A SURVEY OF MOSQUITOES IN KARACHI AREA, PAKISTAN

Pages with reference to book, From 182 To 188

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Abstract

A survey was conducted to determine the number and the species of mosquitoes which transmit diseases in Karachi with special reference to possible vector of Japanese encephalitis virus-Culex tritaeniorhynchus. This species has been found throughout Karachi. Four other species mosquitoes were also identified. With detection of 5 serological probable cases of JE in the larger study, the next question of an animal reservoir has arisen. (JPMA 36: 182, 1986).

INTRODUCTION

Fauna of mosquitoes in Pakistan was first published by Aslam Khan[1]. He listed 92 species, but only a few from Karachi area. The first mosquito species recorded from Karachi city was Aedes aegypti by Barraud[2]. Later Anopheles stephensi[3,4] Culex tritaeniorhynchus[5] and An. subpictus[6]. were detected in this city.

In 1983 the field study team of encephalitis in Karachi area sponsored by the Japanese Ministry of Education and Science surveyed the area widely and found five common species of mosquitoes. This report is the result of the survey.

MATERIALS AND METHODS

Studies were conducted in 22 localities evenly distributed throughout in Karachi city (Fig. 1).

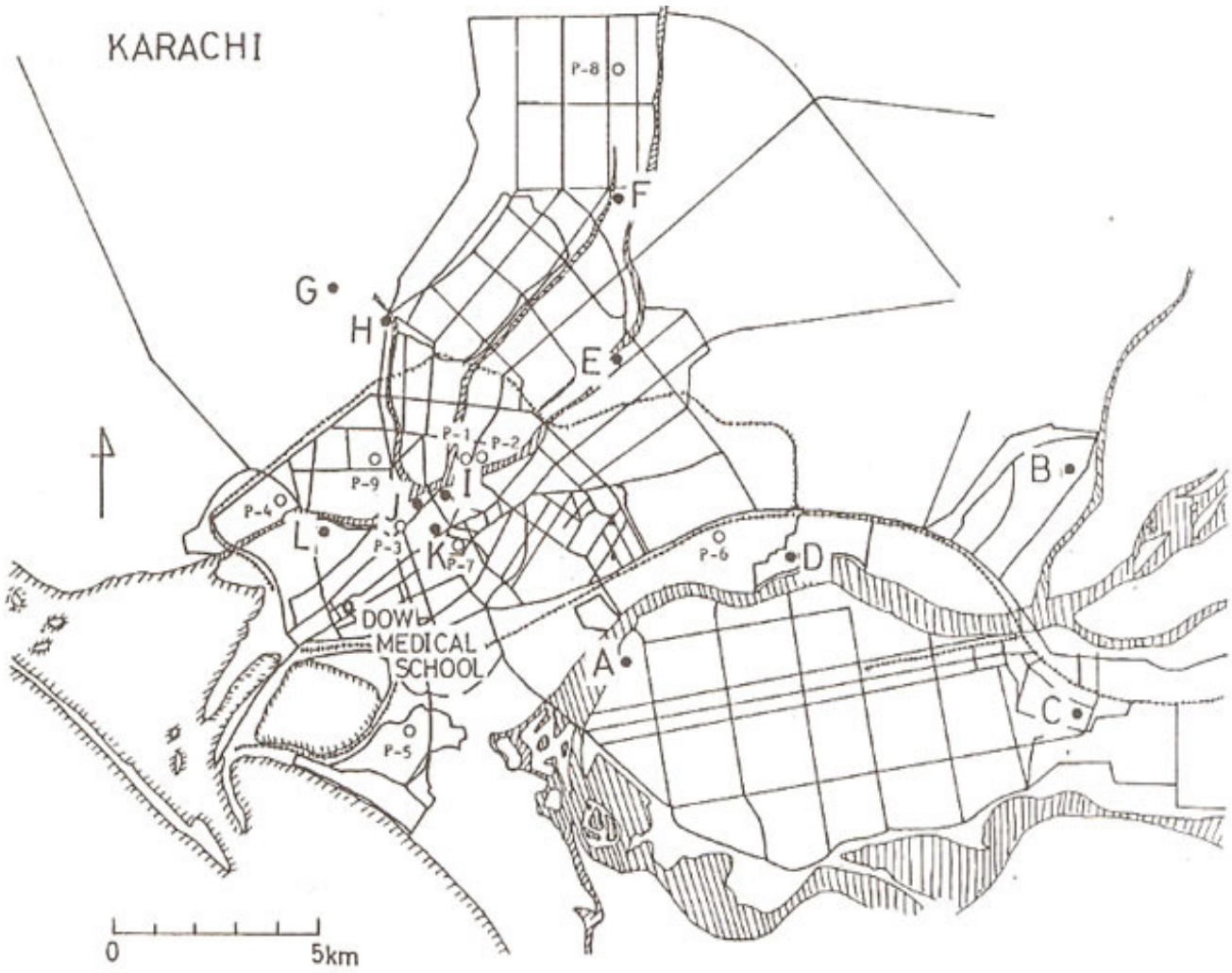

Figure 1. Collection places of Karachi city:
A: Azam town A: near Azam town B: Cattle Colony Malir C: Landhi
D: Sadat Colony E: Sweeper Colony F: Federal B area, Block 15
G:Orangitown, Block 9 H: Frontier Colony I: Golimar
J: Lasbella huts K: Dhobighat L: Shershah Colony
M : Sweeper's house, Airforce Base

