PI: Prem Jauhar
PI's E-mail: prem_jauhar@ndsu.nodak.edu
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PROJECT 1 ABSTRACT
(1 Page Limit)

Scab or Fusarium head blight (FHB) is a devastating disease of durum wheat, a cereal used for human consumption worldwide. Because there is no FHB resistance in current durum cultivars we used wild relatives of wheat, in the secondary gene pool, as donors of resistance. Because diploid wheatgrass (*Lophopyrum elongatum*) is an excellent source of FHB resistance, we crossed it with durum cultivars and produced several fertile hybrid derivatives that had either alien chromatin integrated into the durum genome or as monosomic and disomic additions. Thus, we have fertile hybrid derivatives with the full chromosome complement of durum wheat plus a chromosome or chromosome segments of *L. elongatum*. Some of the alien integrations are not stable. Therefore, by successive backcrossing and selfing we will continue to stabilize wheat-alien chromosome integrations. We are continuing to work on the hybrid derivatives with alien integrations and have screened them for scab resistance both in the greenhouse and in the field. We have isolated monosomic and disomic additions, and will produce more alien addition lines of durum wheat with *L. elongatum* chromosomes. Using fluorescent genomic *in situ* hybridization, we will characterize alien chromatin integrations in the durum genome. We are also using another diploid wheatgrass, *Thinopyrum bessarabicum*, as a source of FHB resistance. To enhance pairing and improve alien integrations into the durum genome, we are using Langdon 5D(5B) substitution in producing F_1 hybrids and backcrosses. By screening 30 hybrid derivative lines in the field scab nursery, we have isolated some promising lines, which are being studied further. After characterizing the alien chromosome in these lines we will subject them to x-irradiation to break the alien chromosome and integrate into the durum genome.

This project fits in the research area of Germplasm Introduction and Enhancement and attempts to utilize novel sources of FHB resistance in the secondary gene pool for producing resistant durum germplasm.