Princess Chulabhorn Science High School Nakhon Si Thammarat Thailand

A study of the relationship between environmental factors and the abundance and diversity of *Acetes* shrimp in mangrove forests in Pak Phun Subdistrict, Meung Nakhon Si Thammarat District, Nakhon Si Thammarat Province, Thailand.

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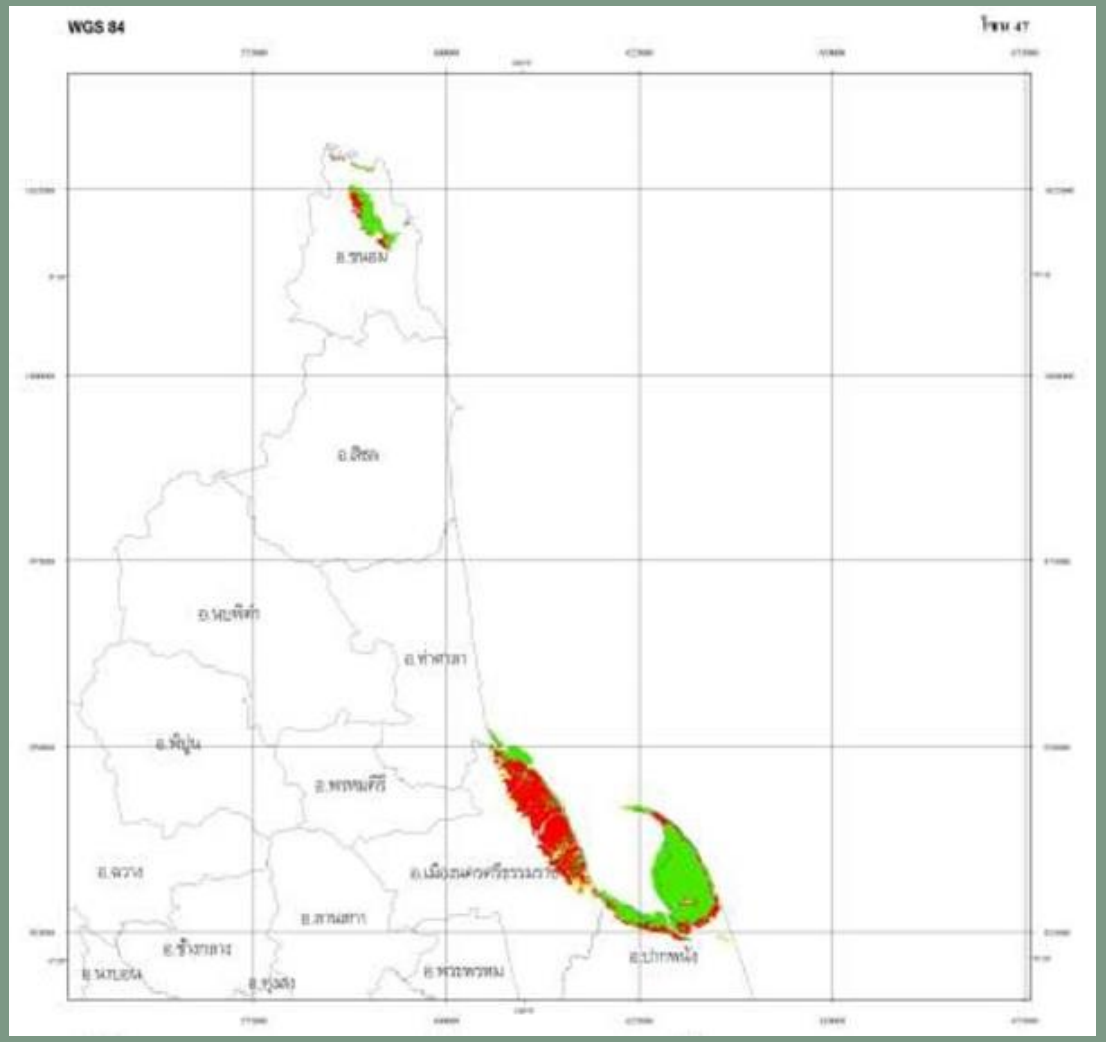
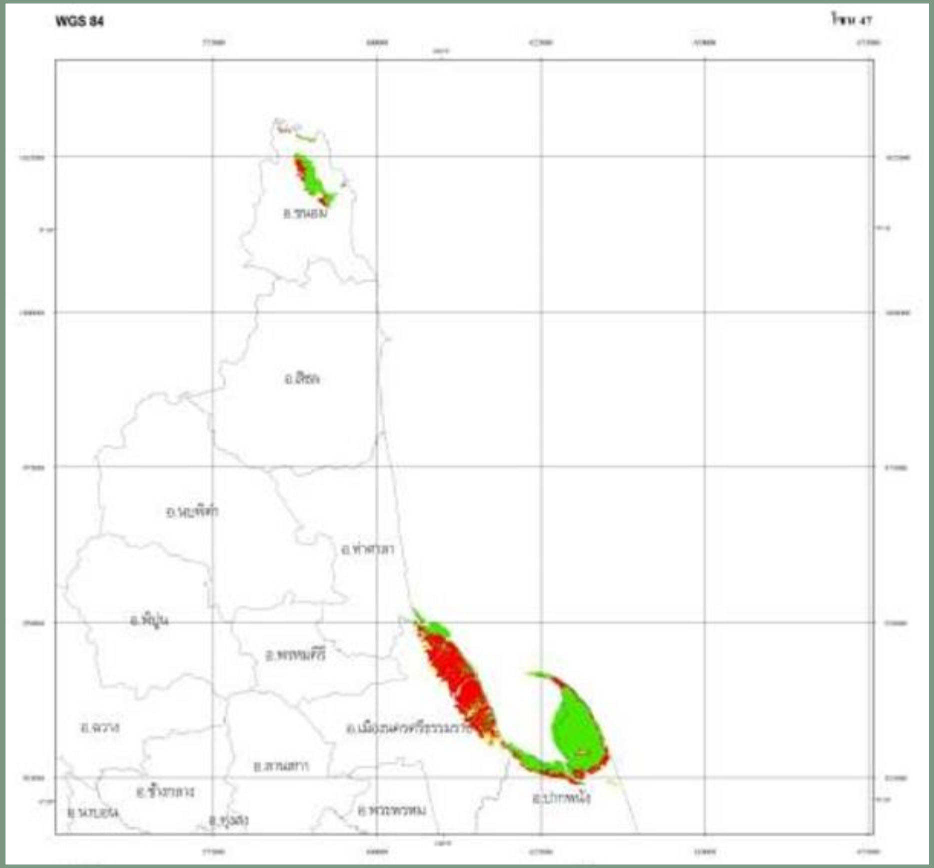
Advisor: Thapanawat Chooklim



