Prevalence of Aedes aegypti at the International Port and Airport, Kolkata* (West Bengal), India

By
Bina Pani Das, S. K. Sharma and K. K. Datta
National Institute of Communicable Diseases, 22 Sham Nath Marg, Delhi - 110054, India

The International Health Regulations (1969)\(^1\) envisage that every port and its adjoining area within a perimeter of 400 metres should be kept free from immature and adult stages of Aedes aegypti, the vector of dengue haemorrhagic fever (DHF) and yellow fever. In order to ensure this, active mosquito surveillance and vector control measures within the prescribed limits are in place at the Kolkata port/airport areas. As a cross check a study was carried out by a team of experts from the National Institute of Communicable Diseases (NICD) in and around the Kolkata international port and airport, in the West Bengal state of India, during September 1997. The findings of the survey are presented in this paper.

Airport area

The Kolkata International Airport area covers about 12.5 sq kms. Daily, on an average, 75 aircrafts, both national and international, touch the airport. The Airport Health Organization (AHO) undertakes the mosquito control measures in the airport area, covering approximately 14 sq kms. These measures include the application of Baytex (fenthion) in polluted drains and spraying/fogging with natural pyrethrum extract/malathion 95% in the main terminal building and other establishments within the airport, including residential staff quarters.

Kolkata port area

The port area comprises two ports, viz. Kolkata port and Budge Budge port. The Kolkata port alone is situated on the bank of Hooghly river at a distance of about 200 km from the sea. An area of about 77 sq kms is covered by the port, including the protective zone, with a depth of 400 metres around it. The operational area of the port comprises Khidirpur (K.P.) dock, Netaji Subhas (N. S.) dock, and Rajabagan Dock. The Budge

* Formerly known as Calcutta
Budge port is situated 50 km down the river Hooghly.

Antilarval measures at the port include weekly search for detection and elimination of active breeding foci of *Aedes aegypti* and application of fenthion (Baytex) in potential non-potable breeding places. For adult mosquito control, the Kolkata Port Health Organization is undertaking pyrethrum space spray at fortnightly interval. No anti-mosquito measures are undertaken in Budge Budge port.

In the present study, the larval and adult collections were made simultaneously in each locality. Container index (per cent positivity of wet containers) has been used to determine the density of *Aedes* breeding. Samples containing larvae other than *Aedes* species were analysed to detect the co-breeding habits of commonly available species in the area.

In order to ascertain the prevalence of adult *Aedes* species (landing rates), a survey was carried out by spending 15 minutes in each dwelling/outdoor situation found positive for *Aedes* breeding and species-wise per manhour density for *Aedes* mosquitoes was recorded. Tables 1 and 2 contain data on container indices in the airport and port areas respectively.

From Table 1 it can be seen that no *Aedes* larval infestations were found at the international airport, whereas in the domestic terminal, the container index for *Aedes aegypti* ranged from 3.45 in slums to 5.26 in office complexes, including staff quarters. For *Aedes albopictus* a high index of 28.58 was recorded in the workshop area and 8.62 in other areas. The container index for *Aedes vittatus*, a feral species, ranged from 3.45 to 3.51 in peripheral areas.

<table>
<thead>
<tr>
<th>Area zone</th>
<th>No. of containers</th>
<th>No. found positive</th>
<th>%</th>
<th>No. found positive</th>
<th>%</th>
<th>No. found positive</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>20</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>B</td>
<td>21</td>
<td>4.76</td>
<td>6</td>
<td>28.58</td>
<td>2</td>
<td>3.51</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>57</td>
<td>5.26</td>
<td>5</td>
<td>8.77</td>
<td>2</td>
<td>3.51</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>58</td>
<td>3.45</td>
<td>5</td>
<td>8.62</td>
<td>2</td>
<td>3.45</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>166</td>
<td>3.61</td>
<td>16</td>
<td>9.63</td>
<td>4</td>
<td>2.40</td>
<td></td>
</tr>
</tbody>
</table>

A = International Airport and surrounding area including hangars and cargo
B = Domestic Airport Terminal including workshop, Administrative Building, cargo shed, junk yards, etc.
C = Office Complexes including Staff Quarters and Barrack buildings
D = Urban/slum areas, State Govt. office, etc. around the Airport

From Table 2 it can be seen that *Aedes aegypti* infestation was restricted to Kolkata port only. The highest index (23.08) was recorded from crowded Babu Ghat surrounding slum areas, while in the dock area the indices ranged from 5.55 to 6.32. *Aedes albopictus* in the port area was confined to dock areas with index ranging from 11.11 to 14.74, whereas *Aedes vittatus* showed low prevalence (2.78). In the Budge Budge port only *Aedes albopictus* with an index of 4.35 was recorded.
The landing rates of all the three Aedine species are given in Table 3.

From Table 3, it is apparent that the adult Aedes survey carried out in the domestic airport terminal and surrounding slum areas revealed the landing rates for Aedes aegypti, Aedes albopictus and Aedes vittatus to be 3.0, 6.0 and 0.0 and 3.0, 9.0 and 3.0 respectively. No adult mosquitoes were detected in the standing aircraft. The adult Aedes survey carried out in Kolkata port areas revealed the landing rates for Aedes aegypti as high as 9 and that of Aedes albopictus varied from 6 to 12 per manhour. In the Budge Budge port area, only Aedes albopictus with a landing rate of 6.0 per manhour was recorded.

The results highlight the need for further strengthening of vector control measures in both the port and airport areas.

References