Name(s)

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Project Number

S2210

Project Title

Assessing the Effect of Light Pollution on Courtship Behavior of Drosophila melanogaster

Abstract

Objectives

Light pollution effects organisms within the ecosystem through the disruption of the circadian rhythm: the mental and physical biological responses that occur over the course of a twenty-four hour period. The objective of this experiment is to determine if nighttime light pollution adversely affects the mating behaviors of male Drosophila melanogaster.

Methods

Testing involved measuring the courtship behaviors of waggling and darting performed by the male Drosophila to attract a female. Groups consisted of a control which was exposed to a Bortle level 5 sky to mimic natural conditions and five subsequent experimental test groups that involved exposure to varying wavelengths of light for a period of 10 minutes. The first test group consisted of blue light, followed by green, amber, bright white, and warm white lights. All groups consisted of ten petri dishes each with a male and female Drosophila.

Results

A remarkable difference in both body waggle and darting occurred between the control group and the five test groups. The average amount of courtship behaviors per test group varied significantly corresponding to the color of the light the Drosophila were exposed to. The control group averaged a total of 58.1 body waggles and 9.6 darts while the test group with the least mating behaviors, test group 4 exposed to bright white light, averaged 22.3 body waggles and 2 darts.

Conclusions

Results indicate that the higher intensity of light reduces performance of mating behavior in male Drosophila and subsequently increases the risk of population decline.

Summary Statement

This study suggests that exposure to varying wavelengths of nighttime light pollution effects the mating behavior of male Drosophila melanogaster.

Help Received

I aquired the Drosophila melanogaster from my AP Biology teacher Mr. Davin Aalto who also discussed the project setup with me.