down (KD) of 90% of the *Ae. aegypti.* This study also assessed the sugar feeding behaviour of *Ae. aegypti* when a blood host is available; and evaluated the efficacy of an attractive toxic sugar bait against *Ae. aegypti* in a semi field environment. Dose response experiments to determine KD90 of IVM against *Ae. aegypti* were done in laboratory conditions through a serial dilution of IVM in 10% sugar solution in separate cages. Mosquito mortality was observed at 4, 8, 24 and 48 hours post introduction of the treatments. *Ae. aegypti* feeding preference between sugar and blood meal was determined by releasing female *Ae. aegypti* into a cage in which both rabbit and sugar bait were deployed. Mosquito feeding status was detected after 24 hours. Ivermectin was toxic against male and female *Ae. aegypti* at 4‰ IVM dose. Over 90% of male and female *Ae. aegypti* were knocked down 48 hours post sugar feeding on sugar solutions containing at least 4‰ IVM respectively. Sugar bait significantly reduced *Ae. aegypti* blood feeding preference (OR=0.06; 95%CI [0.023-0.134]) within 24 hours. An ivermectin dose (0.04%) is enough to be incorporated into attractive sugar baits (ATSB) to achieve 90% *Ae. aegypti* mortality and would be effective against both sexes of *Ae. aegypti*. The presence of sugar bait will significantly inhibit *Ae. aegypti* blood seeking behaviour compared to if there was no sugar bait. Semi field experiments are ongoing to determine the efficacy of the sugar bait against *Ae. aegypti* in a controlled environment.

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WHERE DO THE MALARIA VECTORS ACTUALLY REST INSIDE HOUSES?

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Countries have set ambitious goals towards malaria control, primarily by scaling up effective interventions such as long-lasting insecticide treated nets (LLINs), indoor residual spraying (IRS) and effective case management. LLINs and IRS particularly target indoor-biting and indoor-resting malaria transmitting mosquitoes. It is therefore important to understand resting behaviours of the major malaria vectors inside houses and how much they can be affected by indoor interventions. This would provide crucial information on where best to direct the interventions to effectively prevent malaria. We investigated the resting behaviors of mosquitoes inside common house types in rural south-eastern Tanzania to identify preferred resting surfaces for the two main malaria vectors, *Anopheles arabiensis* and *Anopheles funestus*. The study houses were selected based on the following inclusion criteria: i) thatched roofs and un-plastered mud walls, ii) thatched roofs and un-plastered brick walls, iii) corrugated iron roofs and un-plastered brick walls, and iv) corrugated iron roofs and plastered brick walls. In each of these houses, mosquitoes were collected from multiple surfaces (floors, walls, roof and ceilings, furniture and utensils, clothes and bed nets) using Prokopack aspirators. Preliminary findings suggest that the two vector species do not only rest on walls, where they could be targeted with IRS, but also on the underside of roofs and other surfaces, such as on bed nets, floors, furniture and utensils. We have detected differences between preferred resting sites between the two major vector species. Additionally, we have observed that different house designs influence the preferred resting surfaces for studied vector species. Particularly, *An. funestus.* are much more of generalists in terms of their resting surfaces compared to *An. arabiensis*, even though both species preferred thatched roofs over iron roofs. Besides, while *An. arabiensis* rest mostly on underside of roofs, *An. funestus* readily also rests on other surfaces as well, such as the walls and on bed nets.

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MOSQUITO ABUNDANCES AND BEHAVIOR SUPPORT POTENTIAL TRANSMISSION OF RIFT VALLEY FEVER VIRUS IN COLORADO

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Rift Valley Fever Virus (RVFV) poses a major threat of introduction to several continents, including North America. Such an introduction could cause significant losses to the livestock industry, in addition to substantial human morbidity and mortality. Because of the opportunistic blood host selection of *Cx. tarsalis* mosquitoes in this area, we hypothesized that this species could be a locally important bridge vector of RVFV in the event of an introduction. We investigated the mosquito diversity community composition at livestock feedlots and surrounding natural and residential areas to determine differences in mosquito relative abundance and blood feeding patterns attributed to cattle feeding operations. Blood meals from engorged mosquitoes were sequenced to determine blood source, and these data were used to model host-selection behaviors by habitat type. Multivariate regression analyses revealed differences between mosquito community assemblages at feedlots and non-feedlot sites, with this effect driven largely by differential abundances of *Ae. vexans*. Mosquito diversity was lower on feedlots than surrounding areas for 3 out of 4 feedlots. *Cx. tarsalis* was abundant at both feedlots and nearby sites. Diverse vertebrate blood meals were detected in *Cx. tarsalis* at non-feedlot sites, with a shift towards feeding on cattle at feedlots. These data support a potential for *Cx. tarsalis* to serve as a bridge vector of RVFV between livestock and humans in Colorado.

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A RETROSPECTIVE SURVEILLANCE OF THE OCCURRENCE OF FLAVIVIRUSES IN *AEDES* MOSQUITOES IN PHETCHABUN PROVINCE RELATED TO ENVIRONMENTAL FACTORS

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Mosquito-borne diseases are related to the medically important viruses in the Family *Flaviviridae*. Zika virus (ZIKV) and Dengue virus (DENV) are transmitted to humans by the bite of the infected mosquitoes. The most important vector is *Aedes* mosquito. Environmental factors such as temperature, relative humidity, and biting rate affect dengue virus infection. In addition, surveillance of field-caught mosquitoes is imperative for determining the natural vector and can provide an early warning sign at risk of transmission in an area. In this study, *Ae. aegypti* mosquitoes were collected in Phetchabun Province, Thailand in 2004-2005. The mosquitoes were collected in the rainy and dry season both indoor and outdoor. During mosquito's collection, the data of environmental factors were observed and recorded. Mosquitoes were pooled according to genus/species, and sampling location. Pools consisted of 10 mosquitoes. Ninety-eight pools of 939 *Aedes* mosquitoes were screened with PCR assay for Pan-flavivirus, ZIKV and DENV, respectively. Two pools were detected as DENV positive and no ZIKV was detected from the mosquito. To confirm individual infection for determining true infection rate, the mosquitoes which gave positive DENV infection were tested for dengue virus by RT-PCR method. Four individual *Ae. aegypti* mosquitoes were detected as DENV serotype 4. The infection rate of DENV in this study was 0.43%. Moreover, the probability to detect dengue virus in mosquitoes at the neighbor's houses was 1.25 times, especially where distances between neighboring houses and patient's houses were less than 50 meters. The relative humidity in dengue-infected villages with dengue-infected mosquitoes was significantly higher than villages that free from dengue-infected mosquitoes. Indoor biting rate of *Aedes aegypti* were 14.87 times higher than outdoor, and biting times of 09.00-10.00, 10.00-11.00, 11.00-12.00 yielded 1.77, 1.46, 0.68mosquitoes/man-hour, respectively.