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Salt-Accumulated Salt-Tolerant Plants through Control of Ion Balance

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Summary

High salinity is a major environmental factor, which inhibits plant growth and development, leading to large yield losses in crops. It is vital for a living cell to maintain intracellular ionic homeostasis. We report here the mutations in *SIZ1* or *PHO2,* which causes more accumulation of phosphate compared to wild type, enhance tolerance to salt stresses. The *siz1* and *pho2* mutations reduce the uptake and accumulation of Na^+. These mutations are also able to suppress the Na^+ hypersensitivity of *sos3-1* mutant, whereas genetic analyses suggest that *SIZ1* and *SOS3* or *PHO2* and *SOS3* are additive effect on response to salt stresses. Furthermore, the *siz1* mutation cannot suppress the Li^+ hypersensitivity of *sos3-1* mutant. These results indicate that phosphate accumulating mutants, *siz1* and *pho2*, reduce the uptake and accumulation of Na^+, leading to enhancing salt tolerance and that, genetically, *SIZ1* or *PHO2* are likely independent on *SOS3*-dependent salt signaling.