

'TRAP' preserves genetic properties of popular geranium

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Reseachers at The Ohio State University have demonstrated that Target Region Amplification Polymorphism, or TRAP, is an effective method for preserving the important genetic diversity of ornamental flower collections.

Pelargonium, commonly know as geranium, are some of the most popular flowers the world. So popular, in fact, that the Royal Horticultural Society listed more than 3,000 varieties of geranium in their 2004 distribution catalogue. Sold in hanging baskets, flats and decorative pots, geranium plants accounted for more than \$206 million in wholesale revenue in the U.S. during 2004. Essential oils from some scented geraniums are finding new uses in perfumes and food flavorings.

There are over 280 documented species of Pelargonium. The interest in breeding has resulted in many novel and improved cultivars. According to Rose Palumbo, Department of Plant Pathology at The Ohio State University (OSU), ornamental plants like the geranium are often bred for their ornamental qualities rather than their ability to survive in diverse environments.

Palumbo and a team of researchers recently completed a study of Pelargonium grown at The Ornamental Plant Germplasm Center (OPGC) at Ohio State. OPGC collects heirloom cultivars, breeding lines and wild species.

Intending to find a way to preserve the genetic diversity of Pelargonium,

the team tested a method known as Target Region Amplification Polymorphism, or TRAP. Palumbo explained, "The TRAP method uses molecular markers targeted to a specific gene. Target sequences that have been generally successful in most plants tested the applicability of this method to OSU's geranium collection. Using TRAP allowed us to divide the population into groups of similar species and groups known to share parents."

Palumbo continued, "TRAP has the advantage of producing a large number of markers through use of sequence information that is already available. Our first goal was to determine the feasibility of TRAP for the analysis of this large collection, so that in the future the most diverse genotypes may be retained. To achieve this goal, we first modified existing DNA extraction techniques to account for the high levels of phenolic compounds present in some *Pelargonium* species. Second, we evaluated the TRAP procedure using the DNA isolated from 46 accessions. Based on these results, the molecular analysis of the collection was completed, and the collection has decreased in size by approximately 25%. Continuing analyses should shrink the collection from approximately 800 plants to close to 200 plants by the end of this year."

Using the TRAP method will allow the OPGC to streamline their collection of geraniums into a much more manageable size. According to Palumbo, the smaller collection will be more efficient to maintain, while still providing the diverse genetic resources needed by breeders and researchers.

Source: American Society for Horticultural Science

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