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SUSCEPTIBILITY STATUS OF *PHLEBOTOMUS PAPATASI* TO DDT IN ARSANJAN COUNTRY IN FARS PROVINCE, IRAN

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Key words: *Insecticide, susceptibility, Phlebotomus papatasi, cutaneous Leishmaniasis*

Abstract

Susceptibility status of *Ph.papatasi* to DDT 4% has been evaluated in Arsanjan country, the new focus of cutaneous Leishmaniasis, in Fars province in 1999. Sandflies were collected from human habitations. Tests revealed that this species was sensitive to DDT. Results from data analysis showed that LT50 and LT90 can be measured as 30 (fiducial limit; 23, 36) and 55 minutes (fiducial limit: 44, 84), respectively. The mortality rate at the diagnostic dose of DDT with an exposure time of one hour followed by 24 hour recovery period exhibited 97 ± 2% mortality.

Introduction

Phlebotomus papatasi is considered as the main zoonotic cutaneous Leishmaniasis (ZCL) vector in the world. This species has been reported as a proven vector of ZCL in USSR, Iran (5), Tunesia, Moraco and Egypt (2).

In Iran, it has been found as a proven vector of Leishmaniasis in endemic foci of the disease including Isfahan, Khuzestan Provinces (6). *Ph. papatasi* is predomestic species and nearly susceptible to all currently-used insecticides in public health programms.

Resistance of *Ph.papatasi* against DDT has been recognized from Bihar, India (3) in 1979 for the first, and then by WHO from Turkey (8). Recent studies in Rajistan, India, indicated the resistance of *Ph.papatasi* to DDT, Dieldrin and Propoxur (1,4). There are some reports of tolerance to DDT (7).

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It is quite clear that susceptibility evaluation of the *Ph.papatasi* is much important for control programming and this study has been planned for this purpose.

Materials and methods

The studies were conducted under field condition in desert districts of Khobris village, Arsanjan country (Map 1), Fars province in the summer of 1999. The temperature ranged between 26 and 28°C and relative humidity between 60 and 65 percent. Freshly fed females sand-flies were collected from human habitations using aspirator tube. The collected sand-flies were kept in cages for 2-3 hours, the damaged sand-flies were removed and only live sandflies were tested.

The tests were conducted following WHO recommended method. Batches of 20 females were exposed to DDT 4% at different interval times of 7.5, 15,30, 45, 60 and 120 minutes. For each exposure time 3 replicates were used. The mortality were counted following 24 hours recovery period. The values were subjected to the Probit analysis and different parameters of regression lines were calculated.

Results and Discussion

Attentive to Table 1, the mortality rates of *Ph.papatasi* against DDT 4% at exposure times of 7.5, 15,30,45-60 and 120 minutes by 24 hours recovery were found 1.7, 8.3, 41.7, 81.7, 96.7 and 100%, respectively.

Regression line of the tests showed that, LT50 and LT90 of exposed population of sand-flies were 30 (fiducial limit, 23,26) and 55 minutes (fiducial limit, 44.84), respectively, with lineslope 4.8 $\pm$ 0.46 (Table 2).

The mortality rate of control tubes were 3.3%. The results of the study revealed that *Ph.papatasi* is susceptible to DDT 4% in this focus but as mentioned before reports about the resistance of this species against DDT as well as dieldrin and propoxur (3,6), the periodic monitoring of insecticides susceptibility of *Ph.papatasi* is warranted. This would not only help in determining, the development of resistance due to cross resistance to agricultural pesticides, but also in ascertaining the insecticide of choice as and when an outbreak or epidemic of cutaneous Leishmaniasis occurs.

