

邻苯二甲酸二丁酯对翡翠贻贝抗氧化酶及脂质过氧化水平的影响

秦洁芳^{1,2},陈海刚^{1,2},蔡文贵¹,杨涛^{1,2},贾晓平^{1**}¹中国水产研究院南海水产研究所广东省渔业生态环境重点实验室/农业部南海渔业资源环境重点野外科学观测实验站, 广州 510300; ²上海海洋大学海洋科学学院, 上海 201306Effects of di-n-butyl phthalate on the antioxidant enzyme activities and lipid peroxidation level of *Perna viridis*.QIN Jie-fang^{1,2}, CHEN Hai-gang^{1, 2}, CAI Wen-gui¹, YANG Tao^{1,2}, JIA Xiao-ping¹¹Guangdong Province Key Laboratory of Fishery Ecology Environment/ Ministry of Agriculture Key Field Scientific Experimental Station of South China Fishery Resource and Environment, South China Sea Fisheries Research Institute, Chinese Academy of Fishery Sciences, Guangzhou 510300, China; ²College of Marine Science, Shanghai Ocean University, Shanghai 201306, China

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摘要 实验室条件下,研究了不同浓度邻苯二甲酸二丁酯(DBP)长期胁迫(15 d)对翡翠贻贝内脏团和外套膜抗氧化酶(超氧化物歧化酶SOD、过氧化氢酶CAT)及脂质过氧化(LPO)水平(以MDA含量表示)的影响,以及受胁迫翡翠贻贝在清洁海水中恢复阶段上述生化指标的变化特征.结果表明:胁迫阶段,0.5和2.5 mg·L⁻¹DBP下翡翠贻贝内脏团SOD活性表现为先抑制后逐渐恢复,12.5和62.5 mg·L⁻¹下则持续受到显著抑制;不同浓度组CAT活性均明显被抑制,LPO水平明显升高.外套膜中,2.5 mg·L⁻¹下SOD活性受到持续诱导,其他浓度组则先被抑制,后随暴露时间延长逐渐被诱导;各浓度组CAT的变化波动较大,没有明显规律;而LPO水平明显升高.净化恢复阶段,12.5和62.5 mg·L⁻¹DBP胁迫下的内脏团SOD和CAT活性恢复较慢,其LPO水平随时间延长逐渐恢复至对照组水平;外套膜中SOD活性呈持续升高趋势,CAT活性和LPO水平则随时间延长恢复到对照组水平.

关键词: 邻苯二甲酸二丁酯 翡翠贻贝 超氧化物歧化酶 过氧化氢酶 丙二醛 脂质过氧化

Abstract: A laboratory experiment was conducted to examine the superoxide dismutase (SOD) and catalase (CAT) activities and the lipid peroxidation (LPO) level presented by malondialdehyde (MDA) in visceral mass and mantle of green mussel (*Perna viridis*) after exposure to 0.5- 62.5 mg·L⁻¹ of di-n-butyl phthalate (DBP) for 15 days, and to study the change characteristics of these biochemical indicators after the green mussel released into DBP-free seawater for 10 days. During exposure period, the SOD activity in visceral mass was inhibited first and then reached the level of the control at 0.5 and 2.5 mg·L⁻¹ of DBP, but inhibited significantly ($P<0.01$) at 12.5 and 62.5 mg·L⁻¹ of DBP. The CAT activity in visceral mass was inhibited at all test concentrations of DBP, while the LPO level was obviously induced. During the chronic DBP exposure, the SOD and CAT activities in the mantle were induced significantly but had no regular pattern, and the LPO level was also obviously induced. After the exposed green mussel was released into clean seawater, the SOD and CAT activities in the visceral mass in 12.5 and 62.5 mg DBP·L⁻¹ groups recovered much slowly, but the LPO level gradually recovered to control level. During the recovery period, the SOD activity in the mantle showed an increasing trend with time, but the CAT activity and LPO level reached gradually to the level of the control.

Key words: di-n-butyl phthalate (DBP) *Perna viridis* superoxide dismutase (SOD) catalase (CAT) malondialdehyde (MDA) lipid peroxidation (LPO)

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