants showed high resistance or

immunity to these stripe rusts. The genes for resistance to stripe rust were located on 1VL of *D. villosum*. In comparison to CS, the dough from T1DS•1V#3L had a significantly shorter developing time (1.45 min) and stable time (1.0 min), a higher weakness in gluten strength (208.5 FU), and a lower farinograph quality index (18). T1DL•1V#3S had a significantly longer developing time (4.2 min) and stable time (5.25 min), a lower weakness in gluten strength (53 FU) and a higher farinograph quality index (78.5). We also found that T1DS•1V#3L had reduced gluten strength and dough quality compared to CS, but T1DL•1V#3S had increased gluten strength and dough quality. The results of SDS-PAGE analysis indicated that *Glu-V1* of *D. villosum* was located on short arm 1VS and long arm 1VL. These results prove that the new translocation lines, T1DS•1V#3L and T1DS•1V#3L, have valuable stripe rust resistance and dough quality traits that will be important for improving wheat quality and resistance in future wheat breeding programs.

Key words: Stripe rust resistance; Dough quality; HMW-GS; Wheat; *Dasypyrum villosum*

