ASTMH
AMERICAN SOCIETY OF TROPICAL MEDICINE & HYGIENE
ADVANCING GLOBAL HEALTH SINCE 1903

VOLUME 99 OCTOBER 2018 NUMBER 4 SUPPLEMENT

SIXTY-SEVENTH

ANNUAL MEETING

Sheraton New Orleans and New Orleans Marriott | New Orleans, LA USA

October 28 – November 1, 2018

ABSTRACT BOOK

"There will be epidemics..."

EBOLA: WORLD GOES ON RED ALERT -2014

Six Dead, 17 Sick From Drug-Resistant TB -2017

Panic as 1,500 Die of Malaria -1998

Spread of Spanish Flu Menaces War Production -1918

Cholera Epidemic in Yemen Now Affects One Million People -2017

Charity to Help Fight Malaria in Africa -2010

Ebola Out of Control -2014

Success in Tests of Yellow Fever Serum Reported -1932

Death Toll Growing as Influenza Claims Many Score Victims -1918

Brace for Dengue -2017

Dengue Dengue EVERYWHERE -2017

Officials: Texas Sees Growing Number of Typhus Cases -2017

FDA Busts Fake Malaria Medicines -2013

New Hope for AIDS Drug -1996

ZIKA THREAT ON OUR DOORSTEP -2016

African Countries to Plot New Malaria Vaccine -2017

Zika Spreads Worldwide -2016

Island Declares State of Emergency Over Zika Virus, Dengue Fever Outbreak -2016

DIPHTHERIA: Why Is It Back? -2017

ASTMH Annual Meeting Canceled Due to Spanish Flu Outbreak -1918

QUARANTINE WANTED as Yellow Fever Spreads -1878

An American Plague: Yellow Fever Epidemic of 1793 -2005

Been to an Ebola-affected country? Stay away from ASTMH meeting, Louisiana says -2014

Malaria Cases on the Rise in Last 3 Years -2016

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Supplement to
The American Journal of Tropical Medicine and Hygiene

Cambodia, [3]Genetics and Genomics of Insect Vectors Unit, Institut Pasteur, Paris, France, [4]Malaria: Parasites & Hosts Unit, Institut Pasteur, Paris, France

The main vector control tools against malaria mosquitoes have been the scaling up of indoor-oriented vector control tools, despite the fact that Southeast Asian mosquitoes populations mainly feed early and outdoors. In Cambodia, the main persistent reservoirs of transmission appear to be located outside of villages, in forests. This study aimed at better characterizing *Anopheles* vector bionomics to inform novel vector control tools development. Mosquitoes were sampled hourly over a 24h period during the rainy and the dry season in three types of sites: villages, forest habitats surrounding the villages, and deep forest. Inherent mosquito host preference was determined using odour-baited traps set side by side in a choice arrangement, releasing either human or cow odors. This allows calculation of the anthropophily index (AI): number of *Anopheles* mosquitoes caught in the human-baited trap over the total number of mosquitoes caught in both traps. A total of 3803 *Anopheles* mosquitoes were caught, with most of them at night, although 25.9% were caught during daytime. Overall *Anopheles* mosquitoes caught in the deep forest were significantly more anthropophilic (AI rainy season=26.5%; AI dry season=32.9±3.1%) than mosquitoes caught in the villages (AI rainy season=4.3±1%, P<0.0001; AI dry season=6.3±4.9%, P<0.0001) or in the forests surrounding the villages (AI rainy season=5.3±1%, P<0.0001; AI dry season=16.5±5.5%, P<0.0001). When considering females collected in the human-baited traps only, similar numbers were collected during the two rainy seasons, with 79.5% collected in the deep forest sites. These results strengthen the hypothesis that forests are the main risk areas for human malaria transmission, and highlight the importance of daytime biting behavior as a potential source for transmission. Molecular biology analyses are ongoing to determine malaria prevalence and transmission risks. In the current context of malaria elimination in Greater Mekong Subregion, there is an urgent need to develop vector control tools adapted to forest transmission settings in order to effectively break malaria transmission.

