

研究论文

云南瑞丽桔小实蝇成虫种群数量变动及其影响因子分析

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摘要 分别于1997、2000、2003和2004年通过诱蝇迷对云南瑞丽桔小实蝇种群动态进行了全年监测, 并就气候因子及寄主植物对该种群变动的影响进行了系统分析。结果表明, 桔小实蝇在瑞丽常年发生, 当年11月至翌年1月份, 桔小实蝇种群处于较低水平, 2月份以后种群数量逐渐上升, 至6月份形成种群的年增长高峰, 此后至10月份种群数量迅速下降。经逐步回归分析表明, 月均温、月平均最高温、月平均最低温、月极端最高温、月极端最低温和月雨日数是影响瑞丽桔小实蝇种群月变动的主要气候因子。通径分析和决策系统分析表明, 月均温对种群数量变动具有正效应, 是直接影响桔小实蝇种群变动的重要指标, 月均最低温是影响种群增长的最主要的限制因素, 月雨日数对种群动态的综合影响力最大。瑞丽各月平均温度位于桔小实蝇各虫态生长发育温度范围内, 但11~翌年1月份的月均最低温低于桔小实蝇的适温范围, 对桔小实蝇种群数量有一定抑制作用。2~5月份雨日数逐渐增多, 雨量逐渐增大, 有利于种群数量增长; 7~8月份持续的强降雨过程被认为是桔小实蝇在该时期种群数量下降的主要原因。而瑞丽的多种瓜果成熟期的交替出现保证了桔小实蝇的食物供应。

关键词 桔小实蝇; 种群变动; 气候因子; 寄主植物; 瑞丽

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Population dynamics of *Bactrocera dorsalis* (Diptera: Tephritidae) along with analysis on the factors influencing the population in Ruili, Yunnan Province

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Abstract Annual monitoring was conducted on the population dynamics of the oriental fruit fly, *Bactrocera dorsalis* (Hendel) (Diptera: Tephritidae) through methyl eugenol-baited traps all year during 1997, 2000, 2003 and 2004 respectively. Temperature, rainfall and host-plant species were analyzed in relation to population fluctuation of the fly. During the study periods the fruit fly occurred all year. Its population remained low from November to January and increased steadily from February until reaching a peak in June. Afterwards, the population declined until October. The results of stepwise regression analysis indicated that monthly mean temperature, monthly mean maximum temperature, monthly mean minimum temperature, monthly extreme maximum temperature, monthly extreme minimum temperature, and monthly raining days were the major climatic factors influencing populations. Path and decision coefficient analyses indicated that the monthly mean temperature was the crucial factor influencing population fluctuation, the monthly mean minimum temperature was the crucial limiting factor indirectly influencing population increase, and monthly raining days the strongest influence on fly population dynamics. Generally, the monthly mean temperatures fell into the ranges of temperatures suitable for development and reproduction of the fly. But the monthly mean minimum temperatures from November to January appeared to be lower and were suggested to be responsible for the low populations in this period. Monthly rainfall and rainy days increased steadily from February through June, which explained population increase. During periods of continuous heavy raining from July through August, the fruit fly population de

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creased remarkably. Host plant species was another essential factor influencing the population fluctuations. Abundant fruit and melon species provided the fly with a continual supply of the food and breeding material during the study periods.

Key words [Bactrocera dorsalis](#); [population dynamics](#); [climatic factors](#); [host plant](#); [Ruili](#)

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