



烟曲霉SL-30菌株对非靶生物的安全性观察

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Biological Safety of Aspergillus fumigatus SL-30 to Non-target Organisms

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摘要

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摘要 目的 初步研究烟曲霉 (*Aspergillus fumigatus*) SL-30菌株对非靶生物的安全性。方法 将烟曲霉SL-30菌株分生孢子分散于200 ml 长江水、湖水、雨水和自来水中, 孢子浓度为 6×10^6 cfu/ml, 每2天取样检测并记录孢子数。采用半静态法测定浓度为104、105和106 cfu/ml 烟曲霉SL-30菌株分生孢子对斑马鱼 (*Brachydanio rerio*)、日本沼虾 (*Macrobrachium nipponensis*) 和泽蛙 (*Rana limnochris*) 蝌蚪的影响, 以去氯水作为对照, 观察处理后30 d内上述动物的存活情况, 并计算存活率。测定烟曲霉SL-30菌株分生孢子对小鼠经口急性毒性、大鼠经皮和吸入急性毒性。结果 烟曲霉SL-30菌株分生孢子在各供试水样中可存活约12 d。当烟曲霉SL-30菌株分生孢子浓度分别为104、105和106 cfu/ml时, 孢子浓度与实验动物存活率之间未见显著剂量依赖关系, 且斑马鱼、日本沼虾和泽蛙蝌蚪的存活率与处理相同天数的对照组间的差异, 无统计学意义 ($P > 0.05$)。烟曲霉SL-30菌株分生孢子对小鼠经口急性毒性、大鼠经皮和吸入急性毒性均属于低毒级, 实验组动物均无明显中毒症状, 大体解剖均未见明显异常, 重要脏器的组织切片均未见明显病理改变。结论 烟曲霉SL-30菌株对环境和非靶生物较安全。

关键词: 烟曲霉 非靶生物 生物安全性 杀螺剂

Abstract: Objective To evaluate biological safety of *Aspergillus fumigatus* SL-30, a potential molluscicide, to non-target organisms. Methods *A. fumigatus* SL-30 spores were scattered in the water (200 ml) from Yangtze River, lake, rain and tap water to forming 6×10^6 cfu/ml, the number of spores were then determined and recorded every 2 days. Effect of *A. fumigatus* SL-30 spores with concentration ranging from 104 cfu/ml to 106 cfu/ml on *Brachydanio rerio*, *Macrobrachium nipponensis* and tadpoles of *Rana limnochris* was tested by standard laboratory procedure, and survival rate of the above animals in 30 days was recorded. The tests included acute oral toxicity in mice, acute dermal toxicity and acute inhalation toxicity in rats. Results Spores of *A. fumigatus* SL-30 can survive for about 12 days in each water samples. Under the spore concentration of 104 cfu/ml, 105 cfu/ml and 106 cfu/ml, there was no significant dose-dependent relationship between spore concentration and survival rate of experiment animals. No significant difference in survival rate was found between the three kinds of aquatic organisms treated with *A. fumigatus* SL-30 and de-chlorinous water ($P > 0.05$). According to the experiment results of acute oral toxicity, acute dermal toxicity and acute inhalation toxicity, the acute toxicity of *A. fumigatus* SL-30 on animal was low. And the animals in experiment group did not show any obvious poisoning symptoms, anatomical abnormalities and pathologic change of the tissues. Conclusion *Aspergillus fumigatus* SL-30 is comparatively safe to environment and tested non-target organisms.

Keywords: *Aspergillus fumigatus* Non-target organism Biological security Molluscicide

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