

A Study of Plankton Biodiversity in the Water Source of Sa Nae Daeng



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01 Abstract

Abstract; This research, "A Study of Plankton Biodiversity in the Water Resources of Sa Nae Daeng Pond, Somdet Phra Srinagarindra 95 Public Park (Khao Pae Choy), Na Ta Luang Subdistrict, Mueang Trang District, Trang Province," aims to investigate the biodiversity of plankton in the water resources of Sa Nae Daeng Pond. The study examines water temperature, pH, dissolved oxygen (DO), cloud types, relative humidity, and air temperature. The water quality study of Sa Nae Daeng Pond revealed an average water pH of 8, an average water temperature of 28.25°C, a dissolved oxygen (DO) range of 5.25 mg/l, and an average water transparency of 0.32 m. The average air temperature was 32.8°C, the average humidity was 51.95%, and the most prevalent cloud type was Cirrus, followed by Cumulus. The plankton biodiversity study identified 10 species of zooplankton, including Dugesia spp., Ephemeropterus barroisi, Rotifer sp., Paramecium sp., Spirulina sp., Neidium productum, Phacus sp., Strongyloides stercoralis, Oscillatoria sp., and Odonata sp. Three species of phytoplankton were identified: Micrasterias furcata, Closterium sp., and Arcella discoidea Ehr. Keywords: Somdet Phra Srinagarindra 95 Public Park (Khao Pae Choy), Na Ta Luang Subdistrict, Mueang Trang District, Trang Province, plankton, water quality, Sa Nae Daeng Pond.

02 Research Question

Does the water quality of Sa Nae Daeng Pond affect the diversity of plankton?

03 Introduction

Water is a natural resource essential for the survival of all living organisms. It is also a crucial factor in the development of various fundamental economic sectors. Plankton, meaning "drifting" or "wanderer," refers to organisms that float in water bodies with minimal resistance to currents. Due to their minute size, plankton are often difficult to see. However, microscopic examination of water samples reveals a diverse array of colorful plankton. This high diversity is attributed to the varying nutritional needs and environmental preferences of different plankton species. Plankton are broadly classified into phytoplankton and zooplankton, both of which are vital food sources for other aquatic organisms. Phytoplankton serves as the primary producer in the food chain, consumed by zooplankton, which are then eaten by juvenile fish and other aquatic animals, ultimately reaching humans. Thus, the species and abundance of all organisms in the food chain are inextricably linked. The species and abundance of phytoplankton dictate those of zooplankton, and so on, throughout the food chain. Environmental factors, therefore, play a critical role in determining phytoplankton species and abundance. Human activities, such as waste disposal into water bodies from communities and industries, disrupt this delicate balance, altering water properties and subsequently affecting plankton composition, with cascading effects on other organisms in the food chain.

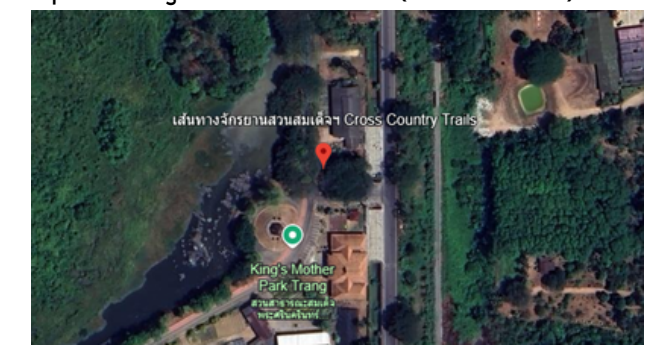
Therefore, the research team is interested in studying the biodiversity of plankton in the water source of Sa Nae Daeng Pond, Somdet Phra Srinagarindra 95 (Khao Pae Choy) Park, and the water quality, as well as the relationship between plankton and water quality. This study aims to establish a baseline for water quality management and to enhance the park's aesthetic appeal, as no prior research has been conducted in this area.

04 Research Methods

1. Research Preparation Stage
 - 1.) Define the research topic and select the study subject.
 - 2.) Conduct literature review and gather knowledge and theories related to the research.
 - 3.) Define the objectives of the study.
 - 4.) Determine the sampling points within the study area
2. Implementation Stage
 - 1.) Plan the research execution.
 - 2.) Survey the research area.
 - 3.) Collect water samples to study plankton species using a light microscope.
 - 4.) Study the physical factors affecting plankton diversity in the water source at Somdet Phra Srinagarindra 95 (Khao Pae Choy) Park, Na Ta Luang Subdistrict, Mueang Trang District, Trang Province.

carrying out investigations

- Part 1: Water Sampling
1. Determine water sampling points and survey the water source area.
 2. Measure the pH of the water using universal indicator paper, read and record the results.
 3. Measure the water temperature using a thermometer for temperature measurement at a depth of 10 centimeters, wait for 5 minutes, read the value, and then record the results.
 4. Measure the dissolved oxygen (DO) level by taking the collected water and testing it with an oxygen test kit, read and record the results.
 5. Measure the water transparency using a Secchi disk, immerse it in the water at 4 points, 3 times at each point, read and record the results, and observe the amount of cloud cover.
 6. Measure the air humidity using a digital hygrometer.
- Part 2: Plankton Sampling
1. Collect water samples along the pond's edge at 4 points, 3 times each, in a straight line over a distance of 50 meters. Use a plankton tow net and water sample bottles.
 2. Study the plankton species using a light microscope. Capture images of the plankton with a mobile phone.
 3. Identify the plankton species and record the results.
- Analysis
1. Analyze and compare the relationships between the data using statistics, specifically the mean (X) and standard deviation (S.D.).
 2. Estimate the percentage of cloud cover (out of 100%).



