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Genome-wide association mapping for malondialdehyde and proline contents in semi-wild accessions of *Gossypium hirsutum* races under drought stress

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Gossypium hirsutum is the most important source of fiber for textile industry worldwide. To meet the demand of the world's growing population and rising income, cotton production must be improved. However, crop production, in general, is under threat due to human-mediated climate change, which has left farmers and crop breeders with almost no choice but to contend with frequent and long-term droughts, among other abiotic stress. Semi-wild accessions of *Gossypium hirsutum* races are repositories of desirable alleles for several economically important traits, such as tolerance to drought stress. Thus, uncovering the molecular basis of drought related traits in the accessions may play a key role in developing new drought tolerance related physiological responses, genome-wide association study (GWAS) was conducted in 189 semi-wild accessions of *Gossypium hirsutum* races using 80K Illumina Infinium SNP array. We performed GWAS using mixed linear model implemented in TASSEL 5 software and detected 1 and 2 SNPs significantly associated with malondialdehyde and proline, respectively on 2 of the 26 cotton chromosomes, explaining 9.80-11.61% of the total phenotypic variation. In addition, we identified 7 and 59 candidate genes related to malondialdehyde and proline, respectively. The identified SNPs and genes not only further advance our understanding of the genetic architecture of drought tolerance but also could be utilized in future drought tolerance improvement programs though marker assisted selection in cotton.

Biography

Kiflom Weldu Okubazghi has completed his MSc in Crop Genetics and Breeding from Graduate School of Chinese Academy of Agricultural Sciences. Currently, he is a PhD Scholar at Graduate School of Chinese Academy of Agricultural Sciences. He is also a Lecturer at Hamelmalo Agricultural College, Keren, Eritrea. He has published a paper in a reputed journal named *Journal of Integrative Agriculture* and his other papers are ready for submission to other reputed journals.

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