INTRODUCTION

Nakhon Si Thammarat province is one of many provinces in Thailand that have lots of areas next to the sea hence there are abundant areas such as mangroves, mudflat, and open water.



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อ.เมืองนครศรีธรรมราช
อ.ลานสกา
อ.ช้างกลาง
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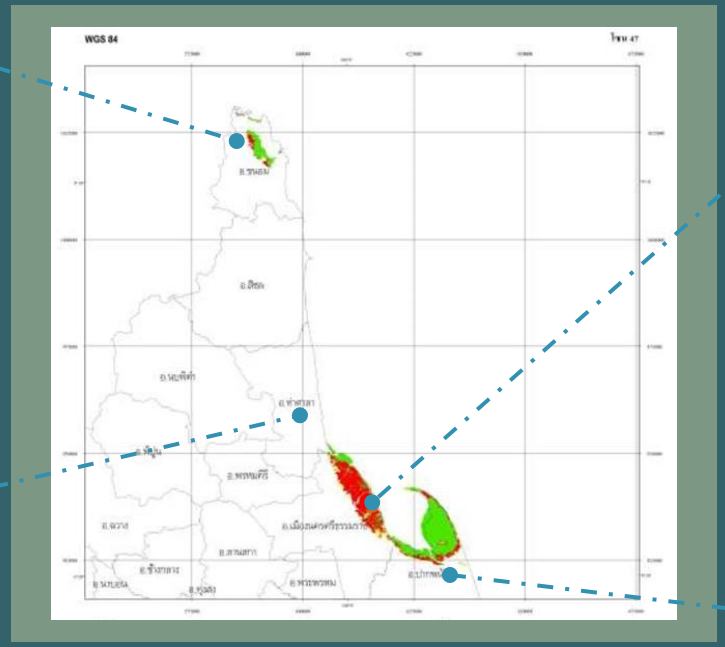


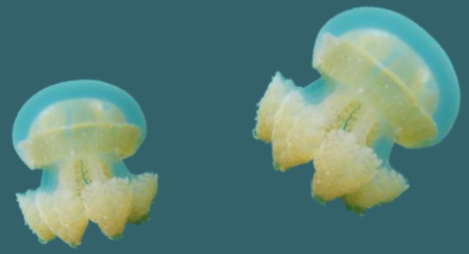
Tha Sala

Pak Phanang

129,475,856 m^2

These mangroves are nurseries for aquatic animals and mangroves also are food resources for a variety of fish and marine animals. One of the groups of organisms that play an essential part in the ecosystem, especially the food chain, is the ...

Acetes shrimp



It serves as food for a wide range of aquatic creatures.
Acetes shrimp were once used as biological monitoring organisms.
Simultaneous study of biodiversity. Therefore, it is an index that
indicates the abundance and balance of that ecosystem.

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Research Questions ?

- What are factors that affect population density and variety of *Acetes* shrimps in mangrove in Nakhon Si Thammarat ?

- How *Acetes* shrimps indicate and improve the abundance of the ecosystem?

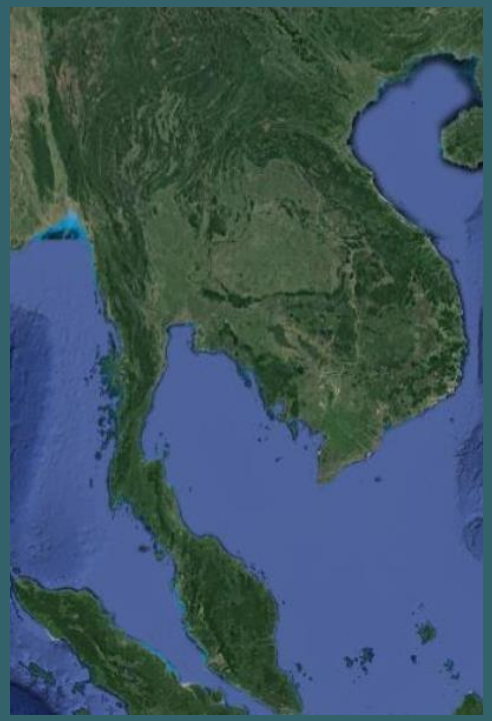
The Objectives

- To measure pH and salinity of water in mangrove in Pak Pha Ying canal, Nakhon Si Thammarat province.
- To study and collect *Acetes* shrimp in different environment to analyze related factors.
- To study the environment of *Acetes* shrimp's habitat and predators.

