

# Filariasis Survey at the Youth Training Centre in Dusun Tua, Selangor, Peninsular Malaysia

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## INTRODUCTION

FILARIASIS is mainly a rural health problem in Malaysia. This disease due to *Brugia malayi* and *Wuchereria bancrofti* is endemic in the country. *B. malayi* is the predominant species that exists in both the periodic and subperiodic forms of which the latter is incriminated as a zoonotic agent. Endemic areas of *B. malayi* are found mainly in coastal fresh water open swampy areas and in riverine regions near swamp forests. *W. bancrofti* is seen mostly among the indigenous people and other inhabitants of remote rural areas.

Malaysia is in the process of tremendous land development schemes and youth training programmes. Up to the end of 1971, the Federal Land Development Authority had resettled 22,634 families in land schemes covering 460,000 acres. Another 250,000 acres would have been developed under the Second Malaysia Plan, 1971-1975 (*Malaysia Year Book*, 1973/74). Youth training programmes have been instituted to equip youths with technical, agricultural, and leadership skills. These two programmes have resulted in massive internal migrations and population movements in the country. As the majority of these migrants are recruited from the rural areas where filariasis may be endemic, there is the potential risk of spreading the disease among participants and also into the population around such areas. Because of this concern, a youth training centre in Dusun Tua, in an outlying district in Selangor State was surveyed for filariasis. The objective was to assess whether there was any filariasis infection among the trainees and also to determine whether mosquito vectors were present

to pose a potential threat of spreading the infection to other recruits within the Centre and also into the surrounding areas. The mukim (sub-district) of Ulu Langat, where Dusun Tua is situated, has a known mean microfilarial rate of 4.8% (unpublished data, Institute for Medical Research). The possibility of filarial infection being transmitted from the surrounding areas into the Centre is therefore present.

## MATERIALS AND METHODS

### Dusun Tua Youth Training Centre

Surveys were carried out at the Youth Training Centre in Dusun Tua during the period of 1973-1974. The Centre is situated in a typical rural area along the Sungei Langat valley about 16 miles south of Kuala Lumpur, in Dusun Tua, Ulu Langat District of Selangor State (Figure 1). The Centre covers an area of 64 acres bounded on the west and south by the river and to the east and north by swamps and agricultural land. The Centre was established in 1966 and conducts residential course for periods ranging from 6 months to 2 years for youths, aged 15-29 years.

The Centre has its own medical unit with a sick bay of 35 beds. Medical and health problems are looked after by a full-time medical officer and other ancillary staff. Recruits are from all over Malaysia and to date 13,000 trainees have passed through the centre.

### Surveys

All newly admitted recruits to the Centre in 1973-74 were screened, within two weeks of arrival

