

CLONING AND IDENTIFICATION OF CYTOCHROME P450 RESISTANCE RELATED GENES IN THE MOSQUITO, *CULEX PIPIENS PALLENS* *

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Abstract [Objective] To inquire into the relationship between cytochrome P450 and deltamethrin resistance. [Methods] 24 new cDNA sequences encoding cytochrome P450 were amplified respectively from deltamethrin-susceptible and -resistant strains of *Culex pipiens pallens* with a pair of degenerate primers according to the conservative amino acid sequences of CYP4 in insects by RT-PCR and the Direct Cloning Method, and then were identified by cDNA chip and reverse Northern. [Results] 112 positive clones were obtained, of which 24 were shown to be new sequences encoded for cytochrome P450. They have been lodged in GenBank and were appraised by the Nomenclature Committee of Cytochrome P450, belonging to the subfamily CYP4C, CYP4D, CYP4H and CYP4J in CYP4 family. The hybrid signal values of 6 P450 sequences (NYDS3, NYDS5, NYDR6, NYDR9, NYDR15 and NYDR17) were 3.1~9.7 times higher in the resistance probe than in the susceptible probe, and NYDR17 only reacted with the resistance probe. The result of reverse Northern in NYDR15 was similar to that of cDNA chip. [Conclusion] CYP4 is related to deltamethrin resistance and the specific expression caused by point mutation of cytochrome P450 gene may exist in deltamethrin-resistant *Cx. pipiens pallens*.

Key Words: *Cx. pipiens pallens*, insecticide resistance, cytochrome P450, gene cloning, cDNA chip, reverse Northern

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牛皮蝇幼虫所致蝇蛆病一例

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患儿男性, 11 岁。1999 年 11 月 26 日患儿家长从患者背部感染化脓处挤出一条长约 2 cm 乳白色虫体。12 月 1 日从背部另一感染化脓处又挤出一条乳白色虫体后到我院就诊。检查所见: 虫体长约 1.7 cm, 已有些干瘪, 经浸泡处理后虫体伸展, 在生物显微镜下观察形态结构, 可见虫体分节, 具头部、胸部、腹部, 第 7 腹节背面无刺, 气门后面向中心凹入呈漏斗状, 气门裂较窄, 气门板颜色较浅。经鉴定该虫体为牛皮蝇二龄幼虫, 诊断为牛皮蝇幼虫所致皮肤蝇蛆病。3 wk 后患儿来我院复诊, 背部感染已消失。

该患儿自幼生活居住在牧区, 父母均为牧民, 课余时间经常帮助父母管理牲畜, 野外活动很多。该地区是牛皮蝇和纹皮蝇的流行区, 常年在草原上放牧的牧民和在野外玩耍的儿童感染机会较多。根据牛皮蝇的生活史特点, 牛是正常寄生宿主, 人是非正常寄生宿主, 人多在夏秋季偶然感染后, 幼虫在患者体内寄生并移行造成损害。在流行区应广泛进行健康教育, 注意防护, 避免感染致病。

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