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棉花不同耐高温品系的SOD、POD、CAT活性和MDA含量差异及其对盛花期高温胁迫的响应

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Differences in SOD, POD, CAT Activities and MDA Content and their Responses to High Temperature Stress at Peak Flowering Stage in Cotton Lines with Different Tolerance to High Temperature

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摘要 分别以耐高温、中度敏感与敏感型3个棉花品系为材料，分析了它们在不同发育时期叶片和花药中SOD、POD、CAT保护酶活性和MDA含量的差异及在盛花期高温胁迫下的变化。3个品系间叶片保护酶活性在苗期和盛蕾期几乎相同，在盛花期和结铃盛期耐高温显著高于敏感类型，而耐高温棉花叶片MDA含量自盛蕾期起显著低于敏感类型。花药保护酶活性随生育进程而逐渐增加，耐高温棉花花药SOD和POD活性在花粉粒成熟期才显著高于敏感类型，而CAT活性和MDA含量在整个发育时期均分别显著高于和低于敏感类型材料。盛花期高温胁迫显著地抑制叶片和花药的保护酶活性，导致MDA含量极显著地增加，但耐高温棉花叶片和花药保护酶活性的降低和MDA含量的增加幅度明显少于敏感类型。

关键词： 棉花 耐高温性 SOD POD CAT MDA

Abstract： Activities of SOD, POD, CAT protective enzymes and MDA content in main-stem leaf and anther at different developmental stages and their responses to high temperature stress at peak flowering stage were analyzed comparatively using three cotton lines exhibiting tolerance, moderate sensitivity and sensitivity to high temperature in the present paper. The protective enzyme activities in main-stem leaves were nearly same among the three cotton lines at seedling and peak squaring stages, but significantly higher in tolerant line than susceptible ones at peak flowering and boll-setting stages. The MDA content was markedly lower in tolerant line than susceptible ones from peak squaring stage. Activities of protective enzymes in cotton anther increased with developmental processing, and remarkably higher SOD and POD activities in anther at the pollen maturing stage were measured in tolerant line. During the whole developmental period of anther, CAT activity was greater, while the MDA content was lower distinctly in tolerant line than susceptible ones. The protective enzyme activities were inhibited, and the MDA content increased excessively in main-stem leaves and anther of the three cotton lines under high temperature stress at the peak flowering stage. However, changes of decreasing in activities of protective enzymes and increasing in the MDA content in leaves and anther were less obviously in tolerant line than susceptible ones.

Keywords： cotton high temperature tolerance SOD POD CAT MDA

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