

### 毒死蜱(CPF)对克氏原螯虾的急性毒性及组织病理观察

丁正峰,薛晖,王晓丰,唐建清

江苏省淡水水产研究所

### Acute Toxicity of Chlorpyrifos(CPF) to Crayfish(*Procambarus clarkii*) and the Histopathological Observation

DING Zheng-Feng, XUE Hui, WANG Xiao-Feng, TANG Jian-Qing

Freshwater Fisheries Research Institute of Jiangsu Province

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**摘要** 采用静水生生物测试法研究毒死蜱(CPF)对克氏原螯虾(*Procambarus clarkii*)的急性毒性效应及克氏原螯虾的组织病变情况并进行安全评价。设定0、2、10、20、40和80 $\mu\text{g}\cdot\text{L}^{-1}$  6个CPF浓度梯度进行急性暴露试验,结果表明,CPF浓度升高对克氏原螯虾产生较大毒性,24、48和96 h半致死浓度( $\rho(\text{LC}_{50})$ )分别为(28.24 $\pm$ 2.81)、(19.50 $\pm$ 2.03)和(13.13 $\pm$ 1.70) $\mu\text{g}\cdot\text{L}^{-1}$ , $\rho(\text{LC}_{50})$ 随着暴露时间延长呈显著下降趋势,符合双曲线衰减模型( $r=0.9999$ , $P<0.0001$ ),安全浓度为(2.79 $\pm$ 0.31) $\mu\text{g}\cdot\text{L}^{-1}$ 。组织病理观察发现,染毒虾心脏上皮细胞增生,心肌束间充满血淋巴细胞;神经细胞肿大,尼氏体溶解消失,细胞由多极形状变为圆形,神经纤维坏死并解体;肝胰腺小管收缩并充血,空泡增加;鳃组织空泡化,表面出现黑色素沉积,被多量血淋巴细胞浸润;肌肉纤维萎缩并溶解。

**关键词:** 毒死蜱 克氏原螯虾 急性毒性 组织病理

**Abstract:** Acute toxicity of chlorpyrifos(CPF) on crayfish(*Procambarus clarkii*) was studied with the static test method. In the acute exposure experiment, crayfish was exposed to CPF at the following concentrations, 0, 2, 10, 20, 40, and 80  $\mu\text{g}\cdot\text{L}^{-1}$ . Results show that the higher the CPF concentration, the higher the toxicity to the crayfish. The 24, 48 and 96 h  $\rho(\text{LC}_{50})$  was (28.24 $\pm$ 2.81), (19.50 $\pm$ 2.03) and (13.13 $\pm$ 1.70)  $\mu\text{g}\cdot\text{L}^{-1}$ , respectively, and the safe concentration was (2.79 $\pm$ 0.31)  $\mu\text{g}\cdot\text{L}^{-1}$ . The lethal concentration of CPF to 50% of crayfish [ $\rho(\text{LC}_{50})$ ] decreased significant with time, which fitted a hyperbolic decay model ( $r=0.9999$ ,  $P<0.0001$ ). Histopathological observation of the crayfish revealed that CPF pollution caused serious damages to its main organs, such as epithelial hyperplasia of the heart, impregnation of cardiac muscle bundles with haemocytes; swollen neurons, chromatolysis, change of cells from multipolar to round shape, necrosis and disorganization of nerve fibres, constriction and congestion of hepatopancreas tubules with more vacuoles; vacuolation surface deposition of melanin and impregnation with haemocytes of gill tissues and atrophy and dissolution of muscle fibers. The study enriched the database of aquatic toxicology and helped accumulate basic data for control of proliferation of CPF pollution and development of ecological farming of crayfish *P. clarkii*.

**Keywords:** chlorpyrifos(CPF) *Procambarus clarkii* acute toxicity histopathology

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Corresponding Authors: 薛晖 江苏省淡水水产研究所 Email: jsxuehui@163.com

About author: 丁正峰(1981—),男,江苏阜宁人,助理研究员,硕士,主要从事水产经济动物病害防治研究。E-mail: dingzf@yeah.net

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