

外源SA对低温下杏花器官超微结构的影响

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Effect of Exogenous SA Pretreatment on the Ultrastructure of Flower Cells in Apricot Under Chilling Stress

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摘要 应用透射电镜技术对外施水杨酸 (salicylic acid, SA) 的杏花在低温胁迫处理后花瓣、花粉、柱头和胚珠珠心细胞的超微结构进行了观察。结果表明, 喷水对照经 -2 °C 低温处理 4 h 后, 花瓣细胞结构受到了严重破坏, 发生了质壁分离, 线粒体内嵴结构被破坏; 花粉壁外壁结构破坏明显; 柱头细胞和胚珠珠心细胞的线粒体内嵴发生囊泡化甚至解体呈空洞状, 细胞核双层核膜发生溶解或部分消失。而外施 100 μmol · L⁻¹ SA 的杏花花瓣、花粉、柱头和珠心细胞在 -2 °C 低温处理 4 h 后, 依然保持与正常细胞相似的细胞器结构。这说明 SA 预处理可增强在低温下细胞结构的稳定性, 从而提高杏花的低温适应性, 从细胞学角度证实了外施适宜浓度的 SA 可增强杏花的抗寒性。

关键词: 杏 花器官 水杨酸 超微结构 低温

Abstract: The ultrastructure of petal, pollen, stigma and ovule cells under chilling stress after SA pretreatment was observed using the transmission electron microscopy. The results showed that the ultrastructure of normal flower cells pretreated with H₂O was damaged remarkably under -2 °C for 4 h. The plasmolysis phenomenon occurred in the spetal cells, the cristae of mitochondria were damaged; Obvious injury occurred in pollen exine; The cristae of mitochondria of stigma and nucellus cells were disrupted and even became empty, the nucleus membrane was partly dissolved. In contrast, the ultrastructure of petal, pollen, stigma and ovule cells pretreated with 100 μmol · L⁻¹ SA still maintained nearly integrated state after 4 h chilling stress. Therefore, the stability of flower organ cells under chilling stress could be increased by SA pretreatment. The obtained results, to our knowledge, firstly offered the cytological evidence for the chilling resistance increased by exogenous SA pretreatment in apricot flower.

Keywords: apricot, flower organ, salicylic acid, ultrastructure, low temperature

基金资助:

北京市科技新星计划项目 (2009B27); 北京市自然科学基金项目 (6122011)

引用本文:

张俊环, 王玉柱, 孙浩元等. 外源SA对低温下杏花器官超微结构的影响[J]. 园艺学报, 2014, V41(3): 429-436

ZHANG Jun-Huan, WANG Yu-Zhu, SUN Hao-Yuan etc. Effect of Exogenous SA Pretreatment on the Ultrastructure of Flower Cells in Apricot Under Chilling Stress[J]. ACTA HORTICULTURAE SINICA, 2014, V41(3): 429-436

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