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# UNLOCKING THE HIDDEN POTENTIAL OF GENETIC DIVERSITY TO IMPROVE DURUM WHEAT RESISTANCE TO HEAT STRESS

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Climate change and rise in temperature severely hampers crop growth and development. Several physiological drawbacks affect crop yields causing also a modification in cultivated areas. At the same time, food production must double by 2050 to meet the demand of the world’s growing population and innovative strategies are needed to help combat hunger, which already affects more than 1 billion people in the world. Wheat, is one of the major cereal crops worldwide, providing 20 % of the total dietary calories and proteins worldwide. FAO has projected a 43% increase in global demand for cereals, including wheat, by 2050, mainly from developing countries. To address these needs, that availability of new genetic materials able to overcome the continuous raising o temperatures and climate change is mandatory to achieve these goals.

The exploitation of the hidden in the genetic diversity contained in

germplasm collections can be a key strategy to achieve this goal. Small Hsps represent a good target to improve heat resilience. Here, by means of an innovative, cost-effective targeted resequencing approach coupling Next Generation Sequencing and KASP assay we, assess the presence of SNPs in the *sHsp26* sequence in a panel of durum wheat landraces. Plants have been subjected to heat stress at different developmental stages and we associated the different haplotypes of *Hsp26* with the different responses to thermal stress, giving details on the role of small Hsp in the response to thermal stress.

From this analysis, contrasting genotypes were identified as heat resilience or susceptible. 69 and 178 SSD genotypes demonstrated an high heat resilience while 397 and 244 SSD genotypes were identified as susceptible, opening new perspectives in heat resilience breeding.