Table 1- Results of suscpetibility status of *Ph.papatasi* to DDT 4% at different intervals in Arsanjan, Fars province, Iran, 1999

Temperature	Humidity	Exposure time (min)	No. tested	Mortality (%)	LT50 (min)	LT90 (min)
27 ± 1 °C	65 ± 5%	control	60	3.3	29.7	54.9
		7.5	60	1.7		
		15.0	60	8.3		
		30.0	60	41.7		
		45.0	60	81.7		
		60.0	60	96.7		
		120.0	60	100		

Table 2- Probit regression line parameters of *Phleboltomus papatasi* exposed to DDT 4% at different intervals in Arsanjan , Fars province, 1999

A	Slope ± SE	LT50, 95% FL	LT90,95% FL	X2 (df)	P
7.024	4.8 ± 0.46	23.05	43.6	9.3(4)	< 0.05
		29.57	54.9		
		36.22	84.2		

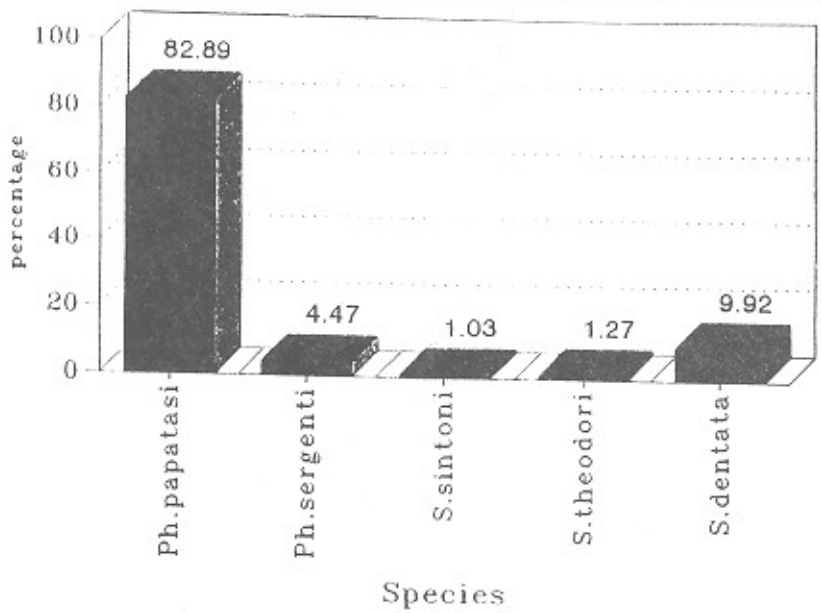

Fig. 1- Fauna and density of sandflies collected indoor in Arsanjan, Fars province, Iran, 1999

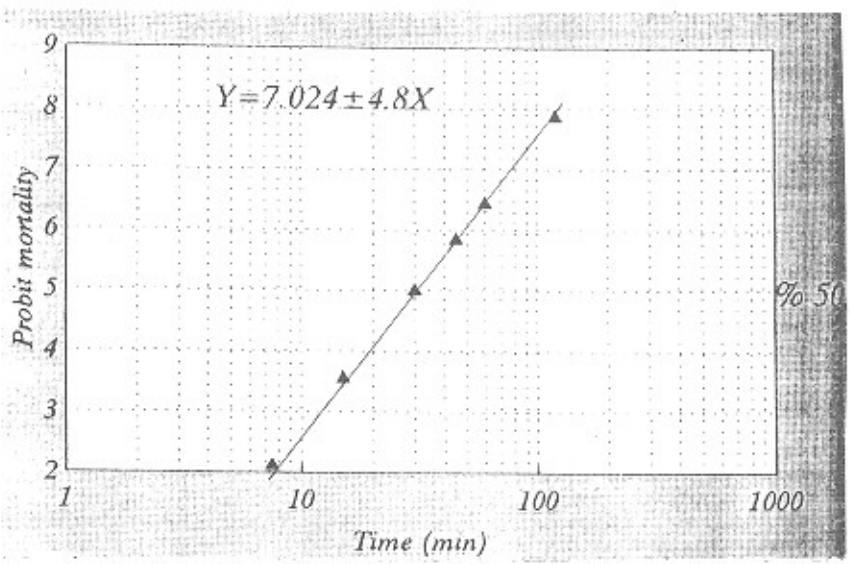

Fig. 2- Probit regression line of *Phlebotomus papatasi* exposed to DDT 4% In Arsanjan, Fars province, 1999

Map 1- Study area located in Arsanjan country, Fars province, Iran

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