

The difference of microorganisms and water quality of water sources between Japan and Thailand.

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Abstract:

This research aimed to investigate and compare the water quality of aquatic resources in Thailand and Japan. The study areas included water sources around ²Princess Chulabhorn Science High School, Trang Province, Thailand, and water sources around ¹Matsusho Gakuen High School in Japan. In addition, small aquatic organisms were surveyed to compare the biodiversity of living organisms in these water bodies. The results showed that the water temperature of the study sites in Thailand was significantly higher than that of Japan at the 0.05 level of statistical significance. However, there was no statistically significant difference in pH values between the water sources in Thailand and Japan. Furthermore, a greater diversity of small aquatic organisms was found in Thailand, including both zooplankton and phytoplankton, whereas the water sources in Japan were dominated mainly by algae.

Keywords: Water quality, Microorganisms

1. Introduction

Thailand and Japan differ significantly in terms of geography, climate, and environmental conditions, which lead to distinct patterns of biodiversity, particularly in aquatic ecosystems. Thailand is located in a tropical climate zone and is characterized by three seasons—summer, rainy season, and winter. As a result, water bodies in Thailand often contain relatively high levels of sediment due to heavy rainfall and surface runoff. In contrast, Japan is situated in a temperate climate zone with four distinct seasons, and its water bodies generally exhibit lower sediment levels and more stable environmental conditions.

These differences in climate and environmental characteristics play a crucial role in influencing water quality and the composition of aquatic ecosystems. Factors such as water temperature, pH, and sediment levels directly affect the survival and diversity of aquatic organisms, especially small organisms such as plankton and algae, which are sensitive to environmental changes. Consequently, variations in these factors may lead to differences in aquatic biodiversity between the two countries.

Therefore, this study focuses on examining water quality and small aquatic organisms in selected water sources in Thailand and Japan in order to compare the characteristics of aquatic biodiversity between the two regions. By analyzing environmental parameters and the diversity of small aquatic organisms, this research aims to provide a better understanding of how geographic and climatic differences influence aquatic ecosystems in both countries.

2. Methodology

2.1 Water Sample Collection

Water samples were collected from selected water sources in Japan and Thailand using sterile containers. All samples were labeled and transported for analysis.

2.2 Water Quality Measurement

Water quality parameters, including pH, temperature, and turbidity, were measured using standard instruments. The results were recorded for comparison.

2.3 Microscopic Observation

Microorganisms in the water samples were observed using a stereo microscope for larger organisms and a light microscope for microscopic organisms.

3. Results

Water quality parameters, including temperature, pH, and turbidity, were investigated in water sources located around ²Princess Chulabhorn Science High School, Trang, Thailand and ¹Matsusho Gakuen High School, Japan. Three water sources were studied in each country. The results indicated that the average water temperature in Thailand was 29 °C, which was significantly higher than the average water temperature in Japan (25.33 °C) at the 0.05 level of statistical significance, as shown in Figure 1. However, there was no statistically significant difference in pH values between the water sources in Thailand and Japan at the 0.05 significance level, as shown in Figure 2.