Adult mosquitoes were collected mostly by spray sheet collections and sometimes hand collections from the resting sites of mosquitoes. In addition to these, mosquitoes were also collected from cattle sheds at night. For the spray sheet collection, white sheets were laid over the entire floor and beds in the room, all doors and windows were closed and pyrethrum in Kerosene was sprayed. After about 10 minutes killed adult mosquitoes were collected from the sheets. To detect larvae, dips of water were examined at each breeding place in the same localities which are mostly adjacent to tributaries of Lyari river into which sewerage is discharged.

RESULTS

By spray sheet collection in Karachi area, 12636 female and 7,952 male mosquitoes were identified.

TABLE - I

Species and Numbers of Adult Mosquitoes captured from the Bedrooms in Karachi City.

Location	Method of collection	Date of collection	Culex tritaenior-hynchus		Culex pipiens quinque-fasciatus		Anopheles subpictus		Aedes aegypti		Others	
			Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
Azam	Spray	Jul. 5	138	198	327	323	2	14	0	0	2	0
Town	Spray	Jul. 30	80	110	16	28	1	0	0	0	1	1
	Spray	Aug. 11	1613	571	656	1110	15	8	0	0	6	1
	Spray	Aug. 28	137	82	128	171	36	43	0	0	2	0
	Night	Aug. 28	192	0	14	52	16	0	0	0	0	0
	Night	Aug. 31	54	0	17	1	18	0	0	0	0	0
	Spray	Sep. 21	3	0	7	8	28	34	0	0	0	0
	Spray	Oct. 22	3	2	9	4	2	2	0	0	0	0
	Spray	Nov.19	1	0	11	6	2	5	0	0	0	0
	Spray	Dec. 26	8	3	435	214	0	0	0	0	0	0
	Spray	Jan. 24	2	2	132	111	1	0	0	0	0	0
	Spray	Mar. 14	1	1	146	124	0	0	0	0	0	0
	Spray	Total	1986	969	1867	2099	87	106	0	0	11	2
Cattle	Spray	Jul. 6	0	0	4	8	242	15	13	1	0	0
Colony	Spray	Jul. 30	0	0	33	7	227	61	2	0	0	0
Malir	Spray	Aug. 11	0	0	47	50	255	27	14	17	0	0
	Spray	Aug. 28	0	0	65	76	25	1	19	0	0	0
	Night	Aug. 31	16	0	26	11	18	0	8	14	0	0
	Spray	Sep. 16	0	0	220	252	132	15	10	1	0	0
	Spray	Sep. 21	0	0	320	173	84	8	7	2	0	0
	Spray	Oct. 22	0	0	3	4	97	43	1	2	0	0
	Spray	Nov. 19	0	0	149	167	32	12	0	0	0	0
	Spray	Dec. 26	0	0	2	11	0	0	0	0	0	0
	Spray	Jan. 24	0	0	12	19	0	0	0	0	0	0
	Spray	Mar. 14	2	0	229	79	0	0	0	0	0	0
Total	Spray		2	0	1084	846	1094	182	66	23	0	0

