Olfactometer Assays to Measure the Response of Culex quinquefasciatus to Plant and Fungal Volatiles

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Mosquito-borne diseases are spreading into geographic areas due to climate change. Most mosquito control methods use lures based on odors from human hosts or gravid traps that attract only female mosquitoes. Because nectar is the main food source for both sexes of mosquitoes, flower volatiles functioning as mosquito semiochemicals could be used in traps to monitor mosquito species. The purpose of this study was to identify flowers that attract mosquitoes. Mosquito larvae were purchased and reared into adults. A y-tube olfactometer was constructed in which filtered air was pumped simultaneously through either a jar with a test substance (test chamber) or an empty jar (negative control chamber). The air streams from each jar were combined via a y-tube and channeled into a release chamber containing mosquitoes. For each test, a flower (carnation, rose, baby's-breath, lily) or fungus (Phoma exigua) was placed in the test chamber and twenty mosquitoes were placed in the release chamber. After ten minutes, the mosquitoes that had migrated down each branch of the y-tube were counted. Five tests were conducted with each flower species and three tests were conducted with the fungus. Of the total number of mosquitoes that left the release chamber, 69% chose the carnation scent, 44% chose the rose scent, 62% chose the baby's breath scent, 54% chose the lily scent, and 31% chose the fungus scent. These results suggest that fragrances from certain flowers can be used as lures to monitor mosquito populations and that some fungi may produce novel mosquito repellents.

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