Novel Tools for Sampling Outdoor-Biting Mosquitoes: the Suna Trap and Long-Lasting Attractants

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Why do we need a tool for sampling outdoor-biting mosquitoes?

- Need to assess outdoor mosquito populations in a standardised, cost-effective manner.
  - Measure changes in vector populations across time and space.
- Importance of sampling host-seeking females.
- Ethics of conducting human landing catches.

The mosquitito trap – early 2012

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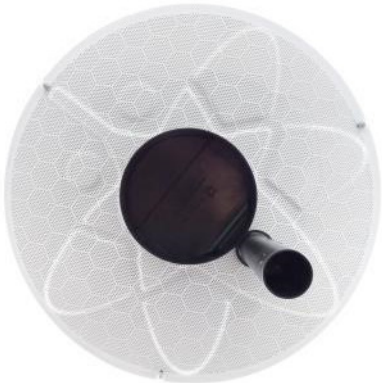
First Suna trap prototype, mid-2012

- "*Suna*" meaning mosquito in DhoLuo language.
- Solid metal cone introduced – more robust than fabric.
- Fabric base replaced with flexible plastic mesh base.
- Introduction of CO_2 release pipe.

Second Suna trap prototype – end 2012

- Suna trap prototype with a rigid plastic base (reduced air-flow caused reduced performance).

The final Suna trap – early 2013



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Biogents

Long-lasting attractants to mimic a human host

- The Mbita-5 odour blend (MB5).

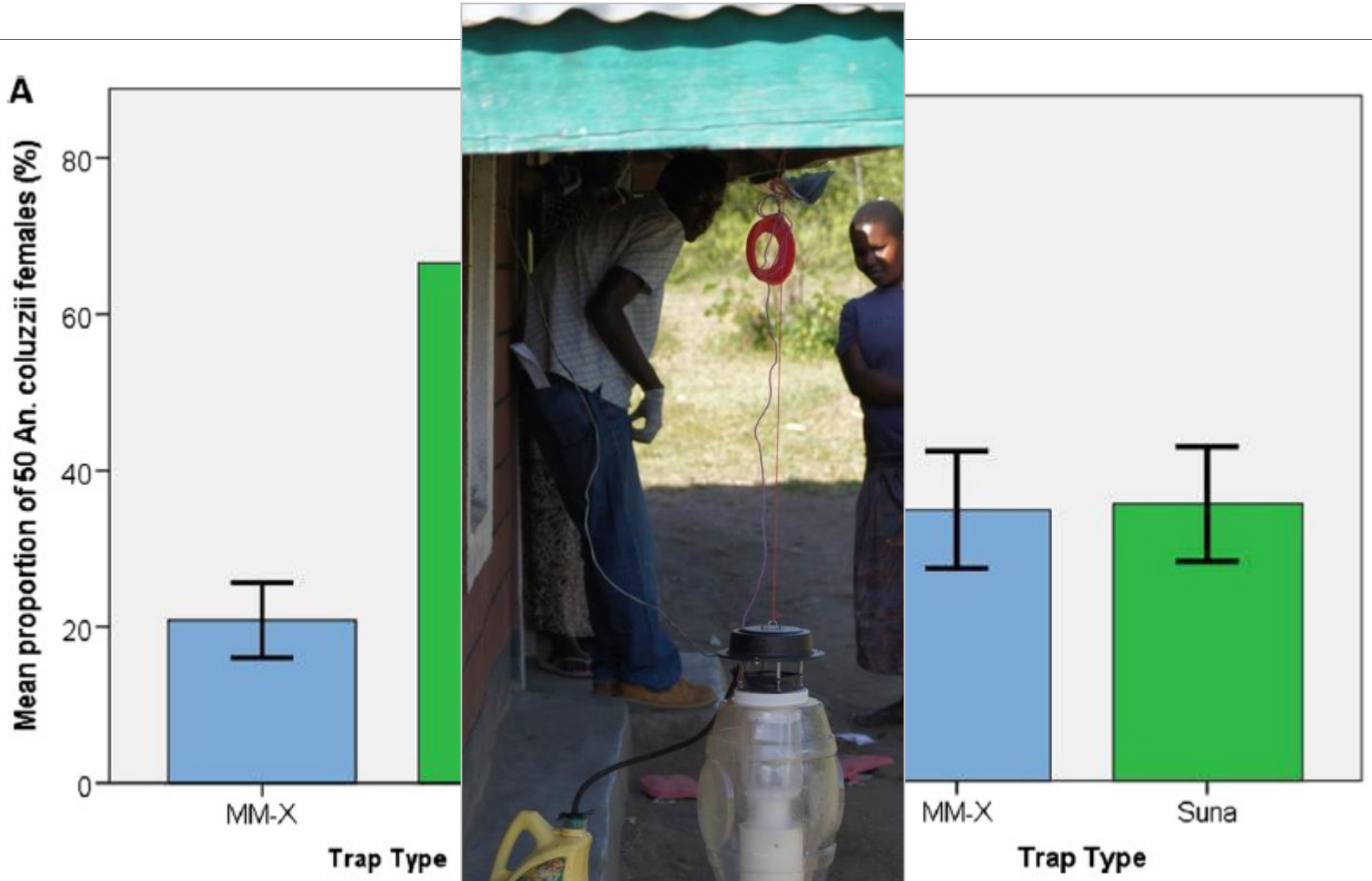
Medical and Veterinary Entomology (2014), doi: 10.1111/mve.12061

