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Identifying Candidate Genes that Affect Epidermal Development

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ABSTRACT

The regulation of stomata, pores on the epidermis of leaves that allow for gas exchange, is an ideal target for creating a plant capable of acclimating to environmental stresses such as drought. Changes in stomatal density (SD) are correlated with different environments, but the identity of genes that act as modulators of SD are mostly unknown. To identify transcription factors that may act as modulators of SD, T-DNA mutants of candidate transcription factors identified in a genome-wide association study were characterized, and one candidate mutant displaying a phenotype was further characterized for anatomical and physiological traits. Expression of *Arabidopsis thaliana* plants with a mutation in the candidate gene had ~20% lower SD than their respective wild type lines, which was also correlated with a significantly lower transpiration rate. Expression of the candidate gene varied among alleles. Growth was not affected by any of the allelic mutations. Expression was repressed in response to water stress, suggesting that it may play a role in plant response to environmental stress. We have identified a potential modulator of acclimation through changes in epidermal development. Next steps include the identification of target genes and regulators.

KEYWORDS

Stomata

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