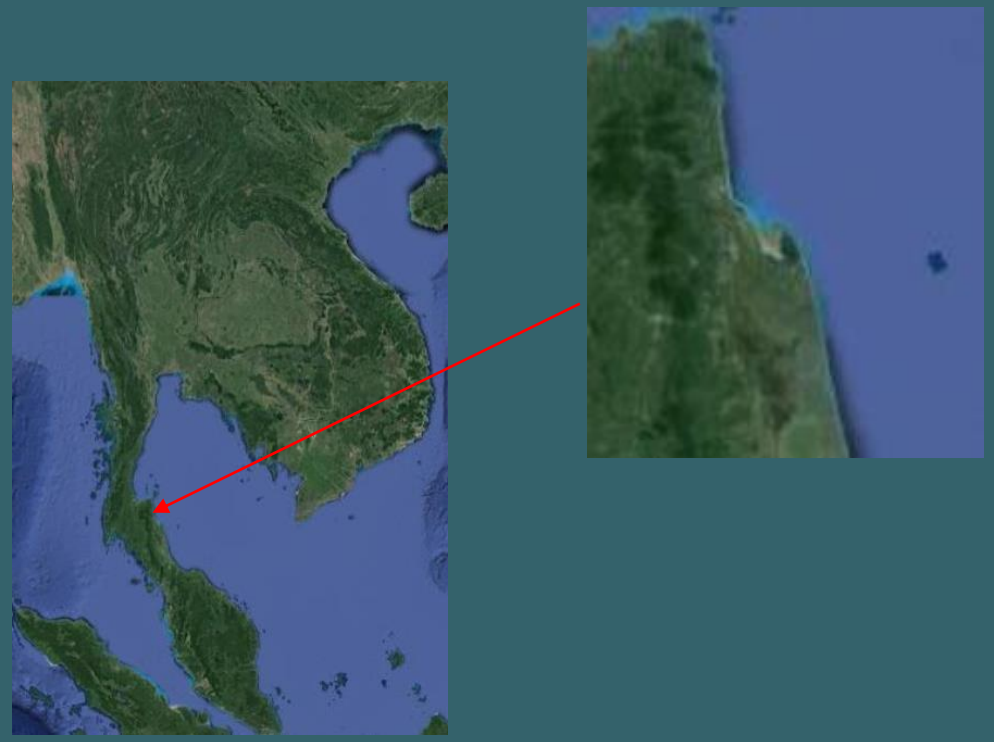
Study methods

Study methods

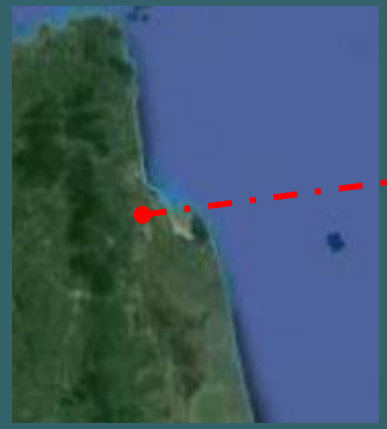
Study sites

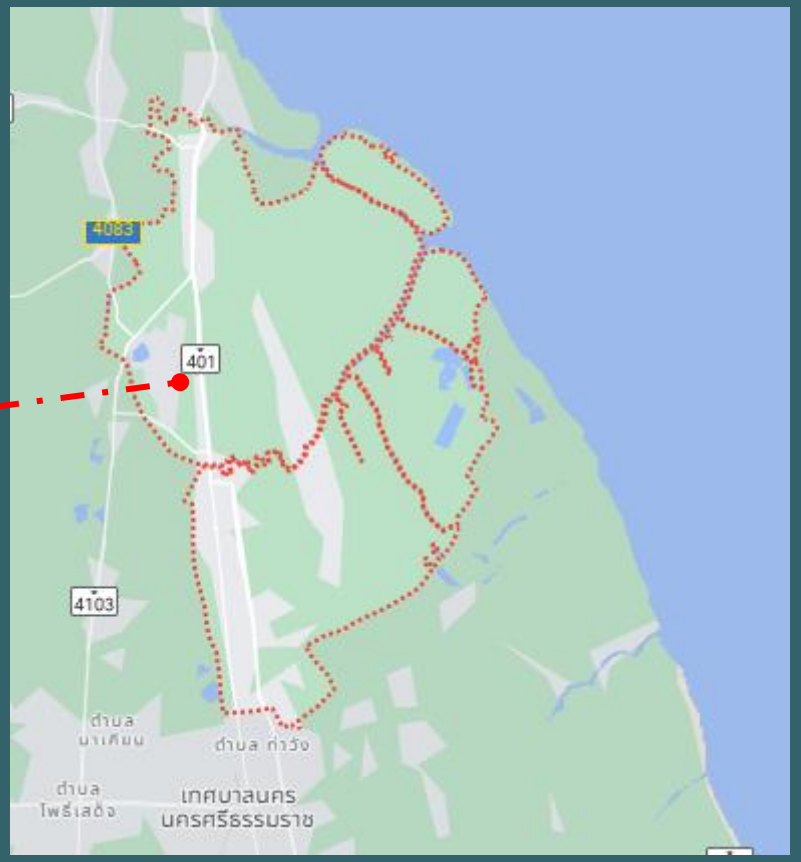


Study sites



Pak Phun Subdistrict, Meung Nakhon Si Thammarat District,
Nakhon Si Thammarat Province, Thailand

