

# Understanding apples' ancestors

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Researchers study wild *Malus orientalis* in the Caucasus region. Credit: Photo by Phil Forsline

Wild *Malus orientalis* -- species of wild apples that could be an ancestor of today's domesticated apples -- are native to the Middle East and Central Asia. A new study comparing the diversity of recently acquired *M. orientalis* varieties from Georgia and Armenia with previously collected varieties originating in Russia and Turkey narrows the large population and establishes a core collection that will make *M. orientalis* more accessible to the breeding and research communities.

To identify and record the genetic diversity of these wild apples, Gayle Volk and Christopher Richards at the National Center for Genetic Resources Preservation, U.S. Department of Agriculture (USDA), performed genetic diversity analyses on [trees](#) grown from *Malus orientalis* seeds collected in Georgia, Armenia, Russia, and Turkey. The

trees are located at the USDA-ARS Plant Genetic Resources Unit (PGRU) in Geneva, New York. Seedling trees were evaluated for resistance to critical diseases such as fire blight, [apple scab](#), and cedar apple rust. The full report was published in a recent issue of the Journal of the American Society for Horticultural Science.

Seeds from wild *Malus orientalis* trees were collected from 1998 during explorations to Armenia, Georgia, Turkey, and Russia. Seedling orchards with between eight and 171 "individuals" from each collection location were established, and [disease resistance](#) data were collected for 776 trees. The [genetic diversity](#) of the 280 individuals from Armenia and Georgia was compared with results obtained for individuals from Russia and Turkey. A total of 106 alleles were identified in the trees from Georgia and Armenia. The average gene diversity ranged from 0.47 to 0.85 per locus. The researchers concluded that "the genetic differentiation among sampling locations was greater than that found between the two countries."

Six individuals from Armenia exhibited resistance to fire blight, apple scab, and cedar apple rust. According to Volk; "The data suggest wild populations of *M. orientalis* from regions around the Black Sea are genetically distinguishable and show high levels of diversity."

A core set of 27 trees that captures 93% of the alleles in the PGRU *M. orientalis* collection will be maintained in the field at the PGRU in Geneva, New York.

More information: The complete study and abstract are available on the ASHS Journal of the American Society for Horticultural Science electronic journal web site: [journal.ashspublications.org/c ... t/abstract/134/4/453](http://journal.ashspublications.org/content/abstract/134/4/453)

Source: American Society for Horticultural Science

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