

## 东莨菪内酯与双脱甲氧基姜黄素对朱砂叶螨毒力的温度效应

杨振国, 张永强, 丁伟, 罗金香, 秦培元

西南大学植物保护学院, 重庆 400716

### Effect of temperature on toxicities of scopoletin and bisdemethoxycurcumin against *Tetranychus cinnabarinus* (Acari: Tetranychidae)

YANG Zhen-Guo, ZHANG Yong-Qiang, DING Wei, LUO Jin-Xiang, QIN Pei-Yuan

College of Plant Protection, Southwest University, Chongqing 400716, China

- 摘要
- 参考文献
- 相关文章

全文: PDF (4364 KB) HTML (1 KB) 输出: BibTeX | EndNote (RIS) 背景资料

**摘要** 为明确植物性杀螨活性物质东莨菪内酯与双脱甲氧基姜黄素对朱砂叶螨 *Tetranychus cinnabarinus* 雌成螨毒力的温度效应, 采用玻片浸渍法测定了两者不同温度下的杀螨活性。结果表明: 在8~26℃的温度范围内, 东莨菪内酯和双脱甲氧基姜黄素对朱砂叶螨雌成螨的毒力呈正温度系数; 在26~34℃的温度范围内两者对朱砂叶螨雌成螨的毒力呈负温度系数。其中26℃下东莨菪内酯和双脱甲氧基姜黄素表现出较好杀螨活性, 处理后48 h的致死中浓度(LC<sub>50</sub>)分别为0.1884和0.3376 mg/mL; 23℃下的毒力次之。致死中浓度(y)与温度(x)关系的拟合方程为: 东莨菪内酯:  $y_1 = 0.006x_1^2 - 0.278x_1 + 3.403$ ; 双脱甲氧基姜黄素:  $y_2 = 0.007x_2^2 - 0.354x_2 + 4.826$ 。对y求最小值得出, 东莨菪内酯和双脱甲氧基姜黄素对朱砂叶螨雌成螨的最高毒力温度分别为23.2℃和25.3℃, LC<sub>50</sub>分别为0.1828和0.3504 mg/mL。据此认为, 在一定的温度范围内, 随着温度的升高, 这两种植物性杀螨活性物质对朱砂叶螨的毒力与温度先呈正相关, 到达最佳毒力温度后再呈负相关。

**关键词:** 朱砂叶螨 东莨菪内酯 双脱甲氧基姜黄素 毒力 温度效应

**Abstract:** The toxicities of botanical acaricides scopoletin and bisdemethoxycurcumin (BDMC) were investigated for their acaricidal activity against female adults of the carmine spider mite, *Tetranychus cinnabarinus*, by slide dip bioassay at different temperatures in order to ascertain the temperature effect of scopoletin and BDMC. Both scopoletin and BDMC displayed a positive temperature coefficient at temperatures from 8 to 26°C and a negative temperature coefficient at temperatures from 26 to 34°C. At 26°C, 48 h after treatment, scopoletin and BDMC showed the strongest acaricidal activity against *T. cinnabarinus* with the LC<sub>50</sub> values of 0.1884 and 0.3376 mg/mL, respectively. The mathematical models of the relationship between LC<sub>50</sub> (y) and temperature (x) were simulated: for scopoletin,  $y_1 = 0.006x_1^2 - 0.278x_1 + 3.403$ ; for BDMC,  $y_2 = 0.007x_2^2 - 0.354x_2 + 4.826$ . Based on the differential coefficients of above models, the optimal acaricidal activities of scopoletin and BDMC were obtained at 23.2 and 25.3°C, respectively, with the LC<sub>50</sub> values of 0.1828 and 0.3504 mg/mL, respectively. It is so concluded that the toxicities of scopoletin and BDMC exhibit a positive temperature coefficient first and then exhibit a negative temperature coefficient with increasing temperature.

