

# A RE-SURVEY OF THE PREVALENCE OF MALAYAN FILARIASIS IN SOUTH-WEST SABAH, MALAYSIA

Jeffrey L. K. Hii

Medical Entomologist,  
Vector Control Unit,  
Department of Medical Services,  
Kota Kinabalu,  
Sabah, Malaysia

## INTRODUCTION

IN Sabah endemic Malayan filariasis is closely associated with fresh and brackish-water swamp areas in the southwest and northeast parts such as the swampy delta areas at the mouths of the Klias, Padas, Sugut, Labuk and Kinabatangan rivers. The primary parasite is *Brugia malayi* in its sub-periodic form while the less common *Wuchereria bancrofti* infections are found to be endemic in the hilly areas of the primary forests in the southwest, northeast and upper Kinabatangan regions, the areas of maximum rainfall in the country (Barclay, 1969).

Detailed prevalence studies on Malayan filariasis in the south-west part of Sabah (the Mempakul area of Kuala Penyu district) had previously been reported by Barclay (1965, unpub. report 1968). The total filariasis infection rate was 4.9% (microfilaria positive rate) and the microfilaria were of nocturnal subperiodicity with the peak at 2400 hours. No mosquito vectors were incriminated there and then. In 1965, twenty cases of *Brugia malayi* infections were treated with diethylcarbamazine in the Kilugus area (Barclay, unpub. report 1968).

Further information from this area was provided in July and August, 1977 when a malaria microscopist in Menumbok dispensary detected two positive microfilaria carriers (one male and one female) in daytime blood films. In order to determine the current status of filariasis in Kuala Penyu district, a parasitological survey was carried out in October, 1977 by the Vector Control team from the Department of Medical Services of Sabah. This paper reports the results of the blood surveys for filariasis.

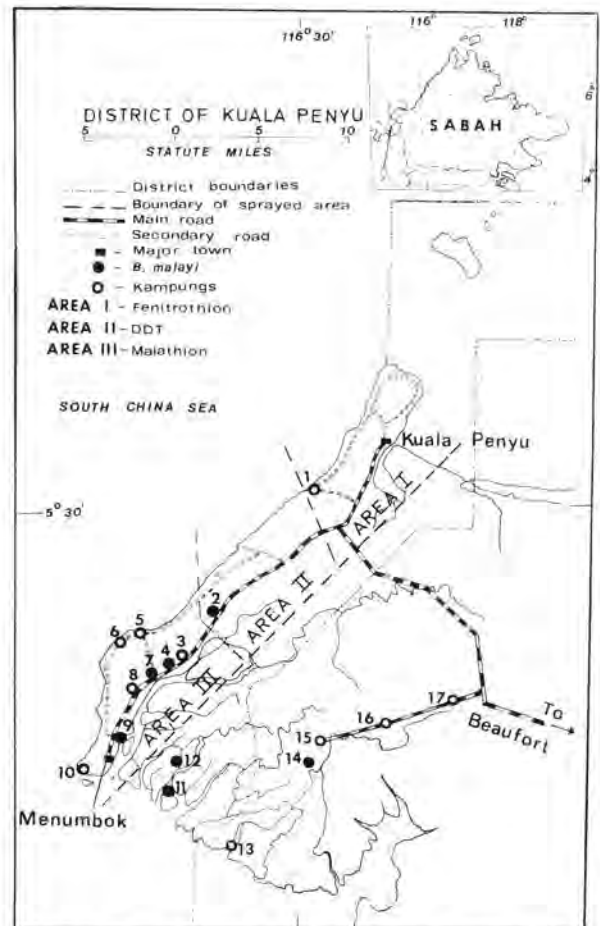


Fig. 1. Map showing Kuala Penyu district and distribution of *Brugia malayi* in surveyed areas. (Kampung Nos. 1 to 17 are referred in Table 1)

## MATERIALS AND METHODS

Fig. 1 shows the area surveyed. A brief description of this area and other relevant data have been reported by Barclay (1965). The general socio-economic status of the population who are mainly Bisaya (Malay stock) seemed to be better than in 1960-1965 due to the opening up of new land for rural and agricultural development. Communication between the main town (Menumbok) and other villages in this area is now mainly by land and river. There is now a main road connecting Menumbok to Kuala Penyu townships and vehicles can now reach the kampungs at any time of the year.

Fifteen kampungs with a total population of 4747 inhabitants were selected for the surveys. The method used was to visit the kampung and explain to the *ketua kampung* the purpose of the survey. The Information unit gave assistance by screening several documentary films during the night surveys. A census of the population was obtained from the district malaria office. 20 c.mm

finger blood samples were collected from the village people between 1900 to 2100 hours. The quantity of blood per film was not measured but it was estimated to be about 20 c.mm. The films were spread evenly onto a clean microscope slide and dried overnight. They were stained the following morning as per routine with dilute Giemsa (35 drops in 100 ml buffered water, pH 7.2) and later examined thoroughly for microfilaria with 6X oculars and 10X or 100X objective.

