Rec. zool. Surv. India, **81** : (3 & 4) 9-12, 1984

PHLEBOTOMUS ARGENTIPES ANNANDALE AND BRUNETTI (DIPTERA) CAUGHT ON MAN BAITS AT NIGHT IN A CLEAN BIOTOPE

By

A. K. HATI[1], A. PALIT[2], S. CHAKRABORTY[3], S. BHATTACHARYA[4], K. K. GHOSH[5] AND S. DAS[6]

(With 2 Tables)

INTRODUCTION

A longitudinal study on nocturnal man/*Phlebotomus argentipes* contact in a village in West Bengal has been documented (Hati et al, 1981) in and outside a cowshed where these sandflies usually breed. Do they come to suck human blood in a clean biotope situated near the cowsheds ? To find out the answer the present study was designed.

MATERIALS AND METHODS

An isolated but well-ventilated brick built room 10m×5m×8m with cemented floor and plastered walls inside and outside, having no cracks and crevices, situated about 12m away from the three cowsheds at a locality in a village named Nudipur, about 80 km from Calcutta, was selected for indoor capture. It had one door (3m×1m) and two windows (10m×0.75m each), situated 1m–1.5m above the ground level. The alighting flies were caught off human baits indoors and outdoors from November 1980 to October 1981, following the method of Hati *et al* (loc. cit.), the only deviation was that the catch was performed four times a month including fullmoons and newmoons. Per manhour collection of *P. argentipes* in three cowsheds, conducted twice in a month in morning hours varied from 5.5 to 10.5. No sandfly was, however, obtained from the brick built room during the morning catches.

Address :

1, 2, 3, 4, Department of Medical Entomology, Calcutta School of Tropical Medicine

5, 6, Department of Zoology
MUC Women's College
Burdwan

Results and Discussion

All the sandflies caught off human baits were identified as *P. argentipes*. Even from such a clean biotope altogether 153 *P. argentipes* were caught off human baits (Table 1) out of which thirty were females (13 from indoor baits and 17 from outdoor baits) and 123 were males (56 from indoors baits and 67 from outdoors baits). This phenomenon of attraction of a significantly greater number of males to human baits both indoors and outdoors, observed earlier (Hati *et al.*, loc. cit.) still remains unexplained though Smith (1959) reports that *P. argentipes* males have been sometimes known even to suck blood from open wounds.

TABLE 1. Mean number of *P. argentipes* per man per night in and around a clean biotope

Month	Indoor	Outdoor	Maximum temperature (0°C)	Minimum temperature (0°C)	Relative humidity (%)
November' 80	0.25	——	29.5	18.8	91.2
December	——	0.25	27.2	12.6	93.7
January' 81	0.50	——	25.4	11.4	86.7
February	0.25	——	28.6	14.2	89.8
March	0.25	0.75	31.7	16.7	89.7
April	0.50	0.75	35.4	20.3	91.6
May	——	0.25	28.8	22.4	82.1
June	——	0.75	32.0	31.0	84.4
July	0.25	1.50	31.2	28.6	91.6
August	0.75	——	30.4	29.4	88.2
September	0.50	——	29.7	29.2	89.1
October	——	——	32.9	24.1	93.0
Yearly mean	0.27	0.35			

There is no significant difference between indoor and outdoor catches in both the sexes (Tables 2). This finding varies significantly from the earlier observation of Hati *et al* (loc. cit.) which may be explained by the fact that in such a different biotope *P. argentipes* have dispersed from their original breeding places to the surrounding area in search of food and/or shelter and during this dispersion they may equally come in contact with indoor or outdoor baits. The nearest cowshed being about 12m from the baits, *P. argentipes* have travelled at least 12m in their search to suck human blood. During their search of food and/or shelter *P. argentipes* may enter not only the huts but also the brick built plastered rooms, where there is no facility for breeding.

TABLE 2. Total number of *P. argentipes* caught off human baits each hour of the night in and around a clean biotope (48 night observations in one year)

Hours	Indoor			Outdoor			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
18hoo—19hoo	5	1	6	5	1	6	10	2	12
19hoo—20hoo	2	0	2	2	1	3	4	1	5
20hoo—21hoo	1	1	2	2	0	2	3	1	4
21hoo—22hoo	7	3	10	7	1	8	14	4	18
22hoo—23hoo	7	1	8	8	1	9	15	2	17
23hoo—24hoo	11	1	12	12	0	12	23	1	24
24hoo—01hoo	14	1	15	13	7	20	27	8	35
01hoo—02hoo	7	2	9	3	4	7	10	6	16
02hoo—03hoo	1	2	3	14	2	16	15	4	19
03hoo—04hoo	1	1	2	1	0	1	2	1	3
04hoo—05hoo	—	—	—	—	—	—	—	—	—
05hoo—06hoo	—	—	—	—	—	—	—	—	—
Total	56	13	69	67	17	84	123	30	153

The dispersion of *P. argentipes* continued from 18hoo to 04hoo hours.

The maximum number of *P. argentipes* (both male and female) were caught off human baits between 24hoo and 01hoo hours.

The maximum number of males disperse in the second and third quadrants of night (42.27% in each quadrant). The rate of dispersion in female is significantly high in the third quadrant of night (60%).

The overall vector/man contact expressed as numbers of landing per man hour per night was 0.27 indoors and 0.35 outdoors (Table 1). The maximum vector/man contact was outdoors in July (1.5). The overall vector/man contact indoors and outdoors is not significantly different, which finding again differs from the earlier observation of Hati *et al* (loc. cit.), possibly owing to the unique location of the present clean biotope situated some distance away from the breeding site of the vector, indicating that man may contact the disease both indoors and outdoors.

Seventy-five per cent of sandflies were caught off the lower extremities of the human baits. No statistically significant difference in the numbers of sandflies being attracted to human baits during the different moon phases of the night was observed. These findings however tally with the earlier results of Hati *et al* (loc. cit.). This finding points out

that nocturnal *P. argentipes*/man contact is variable according to difference in biotopes and *P. argentipes* may invade even a clean room situated near their breeding places.

Summary

P. argentipes during dispersion from their breeding places invaded a clean brick-built room and its surrounding area. Thirty female *P. argentipes* were caught off human baits in weekly all-night captures conducted indoors and outdoors of that well-ventilated room that had cemented floor and smooth plastered walls and was situated, about 12 m away from cowsheds, in a village in West Bengal. The overall mean number of vectors per man per night captured indoors (0.27) and outdoors (0.35) showed no significant difference, though the man landing rate was highest in July at outdoors (1.5), indicating the possibility of a man's contacting the disease even out of doors.

Acknowledgements

The authors are grateful to Dr. B. K. Tikader, Director, Zoological Survey of India for the publication facilities and to the Director, Calcutta School of Tropical Medicine, for permission to publish this paper. The authors also thank Mr. S. Sur and Mr. N. De, Senior Technicians, Department of Medical Entomology, Calcutta School of Tropical Medicine for technical assistance.

References

Hati, A. K., Ghosh, K. K., Das, S., De, N. and Sur, S. (1981). A longitudinal study on *Phlebotomus argentipes*/man contact in a village in West Bengal, *WHO/VBC/81-801*, 1-4.

Smith, R. O. A. (1959). Bionomics of *Phlebotomus argentipes*. *Bull. Calcutta Sch. Trop. Med.* **1**, 17-21.