

Researchers identify gene that allows corn to grow in poor conditions

March 13 2013

(Phys.org) —Approximately 30 percent of the world's total land is too acidic to support crop production, according to the U.S. Department of Agriculture. However, a solution may lie in a strand of corn that is able to grow successfully in acidic soil, thanks to a genetic variation recently identified with help from the University of Florida Genetics Institute.

Findings published Monday in the journal *Proceedings of the National Academy of Sciences* show that certain strands of corn growing in acidic tropical and [subtropical areas](#) have three copies of a particular gene. The expression of the copies results in an increased tolerance to aluminum—a chemical element toxic to many plants at high levels in acidic soil.

The triplicate gene may ultimately be used to breed or genetically modify plants to adapt to soil containing high levels of aluminum.

"Identifying genes that make plants more tolerant of aluminum is very critical for farmers growing crops where productivity is suboptimal due to acidic soil," said Matias Kirst, co-author and a member of Genetics Institute.

In plants, tolerance to aluminum is a phenotype—a trait such as growth, physiology and yield. It has been long suspected that multiple gene copies determine certain phenotypes, but this is the first actual proof, said Kirst, an assistant professor in UF's College of Agricultural and Life Sciences.

"This is the first time copy number variation has been shown to affect a phenotype in plants," Kirst said. "From now on, people will be paying more attention to this type of variation to identify and explain traits."

The findings suggest that the changes in gene copy number may be a rapid evolutionary response to new environments or [climate change](#). The fact that genome changes are still happening today, after the [domestication](#) of maize, is relevant, said lead author Lyza Maron.

"That has implications for adaptation," said Maron, a research associate at the Robert W. Holley Center for Agriculture and Health at Cornell University. "It's important, more than ever, that we can breed crops in a changing environment."

Provided by University of Florida

Citation: Researchers identify gene that allows corn to grow in poor conditions (2013, March 13) retrieved 21 June 2024 from <https://phys.org/news/2013-03-gene-corn-poor-conditions.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--