

## 研究报告

# 铜对节节草生理代谢及抗氧化酶活性的影响

李影,刘登义

安徽师范大学生命科学学院省重要生物资源保护与利用研究安徽省重点实验室, 芜湖 241000

收稿日期 2005-4-12 修回日期 2005-8-28 网络版发布日期 接受日期

## 摘要

采用盆栽试验方法,研究了重金属Cu对节节草的生理代谢及抗氧化酶活性的影响.结果表明,低浓度Cu(500 mg·kg<sup>-1</sup>)处理下节节草生理代谢变化不明显.高浓度Cu(1 000~3 000 mg·kg<sup>-1</sup>)处理下,节节草体内叶绿素a和叶绿素b含量均显著下降,叶绿素b的含量仅为对照的43%;可溶性糖含量平均为对照的1/2,细胞膜透性平均高出对照1~2倍,MDA含量平均为对照的1~3倍,表明高浓度Cu胁迫对节节草细胞质膜系统及主要细胞器的结构与功能具有破坏作用.Cu胁迫下节节草抗氧化酶活性随Cu浓度增加而上升,POD和SOD酶活性平均分别增长34.73%和51.55%,且与Cu浓度呈显著正相关( $r_{\text{POD}}=0.978$ ,  $r_{\text{SOD}}=0.926$ ,  $P<0.05$ ).

关键词 [节节草](#) [Cu毒害](#) [生理代谢](#) [抗氧化酶活性](#)

分类号

## Physiological metabolism and protective enzyme activity of *Equisetum ramosissimum* under Cu stress

LI Ying, LIU Dengyi

Provincial Key Laboratory of Conservation and Exploitation of Biological Resources, College of Life Science, Anhui Normal University, Wuhu 241000, China

### Abstract

The study with pot culture experiment showed that *Equisetum ramosissimum* did not appear obvious poisoning symptoms when treated with low concentration Cu (500 mg·kg<sup>-1</sup>), while serious injuries were found when treated with high concentration Cu (1 000~3 000 mg·kg<sup>-1</sup>), which reflected in the severe damage of cell membrane and cytoarchitecture as well as the structure and function of main organelles, and the significant decrease of the contents of leaf chlorophyll a and b and stem soluble monosaccharose. The cell membrane osmolarity and the average MDA content of the plant exposed to heavy copper pollution was 1~2 and 1~3 times greater than the control, respectively. It could be concluded that high concentration Cu disturbed the physiological metabolism, and critically threatened the normal growth of *E. ramosissimum*. The activities of protective enzyme, especially of SOD and POD, were enhanced with increasing Cu concentration, and had a positive correlation with Cu concentration ( $r_{\text{POD}}=0.978$ ,  $r_{\text{SOD}}=0.926$ ,  $P<0.05$ ).

### Key words

[Equisetum ramosissimum](#) [Cu injury](#) [Physiological metabolism](#) [Protective enzyme activity](#)

## 扩展功能

### 本文信息

- ▶ [Supporting info](#)
- ▶ [PDF\(406KB\)](#)
- ▶ [\[HTML全文\]\(0KB\)](#)
- ▶ [参考文献](#)

### 服务与反馈

- ▶ [把本文推荐给朋友](#)
- ▶ [加入我的书架](#)
- ▶ [加入引用管理器](#)
- ▶ [复制索引](#)
- ▶ [Email Alert](#)
- ▶ [文章反馈](#)
- ▶ [浏览反馈信息](#)

### 相关信息

- ▶ [本刊中 包含“节节草”的相关文章](#)
- ▶ [本文作者相关文章](#)

- [李影](#)
- [刘登义](#)

