Title: Study the relationship between soil quality and water quality that affects molluskdensity.in the mangrove forest area of Khanom National Park and SaNai Mangrove Forest in Khanom District. Nakhon Si Thammarat

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Abstract

A study on the relationship between soil quality and water quality affecting shellfish density in Khanom Park and Sa Mangrove Forest in Khanom District, Nakhon Si Thammarat Province. Objective 1) To study the soil quality in the area of Khanom Park mangrove forest and SaNai mangrove forest affecting the density of shellfish. 2) To study the quality of water in the area of Khanom National Park mangrove forest and SaNai mangrove forest affecting the density of shellfish by studying moisture, soil pH, temperature, soil color, soil texture characteristics, and soil macronutrients that are indicators of soil quality in each study zone and the density of shellfish. It was found that the salinity and oxygen content in Khanom National Park mangrove forests are higher than in the Inner mangrove forests, resulting in higher shellfish counts than in the inner pond mangroves.

Keywords: Shellfish, Striped forest, Soil quality, Water quality

Introduction

Mangroves are ecosystems made up of a variety of plants and animals. Living together in a clay environment brackish water or regular seawater flooding. Found in estuarine plains, bays, and coastal areas in the intertidal zone, it is a nursery and habitat for many aquatic species, including shrimp, crabs, fish, and mollusks. It is classified as another popular economic animal. There is a stripe parallel to the curvature of the edge of the lid. It tastes like oysters. It can be used in many forms of cooking, so it is another popular food, especially in Khanom district because it is a district that borders the sea coast and has many mangrove forests.

The group studied data on the density of mollusks. It was found that each mangrove forest area has a different rate of density of shellfish. The group wanted to study the relationship between soil quality and water quality that affect shellfish density. The study was conducted in the area of Khanom National Park mangrove forest and SaNai Kaeng mangrove forest.

Research Questions

1. Does the soil quality in Khanom Park and SaNai mangrove forest affect the density of shellfish?

2. Does the water quality in Khanom Park and SaNai Mangrove Forest affect the density of shellfish?

Research hypothesis

1. The quality of the soil in the area of Khanom Park mangrove forest and SaNai mangrove forest is different, the density of shellfish is different.

2. The water quality in the areas of Khanom Park and SaNai Mangrove Forest is different, the density of shellfish is different.

Research Objectives

1. To study the quality of soil in the area of Khanom Park mangrove forest and SaNai mangrove forest affecting the density of shellfish.

2. To study the water quality in the area of Khanom Park mangrove forest and SaNai mangrove forest affecting the density of shellfish.

Methods and material

1.) Thermometer
2.) Soil sampling canister
3.) Soil pH measurement kit
4.) Stir glass stick
5.) Beaker
6.) Photographic Equipment
7.) Geo-coordinate meter
8.) Test tube
9.) Weighing scale
10.) Filter paper
11.) Water Quality Measurement Kit

Defining Study Points

The area of Khanom Park mangrove forest and Sa Mangrove forest in Khanom District, Nakhon Si Thammarat Province

How to conduct research

1. Pre-research stage

1) Set study points, choose the topic you want to study.
2) Study, research, gather knowledge and theories related to the research.
3) Determine the purpose of the study.
4) Determine the sampling point in the study area.

2. Implementation stage

Part 1 study the soil quality in the area of Khanom Park mangrove forest and SaNai mangrove forest.

1.) Establish sampling points in the mangrove forest area of Khanom Beach Park and SaNai Mangrove Forest, with 3 soil sampling points each, totaling 6 soil sample collection points.

2.) Study the physical characteristics of the soil by studying the structure of the soil. Study soil texture and soil color by comparing it to soil charts.

3.) Measure the soil temperature at all points by bringing a thermometer to measure the soil temperature at a depth of 10 centimeters. Data collected 3 times

4.) Measure soil moisture at all points by bringing a multi-purpose meter to a depth of 5 centimeters. Soil moisture readings Data collected 3 times

5.) Measure the pH of the soil using a multi-purpose measuring tool.

