

Introduction

In this experiment some scientist tested the effect of bar and foam soap on earthworms. People think as soap as soothing and gentle but can cause many problems to humans. Eating soap can cause nausea, vomiting, and diarrhea. Another effect of eating soap is that it can cause an increase risk of certain types of cancers. Another way that soap can get into your body is by inhaling it. If someone inhale soap fumes they may experience difficulty breathing or have swelling in the throat. Soap can also get into someone's eyes too and if that ever happened the causes are, they will experience eye redness, pain, loss of vision, and difficulty focusing. 13 billion bars of soap were sold in the whole year of 2020. These scientist want to test the real causes of soap. So the scientists took tests on these earthworms to see what happened. The scientists came up with a hypothesis which is, if scientists expose an earthworm to soap, then the soap will negatively affect its burrowing time because the earthworm's muscle will be affected by the chemicals, possibly in a state of self defense or shock.

Methods and Materials

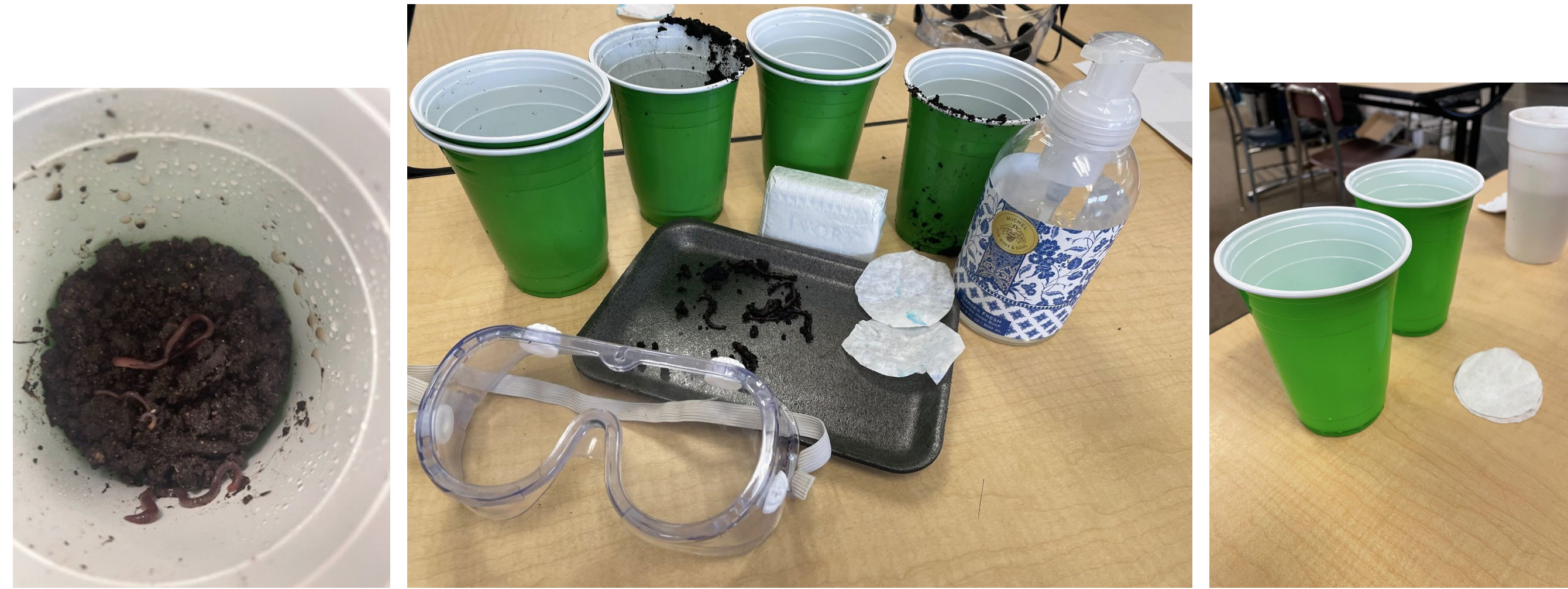
The scientists needed about a total of 54 adult worms to do this experiment. To start this test the scientists needed to make an exposure chamber. To make the exposure chamber the scientist need 2 cups and 36 coffee filters that are 2 ½ inches wide and long. First the scientists put one cup on the table, then put one coffee filter in that. Next the scientists put 3 of there earthworms in the cup. On top of that the scientist put there dilution in the cup with the worms. Then, the scientists put the last coffee filter on the earthworms and the next cup on top of all of that. After waiting for the certain amount of time they put the earthworms into a burrowing chamber. In order to make a burrowing chamber the scientists needed to get dirt from the school garden. Once the worms were in the chamber the scientists had to set a stopwatch and see how long it took the worms to burrow. By the time one worm was burrowed the scientists wrote down the time and did this till all of the earthworms. The scientists repeated this process for 20% foam soap, 10% bar soap, and 20% bar soap. To make these dilution the scientists needed water and their soap. For 10% dilution the scientists needed 9 mL of water and only 1 mL of their containment. On the other hand, for 20% dilution the scientists needed 80 mL water and 20 mL of soap.