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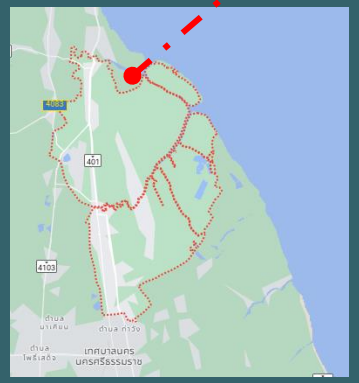
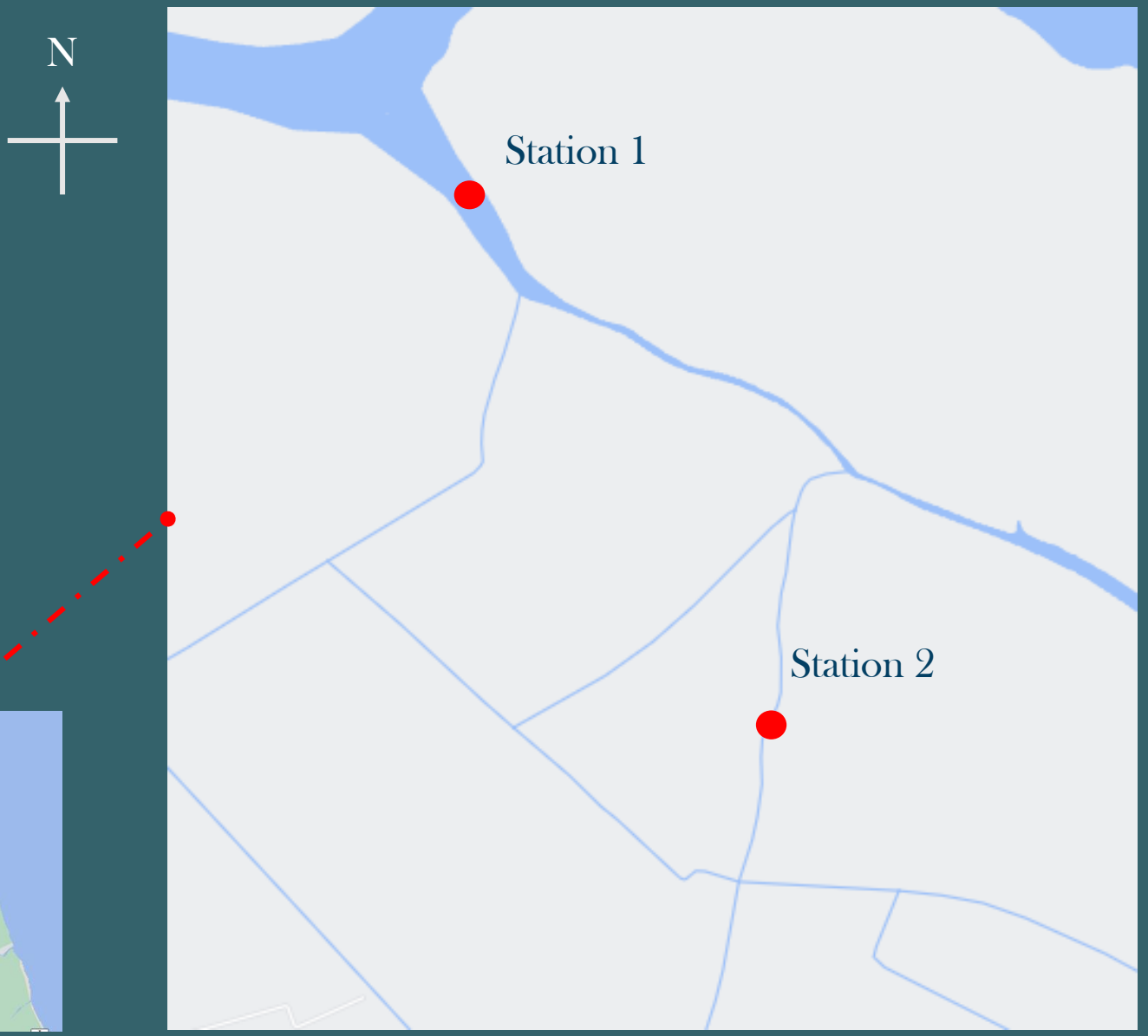
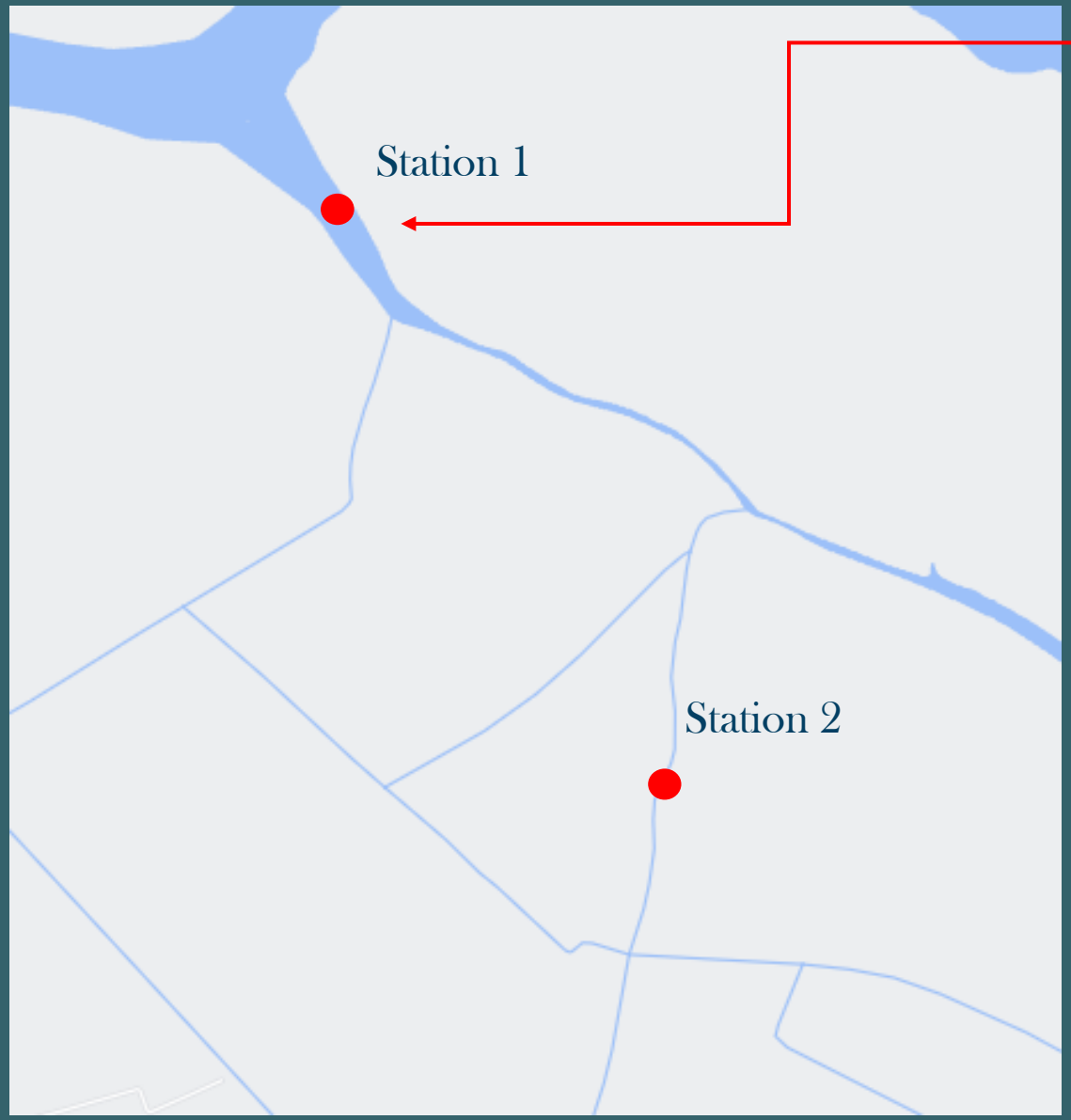



