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研究论文

桔小实蝇抗性个体流动对抗性个体频率的影响

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Changes of the frequency of resistant individuals in populations of the oriental fruit fly, Bactrocera dorsalis (Diptera: Tephritidae), with resistant individual flow

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全文: PDF (0 KB) HTML (1 KB) 输出: BibTeX | EndNote (RIS) 背景资料

摘要 为了解害虫个体的迁移对害虫群体抗药性发展的影响, 本研究利用实验室内建立的桔小实蝇*Bactrocera dorsalis*对敌百虫和高效氯氰菊酯两种抗性品系以及相对敏感品系, 设计5%~25%个体的迁移比例, 研究桔小实蝇抗、 感个体流动对原始种群抗性个体频率的影响。结果表明: 桔小实蝇抗性个体迁入敏感种群, 使得敏感种群抗性个体频率增加, 在抗性个体迁移率为25%时, 影响敏感种群敌百虫和高效氯氰菊酯抗性个体频率的变化值分别为20.04%和41.75%; 同样随着敏感个体迁入比例的增加, 抗性种群中抗性个体频率降低程度越大, 在敏感个体迁移率为25%时, 抗性种群敌百虫和高效氯氰菊酯抗性个体频率的变化值分别为56.20%和25.88%。利用抗性个体频率变化值与相应迁移率的比值来表示迁移的相对效率, 在抗性个体迁移率为5%时, 影响敏感种群抗性个体频率变化的相对效率最高; 在敏感个体迁移率分别为5%和10%时, 影响敌百虫抗性种群和高效氯氰菊酯抗性种群抗性个体频率变化的相对效率最高。以抗、 感个体迁移引起的抗性个体频率变化值进行趋势拟合, 发现抗敌百虫与抗高效氯氰菊酯桔小实蝇品系不同迁移比例下的抗性个体频率变化趋势分别符合密度模型(density model)和房屋模型(housing model), 相关系数分别是0.9696和0.9647。研究结果表明通过合理地设计抗、 感迁移比例能有效地延缓桔小实蝇抗性水平的上升, 达到抗性治理的目的。

关键词:

Abstract:
To investigate the effects of immigration of individuals on evolution of insecticide resistance, frequencies of resistant individuals of the oriental fruit fly, *Bactrocera dorsalis*, to trichlorphon and β-cypermethrin were measured with different immigration rates of resistant or sensitive individuals in this study. The results showed that when resistant adults were immigrated into the susceptible population, the frequency of resistant individuals increased as the immigration rates increased. The changes in the frequency of resistant individuals to trichlorphon and β-cypermethrin were 20.04% and 41.75%, respectively, when the immigration rate of resistant individuals was 25%. Similarly, the frequency of resistant individuals decreased when increasing susceptible adults were immigrated into the resistant population. When the immigration rate of susceptible adults was 25%, the changes in the frequency of resistant individuals to trichlorphon and β-cypermethrin were 56.20% and 25.88%, respectively. The relative efficacy of influence on the changes of the frequency of resistant individuals by resistant adult immigration was the highest among all the tested populations when the immigration ratio was 5%. However, when susceptible individuals were immigrated into the resistant population, the relative efficacy of influence on the changes of the frequency of resistant individuals by trichlorphon-resistant adults and β-cypermethrin-resistant adults was the highest when the immigration ratio of sensitive individuals were 5% and 10%, respectively. The relative efficacy of influence on the changes of the frequency of resistant individuals by immigration was the highest among all the tested populations when the immigration ratio was 5%. The tendency fitting for changes of the frequency of resistant individuals and different immigration ratios indicated that resistance to trichlorphon and β-cypermethrin followed the density model and housing model, and the correlation coefficients were 0.9696 and 0.9647, respectively. The results suggest that the reasonably designing immigration rate would effectively postpone resistance development in *B. dorsalis* populations and meet the requirements for resistance management.

Key words:

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