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Genome wide association study for oil content under terminal heat stress in Indian mustard (*Brassica juncea*)

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Indian mustard (*Brassica juncea* L. Czern & Coss) offers better prospects for horizontal expansion of oilseed crops in semi-arid ecologies of the world than *B. napus* (canola) due to greater tolerance to heat and drought stress. Inherent higher resistance to blackleg fungal disease, pod-shattering and also higher oil and protein content in genotypes with thinner seed coat further support the argument for research focus on *B. juncea*. Being oilseed crop, its oil content and oil composition are major breeding objectives. Therefore, development of high oil content varieties having stable performance under terminal heat stress is very important as the trait is strongly impacted by abiotic stresses. Identification of SNP markers associated with oil content would expand our knowledge of the genetic control of the trait and will be very helpful to accelerate breeding programme for high oil content in *B. juncea* under terminal heat stress.

PLENARY TALKS

Hence, present study was conducted to identify SNPs associated to oil content in Indian mustard under terminal heat stress condition using GWAS based approach. A panel of 96 genotypes was constituted from diverse stock of 500 Indian mustard lines based on two year (2015-16; 2016-17) field evaluation under delayed planting conditions. Panel was raised in alpha lattice design with two replications under terminal heat stress (THS) as well as normal sown (NS) environments in 2017-18. THS condition was created by covering a set of field grown germplasm stock with poly-tunnels during reproductive phase i.e., from onset of flowering to seed filling stage. Best linear unbiased predictors (BLUPs) were calculated for individual environments (THS and NS) as well as for combined environment (BLUPenv). Various identified SNPs were distributed on chromosomes A02, A04, A08, B02, B04, B05 and B07. One SNP (CB04.17559973) identified for THS on chromosome B04 was consistently identified in BLUPenv. Also, one SNP (CB07.21583568) identified under NS on chromosome B07 was also identified in BLUPenv. Previous QTL mapping studies have reported QTLs for OC located on chromosomes A08, B04, B05 and B07 (Yadava et al. 2012).

Identified SNP (CB04.17559973) after validation, would be of great utility to accelerate the marker assisted breeding programme for increasing oil content under THS in Indian mustard.

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