

Little plant has big stories to tell

August 29 2011



Flowers of the model plant *Arabidopsis thaliana*. Credit: Courtesy of the Clark lab in the Biology Department at the University of Utah.

(PhysOrg.com) -- Understanding which genes control traits, like when a plant will flower, what soil type is best or its ability to persist in drought conditions provides insight into the ability of plants to adapt to new environments. This type of scientific data is important for crop improvement and significant to human well being.

An international collaboration of researchers, including [biologists](#) at the University of Utah (the U), [compared genetic data from 19 different strains of a humble plant called *Arabidopsis thaliana*](#). The genome

sequences of these [strains](#), 18 of which are presented in the study, will now make it easier to study plants' surprisingly wide trait variation that underlies their adaptability. The results of the study are published online in the journal Nature.

“*Arabidopsis thaliana* is widely used by the international community and has provided a wealth of knowledge about plant biology,” says Richard Clark, University of Utah biologist and one of the authors of this multi-national project. “However, so far our knowledge has come largely from a single *Arabidopsis* strain, even though other strains can vary greatly in traits like flowering time. By comparing genetic information from multiple strains, we can now understand how genome differences between strains enable plants to adapt to different climates and situations. This means, we are better equipped to understand the genetic processes that underlie variation in traits of ecological and agricultural relevance,” he concludes.

The results become a founding part of the 1001 Genomes Project, launched by members of the international *Arabidopsis* community to catalog genetic information in hundreds of strains from different regions in the world. However, the study goes beyond simply cataloging DNA sequence differences.

“In every cell, there are ‘messages’ between the gene and the protein it creates, which in turn affects traits,” says Joshua Steffen, University of Utah post-doctoral researcher, and co-author on the paper. “By recording the content of the messages (called mRNA) of all the genes in each of the 19 different strains, we have captured information vital to understand which [genes](#) are functional in a given strain.” This information is critical in understanding how differences in DNA and gene sequences lead to differences in traits.

Arabidopsis is a small flowering plant native to Europe, Asia and

northern Africa, and is to plant research as mice and fruit flies are to understanding the molecular nature of animals. Because of its small size, short life cycle and prolific seed production, it is ideal for research. It has one of the smaller genomes among [plants](#), thus facilitating genome sequencing studies, and was the first plant genome to be fully sequenced in 2001.

The study was funded in part by the National Science Foundation, and conducted in collaboration with researchers at Kansas State University, the University of Oxford, the Friedrich Miescher Laboratory of the Max Plank Society, and the University of Bath.

Provided by University of Utah

Citation: Little plant has big stories to tell (2011, August 29) retrieved 26 April 2024 from <https://phys.org/news/2011-08-big-stories.html>

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.