Demonstrating D. pulex as Environmental Buffers to Acetylcholinesterase Inhibitors on H. littoralis

Harrow, Jordan (School: Episcopal School of Jacksonville)

The purpose of this experiment was to determine efficacy of lab-engineered pesticide resistant D. pulex as environmental buffers against the effects of malathion on H. littoralis. Pesticide resistant D. pulex could act as environmental buffers that protect freshwater organisms from the effects of pesticides. Success of resistance buffering allows for a decrease in mortality rates of exposed organisms because of pesticide resistant D. pulex. It was hypothesized if H. littoralis were exposed to malathion in the presence of resistant and sensitive D. pulex, then H. littoralis with resistant D. pulex would have lower mortality rates than H. littoralis with sensitive D. pulex. Within 4 groups of D. pulex, resistant groups received pesticide additions while sensitive groups did not. After 63 days, all groups received pesticide addition. Additionally, exposure groups were placed with H. littoralis and survival rates were monitored. After addition, results showed that H. littoralis exposed to malathion and resistant D. pulex had a 50% lower mortality rate than H. littoralis exposed to malathion and sensitive D. pulex. This shows that the presence of resistant D. pulex increased survival of H. littoralis in the presence of pesticides, demonstrating environmental benefits of resistant D. pulex. The results suggest that pesticide resistant D. pulex create effective environmental buffers for freshwater organisms against the effects of pesticides, creating a method to decrease freshwater organism mortality due to pesticide runoff.

Awards Won:
Third Award of $1,000