Two carriers who were first detected in the Menumbok dispensary were traced and additional finger blood samples were collected at 2 hour intervals for 24 hours using a modified Sinton's pipette.

### Microfilarial periodicity

In all thick blood films the microfilariae showed the irregular curves and kinking form characteristic of *Brugia malayi*. Most retained their sheaths, which stained bright pink after Giemsa staining. The results of the periodicity studies are shown in Fig. 2.

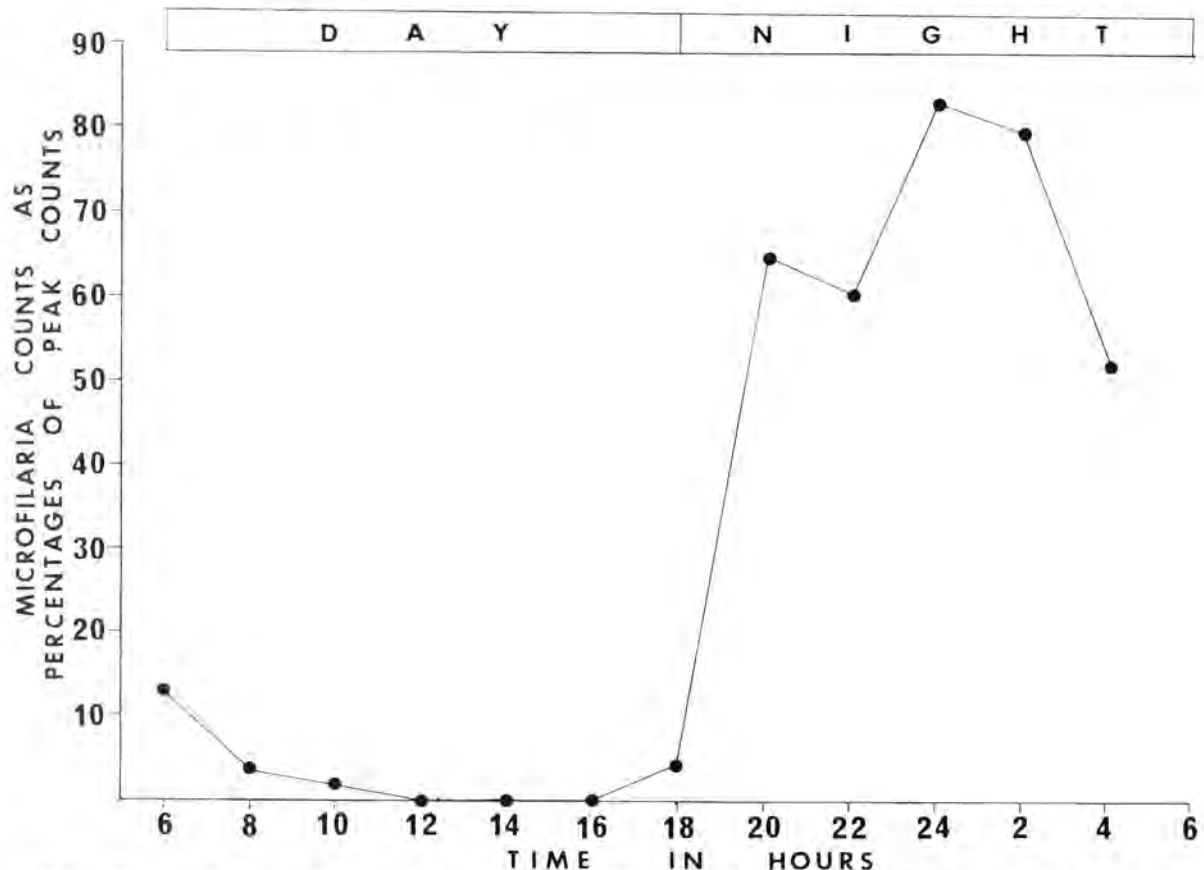


Fig. 2. Showing the periodicity of *Brugia malayi* microfilariae in Kuala Penyu district (based on 2 carriers).

### Microfilarial prevalence rate

The prevalence rate of *B. malayi* microfilaria among those examined in the 15 kampungs ranged from 1.6 to 4.9% with an infection rate of 0.84% (Table I). Table I also compares microfilaria rates with Barclay's (1965) results.

The age group and sex distribution of the positive microfilaria cases are shown in Table II.

### Microfilarial density

Among 11 microfilarial positive cases six (54.5%) had an average of 1 to 10 microfilaria per 20 c.mm. blood and more females than males were affected (Table II). The mean microfilarial density among positive carriers was 18.5 per 20 c.mm. blood.

