A Novel Aspirator For the Surveilance of Mosquito-Borne Diseases

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Technology description

Technical Summary

Knowledge of adult mosquito population density is paramount to the understanding of host-vector contacts, pathogen inoculation rates, and, ultimately, vector- borne disease transmission risk. A myriad of mosquito collection methods exist (e.g., light traps), but most of them have limitations in sensitivity and are biased toward collection of mosquitoes of certain stages or nutritional states, or they are limited operationally by their cost or convenience for extensive and long-term deployment. Battery-powered aspirators collect mosquitoes of both sexes and all physiological stages directly from their resting sites, resulting in better estimates of the number of different mosquito species in a given area, abundance, sex ratio, age structure, and the physiological condition of sampled populations. The CDC-Backpack Aspirator (CDC-BP) is considered the most effective method for indoor collections of certain domestic mosquito species. However, its heavy weight (12 kg, including battery) coupled with its non-extendable and primarily rigid suction hose make it difficult to maneuver in confined spaces, dramatically limiting the ability to aspirate mosquitoes indoors. Furthermore, because its reach cannot be extended, CDC-BP cannot be used to collect mosquitoes in elevated and out of reach locations such as upper walls, ceilings, and under beds. As a consequence, mosquito collections using the CDC-BP commonly yield low capture rates. In addition, commercially available CDC-BPs are very expensive (US$ 468-758 in the United States), limiting their potential for widespread mosquito surveillance. Drs. Uriel Kitron and Gonzalo Vazquez-Prokopec, both of the Department of Environmental Studies at Emory University, have developed a new mosquito aspirator with the same aspiration capacity of the CDC-BP and the following added advantages: greater maneuverability, smaller, lighter, less expensive, easier to build, single-handed usability and easier access to hard to reach locations because of its compatibility with telescoping extension poles. The performance of this new aspirator, named ProkoPackTM (patent pending), compared favorably against the CDC-BP in laboratory and epidemiological studies. ProkoPackTM is expected to improve quality and coverage of surveillance of different mosquito vectors that carry diseases such as dengue and yellow fever, especially since such vectors are less likely to be attracted to traditional traps. The device should also allow for more efficient data collection in research and disease surveillance.

Advantages

Enhanced efficiency for monitoring mosquito bone-diseases.
Light weight; can be used in confined spaces.
Inexpensive.

Institution

Emory University

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