OPERATIONAL AND SCIENTIFIC NOTES

A RECORD OF BITING CYCLES OF THE POSSIBLE VECTORS OF "TIMOR FILARIA" ON TIMOR ISLAND, INDONESIA [1]

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Little is known of the bionomics of the vectors of "Timor filaria" and even malaria on Timor Island, Indonesia, although information about mosquitoes has been reported from other parts of Indonesia (Bonne-Wepster and Swellengrebel 1953; Colless 1957; Lie et al. 1960; Raghaven 1961). When the present authors carried out a microfilaria survey on the residents in a village which is an endemic area for filariasis and malaria (Kanda et al. 1975), some biting collections of the possible vectors of the filariae were at the same time obtained. The present paper reports the results of these collections.

METHODS. The mosquito collections were made using human bait and cattle bait at Tepas, an endemic area of "Timor filaria" on Timor Island, Indonesia on Jannuary 23 and 25, 1975. Each man was used as bait twice at different houses in the village. The rooms used for human bait collections were roughly 3 x 4 x 2.5 (height) m. Roofs and walls of the rooms consisted of palm leaves; therefore mosquitoes as well as other small animals could enter without any difficulty. From 6:00 p.m. to 5:00 a.m. all mosquitoes which were biting or attempting to bite the men lying on the floor were collected and grouped by the hour. Large numbers of 3 species were collected on the night of January 23 (Table 1). After identification individuals belonging to these species were dissected as quickly as possible to ascertain their physiological ages and infection, if any, with filarial larvae. The estimates of the physiological ages were made by checking the development of ovarioles and also the state of development of the filariae if any were present. On the other hand with cattle bait a mosquito net trap (4.5 x 4.5 x 1.5 m.) was set up between 6:00 p.m. and 4:00 a.m. The mosquitoes which entered the opening of the net to bite an animal within the trap were collected the next morning and examined for infection with filarial larvae after identification.

RESULTS. Seven species of mosquitoes were collected by the human bait method; the most numerous were the *Anopheles barbirostris* species group, the *Culex vishnui* subgroup and *Culex quinquefasciatus* Say (= *fatigans* Wiedemann). The results are summarized in Table 1 which shows that the biting activity of these 3 species started around 7:00 p.m. and continued until 4:00 a.m., with a peak between 10:00 p.m. and 2:00 a.m. In the dissections of the mosquitoes collected and identified, 2 individuals of the 3rd ovarial stage, 7 of the 2nd ovarial stage, and 24 parous individuals were observed among 42 of the *An. barbirostris* species group dissected. Of the 55 *C. vishnui* subgroup females dissected, 16 parous individuals, not in the 3rd ovarial stage, were found. Of the 68 *C. quinquefasciatus* females dissected 21 parous individuals, not in the 3rd ovarial stage, were found.

On the other hand, 9 species of mosquitoes were collected by the net with cattle bait, and the total was 343; only one of the *An. barbirostris*

Table 1. The results of overnight mosquito collection on human bait in Tepas, Timor Is., Indonesia, on January 23 and 25, 1975.

Hour	P.M. 6 – 7	7 – 8	8 – 9	9 – 10	10 – 11	midnight – 12	12 – 1	A.M. 1 – 2	2 – 3	3 – 4	4 – 5	Total
An. barbirostris species group	1	7	9	14	8	12	16	21	6	2		96
C. vishnui subgroup	8	15	22	10	17	19	14	7	4			116
C. quinquefasciatus	7	15	13	17	10	7	9	3	3	2		86
An. aconitus	2	3		1				1				7
C. bitaeniorhynchus	2	1				2						5
Ae. hepti			1	1								2
Ae. aegypti			1									1
Total	20	41	46	43	35	40	39	32	13	4		313

Number = Total number of mosquitoes collected from two men by hour.

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species group was found to be infected with filarial larvae. One was in the 3rd stage with a body length of 1,615 microns, and 2 were in the 2nd stage on the 7th day after collection.

DISCUSSION. The village was not only an endemic of "Timor filaria" but also malaria (Carney et al. in press), and the *An. barbirostris* species group is one of the important vectors of human filariae and malaria in Indonesia (Lie et al. 1960; Raghavan 1961). The identifications of the species of the mosquitoes collected followed the key of Soemalan and Oerip (1970) and Reid (1968) for *Anopheles;* and Bram (1967), Sirivanakarn (1975) and Lien et al. (1975) for *Culex* and *Aedes.* The biting activity of the 3 species of mosquitoes mentioned above fitted the nocturnal periodic type of "Timor filaria" reported by David and Edeson (1965). High parous rates of these 3 species suggest that they survived for a relatively long period. However, the 3rd stage filarial larva was found only in a mosquito of the *An. barbirostris* species group. This larva would be considered to belong to the genus *Brugia,* from its morphological characters—lacking of any papillae or processes at the tail or frontal part and also its body length. Although exact identification of this species could not be undertaken, the larva may be considered to be not one of another animal host such as *Setaria* spp. *An. barbirostris* species group could be one of possible vectors of "Timor filaria."

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