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FACING THE INVASION OF ALIEN ARTHROPODS SPECIES
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Estimating *Aedes albopictus* biting females by ovitrap surveillance data in an area at high-risk of exotic arbovirus introduction

Mattia Manica[1], Antonello D'Alessandro[1], Roberto Rosà[2], Alessandra della Torre[1], Beniamino Caputo[1]

[1]*Dipartimento di Sanità Pubblica e Malattie Infettive, Università di Roma "Sapienza", Piazzale Aldo Moro 5, 00185 Rome, Italy*
[2]*Dipartimento di Biodiversità ed Ecologia Molecolare, Centro Ricerca e Innovazione, Fondazione Edmund Mach, 38010 San Michele all'Adige, TN, Italy*

Aedes albopictus is an aggressive invasive mosquito species which represents a serious health concerns in both tropical and temperate regions due to its role as vector of arboviruses. Estimates of mosquito biting rates are essential to account for vector-human contact in models aimed to predict the risk of arbovirus autochthonous transmission and outbreaks as well as nuisance threshold useful for planning mosquito control interventions. Methods targeting daytime and outdoor biting *Ae. albopictus* females (e.g. Human Landing Collection, HLC) are expensive and difficult to be implemented in large scale schemes. Instead, egg-collections by ovitraps is the most widely used routine approach for large-scale monitoring of the species. We here present the first attempt to provide: i) rough estimates of adult biting *Ae. albopictus* females based on ovitrap data, ii) straightforward indicators to be exploited by decision-makers in charge of planning mosquito-control activities. We carried out parallel ovitrap and human landing collections in hot-spots of high *Ae. albopictus* abundance in Rome (Italy) along a whole reproductive season and assessed the relationship between the two sets of data by regression analysis. The mean number of females/person collected by HLC in 15' (hereafter females/HLC) and the mean number of eggs/day were 18.9±0.7 and 39.0±2.0, respectively. Results shown a significant positive relationship between the two sets of data and estimated an increase of one biting female/person/day every 5 additional eggs found in ovitraps. Both observed and fitted values indicated presence of adults in the absence eggs in ovitraps. The patterns of exotic arbovirus outbreak probability obtained by introducing these estimates in risk models were in the range of those based on females/HLC (R0>1 in 86% and 40% of sampling dates for Chikungunya and Zika, respectively; R0<1 along the entire season for Dengue). However, the model predicted that under our experimental conditions an R0>1 for Chikungunya is to be expected at very low number of eggs/ovitrap and even in their absence. Overall, large confidence intervals in the model predictions warn about the significance of relying on ovitrap monitoring schemes to estimate numbers of biting females and plan control interventions aimed to prevent risk of arbovirus transmission or of high nuisance.

CONTACT MAIL: mattia.manica@uniroma1.it