N
Station 1
Station 2



Collecting *Acetes* shrimp samplings

We're using a huge shrimp hooker net to collect shrimp samplings at the estuary (station 1) because of the speed and depth of the water.

Collecting *Acetes* shrimp in still water (station 2) by using a long-arm colander because acetes shrimp were seen clearly in still water at a depth of about 1 meter.

Collecting *Acetes* shrimp samplings

Collecting water samplings

About 250 mL of water samples were taken from the surface of the water at each station by using plastic bottles. These samples were taken twice each.

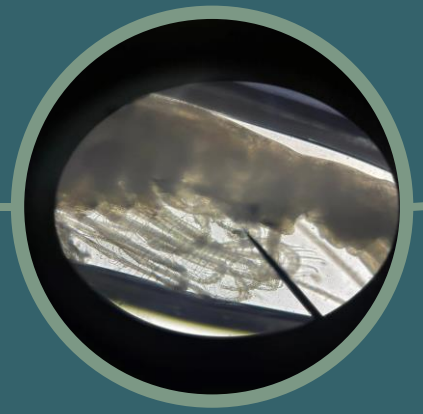
Collecting data from *Acetes* shrimp

Collecting data from *Acetes* shrimp

(1) Immersing the *Acetes* shrimp samplings in formalin at the concentrate 10 percent volume by volume.

(2) The samples were observed and examined using a compound light microscope at a 4x magnification of objective lens.

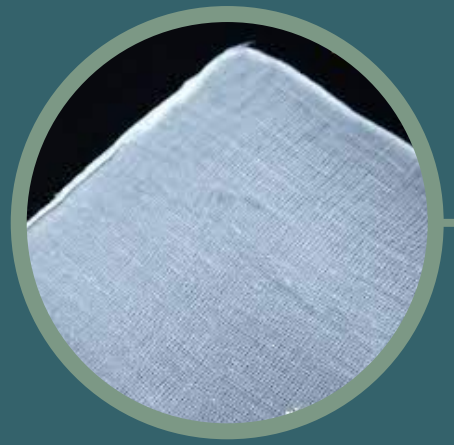
(4) Identifying the genus of the samplings.



(3) The *Acetes* shrimps were taken a picture for observing their attributes and features.

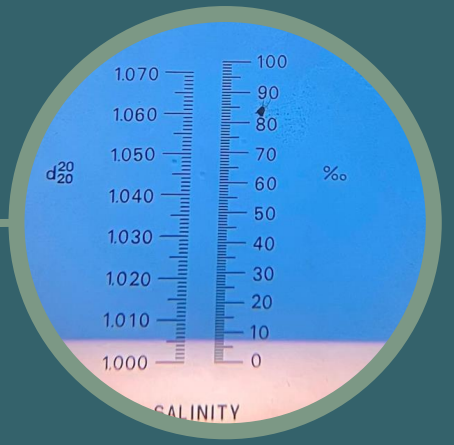
The water quality testings

The water quality testings



(1) Using a filter cloth to filter the water samplings for removing the sediments.

(2) Measuring the pH of the water with a universal indicator.



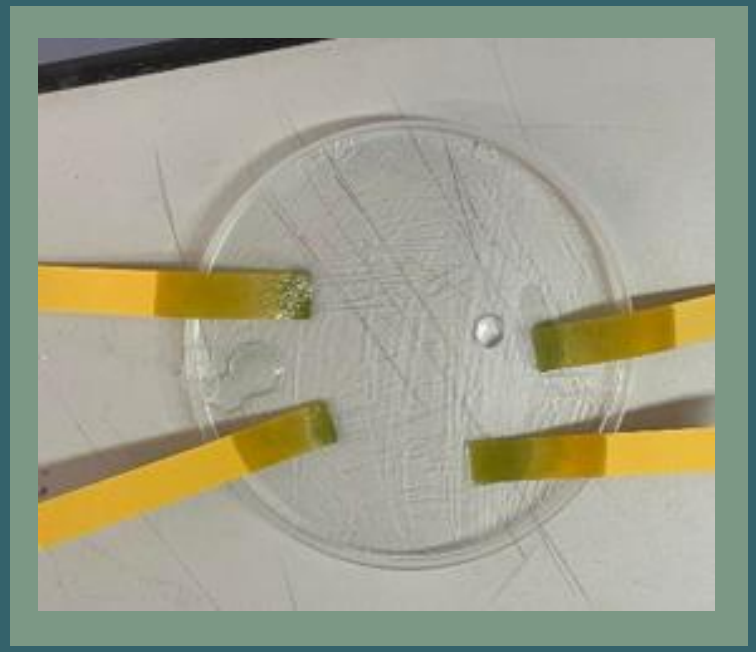
(3) Measuring the salinity of the water with a RHNS-10ATC salinity refractometer.