Assessing the efficacy of candidate mosquito repellents against the background of an attractive source that mimics a human host

D. J. MENGER, J. J. A. VAN LOON and W. TAKKEN

- Impregnated on to nylon strips.
- Remains attractive to *An. gambiae s.s.* even after 4 months of continuous use in the field (Mweresa in prep).

Comparison with MM-X trap



Hiscox *et al. Malaria Journal* 2014, **13**:257
http://www.malariajournal.com/content/13/1/257

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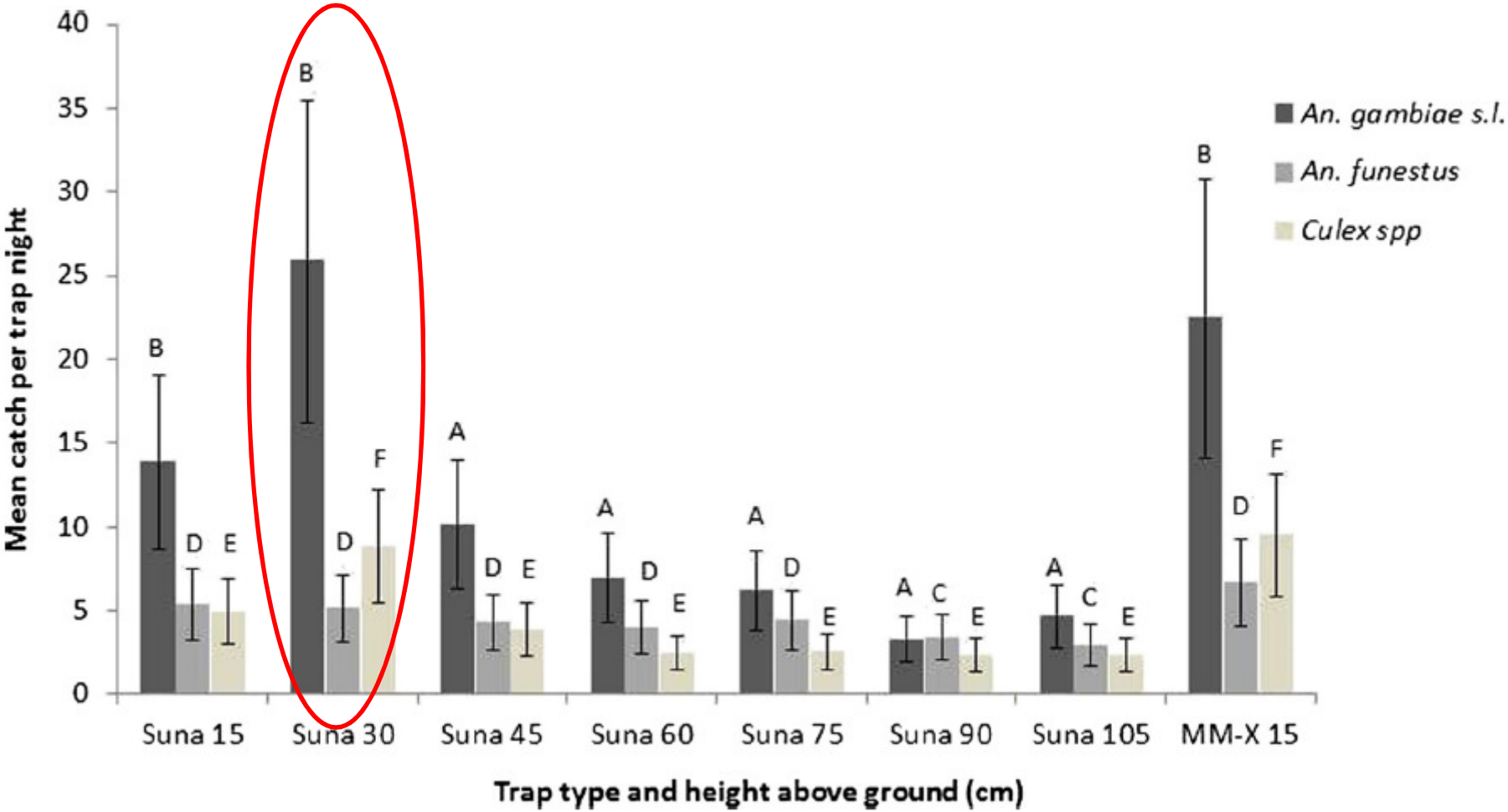
Trap positioning outside houses



