

THE BITING ACTIVITY OF ANOPHELES DTHALI IN A RURAL
AREA UNDER IMPACT OF ORGANO-PHOSPHOROUS SPRAYING
MAMASANI, SOUTHERN IRAN, 1978 *

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ABSTRACT

Anopheles dthali Patton which is one of the 7 malaria vectors in Iran, was not taken into consideration until November 1965 when definite sporozoites were found for the first time in its salivary glands in Bandar Abbas, south of Iran. Afterwards, efforts have been made to get complete ecological and epidemiological information on this species.

The areas of study were two districts of Mamasani County, an agricultural area, located 200 km north of the Persian Gulf. The objective of the present paper is to summarize and discuss briefly the field investigations concerning the nocturnal biting cycle and behaviour of An dthali as well as the comparative attractiveness of man and cattle to this vector under the impact of the organo-phosphorous insecticides. On the basis of the data collected, it was found that most of the bites take place between 21.00-24.00 hr. Biting pattern under local condition indicated that the number of bites per cow was much greater than the number of bites per man.

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INTRODUCTION

Anopheles dthali Patton has long been suspected as a vector of malaria in Arabia (6). It is a widely distributed species in the semi-arid regions from the Atlantic coast of north Africa to Baluchistan and north-west Pakistan. It has been shown to be a secondary vector of malaria in northern Somalia(2) and in southern Iran (3).

This mosquito is the 2nd commonest anopheline in some parts of the south of Iran. It is found in houses, but is considered to rest outdoors most of the time. Inside the houses, it likes to rest on spider webs and hanging clothes. It is photosensitive and is often captured in flight. Outdoors, it has been found resting in natural shelters such as stony or earthly cracks along the riverbeds, rodent holes, etc.

The technical difficulties encountered in the malaria eradication activities the area were the resistance of An.stephensi, the main vector of malaria in southern Iran to DDT, dieldrin and malathion; the exophilic and exophagic habits of An.dthali and An.fluviatilis; and living habits of the inhabitants (1,5). During the transmission season, inhabitants rest and sleep outdoors because of the very high temperature, inside houses. Females of An.dthali feed readily on man and animals. Experiments performed on biting cycle of An.dthali at Khesht, Kazeroun County, southern Iran, indicated that this species is active from April to early November(4).

Two villages of Gaw-shakhi and Bakesh - dodangueh in Mamasani area, southern Iran, were chosen as study areas. They were alternatively under DDT and malathion spraying in March, May, August and September. Malathion house spraying, 50% w.d.p., 2 g/m², has been implemented in south Iran, 1-2 rounds per year, since 1968. These areas are located on the southern slopes of the Zagros Mountains and have a sub-tropical climate. The winter is moderate and the temperature rarely drops below zero. The relative humidity is usually about 30-50%.

MATERIALS AND METHODS

Collections of An.dthali were carried out at 10 day intervals on human and cow baits, from June to November 1978. The catches on human and animal baits were carried out outdoors from 18.00 to 05.00 A.M. hours.

Four local people were hired as baits in each district. The men were stretched as baits with rolled up sleeves and exposed face and feet. Direct biting captures started at 18.00 and lasted until 05.00 hours, for the months of June till November. According to our usual practice, two teams of two field technicians each were on duty for 2 hours shifts through the night. The concurrent assessment of animal bait was conducted by two other technicians collecting from the two cows in 2hr. shifts. Collection sites on man and animal were separate from each other with a distance of 150 m.

Collections were made by aspirating mosquitoes as they landed on man or cow. Each hour's catch was placed in a separate paper cup and all specimens were taken each morning to the laboratory, where they were identified and counted. The average number of biting mosquitoes collected from human and/or animal bait, was considered as number of bites per man or animal, per night.

RESULTS AND DISCUSSION

The observed incidence of outdoor biting by An.dthali on man and animal is shown by months and hours in Figures 1-2. Results of biting activity of An.dthali, is the sum of 18 outdoor catches, in two districts of Mamasani County during June-November (Table 1).

