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"Control of endemic zoonotic and vector-borne emerging and re-emerging diseases: Current challenges in Latin America"

ABSTRACT BOOK

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of the

II Congress of the Latin American Society for Vector Ecology

"Control of endemic zoonotic and vector-borne emerging and re-emerging diseases: Current challenges in Latin America"

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INTERACTIVE INDEX

Evaluation of the efficacy of oviposition traps with attractants in the population control of the *Aedes aegypti* mosquito

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The *Aedes aegypti* mosquito species is the main transmitter of the dengue virus in the region and is a vector of other viruses such as Zika, yellow fever and chikungunya. These diseases have increased their incidence over the last three decades and represent a growing health problem. There are several methods to control the vector's population level, the most widespread and considered the most effective is the elimination of potential oviposition sites. The use of ovitraps with the addition of compounds to lure gravid females to lay eggs is one of the alternatives currently under study. The objective of this work is to do a preliminary field evaluation of the efficacy of potential attractant solutions in ovitraps as instruments -complementary to eliminate oviposition sites-for the population control of the vector. For this purpose, two compounds reported in the literature as attractants were used: a mixture of yeast, sugar and water (0.5% m/v yeast and 28% m/v sugar) and a solution of *Paspalum dilatatatum* (0.4% m/v) in water, which were compared with a distilled water blank. The experiments were carried out in field at six sampling sites in the locality of Los Polvorines (Malvinas Argentinas, Buenos Aires). Ovitraps were placed at each site, three for each treatment and three for the distilled water blank. The traps were replaced every five days and the number of eggs oviposited per treatment per site was counted for a total of eight samplings. Preliminary results indicate that the distilled water control treatment was more effective in attracting mosquito oviposition than *Paspalum dilatatum*, while yeast with sugar and water solution did not show oviposition activity. In the case of treatment with *Paspalum dilatatatum*, a possibly explanation for the result could be that the pieces of the material prevent the reflection of light, which stimulates the females to locate the oviposition site. The carbon dioxide, on the other hand, released from the yeast and sugar solution is reported as a feeding attractant, which was tested as an oviposition attractant because of the specific attraction it produces in the gravid females and because the yeast would increase the chances of survival of the larvae. However, in the field it attracted other insects known to feed on mosquito eggs. Finally, it is important to continue with field studies of this type. Although the present study presents preliminary results, these trials sustained over time could demonstrate a promising option for the control of *Aedes aegypti* mosquitoes.

A field experiment to test the effect of containers brushing and scrubbing on *Aedes aegypti* eggs and non-target accompanying dipterans

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Aedes aegypti populations survive long periods of drought and winter temperatures in the egg stage, which remain attached to the walls of the containers until favourable conditions occur. Cleaning of water storage containers may not eliminate all immatures and cleaning techniques commonly used may lack the specificity needed to effectively remove *Ae. aegypti* eggs. More extended ovicidal procedures such as "the untadita" and its modifications requires concentrated chemicals (chlorine bleach and/or detergent), which not always are accepted or available in the entire community. In addition, there is a constant need to search for environmentally friendly control methods of *Ae. aegypti*, including the preservation of the accompanying fauna in the aquatic habitat. In this work, we compare the efficiency of two non-chemical methods, brushing and scrubbing, to remove *Ae. aegypti* eggs and the collateral effects on non-target dipterans that lay eggs on container walls. A field experiment was carried on during March 2022 on pre-existent and standardized flower vases (conic, plastic, black, 300cc) from Benavídez cemetery, Buenos Aires, Argentina. On three groups of 70 vases each, the following treatments were randomly applied: BR) brushing with toilet brush, SC) scrubbing with an all-purpose microfiber cloth and CT) control without intervention. In all the treatments, the water contained in the vase was previously emptied to eliminate pre-existing immatures and, after the application of the treatment, the vase was filled with tap water up to the top to promote the hatching of the remaining eggs. In two consecutive samplings carried out every 5 days, the content of each vase was checked to record and extract all *Ae. aegypti* immatures and non-target dipterans. The proportion of infested vases (vases with immatures/vases with water) was compared among treatments with Chi^2 and Tukey tests. The proportion of infested vases of *Ae. aegypti* was significantly lower in scrubbing than in brushing and control vases (SC: 3/126, BR: 16/129, CT: 26/128; $X^2_{(2)}$=19,99, p<0,0001; SC<CT, p<0,001; SC<BR, p<0,01). On the other hand, the proportion of infested vases with non-target Diptera was lower in both ovicidal treatments than in the control, both for the Psychodidae *Clogmia albipunctata* (SC: 0/126, BR: 0/129, CT: 5/128; $X^2_{(2)}$=7,07, p<0,029; SC<CT>BR, p<0,05) and the Ceratopogonidae *Dasyhelea necrophila* (SC: 0/126, BR: 3/129, CT: 15/128; $X^2_{(2)}$=21,92; p<0,0001; SC<CT, p<0,001; BR<CT, p<0,01). Scrubbing was the most efficient ovicidal method and reduced markedly the infestation levels of *Ae. aegypti* without the need of using chemical. Unfortunately, both ovicidal methods also had a strong impact on non-target insects with similar oviposition strategy than the dengue vector. In a wide-ranging control campaign there could be a drastic decrease in these non-target urban insects.

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