Table 1 (upperside) and

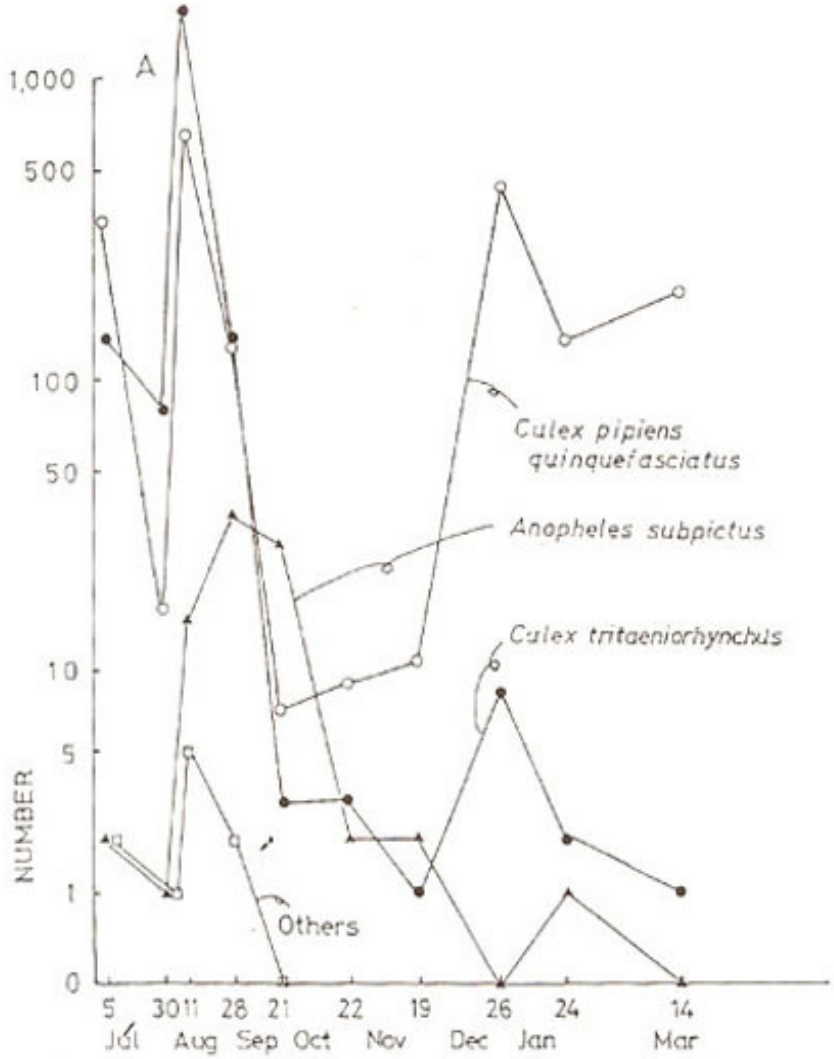

Figure 2. Seasonal dynamics of female mosquitoes by spray sheet collections at Azam Town, Karachi City.

Figure 2 indicate the number of adult mosquitoes captured at Azam town, near seaside of Karachi city. Cx tritaeniorhynchus, the principal vector of J. encephalitis and west nile (WN) virus and Cx. quinquaefasciatus were abundant in the summer season from July to August, and their common breeding places were ground pools at the riverside of tributaries of Lyari river.

