

## THE BITING ACTIVITY OF *ANOPHELES STEPHENSI* IN TWO IRANIAN VILLAGES SPRAYED WITH ORGANOPHOSPHOROUS INSECTICIDES<sup>1</sup>

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**ABSTRACT.** The areas of study were two districts of Mamasani County, an agricultural area, located 200 km north of the Persian Gulf. The build-up of *An. stephensi* populations is incredibly rapid in July-August and decreases in November. The peaks of the populations are in July, August and early September.

### INTRODUCTION

Human and animal bait catches are made for a variety of reasons, including the assessment of the effectiveness of control operations, the monitoring of temporal changes in relative population size and the estimating of biting rate (Service 1976). The man-biting rate is defined as the index of actual incidence of contact between man and mosquito (Garrett-Jones 1964, WHO, unpublished).

*Anopheles stephensi* has long been recognized as one of the most important vectors of human malaria in south Iran. It is endophilic, endophagic and rests indoors, but it is collected outdoors also.

The nocturnal biting cycle and behavior of *An. stephensi* and the comparative attractiveness of man and cattle under the impact of the organophosphorous insecticides was studied. A field trial of sumithion (OMS-43) was implemented, and comparisons were made with malathion house spraying in the Mamasani area, southern Iran, in 1974. (Eshghy et al. 1975). The technical difficulties encountered in the area were the resistance of *An. stephensi* to DDT and dieldrin,

Catches on human and animal bait were carried out from 18.00–05.00 hr outdoors. On the basis of the data collected, it was found that biting was maximal from 20.00–24.00 hr. The average catch per bait/hr on man was lower than on cattle outdoors.

the exophilic and exophagic habits of *An. dthali*, *An. fluviatilis* and *An. superpictus* and the ecology of the inhabitants.

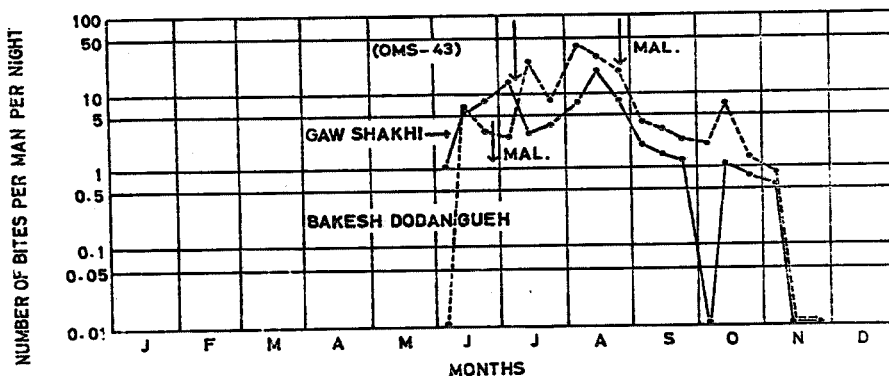
The study area is located on the southern slopes of the Zagros mountains and has a sub-tropical climate. The summer is long and hot with maximum temperatures over 40°C. The winter is moderate and the temperature rarely drops below zero. The relative humidity is usually about 30–50%. Malaria transmission usually occurs from May to November with a peak from August to mid October. The main larval breeding places are rice fields, canals and river banks.

### MATERIALS AND METHODS

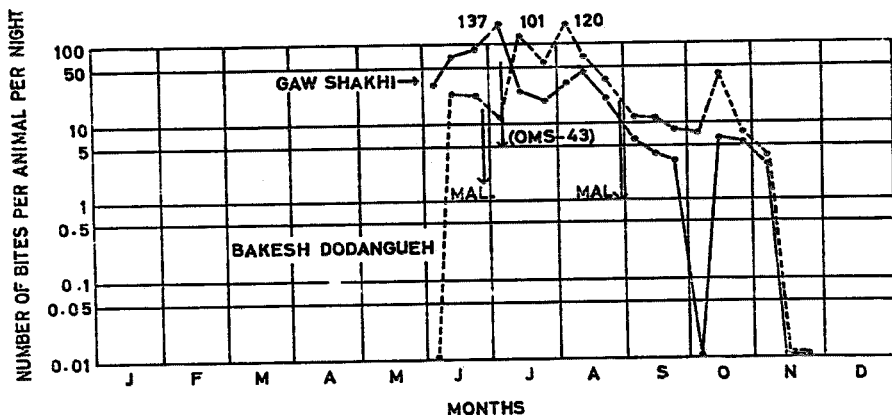
Night biting collections on human and animal bait were made at 10-day intervals in 2 villages in Mamasani County; Gaw Shakhi had been treated with sumithion and Bakesh Dodangueh with malathion. Four local people with rolled sleeves and exposed faces and feet served as bait. Two catchers were on duty for 2 to 3 hr at a time throughout the night. The team on the first shift served on the last shift. The average number of biting mosquitoes collected from the 4 persons was considered as the number of bites per person per night. Collection from a cow proceeded all night with collectors on 2-hr shifts. Most

