Unraveling Drought Resistance Mechanisms at Root Level In Various Monkey Flower (*Mimulus guttatus*) Populations

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Abstract: Last year, summer drought cost the state over a billion dollars in crop losses. Understanding how plant can cope with this stress is a challenge, but various species in nature are already adapted and have their own mechanisms for combating drought. Native to the American west coast, *Mimulus guttatus* can survive in Mexican desert, on serpentine rocks, or snow-covered peaks. This suggests that different populations have evolved various resistance mechanisms. Using 29 different populations harvested across California and Oregon, we plan to carry out a genome-wide association study. We want to compare the SNPs present in these populations with their root system architecture phenotype, an analyze of differentially expressed genes and a histological analysis focusing on cell wall compounds such as lignin and suberin. We hope to find new QTLs involved in drought resistance and even shed light new defense mechanisms that could be exported to crops in the future.