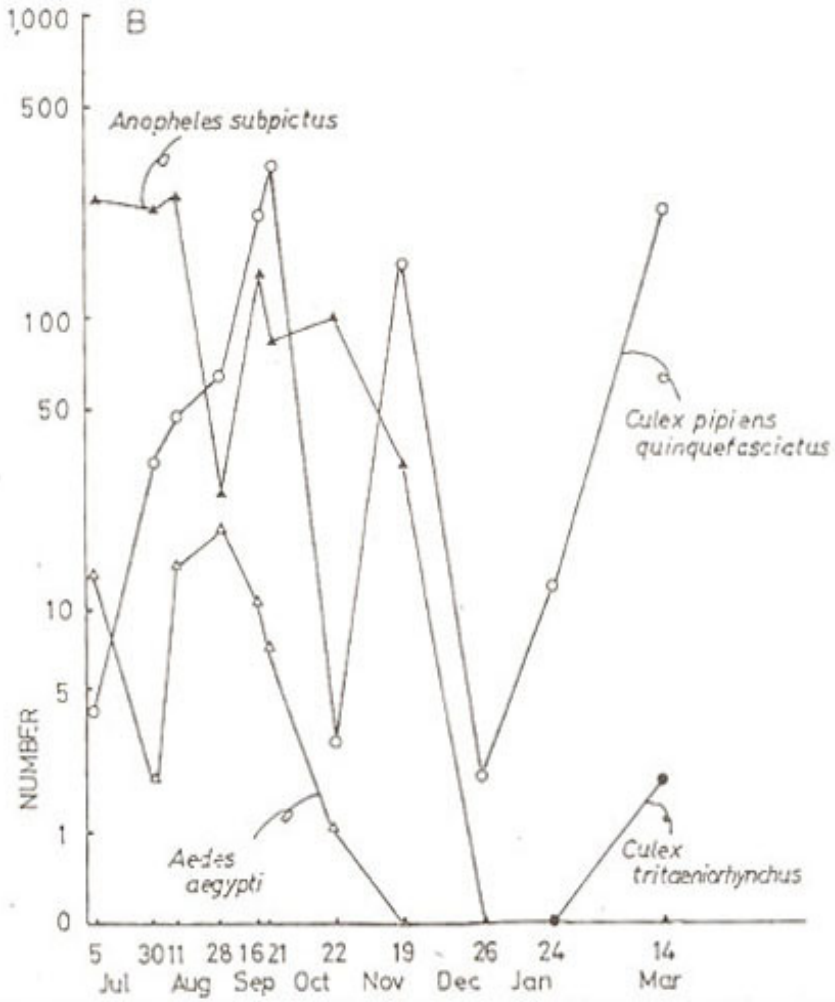

Figure 3. Seasonal dynamics of female mosquitoes by spray sheet collections at Cattle Colony Malir, Karachi City.

Table 1 underside and Figure 3 indicate the number of adult mosquitoes captured at Cattle colony Malir, Karachi. Cx. pipiens quinquaefasciatus, the principal vector of filariasis appeared in all seasons, and their common breeding places were cesspools and ditches in human habitation. An. stephensi, the principal vector of malaria, were rare. An. subpictus were abundant from July to October, and their common breeding places were ground pools, cesspools and ditches in the human habitation and along riversides.

The number of adult mosquitoes captured at the other localities in Karachi city. Ae. aegypti, the principal vector of dengue, was abundant in the sunijner season from July to September at the midtown area and their common breeding places were water tanks. Cx. tritaeniorhynchus was rare (Table II).

TABLE - II

Species and Number of Adult Mosquitoes captured in Karachi City (*:Anopheles stephensi).

Location	Method of collection	Date of collection	Culex tritaeniorhynchus		Culex pipiens quinquefasciatus		Anopheles subpictus		Aedes aegypti		Others	
			Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
A: near Azam Town	Night	Aug. 31	16	0	26	11	18	0	0	0	0	0
C:Landhi	Hand	Sep. 3	2	0	6	12	2	1	0	0	0	0
D: Sadat Colony	Spray	Jul. 5	0	0	1	4	6	1	0	0	0	0
E: Sweeper Colony	Spray	Jul. 4	0	0	30	7	749	125	0	0	0	0
F: Federal B area, Block 5	Spray	Jul. 4	0	0	0	0	42	0	0	0	0	0
G: Orangi Town, Block 9	Spray	Aug. 31	6	0	54	65	393	395	0	0	5*	4*
H: Frontier Colony	Spray	Aug. 31	0	0	15	13	166	192	1	0	0	0
I: Old Golimar	Spray	Aug. 30	1	2	2	4	755	431	1	1	0	0
	Hand	Aug. 30	2	0	74	1	23	0	0	0	1	0
J: Lasbella Huts	Spray	Aug. 30	0	0	3	0	1645	1243	5	0	0	0
	Hand	Aug. 30	0	0	0	0	35	17	0	0	0	0
K:Dhobighat	Spray	Jul. 7	0	0	1	2	95	76	2	0	0	0
	Spray	Aug. 29	1	0	9	11	118	28	3	0	1	0
	Night	Aug. 29	0	0	0	0	20	1	0	0	0	0
L:Shershah Colony	Spray	Jul. 7	1	1	0	0	160	77	0	0	0	0
	Spray	Aug. 29	2	0	40	26	214	66	1	1	0	0
	Hand	Aug. 29	0	0	1	0	5	0	0	0	0	0
M:Sweeper's house, Air-force Base	Hand	Sep. 20	1	0	31	13	8	0	0	0	0	0
Total	Spray		11	3	155	132	4343	2636	13	2	6	4

TABLE - III

Species and Number of Adult Mosquitoes collected from the Patient Rooms in Karachi City.

Location	Method of collection	Date of collection	Culex tritaenior-hynchus		Culex pipiens quinque-fasciatus		Anopheles subpictus		Aedes aegypti	
			Female	Male	Female	Male	Female	Male	Female	Male
P–1	Hand	Sep. 12	0	0	1	2	0	0	0	0
P–2	Spray	Sep. 12	1	0	0	0	5	5	2	1
P–3	Spray	Sep. 12	0	0	15	3	2	0	4	3
P–4	Spray	Sep. 12	0	0	29	33	0	0	0	0
P–5	Spray	Sep. 13	0	0	2	0	0	0	0	0
P–6	Spray	Sep. 13	0	0	1	0	0	0	0	0
P–7	Spray	Sep. 14	0	0	12	8	0	1	2	1
P–8	Spray	Sep. 14	0	0	34	35	10	7	0	0
P–9	Spray	Sep. 14	0	0	9	18	51	23	3	1
P–9	Hand	Sep. 14	0	0	0	0	8	0	0	0
Total	Spray	Sp. 12–14	1	0	102	97	68	36	11	6

Table III indicates the number of adult mosquitoes captured in the bedrooms of nine encephalitis patients. Number of resting mosquitoes were fewer than those on the riverside. Cx. tritaeniorhynchus (abundant in the outskirts and the riverside of Karachi area) were fewer in the houses of encephalitis patients.

