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A Novel Breeding Method of Sweet Tomato by Utilizing Salt Sensing Signal Molecules Regulating Na^+ Transporter

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Summary

Floral and reproductive organs are relatively sensitive to biotic and abiotoic stresses compared with vegetative organs. Calcineulin B-Like molecule (CBL) Interacting Protein Kinase (CIPK) has appeared to be involved in aquiring tolerance and acclimation under environmental stress such as salinity, drought and chilling. To examine whether CIPK functions in reproductive organ-specific stress signaling, expression profiles of Calcineurin B-Like molecule (CBL) Interacting Protein Kinases (CIPK) were analyzed by semi-quantitative RT-PCR with a set of CIPK homolog specific primers. SlCIPK2 has been identified as a floral organ-specific CIPK in tomato Micro-Tom. Furthermore, an anti-CIPK specific antibody cross-reacted to a CIPK-related polypeptide at a significant level in flower particularly, in stamen, to the recombinant protein of the flower specific CIPK, SlCIPK2. The flower specific CIPK is tightly associated with the microsomal fractions. A specific antibody was raised against tomato SOS3 homolog which is possibly involved in salt tolerance. The anti-SlSOS3 antibody cross-reacted to a 30-kDa polypeptide in leaf but not in flower. Protein level of SlSOS3 in leaf increased when tomato plant was subjected to salt stress. SlSOS3 appeared to bind to microsomal fraction of leaf as same as tomato CIPK. The present data suggests that the flower-specific CIPK, SlCIPK2, is involved in calcium signaling and stress tolerance in stamen and pollen in tomato and that tomato SOS3 possibly regulating salt stress signaling function in leaf but not in flower.