



## Assessment of sources of adult plant resistance genes to stem rust in Ethiopian durum wheat genotypes

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### Abstract:

Stem rust is a devastating disease of bread wheat and durum wheat in the major wheat-growing regions of the world. Races belonging to the Ug99 (TTKSK) lineage of the wheat stem rust fungus, carrying complex virulence combinations, and their migration to countries in Africa, Middle East and Asia continue to pose a significant threat to global wheat production. Therefore, the present study was conducted in the greenhouse and field to assess sources of durable resistance to stem rust. Fifteen durum wheat genotypes and a susceptible cultivar 'Morocco' were evaluated in the greenhouse and field at Debre Zeit Agricultural Research Center, Ethiopia in order to detect the presence of effective stem rust resistance genes. A mixture of three dominant races of *Puccinia graminis* f. sp. *tritici* (TKTTF, TTKSK and JRCQC) was used for inoculation. The field experiment was conducted using RCB design with three replications at two different locations. Phenotyping of the genotypes at seedling stage in the greenhouse showed four genotypes (Ginchi, Quami, DW#3 and DW#11) that carried effective ASR genes; however, the rest eleven genotypes showed susceptible reaction. On the other hand, the field assessment of the genotypes for stem rust resistance showed presence of varied levels of field resistance. The combined results from both seedling reaction test and field experiments indicated that the eleven genotypes might possess one or more adult plant resistance (APR) genes to stem rust of wheat. Molecular marker analysis for detection of the known APR genes (Sr2, Sr55, Sr56, Sr57, and Sr58) should be conducted along with multi-pathotype tests for further determination of the specific genes(s) that conferred resistance to stem rust pathogen races including Ug99 and its derivatives for each genotype. The eleven genotypes that possessed APR genes can be good sources of durable stem rust resistance genes to be incorporated in the Ethiopian durum wheat improvement program.



### Biography:

Mesfin Kebede Gessese has been an IT professional for over 20 years, acquiring significant experience as a Security Data Scientist, and as an Artificial Intelligence and Cybersecurity specialist. He has experience of operating within organizational and decisional contexts characterized by high complexity. Over the years, he has helped companies to adopt Artificial Intelligence and Blockchain DLT technologies as strategic tools in protecting sensitive corporate assets. He holds an MSc in Economics and Statistics.

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