

Ecological Study of the Effect of Polychaetas on Soil Quality in Intertidal Ecosystems

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Introduction

Background

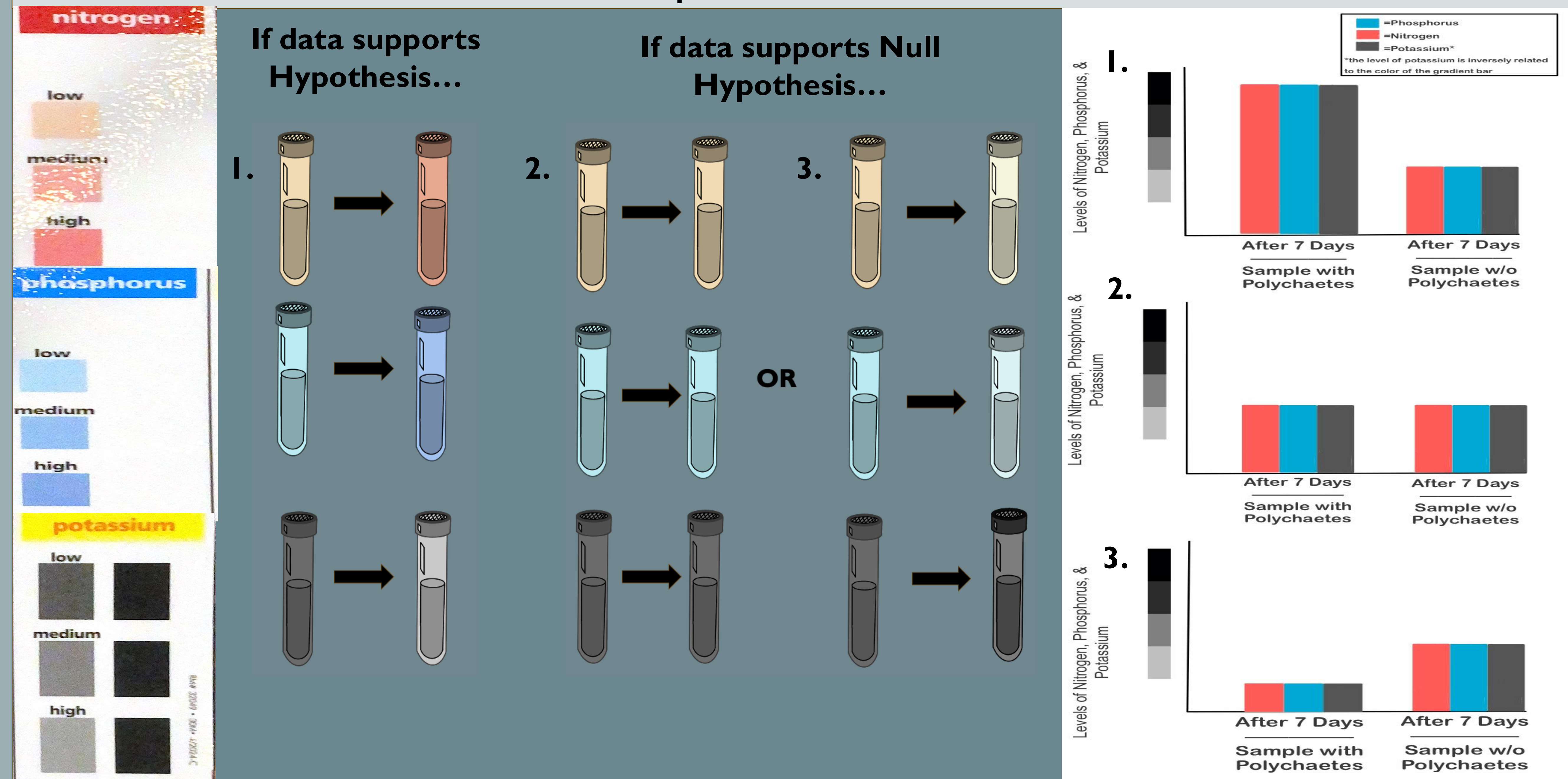
Intertidal ecosystems support a vast array of flora and fauna, and soil quality is a foundational component of an intertidal ecosystem's health. Healthy soil comprises a balance of nutrients including nitrogen, phosphorus, and potassium. This balance supports the growth of various seagrasses by aiding in photosynthesis, root development, and drought resistance while also supporting the wellbeing of many sand-dwelling species by encouraging the free movement of oxygen and nutrients.

While phenomena like decomposition naturally return these nutrients to the soil, it is well-established that the Annelid class oligochaetes, or earthworms, vastly improve soil health in terrestrial ecosystems by speeding up the breakdown of organic matter as they consume their weight in it per day. However, the literature on the effect of another closely related Annelid class—the polychaetas, or marine worms—on soil quality in marine ecosystems is less extensive.

Research Objective

This study aims to examine if polychaetas significantly increase the amounts of macronutrients and micronutrients nitrogen, phosphorus, and potassium in sand over time using the intertidal ecosystem of St. Teresa Beach, FL.

Expected Results



Materials & Methods

- 6 oz. of several polychaete species was collected. The polychaetes were collected from St. Teresa Beach, FL using a shovel and sand sifter.
- Four 6 oz. sand samples were collected from different areas of St. Teresa Beach, FL and homogenized in a mixing bowl.
- After homogenizing the sand, a Mosser Lee/Soil Master ML1210 Soil Test Kit was used to collect a soil sample and test for the initial amounts of nitrogen, phosphorus, and potassium.
- Four 12 oz. containers were then prepared with 6 oz. each of the homogenized sand and 5 oz. of sand-filtered seawater. The polychaetes were distributed among two of the containers, and the other two were left empty. Air stones were placed in the containers to provide a continuous supply of oxygen.
- After 7 days, Mosser Lee/Soil Master ML1210 Soil Tests were used to collect soil samples and test for the new amounts of nitrogen, phosphorus, and potassium in each of the four containers.
- The experiment is repeated 3 times, and for each repetition a new sample of polychaetas and beach sand is collected.



References

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