

# Malaria situation in a forested foot-hill area of Pegu Division

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## INTRODUCTION

Exploratory surveys were carried out by the Medical Entomology Research Division, Department of Medical Research to select suitable areas for anopheline ecology studies. During July 1987, entomological and parasitological survey was conducted at Tha-bye-wa village, Oktwin Township, Pegu Division. This village is situated 17 miles away from Oktwin on the Toungoo-Prome road. It is about 700 feet above sea level and is built in a valley among the foot-hills of Pegu Yoma at the confluence of Ka-baing and Tha-bye-chaungs. There are about 40 houses with a population of about 180 persons. Most houses have only 3 walls and is easily accessible to mosquitoes. Many perennial streams are present near the village which is surrounded by deep forest on all sides.

## MATERIALS AND METHODS

Entomological survey-  
Mosquito catches were done by the following methods:

(1) Human bait biting catches where the collector catches all mosquitoes that bite him with a WHO Sucking Tube.

(2) Big bed-net (11x11x6') catches with two adult human baits sleeping in the net.

(3) Big bed-net (11x11x6') catches with a cow as bait inside the net.

Blood examination- Thick and thin films were taken from all persons present in the village during the survey period. All blood films were stained with Giemsa and examined in the DMR laboratory.

Spleen examination and investigations- After taking blood films, history of recent illness and febrile attacks was recorded. All children between 2-9 years of age were examined for spleen enlargement according to Bruce-Chwatt (1980) (1). Occupation and travelling habits of all adults were also recorded.

## RESULTS

### Entomological results

#### (a) Fauna

Table 1: Fauna of Anophiles (Cellia) mosquitoes recorded

SPECIES	Number caught from		Man biting rate (mbz)
	Human	Cattle	
An. dirus	46	4	4.6
An. minimus	7	9	0.7
An. vagus	96	450	9.6
An. tessellatus	26	61	2.6
An. pacificus	6	4	0.6
An. rivipes	1	27	0.1
An. Jamesi	2	2	0.2
An. annularis	-	2	-
An. splendens	-	2	-

Other species of mosquitoes recorded were:

1. ANOPHELES -  
Anopheles (Anopheles) sinensis,  
Anopheles (Anopheles) umbrosus,  
Anopheles (Anopheles)  
barbirostris.
2. AEDES -  
Aedes (Scutellaris) albopictus,  
Aedes (Aedimorphus) vittatus,  
Aedes (Stegomyia) craggi
3. CULEX -  
Culex (Culex) tritaeniorhynchus,  
Culex (Culex) gelidus, Culex  
(Culex) vishnui
4. ARMIGERES -  
Armigeres (Armigeres) theobaldi,  
Armigeres (Leicesteria) flavus.
5. HEIZMANNIA -  
Heizmannia (Heizmannia) communis

Identification of the mosquito fauna was done according to the following authors: -

Harrison & Scanlon (2), Reid (3), Sirivanakarn (4), Yiau-Min-Huang (5).

#### (b) Dissection Results

An. dirus were all brought back alive to the DMR laboratory for further taxonomy, polytene and mitotic chromosome studies. Out of 16 An. minimus dissected, one caught biting man outdoors was found to have oocysts. Out of the total An. vagus, 76 caught from human baits were dissected and one was found with sporozoites in the salivary glands. Elisa identification of sporozoites was not carried out. An. tessalatus, An. jamesi and An. maculatus were found to be uninfected.

#### (c) New records of mosquitoes from Burma

(1) All the female mosquitoes identified as An. philippinensis were given blood meal and

brought back alive to the laboratory to raise iso-female lines. Using the method of Reid (1967) (3), detail morphological studies were carried out on larval & pupal skins and Fl adult males. The results indicated that these mosquitoes which were previously identified as An. philippinensis were actually Anopheles (Cellia) nivipes Theobald (1903). This is the first time that An. nivipes has been recorded from Burma. Larval & pupal skins and adult specimens are now preserved in DMR.

(2) During daytime, mosquitoes of Aedes (Stegomyia) annandalei subgroup were caught biting man in the forest. After rearing in the laboratory, detail examination of pupal skins, adult morphology and male genitalia was carried out according to Yiau-Min-Huang (1977) (5). The specimens were found to be Aedes (Stegomyia) craggi Barraud, which was also recorded for the first time from Burma. Specimens of male & female adults, pupal skins and male genitalia are preserved at DMR.

#### Blood Examination Results

Table 2. Parasitaemia rate according to age group

Age group (in years)	No. exam'd	No. positive	% positive
1	4	2	50.0
1 - 4	12	9	75.0
5 - 9	8	5	62.5
10 - 14	11	7	63.6
15 - 19	10	8	80.0
20	28	10	35.7
Total all age groups	71	41	56.2
Under 10 years	24	16	66.7

out of 41 malaria parasite positive blood films, 36 was identified to be P. falciparum and 5 films was found to have mixed infection with P.falciparum & P.vivax. Five P.falciparum gametocytes carriers were also detected.

Spleen rate determined in 2-9 years age group according to Bruce-Chwatt (1980) (1) was observed to be 88.2% (15/17). Out of 15 children with splenomegaly, the parasite rate was 73.3% (11/15) and fever rate was 60% (9/15). The average enlarged spleen (AES) according to Hackett's method as quoted by Bruce Chwatt (1980)(1) was calculated to be 1.4.

The high man vector contact rate of a very efficient malaria vector, An.dirus, the high parasitaemia & spleen rates and high infant parasite rate indicated that this is a highly endemic area. With the end of the rainy season, An.minimus and An.maculatus, generally associated with slow-running clear streams will increase as many perennial streams were observed in the area. The ecology of the area, with its dense teak forests & banana plantations and with high relative humidity, is ideal for vector survival throughout the year. Hence, it can be assumed that malaria transmission will occur throughout the year. Presumably, the local residents are taking some antimalarial drugs because we detected 15 blood films with drug-treated parasites which were not included in calculating the positive rate.

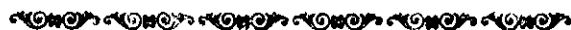
There is no health service personnel in the village. The nearest health centre is at

Pauk-taw about 11 miles away and there is no regular transportation. For such areas, Community Health Workers (CHW) should be made available. Anti-malarial drugs should be made available to the community through the village elders or anyone in the village who is trusted by the villagers. Easy availability of drugs will prevent mortality and keep morbidity low.

Prevention of man-vector contact by use of bednets, mosquito coils and use of cattle as zooprophylaxis should be some control methods for demonstration.

#### REFERENCE

1. Bruce-Chwatt, J.L.: Essential Malariology, William Heinemann Medical Books Ltd., London 1980.
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(a) One author: Khin-Maung-U. In vitro determination of intestinal amino acid (14-C-L-Glycine) absorption during cholera. American Journal of Gastroenterology 1986;81(7):536-538.

(b) More than 6 authors: Pe-Than-Myint, Mg-Mg-Lay, Aung-Shwe-Saw et al. A comparative study of Artemether (Qinghaosu derivative) and standard anti-malarial drugs in the treatment of falciparum malaria in Burma. Burma Medical Journal 1985; 31(1): 36-43.

(c) Book: Thein-Hlaing. Acaris lumbricoides infections in Burma. In: Ascariasis and its Public Health Importance. Crompton, DWT, et al (Eds) Taylor and Francis, London, 83-112.

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