



Chonradsadornnumrung School



Effects of Brackish Water on Mangrove Crab (*Episesarma mederi*) Population in Samet, Chonburi, Thailand

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Abstract

Evaluating the effect of brackish water and various physical factors that are capable of affecting the Mangrove Crab (*Episesarma mederi*) population is the main goal of this current investigation. Using the standard equipment from Extech, the researchers characterized several physico-chemical factors, biological factors, physical factors in the natural habitat of mangrove crab such as water temperature, TDS, dissolved oxygen, electrical conductivity, salinity, transparency, water pH, air temperature, and relative humidity. The number and diameter of the mangrove crab holes were counted and measured. Results showed that there was a significant difference in various physico-chemical factors measured except for water temperature. The population of the experimental organism varied due to different level of salinity. Based on the experimentations, results and gathered data, the researchers concluded that there was significant difference ($p < 0.05$) in the physico-chemical factors measured in the natural habitat of mangrove crab (*Episesarma mederi*) and the population of mangrove crabs (*Episesarma mederi*) at Samet, Chonburi, Thailand is impacted by brackish water with varying salinity levels. Furthermore, the researchers recommended that further research will be conducted to evaluate the other parameters in the seawater and more experimental sites in Chonburi will be tested and compared which are necessary for determining the correlation of water quality and mangrove crab population.

Keywords: Physico-chemical factors, crab's population, brackish water

