

# The Effects of Isopods on Environment

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My research was done over isopods and how they impact the soil as decomposers. I wanted to research this because of climate change, and the knowledge that decomposers, such as isopods, are essential to the environment. As an major agriculture state, one of the most devastating effects of climate change has been how our soil has gotten less and less fertile. I wanted to research isopods specifically because they are quite common in central Indiana, and are a major decomposer.

My research question was how do isopods affect the soil of their habitat? If isopods were to be put in their ideal environment, would they cause a positive effect on the soil?

My hypothesis was that if an area of soil has isopods, then it will be more fertile. This soil will have a healthier pH, average CEC (Cation Exchange Capacity), and higher nutrient levels.

The starting design of experiment was to keep isopods in tank simulating a near perfect environment, which I did by keeping them in a humid tank that had sphagnum moss and a coconut substrate-creature soil mix.

I carried out my experiment by keeping ~30 Powder Blue isopods in a tank, watering them daily and feeding weekly, then taking data of the tank's soil's pH, CEC, and nutrient levels every 2 months.

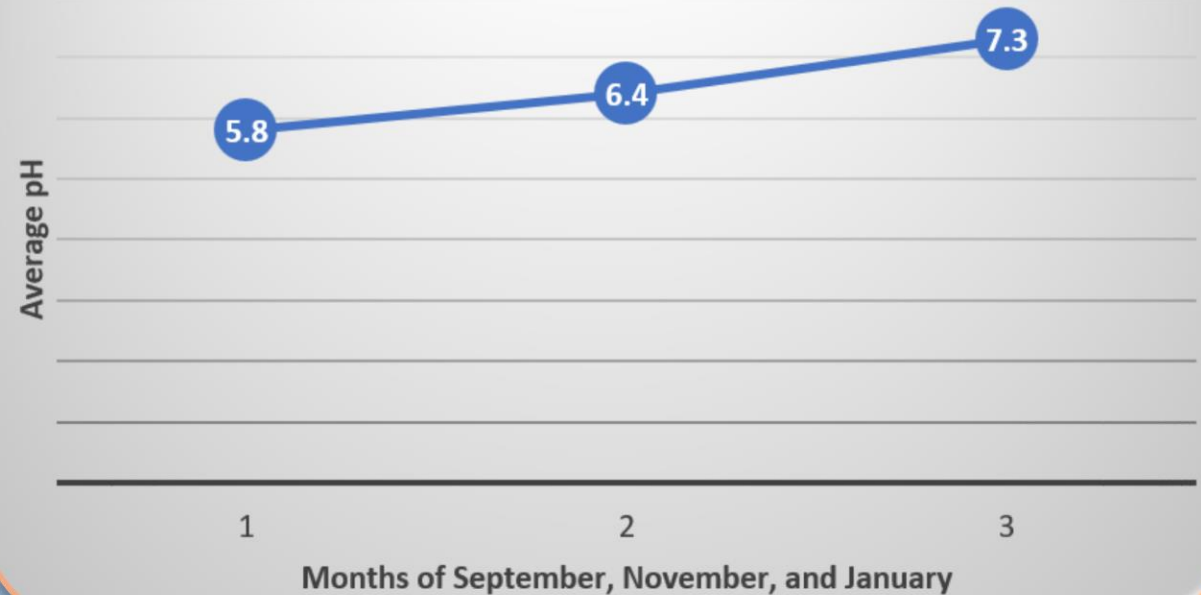
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I collected my data samples by putting soil into a 2;1 slurry of the tank soil and water. Nutrient levels were measured by soil test kits, the pH with a pH meter, and the CEC with the standard CEC estimation

