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渤海沉积物中磷的分布与埋藏通量

Distribution and burial flux of phosphorus in sediments of the Bohai Sea

关键词: [渤海](#) [沉积物](#) [磷](#) [分布](#) [埋藏通量](#)

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摘要: 对渤海27个站位的表层沉积物和25个站位的柱状沉积物中总磷(TP)、无机磷(IP)及有机磷(OP)的含量及其分布特征进行了研究.结果表明,渤海表层沉积物总磷含量的变化范围为 $10.83 \sim 20.27 \mu\text{mol} \cdot \text{g}^{-1}$,IP是表层沉积物中磷的主要存在形式,平均占TP的81%,柱状沉积物中无机磷同样占绝对优势.沉积物中总磷与无机磷的垂直分布具有由较深层向浅层增加的趋势,有机磷含量也随着深度的增加而减小,一般是上部变化较大、下部变化较小.渤海沉积物中总磷及无机磷在黄河口及莱州湾附近海域含量最高,渤海西部也有较高含量,中部次之,东部及海峡沉积物中磷含量最低;沉积物中有机磷在渤海西北部、渤海湾及辽东湾口附近含量较高.影响渤海沉积物中磷含量的主要因素有陆源输入与水动力条件.渤海磷的埋藏通量和埋藏效率都具有明显的区域性,研究发现,磷的埋藏通量与沉积速率的相关性显著($r=0.897, p<0.01$),而磷的埋藏效率沿岸高,并向外海逐渐降低.通过对比1998年与2008年渤海中南部的表层沉积物磷含量数据,发现2008年沉积物中总磷、有机磷含量高于1998年,说明随着社会经济的发展和人类活动的加剧,渤海水体富营养化程度愈加严重.

Abstract: Biogeochemical observations were carried out to determine different phosphorus compositions (TP, IP and OP) and their distribution characteristics in sediments of the Bohai Sea. The results show that, the content of TP ranged from 10.83 to $20.27 \mu\text{mol} \cdot \text{g}^{-1}$ in surface sediment. IP was the major phosphorus form accounting for 81% of the TP, and also the dominate form in core sediment. Both IP and TP in sediments had an increasing trend from bottom to surface. The OP content decreases with core depth, and generally changes in a larger range in the upper layer while smaller in the lower layer. The TP and IP concentrations were the highest in the Yellow River estuary and Laizhou Bay. The phosphorus content in sediments of western Bohai Sea was also high, followed by central Bohai, and the lowest in eastern Bohai and Bohai Straits. The most dominant factors affecting the phosphorus content in sediments of Bohai Sea were terrestrial input and hydrodynamic conditions. The phosphorus burial flux (PBF) and the phosphorus burial efficiency (PBE) had a significant regional characteristic. It was found a high correlation between the burial flux and the deposition rate ($r=0.897, p<0.01$), and the PBE was higher along the coast and gradually reduced in the open sea. By comparing the phosphorus content in surface sediments of southern and central Bohai Sea in 1998 and 2008, the phosphorus concentration was higher in 2008 than that in 1998, which indicated that with the economy development and human activities, the Bohai eutrophication was more and more serious.

Key words: [the Bohai Sea](#) [sediment](#) [phosphorus](#) [distribution](#) [burial flux](#)

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