Research Questions

1. Is there a significant difference in the physico-chemical factors of brackish water in Samet, Chonburi, Thailand?
2. Can brackish water affect the mangrove crab (*Episesarma mederi*) population in Samet, Chonburi, Thailand?

Hypotheses

Alternative: There is a significant difference in the physico-chemical factors and mangrove crab (*Episesarma mederi*) population in Samet, Chonburi, Thailand.

Null: There is no significant difference in the physico-chemical factors and mangrove crab (*Episesarma mederi*) population in Samet, Chonburi, Thailand.

Introduction

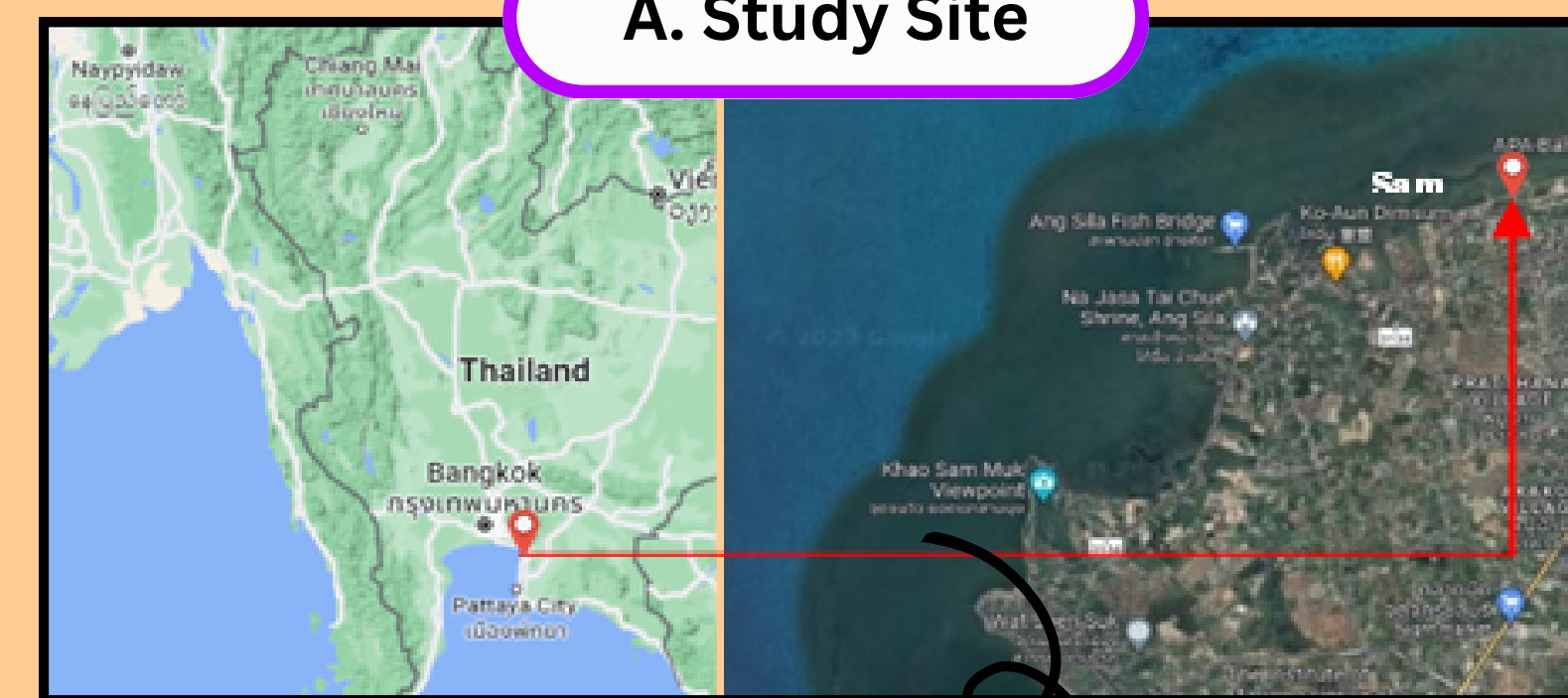
Chonburi, Thailand has made tremendous advancements in recent years, surpassing previous expectations in the fields of industry, infrastructure, technology, and economy. However, these advancements including anthropogenic activities have significantly impacted the quality of nearby water, both directly and indirectly. The intertidal zones of Samet, Chonburi, is habitat to various aquatic organisms. One of the most common organisms present there are Mangrove Crab (*Episesarma mederi*). The life of crabs and all living things present in this aquatic zone depends on the constantly shifting quality of the water brought about by development, high and low tides, and freshwater from nearby rivers. The primary physical and chemical factors influencing the number of mangrove crabs and the size of their holes in soil are waste water and saltwater, both of which are products of human activity. Therefore, it is important to evaluate these polluted water physico-chemical parameters (pH levels, salinity, dissolved oxygen, etc.) because they have a significant effect on the crabs themselves (Marine Ecology: Processes, Systems, and Impacts, 2011).