Figure 1. Experimental results: Water temperature of water source

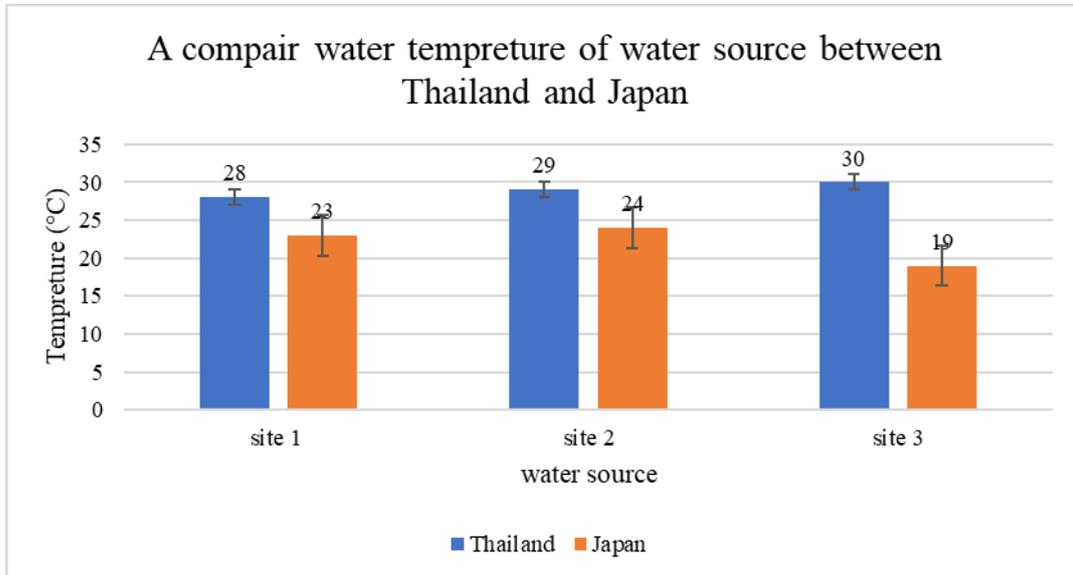
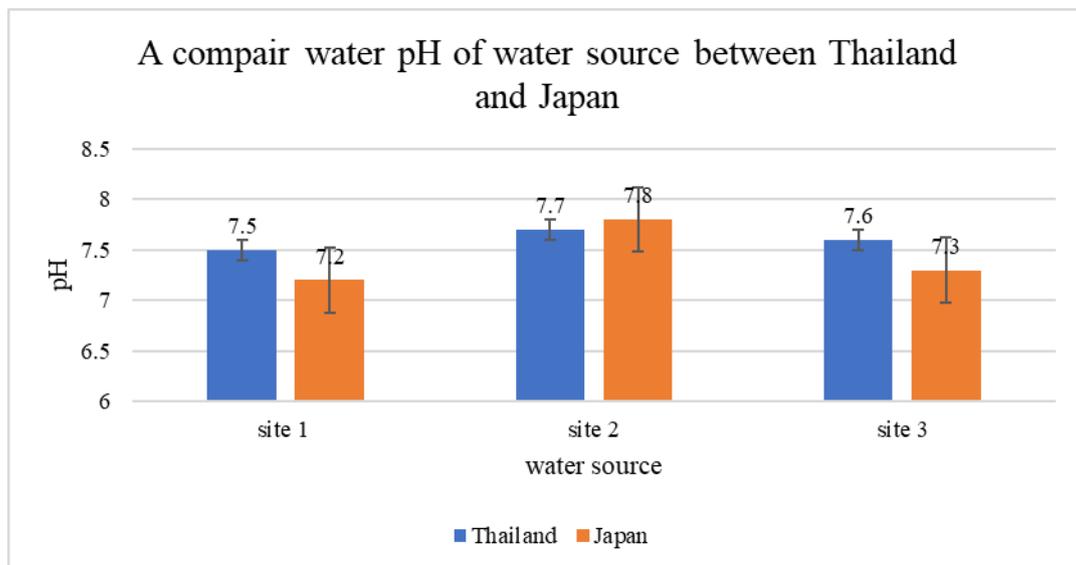
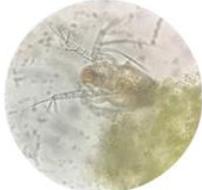


Figure 2. Experimental results: Water pH of water source



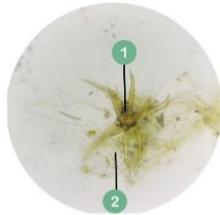
From the survey of microorganisms in the studied water sources, it was found that the diversity of microorganisms in Thailand was higher than that in Japan, whereas the water sources in Japan were dominated mainly by algae, as shown in Table 1.

Table 1. Experimental results: microorganisms in water sources

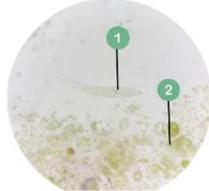
Thai microorganisms	Japanese microorganisms
 <p><i>Daphnia sp.</i></p>	 <p><i>Batrachospermum sp.</i></p>
 <p><i>Acanthocystis sp.</i></p>	 <p><i>Spirogyra sp.</i></p>
 <p><i>Stentor sp.</i></p>	 <p><i>Green Algae</i></p>
 <p><i>Cosmarium sp.</i></p>	
 <p><i>Diatom & Cyanobacteria sp.</i></p>	



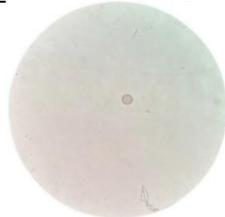
Chlamydomona sp.



1. *Asterionella sp.*
2. *Cladophora sp.*



1. *Rotifera sp.*
2. *Chlorella sp.*



Trachelomona sp.

4. Discussion

Water temperature in Thailand was significantly higher at a 0.05 level of significance, supporting greater aquatic organism diversity, while clearer water in Japan with visibility exceeding 1 meter favored freshwater algae. Similar pH values ranging from 7.2 to 7.8 indicate minimal influence of pH.

5. Conclusion

Higher water temperatures in Thailand support greater aquatic organism diversity, including phytoplankton and zooplanktons such as *Daphnia* and *Rotifera*. Whereas cooler waters in Japan mainly favor freshwater algae. Lower turbidity in Japan (visibility > 1 m) promotes filamentous algae, while higher turbidity in Thailand suggests elevated nutrient availability and increased abundance of aquatic organisms. As pH values in both countries remain near neutral (about 7.2-7.8), temperature and turbidity are the primary factors influencing organism community composition.

6. References

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