

研究论文

秋茄幼苗叶片单宁、可溶性糖和脯氨酸含量对Cd胁迫的响应

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摘要 在温室条件下, 采用土壤盆栽技术研究了红树植物秋茄的幼苗在不同浓度的Cd(0~50 mg•kg⁻¹)胁迫下叶片单宁、可溶性糖和脯氨酸的含量变化。研究表明: 秋茄幼苗叶片中的单宁、可溶性糖和脯氨酸含量均随着Cd胁迫浓度的增加出现不同程度先升后降的趋势, 这表明秋茄幼苗对低浓度的Cd有一定的抵抗能力, 但在高浓度的Cd胁迫下则受到伤害; 单宁、可溶性糖和脯氨酸的含量分别在土壤Cd处理浓度为30mg•kg⁻¹、20mg•kg⁻¹、40mg•kg⁻¹时达到最高, 相应地, 单宁、可溶性糖和脯氨酸浓度最高分别达到66.2mg•g⁻¹、105.0mg•g⁻¹和12.22mg•g⁻¹; Cd胁迫对脯氨酸含量的影响极显著, 因此可以作为秋茄对Cd污染的检测指标。

关键词 [Cd](#); [秋茄](#); [单宁](#); [脯氨酸](#); [可溶性糖](#)

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Effect of cadmium stress on the contents of tannin, soluble sugar and proline in *Kandelia candel* (L.) Druce seedlings

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Abstract Soil-culture medium was used to investigate the physiological and ecological response of the *Kandelia candel* (L.) Druce to cadmium pollution stress, including the contents of tannin, soluble sugar and proline. The seedlings were cultured in greenhouse conditions under a series of cadmium pollution stress(0~50 mg•kg⁻¹) from the beginning of May in 2004 to the end of December in 2004. After harvesting, the contents of tannin, soluble sugar and proline of leaves in *Kandelia candel* (L.) Druce were measured. The results showed that contents of tannin, soluble sugar and proline all increased firstly in lower cadmium stress, which might be regarded as a self-protecting function of plants. After they reached the highest values, 66.2mg•g⁻¹, 105.0mg•g⁻¹ and 12.2mg•g⁻¹, when the treated concentration of CdCl₂ was 30mg•kg⁻¹, 20mg•kg⁻¹ and 40mg•kg⁻¹, respectively, the contents of these solutes decreased. This indicates that the plants would have been harmed at the greater amount of cadmium. The increasing concentration of tannin might result in the over accumulation of cadmium in *Kandelia candel* (L.) Druce. As tannin can combine with cadmium, however, it could reduce the toxicity of this pollutant. The increasing concentration of soluble sugar and proline functioned as osmotic adjustors, so the heavy metal cadmium could be less harmful to the plant. As the content of proline was significantly influenced by the cadmium stress, it could provide a valuable monitoring index of heavy metal cadmium pollution.

Key words [Kandelia candel](#) (L.) Druce _ [cadmium](#) _ [tannin](#) _ [soluble sugar](#) _ [proline](#)

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