The major region of the overall landscape of Samet, Chonburi, Thailand are plains and coastal area. Therefore, these geographical features made this area experienced with plethora of natural phenomenon such as storm surges, tidal fluctuations, sedimentation, sea level rise, etc. In general, Samet manages its water resources by collecting all of the household waste water and sending it to the sea, where mangrove forests—a habitat for crabs—serve as a passageway (Simon A. McKee 2004). Water from an industrial business that had been tainted with dangerous chemicals was also dumped into the ocean. As a result, physico-chemical factors are highly vulnerable.

The situations above prompted the researchers to conduct a thorough research entitled "Effects of Brackish Water on Mangrove Crab (*Episesarma mederi*) Population in Samet, Chonburi, Thailand" in which the main goal of this research is to evaluate various physical factors that are capable of affecting the crab's population.

Research Methodology

A. Study Site



B. Survey and Preparation of Materials



C. Field Measurement in the natural habitat of mangrove crab

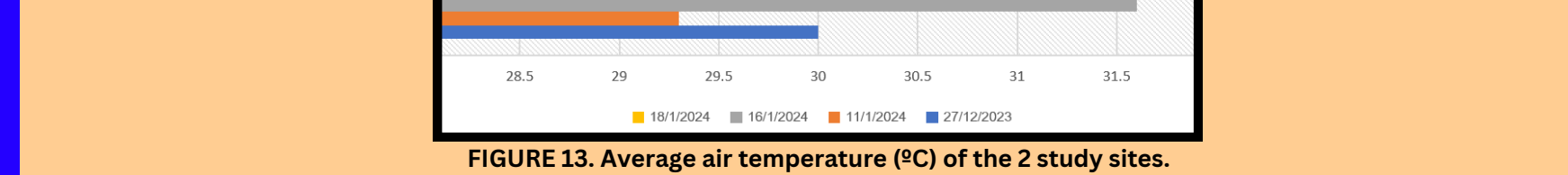
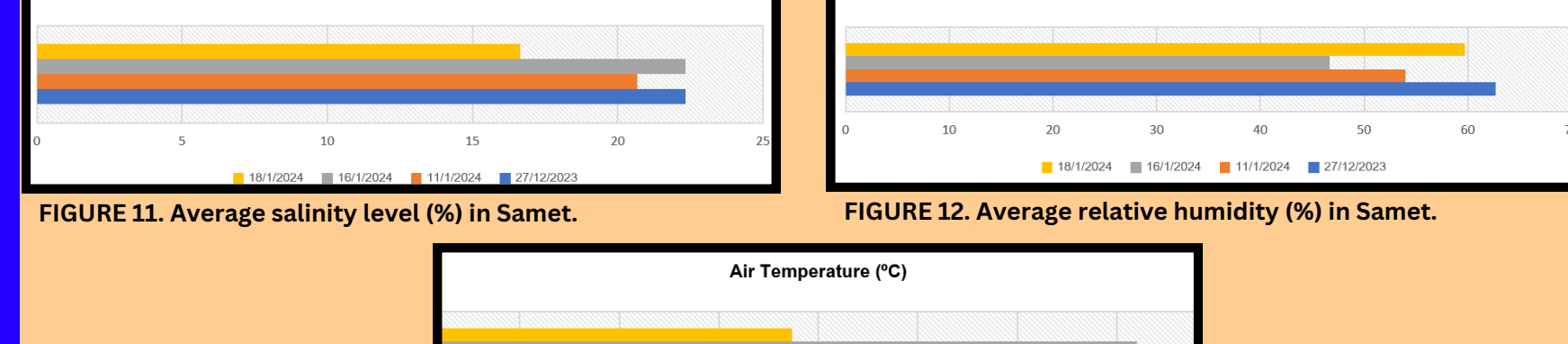
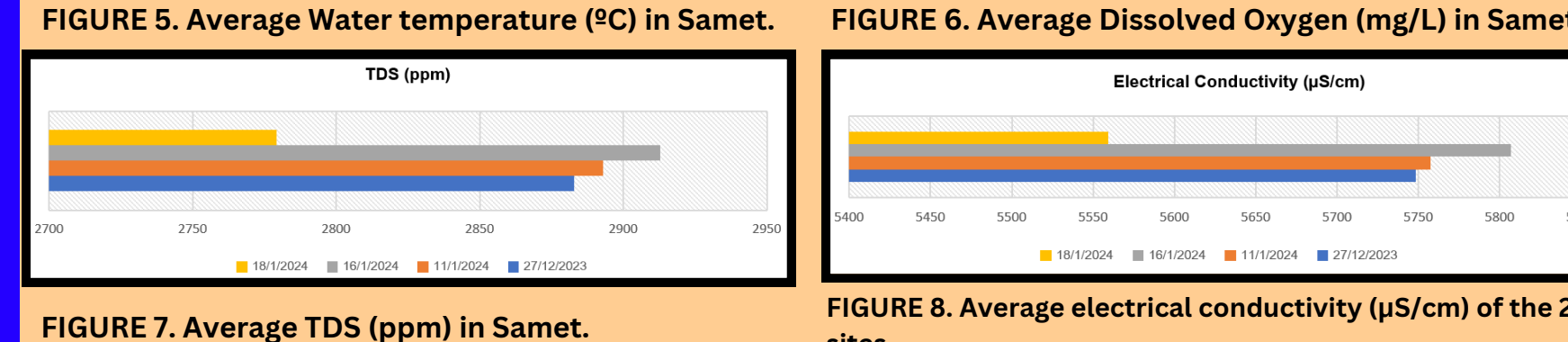
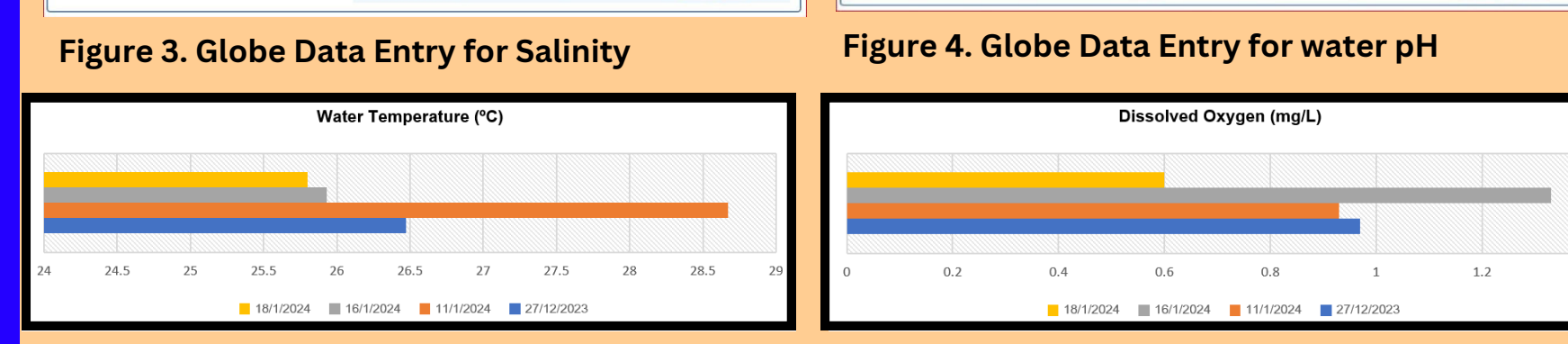
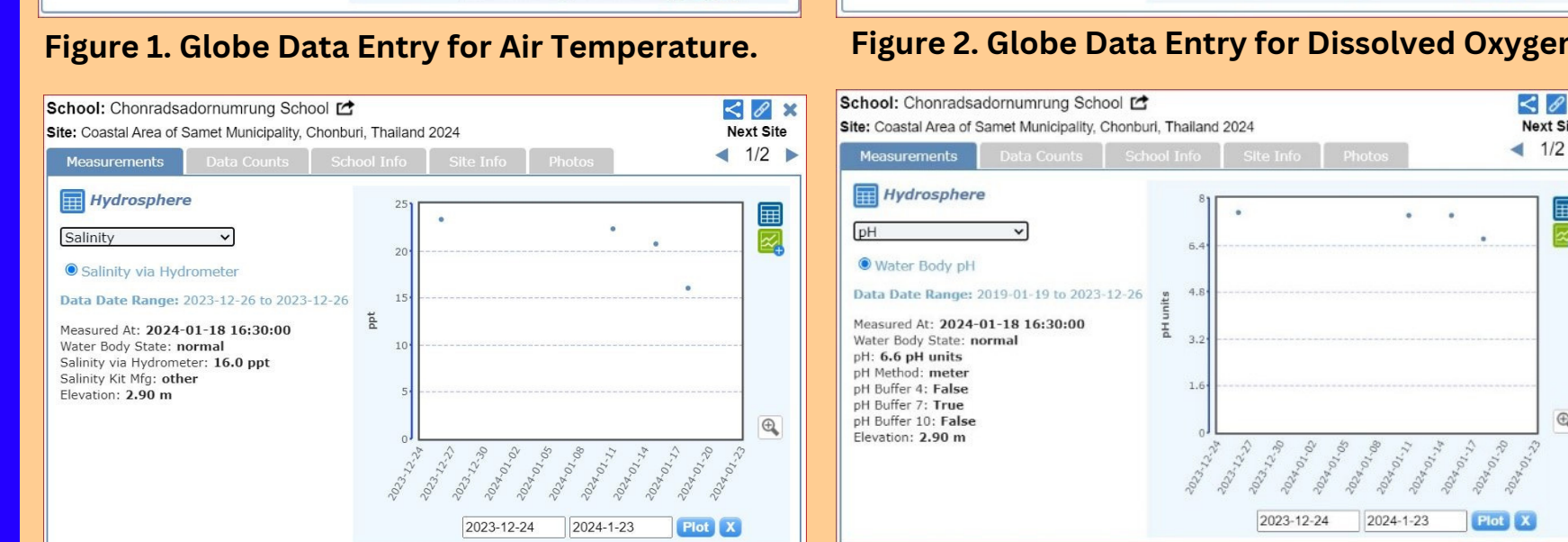
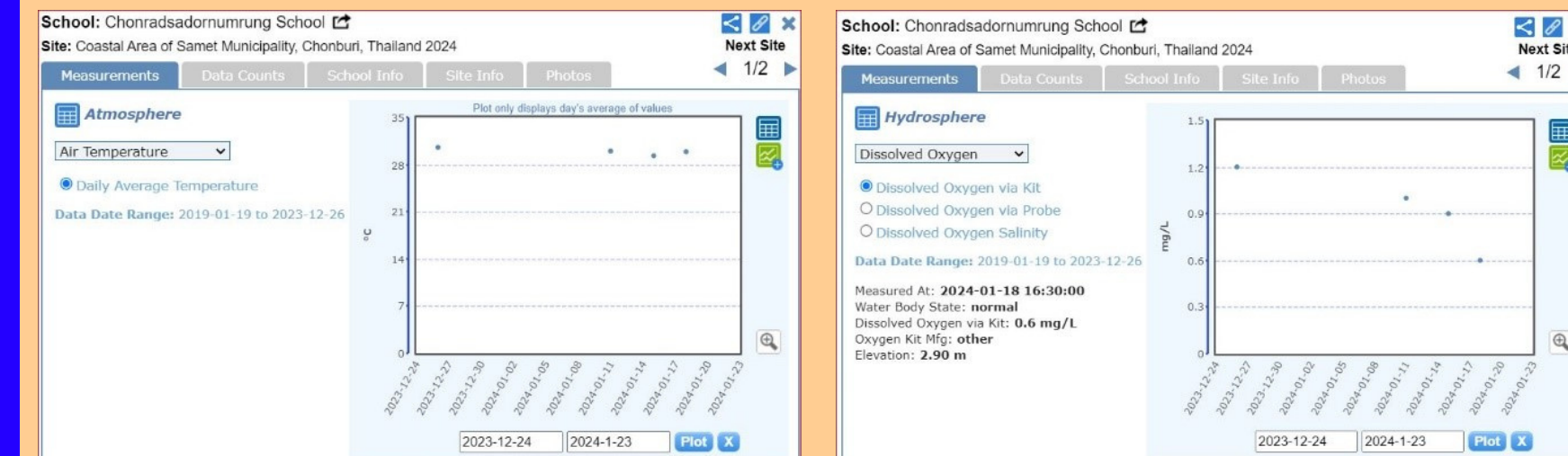


