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Malaria Research Lead Programme

**Repellency Testing Of An Insecticide Impregnated Fabric  
Frame Fabrics  
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**Medical Research Council**

**The work described in this report is being carried out in the Durban laboratories of the Malaria Research Programme of the Medical Research Council and was commissioned for Frame Fabrics.**

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## **Objective**

This study was conducted to determine if an insecticide impregnated fabric has a repellent effect against the malaria mosquito.

## **Materials and Methods**

Repellency tests had been conducted in accordance with the standard WHO protocol and using the target species, *Anopheles arabiensis* (WHO, 1996).

The rodent *Mastomys coucha* was the test animal used for the screening of the samples for repellency activity. Ethical approval for the use of *Mastomys* in these trials was sought from the MRC's Ethics Committee for Research on Animals.

Each adult *Mastomys* had been weighed individually, and injected intraperitoneally with sodium pentobarbital at a rate of 1ml per 2.25 kg. The anaesthetized rodents were shaven on the ventral surface and the product was applied.

Paper cups (500ml) were modified by replacing the base of the cup with mosquito netting held in place with a rubber band and covering the mouth of the cup with transparent plastic film.

The trial comprised of four tests namely, one sample, a repeat test, and two negative controls.

Thirty unfed 4-day old *Anopheles arabiensis* females was introduced into a cup and held in contact with exposed skin of each rodent. Mosquito activity was observed through the transparent plastic film. After a period of two minutes the number of mosquitoes probing had been recorded. The mosquitoes exposed to the product had been monitored one hour post exposure to determine if the product had induced a knockdown effect.

The rodent was returned to the animal facility and allowed to recover from the effects of the anesthetic. Each rodent was monitored for 7 days for adverse reactions to the sample.

## Results

**Table one:** Results of repellency trials

Test	2 minute exposure (%)	1 hour post exposure knockdown (%)
One	93	0
Two	93	0
Negative control-1	33	0
Negative control-2	40	0

## Discussion

Trials were conducted in an insectary under controlled conditions. Frame Fabrics had supplied the Malaria Laboratories with one sample (1m) of insecticide impregnated fabric. The fabric was subsequently cut into 15cm squares for testing. To ensure validity of results, the sample provided was tested twice and two pieces of untreated fabric of similar density was used as negative controls.

The results of the negative control trials have shown that the test species had been greatly attracted to the untreated fabric exhibiting a very low repellency effect.

The insecticide impregnated fabric had exhibited very encouraging results with both tests indicating 93% repellent effect. It was observed that during the first minute of the trial, 27 % of the mosquitoes had been

attracted to the fabric however due to the density of the fabric none had resulted in any bites which lead to a decrease in attractiveness and a higher repellent effect. The test sample did not have a knock down effect on the mosquitoes.

### **References**

WHO,CTD/WHOPES/IC/96.1 Protocols for laboratory and field evaluation of Insecticides and Repellents