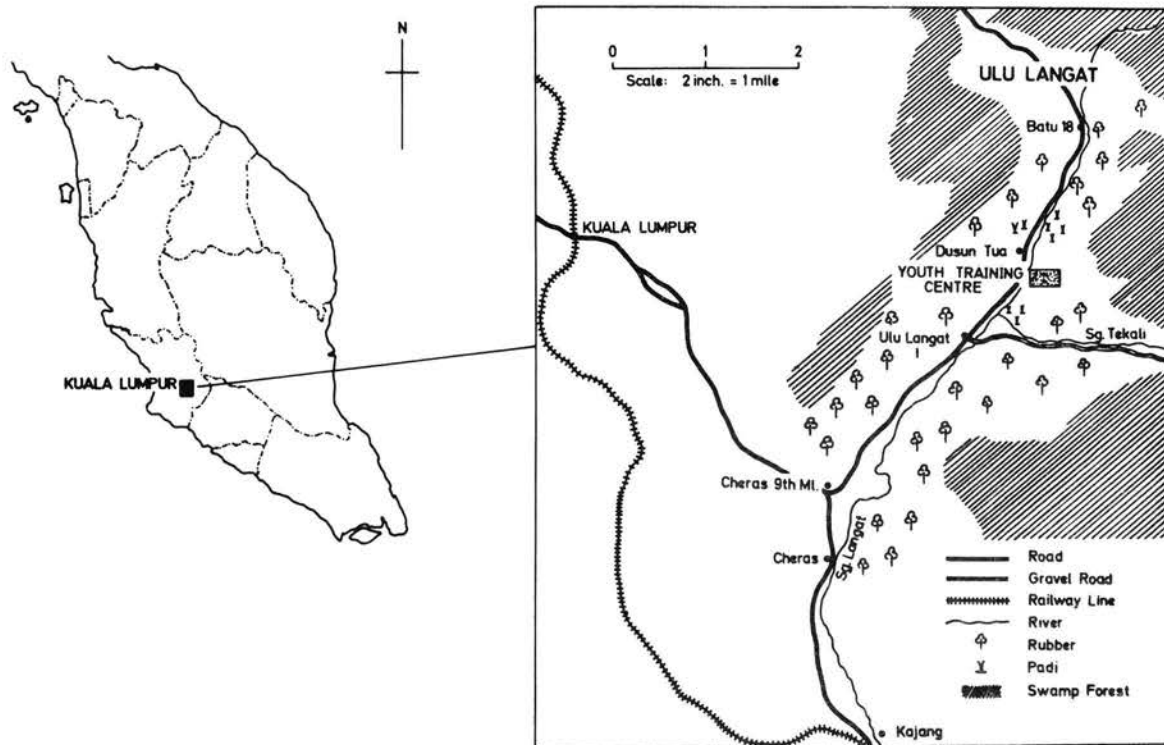


Figure 1

Map of Peninsular Malaysia showing location of filariasis survey at Dusun Tua.

for microfilaremia using a 60-mm<sup>3</sup> thick blood smear from finger pricks. All surveys were carried out at night after 2000 hours. Blood films were dried overnight and stained with dilute Giemsa (1 ml in 100 ml of phosphate buffered water at pH 7.2 for 1 hour).

A full clinical history was taken and symptoms of filarial infections were asked for. A complete physical examination was also carried out on 1127 of the recruits screened.

Entomological studies were also performed by using bare leg catches and human bait traps. Studies were carried out over 25 nights during a period of 7 months. Mosquitoes caught were identified and dissected for evidence of filarial infections. Trappings were done within the Centre as well as in the surrounding areas. Human bait net traps were operated by two men at two sites in the camp from dusk to dawn. Mosquitoes were collected at intervals of two hours. Human bare leg catches were made at various sites inside the camp, with three men collecting from 1800-2100 hours at each site.

## RESULTS

### Blood Surveys

A total of 1733 recruits were screened. The average age of the recruits was 20.2 years with a range of 15-29 years. *B. malayi* infection was found in 63 (3.6%) of the recruits. The majority of the microfilarial carriers had low counts (Table 1) with a mean density of 41.3 microfilariae/60 mm<sup>3</sup> peripheral blood. Thirty-four out of 63 (54%) had counts below 20 microfilariae/60 mm<sup>3</sup>.

### Clinical assessment

A total of 1127 out of 1733 recruits were clinically assessed. Of these 17 out of 1079 (1.6%) without microfilariae and 1 out of 48 (2.1%) with microfilariae gave histories of intermittent fever suggestive of filariasis (Table 2). The difference between these two groups was not significant (Chi square = 0.0984; 0.8 > P > 0.7). Similarly the difference in a positive history of recurrent lymphadenitis in both groups was not significant being 3 out of 48 (6.3%) and 53 out of 1079 (4.9%) respectively (Chi square = 0.0061; 0.95 > P > 0.9).

**Table 1**

**Distribution of microfilarial densities in 63 microfilarial carriers among 1733 recruits examined from the Youth Training Centre, Dusun Tua, Selangor, Peninsular Malaysia, 1973 - 1974**

