Study the quality of water in water sources where lead was detected

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Abstract

Studying the water quality in freshwater sources is a scientifically crucial process for maintaining the balance of ecosystems and the benefits derived from water in daily life. Analyzing chemical solutes such as elements and other compounds aids in understanding water quality, which can impact the biodiversity in water and the surrounding areas.

Examining the biological environmental conditions, including quantifying and identifying living organisms present in water sources, provides vital information for assessing the health of ecosystems and water quality. By analyzing these factors, we can predict changes in local environments and conserve water resources.

Moreover, investigating freshwater systems has practical applications in planning water resource management, improving water quality, and developing policies that promote efficient water usage within communities.

Keyword:

Electrical Conductivity; Total dissolved solids; pH; Water quality; Salinity; Atomic Absorption Spectroscopy; Water Quality Tester

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1. Introduction

The study of water quality in habitats where crayfish are found plays a crucial role in enhancing our understanding of water conditions and their impacts on living organisms and the environment. Analyzing water quality data and managing issues stemming from crayfish presence are vital for preserving water environments and controlling problems that arise in water sources in the future. Collaborative efforts in studying and managing water in crayfish habitats are essential for efficiently and sustainably utilizing water resources in the long term. Therefore, prioritizing the study of water quality in crayfish habitats is paramount for preserving water environments and the health of both humans and aquatic animals, both presently and in the future.

Studying water quality in crayfish habitats is a critical process, both in education and research, to understand and assess health and environmental risks adequately. Collaborative work among educational institutions, local authorities, non-governmental organizations, and communities can help foster understanding and connectivity on this issue to promote community involvement in solving water and environmental problems. This forms the necessary foundation for moving towards a future with improved water and environmental conditions for everyone.

It is hoped that this article will be beneficial and contribute to enhancing readers' understanding of the importance of studying water quality in crayfish habitats and the possibility of effectively addressing water-related issues in the future with efficiency and sustainability.

1.2 Goal of the Project

1.2.1 To explore the quality of water in the examined water sources.

1.2.2 To assess the quality of water in a water source and evaluate health and environmental risks.

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2. Experimental Procedure

1. First we have conducted sampling in the area to collect water samples in Khong Chai District, Kalasin Province

2. Using a Water Quality Tester: Immerse the testing device into the water to be examined and wait until the readings stabilize. Read the Electrical Conductivity (EC) value, measuring the water's ability to conduct electricity. Read the Total Dissolved Solids (TDS) value, measuring the quantity of dissolved solids, organic and inorganic, in the water. TDS is expressed in milligrams per liter (mg/L) or parts per million (ppm). Read the pH value, measuring the concentration of hydrogen ions to determine the water's acidity or alkalinity

3. Using Atomic Absorption Spectroscopy (AAS): Allow atoms to absorb light in an atomic absorption spectroscopy setup. Atoms dissolved in the water absorb light at different wavelengths. The spectrum of absorbed light from atoms is linear, distinguishing it from the spectrum of molecules. Alter the energy levels of electrons in atoms to absorb light. Utilizing both instruments provides essential information about water quality and quantifies various parameters crucial for water assessment, such as electrical conductivity, dissolved solids, and pH. These measurements help evaluate the suitability and quality of water for various applications

2.1 Results and data

	Water source I	Water source II	Water source III
Salinity (%)	0	0.02	0
pH	6.6	6.66	6.705
Electrical Conductivity (μS/cm)	75	574	196
temperature (°C)	76.4	74.6	74.1
TDS (mg/L)	38	287	98

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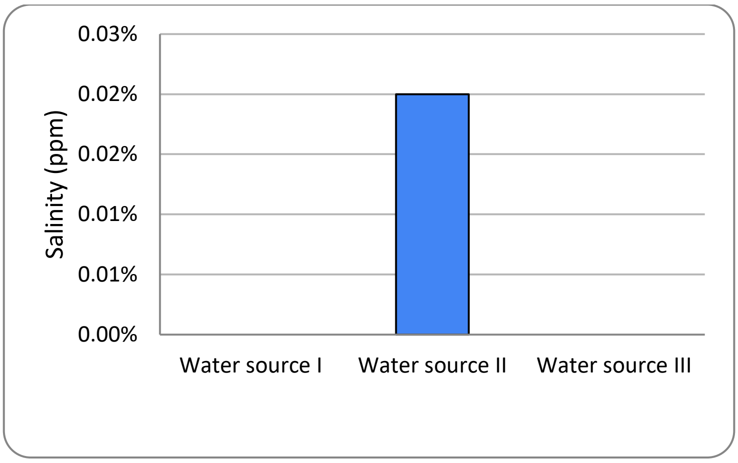
3. Discussion



