Iowa State University



Ecology, Evolution, and Organismal Biology

of science and technology

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Dear Editors of *PeerJ*,

We attach for your consideration our manuscript, “Natural variation in teosinte at the domestication locus *teosinte branched1* (*tb1*)”. Recent work has shown that a transposon insertion ~60kb upstream of the *tb1* coding region increases the expression of this gene resulting in a reduced number of tillers and other phenotypic changes in domesticated maize. This insertion has also been found in natural populations of teosinte (*i.e.*, wild maize) suggesting maize domestication occurred from standing variation at *tb1*. Tillering is a relevant trait to plant competition and *tb1* may play an important ecological role in teosinte. We have assessed the prevalence of the transposon insertion underlying the domesticated phenotype in over 1000 samples of maize and teosinte and have resequenced two ~600bp regions near *tb1* in multiple teosinte populations to evaluate the evidence for natural selection on this locus. We also phenotyped several hundred teosinte individuals with and without the transposon insertion to measure the phenotypic effects of the transposon in a teosinte background. Our results reveal much higher than anticipated frequencies of the transposon insertion in teosinte, particularly in a subset of populations in the Jalisco region of Mexico as well as evidence of selection in the 5’UTR of *tb1*. However, quite surprisingly, the transposon has no detectable effect on tillering in teosinte in our study, suggesting other genetic factors must be involved in controlling this trait in the wild.

Studies such as ours can help build a link between the concepts of natural and artificial selection. By studying the ecological role of domesticated alleles that segregate as standing variation in wild relatives, we can gain insight into how and why natural selection has shaped these loci and better understand the domesticated phenotype.

Thank you for considering our manuscript for publication in *PeerJ*.

Sincerely,

Matthew Hufford

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Dept. of Ecology, Evolution, and Organismal Biology

Iowa State University

339A Bessey Hall

Ames, IA 50011

Tel: 515-294-8511