Hydrogen peroxide pretreatment induces stress tolerance memory in mung bean

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ABSTRACT

Evidenced showed that hydrogen peroxide (H2O2) or cold shock pretreatment changed the calcium signature to subsequent cold stress. This suggested that the modification of calcium signaling provided a cold memory. In an attempt to demonstrate the occurrence of cold memory in plants, mung bean seedlings (Vigna radiate L. cv. Tainan No. 5) was pretreated with 200 mM H2O2 and then measured the chilling (4oC, 36 h) injuries of the seedlings by electrolyte leakage. Tolerance induced by repetitive H2O2 pretreatment at an interval of 3 h gave better chilling tolerance i.e. lower electrolyte leakage than both single H2O2 treatment and 10oC, 48-h acclimated plant. The H2O2 induced chilling tolerance depended on accumulation of glutathione (GSH), which could be inhibited by buthionine sulfoximine (BSO), an inhibitor of glutathione synthesis. The chilling tolerance of both acclimated and H2O2-treated seedlings was decreased by ethyleneglycol-bis(aminoethylether)-N,N'-tetraacetic acid (EGTA) but not by ruthenium red. Our evidences suggest that H2O2 triggered the influx of Ca2+ from extracellular pools leading to the induction of chilling tolerance and stress memory of mung bean seedlings.

Keywords: hydrogen peroxide; stress tolerance; mung bean

REFERENCES