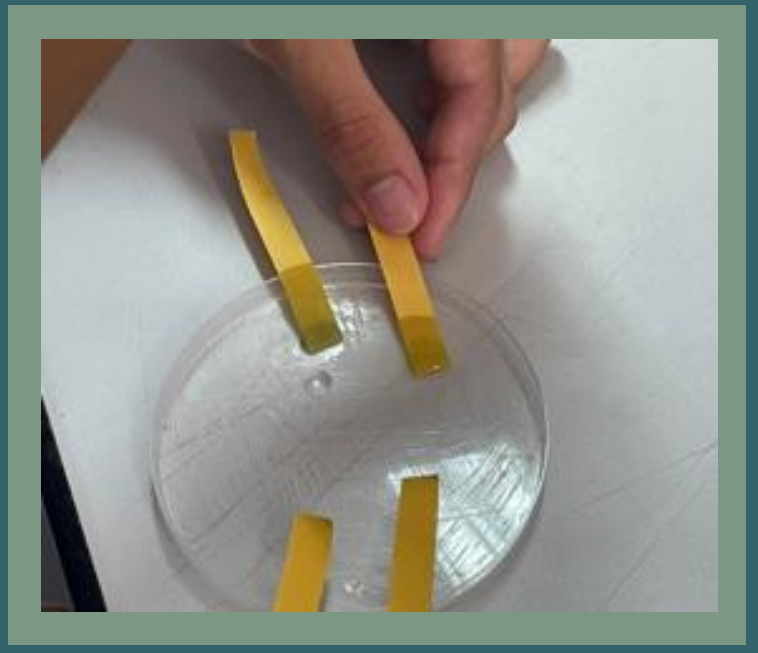
Result

Result

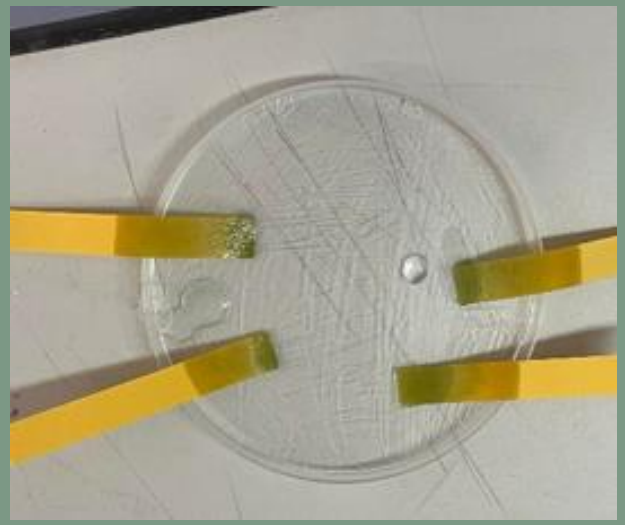
Water quality

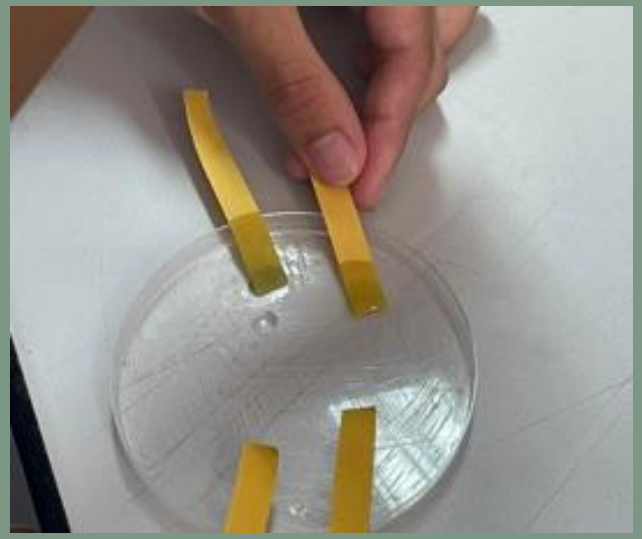
pH testing





Water sampling pH testings

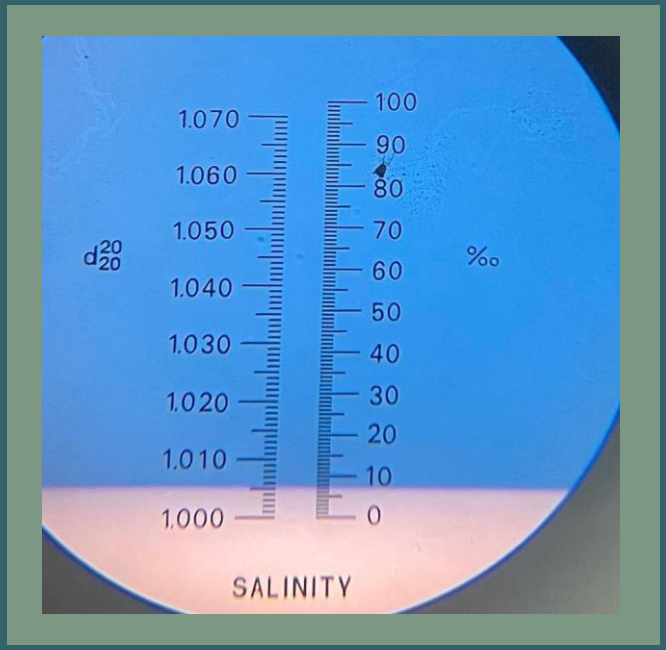




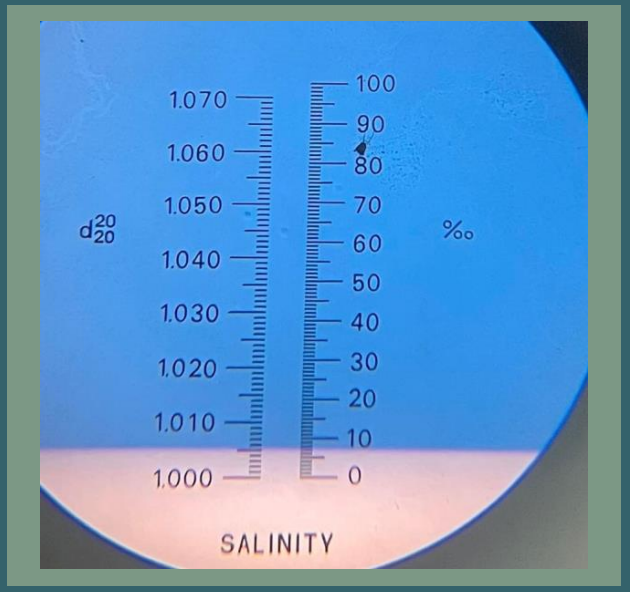
The results of pH testings are in accordance with the following table.

Sites	**pH of water**		
	1st trial	2nd trial	Avg.
Station 1	7	7	7
Station 2	7	7	7

Salinity measurement



Water sampling salinity measurements



The results of salinity measurements are in accordance with the following table.

