CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
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Project Number
31167

Project Title
Escondido Creek: A Water Quality Study

Abstract

Objectives/Goals
The Escondido Creek is surrounded by semi-urban development and agriculture. My hypothesis was that coliforms, including E. coli, from the horse barns nearby might be present in excessive concentrations in the Escondido Creek. I hypothesized that the constant hosing down of the barns at the horse farms might create an influx of bacteria due to runoff even in times of no rain. I decided to test water samples during dry times to see if bacteria levels decreased as more time passed since the last rain event.

Methods/Materials
I rode my bicycle to the creek and obtained water samples on multiple days, 7 days, 14 days, and 21 days after the last rain event. I refrigerated the samples immediately each time. I then cultured samples in a lab with adult supervision, but I did all of the work myself. I cultured the samples using sterile procedures and ColiScan Easygel.I mixed the ColiScan with 2 milliliters of sample water, and put the mixture in labeled Petri dishes in each trial. I also had made 0.1 and 0.001 dilution samples which were mixed with sterile water. The plates were placed in an incubator at 36 degrees C for 48 hours. I then returned to the lab, read the samples and recorded the results.

Results
Excessive levels of bacteria were found in abundance in my samples. In sample one, most of the coliform levels were too numerous to count, seeming to indicate contamination from the horse barns Even 14 or 21 days since the last rain event, my samples continued to reveal high levels of bacteria. For each sample cultured, there were coliform and E.coli lawns. There were also multiple lawns of non-coliform colonies in many plates. I also had other concerns regarding water quality due to some of my results from other measures of water quality testing. The pH level in the Escondido Creek was 8.5 on one day with an ammonia level of 0.25ppm. At a level of pH 8.5, even 0.25 ppm ammonia may be toxic to fish and aquatic life. Phosphate levels in my water samples were also too high (5 ppm -8 ppm). Iron levels were excessive (1 ppm # 5 ppm) and copper levels ranged up to 1.5 ppm. Chromium tested at 0.2 ppm which may indicate industrial waste.

Conclusions/Discussion
I would like to continue collecting more samples over an extended period of time. It appears the Escondido Creek in the area of Olivenhain remains contaminated with excessive loads of bacteria even during dry weather.

Summary Statement
My project tested creek water quality in an area surrounded by semi-urban develpment and agricuture.

Help Received
Thanks to my teacher who provided equipment and scientific guidance. Thanks to my mother who helped edit my report and also provided guidance.