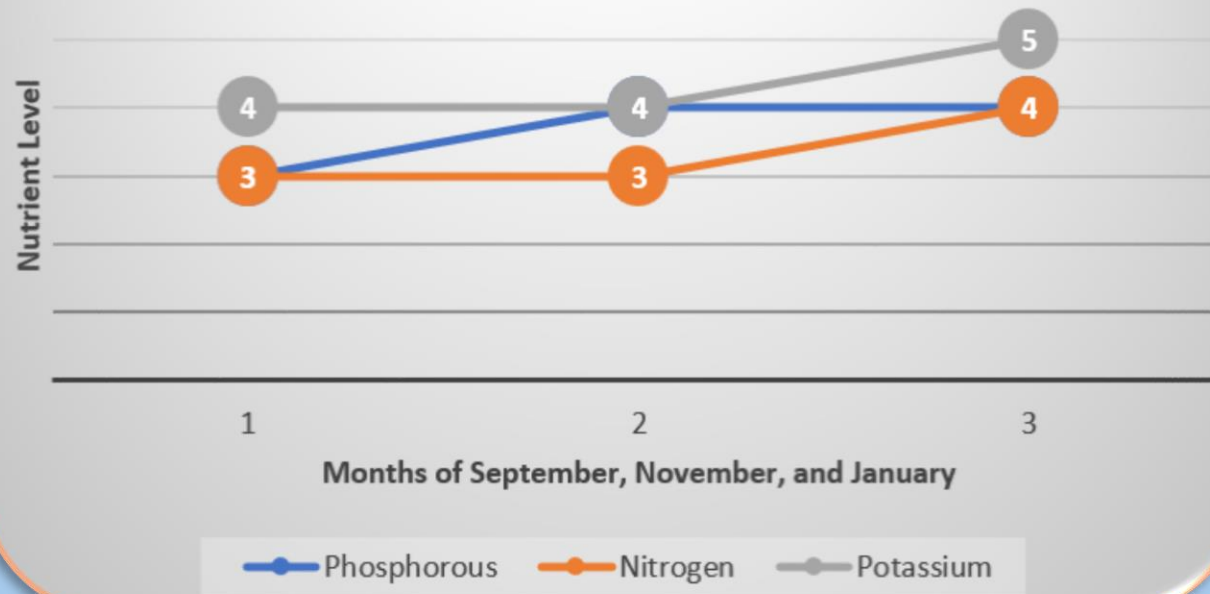
Between September and January, the average pH went from slightly acidic to a neutral measurement. A healthy soil pH is in the ranges of 6.0-7.5, showing a positive change.



### Average pH Over Time



## Average Nutrient Levels Over Time



Over time, the average nutrient levels increased. When measured with a 1-5 scale soil testing kit, the datapoints show higher amounts of nutrients over the length of the experiment



As seen in my data, all measurements of the soil's fertility improved after being exposed to the isopods. The pH of the soil started from 5.8, and was at a 7.3 in the last data point. Plants should thrive in a soil with a pH range of about 6.0 -7.5. Our CEC started at 53, then ended at 72, which is healthy for substrates. The CEC is a way to measure how well soil can hold and retain nutrients, a crucial part to having a fertile soil. Nutrient levels were measured on scales of 1-5, going in order of: depleted, deficient, adequate, sufficient, and surplus. Our phosphorous started at a 3, adequate, then changed to a sufficient 4, and settled at 4. Nitrogen started at an adequate 3 and stayed at 3 when checked in November. In January, this went up to a sufficient 4. Our potassium started with a sufficient 4 and stayed at this 4 when data was taken in November. In January, the soil reached a surplus level of 5.

My results show that isopods overall enhance the soil quality of areas they inhabit for an extended amount of time. Based off of my data, I can infer that if this experiment was redone in real Indiana land, it would have similar findings, other than errors caused by the uncertainty of climate. The data found does support my hypothesis as it shows that, according to the numbers, the isopods caused a positive effect on soil that should allow for better fertility. I believe that with this fertility, it can help with the general damage caused to agriculture by climate change.

If this experiment were to go further, I would definitely take observations over natural soil over a longer course of time. I believe that my experiment does have possible inaccuracies due to trying to keep a better quality of life for the isopods. If I repeated it, I would take measurements more often, and try to make their habitat more accurate to Indiana rather than their optimum conditions.

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