VI. SUMMARY

The present work aims to study some factors governing the vectorial potentiality of Culex pipiens in human filaria transmission. The vector used in this study was collected from a filarious endemic area (El-Kashish village, Qalyubiya Governorate). The present study revealed the following:

A. Selection of susceptible and refractory strains:

High susceptibility and refractoriness were achieved in the selection of Culex pipiens to filarial parasite (Wuchereria bancrofti). The first trial of selection was controlled by brother-sister mating which led to the appearance of lethal genes and termination of the selected groups at the 9 th generation. Accordingly, a cousin-cousin mating method of selection was used in the second trial to avoid accumulation of the deleterious genes. The selection of susceptible and refractory groups in the 2 nd trial was started only with one female mother to minimize the genetic variations and to achieve quick almost homozygous susceptible and refractory strains. According to the same reason, one male was mated with twelve virgin females.

The extrinsic incubation period for development of filarial parasite resulted from our experiments was

found to be 12 days post-infection at 27 ± 2° C.

The deleterious genes were accumulated as a result of repeated full sib-mating in the first trial of selection. Accumulation of these genes resulted in high pupal mortality and a limited number of survived adults. Viability, fecundity and longevity of these adults were substantially reduced. In addition, it was observed that some of the emerged adults had deformations which cause their death after few days of emergence. All these effects, led to the loss of the selected susceptible and refractory groups. It is clear that the survival rates in the refractory group were less than that in the susceptible one.

B. Experimental human filaria transmission by Cx. pipiens using capillary feeding technique:

The capillary feeding technique used by Aitken (1977) for demonstrating virus transmission was modified and used for studing the transmission of filarial parasite by Culex pipiens. By using this technique, the infective females could be separated into two groups; Transmitters and non-transmitters. The capillary feeding technique, provides an easy rapid method to assess parasite transmission by infected mosquitoes under laboratory conditions. Also, by using this technique, the ability of transmitter females to eject L_3 larvae can be determined. Transmission

experiments carried out by this technique showed that the period of transmission of infective stage larvae (L_3) by Cx. pipiens in the two trials of selection is 13 days post-infection.

By using the capillary feeding technique, it was indicated that a high number of the non-transmitter females harboured L_3 larvae in their proboscis. This demonstrates that not all mosquitoes harbouring L_3 larvae are able to eject them during feeding i.e.: not every infective female is capable of ejecting L_3 during feeding and hence, is not able to infect man under experimental conditions. In the transmitter females of Cx. pipiens, it was indicated that the number of ejected larvae are more or less lower than the non-ejected ones.

C. Mode of inheritance of susceptibility and refractoriness of Cx. pipiens to W. bancrofti:

According to the achieved results it may be concluded that, inheritance of susceptibility of Cx. pipiens to W. bancrofti is controlled by a sex-linked incompletely dominant gene.

D. Evaluation of the influence of different media on the ejection of infective larvae (L_3);

The most preferred medium which could stimulate the ejection of infective larvae from the mosquito vectors

was found to be the sweat followed by a mixture of sweat and blood. The thrid medium was a mixture of sugar solution and blood followed by blood then sugar solution and lastely water. In air medium, a fluid free from any L_3 larvae was ejected.

E. Biochemical differentiation between susceptible and refractory groups of Cx. pipiens to W. bancrofti parasite:

1. Characterization of enzymes:

No consistent differences between the two strains have been detected by the study of α-Glycerophosphate dehydrogenase, Esterase, Malate dehydrogenase and Malic enzymes.

Experiments on Aldehyde oxidase enzyme, it was found that the bands of susceptible specimens resulted by starch gel electrophoresis were concentrated while in refractory ones, some bands were absent and the others were very faint. This observation may indicate a higher Aldehyde oxidase activity in the susceptible strain.

2. Characterization of protein subunits:

There are several specific proteins for the susceptible group, others for the refractory one and some proteins are common in the two groups. In each group, there is a specific protein repeated in all generations. The molec-

ular weight of this protein in the susceptible group is 110,000 dalton while in the refractory group, it is 120,000 dalton. These specific proteins may be responsible for susceptibility and refractoriness of Cx. pipiens to W. bancrofti parasite.