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Efficacy and protection time of currently available insect repellents against adult *Culex quinquefasciatus* and *Aedes albopictus* mosquitoes

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The use of topical repellents can provide a protective shield against mosquito bites and protect humans from mosquito-borne diseases. But all commercially available insect repellents are not equally effective and cannot protect completely for long periods of time. So, the repellency and complete protection time (CPT) of the insect repellents need to be evaluated. Therefore, this qualitative study was conducted to identify the most effective repellent for protecting humans from mosquito bites by providing long-time protection. The Laboratory in-vitro assay (Arm-in-Cage) was performed by applying eight tested repellent products on the human subject's right hand and were exposed to cages filled with 150 female mosquitoes (5-7days old) of *Ae. albopictus* and *Cx. quinquefasciatus* which has never received a blood meal. Treated and bare hands were exposed for 3 minutes every 10 minutes at intervals, continuously up to 6 hours of exposure. Three replications for each repellent and a total of 24 human volunteers were used for the study. The landings of mosquitoes were counted on both control and treated hands. Repellency and CPT were calculated to evaluate the efficacy of the insect repellents. A hundred percent (100%) repellency was obtained by all of the tested repellents until the 1st hour of exposure and was gradually found to decrease over time and was lowest the 6th hour. Natural oil-based repellents (Xpel, REPEl, and Purnava) provided relatively lower repellency and CPT compared to DEET (Cutter Skinsations, OFF, ODOMOS) and IR3535 (No Mos, Vaseline) based repellents. Cutter Skinsations insect repellent (120-160 minutes) and Vaseline Mosquito Defence (120-121 minutes) provided the highest complete protection time against both *Aedes* and *Culex* mosquitoes. ODOMOS (DEET) and No Mos (IR3535) showed nearly similar CPT (120 minutes), like Cutter and Vaseline against *Ae. albopictus* and *Cx. quinquefasciatus* respectively. The present study showed that the repellent made with DEET and IR3535 provides active complete protection from mosquito bites and can be used to prevent mosquito-borne diseases. A pilot study can be done in the field to evaluate the role of repellents in the prevention of mosquito-borne diseases, especially dengue and malaria around the globe.