

stresses the importance of using appropriately scaled enclosures for behavioral studies on this species. Mating status of females was found to be influenced by their fructose content, with mated females having lower amounts of fructose; indicating a tendency to nectar feed before mating. Blood feeding was opportunistic, i.e. as likely to occur before as after mating. Implications and relevance of the study for control of this important vector are discussed.

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HUMAN IGG RESPONSE TO *ANOPHELES GAMBIAE* SALIVARY PROTEINS AS AN IMMUNO-EPIDEMIOLOGICAL MARKER OF EXPOSURE TO MALARIA VECTOR BITES

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The evaluation of the human antibody response to arthropod salivary proteins could be an epidemiological indicator of exposure to vector bites, and therefore to risk of pathogen transmission. In the case of malaria, which is transmitted only by anopheline mosquitoes, our group has indeed demonstrated that, in Senegal, IgG response to whole saliva extracts of *Anopheles gambiae* represents a marker of exposure to *An. gambiae* bites. In the objective to increase specificity of malaria exposure, we identified the SG6 salivary protein as *Anopheles* genus specific and antigenic in children living in a malaria endemic area. The objective of the present study was to determine whether the IgG response to the *An. gambiae* gSG6 protein, from its recombinant form to derived synthetic peptides, could be an immunological marker of exposure specific to *An. gambiae* bites. Specific IgG antibodies to recombinant gSG6 protein were observed in children living in a Senegalese area exposed to malaria. With the objective of optimizing *Anopheles* specificity and reproducibility, we designed five gSG6-based peptide sequences using a bioinformatic approach, taking into consideration i) their potential antigenic properties and ii) the absence of cross-reactivity with protein sequences of other arthropods/organisms. The five gSG6 peptides showed differing antigenic properties, with gSG6-P1 and gSG6-P2 exhibiting the highest antigenicity. However, a significant increase in the specific IgG response during the rainy season and a positive association between the IgG level and the level of exposure to *An. gambiae* bites was significant only for gSG6-P1. This step-by-step approach suggests that gSG6-P1 could be an optimal candidate marker for evaluating exposure to *An. gambiae* bites. Furthermore, a complementary study seems to indicate that gSG6-P1 could be a marker in low exposure area. This marker could be employed as a geographic indicator, like remote sensing techniques, for mapping the risk of malaria and especially in low *Anopheles* density conditions, where entomological studies are not sensitive enough (dry season, malaria according to altitude, urban exposure) or adequate (travelers, military corps). It could also represent a direct criterion of efficacy in evaluation of vector control strategies.

CHARACTERIZATION OF HOST-SEEKING ACTIVITY OF *ANOPHELES MELAS* IN RESPONSE TO INDOOR-BASED ANTI-VECTOR INTERVENTIONS ON BIOKO ISLAND, EQUATORIAL GUINEA

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An intensive anti-malaria intervention focused on indoor application of residual insecticides and distribution of insecticide-treated bednets was initiated in 2003 to reduce the burden of malaria on the island of Bioko. Despite documented reductions in prevalence of *Plasmodium falciparum* infections throughout the island and sporozoite infection rates among the dominant vectors *Anopheles gambiae* s.s., *An. melas* and *An. funestus*, prevalence of malaria infection in humans remains high in some areas. Surveillance measures indicate *An. melas* is the most abundant anopheline vector in some of these infection foci. It has been reported from other areas in West-Africa that *An. melas* may have exophilic tendencies. This could explain the relatively high prevalence of malaria infections in these specific localities, despite the widespread application of indoor control measures. We are evaluating this possibility by characterizing the host-seeking behavior of *An. melas*. Indoor and outdoor landing counts and time-segregated trapping were conducted and will provide information on these operationally-relevant behaviors. If a preference of *An. melas* for outdoor blood feeding is demonstrated, this would support the need for supplementary interventions in areas where indoor control measures are not appropriate due to this vector's behavioral characteristics.

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INTEGRATION OF REPORTER TRANSGENES INTO *SCHISTOSOMA MANSONI* CHROMOSOMES MEDIATED BY PSEUDOTYPED MURINE LEUKEMIA VIRUS

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The recent release of draft genome sequences of *Schistosoma mansoni* has underscored the pressing need to develop functional genomics approaches for this significant human pathogen. The sequence information makes feasible genome-scale investigation of transgene integration into schistosome chromosomes. Retrovirus mediated transduction offers a means to establish transgenic lines of schistosomes, to elucidate schistosome gene function and expression, and to advance functional genomics approaches for these parasites. We investigated the utility of the Moloney murine leukemia retrovirus (MLV) pseudotyped with vesicular stomatitis virus glycoprotein (VSVG) for the transduction of *S. mansoni*. Schistosomes were exposed to VSVG-MLV virions after which genomic DNA and protein were extracted from transduced parasites. Southern hybridization analysis indicated the presence of proviral MLV retrovirus in the transduced schistosomes. Fragments of the MLV transgene and flanking schistosome sequences recovered using an anchored PCR-based approach demonstrated definitively that somatic transgenesis of schistosomes had occurred and revealed widespread retrovirus integration into the chromosomes. MLV transgenes inserted in the vicinity of genes encoding immunophilin, zinc finger protein and others, and also near endogenous retrotransposons such as the *fugitive* and *SR1*. Proviral integration appeared to exhibit primary sequence site specificity, targeting a gGATcc-like motif. Reporter luciferase transgene activity driven by the schistosome actin gene promoter was expressed in transduced schistosomules and adults. Luciferase activity appeared to be developmentally regulated in schistosomules with increased activity

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