Attention has been drawn to the definite peaks of nocturnal activities of this species. In Mamasani area, the seasonal biting activity of this species begins in the middle of May or beginning of June. and reaches its peak in August and September. During the 6 months observations, the number of bites per bait per night ranged from 0 to 2.2 on man and from 0 to 47.5 on cow. (Fig. 1)

Table 1. Result of outdoor collections of An.dthalt on human and animal baits in Mamasani county, southern Iran, June-November, 1978

		Number of mosquitoes collected per hour											
		18-19	19-20	20-21	21-22	22-23	23-24	24-01	01-02	02-03	03-04	04-05	Total
*	0		0	8	15	6	16	7	7	0	0	0	59
**	4		92	147	204	192	157	99	72	32	2	0	1001

* Samples collected on 8 human baits of 18 outdoor catches, 10 day intervals each

** Samples collected on 4 cows baits of 18 outdoors catches, 10 day intervals each

It has been found that An.dthali is active between 20.00 and 03.00 hours on man with its peak activity between 21.00 hours. On cow, it was found to be active between 18.00-04.00 hours, and the peak of activity was observed between 21.00-24.00 hours. Considering the 4 quarters of the night, the 1st and 3rd quarters seem to have nearly equal activity. The lowest biting activity was observed during the 4th part of night. The highest biting activity was recorded during the 2nd quarter of the night.(Fig.2).

On the basis of the data collected in this study the nocturnal biting cycle of An.dthali and the comparative attractiveness of man and cattle is approximately the same as previously observed (4) in Khesht, Kazeroun area, in 1970. Thus it seems that the frequent application of organophosphorous insecticides has not changed the feeding behavior of An.dthali, at least during the past decade.

FIG.1
SEASONAL VARIATION OF MAN AND ANIMAL BITING DENSITY IN
ANOPHELES DTHALI, MAMASANI, SOUTHERN IRAN, 1978

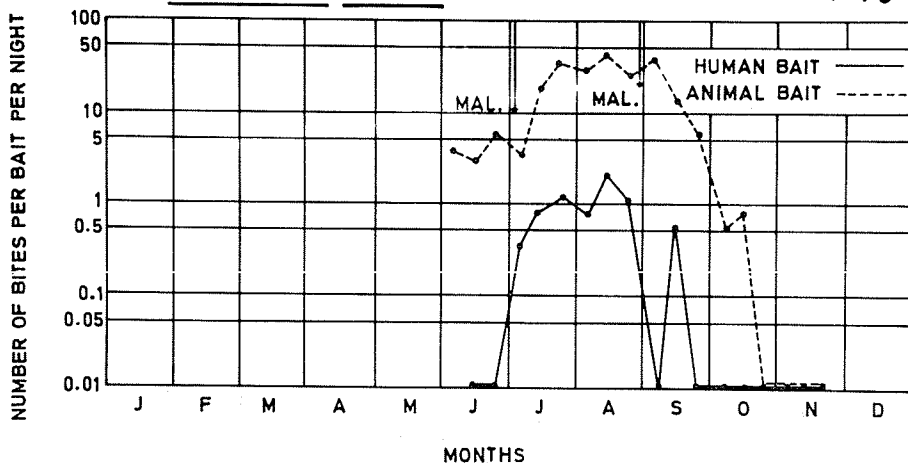
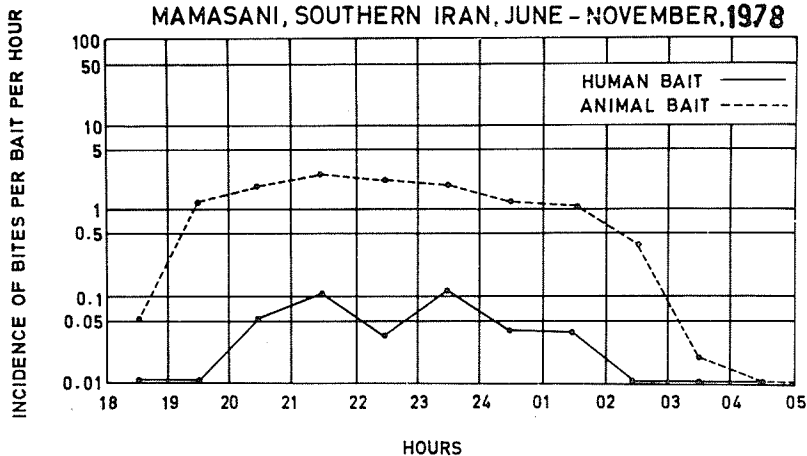


FIG. 2
 OUTDOOR MAN AND ANIMAL BITING INCIDENCE OF ANOPHELES DTHALI
 MAMASANI, SOUTHERN IRAN, JUNE - NOVEMBER, 1978



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