D. Determining Mangrove Crab population



Results

The figures below show the data encoded on Globe web page from 26 December 2023 to 18 January 2024.



DATES	RECORDS	
	Number of Crab's hole	Mean Size of Crab's Hole (cm)
26 December 2023	38	1.54
11 January 2024	98	1.55
15 January 2024	63	2.00
18 January 2024	87	1.08

TABLE 1. The average amount and size of crab's hole in Samet

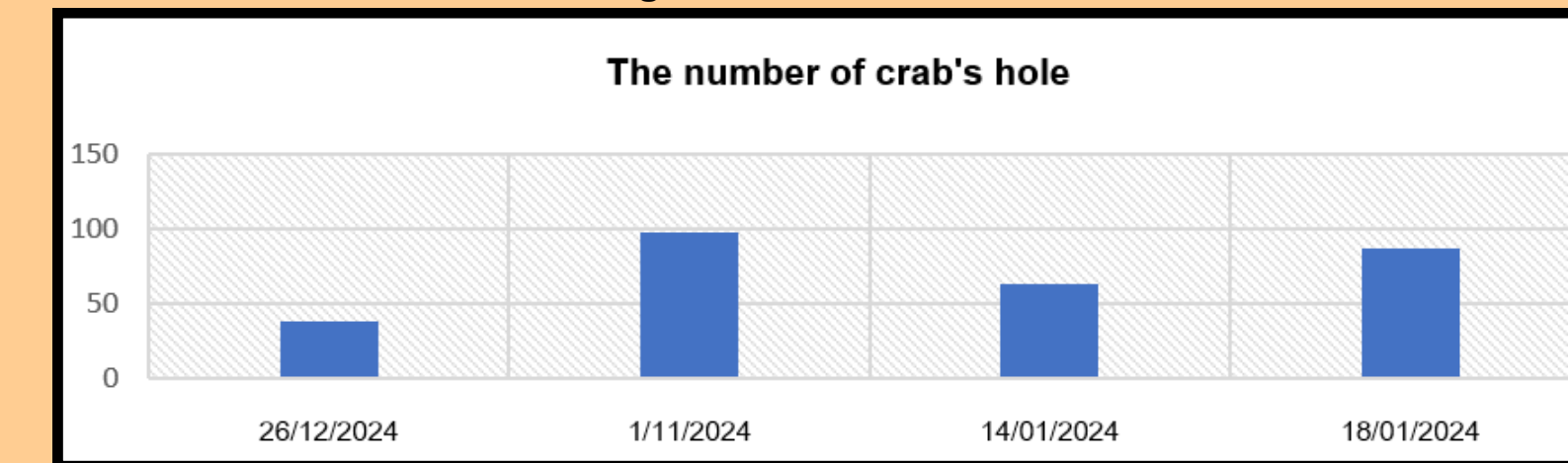


FIGURE 14. Total number of mangrove crab's holes in Samet.

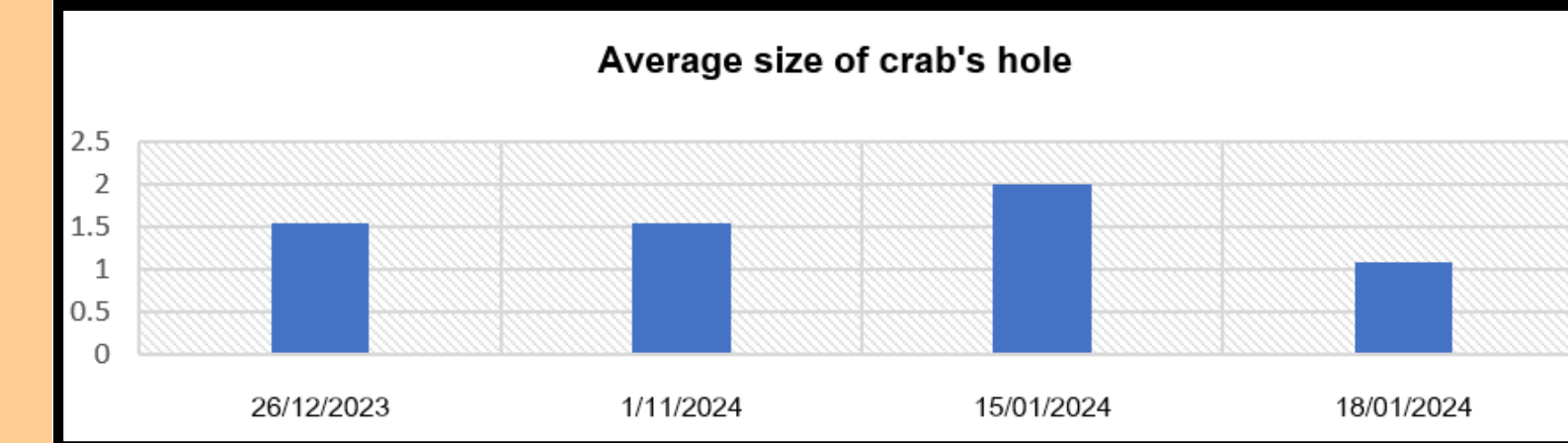


FIGURE 15. Average size of mangrove crab's hole in Samet.

Conclusion

Based on the experimentations, results and gathered data, the researchers concluded that there was significant difference ($p < 0.05$) in the physico-chemical factors measured in the natural habitat of mangrove crab (*Episesarma mederi*) such as Transparency, Dissolved Oxygen, Total Dissolved Solids, electrical conductivity, water pH, air temperature, salinity, and relative humidity. Furthermore, the population of mangrove crabs (*Episesarma mederi*) at Samet, Chonburi, Thailand is impacted by brackish water with varying salinity levels.

Recommendations

For the improvement of the study, the researchers recommended that further research will be conducted to evaluate the other parameters in the seawater and more experimental sites in Chonburi will be tested and compared which are necessary for determining the correlation of water quality and mangrove crab population.

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