

Insecticide Susceptibility in the Oriental House Fly (Musca domestica vicina) in Thailand

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OBJECTIVE: The oriental house fly (Musca domestica vicina) is common throughout Thailand. Efforts to control this and other insect pests in Thailand by the widespread use of a variety of insecticides has led to the development of tolerance to these chemicals in several species. The object of this study is to determine the susceptibility level of the oriental house fly to various insecticides that are at present or may be in the future used in Thailand for its control.

DESCRIPTION: Adult oriental house fly specimens are collected in the field, taken to SMRL and colonized. Reared adult females are tested three to seven days after emergence in the F₁ generation by methods outlined in Memorandum Number 3 (Methods for Determining the Susceptibility or Resistance of Insects to Insecticides) of the U.S. Armed Forces Pest Control Board.

PROGRESS: The level of insecticide resistance in the oriental house fly has been determined for DDT, malathion and lindane in Bangkok, Cholburi, Nakhon Ratchasima, Trat, Samut Songkhram and Nakhon Sawan (Tables 1&2). The lethal concentration (LC) and lethal time (LT) values of the above strains are compared to that of a susceptible (USDA, Gainesville). A ratio of three or greater indicates a significant level of resistance. Significant resistance has been found to lindane in all areas tested, to DDT in Nakhon Ratchasima and Trat, and to malathion in Nakhon Ratchasima. Borderline levels of resistance were found to DDT in Cholburi and Samut Songkhram.

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Table 1. Susceptibility Level (LC-50 and LC-90) of six strains of the oriental house fly from Thailand compared with a susceptible strain of the house fly (15 min. exposure)

Strain	Insecticide	LC-50*		LC-90*	
		% Concentration	Ratio to Regular	% Concentration	Ratio to Regular
Susceptible	DDT	0.054	—	0.19	—
Bangkok	"	0.13	2.4	0.47	2.5
Cholburi	"	0.17	3.1	0.35	1.8
Nakhon					
Ratchasima	"	0.47	8.7	1.1	5.8
Trat	"	0.44	8.1	> 2.5	> 13.1
Samut					
Songkhram	"	0.17	3.1	0.32	1.7
Nakhon					
Sawan	"	0.14	2.6	0.28	1.5
Susceptible	Lindane	0.0059	—	0.024	—
Bangkok	"	0.07	11.9	> 1.0	> 41.6
Cholburi	"	0.0061	1.0	0.135	5.6
Nakhon					
Ratchasima	"	0.09	15.3	> 1.0	> 41.6
Trat	"	> 1.0	> 169.6	> 1.0	> 41.6
Samut					
Songkhram	"	0.015	2.5	> 1.0	> 41.6
Nakhon					
Sawan	"	0.7	118.6	> 1.0	> 41.6

LC-50 & LC-90: concentrations of insecticides required to kill 50% and 90%, respectively, of the exposed population in a specified period of time.

Table 2. Susceptibility Level (LT-50 and LT-90) of six strains of the oriental house fly from Thailand compared with a susceptible strain of the house fly.

Strain	Insecticide	LT-50*		LT-90*	
		Number of minutes for knockdown	Ratio to regular	Number of minutes for knockdown	Ratio to regular
Susceptible	malathion 27 mg/m ²	31	—	42	—
Bangkok	"	15	0.5	21	0.5
Cholburi	"	21	0.7	27	0.6
Nakhon Ratchasima	"	22	0.7	> 300	8.1
Trat	"	17.5	0.6	22	0.5
Samut Songkhram	"	20	0.6	32	0.8
Nakhon Sawan	"	22.5	0.7	29	0.7

LT-50 & LT-90: length time required to kill 50% and 90%, respectively, of the exposed population at specified concentrations of insecticides.