Stress Signaling in Plants

Abstract title: Root−sourced NADPH−dependent H_2O_2 is essential to delay leaf senescence in halophytic plant−seashore paspalum during salt stress

Keywords: Salt stress; Leaf senescence; Root−sourced H2O2; Ion Homeostasis; Jasmonic acid homeostasis; SAGs; Paspalum vaginatum

High salinity stress can hasten leaf senescence, leading to a decline in crop yield and quality. This process is facilitated by the excessive Na^+ induced by salt stress, which results in chloroplast destruction and promotes plant aging hormones. Previous reports have indicated that hydrogen peroxide (H_2O_2), specifically root-sourced H_2O_2, mediates the regulation of Na^+/K^+ homeostasis and leaf senescence. However, the role of root-sourced H_2O_2 in halophytic plants' leaf senescence regulation remains incompletely understood. Therefore, this study aimed to investigate whether and how the root−sourced NADPH−mediated H_2O_2 were involved in delaying leaf senescence, using seashore paspalum as a model plant. Our findings demonstrate that root−sourced NADPH−mediated H_2O_2 significantly contributes to delaying leaf senescence by regulating JA homeostasis as well as JA−induced SAGs. Additionally, our results also provide evidence of root-sourced NADPH−mediated H_2O_2's role in regulating root Na^+/K^+ flux. Thus, our study underscores the importance of root−sourced H_2O_2 in retarding leaf senescence in salt-stressed *P. vaginatum* plants, providing new insights into the potential function of root−dependent H_2O_2 in leaf senescence.