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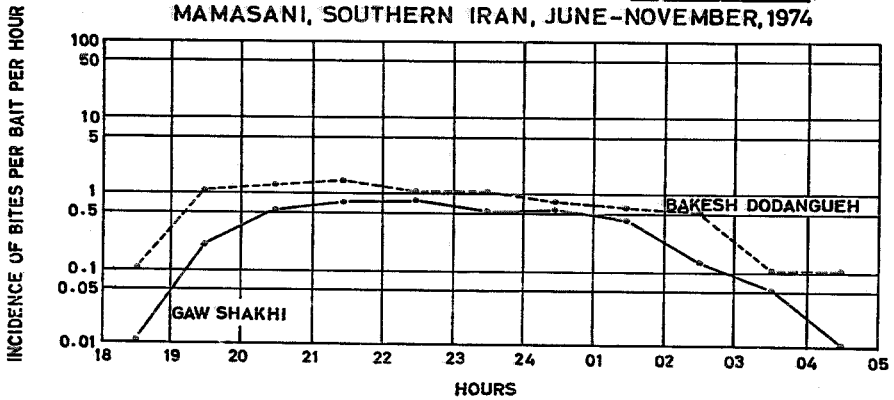
**FIG.1**  
**SEASONAL VARIATION OF MAN-BITING DENSITY IN**  
**A. STEPHENSI, MAMASANI, SOUTHERN IRAN, 1974**



**FIG.2**  
**SEASONAL VARIATION OF ANIMAL-BITING DENSITY IN**  
**A. STEPHENSI, MAMASANI, SOUTHERN IRAN, 1974**



**FIG.3**  
**OUTDOOR MAN-BITING INCIDENCE OF *A. STEPHENSI*,**  
**MAMASANI, SOUTHERN IRAN, JUNE-NOVEMBER, 1974**



collections were made outdoors because during the transmission season indoor temperatures are very high and most inhabitants rest and sleep outdoors.

Collections were made by aspirating

mosquitoes as they attempted to bite man or cow. Catches were conducted in the evening, usually from 19.00 hr to 05.00 hr the following morning. Each hour's catch was placed in a separate paper cup and all

**FIG.4**  
**OUTDOOR ANIMAL-BITING INCIDENCE OF *A. STEPHENSI*,**  
**MAMASANI, SOUTHERN IRAN, JUNE-NOVEMBER, 1974**

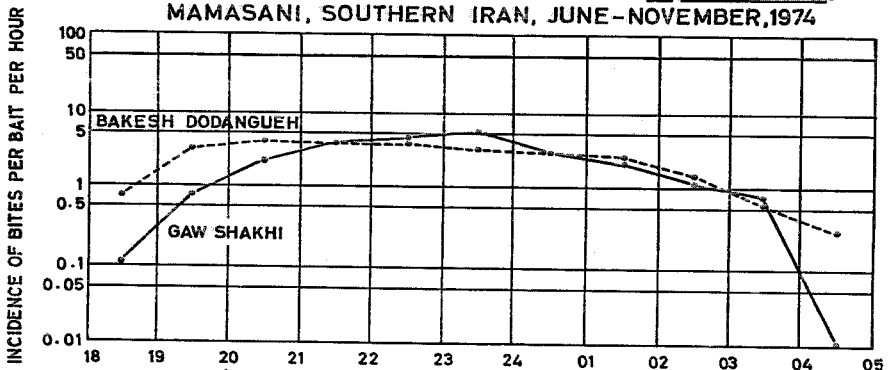


Table 1. Hourly activity of *Anopheles stephensi*, Mamasani, Southern Iran, 1974

Date	Locality	Number of mosquitoes collected per hour												Total
		18-19	19-20	20-21	21-22	22-23	23-24	24-1	1-2	2-3	3-4	4-5		
June- November	Gaw-Shakhi*	1	16	38	63	66	37	44	34	13	4	0	316	
June- November	Bakesh-Dodangueh**	8	79	95	103	79	79	63	54	37	9	9	615	
June- November	Gaw-Shakhi**	5	33	85	160	178	191	128	102	43	26	0	951	
June- November	Bakesh-Dodangueh**	28	122	168	155	162	120	128	106	66	24	11	1090	

\* Samples collected on 4 human baits of 18 outdoor catches.

\*\* Samples collected on 2 cows baits of 18 outdoor catches.

specimens were taken each morning to the laboratory, where they were identified and counted.

## RESULTS AND DISCUSSION

In all, biting density is the sum of 18 outdoor catches, June-November, in each village. Night biting collections of *An. stephensi* during the pre-spray period ranged from 1 to 14.7 per night bait on man and 30 to 137.5 on animals on the OMS-43 area and from 0 to 5.7 per night bait on man and 0 to 21 on animals in the malathion area.

During the 5 months after OMS-43 spray application, the number per bait per night ranged from 0 to 19.2 on man and 0 to 46.5 on animals. In the malathion treated area, it was from 2.5 to 44.5 on man and from 13.5 to 120 on animals during the first round. The seasonal biting activity of *An. stephensi* in this area started in late May with a peak in July-August and continued to the end of November, (Figs. 1-2).

Results of the biting cycle of *An. stephensi*, June-November, are illustrated in Table 1 and Figs. 3-4. The biting activity reached its peak between 21.00-24.00 hours and then gradually decreased until 05.00 hours. After 05.00 hours biting became very rare.

For simplification biting activity may be considered for 4 quarters of the night. The highest biting density was recorded during the 2nd quarter of the night. Considering the 4 quarters of the night, the lowest biting activity was observed during the 4th, and the 1st and 3rd quarters, with nearly equal proportions.

## References

- Eshghy, N., Motobar, M. and Janbakhsh, B. 1975. Field trials of sumthion (OMS-43) and malathion residual sprays for control of *Anopheles stephensi mysorensis* in the Mamasani area, southern Iran, 1974. Mosquito News 35:372-380.
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