

DBT-NABI scientists take a step towards better heat tolerance in wheat.

New Delhi, May 28: Heat shock proteins (HSPs) have a significant role in protein folding and are considered as prominent candidates for development of heat-tolerant crops. Understanding of wheat HSPs has great importance since wheat is severely affected by heat stress, particularly during the grain filling stage.

Research at the Department of Biotechnology's National Agri-Food Biotechnology Institute (DBT-NABI), Mohali, has led to identification of HSPs in wheat. This will help in understanding their role during plant development and under different stress conditions. Collectively, 753 TaHSPs including 169 TaSHSP, 273 TaHSP40, 95 TaHSP60, 114 TaHSP70, 18 TaHSP90 and 84 TaHSP100 were identified in the wheat genome. Compared with other grass species, the number of HSPs in wheat is relatively high. This is probably due to the higher ploidy level. Large number of tandem duplications was identified in TaHSPs, especially TaSHSPs. The TaHSP genes showed random distribution on chromosomes, however, there were more TaHSPs in B and D sub-genomes as compared to the A sub-genome. Interestingly, apart from high expression under heat stress, high expression of TaSHSP was also observed during seed development. The study provided a list of candidate HSP genes for improving thermo tolerance during developmental stages and also for understanding the seed development process in bread wheat.

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