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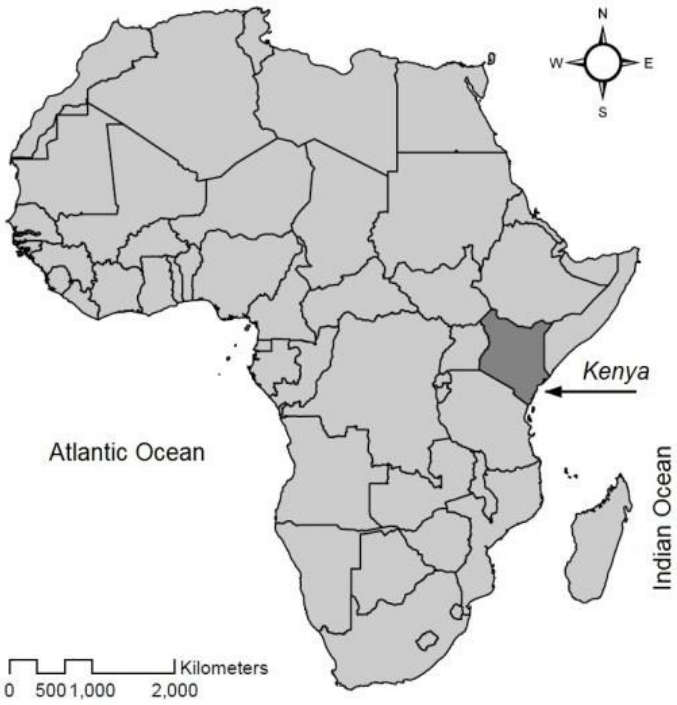
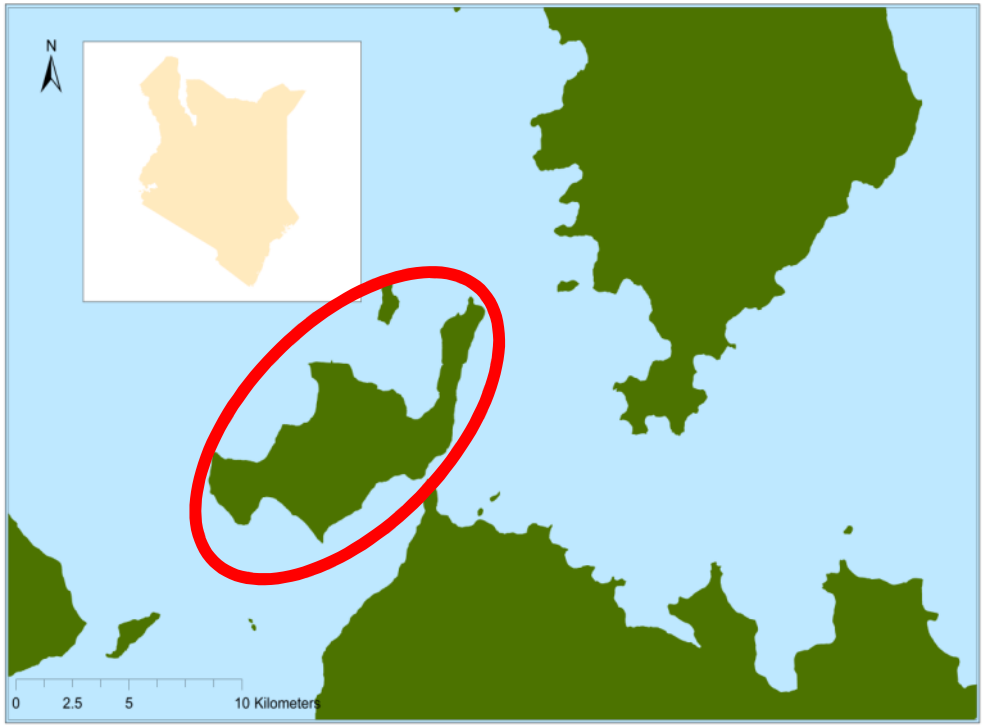
Odour-baited Suna traps for malaria control? SolarMal – Rusinga Island