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SPATIAL DISTRIBUTION OF PCR -IDENTIFIED MALARIA VECTORS IN CROSS RIVER STATE, NIGERIA

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Anopheles gambiae sensu lato complex describes a group of seven morphologically indistinguishable members, comprising the main species responsible for malaria transmission in tropical and subtropical Africa. The diverse biological characters of these sibling species as well as their behavioral variations are responsible for the difference in their ability to transmit malaria and susceptibility to pyrethroids. This highlights the need for precise mapping of their spatial distribution to monitor and evaluate malaria threat levels, and to enhance effective implementation of integrated vector control strategies. The present study aimed at developing a GIS- based overlay on the spatial patterns of PCR-identified *A. gambiae* complex species collected from four sites in Cross River State; Calabar and Akpabuyo in southern, Yakurr in central and Ogoja in Northern region representing three different ecological zones. Trapping was conducted every other month from October 2015 until June 2016, covering both dry and rainy seasons, using CDC-UV traps and pyrethrum spray catch. *Anopheles* complex species were identified using molecular techniques based on differences in the rDNA region between species and the molecular forms of *A. gambiae s.s* specimens. A total of 1,386 female *A. gambiae* mosquitoes were collected and identified. DNA was extracted from legs of each specimen and species identification determined by multiplex PCR using specific primers. The molecular forms of *A. gambiae s.s* were determined by RFLP. Results indicated dominant occurrence of *A. gambiae s.s.* (99.2%) across the four sites in comparison to *A. arabiensis* which was detected in small number (0.8%). Out of 1,375 *A. gambiae s.s* specimens, 78.2%, 20%, and 1.8% were *A. coulzzii, A. gambiae* and hybrid forms respectively, a finding that contradicts other studies. *A. coulzzii* is predominant in guinea-savannah and rain forest ecological zones mainly during rainy seasons, while *A. gambiae* is prevalent in mangrove rain forest during dry season. These results provide important insights for strategic planning of malaria control programs in Nigeria.

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MOON PHASE EFFECT ON MOSQUITO VECTORS OF WEST NILE VIRUS IN MADAGASCAR: BIODIVERSITY, ABUNDANCE, HOST ATTRACTIVENESS AND FEEDING RATES

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West Nile Virus (WNV) infection occurs throughout Madagascar. Its epidemiological cycle involves horses, human, birds and mosquitoes. Our entomological data shows unexpected information on mosquitoes vectors diversity and biology that relates to the collection methods. This study highlights the effect of lunar cycle that has not been previously considered in previous studies in Madagascar. During 2017, the influence of the two lunar phases (full *versus* new moon) on mosquito populations was analyzed in a farm located in the surroundings of Antananarivo city, Madagascar. Each month, mosquito collections were performed twice: one night during the full moon and one during the new moon. Six light traps were used: three indoors (in horse's box stall, in a house, in a cowshed), while three outdoors (near a pigsty, near a chicken coop, near a water point). During 24 night catches, 36,448 specimens belonging to 23 species were collected with *Culex antennatus* (64%) and *Cx. quinquefasciatus* (30%) the most abundant species. *Cx. antennatus* was mostly collected in traps associated with domestic animals while *Cx. quinquefasciatus* in trap placed in house. Each month, the total number of females caught during new moon was 1 to 3,5 times higher than those caught during full moon (ANOVA; F=34.4, DF=3, P<0,05). Larger numbers of mosquitoes, driven mainly by *Cx. antennatus*, were collected during the new moon in the three outdoor traps; and inversely during the full moon in the cowshed. This new moon effect was observed in the house but driven mainly by *Cx. quinquefasciatus*. Lunar phase did not influence the abundance of mosquitoes in horse's box stall and the variation of mosquitos' diversity. The total number of fed and unfed females followed (F=0.709, DF=39, P>0,05) the same pattern than the abundance of mosquitoes collected in the farm. The lunar cycle has an effect on mosquito abundance and host attractiveness and might vary according to the mosquito species. This lunar effect and the location of traps should be taken into consideration for one target species during entomological investigations aiming at unraveling West-Nile virus transmission when using light traps.

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RELATIONSHIP BETWEEN MICROCLIMATE AND ENVIRONMENTAL VARIABLES AND MOSQUITO ABUNDANCE IN RURAL ECUADOR

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Mosquito abundance is an important predictor of mosquito-borne illnesses, such as dengue fever. *Aedes aegypti* mosquitos, which spread the dengue virus, have a close relationship with humans, often living only within urban environments. Fine-scale relationships between climate, environment, and mosquito populations in this setting are poorly understood. Using mosquito traps fitted with microclimate sensors, we