The Effect of Exogenous Melatonin on the Diurnal Phototactic Behavior of Daphnia magna

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The purpose of this study was to determine if melatonin had an effect on the diurnal phototactic behavior of Daphnia magna. A group of 20 Daphnia magna were randomly selected to be observed by placing them into a glass container filled with 200mL of spring water that was visually divided into four segments. The organisms were observed for ten minutes and their phototactic behavior was recorded based on segment placement. The same group was then exposed to melatonin (2.7e-6 g/L) and were allowed a ten minute acclimation period before the post-test began. The post-test was conducted in the same manner as the pre-test. The average segment placement for the pre-test was 3.75, while the average segment placement for the post-test was 3.85. The means were analyzed for statistical significance by using a paired t-test. With an alpha value of 0.05, a p-value of 0.184 was produced by the data. This statistically insignificant value did not support the research hypothesis that if Daphnia magna were exposed to melatonin, then they would demonstrate increased negative phototaxis. In summation, the exposure of the model organism Daphnia magna to melatonin did not significantly affect their diurnal phototactic behavior.

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