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**Are New Trapping Technologies Useful for Mosquito Control Interventions?**

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Effective, sustainable and environmental friendly management of mosquito populations is a challenging task and there exists no silver bullet to control mosquitoes. The use of attractant baited traps for disposal of mosquitoes offers an alternative to the conventional approach of using chemical insecticides on a large scale. This approach has the advantage of reducing the amount of insecticides applied, which are ecologically harmful and have an objectionable impact on nontarget organisms. It is not clear, however, what kind of impact mosquito traps have on the

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reduction of biting rates, the suppression of local mosquito populations or the suppression of transmission of vector borne diseases. To find out if mosquito traps could be useful tools for sustainable management of mosquito populations, we tested the effect of a new trap, the BG-Sentinel® ([www.BG-sentinel.com](http://www.BG-sentinel.com)), in the field with natural mosquito populations as well as in an artificial biotope with *Aedes aegypti*.

In the field, where a mixture of several genera (*Culex*, *Ochlerotatus*, *Aedes*, and *Anopheles*) was present, the traps were equipped with CO<sub>2</sub> and the BG-Lure, which emits compounds identified from human skin. In the artificial biotope with *Aedes aegypti* only the BG-Lure was used; no CO<sub>2</sub> was added.

The field tests have been performed in two different biotopes: Biotope 1 was an alluvial forest in flood plains with a huge population size of one predominating mosquito species (*Ochlerotatus sticticus*), appearing after floods in large numbers. The size of the test area was approximately 2100 m<sup>2</sup>. Biotope 2 was a residential area in the outskirts of a city with 120,000 inhabitants. In this area the mosquito population was smaller than in Biotope 1 and a higher diversity of different mosquito species could be observed. The size of the experimental area was approximately 1000 m<sup>2</sup>.

Each biotope was equipped with 6 traps, forming a sort of protection fence around the guarded area. Outside as well as inside of the protected area one trap was placed for monitoring purposes.

In the artificial biotope (a greenhouse, 11 m length x 3,8 m width at a volume of 121 m<sup>3</sup>) with different breeding sites, 50 mated female *Aedes aegypti* (L.) were initially released as a founder population. As a source for a blood meal a human volunteer entered the biotope almost daily for 10 – 30 min to augment the population with time. The biting pressure was measured daily. Starting from less than 1 bite per min, after 4 months more than 15 bites per min were received due to the growth of the mosquito population present in the greenhouse. Then one BG-Sentinel trap was placed in the middle of the greenhouse to combat the mosquitoes.

Using monitoring traps to measure mosquito densities, the field tests in Biotope 1 have shown that large mosquito populations cannot be extinguished or

even reduced by the application of 6 traps. Within 22 days of periodical operation, no significant change could be observed in the number of mosquitoes caught in both monitoring traps inside and outside the guarded area. Although fluctuations in the population size could be observed, a correlation between trapping events and a drop of the population size could not be detected.

Small populations on the other hand can be influenced by the application of trapping systems. In Biotope 2 the daily catching rates in the monitoring trap were reduced within 8 days of constant operation from initially 39 to 4 in a first trial. In a second trial a few weeks later, after the daily catching rates increased again, a reduction from 23 to 2 could be observed within 8 days of operation. This corresponds to a suppression of the local mosquito population of about 90%.

A similar effect could be observed in the greenhouse experiment. Within two days of operation of a single trap the human biting rates dropped from 15 bites per min to less than 1 bite per min. Within 6 weeks of constant operation of the trap the mosquito population was completely extinguished: no eggs, no larvae and no adults could be found in the greenhouse, although the mosquitoes had the chance to get a blood meal once a day through the presence of a human volunteer. A total of about 1000 mosquitoes (452 females and 543 males) were caught within six weeks of trapping.

Thus small mosquito populations with low migration possibilities might be controlled with a minimal number of traps. So the application of traps could be an interesting method for the control of small mosquito populations.