INCREASED SURVEILLANCE OF EXOTIC MOSQUITOES IN DARWIN AFTER BALI TERRORIST ATTACK 12 Oct 2002

Gisela Lamche
Medical Entomology Branch, Department of Health and Community Services,
PO Box 40596, Casuarina NT 0811, Gisela.Lamche@nt.gov.au

1. INTRODUCTION

The terrorist attack in Bali on 12th Oct 2002 lead to the evacuation of Australian citizens via RAAF Hercules aircraft into Darwin between 13th and 16th Oct 2002. Routine disinsection quarantine procedures such as knock down spraying of arriving aircraft against exotic mosquitoes could not be practised because of the burn wounds of the victims transported. Due to the risk of importation of adult exotic mosquitoes, the Medical Entomology Branch (MEB) and the Australian Quarantine and Inspection Services (AQIS) implemented increased surveillance measures using adult traps and ovitraps from 15th to 23rd Oct 2002.

2. MATERIALS & METHODS

AQIS set carbon dioxide baited EVS mosquito traps (Rohe & Fall, 1979) in the staff car park adjacent to the bays 7-9, which were used by the evacuation aircraft. Two traps were set daily from 15th to 18th Oct 2002 additionally to the routine quarantine monitoring traps.

Sticky ovitraps as described by Ritchie et al. (in press) were placed at two sites in the staff car park adjacent to the bays 7-9. These traps were designed to catch adults when visiting for resting or oviposition. Briefly, the sticky ovitrap consisted of a black 1.2 L plastic bucket fitted with an adhesive plastic strip at the upper inner rim. The bucket was
filled with water to the bottom of the adhesive strip. The traps were set between the 16th and 23rd Oct 2002 and inspected daily to count and determine the species of adult mosquitoes glued to the sticky part of the trap. A magnifying glass was used to identify the collected insects in the field. After collection the sticky strip was unfolded in the laboratory and examined with a stereo microscope. The bucket was dried and flooded to determine whether oviposition had occurred.

3. RESULTS

The adult mosquito collections from EVS traps revealed three common endemic species as summarised in Table 1.

The results of the adult mosquitoes recorded in the sticky ovitrap are presented in Table 2. Two endemic species were observed. Neither larvae nor eggs were found in the sticky ovitraps.

Table 1: Summary of adult CO₂ baited EVS mosquito trapping at two sites during three trap nights (total of six traps)

<table>
<thead>
<tr>
<th>Trap location/Species</th>
<th>Cx. (Cux) quinquefasciatus</th>
<th>Oc. (Fin) notoscriptus</th>
<th>Oc. (Och) vigilax</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of females</td>
<td>No. of males</td>
<td>No. of females</td>
<td>No. of males</td>
</tr>
<tr>
<td>Darwin airport, staff car park, RHS in bush, site 1</td>
<td>26</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Darwin airport, staff car park, LHS in small bush, site 2</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TOTALS</td>
<td>35</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>
Table 2: Adult mosquitoes collected using two sticky ovitraps for 7 days

<table>
<thead>
<tr>
<th>Trap location/Species</th>
<th>Cx. (Cux) quinquefasciatus</th>
<th>Oc. (Fin) notoscriptus</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Darwin airport, staff car park, RHS in bush, site 3</td>
<td>5 females</td>
<td>1 male</td>
<td>6 females</td>
</tr>
<tr>
<td>Darwin airport, staff car park, LHS under gas tank, site 4</td>
<td>0 females</td>
<td>4 male</td>
<td>0 females</td>
</tr>
<tr>
<td>TOTALS</td>
<td>5 females</td>
<td>5 male</td>
<td>6 females</td>
</tr>
</tbody>
</table>

4. DISCUSSION & CONCLUSIONS

Darwin’s airport is classified as a location of moderately high risk of vector importation (Russell, 1998). Any risk situation is subject to eradication and increased surveillance procedures, which are in the process of national standardisation (Whelan & Tucker, 1998; NAMAC, in prep). Surveillance generally includes the setting of adult traps and ovitraps, as well as container breeding surveys. For the risk situation of the possible importation of an exotic mosquito species, the setting of adult traps and ovitraps was considered sufficient, since no observation of an adult mosquito coming in with the Hercules aircraft had been made, although patients and staff might have been too occupied for such observations.

The sticky ovitrap used for the survey has been developed recently (Ritchie et al., in press). The adulticidal characteristic of this type of trap was chosen over regularly used ovitraps for the situation described, because the importation of adult dengue vectors was a possibility (Whelan et al., 1998). The endemic species caught in the sticky trap were similar to the ones caught in Cairns, where the trap type was developed and trialed, with the exception of *Aedes aegypti*, which is not present in the Northern Territory (Ritchie et al., in press, Lamche & Whelan, 2003, Lee et al., 1987). The adulticidal function of the sticky ovitraps was confirmed by the presence of adults and the absence of larvae or eggs in the traps (Ritchie et al., in press).
The mosquito species collected in the EVS traps were endemic species only.

The increased surveillance implemented after the evacuation from Bali under reduced disinsection procedures did not detect exotic mosquitoes. The AQIS and MEB regular ovitrap and adult mosquito monitoring programs in the vicinity of the Darwin airport did not detect the presence of any exotic mosquito species during the months following the Bali evacuations.

However, during the evacuation process, there was a delay in considering the risk of exotic mosquito importation. This is mainly due to the fact that the situation encountered was unexpected and new. The Medical Entomology Branch suggested that aircraft should be sprayed with residual insecticide before leaving Australia, although this suggestion was made on the 16th Oct, when the main evacuation had finished. The NAMAC procedure protocol (in prep.) outlines reactionary measures after an exotic mosquito interception, but does not deal with the means to counter the potential for an importation. AQIS inspection procedures encompass all of the routine situations. The main suggestion is to raise the awareness for precautionary necessary quarantine measures amongst the relevant organisations during the initial discussion of such operations, so that these can be implemented timely. In this case the residual spraying of aircraft before evacuations would have been an adequate response to reduce the risk of exotic mosquito importation.

ACKNOWLEDGMENTS
Graham Goodwin from the Australian Quarantine and Inspection Services initiated discussions on the risk situation and carried out the adult mosquito trapping. Scott Ritchie and Sharron Long from the Tropical Public Health Unit Network, Cairns, Qld kindly provided the sticky ovitrap material with user instructions. Peter Whelan and Allan Warchot critically commented on the manuscript, which is gratefully acknowledged.
REFERENCES


National Arbovirus and Malaria Advisory Committee NAMAC (in prep.): Proposed protocol for action when a ‘risk importation’ or introduced exotic mosquito is detected.


