

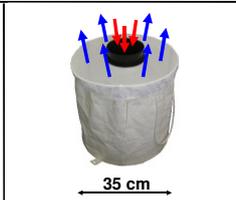
Sampling the Asian tiger mosquito, *Aedes albopictus*: the BG-Sentinel trap is an interesting alternative to the human landing collection.

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Material and Methods

		
Human Landing Collection (HLC)	BG-Sentinel Trap (BGS)	Ovitrap (OT)

Montecatini Terme (Pistoia)

Weeks 27 to 40, 2009
Three untreated study areas.
HLC: Collection for 0.5 h, early evening, once per week on two sites
BGS: Collection for 24 h, once per week on two sites
OT: Continuous use, paddles collected once per week



Cesena (Emilia Romagna)

Weeks 26 to 41, 2008
Three untreated study areas.
HLC: Collection for 1.5 h, early evening, once or twice per week
BGS: Collection for 24 h, once or twice per week
OT: Continuous use, paddles collected once per week

BG-Sentinel (BGS)

The BG-Sentinel, used in combination with the BG-Lure, creates an upward air current which resembles the **host odour plume** of a human body. The BG-Lure contains lactic acid, ammonia, and fatty acids, in a composition also given off by the human skin.

Without carbon dioxide the trap is especially attractive for *Ae. albopictus* (e.g. Meeraus et al., 2008 and *Ae. aegypti* (e.g. Maciel de Freitas et al. 2006). It also catches members from the *Culex pipiens complex* and other species. The mosquitoes are collected in a catch bag in the center of the trap. The BG-Sentinel needs 12 V and 3.4 W.

(More information is available on www.bg-sentinel.com)

Data collection sites

Data were collected in the **untreated control zones** of two different studies evaluating the effectivity of mass trapping (Cesena and Montecatini) and larviciding (Montecatini) on the populations of *Aedes (Stegomyia) albopictus*.

Dissection of abdomina / ovaries (Detinova, 1962)

Gravid: Female with eggs in the abdomen. **Parous:** Female has produced eggs at least once before. **Nulliparous:** Female has not produced eggs before. **Bloodfed:** Female with a recent bloodmeal in the abdomen.

Results: Montecatini Terme (2009)

Sensitivity: positive proof of the presence of <i>Ae. albopictus</i>		
HLC (n=84)	BGS (n=66)	OT (n=111)
96.4 %	100.0 %	100.0 %
Number and sex of captured <i>Ae. albopictus</i> and number of eggs from Ovitrap		
HLC (n=84)	BGS (n=66)	OT (n=111)
♀♀ mean 10.5 ± SE 0.8 min=0 max=26 Σ=885	♀♀ mean 17.9 ± SE 1.7 min=1 max=67 Σ=1178	eggs mean 124.3 ± SE 7.8 min=11 max=562 Σ=13799
♂♂ mean 1.1 ± SE 0.2 min=0 max=7 Σ=90	♂♂ mean 13.4 ± SE 1.6 min=0 max=66 Σ=884	---
Reproductive states of the captured female <i>Ae. albopictus</i> – previous bloodmeals		
	HLC (n=736)	BGS (n=818)
nulliparous	37.4 %	23.8 %
gravid	18.2 %	48.9 %
parous	44.4 %	27.3 %
(recently bloodfed)	(7.7 %)	(10.3 %)

Results: Cesena (2008)

Sensitivity: positive proof of the presence of <i>Ae. albopictus</i>		
HLC (n=60)	BGS (n=63)	OT (n=74)
96.7 %	96.8 %	91.9 %
Number and sex of captured <i>Ae. albopictus</i> and number of eggs from Ovitrap		
HLC (n=60)	BGS (n=63)	OT (n=74)
♀♀ mean 16.7 ± SE 2.5 min=0 max=97 Σ=1004	♀♀ mean 17.2 ± SE 2.0 min=0 max=74 Σ=1138	eggs mean 65.8 ± SE 10.5 min=0 max=522 Σ=4870
♂♂ Σ=0	♂♂ mean 12.3 ± SE 1.8 min=0 max=59 Σ=824	---
Reproductive states of the captured female <i>Ae. albopictus</i> – previous bloodmeals		
	HLC (n= 1004)	BGS (n=1106)
nulliparous	54.6 %	40.6 %
gravid	7.4 %	29.0 %
parous	38.0 %	30.4 %

Discussion

The data presented here were collected in the untreated control zones of two larger studies. Thus, a potential influence of the treatments (mass trapping and/or larviciding) on the mosquito populations was ruled out. The comparison of the three sampling methods showed:

All three sampling methods had a high and **similar sensitivity** in urban areas where *Ae. albopictus* is established.

A 24-hour sampling with the BG-Sentinel collected the same number of female *Ae. albopictus* as the collection of host-seeking mosquitoes from volunteers for 30 to 90 minutes. It thus gives an excellent measure of the current **biting pressure**.

The BG-Sentinel also collected significant numbers of male *Ae. albopictus*. It is therefore an interesting tool in studies involving **sterile male techniques (SMT)**.

The BG-Sentinel captured a large percentage of mosquitoes that have had at least one full bloodmeal that led to the development of eggs. In Montecatini, 10.3% of the captured females had had a recently acquired bloodmeal (no data on this were collected in Cesena).

Thus, the BG-Sentinel captures large quantities of mosquitoes that have had previous host contacts and that are especially interesting for the **detection of disease agents**.

Literature

Detinova (1962) Age-grouping methods in Diptera of medical importance, with special reference to some vectors of malaria. *World Health Organisation Monograph Series* 47, 121 pages.
Maciel de Freitas et al. (2006) Field evaluation of effectiveness of the BG-Sentinel, a new trap for capturing adult *Aedes aegypti* (Diptera: Culicidae). *Mem Inst Oswaldo Cruz* 101(3) 321-325.
Meeraus et al. (2008) Field comparison of novel and gold standard traps for collecting *Aedes albopictus* on Northern Virginia. *J Am Mosq Contr Ass* 24(2) 244-248.

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