Age (years)	Microfilarial count/60 mm <sup>3</sup> blood								Total positive	No. examined	% positive
	1-19	20-39	40-59	60-79	80-99	100-119	120-139	<140			
15-	-	-	-	-	-	-	-	-	-	3	-
16-	-	-	-	-	-	-	-	-	-	19	-
17-	1	1	2	-	-	-	-	-	4	191	2.1
18-	3	3	-	-	-	1	1	1	9	386	2.3
19-	8	3	1	1	1	-	-	2	16	343	4.7
20-	7	-	-	-	1	-	-	-	8	260	3.1
21-	6	2	-	-	-	-	-	-	8	179	4.5
22-	4	-	1	1	-	-	-	1	7	142	4.9
23-	-	2	-	-	-	-	-	-	2	103	1.9
24-	2	-	-	-	-	-	-	1	3	53	5.7
25-	2	-	-	-	-	-	-	1	3	28	10.7
26-	-	-	-	1	-	-	-	-	1	16	6.3
27-	1	-	-	-	-	-	-	-	1	7	14.3
28-	-	-	-	-	-	-	-	-	-	2	-
29	-	1	-	-	-	-	-	-	1	1	100
Total:	34	12	4	3	2	1	1	6*	63	1733	3.6%

\* One each with microfilarial count/60 mm<sup>3</sup> of 174, 291, 306, 760 and two with 219 microfilariae/60 mm<sup>3</sup>.

**Table 2**

**Clinical symptoms suggestive of filariasis in 1127 trainees, in Youth Training Centre, Dusun Tua, Selangor, Peninsular Malaysia, 1973**

Microfilaric state (No. of recruits)	Intermittent fever	Recurrent lymphadenitis				Total	%
		Cervical	Axillary	Inguinal-femoral			
Negative (1079)	17	10	12	31	53	4.9	
Positive (48)	1	1	1	1	3	6.3	
Total (1127)	18	11	13	32	56	5.1	

Clinical evidence of lymphadenopathy was present in 56.3% of microfilaremic and 58.7% of amicrofilaremic recruits giving a mean of 58.6% (Table 3). For this purpose, an enlarged lymph node was one which was palpable and more than 1 cm. at its widest diameter. Again the difference seen in the two groups was not significant (Chi square = 0.2324;  $0.7 > P > 0.5$ ). Even when only enlarged inguinal-femoral lymph nodes were considered, the difference between the microfilaremic and amicrofilaremic patients was not significant (Chi square = 0.3430;  $0.7 > P > 0.5$ ).

No recruit had a history of genital symptoms nor any sign of genital involvement. Lymphoedema and overt elephantiasis was not seen in the 1127 recruits.

### Entomological Studies

A total of 1311 female adult mosquitoes consisting of 121 *Aedes* (3 spp.), 2 *Aedomyia* (1 sp.), 17 *Anopheles* (6 spp.), 972 *Culex* (11 spp.), 198 *Mansonia* (4 spp.), and 1 *Uranotenia* sp. were caught in human bait traps. Of these 197 mosquitoes were *M. bonneae*, *M. dives*, *M. uniformis* and *A. barbirostris*, that are known vectors of *B. malayi* (Wharton, 1960). Of the 196 dissected, 127 were found to be parous. Only 2 *A. maculatus* mosquitoes were caught.

Of the total of 1453 female adult mosquitoes caught by bare leg catches, 532 were known vectors (*M. annulifera*, *M. bonneae*, *M. dives*, *M. indiana* and *M. uniformis*).

Of the combined total of 2764 female adult mosquitoes caught by bare leg catches and human bait traps, 2330 were dissected and 1172 were found to be parous.

Only 3 *C. gelidus* were found to be infected, one with infective larvae of *Setaria* sp., and 2 with other nematodes.

### DISCUSSION

The survey among the recruits confirmed the presence of microfilarial carriers in the youth training scheme. 3.6% (63 out of 1733) of the trainees had *B. malayi* microfilaremia, more than half of them having low microfilarial densities (below 20 microfilariae/60 mm<sup>3</sup> peripheral blood).

Clinical history did not show any difference between the recruits with and without microfilaremia. The proportion of those two groups giving a history of intermittent fever suggestive of filariasis was equal. Similarly histories of recurrent lymphadenitis occurred with equal frequencies in both groups.