**Key words:** *Tetranychus cinnabarinus* scopoletin bisdemethoxycurcumin toxicity temperature effect

收稿日期: 2011-12-28; 接受日期: 2012-03-29

基金资助:

科技部农业科技成果转化基金(2010GB2F100388); 教育部博士点新教师基金(20100182120021)

通讯作者: 张永强 E-mail: zhangyq80@tom.com

作者简介: 杨振国, 男, 1986年生, 云南砚山人, 硕士研究生, 研究方向为天然产物农药, E-mail: zhenguoyang@qq.com

引用本文:

杨振国,张永强,丁伟等. 东莨菪内酯与双脱甲氧基姜黄素对朱砂叶螨毒力的温度效应[J]. 昆虫学报, 2012, 55(4): 420-425.

YANG Zhen-Guo, ZHANG Yong-Qiang, DING Wei et al. Effect of temperature on toxicities of scopoletin and bisdemethoxycurcumin against *Tetranychus cinnabarinus* (Acari: Tetranychidae)[J]. ACTA ENTOMOLOGICA SINICA, 2012, 55(4): 420-425.

#### 服务

- ▶ 把本文推荐给朋友
- ▶ 加入我的书架
- ▶ 加入引用管理器
- ▶ E-mail Alert
- ▶ RSS

#### 作者相关文章

- ▶ 杨振国
- ▶ 张永强
- ▶ 丁伟
- ▶ 罗金香
- ▶ 秦培元

没有本文参考文献

- [1] 李茂业, 林华峰, 李世广, 金立. 黄绿绿僵菌Mf82菌株对不同虫态褐飞虱的毒力[J]. 昆虫学报, 2012, 55(3): 316-323.
- [2] Neda NABAEI, Ali MEHRVAR, Moosa SABER, Mohammad BAGHERI. 昆虫病原真菌与硅藻土混用对四纹豆象的毒力效果(英文)[J]. 昆虫学报, 2012, 55(11): 1282-1288.
- [3] 杨洪, 王召, 金道超. 氯虫苯甲酰胺对白背飞虱实验种群的亚致死效应[J]. 昆虫学报, 2012, 55(10): 1161-1167.
- [4] 魏纪珍, 郭予元, 高希武, 张涛, 梁革梅. Cry1Fa对Cry1Ac抗性棉铃虫的毒力评价[J]. 昆虫学报, 2012, 55(10): 1154-1160.
- [5] 任学祥, 王刚, 左一鸣, 王开运, 王杰. 噻虫胺对桃蚜的毒力及其亚致死剂量对桃蚜解毒酶系活力的影响[J]. 昆虫学报, 2011, 54(3): 299-305.
- [6] 雍小菊, 张永强, 丁伟. 东莨菪内酯对朱砂叶螨实验种群的亚致死效应[J]. 昆虫学报, 2011, 54(12): 1377-1383.
- [7] 郭天娥, 张正群, 周超, 刘峰, 慕卫. 山东省五个棉花产区绿盲蝽对药剂的敏感性检测(英文)[J]. 昆虫学报, 2010, 53(9): 993-1000.
- [8] 刘雨晴, 薛明, 张庆臣, 周方园, 尉吉乾. 黄荆中 $\beta$ -石竹烯对棉蚜的毒力和作用机理[J]. 昆虫学报, 2010, 53(4): 396-404.
- [9] 刘颖, 谢蓉蓉, 洪晓月. 共生菌Cardinium对朱砂叶螨的生殖调控作用[J]. 昆虫学报, 2010, 53(11): 1233-1240.
- [10] 张正群, 郭天娥, 王伟, 刘峰, 慕卫. 两种室内生物测定方法评价杀虫剂对绿盲蝽的相对毒力[J]. 昆虫学报, 2009, 52(9): 967-973.
- [11] 冯宏祖, 刘映红, 何林, 李明, 卢文才, 薛传华. 朱砂叶螨HSP90基因克隆及原核表达[J]. 昆虫学报, 2009, 52(8): 845-851.