Investigating The Ways Domesticated Plants Change in Past and Future Climates

Dolores Piperno

Senior Scientist and Curator of South American Archaeology Emerita

CURRENT RESEARCH

Using innovative techniques to understand environmental responses of major agricultural crops

About 12,000 years ago, hunters and gatherers around the world began to cultivate plants, leading to the domestication of our major cereals, legumes, and tuberous crops. This was one of the premiere developments in human history, because without agricultural economies based on domesticated plants everything considered integral to our current way of life—including the development of food surpluses, craft specialization, state level societies, and institutions—would not be possible. Dr. Dolores Piperno, Senior Scientist and Curator of South American Archaeology Emerita at the Smithsonian Institution in Washington D.C. and Panama, investigates how major crops such as maize, squashes, and beans were domesticated by past human populations, while studying the plants' responses to past, current, and future environments. Her innovative research reveals the ways these plants once adapted and will adapt (or not) to future environments in terms of their overall growth, genetics, seed yield, and nutritional quality. These findings will be crucial to geneticists, botanists, and breeders who seek to understand how crops will respond to predicted higher atmospheric CO_2 and temperature, and decreased rainfall in the future.

Plant domestication was an evolutionary process. The earliest farmers performed gene breeding (though they didn't know it at the time) as they selected for beneficial attributes, such as larger and nontoxic seeds, fruits, and tubers. In the process, they bred out other traits important to the crops' wild progenitors for adapting the plants to the natural environment. Maize's wild progenitor, called teosinte, thus contains more genetic diversity than maize and conserving these and other progenitors...

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AFFILIATION

Smithsonian Institution

EDUCATION

- Ph.D in Anthropology 1983,Temple University

AWARDS

- Election as Fellow of the American Association for the Advancement of Science
- Election to the National Academy of Sciences
- Election to the American Academy of Arts and Sciences
- Orden de Vasco Nunez Award
- Pomerance Career Award from the Archaeological Institute of America

RESEARCH AREAS

Environment, Agriculture, Archaeology, Agriculture

FUNDING REQUEST

Your contributions will help fund Dr. Piperno's continued research in studying plant domestication and crop plant responses to the changing environment. Costs include $20-25K/year for lab assistants and $20K/year for basic materials and supplies to lower and raise CO_2 and temperature and carry out phenotypic and gene expression studies.