6.) Measure the amount of nitrogen, phosphorus and potassium in the soil by taking the collected soil and dissolving it with distilled water, the ratio of soil: water is 1:5, then the dissolved soil is filtered with filter paper and examined with a nitrogen, phosphorus and potassium monitoring kit.

Part 2 to study the water quality in the area of Khanom Park mangrove forest and SaNai mangrove forest.

Acidity Measurement Base of water

Measure the acid-base in the area. Acid-Base Measurement with Multipurpose Meter A total of 3 measurements were taken.

Water temperature measurement

Measurement Temperature with thermometer by immersing the thermometer in the water of the study area. About 3 – 5 minutes to read the thermometer. Dip the thermometer for another 1 minute to measure, measure the 2nd and 3rd times, and read the reading, record the result.

Determination of dissolved oxygen content

Measure the amount of dissolved oxygen in the area. The water collection bottle was emptied with water at study site 3. Then open the lid, drop 2 drops of the 1st solution, then drop 2 drops of the 2nd solution, and close the lid. Shake until a yellow sediment forms, waiting for the sediment to fall in half, then open the lid of the 3rd. 5 drops and shake well until the sediment is completely dissolved. Pour 5 mL of the resulting water into the new test tube, add the 4th reagent drop by drop, count the number of drops used, and see the color of the water as a faded yellow. Then 2 drops of the 5th solution turned blue, then dripped the 4th solution, and counted the number of drops until the water became colorless.

Measuring water transparency with a turbidity meter

Scoop up water from the study source and fill it into the cylinder until you reach the point where the black and white in the transparency cylinder is not visible. Read the value, save the result.

Measure the salinity of water.

Water samples were collected from the study site, dripped onto a pen salinity meter. Read salinity values, record results, repeat the experiment 3 times.

Part 3: Measure the density and size of mollusks together.

Determine the study area around Khanom Park mangrove forest area and SaNai mangrove forest. Wait for the low tide period. Use a random table measuring 100 x 100 centimeters. Place on the study area, count the number of clams together. Save the result. After that, take the clams. 1 smallest, 1 medium, and 1 large Measure dimensions Find the average, record the result.

Result and Data

Table Soil structure Adhesion of soil, soil color and texture

Mangrove area	Earth color	Soil fixation	Ground beef
Khanom Park	dive	solid	Clay loam
Inner Pool	sugar	Ruansui	Sandy soils mixed with loam.

Table Soil fertility in each district

Mangrove zone	Soil fertility		
	nitrogen	phosphorus	potassium
Khanom Park	trace	medium	low
Inner Pool	low	low	trace

Table pH in soil

Mangrove zone	Soil pH			
	1st time	2nd time	3rd time	average
Khanom Park	6.5	7	6.5	6.7
Inner Pool	7.5	8	7	7.5

Table Moisture value in the soil

Mangrove zone	Soil moisture			
	1st time	2nd time	3rd time	average
Khanom Park	More than 10	More than 10	More than 10	More than 10
Inner Pool	9.5	9	9	9.10

Table Soil temperature

Mangrove zone	Soil temperature(degrees Celsius)			
	1st time	2nd time	3rd time	average
Khanom Park	26	25	26	25.67
Inner Pool	27	26	26	26.33

Table Water Transparency

Mangrove zone	Water transparency			
	1st time	2nd time	3rd time	average
Khanom Park	45	40	45	43.33
Inner Pool	50	50	45	48.33

Table Water temperature

Mangrove zone	Water temperature (degrees Celsius)			
	1st time	2nd time	3rd time	average
Khanom Park	26	26	26	26
Inner Pool	27	27	26	26.66

Table Salinity of water

Mangrove zone	Water Salinity (PSU)			
	1st time	2nd time	3rd time	average
Khanom Park	30	28	30	29.33
Inner Pool	21	21	22	21.33

Table pH in water

Mangrove zone	pH in water			
	1st time	2nd time	3rd time	average
Khanom Park	7	6.5	6.5	6.7
Inner Pool	7	7.5	7.5	7.5

Table Oxygen content in water

Mangrove zone	Oxygen content in water (DO)			
	1st time	2nd time	3rd time	average
Khanom Park	4.0	3.5	4.0	3.83
Inner Pool	3.5	3.5	3.0	3.67

Table showing the density of mollusks together.

