

ABSTRACT

Background Electric nets (e-nets) are used to analyse the flight behaviour of insects and have been used extensively to study the host-oriented flight of tsetse flies. Recently we adapted this tool to analyse the oviposition behaviour of gravid malaria vectors, *Anopheles gambiae* s.s., orienting towards aquatic habitats and traps by surrounding an artificial pond with e-nets and collecting electrocuted mosquitoes on sticky boards on the ground next to the nets. Here we study whether e-nets themselves affect the responses of gravid *An. gambiae* s.s.. Methods Dual-choice experiments were carried out in 80 m² screened semi-field systems where 200 gravid *An. gambiae* s.s. were released each night for 12 nights per experiment. The numbers of mosquito landing on or approaching an oviposition site were studied by adding detergent to the water in an artificial pond or surrounding the pond with a square of e-nets. We also assessed whether the supporting framework of the nets or the sticky boards used to retain electrocuted mosquitoes influenced the catch. Results Two similar detergent treated ponds presented in choice tests caught an equal proportion of the mosquitoes released, whereas a pond surrounded by e-nets caught a higher proportion than an open pond (odds ratio (OR) 1.7, 95% confidence interval (CI) 1.1 - 2.7; $p < 0.017$). The separate evaluation of the impact of the square of electric nets and the yellow boards on the approach of gravid females towards a pond suggests that the tower-like construction of the square of electric nets did not restrict the approach of females but the yellow sticky boards on the ground attract gravid females to a source of water (OR 2.7 95% CI 1.7 – 4.3; $p < 0.001$). Conclusion The trapping efficiency of the electric nets is increased when large yellow sticky boards are placed on the ground next to the e-nets to collect electrocuted mosquitoes, possibly because of increased visual contrast to the aquatic habitat. It is therefore important when comparing two treatments that the same trapping device is used in both. The importance of contrast around artificial habitats might be exploited to improve collections of *An. gambiae* s.s. in gravid traps.