Daphnia magna in Surface Runoffs

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The purpose of this project was to determine if surface runoffs are harmful to Daphnia Magna by measuring the heart rates of Daphnia before and after exposure to the surface runoffs. Five different sediments were collected from Metro Detroit areas (two sidewalks, one parking lot, one street and one nature trail). Each sample was prepared by measuring out a sample of sediment that ranged from 114g to 114.58g and adding it to the labeled jar with 200 mL of spring water. The control sample contained only spring water. The heart rates of the 5 Daphnia were measured before placing them in the sediments and every twenty-four hours for six days. The mortality and survival rates were also recorded each day. The results indicate the most harmful sediment to the Daphnia was the street sediment; the population died out within 72 hours. The least toxic was the nature trail, it had the most living out of all five sediments. Experimental results indicate that Daphnia are more likely to be found in nature places and support that any natural environment should not be harmful to the Daphnia. The order of toxicity (from most to least) was the street, sidewalk B, sidewalk A, the parking lot, and the nature trail. One possible explanation for the street toxicity is that tires may drive over oil and other toxins that then end up in the street sediment. Some limitations to the experiment were: the natural lifespan of the Daphnia, the limited number of Daphnia placed in each jar, the overall variability of the Daphnia heart rates, and the timing of the heart rate measurements.

Awards Won:
Lawrence Technological University: Tuition scholarship of $19,650 per year, renewable for up to four years and applicable to any major