

6 种药剂对黄野螟不同龄期幼虫的毒力测定及林间药效试验

黄海¹ 郑伟² 陈海辉¹ 田乐宇² 余雪标^{1*}

海南大学林学院, 海口 570228; 2. 海南省林业科学研究院 (海南省红树林研究院), 海口 571100)

摘要:【目的】黄野螟 *Heortia vitessoides* 是白木香 *Aquilaria sinensis* 危害最严重的食叶害虫, 为筛选适宜黄野螟防治的理想药剂, 选择了 6 种商品药剂进行黄野螟不同龄期幼虫室内毒力测定和林间药效试验。

【方法】采用浸叶法和喷雾法, 分别比较研究了高效氯氰菊酯、棉铃虫核型多角体病毒、氯虫苯甲酰胺、杀虫双、苦参碱及敌百虫对黄野螟 2 龄、4 龄幼虫的毒力和林间药效。【结果】除 0.3% 苦参碱, 其他药剂对黄野螟幼虫的毒力均随龄期增大而降低, 其中 0.3% 苦参碱对 2 龄和 4 龄幼虫毒力均最大, LC_{50} 分别为 0.485、0.388 $mg \cdot L^{-1}$; 4.5% 高效氯氰菊酯对不同龄期幼虫的毒力相差较大, 2 龄是 4 龄的 7.34 倍, LC_{50} 分别为 7.032、51.640 $mg \cdot L^{-1}$, 其次是 5% 氯虫苯甲酰胺, 2 龄是 4 龄的 4.46 倍, LC_{50} 分别为 19.362、86.278 $mg \cdot L^{-1}$; 20 亿 PIB/毫升棉铃虫核型多角体病毒、18% 杀虫双和 30% 敌百虫三种药剂对不同龄期幼虫的毒力相差较小, 2 龄与 4 龄分别相差 1.16、1.35、1.31 倍, 其对 2 龄幼虫的 LC_{50} 分别为 15.651、74.236、107.915 $mg \cdot L^{-1}$, 对 4 龄幼虫的 LC_{50} 分别为 18.173、100.375、141.871 $mg \cdot L^{-1}$ 。林间药效试验结果显示, 几种药剂对黄野螟幼虫药效均随药剂浓度增加而增大, 除 5% 氯虫苯甲酰胺, 其他药剂对 2 龄幼虫致死率均可达平均 80.00% 以上, 其中 20 亿 PIB/毫升棉铃虫核型多角体病毒药效最佳, 致死率为 90.37~100.00%; 对于 4 龄幼虫, 0.3% 苦参碱药效最佳, 致死率为 95.56~100.00%, 其次是棉铃虫 20 亿 PIB/毫升核型多角体病毒, 致死率为 70.00~100.00%, 5% 氯虫苯甲酰胺药效最弱, 5 个浓度致死率均为 0.00%, 4.5% 高效氯氰菊酯药效也相对较弱, 致死率为 10.00~58.89%。【结论】6 种药剂用于防治黄野螟时在低龄幼虫期施药效果要优于高龄幼虫期, 建议于黄野螟低龄幼虫期选用 0.3% 苦参碱或 20 亿 PIB/毫升棉铃虫核型多角体病毒进行防治。

关键词: 白木香; 黄野螟; 杀虫剂; 毒力; 药效

Toxicity determination and forest efficacy test of six insecticides against different instar larvae of *Heortia vitessoides*

Abstract : 【Objective】*Heortia vitessoides* is the most serious leaf-eating pest of *Aquilaria sinensis*. In order to screen the ideal insecticides for the control of *H.vitessoides*, six commercial insecticides were selected for indoor toxicity determination and forest efficacy test of different instar larvae of *H.vitessoides*. 【Method】The toxicity and forest efficacy of beta-cypermethrin, *Helicoverpa armigera* nuclear polyhedrosis virus, chlorantraniliprole, dimehypo, matrine and trichlorfon to the second and fourth instar larvae of *H.vitessoides* were compared by leaf dipping method and spray method. 【Result】Except for 0.3 % matrine, the toxicity of other insecticides to the larvae decreased with the increase of instar. The toxicity of 0.3 % matrine to the second and fourth instar larvae was the highest, and the LC_{50} was 0.485 and 0.388 $mg \cdot L^{-1}$, respectively. The toxicity of 4.5 % beta-cypermethrin to different instar larvae was quite different. The toxicity of second instar larvae was 7.34 times that of fourth instar larvae, and the LC_{50} was 7.032 and 51.640 $mg \cdot L^{-1}$, respectively. The toxicity of 5 % chlorantraniliprole was 4.46 times that of fourth instar larvae, and the LC_{50} was 19.362 and 86.278 $mg \cdot L^{-1}$, respectively. 2 billion PIB/ml of *Helicoverpa armigera* nuclear polyhedrosis virus, 18 % bisultap and 30 % trichlorfon had little

difference in toxicity to different instar larvae. The difference between the second and fourth instar larvae was 1.16, 1.35 and 1.31 times, respectively. The LC_{50} of the second instar larvae was 15.651, 74.236 and 107.915 $mg \cdot L^{-1}$, respectively, and the LC_{50} of the fourth instar larvae was 18.173, 100.375 and 141.871 $mg \cdot L^{-1}$, respectively. The results of forest efficacy test showed that the efficacy of several insecticides on the larvae of *H.vitessoides* increased with the increase of pesticide concentration. Except for 5 % chlorantraniliprole, the mortality rate of other insecticides on the second instar larvae could reach more than 80.00 % on average. Among them, the efficacy of 2 billion PIB / ml cotton bollworm nuclear polyhedrosis virus was the best, and the mortality rate was 90.37~100.00 %. For the fourth instar larvae, 0.3 % matrine had the best efficacy, with a mortality rate of 95.56~100.00 %, followed by 2 billion PIB/ml nuclear polyhedrosis virus of cotton bollworm, with a mortality rate of 70.00~100.00 %. The efficacy of 5% chlorantraniliprole was the weakest, with a mortality rate of 0.00 % at five concentrations. The efficacy of 4.5% beta-cypermethrin was also relatively weak, with a mortality rate of 10.00~58.89 %. **【Conclusion】** The application effect of 6 kinds of pesticides in the young larvae stage was better than that in the old larvae stage. It was suggested that 0.3 % matrine or 2 billion PIB/ml cotton bollworm nuclear polyhedrosis virus should be used to control the young larvae stage of *H.vitessoides*.

Keywords : *Aquilaria sinensis* ; *Heortia vitessoides* ; insecticide ; toxicity ; efficacy