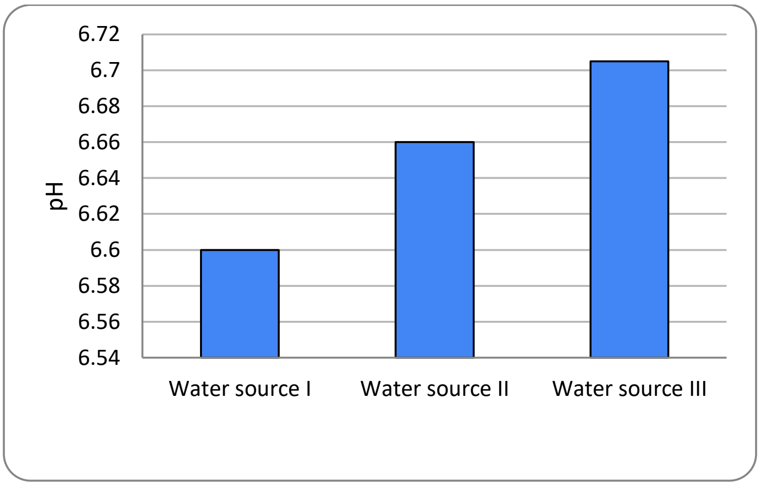
The graph provided illustrates the salinity levels of three different water sources. Here are the main points:

Water Source I: This water source shows no detectable salinity, indicated by the absence of a visible bar on the graph.

Water Source II: The salinity level for this water source is approximately 0.02%, or 0.02 parts per million (ppm).

Water Source III: Similar to Water Source I, this water source also shows no detectable salinity.

Understanding salinity is vital for assessing water quality and its impacts on aquatic life and human health. Maintaining appropriate salinity levels is crucial for effective environmental management and the conservation of resources.



The graph provided illustrates the pH levels of three different water sources. Here are the main points:

Water Source I: This water source has a pH level just above 6.58, making it slightly acidic.

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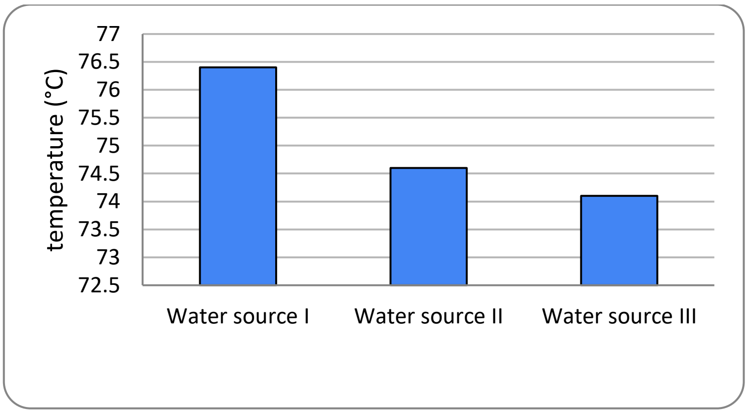
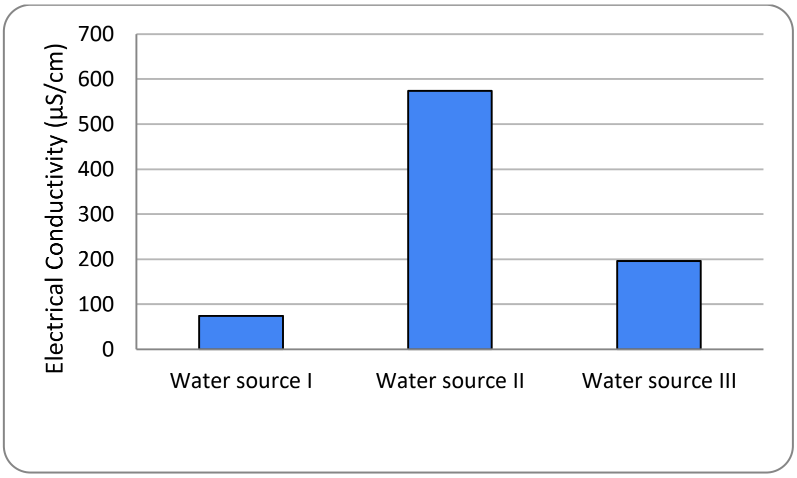
Water Source II: This water source has a pH level slightly below 6.66, indicating medium acidity.
Water Source III: This water source has the highest pH level, just below 6.72, making it the least acidic among the three.
On the pH scale, which ranges from 0 to 14, values below 7 are acidic, 7 is neutral, and values above 7 are basic. In this case, all three water sources are slightly acidic, with Water Source III being the least acidic. It's important to maintain appropriate pH levels in water sources for the health of aquatic life and human well-being. pH levels impact various aspects of water quality and environmental management.