Sources

<https://www.healthline.com/health/how-to-make-soap>
<https://www.soapguild.org/consumers/how-soap-made.php>
<https://m.economictimes.com/magazines/panache/soap-additive-may-cause-cancer-liver-disease/articleshow/45192310.cms>
<https://www.healthline.com/health/eating-soap#is-eating-soap-bad-for-you>
<https://oureverydaylife.com/ingredients-of-bar-soap-12259210.html>
<https://www.nytimes.com/2020/03/13/health/soap-coronavirus-handwashing-germs.html>

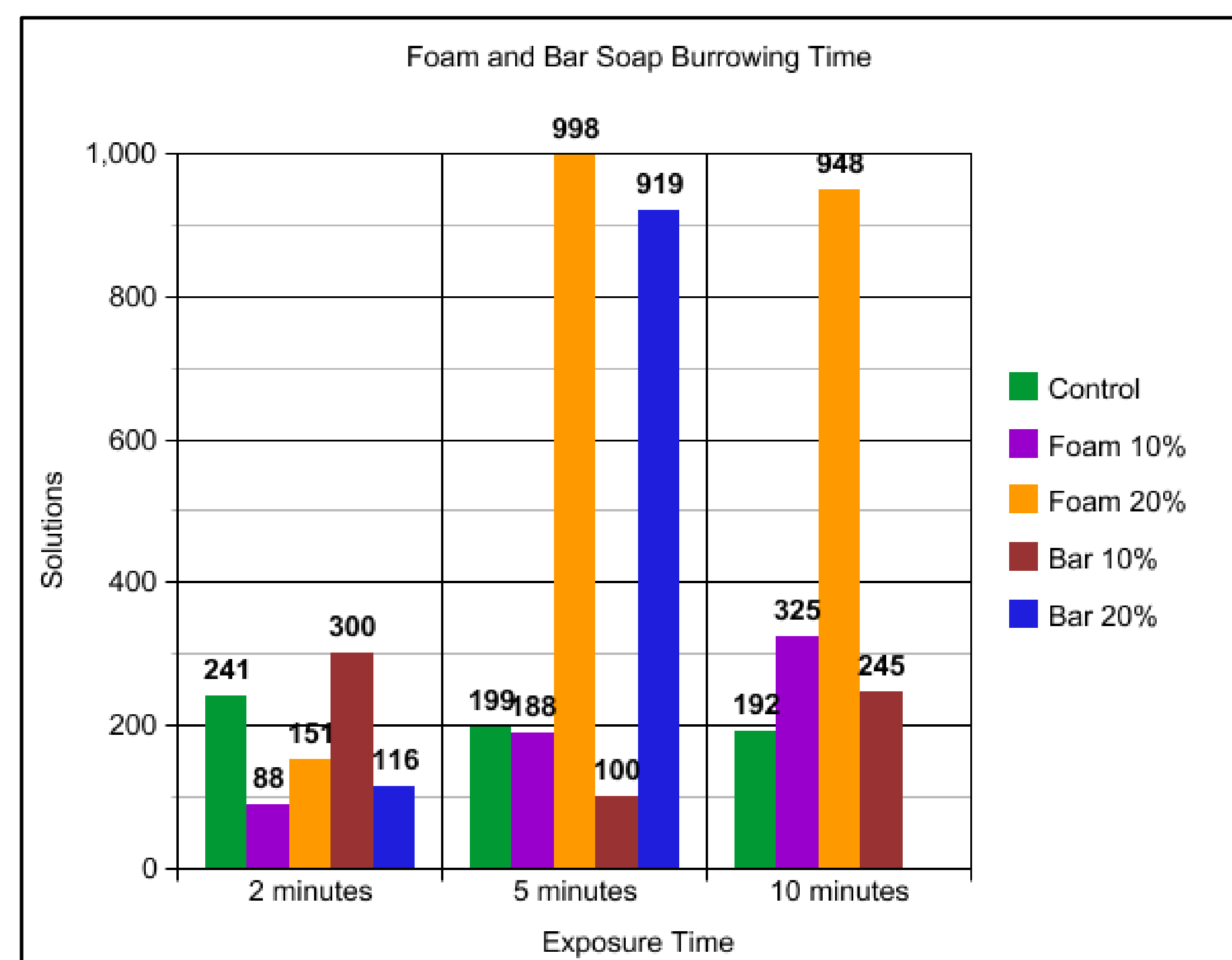
Clean Worms

By Lily



Abstract

Many people in the world use foam and bar soap on a daily basis, but don't know the harms of it. The research that was found that by testing on the worms stated that the earthworms burrowed slower when the worms are exposed for a certain amount of time to the contaminant. A contaminant is the soap that is being used in the experiment. The purpose of having to test the earthworms is to make sure that humans don't get hurt or affected in the process of creating or making the soap. The earthworms are also there to help them decide or know if any of their ingredients inside of the soap is effective to the worms. The scientists tested with soap because if humans eat soap, some effects could be swelling in the throat and a higher risk of cancer. The scientists tested on earthworms because they have the same muscular system as humans. Later on the scientists tested on the worms with 10% and 20% foam or bar soap for 2 minutes, 5 minutes, and 10 minutes. The scientists did multiple tests until all the worms burrowed pasted 20 minutes. With this experiment the scientists have found out that the soap affected the worms. In the end the scientists answer their question, can soap affect the burrowing time of earthworms?



Results

During this experiment, adult earthworms were exposed to 2 different contaminants. The contaminants that the earthworms were exposed too were foam and bar soap. The scientist also included a control which was water. Each contaminant was combined with water to make a 10% and 20% solution. Over all the scientists accepted the hypothesis. The scientists accepted their hypothesis because most of their data was statistically significant. The data is statistically significant because the t-score is higher than one. When the t-score is higher than one that means that the data is statistically significant. The t-score is important for this experiment because this helps the scientists agree or disagree with their hypothesis.

