CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)

Avenlea Gamble; Alisa Smith

Project Number

31613

Project Title

How Are Native Mendo Co. Stream Invertebrates Affected by Four Common Pollutants Used in Illegal Marijuana Grow Sites?

Abstract

Objectives/Goals

Our objective was to see how four common pollutants (diesel fuel, pesticides, fertilizer, and fungicides) used by illegal marijuana growers affects the stream organism, Daphnia Pulex.

Methods/Materials

We used: Spring water, Daphnia Pulex, plastic containers, a microscope, slides, pipettes, pesticide (AzaMax: Botanical incecticide, miticide, and nematicide), fungicide (Serenade Garden: Disease control), fertilizer (Grow More), diesel fuel, and rubber gloves.

We did our tests by placing the Daphnia into containers of water mixed with the designated chemical and observing them under a microscope after two thirty minute intervals. For one set of tests, we moved the Daphnia into clean water for an additional 24 hours and then observed what happened to them. For the other set, we left them in the chemical solution for 24 hours straight and then observe their behavior.

Results

Overall, 79 of the original daphnia 160 Daphnia tested in chemicals survived during the duration of the experiment. All 40 of the 'control' Daphnia survived. During short-term exposure to the chemicals, the fungicide killed two of 30 daphnia throughout all five trials. All 30 of the Daphnia exposed to the diesel fuel died, five died when tested with the pesticide, and 19 were killed when tested with the fertilizer.

During the long-term exposure trials, the fungicide killed two of the ten tested Daphnia, nine were killed by the diesel fuel, six were killed by the pesticide, and the fertilizer killed all 10 of the tested Daphnia.

Conclusions/Discussion

All of the chemicals we tested during this experiment affect the Daphnia in some way. The diesel fuel slowed their heart rates and their bodies down before killing them. The fertilizer, on the other hand, simply killed them. Some of the Daphnia's heart rates were sped up far above normal after being exposed.

In a real life situation, the Daphnia that weren't killed from the chemicals probably wouldn't have a good chance of survival. The ones that were slowed down or got stuck in the chemical wouldn't be able to find food, reproduce, or run away from predators. In addition, since the chemicals are so toxic to the Daphnia, we believe that it is possible that this toxicity would pass upwards through the food chain.

Summary Statement

Our project is about the affects of four commonly used chemicals by illegal marijuana growers on the stream organism, Daphnia Pulex.

Help Received

Our teacher helped us order that supplies necessary for the project.