The graph provided offers valuable insights into the temperature variations among three distinct water sources. Water Source III exhibits the highest temperature at approximately 34.6°C, indicating potential thermal stress for aquatic organisms in this ecosystem. Conversely, Water Source II records the lowest temperature around 33.4°C, suggesting a comparatively cooler environment. Such temperature disparities play a pivotal role in regulating biological processes within aquatic ecosystems, impacting factors like metabolic rates and dissolved oxygen levels. Understanding these variations is vital for effective environmental management, enabling stakeholders to implement targeted conservation measures and ensure the sustainability of both aquatic life and human activities reliant on these water sources.



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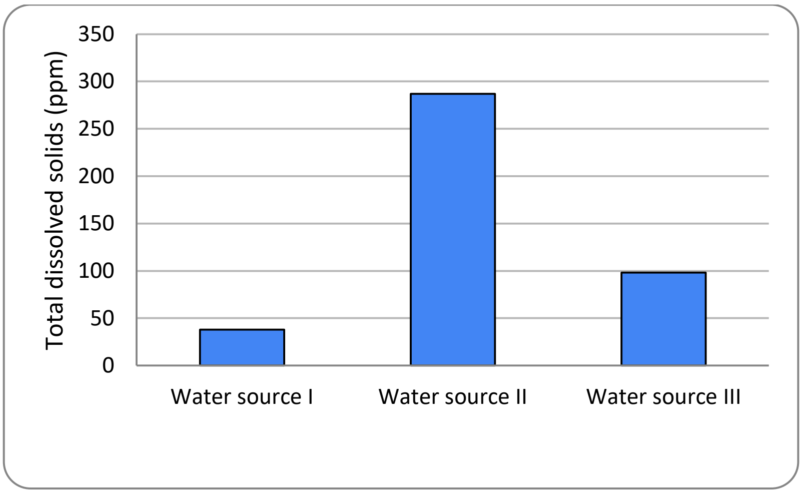
The graph provided illustrates the electrical conductivity of three different water sources. Here are the main points:

Water Source I: This water source shows no detectable electrical conductivity, indicated by the absence of a visible bar on the graph.

Water Source II: The electrical conductivity for this water source is approximately 0.02 microsiemens per centimeter (µS/cm).

Water Source III: Similar to Water Source I, this water source also shows no detectable electrical conductivity.

Electrical conductivity is a critical parameter for assessing water quality as it indicates the presence of dissolved ions and minerals. Varied levels of electrical conductivity can significantly affect aquatic ecosystems and human health. Maintaining appropriate electrical conductivity levels is essential for effective environmental management and the conservation of resources."



The graph provided offers insights into the Total Dissolved Solids (TDS) levels in mg/L across three water sources. According to established standards, a TDS reading falling between 300-600 mg/L indicates good water quality. Interestingly, Water Source II, with a TDS level of approximately 300 ppm, falls within this range, suggesting acceptable water quality despite its higher concentration. Conversely, Water Source I displays the lowest TDS level, slightly above 50 ppm, indicating superior water quality. Water Source III falls in between, with a TDS level around 150 ppm, also signifying acceptable water quality. Understanding TDS as a key indicator of water quality is essential for ensuring safe drinking water. Monitoring and managing TDS

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4. Conclusion

Analyzing the water quality at estuarine sources is a process intricately linked to a deep understanding of the physical and chemical nature of water. Collecting samples from various water sources enables us to examine the natural diversity present in these waters.

The concentration of dissolved substances in water significantly impacts the sustainability of aquatic life and the economic viability of water resources. The pH level influences the effectiveness of diluting substances, while electrical conductivity relates to the transportation of dissolved substances through electrical currents.

The data obtained from studying water quality at estuarine sites is pivotal for developing water management policies and maintaining water resources at appropriate levels. Furthermore, it is crucial to utilize this information for sustainable water usage planning and to mitigate potential environmental issues.

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