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研究报告

环境因子对小麦体内镉的生物毒性和植物络合素合成的影响

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摘要 采用水培方式,研究了不同环境因子对小麦体内Cd的生物毒性与植物络合素(PCs)合成的影响.结果表明,Cd胁迫对小麦产生明显的毒害效应,并显著诱导根合成PCs；pH、Ca和S对小麦体内Cd的吸收和生物毒性具有不同程度的影响,根中PCs的诱导量与Cd的生物毒性变化表现一致；供磷减轻了Cd胁迫的生物毒性,根中PCs的诱导量也显著降低；镁对Cd胁迫的生物毒性影响甚微,根中PCs的诱导量和Cd的吸收量均未见明显变化.本实验结果证明Cd对PCs的诱导能力与植物体内Cd的毒性之间存在一定的相关关系,可将PCs作为Cd胁迫的生物标记物.

关键词 环境因子,植物络合素,镉生物毒性,小麦

分类号

Effects of environmental factors on Cd biotoxicity and phytochelatins production in Triticum aestivum

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Abstract

In this paper,a solution culture experiment was conducted to study the effects of environmental factors on Cd biotoxicity and phytochelatins (PCs) production in wheat.The results showed that Cd stress had significant inhibitory effects on wheat growth and PCs overproduction.The Cd biotoxicity and Cd uptake by wheat were affected in varying degrees by soil pH,Ca and S,and the levels of PCs production in root were consistent with the changes of Cd biotoxicity.Furthermore,the Cd biotoxicity was decreased with increasing P supply,coinciding with the decrease of PCs level in root.Mg had no obvious effect on both Cd biotoxicity and PCs level in root.The present results further confirmed that the induced PCs production level by Cd was related to Cd biotoxicity in plant,suggesting that PCs could be a promising biomarker for estimating Cd phytotoxicity.

Key words

Environmental conditions Phytochelatins Cd biotoxicity Triticum aestivum

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