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SaHsfA4c From Sedum alfredii Hance Enhances Cadmium Tolerance by Regulating ROS-Scavenger Activities and Heat Shock Proteins Expression

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论文摘要:

The heat shock transcription factor (Hsf) family, an important member in plant stress response, affects cadmium (Cd) tolerance in plants. In this study, we identified and functionally characterized a transcript of the Hsf A4 subgroup from *Sedum alfredii*. Designated as SaHsfA4c, the open reading frame was 1,302 bp long and encoded a putative protein of 433 amino acids containing a complete DNA-binding domain (DBD). Heterologous expression of SaHsfA4c in yeast enhanced Cd stress tolerance and accumulation, whereas expression of the alternatively spliced transcript lnSaHsfA4c which contained an intron and harbored an incomplete DBD, resulted in relatively poor Cd stress tolerance and low Cd accumulation in transgenic yeast. The function of SaHsfA4c under Cd stress was characterized in transgenic *Arabidopsis* and non-hyperaccumulation ecotype *S. alfredii*. SaHsfA4c was able to rescue the Cd sensitivity of the *Arabidopsis* *athsfA4* mutant. SaHsfA4c reduced reactive oxygen species (ROS) accumulation and increased the expression of ROS-scavenging enzyme genes and Hsps in transgenic lines. The present results suggest that SaHsfA4c increases plant resistance to stress by up-regulating the activities of ROS-scavenging enzyme and the expression of Hsps.

论文链接: <https://www.frontiersin.org/articles/10.3389/fpls.2020.00142/full>

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