### Disease manifestations

No elephantiasis of the limbs were seen in the present surveys. There were, however, a few

Table II

Distribution of *Brugia malayi* infections by age and sex in Kuala Penyu district

Age group (years)	Sex	Year	
		1965	1977
0-15	Male	2 (12)	4* (409)
	Female	1 (7)	3 (369)
≥ 16	Male	10	1 (255)
	Female	0	3** (272)
Total		13 (145)	11 (1305)

\* one male (13 years) from Kg. Sungai Bubos

\*\* one female (17 years) from Bandungan (both detected at Menumbok dispensary)

Table I

Distribution of microfilarial carriers by kampung in 1964 (after Barclay, 1965) and 1977 in Kuala Penyu and Beaufort districts, Sabah, Malaysia.

Serial no.	Kampung	Population		Number examined		Number with microfilaria		Microfilaremia Rate	
		1977	1964	1977	1964	1977	1964	1977	
1	Tempurung	189	-	93	-	0	-	0	
2	Kilugusan	280	198	123	4	1	2.0	1.6	
3	Jungkon	91	-	37	-	0	-	0	
4	Manggis	149	-	81	-	4	-	4.9	
5	Tg. Aru	220	-	116	-	0	-	0	
6	Sangkabok	127	-	60	-	0	-	0	
7	Malikai	299	32	113	1	2	3.1	1.8	
8	Paringan	80	-	69	-	0	-	0	
9	Barangkok	150	-	87	-	1	-	1.6	
10	Mempakul	117	-	51	-	0	-	0	
11	Sg. Bubos	-	-	-	0	1*	-	-	
12	Bandungan	-	-	-	0	1*	-	-	
13	Bongkuduan	-	-	58	-	0	-	0	
14	Bangkalalak	128	138	60	12	1	8.7	1.7	
15	Padas Darmit	141	218	72	11	0	5.1	0	
16	Gadong	138	76	188	1	0	1.3	0	
17	Limbawang	2678	-	97	-	0	-	0	
TOTAL		4747	662	1305	29	11	4.4	0.84	

\* detected by malaria PCD post at Menumbok dispensary.

anecdotal reports of the occasional individual past or present with a big leg or hydrocoele. Three cases reported intermittent fever, lymphadenitis and lymphagynitis.

### Spraying status

The Sabah Malaria Control Programme has maintained DDT spraying operations from 1959 to 1965, in 1968 and from 1969 to 1976, with two breaks in 1966-1967 and 1969-1970. In October 1976 to 1977, the Kuala Penyu district was divided into three areas and sprayed with fenitrothion, DDT and malathion (Fig. 1) as part of an insecticide trial to determine the effects of each insecticide on the interruption or reduction of malaria transmission.

### DISCUSSION

Results of this study suggest that filariasis may not be a great important public health problem in the fifteen *kampungs* surveyed. Although infections with subperiodic *B. malayi* were detected in several villages the microfilaria rate was low and clinical manifestations were rare, being limited to those cases coming to the dispensary for treatment. As few clinical examinations were performed in the survey future work should include this aspect. Several endemic foci were reported by Barclay (1965) but they did not remain as serious areas.

The findings in this survey might have indicated that without mass drug administration for filariasis treatment a marked reduction (80.5%) in microfilaria rates had taken place in the district during the 13-year period from 1964 to 1977. Treatment of cases using diethylcarbamazine in 1965 by Barclay (unpub. report, 1968) had been on parasitological and symptomatic criteria with probable re-infection on return home. It was unfortunate that there are no reliable records for population census and surveys made in 1964 so that case detection could be carried out to find the number of individuals converting from microfilaria positive to negative. However there was a marked reduction in the number of positive microfilaria carriers from 29 to 11.

The common mosquito species found in this area are *Mansonia bonnea*, *Mansonia uniformis*, *An. balabacensis*, *An. donaldi* and culicines. Future work to identify the important filarial vectors is planned by the Vector Control Unit. DDT spraying

could have resulted in a reduction of the vector population or the longevity and survival rate. Harinasuta and Sucharit (1977) assumed that the reduction in the filariasis in Chumphon Province of south Thailand was due to the interruption of transmission of filariasis cycle in the mosquitoes resulting from DDT spraying operations. Similarly Webber (1975) also found that the apparent decrease of microfilaria positives of *W. bancrofti* infections in Solomon Islands and the control of filariasis has been achieved by vector reduction through the Malaria Eradication Programme. No filariasis campaigns have had any persisting success with vector control methods alone, but concomitant reduction of filariasis in other Malaria Eradication Programmes have been observed (Iyengar *et al.*, 1959; van Dijk, 1964).

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