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闽江河口短叶茳芏沼泽湿地沉积物磷的赋存形态和空间分布

Fractions and spatial distribution of phosphorus in sediments of the *Cyperus malaccensis* marshes in the Min River estuary

关键词：磷 赋存形态 空间分布 沉积物 短叶茳芏沼泽湿地 闽江河口

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摘要：对闽江河口区不同盐度短叶茳芏沼泽湿地沉积物中磷的赋存形态和分布特征进行了研究,探讨了河口沉积物中磷的来源及其影响因子.结果表明:①闽江河口湿地沉积物全磷(TP)含量介于607.91~807.60 mg·kg^{-1},平均值为726.29 mg·kg^{-1};有机磷(OP)含量介于120.44~166.63 mg·kg^{-1},平均值为139.43 mg·kg^{-1},约占TP的18.93%;无机磷(IP)含量介于479.65~647.56 mg·kg^{-1},平均值为586.86 mg·kg^{-1},约占TP的81.07%,IP是磷的主要赋存形态.②IP中,赋存形态以闭蓄态磷(O-P)和铁结合态磷(Fe-P)为主,分别占IP的39.97%和32.92%;其次是钙结合态磷(Ca-P)和铝结合态磷(Al-P),分别占IP的17.89%、9.22%.③在空间分布上,TP、OP、IP含量在由海向陆方向整体呈先降低后递增趋势;IP不同赋存形态在空间上也整体上呈现出以上趋势;垂直方向上,总体都表现为随土层深度波动降低,这在一定程度上反映了近年来河口湿地环境污染的加剧.④磷的赋存形态和空间分布特征是电导率、pH、容重、含水率和粒度等多因子综合作用的结果.

Abstract：Fractions and spatial distribution of phosphorus in the sediments of the *Cyperus malaccensis* marshes along the salinity gradient in the Min River estuary were determined, and the sources and main impact factors were discussed. Total Phosphorus (TP) contents in the sediments ranged from 607.91 to 807.60 mg·kg^{-1}, with an average of 726.29 mg·kg^{-1}. Organic Phosphorus (OP) contents ranged from 120.44 to 166.63 mg·kg^{-1}, with an average of 139.43 mg·kg^{-1} and accounting for 18.93% of TP; Inorganic Phosphorus (IP) contents ranged from 479.65 to 647.56 mg·kg^{-1}, with an average of 586.86 mg·kg^{-1} and accounting for 81.07% of TP. The occluded forms of P(O-P)and phosphate bound to iron oxides(Fe-P)were the major part of IP, accounting for 39.97% and 32.92% of IP, respectively. They were followed by Ca-bound P(Ca-P)and Al-bound P(Al-P), accounting for 17.89% and 9.22% of IP, respectively. Overall, the contents of TP, OP and IP as well as various forms of IP showed a decreasing then increasing trend from coastal areas to inland. The contents of various forms phosphorus in sediments had a fluctuating decreasing trend with sediments depth, indicating the increasing environmental pollution in recent years. Characteristics of fractions and spatial distribution of phosphorus are the combined effects of multiple factors, such as salinity, pH, bulk density, moisture and grain size.

Key words：phosphorus fractions spatial distribution sediment *Cyperus malaccensis* marsh Min River estuary