map of study site

- I AM A COLLABORATOR**
In the study of plankton biodiversity in the water source at Sa Nae Daeng Pond, Somdet Phra Srinagarindra Park, Na Taluang Subdistrict, Mueang Trang District, Trang Province. The researchers are Ms. Kanokwan Songsaeng, Ms. Warisa Khongthep, and Ms. Kumuttamas Phetkhan. We have a strong and efficient team, with clear division of duties. Each member is able to fully perform their tasks and support each other throughout the work. In data analysis, there is coordination with students from Wichienmatu School at the same level, namely Mr. Kritin Kongkaew, Mr. Sittikhorn Nuwan, and Ms. Sakuna Khaopong, who are studying the physical factors affecting the biodiversity around Nong Chumsaeng Public Park, Yantakhao District, Trang Province. The advantage of working as a team is that both groups have been able to exchange knowledge.
- I AM A STUDENT RESEARCHER**
I am investigating Sa Nae Daeng Pond in Somdet Phra Srinagarindra 95 Park (Khao Pae Choy), Na Taluang Subdistrict, Mueang Trang District, Trang Province. I am using the GLOBE database to collect data. I have created a table to record the results of the study, calculate the average from the raw data, summarize the findings, and answer the research questions from the project.
- I AM A COLLABORATOR**
The researchers are interested in studying the biodiversity of plankton in Sa Nae Daeng Pond, Somdet Phra Srinagarindra 95 Park (Khao Pae Choy), Na Taluang Subdistrict, Mueang Trang District, Trang Province, to explore plankton diversity. The researchers conducted the study by collecting water samples on-site. These samples were then examined under a light microscope to identify the different species. The resulting data was analyzed and used to summarize the research.

05 Results

Table 5: Zooplankton Count Display

Species	Cell count				Average (X)
	Area 1	Area 2	Area 3	Area 4	
Dugesia spp.	1	0	0	0	0.25
Ephemeropterus barroisi	3	0	0	0	0.75
Rotifer sp.	0	0	1	2	0.75
Paramecium sp.	0	0	1	0	0.25
Spirulina sp.	0	0	2	0	0.5
Neidium productum	0	1	1	0	0.5
Phacus sp.	2	4	3	2	2.75
Strongyloides stercoralis	0	0	3	0	0.75
Oscillatoria sp.	0	3	0	2	1.25
Odonata sp.	0	0	0	3	0.75
Total	6	8	11	9	8.5

From Table 5, which shows the number of zooplankton, it was found that there is a diversity of 10 types of zooplankton : Dugesia spp., Ephemeropterus barroisi, Rotifer sp., Paramecium sp., Spirulina sp., Neidium productum, Phacus sp., Strongyloides stercoralis, Oscillatoria sp., and Odonata sp.

Table 6: Phytoplankton Count Display

Species	Cell count				Average (X)
	Area 1	Area 2	Area 3	Area 4	
Micrasterias furcata	0	0	1	0	0.25
Closterium sp.	0	0	0	1	0.25
Arcella discoidea Ehr.	0	2	0	0	0.5
Total	0	2	1	1	1

From Table 6, which shows the number of phytoplankton, it was found that there is a diversity of 3 types of phytoplankton : Micrasterias furcata, Closterium sp., and Arcella discoidea Ehr.

06 Discussion

From the water quality study at Sanare Dang Pond, Somdet Phra Srinagarindra 95 Public Park (Khao Pae Choy), Na Taluang Subdistrict, Mueang Trang District, Trang Province, the average dissolved oxygen was 5.25 mg/l. According to the surface water quality standards for Category 3, this is considered normal dissolved oxygen levels. The pH value was 8, indicating that the water is alkaline. At an average depth of 0.32 meters, the average water temperature was 28.25 degrees Celsius. According to the surface water quality standards for Category 3, this is considered a high temperature. This water quality has an impact ON THE DIVERSITY OF PLANKTON IN THE SANARE DANG POND AREA.

07 Conclusion

Summary of the experiment
The study of plankton biodiversity in the water source at Sa Nae Daeng Pond, Somdet Phra Srinagarindra 95 Public Park (Khao Pae Choy), Na Ta Luang Subdistrict, Mueang Trang District, Trang Province, found that the average pH of the water was 8, the average water temperature was 28.25°C, the dissolved oxygen (DO) was in the range of 5.25 mg/l, the average water transparency was 0.32 m. The average air temperature was 32.8°C, the average air humidity was 51.95%, and the cloud cover was found to be mostly Cirrus, followed by Cumulus.
Study of Plankton Diversity in the Water Source at Sanare Dang Pond, Somdet Phra Srinagarindra 95 Public Park (Khao Pae Choy), Na Taluang Subdistrict, Mueang Trang District, Trang Province: study results
Zooplankton : A total of 10 species were found, including Dugesia spp. , Ephemeropterus barroisi , Rotifer sp. , Paramecium sp. , Spirulina sp. , Neidium productum ,Phacus sp., Strongyloides stercoralis , Oscillatoria sp. , Odonata sp. Phytoplankton: A total of 3 species were found, including Micrasterias furcata , Closterium sp. , Arcella discoidea Ehr.

08 Bibliography

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