Study reveals troubling loss in Mexico's maize genetic diversity

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The new study contradicts some earlier and more optimistic assessments of corn diversity in Mexico. Credit: Thinkstock

(Phys.org) —The genetic diversity of maize, or corn, is declining in Mexico, where the world's largest food crop originated, report researchers in Mexico and at the University of California, Davis.

The findings are particularly sobering at a time when agriculturists

around the world are looking to the gene pools of staple foods like corn to dramatically increase food production for a global population expected to top 9 billion by 2050.

The new study, which contradicts some earlier and more optimistic assessments of corn diversity in Mexico, appears online this week in the *Proceedings of the National Academy of Sciences*.

"For decades, researchers have been trying to ascertain whether crop genetic resources are endangered at their centers of origin," said study co-author J. Edward Taylor, professor of agricultural economics at UC Davis. "This is a vital question, because genetic diversity is the basic ingredient for crops to respond to environmental threats ranging from pests to climate change."

The erosion of crop genetic resources has been a concern since the 1940s, when serious conservation efforts began. This study—the first to examine changes in maize diversity across Mexico—compares maize diversity estimates from 38 case studies over the past 15 years with data from farmers throughout Mexico.

"The question of diversity finally can be answered for maize, thanks to a unique database gathered through this binational project," said lead author George A. Dyer of El Colegio de México, in Mexico City.

"Sadly, we found that earlier on-farm assessments of maize diversity in Mexico are seriously flawed and conceal a widespread genetic erosion that could hamper efforts to improve food security in the face of global climate change and population growth."

The researchers warn that as the impacts of climate change intensify, yields from currently cultivated maize varieties will likely decline. Unless farmers have access to genetic resources that will equip them to

restore yields to profitable levels, many of them may abandon agriculture at a time when there is a growing need to boost global food production.

They stress that there are likely multiple causes for the decline in genetic diversity in maize and identifying those causes will be crucial for future conservation efforts.

More information: "Genetic erosion in maize's center of origin," by G.A. Dyer, A. López-Feldman, A. Yúnez-Naude, and J.E. Taylor. www.pnas.org/cgi/doi/10.1073/pnas.1407033111

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