



Genetic Architecture of the Climate-Resilient Tepary Bean

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Researchers evaluated phenotypic and genetic diversity in more than 400 tepary bean accessions.

Researchers evaluated phenotypic and genetic diversity in more than 400 tepary bean accessions. Image by Nolan Bornowski, Timothy Porch, and C. Robin Buell.

The tepary bean, a close relative of the common bean, is a climate-resilient crop and a unique source of resistance to insects and diseases. However, despite their hardiness, tepary beans have not shared the same historical breeding effort and commercialization as common beans. A better understanding of tepary bean genetic diversity is a prerequisite for breeding and improvement of this underutilized crop.

A team of plant breeders and genome scientists assembled a diverse panel of more than 400 tepary bean accessions, including cultivated, wild, and weedy lines. The accessions, grown in multiple locations and years, were evaluated for their resistance to a suite of pests and pathogens. Additionally, the accessions were sequenced to reveal genetic differences within the panel and to identify genomic regions associated

with disease and pest resistance.

The researchers found that wild tepary accessions generally exhibited more pest resistance and higher genetic diversity than cultivated tepary accessions and identified regions of the tepary genome that confer protection against agronomically important pests and diseases. These findings are valuable to not only plant breeders seeking to improve tepary beans, but also scientists studying resistance mechanisms.

Adapted from Bornowski, N., Hart, J. P., Palacios, A. V., Ogg, B., Brick, M. A., Hamilton, J. P., ... & Porch, T. (2023). Genetic variation in a tepary bean (*Phaseolus acutifolius* A. Gray) diversity panel reveals loci associated with biotic stress resistance. *The Plant Genome*, 16, e20363. <https://doi.org/10.1002/tpg2.20363>

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