‘SAF2’ Mint Family – Genetic Research

USDA-ARS, Washington State University, Oregon State University, and the Mint Industry Research Council

NPGS germplasm powers 20 years of mint research and innovation!

Horse mint (*Mentha longifolia*) is a wild species with a relatively small genome that is simpler to study than that of most cultivated mints. A segregating family called ‘SAF2’ was derived from horse mint accessions maintained by the U.S. National Plant Germplasm System (NPGS). This family was used to identify the genes for a novel essential oil profile exhibited by a subset of the plants, and has resulted in 20 years of continued research and expanded knowledge of mint genetics.

SAF2 population in Oregon State University’s greenhouse.

Photo by Kelly Vining

PROJECT GOALS

- ✓ Develop resources that increase understanding of the genetic underpinnings of important traits in mint, like disease resistance and essential oil content

Problems Addressed

Mint oil is vital to a multi-billion-dollar global industry powering consumer products from toothpaste to pharmaceuticals. It is therefore essential for mint breeders to understand the genetic underpinnings of important traits, such as oil production and resistance to devastating diseases like *Verticillium* wilt. Mint oils consist of a mixture of different monoterpene molecules. The monoterpene biosynthesis pathway is complex, and it is challenging to evaluate the relationship between genes and traits in the mint genotypes commonly cultivated for their oils, which are mostly sterile and polyploid.

Solutions Developed

Horse mint is a diploid self-fertile species with a small genome and considerable variation of commercially important traits. Wild horse mint collected from South Africa and conserved at the NPGS genebank in Corvallis, Oregon was used to breed the SAF2 population. SAF2 has become a valuable resource for mint genetic research on monoterpene profiles (including genetics of novel monoterpenes), *Verticillium* wilt resistance, and male sterility traits. It has been used in research, teaching, and breeding, helping secure the future of mint cultivation in the face of disease and market demands for new traits.

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