Sites	**Salinity of water (%)**			
	1st trial	2nd trial	3rd trial	Avg.
Station 1	0.75	0.75	0.8	0.767
Station 2	0.7	0.7	0.75	0.717

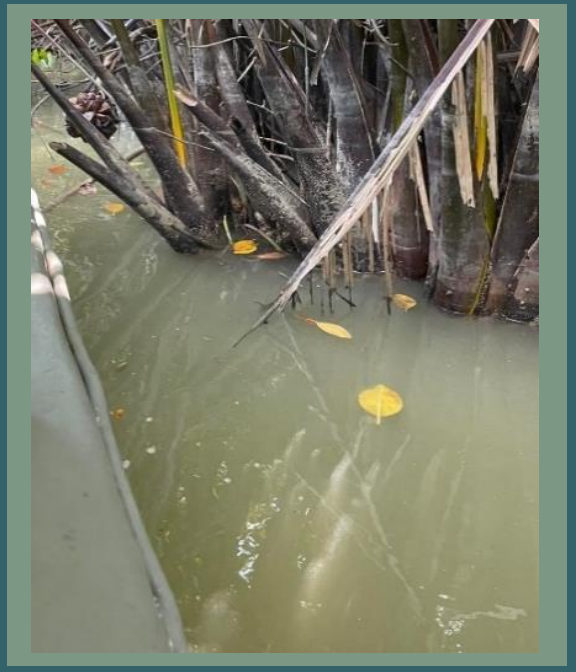
Water velocity

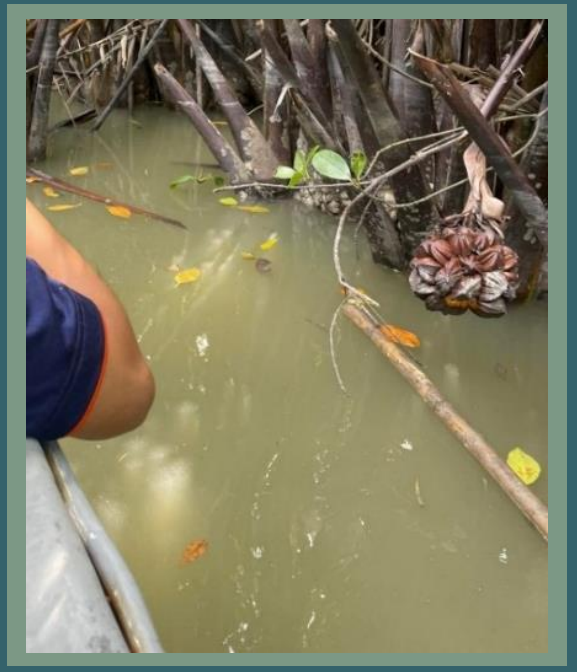
Water velocity

Station 1

According to the above, station 1 is an estuary before the Pak Pha Ying canal, which has a width of canal more than 50 meters and thus has a constant flow. The flow was clearly visible and can be observed by the motion on the surface of the water.

