

滨海湿地生态学与生物地球化学

溢油分散剂对马粪海胆油污染效应的影响

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摘要 在实验生态条件下, 研究了0号柴油分散液(WAFs)及加入溢油分散剂后的0号柴油乳化液(dis WAFs)对马粪海胆〔WTBX〕(*Hemicentrotus pulcherrimus*)〔WTBZ〕的急性毒性作用; 并研究了亚致死浓度下海胆消化腺中超氧化物歧化酶(SOD)、过氧化氢酶(CAT)和谷胱甘肽硫转移酶(GST)活性的变化. 结果表明: WAFs对马粪海胆幼胆的24, 48, 72和 96 h 半致死浓度分别为 18.2, 15.5, 11.5 和 9.5 mg/L; dis WAFs对马粪海胆幼胆的24, 48, 72和 96 h 半致死浓度分别为 11.7, 9.1, 7.4 和 5.1 mg/L. 加入溢油分散剂后, 使0号柴油分散液对马粪海胆的毒性效应变大. 亚致死浓度下的dis WAFs污染对消化腺内抗氧化酶活性的影响存在时间、剂量-效应关系. 同一剂量组随着污染时间的延长, SOD, CAT和GST的活性表现为先诱导后抑制的趋势, GST趋势尤其显著. 受污染个体在污染解除之后, 其SOD, CAT和GST酶活性得到恢复. SOD, CAT和GST可以作为海洋环境石油烃污染监测的生物标志物, 为生物损害评估提供依据.

关键词 [马粪海胆; 0号柴油分散液\(WAFs\); 0号柴油乳化液\(dis WAFs\); 抗氧化酶](#)

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Toxicity effects of oil and dispersant on sea urchin (*Hemicentrotus pulcherrimus*)

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Abstract

The acute toxic effects of No.0 diesel oil water accommodated fractions(WAFs) and dispersed oil (dis WAFs) on sea urchin were studied, and the response of antioxidase(superoxide dismutase, SOD; catalase, CAT; glutathione S transferase,GST) in digestive gland to dis WAFs were tested. *Hemicentrotus pulcherrimus* was exposed to different concentrations of dis WAFs (0.5, 1, 2 mg/L) for 13 days, and then transferred into clean sea water for 11 d restoring experiment. The results showed that the dis WAFs was more toxic, with 24, 48, 72, 96 h LC₅₀ values of 11.7, 9.1, 7.4 and 5.1 mg/L respectively. The activity of antioxidase was statistically significant dose related effect in different dis WAFs concentrations. Under the same dose concentration exposure, SOD, CAT and GST activities increased first and then decreased with the prolonged exposure time. This trend was most significant in GST activity. The activities of SOD, CAT and GST of all concentration groups recovered to the corresponding control level after recovery experiment. According to the data, SOD, CAT and GST can be taken as biomarkers to monitor benthic marine oil pollution and provide.

Key words [Hemicentrotus pulcherrimus](#) [No.0 diesel oil water accommodated fractions \(WAFs\)](#) [No.0 diesel oil emulsion \(dis WAFs\)](#) [antioxidase](#)

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