

研究报告

## 一种新发现的铜积累植物——密毛蕨

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### 摘要

对铜尾矿上生长的密毛蕨(*Petridium revolutum*)进行了野外调查分析和温室营养液砂培实验.结果表明,密毛蕨所生长的废铜矿土壤中Cu含量平均为 2 432 mg·kg<sup>-1</sup> DW,最高达 7 554 mg·kg<sup>-1</sup> DW;地上部生物量平均为18.33 g·plant<sup>-1</sup> DW,最高达40.05 g·plant<sup>-1</sup> DW;地上部Cu含量平均为201 mg·kg<sup>-1</sup> DW,最高达567 mg·kg<sup>-1</sup> DW;地下部Cu含量平均为346 mg·kg<sup>-1</sup> DW,最高达1 723 mg kg<sup>-1</sup> DW;密毛蕨对Cu的转移系数平均为0.81,最高达3.88.在营养液砂培的条件下,Cu 7 mg·L<sup>-1</sup>处理没有抑制密毛蕨地上部的生长;密毛蕨体内的Cu含量随着介质中Cu浓度的增加而显著增加,但是大部分的Cu积累在地下部.密毛蕨对Cu具有较强的忍耐和较高的积累能力,可作为修复Cu污染土壤的新材料.

关键词 [密毛蕨](#) [积累植物](#) [Cu](#) [植物修复](#)

分类号

## *Petridium revolutum*, a promising plant for phytoremediation of Cu-polluted soil

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### Abstract

A field survey on the *Petridium revolutum* growing on the Cu mining spoils in Yunnan Province and related greenhouse hydroponic sand culture experiment showed that when growing on the soil with an average Cu concentration of 2 432 mg·kg<sup>-1</sup> DW and the maximum Cu concentration of 7 554 mg·kg<sup>-1</sup> DW, *P. revolutum* had a large amount of aboveground biomass, with the maximum dry weight of 40.05 g·plant<sup>-1</sup> DW and the average dry weight of 18.33 g·plant<sup>-1</sup> DW. The average and maximum Cu contents were 201 and 567 mg·kg<sup>-1</sup> DW in aboveground biomass, and 346 and 1 723 kg<sup>-1</sup> DW in underground biomass, respectively. The transfer factor of Cu reached a maximum of 3.88, with an average of 0.81. Under quartz sand culture condition, *P. revolutum* could grow well when the Cu concentration in nutrient solution was 7 mg·L<sup>-1</sup>. The accumulation of Cu by *P. revolutum* plant increased significantly with increasing Cu concentration, with the most of absorbed Cu concentrated in underground biomass. It was suggested that *P. revolutum* had a remarkable tolerance to Cu and a potential

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capacity of Cu accumulation, and could be used in the phytoremediation of Cu-polluted soils.

**Key words** [Petridium revolutum](#) [Phytoaccumulator](#) [Cu](#) [Phytoremediation](#)

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