

Pb胁迫对金丝草体内Pb化学形态及细胞分布的影响

侯晓龙,陈加松,刘爱琴,蔡丽平

福建农林大学林学院

Effects of Pb Stress on Fractionation and Distribution of Pb in *Pogonatherum crinitum*

HOU Xiao-Long, CHEN Jia-Song, LIU Ai-Qin, CAI Li-Ping

College of Forestry, Fujian Agriculture and Forestry University

[摘要](#)[参考文献](#)[相关文章](#)Download: [PDF \(1222KB\)](#) [HTML 1KB](#) Export: [BibTeX](#) or [EndNote \(RIS\)](#) [Supporting Info](#)

摘要 采用室内模拟Pb胁迫水培试验,利用化学试剂逐步提取和电镜观察的方法,研究Pb胁迫下金丝草(*Pogonatherum crinitum*)体内Pb的化学形态及细胞区室化作用。结果表明,Pb在金丝草根和叶中主要以HCl提取态存在,所占比例平均在30%以上,最大比例分别达46.84%和61.49%,其次为HAc提取态和NaCl提取态,残渣态和去离子水提取态所占比例较小,说明金丝草体内Pb化学形态除HCl提取态外主要以磷酸盐结合态、蛋白质结合态或吸附态等迁移活性较弱的化合态存在,从而减小Pb的毒害作用。电镜观察发现,Pb胁迫下金丝草根和叶中大部分Pb被束缚在细胞壁上,这与其化学存在形态结果一致。但金丝草根系仍可将大量Pb转移到地上部分,对Pb具有强转运能力。

关键词: Pb 富集植物 金丝草 化学形态 区室化

Abstract: An indoor hydroponic experiment was carried out cultivating *Pogonatherum crinitum* under Pb stress for 15 days and then the plants were sampled for analysis of chemical forms and cellular compartmentation of Pb, using the sequential chemical extraction method and electron microscopy. It was found that Pb existed in the roots and shoots mainly in the form of HCl-extractable Pb, which accounted on average for >30% of the total Pb present in the plant, and peaked up to 46.84% and 61.49%, respectively. HAc- and NaCl-extractable Pb were the next most abundant forms of Pb and residual and water extractable Pb the least abundant. The findings suggest that among the chemical forms of Pb in the plant, apart from HCl-extractable Pb, there were mainly phosphate-bonded Pb, protein-bonded Pb or adsorbed Pb, which, being rather weak in mobility and reducing Pb toxication of the plant. Observation by electron microscope found that most of the Pb in roots and leaves of the plant was bound to the cell walls, which is consistent with the findings about Pb chemical forms in *Pogonatherum crinitum*. However, the plant is still highly capable of transporting Pb from roots to shoots.

Keywords: Pb hyperaccumulator *Pogonatherum crinitum* chemical form cellular compartmentation

Received 2011-11-10; published 2012-05-25

Fund:

国土资源部公益性行业科研专项(201111020-2); 福建省自然科学基金(2009J01051)

Corresponding Authors: 刘爱琴 福建农林大学林学院 Email: fjlq@126.com

About author: 侯晓龙(1981—),男,山西永济人,讲师,博士生,主要从事重金属污染防治方面的研究。E-mail: lxyhxl@126.com

引用本文:

侯晓龙,陈加松,刘爱琴,蔡丽平.Pb胁迫对金丝草体内Pb化学形态及细胞分布的影响[J] 生态与农村环境学报,2012,V28(3): 271-276

HOU Xiao-Long, CHEN Jia-Song, LIU Ai-Qin, CAI Li-Ping. Effects of Pb Stress on Fractionation and Distribution of Pb in *Pogonatherum crinitum*[J] Journal of Ecology and Rural Environment, 2012, V28(3): 271-276

Service

- ▶ 把本文推荐给朋友
- ▶ 加入我的书架
- ▶ 加入引用管理器
- ▶ Email Alert
- ▶ RSS

作者相关文章

- ▶ 侯晓龙
- ▶ 陈加松
- ▶ 刘爱琴
- ▶ 蔡丽平