TABLE - IV

Species and Number of Adult Mosquitoes collected from Hyderabad to Thatta.

Location	Method of collection	Date of collection	Culex tritaeniorhynchus		Culex pipiens quinquefasciatus		Anopheles subpictus		Anopheles stephensi		Aedes aegypti		Others	
			Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
Goth Mahd Sidiare	Hand	Sep. 5	42	10	0	0	40	16	6	2	0	0	7	0
DAD Machi Solangi	Hand	Sep. 5	3	2	0	0	3	0	4	1	0	0	3	0
Sidique	Hand	Sep. 5	8	0	0	0	2	1	0	0	0	0	3	0
Tendo Sundol	Hand	Sep. 6	2	0	7	0	5	2	0	0	0	0	0	0
Azb Solangi	Hand	Sep. 6	4	0	0	0	0	0	0	0	0	0	0	0
Babus Shah (Hyd.)	Spray	Sep. 7	0	0	9	4	1482	629	0	0	0	0	0	0
Bangali (Hydera.)	Spray	Sep. 7	0	0	5	2	9	9	0	0	0	0	0	0
Nakrani Puoa (Hyd)	Spray	Sep. 7	16	2	124	67	56	76	2	0	0	0	2	0
Cattle Colony Hyd.[1]	Hand	Sep. 8	2	0	10	16	8	1	0	0	0	0	0	0
Cattle Colong Hyd.[2]	Hand	Sep. 8	5	1	1	0	1	1	0	0	0	0	0	0
Thatta 1	Hand	Sep. 8	13	4	0	0	21	6	0	0	0	0	0	0
Thatta 2	Night	Sep.13	478	0	0	0	85	0	0	0	0	0	92	0
Chaudhary Mohd	Hand	Sep. 8	27	1	0	0	4	0	0	0	0	0	0	0
Heji Heshi Kosa	Spray	Sep. 9	1	0	5	3	3	3	1	0	0	0	0	0
Soth Skeikh Inyet[1]	Spray	Sep. 9	1	0	2	5	11	9	0	0	0	0	0	0
Soth Skeikh Inyet[2]	Hand	Sep. 9	0	0	0	0	2	1	0	0	0	0	0	0
Total	Spray	Sep. 7–9	18	2	145	81	1561	726	3	0	0	0	2	0
	Hand	Sep. 5–9	106	18	18	16	86	28	10	3	0	0	13	0

Table IV shows the number of adult mosquitoes captured at the outskirts from Thatta to Hyderabad. Cx. tritaeniorhynchus were breeding abundantly in the rice fields, swamps and ground pools.

DISCUSSION

The species and the number of mosquitoes which carry viruses were surveyed in Karachi area, Pakistan. Cules tritaeniorhynchus, which cany Japanese encephalitis virus, were distributed all over Karachi area in low density. Anopheles step. hensi, vector of malaria, were rare but An. subpictus were abundant. Cx. pipiens quinquae fasciatus, vector of fuiariasis, had appeared throughout the season and Aedes aegypti, vector of dengue appeared in the town in rainy season.

It has been debated whether Japanese encephalitis occurs west of India. In this Project studies five suspected cases of Japanese encephalitis were found (Taksau et al[7]). In Karachi area great many cattles are reared but not pigs, the known carriers of Japanese encephalitis, and also the density of Cx. tritaeniorhynchus, the principal vector of Japanese encephalitis, was low. So perhaps some of these cattles get infected with Japanese encephalitis virus and act as reservoirs. On the other hand if the vector mosquitoes of Japanese encephalitis were to appear abundantly, most of the animals would develop anti-body and the Japanese encephalitis virus would not be able to maintain itself and new infection with Japanese encephalitis would not be found. Pigs, 'amplifiers' of Japanese encephalitis virus, are not reared in Karachi area. In the outskirts from Thatta to Hyderabad, Cx. tritaeniorhynchus breed abundantly, the wide pigs for which the area is well known may provide the reservoir for the IE virus. This aspect needs to be investigated further.

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