Mangrove zone	Number of shellfish (body)			
	1st time	2nd time	3rd time	average
Khanom Park	5	8	6	6.33
Inner Pool	3	2	4	3

Table Sizes of mollusks

Mangrove zone	Body size of mollusks (centimeters)			
	1st character	2nd character	3rd character	average
Khanom Park	8.7	8.4	6.5	7.87
Inner Pool	6.4	4.4	5.3	5.37

Conclusions

Part 1 from the study of soil quality, mangrove areas, Khanom Park and SaNai mangrove forests.

The soil texture in the mangrove forest park is characterized by a clay loam texture. The earth color is black, holding together tightly. It has an average pH of 6.7, an average temperature of 25.67, a high humidity greater than 10, and soil integrity. The soil texture of the inner pond mangrove forest is a loamy and sandy soil with a dark brown color, pH of 7.5 and an average temperature of 26.33 degrees Celsius. Moisture content of 9.10 and soil quality were found to have low nitrogen and phosphorus content, and potassium was not found in the pond forest soil in the mean salinity value of 21.33 and average oxygen value (*DO)* of 3.83.

Part 2 From the study of water quality in Khanom Park mangrove forest area and SaNai mangrove forest, it was found that the water

In Khanom Park mangrove forest. The average temperature is 26 degrees Celsius. The average *pH* was 6.7, the average transparency was 43.33, the salinity was 29.33, and the oxygen (*DO)* was 3.83.

Part 3 Measure the density and size of mollusks together.

From the study of the density and size of shellfish in Khanom Park mangrove forest and SaNai mangrove forest, it was found that the average number of clam densings at Khanom Park mangrove forest was 6.33 and the average size was 8.87, while the density rate of the number of clams in the SaNai mangrove forest averaged 3 and the average size was 5.37.

Discussion

The relationship between soil quality and water quality has been studied. It was found that moisture, soil pH, temperature, soil color, soil texture characteristics, and macronutrients in the soil are indicators of soil quality in each study zone and the density of mollusks. It was found that the salinity and oxygen content in Khanom National Park mangrove forests are higher than in the inner mangrove forests, resulting in higher shellfish counts than in the inner pond mangroves.

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Citations

จักรกฤษณ์ จันทร์แฉล้ม.2558. กระบวนการฟื้นฟูพื้นที่ป่าชายเลนเพื่อการพัฒนาที่ยั่งยืน:กรณีศึกษาชมชต้นแบบบ้านเปร็ตในตำบลห้วยน้ำขาว อำเภอเมือง จังหวัดตราด.(วิทยานิพนธ์มหาบัณฑิต)มหาวิทยาลัยศิลปากร,กรุงเทพ

พลูศรี วันธงไชยและคณะ.2556.คู่มือความรู้เรื่องป่าชายเลน.(พิมพ์ครั้งที่ 5).กรุงเทพ :กรมทรัพยากรทางทะเลและชายฝั่ง

วรรณธิดา พันธุ์พงศ์.2553.การปรับปรุงการจัดการทรัพยากรจัดการป่าชายเลนของคณะกรรมการชุมชนในเขตตำบลบางปู อำเภอเมือง จังหวัดสมุทรปราการ.(วิทยานิพนธ์มหาบัณฑิต). วิทยาลัยการปกครองมหาวิทยาลัยขอนแก่น,ขอนแก่น

Thai aquatic animals. Retrieved from https://www.sanook.com/dictionary/dict/dict-fish/search

Marine and coastal resources. Mangroves Retrieved from https://km.dmcr.go.th/c_11