Use of a Novel Arduino System as a Sensor for Detecting and Controlling Mosquito Populations

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Mosquitoes are known carriers of different viruses such as: Chikungunya, Dengue, Zika, among others (WHO, 2016). The bite of these insects can be dangerous for human health since some can lead to death. The Centers for Disease Control report that 45% of the world's population live in an area at risk of Dengue; also, that Chikungunya and Zika have spread to more than 45 and 35 countries respectively. Standard mosquito traps and repellents are not enough (CDC, 2016). They are also expensive, and not very efficient. A Cornell University study (Cator, et.al. 2009) found that mosquitoes produce sound in specific frequency ranges. Female mosquitoes generate a frequency between 300-400 Hz and male mosquitoes in the 550-650 Hz range. Female mosquitoes transmit the viruses; the male only mates. The purpose of this research is to use a frequency sound generator application in the 550-650 Hz to simulate male mosquitoes' frequencies to attract female mosquitoes toward the device. The Arduino UNO is a programmable device capable of driving and controlling different types of sensors. We used the Arduino Uno to drive a microphone and software to analyze the sound being received by the microphone. With the purpose of eliminating virus-carrying mosquitoes, the device was set to identify a range between 300-500 Hz. Once the frequency was detected, the Arduino UNO triggered an atomizer simulating mosquito insecticide, thus, spraying all mosquitoes in the area. Reducing the mosquito population will help to radically improve health and quality of life for most households.

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