

mortality), variation was found in the susceptibility/resistance. In contrast, resistance was found in all three populations with 3-6% mortality. In conclusion, our results suggest some degree of resistance to insecticides in three populations of *A. aegypti* in Cartagena-Colombia. This might indicate a growing phenomenon of insecticides resistance in this location.

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ASSESSING THE EFFICACY OF DELTAMETHRIN-IMPREGNATED LETHAL TARGETS FOR THE CONTROL OF THE LYMPHATIC FILARIASIS VECTOR IN TAHITI, FRENCH POLYNESIA

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Lymphatic filariasis (LF) is one of the world's leading causes of disability. The ongoing Pacific Program to Eliminate Lymphatic Filariasis (PacELF) is based on a mass drug administration program to reduce human LF prevalence. A supplemental method to eliminate LF is the control of its main vector, *Aedes polynesiensis*, to reduce host-vector contact. The use of insecticide impregnated materials is showing great efficacy for the control of various mosquito-borne diseases, particularly malaria. We have been evaluating the efficacy of pyrethroid impregnated outdoor visual resting targets (Lethal Targets) to control this exophilic diurnal mosquito in the field. Following preliminary laboratory attractiveness tests of different colors, a navy blue 100% cotton fabric was selected. Effective impregnation with deltamethrin was verified using a standard WHO cone bioassay. Preliminary sampling was conducted in four different villages along the west coast of Tahiti to identify potential experimental field sites. Twice monthly collections were undertaken with BG Sentinel traps (Biogents, Regenwald) to derive baseline data on the vector populations and likely-use blocks (treatment and control) were selected in the village of Toahotu on the Tahiti peninsula. Permission was obtained from property owners to place a lethal target and to use a BG trap for weekly collections. Mosquito sampling during the month preceding deployment of the LTs is underway and will provide an estimate of the mosquito density prior to the treatment. A similar sampling regime will be used following placement of LTs to assess their overall impact on the mosquito population. Results of the ongoing trials will be presented.

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LARVAL HABITAT SEGREGATION BETWEEN THE MOLECULAR FORMS OF THE AFRICAN MALARIA MOSQUITO, *ANOPHELES GAMBIAE* IN A RICE FIELD AREA OF BURKINA FASO, WEST AFRICA

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Disruptive selection acting on alternative eco-phenotypes can promote the evolution of reproductive isolation between populations, a process known as ecological speciation. In West Africa, lineage splitting between the M and S forms of the major Afro-tropical malaria mosquito, *Anopheles gambiae* is thought to be driven by ecological divergence, occurring mainly at the larval stage. Here, we will present evidences for habitat

segregation between these two cryptic species in and around irrigated rice-fields located within the humid savannas background of western Burkina Faso, West Africa. Longitudinal sampling of adult mosquitoes emerging from a range of larval development sites was conducted from June to November 2009. Every other week, emergence traps were set up above larval development sites distributed along a 15km-long transect, from the heart of the rice-fields area into the surrounding savannas. In total, eighty larval development sites were georeferenced and characterized (distance to the rice fields and to the nearest house, surface, depth, presence of standing vegetation, algae and/or debris, presence of predators and other culicine species, water origin, turbidity and general surrounding). A null model analysis revealed that the two molecular forms are non-randomly distributed ($p=0.003$). Canonical correspondence analysis was used to explore the spatial pattern of occurrence of the two sibling species and their relation to environmental variables. A major ecological gradient was extracted, in relation to the rice field perimeter ($p=0.002$). The M form was associated to larger breeding sites, which were mainly represented by rice field paddies. On the opposite, the S form was found to depend upon temporary, rain-filled breeding sites. These results support hypotheses about larval habitat segregation and confirm that both forms have different larval habitat requirement. Segregation appears clearly linked to anthropogenic permanent habitat and the community structure and diversity cascades they support.

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HOUSEHOLD-LEVEL PREDICTORS OF *Aedes aegypti* PRESENCE AND ABUNDANCE IN IQUITOS, PERU: IMPLICATIONS FOR DENGUE CONTROL

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Understanding what factors affect *Aedes aegypti* presence and abundance in/around houses enhances opportunities to target high-risk sites for mosquito control efforts. Using extensive *Ae. aegypti* surveillance data collected throughout Iquitos, Peru during 1999 through 2002, we evaluated associations between household characteristics and presence of adult mosquitoes. Houses with at least one adult *Ae. aegypti* captured with backpack aspiration (cases) were compared with mosquito-free houses (controls). Matching of case and control houses for space (<100 m distance) and time (same day) was performed to eliminate possible confounding from non-house factors and changes in mosquito abundance over time. Vegetation coverage surrounding houses was estimated from NDVI values (Landsat satellite images). Adjusted odds ratios were calculated using conditional logistic regression. Significantly more houses with adult *Ae. aegypti* had open soffit and room partitions (OR = 1.46, $p = <0.0001$), more manually filled containers (OR1 Container Increase = 1.02, $p = <0.0001$), more naturally rain filled containers (OR1 Container Increase = 1.05, $p = <0.0001$), more containers filled via roof runoff (OR1 Container Increase = 1.12, $p = <0.0001$), more residents (OR1 Person Increase = 1.03, $p = <0.0001$), and greater vegetation (OR = 1.05, $p = <0.0016$). These results demonstrate a complex pattern of household-level biophysical and social factors that are associated with transmission risk in this region of endemic dengue, and suggest contexts where interventions might be more effective.