Effect of Sanco Crystal Blue Ultra Concentrate Pond Dye on Swimming Behavior of Daphnia magna

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Daphnia magna is an invertebrate water flea species that lives in freshwater and brackish water and is commonly found on the United States' northeastern coasts. The purpose of this experiment was to determine the effect of Sanco Crystal Blue Ultra Concentrate pond dye on the swimming behavior of Daphnia magna. Using a LEICA EZ4 W stereoscope, the swimming behavior of 20 adult Daphnia in springwater was analyzed for two minutes each by determining the frequency of quadrant switches and somersaults per second. Then, the Daphnia were transferred to springwater with pond dye, and analyzed for another two minutes each. This process was repeated with 20 adult Daphnia that were transferred from springwater to springwater as the control group. The Daphnia transferred to springwater with pond dye exhibited an increase of 26.78% somersaults ($p=0.024$) and a decrease of 21.57% quadrant switches ($p=0.010$), post-transfer. The control group averaged an increase of 2.67% somersaults ($p=0.725$) and an increase of 1.32% quadrant switches ($p=0.769$), post-transfer. The data implies that exposure to the pond dye caused fewer quadrant switches and more somersaults in Daphnia swimming behavior. The Daphnia exposed to pond dye exhibited lesser linear movement and greater rotational movement. The control group data indicates that the transfer of Daphnia to springwater did not significantly affect swimming behavior. Therefore, since Crystal Blue pond dye and similar products are commonly used in suburban lakes and ponds, this research could aid in determining the effects that pond dyes have on the ecosystems within affected water bodies.

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