LABORATORY EVALUATION OF AN INSECTICIDE PAINT CONTAINING PROPOXUR AGAINST SEVERAL STRAINS OF AEDES AEGYPTI MOSQUITOES

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INTRODUCTION

The Arboviruses transmitted by *Aedes* mosquitoes are a serious public health problem in many regions of the world, with increasing cases of Dengue, Zika and Chikungunya. The absence of effective vaccines means that prevention of these diseases is focused on vector control.

The endophilic and endophagic behavior of the *Aedes aegypti* mosquito offers the possibility of treating indoor surfaces with insecticides to control adult mosquito populations and prevent bites.

Microencapsulated Insecticide Paints have shown efficacy, biosafety and residual effect between 1 and 2.5 years against various disease-transmitting arthropods[1-3].

OBJECTIVE

To evaluate the biological and residual efficacy of a paint containing 1.0% Propoxur against three strains of *Aedes aegypti* at the laboratory level in Mexico.

METHODOLOGY

Substrates of cement, clay, bajareque and wood were prepared by sealing and painting at a dose of 140 ml/m2 of propoxur paint (Carbapaint 10, Inesfly Corporation S.L., Spain).

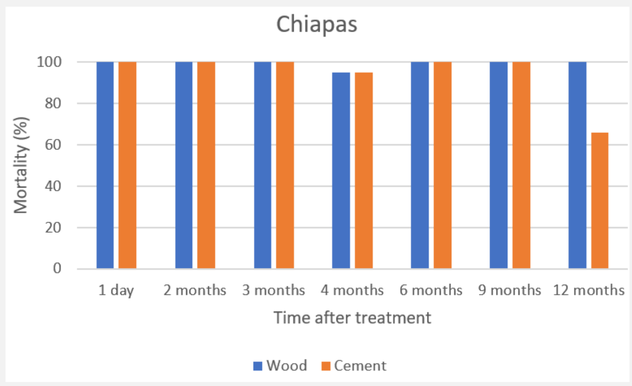
Eggs of *Aedes aegypti* mosquitoes (parental) captured with ovitraps placed in Pochutla, Oaxaca, Tapachula in Chiapas and Hermosillo in Sonora, were raised in the laboratory until F1. Adults from a fully laboratory susceptible strain (Rockefeller) were used in the bioassays.

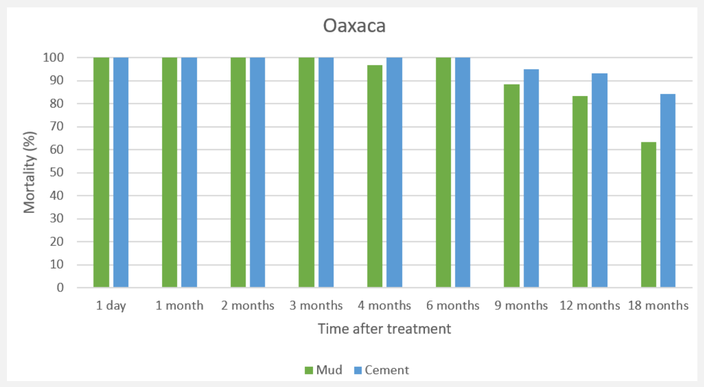
WHO cone bioassays (30 min exposure, 24h mortality) were conducted.

During 7 and 9 evaluation times, which represented one year of follow-up, 4,760 mosquitoes were exposed to the substrates treated with the propoxur paint.

RESULTS

- Mortality values between 83.3% and 100% were recorded for all three strains of mosquitoes on wood, clay, bajareque (mud) and cement, except for the cement substrate in Tapachula, Chiapas, where 66% mortality was determined.
- Of the total 4,760 mosquitoes exposed from the three Mexican states, an average mortality rate of 96.8% was calculated (4,607 dead mosquitoes). No mortality was observed in 1,180 (100%) mosquitoes used as control groups.
- The Rockefeller strain reported 100% mortality in the tests performed on wood and cement materials for 3 months.
- Particularly, a follow-up to evaluate the efficacy at 18 months was carried out in Pochutla, Oaxaca, obtaining a mortality higher than 80% in both substrates.





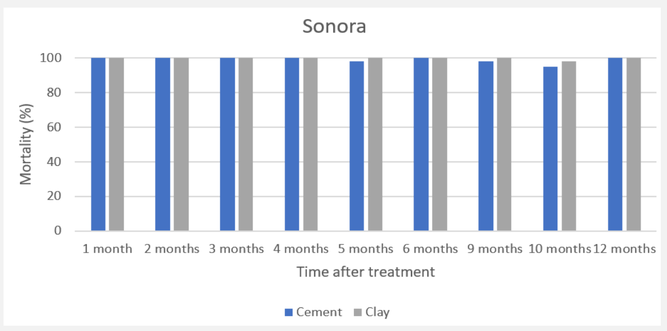


Table 1. Biological and residual efficacy of propoxur paint against *Aedes aegypti* strains Oaxaca, Chiapas and Sonora, Mexico under laboratory conditions 2016-2018.

Fig. 1 Ellaboration of bajareque (mud) substrates in Pochutla, Oaxaca, Mexico.

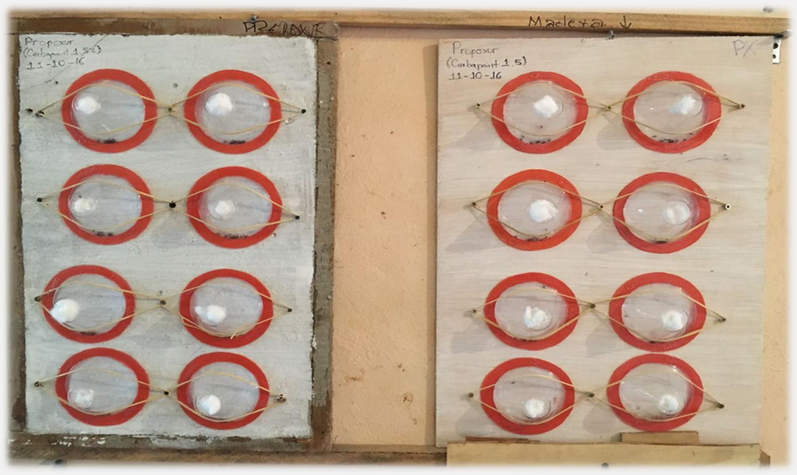


Fig. 2 Exposure of mosquitoes to painted cement and wood substrates in Tapachula, Chiapas, Mexico

CONCLUSIONS

-Propoxur paint produced a prolonged lethal effect on different surface materials against mosquitoes of 3 distinct wild Aedes aegypti strains in Mexico.

-Inesfly Propoxur paint is a promising and potent strategy for the control of arthropods of public health importance, in addition to providing housing improvement.

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