

Enrichment of the bread wheat genome with new leaf pubescence genes from related species

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Leaf hairiness is an important adaptive trait as affects the leaf surface microclimate. Variability for this trait is found in common wheat. Three genes are known for today. The *Hl1* gene located on 4B chromosome provides a dense layer of trichomes up to 150 μm . The *Hl2* gene located on 7B chromosome forms rare long trichomes more than 400 μm . The predicted *Hl3* gene forms a rare layer of short trichomes, mainly on the underside of the leaf. The wheat genome has been enriched with hairiness genes from various sources. Homologous to the *Hl2* gene, the *Hl2^{aesp}* gene was transferred to chromosome 7B from *Aegilops speltoides*. The *Hl1t* gene with the phenotypic effect similar to *Hl2* was transferred to 5A chromosome from *Triticum timopheevii*. The replacement of chromosome 4B by 4Th from wheatgrass changes the dense hairiness into rare long trichomes. In 4D/4Th substitution, rare long trichomes are combined with a canopy of short trichomes. Some of these genes affect the intensity of transpiration and photosynthesis and may be relevant to adaptation to diverse environment including the droughty ones. Financial support: Russian Science Foundation (23-24-10029) and Novosibirsk Region (p-63).

The main publications of authors on the subject of the abstract:

Simonov et al. The identification of a new gene for leaf pubescence introgressed into bread wheat from *Triticum timopheevii* Zhuk. and its manifestation in a different genotypic background // *Plant Genetic Resources: Characterization and Utilization* (2021) 19(3): 238-244. doi:10.1017/S1479262121000277

Pshenichnikova et al. Diversity of leaf pubescence in bread wheat and relative species // *Genetic Resources and Crop Evolution* (2017) 64(7):1761-1773. doi: 10.1007/s10722-016-0471-3