Discussion

The scientists tested soap on earthworms to see if the soap could affect the worms burrowing time. During this experiment the scientists found out that was true. After taking multiple tests on the earthworms, they all started to take longer than 20 minutes. The scientists tested with soap because some short term effects of foam and bar soap for humans is, tongue, throat, and other parts of your body to swell. Some more effects of eating soap are, nausea, vomiting, and diarrhea. So the scientists did this experiment to see if these were true. The scientists also found some trends and patterns during these tests. The first trend that the scientists did in this experiment, was that they tested on the worms for 2 minutes, 5 minutes, and 10 minutes. Another trend in this experiment is the earthworms keep getting slower and slower over time. One more of the trends was that the scientists always had to use 3 earthworms while testing. This is because, if one earthworm had been injured then the other 2 earthworms could have a better test. But also in this experiment there were also limitations. A limitation that was found in this experiment was that the scientists didn't have enough worms at times. Since there weren't a lot of worms they had to slow down and dig for worms. This affected the scientists because they didn't have a lot of time. This is also a limitation, that the scientists didn't have a lot of time. The scientists only had about 2 weeks to work on this experiment. If they would better results that would take months to finish. The next limitation that was found in this experiment was that at the start wad human error. Everyone makes human errors and the scientists did too. At the start of this experiment when the scientists were testing on the 10% foam soap, they added too much of the dilution. The scientists were only supposed to have 2 mL of the dultion in this experiment but they put 10 mL instead. Overall the scientists accepted their hypothesis, if scientists expose an earthworm to soap, then the soap will negatively affect its burrowing time because the earthworm's muscle will be affected by the chemicals, possibly in a state of self defense or shock.