The proportion of those having lymphadenopathy was similar in both the groups with and without microfilaremia. Edeson (1955) reported a significantly higher number of children in the age group 0-5 years in endemic areas with enlarged axillary lymph glands than those in non-endemic areas. As the presence of enlarged axillary glands was also frequent in filariasis free areas, he considered the enlargement of the lymphatic glands as valueless for the clinical diagnosis of filariasis. Among young children in Malaya, Turner (1959) found less than half of all the microfilarial carriers had palpable nodes and only 51% of all filarial patients with and without microfilaremia had enlarged nodes. He concluded that although simple enlargement of lymph nodes occurred in patients with *B. malayi* infection, it was not a consistent sign of early

Table 3  
Types of lymphadenopathy in 660 among 1127 trainees examined in Youth Training Centre, Dusun Tua, Selangor, Peninsular Malaysia, 1973

Microfilaremic state (No. of recruits)	Lymphadenopathy						Total	% of Total Patients examined
	Cervical	Axillary	Inguinal-femoral	Cervical & Inguinal-femoral	Axillary & Inguinal-femoral	Cervical, Axillary & Inguinal-femoral		
Positive (48)	1	0	22	4	0	0	27	56.3
Negative (1079)	34	2	437	143	6	11	633	58.7
Total (1127)	35	2	459	147	6	11	660	58.6

infection. He further stated that the clinical characteristics of the nodes were not peculiar and other causes of simple enlargement of node could not readily be excluded.

Dondero *et al.* (1971) found 85% (11 out of 13) of the microfilaremic patients, 86% (25 out of 29) elephantiasis patients and 75% (6 out of 8) patients with lymphangitis with either or both inguinal and femoral lymphadenopathy compared to 25% (2 out of 8), of the group without the disease. In a later study, Dondero and Menon (1973) found 84% (45 out of 56) males with clinical filariasis or microfilaremia to have enlarged inguinal femoral lymph nodes compared to only 41% (46 out of 112) of those without microfilaremia or apparent disease. In our present study, 56.3% of the recruits with microfilaremia and 58.7% without microfilaremia had lymphadenopathy using the same criterion of enlarged nodes as that of Dondero *et al.* (1971). The difference between the two groups was not significant. No clinical evidence of genital involvement was seen in any of the 1127 recruits examined.

*Mansonia bonnea*, *M. dives*, *M. uniformis*, *M. indiana*, *M. annulifera* and *A. barbirostris*, known vectors of *B. malayi*, were caught in and around the Centre. *A. maculatus*, a known vector of the rural strain of *W. bancrofti*, was also caught there. Vector mosquitoes accounted for 36.6% (532 out of 1453) of those caught by bare leg catches and 15.0% (197 out of 1311) caught in human bait traps. None of the 2330 dissected mosquitoes was found to be infected with human filarial larvae although a *Culex gelidus* was found with an animal filarial parasite, *Setaria* sp.

The parasitological and entomological surveys have therefore shown that microfilarial carriers as well as known mosquito vectors are present in the Dusun Tua Youth Training Centre. Although the sub-district of Ulu Langat is known to have a mean microfilarial rate of 4.8%, the nearby villages adjacent to the Centre have not been surveyed. Even though most of the 63 microfilarial carriers had low microfilaremia with a mean density of 41.3 microfilariae/60 mm<sup>3</sup> but with the presence of known mosquito vectors there transmission in and around the camp is a possibility. However, no mosquito hitherto was found to be infected with human filarial parasites. It would be recommended therefore that routine examination of all recruits at entry should include a blood examination for microfilariae. Treatment of microfilarial carriers is necessary and perhaps it may

be wiser to institute mass chemotherapy with diethyl-carbamazine for all future new recruits.

## SUMMARY

Mass population movements of people from endemic areas of filariasis involved in land development schemes will pose a potential risk of spreading the disease where vector mosquitoes are present. A survey on recruits, from endemic areas for residential training for periods of 6 months to 2 years at a youth training centre in Dusun Tua, Ulu Langat District, Selangor State, was conducted to determine whether this problem was present. It was found that 3.6% of the recruits had *B. malayi* microfilaremia and known vector mosquitoes were present in and around the Centre. Although no mosquito was found to be infected with human filarial parasites, there is a potential risk of spreading the infection in the locality concerned. It is therefore recommended that all new recruits should be examined for microfilaremia and treatment given to positive carriers. Perhaps mass chemotherapy with diethyl-carbamazine should also be given to these recruits.

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