Shampoo Does More Than Just Clean

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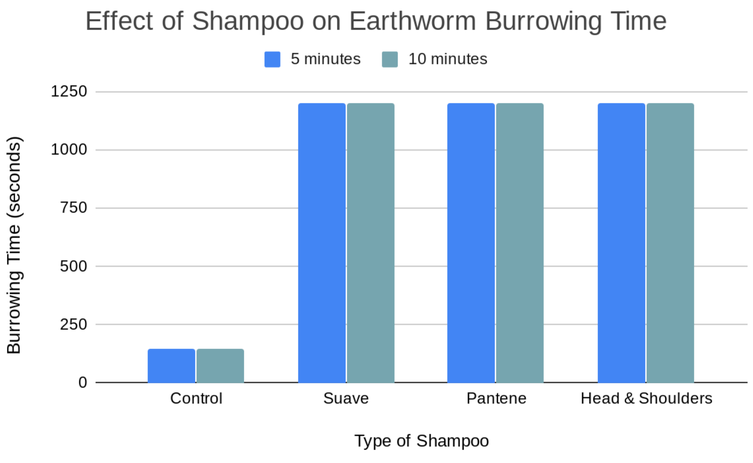
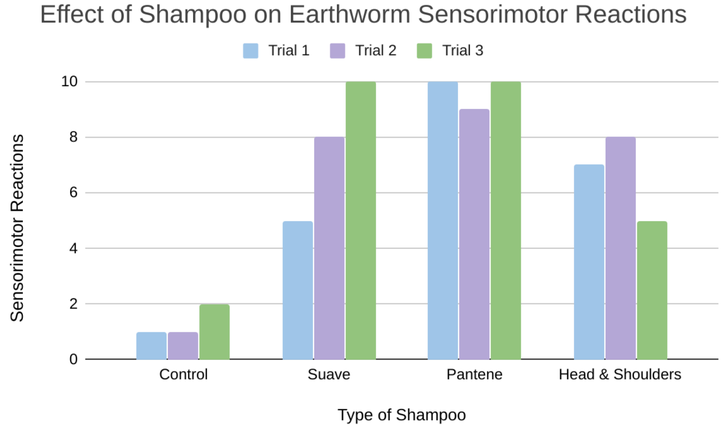
Abstract::

Does shampoo effect earthworm locomotion? Three scientists decided to conduct two main experiments to answer this question, and to find out if shampoo could potentially be doing more to humans than what people originally thought. The scientists did know that the shampoos they tested contained a chemical called methylisothiazolinone. MIT has been proven to slow connections between neurons in and is a suspected carcinogen also in due to its corrosivity on the skin. This helped explain why after being exposed to any type of shampoo for any duration of time, the earthworms' burrowing times were greater than 20 minutes. In addition to this, the results from the sensorimotor response testing showed the earthworms giving severe reactions. The scientists believed all of these responses were because of the MIT slowing chemical signals in the worms, and the corrosivity of the MIT on the worms' skin. The scientist's experiment can help people possibly avoid using shampoos with MIT. It can also possibly help companies stop using MIT in shampoo.





Introduction:

People use shampoo because it cleans their hair and gets rid of dirt and debris. However, shampoo can actually cause a lot of damage in addition to long and short term effects; this is a result to all the ingredients and chemicals in shampoo.

One main chemical that can cause damage to a human is called sodium laureth sulfate. Sodium laureth sulfate can have many effects on humans, such as eye and skin irritation and sometimes even cancer. Three scientists felt the need to conduct an experiment on the effects of shampoo on earthworms, due to the similarity in DNA. Three worms (representing three different trials) were put in an exposure chamber and were exposed to three different types of shampoos for different durations. To test if the shampoo was affecting them, their burrowing times were recorded afterward and compared to results from control experiments. A hypothesis was drawn that if scientists expose earthworms to shampoos then their burrowing times will increase because the MIT will slow the conection between nuerons.

Sensorimotor responses were also tested, where a worm would be encircled with a thin ring of shampoo. This was done three times with each shampoo type. The worms' responses to the shampoos would be graded on a scale of 1 to 10 on how strong their reactions were. A second hypothesis was that if scientists expose earthworms to shampoo, then the sensorimotor responses will be intense because the earthworms are irritated by the MIT.

Materials and Methods:

The scientist's procedures for the two experiements done were:

Burrowing Time Experiment-

Create exposure chamber with two cups with coffee filter and shampoo in between them. Burrowing chamber is another plastic cup with soil in it.

1. Place worms in exposure chamber with shampoo and let them sit for five minutes
2. Put them in burrowing chamber and time how long burrowing takes for each worm
3. Do this for exposure times of both 5 minutes and ten, and for all shampoo types

The scientist's procedure for their

Sensorimotor Response Experiment-

Use metal tray and each type of shampoo.

1. Make a thin ring of shampoo in a circle on metal tray
2. Place one worm in shampoo ring and grade reaction on a scale of 1 to 10- one being no reaction, ten being a very strong reaction
3. Take the worm out and rinse with water, then do the experiment three times with each shampoo

The scientists collected data using a stopwatch and timer and recorded it on a Google spreadsheet. They also determined the t value of their data by using an online calculator.

Results:

It took the earthworms over 20 minutes to burrow in all the burrowing time experiments, with all three types of shampoos. However, the control tests done for 5 and 10 minute exposure times only took about 2 minutes and 25 seconds.

In the sensorimotor response experiments, the reactions the worms gave were all pretty intense, with the lowest reaction a five and the highest a ten. The control tests done, however, only gave ones and twos as reactions. The graph to the left shows this data.

Both of these tests done show that all three types of shampoos have major impacts on the worms' ability to move, react, and support the scientist's hypothesis. The scientists knew that the data was significantly sufficient because all calculated values of T were over 1.

Discussion:

After doing research, the scientists believed that when an earthworms is exposed to methylisothiazolinone (MIT), it causes chemical signals to take longer to get to the synapse area. Without the chemical signal, the muscles inside of the worm cannot contract and relax as quickly. This would cause the worm to coil up, get cramps, and to be in a lot of pain when trying to move. This would explain the worms' reactions because MIT was in all the shampoo types.

However, for the sensorimotor response testing, the scientists believe that the MIT damaged their skin, which irritated the earthworms. Because earthworms breathe through their skin, it is believed that the earthworms were also struggling to breathe due to the damage.

Unfortunately, the scientist's experiment is not adequate. They did not have enough time and should do more testing. To expand their experiment, the scientists want to either test other brands of shampoos; these would be shampoo types which don't contain MIT, or other forms of it.

Sources Cited:

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