

The Resilience of Daphnia to Liquid Household Products

Alfaro, Eduardo (School: Downtown Doral Charter Upper School)

Kaya, Elif (School: Downtown Doral Charter Upper School)

San Martin, Isis (School: Downtown Doral Charter Upper School)

Liquid household products that are thrown down the drain and into bodies of water may threaten aquatic life, especially organisms like *Daphnia magna*. Understanding said household products and the effect they have on *D. magna* is of importance since *D. magna* serve as a model bioindicator organism in ecotoxicology (Tiwari, et. al 2021). Therefore, we aim to answer the question "Do different liquid household products (perfume (Parfum/Fragrance), sunscreen (Homosalate 9.8%, Octocrylene 9.5%) and detergent (Parfum & Alcohol Ethoxylates) concentrations lead to differences in survival rate amongst *Daphnia magna*?". Our experiment tests the resilience of *D. magna*, meaning their ability to withstand circumstances and survive, in varying concentrations of diluted household products in spring water (0, 0.01, 0.05, and 0.1 % volume by volume (% v/v)). *Daphnia* were exposed to said concentrations over 5 days and survival rates were measured. An LC50 indicated that the concentration at which 50% of the *Daphnia* perished were 0.003% v/v for detergent, 0.006% v/v for sunscreen and 0.012% v/v for perfume, indicating that lower concentrations of detergent were required to achieve higher mortality rates of *D. magna* compared to sunscreen and perfume. A Kruskal and Wallis Test of Ranks indicated that there was significant difference among samples. A Mann Whitney test indicated that there was no significant difference between and within samples, only a significant difference for samples containing the diluted household products compared to the control samples. Thus, all liquid household products tested are equally harmful to *D. magna* based on our study. These findings have big implications for conservation methods and strongly support sustainability practices in both homes and companies.