

# Evaluation of the efficacy of a new trap to monitor *Aedes albopictus* and analysis of the correlation between eggs and landings in field

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**Introduction:** the Asian tiger mosquito's arrival in Italy caused the need of a completely different approach to mosquito control because of its different behavior respect to the indigenous species *Culex pipiens* (Figures 1; 2). The struggle against the larval instars is basic but in some cases the adulticidal intervention becomes necessary. Spraying on vegetation is an effective tool to suppress the mosquitoes but it has strong side effect, since it causes the killing of several non-target arthropod species; therefore, this method should be used just in really necessary cases. The most commonly employed monitoring systems to evaluate the population of *Aedes albopictus* is ovitraps, but the number of eggs considerably vary depending on the availability of other breeding sites and on the fertility of females. A general method to evaluate the presence of mosquitoes is Human Landing counting, but this should be performed by the same person at the same hour because these factors considerably affect mosquito activity; besides, the number of landings is not always representative of the number of adults because the same female can land just once or several times. Many different adult mosquito traps are also available on the market, but they are not effective against Asian tiger mosquito or very expensive and cannot be left unsupervised in public areas for the risks of damaging or stealing.



Figure 1



Figure 2

**Materials and methods:** in this project the ovitrap and the Human Landing techniques were compared to a trap created by Mahidol University in Bangkok (Figures 3; 4; 5). This trap is significantly cheaper than the others since it's made of waterproof cardboard, contains water as attractant and a glued paper to catch adults. This trap, which was created to monitor *Aedes aegypti*, is easy to assemble and lightweight to transport (Figure 6).



Figure 3

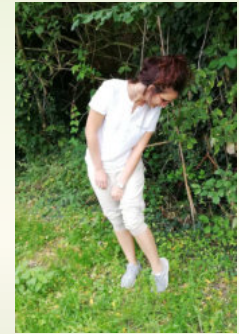


Figure 4

The three monitoring systems were compared inside three public parks in Padua city with weekly evaluations from July to September (Figure 7): each ovitrap was placed at least 3 meters far from the sticky trap to avoid competition; the Human Landing assessments were performed always by the same person counting the number of landings for three minutes. The number of landings and the number of eggs caught by the ovitraps for each park were compared to understand if there is a correlation between the two series of data. R2 was calculated using Excel 2016.

**Results:** the cardboard trap didn't give good results since it caught very low numbers of mosquitoes (from 0 to 10 adults of *Ae. albopictus* per week). The trap was often missing or damaged probably because it drew kids' attention for the shape and the red color, even if it was hidden. For these reasons, the results of cardboard trap's catches weren't statistically analyzed.



Figure 6



Figure 5

The analysis of correlation between eggs and landings showed that there is no correlation (Graphics 1; 2; 3).

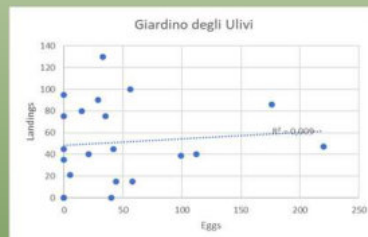
**Conclusions:** a cheap effective trap to catch adult Asian tiger mosquito is still to be found.

Ovitrap and the Human Landing counting are very effective but it's still to be proved which one is the best indicator to evaluate the population size.

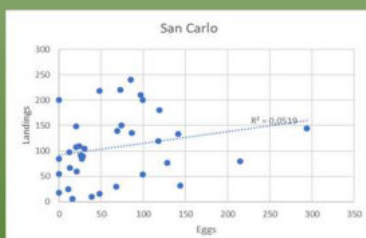
There is no correlation between laid eggs and human landings



Graphic 1



Graphic 2



Graphic 3

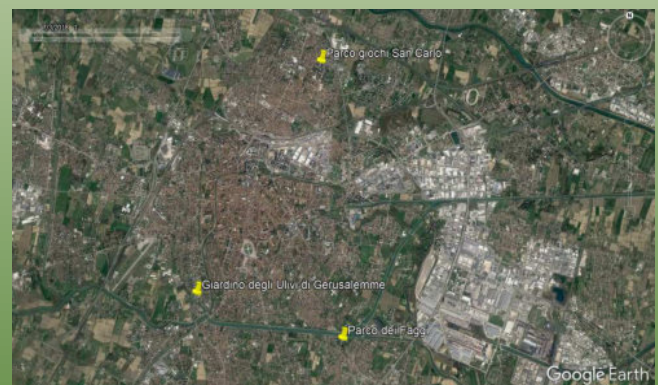


Figure 7