

研究论文

# 鄂尔多斯地区公路沿线土壤重金属形态与生物有效性

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**摘要** 采用Tessier A连续提取法对鄂尔多斯地区公路沿线土壤重金属(Pb、Zn、Cu、Ni、Cr)化学形态进行了测定。同时对土壤pH值、重金属含量和公路绿化植物重金属(Cd、Hg、Pb、Cu、Zn、Ni、Cr、As和Se)含量进行了分析, 对该区域重金属的生物有效性与潜在生态风险进行预测。结果表明: 土壤重金属有效态占总量百分比的大小序列为 Zn > Pb > Ni、Cr > Cu, 与重金属元素在绿化植物中含量大小序列 Zn > Cu > Ni、Cr、As、Pb > Cd > Hg 并非完全趋于一致。不同公路段土壤重金属与其不同形态存在较大的变幅。公路沿线表层土壤中重金属的有效态占其总量为G109(东胜-准格尔段)15.7%~46.1%, G210(达拉特-东胜段)8.0%~40.9%, G109(东胜-鄂托克段)9.1%~33.9%, 而且以有机态和Fe-Mn氧化结合态的比例较大, 为各元素有效态的主要形态特征。Cu在不同植物不同器官中的含量较高, 可能在鄂尔多斯地区特定环境条件下随植物的蒸腾拉力、水分和营养盐运移的生理生态作用下使其在植物体中富集。土壤重金属Zn的有效态含量较高, 而残渣态含量低, 须特别注意其对区域生态系统的潜在影响。

**关键词** [重金属](#) [形态特征](#) [生物有效性](#) [土壤-植物系统](#) [鄂尔多斯](#)

**分类号** [Q149](#), [S718](#), [S151.9](#), [X171.1](#)

## The speciation and bioavailability of heavy metals pollutants in soil along highway in Erdos

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**Abstract** The concentration and speciation of heavy metals and pH in soil along the highway were analyzed for assessing their bioavailability and potential ecological risk in Erdos. The results indicated that valid state percentage of heavy metal in soil followed the order of Zn > Pb > Ni、Cr > Cu whereas the heavy metals concentration in plants followed another order of Zn > Cu > Ni、Cr、As、Pb > Cd > Hg, suggesting that there was not consistency between concentration and speciation of heavy metals in soil. The valid state percentage of heavy metal in soil of three various roads were 15.7%~46.1%, 8.0%~40.9% and 9.1%~33.9%, respectively. The higher organic state and Fe-Mn oxygenation speciation were dominant. A higher Cu concentration was observed in different organs of different plants. These might be implied that there was Cu accumulation in plants due to their physiological function such as transpiration, water and nutrient transportation. The higher valid state and lower rudimental percentage of Zn in soil implied that it should be paid attention to potential effects of heavy metals on regional ecosystem.

**Key words** [heavy metal](#) [speciation](#) [bioavailability](#) [soil-plant system](#) [Erdos](#)

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