Water velocity





Station 2

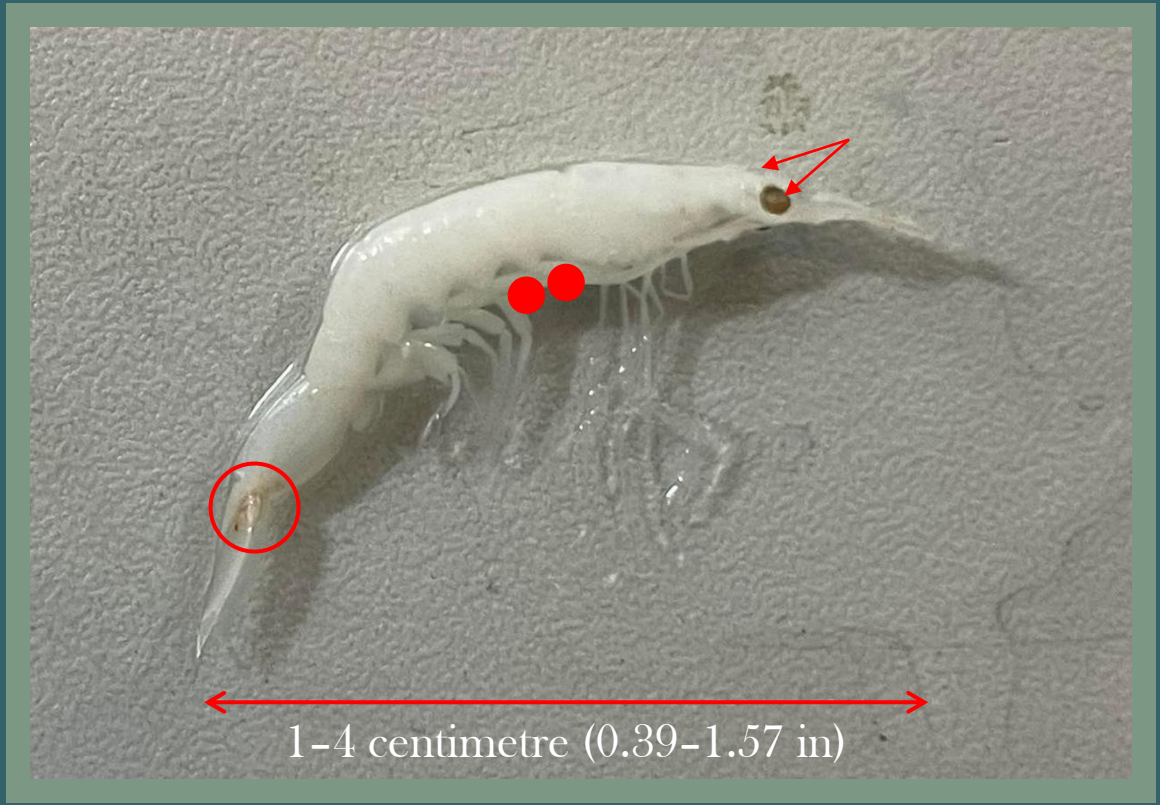
This station's location was in a narrow canal which had a width of between 7 and 10 meters made it simpler to explore the surrounding area. As a following pictures, there wasn't any flow here.

The appearance of *Acetes* shrimp

The appearance of *Acetes* shrimp

The appearance of *Acetes* shrimp

Acetes genus

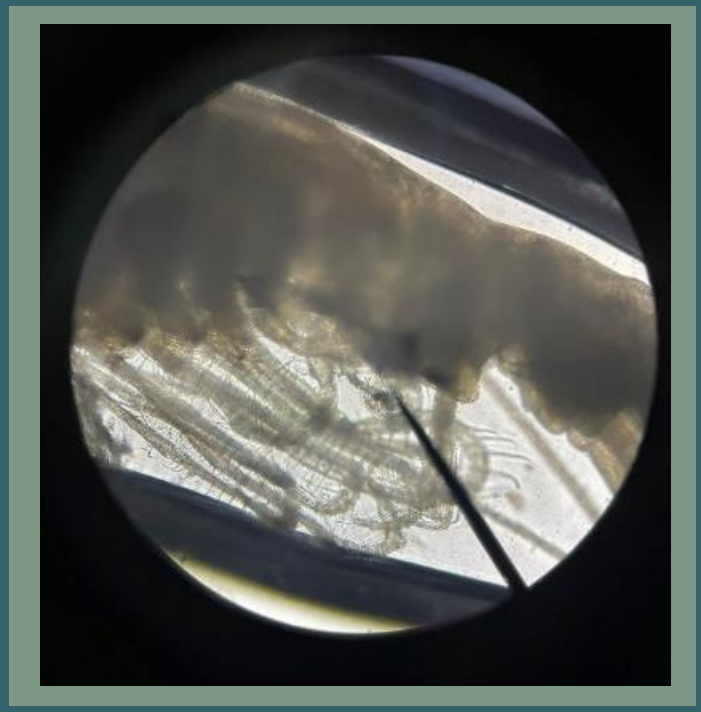


Acetes genus

Normally, the genus is characterised by the loss of the fourth and fifth pairs of pereiopods. They are small prawns, 1–4 centimetre (0.39–1.57 in) long, translucent, but with a pair of black eyes, and a number of red spots of pigment on the uropods.

samplings in different sizes

picture of pereiopods of the samplings were taken by a 4x magnification light compound microscope



The population of *Acetes* shrimp

Acetes shrimp are typically found from November to May, but due to the monsoons, they were not taken over that entire period.

Febuary

As the Acetes shrimp reproduce in February, when we conducted our investigation, they were hardly visible above the water's surface.

Febuary

The fishermen were interviewd about the behavior of the *Acetes* shrimp at different times so we can draw a data conclusion like this...

The *Acetes* shrimp naturally congregate in quiet water during the breeding season since the current can blow the eggs away.

As a result, we discovered that station 1 had fewer shrimp than station 2, which is evident from the following table:

Sites	Tool	The number of *Acetes* shrimp
station 1	fishing net	4
station 2	spoon net	20

Discussion

Discussion

Acetes shrimp is one of the key zooplankton that have considerable impact on mangrove ecosystems. They serve as a source of food and a nursery for aquatic creatures. They are also crucial for economy and fisheries.

According to a survey of local fishermen, the season and monsoon were shown to be significant influences on how *Acetes* shrimp behaved when choosing a habitat, in addition to characteristics relating to water and the ecosystem's social structure.

Our observations of the environment as a whole lead us to the conclusion that *Acetes* shrimp can be used as biological monitoring organisms to reveal environmental abundance and balance so that means studying them is necessary knowledge.

Conclusion

The experimental and survey results show that natural factors affect the habitat selection behavior of the *Acetes* shrimp. It was found that the differences in salinity of only a thousandth had almost no effect on the population density of the *Acetes* shrimp. The monsoon season and the water velocity are the variables that have the biggest effects.

They are crucial for fishing as well. because humans and many other animals depend on their larvae when they mature into adults. Mangrove forests are another aquatic environment that is home to many zooplankton species. It is recognized as a foraging-friendly habitat. The spawning area is marked by growth. provides a breeding ground for a variety of aquatic animals, including juvenile fish that have economic value.

In order to protect *Acetes shrimp* habitats and breeding grounds, natural breakwaters like mangroves and other plants that grow along beaches and in mangrove forests are crucial natural resources. This helps to conserve a variety of marine species.

Very Thank You for your Attention