

Exposure of primate reservoir hosts to mosquito vectors in Malaysian Borneo

ABSTRACT

Several vector-borne pathogens of primates have potential for human spillover. An example is the simian malaria *Plasmodium knowlesi* which is now a major public health problem in Malaysia. Characterization of exposure to mosquito vectors is essential for assessment of the force of infection within wild simian populations, however few methods exist to do so. Here we demonstrate the use of thermal imaging and mosquito magnet independence traps (MMIT) to assess the abundance, diversity and infection rates in mosquitoes host seeking near long-tailed macaque (*Macaca fascicularis*) sleeping sites in the Lower Kinabatangan Wildlife Sanctuary, Malaysian Borneo. The primary *Plasmodium knowlesi* vector, *Anopheles balabacensis*, was trapped at higher abundance near sleeping sites than control trees. Although none of the *An. balabacensis* collected (n = 15) were positive for *P. knowlesi* by PCR screening, two were infected with another simian malaria *Plasmodium inui*. Analysis of macaque stools from sleeping sites confirmed a high prevalence of *Plasmodium* infection, suspected to be *P. inui*. Recently, natural transmission of *P. inui* has been detected in humans and *An. cracens* in Peninsular Malaysia. The presence of *P. inui* in *An. balabacensis* here and previously in human-biting collections highlight its potential for spillover from macaques to humans in Sabah. We advocate the use of MMITs for non-invasive sampling of mosquito vectors that host seek on wild simian populations.