# The Resilience of Daphnia to Liquid Household Products

San Martin, Isis (School: Downtown Doral Charter Upper School )
Kaya, Elif (School: Downtown Doral Charter Upper School )
Alfaro, Eduardo (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.

**Awards Won:**