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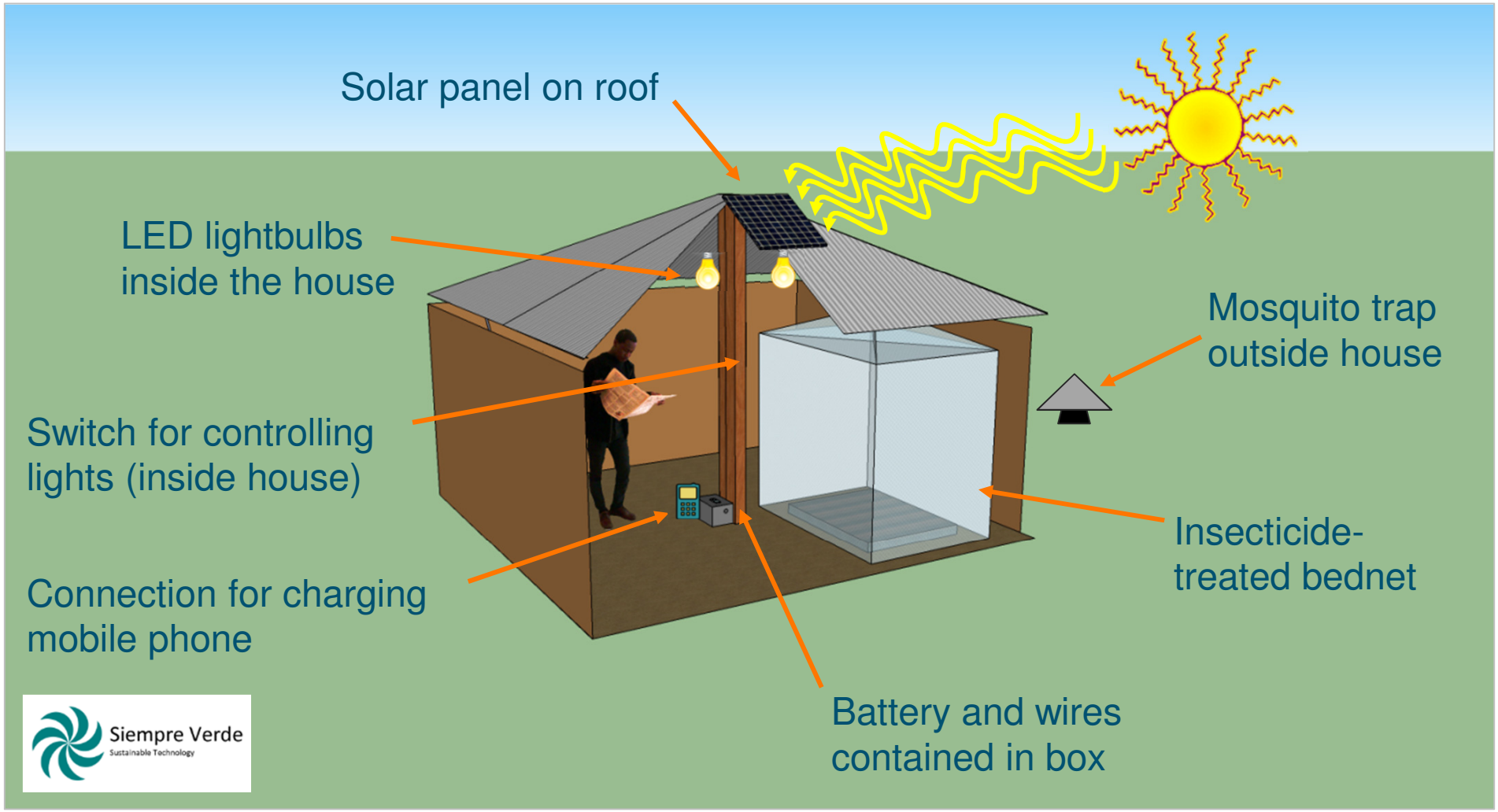
SMoT
(Solar-powered Mosquito Trapping system)



The SolarMal Project

- Against a background of LLINs and case managment
- Odour-baited Suna traps installed outside 4,200 houses (~ 25,000 people).
    - Rollout commenced June 2013, will be complete by May 2015.
- Outcome measures:
    - Clinical malaria incidence, malaria parasite prevalence
    - HDSS
    - Mosquito densities, species composition and sporozoite rates
    - Sociological indices – perceptions, adherence, willingness to pay.

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What next?

- Comparison with HLC inside and outside houses
- Testing traps in multiple locations - South America, West Africa, Southeast Asia. Urban areas? Forests?
- Use of molasses fermentation to attract blood-fed females (Mweresa *Malaria Journal* 2014, **13**:160 doi:10.1186/1475-2875-13-160).
- Trap modifications to preserve condition of trapped mosquitoes.
- Even longer lasting odour baits?
- Impact as a tool for malaria control – SolarMal.
- Economic evaluation – cost-effectiveness, willingness to pay, distribution channels.

Acknowledgements

SolarMal

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