



氯胺酮对大头金蝇生长发育的影响

吕宙, 翟仙敦, 周海梅, 李朴, 马锦琦, 官玲, 莫耀南*

河南科技大学法医学院, 洛阳 471003

Effect of Ketamine on the Development of *Chrysomya megacephala* (Diptera : Calliphoridae)

LV Zhou, ZHAI Xian-dun, ZHOU Hai-mei, LI Pu, MA Jin-qi, GUAN Ling, MO Yao-nan*

College of Forensic Medicine, Henan University of Science and Technology, Luoyang 471003, China

摘要

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摘要 【摘要】 目的 探究氯胺酮对大头金蝇 (*Chrysomya megacephala*) 生长发育的影响。 方法 分别用含0 (对照组)、25[1/2半数致死剂量 (LD50) 组]、50 (LD50组) 和100 mg/kg (2LD50组) 氯胺酮的培养基在光照周期12 h : 12 h, 相对湿度75%, 温度分别为32 °C、28 °C和24 °C的恒温室中孵化大头金蝇幼虫, 每组约400枚卵。幼虫孵出后16 h开始取样, 每隔12 h取样一次, 每组每次10只幼虫, 直至半数以上幼虫化蛹。测量幼虫体长和体重, 记录每组幼虫最大体长和体重, 计算平均体长和体重增长速度。观察虫体发育状态, 记录各阶段发育历期。 结果 不同温度下, 对照组体长和体重在达到最大值前均显著大于3个氯胺酮处理组 ($P < 0.05$), 3个处理组间无明显的剂量依赖关系。不同温度下, 各组最大体长和体重均在28 °C时达到最大, 24 °C时最小。多因素方差分析结果显示, 氯胺酮剂量、温度和两者之间的交互作用对幼虫平均体长和体重增长速度均有显著影响 ($P < 0.01$)。氯胺酮剂量对大头金蝇幼虫体长增长速度的影响占总效应的20.9%, 温度占60.2%, 两者之间的交互作用占18.9%; 氯胺酮剂量对体重增长速度的影响占总效应的8.3%, 温度占85.6%, 交互作用占6.1%。各处理组大头金蝇幼虫期于各个温度均较对照组显著延长 ($P < 0.05$), 预蛹期于28 °C和24 °C时均较对照组显著延迟 ($P < 0.05$), 蛹期于24 °C时较对照组显著缩短 ($P < 0.05$)。 结论 氯胺酮能抑制大头金蝇幼虫生长发育速度并相应延长发育历期, 且与环境温度存在交互作用。

关键词: 法医昆虫学 法医昆虫毒理学 大头金蝇 氯胺酮 生长发育 死后经历时间

Abstract: 【Abstract】 Objective To research the pattern of larvae and pupae development when exposed to ketamine. Methods The larvae of *Chrysomya megacephala* were reared in artificial diet containing ketamine with concentration of 0, 25, 50 and 100 mg/kg respectively at 32 °C, 28 °C and 24 °C in environmental chamber with a 12-h photoperiod and 75% humidity. 10 samples were collected from each group every 12 h from the 16th h after hatching to pupation. The max body length, weight of the larvae, growth rate of body length, weight and developmental duration of each stage were observed. Results The average length and weight in the treatment groups were significantly less than the control before achieving the maximum ($P < 0.05$), and the growth rate of 1/2LD50 group at 24 °C was most retarded. No dose dependence were observed among the ketamine fed groups. The effect of ketamine dose, temperature and their interaction on larval length and weight was statistically significant ($P < 0.01$). The effect of ketamine dose, temperature and their interaction account for, respectively, 20.9%, 60.2% and 18.9% of the total effect on growth of larval length, and they account for 8.3%, 85.6% and 6.1% of the total effect on growth of larval weight. The duration of larval stage in treatment groups was significantly delayed in comparison to the control at different temperatures ($P < 0.05$), and the duration of prepupal stage in treatment groups was significantly delayed ($P < 0.05$). However, the duration of pupal stage in treatment groups at 24 °C was significantly shorter than the control ($P < 0.05$). Conclusion The time achieving maximum length and weight was significantly delayed, which results in an increased development duration of larval and prepupal stages, indicating that ketamine inhibits the growth of the larvae of *C. megacephala*.

Keywords: Forensic entomology Forensic entomotoxicology *Chrysomya megacephala* Ketamine Larval development Postmortem interval

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