Abstract Book

37th SIL 2024

FOZ DO IGUAÇU | BRAZIL

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Organization

SIL
International
Society of Limnology

ABLimno
Brazilian
Limnology Association

Committee

Asociación
Ibérica de
Limnología
AIL

LACAN
RED LATINOAMERICANA Y
CARIBEÑA DE LIMNOLOGÍA

Content

Regular Sessions (RS)

Special Sessions (SS)

Welcome to SIL 2024

37th SIL 2024
FOZ DO IGUAÇU | BRAZIL

After almost 30 years, Brazil is once again hosting a **SIL International Congress on Limnology.** As a historical indigenous land, Latin America and the Caribbean are blessed with incredible water resources and breathtaking landscapes! However, the fragmentation of the indigenous people and water bodies across the continent has led to scientific and economic inequalities with serious consequences for biodiversity conservation.

The diversity of water bodies in Latin American and the Caribbean is as great as their indigenous people and their culture, which are fully connected to the water. For these people and their descendents, freshwaters are considered a holy ground, a gift supporting the dignity of their people and ancestors. These characteristics make Brazil a relevant site to host this global Limnology event.

Therefore, in 2022, limnologists from 18 countries came together to reduce such distances and borders, in an effort to restore part of the connections between people and waters over these incredible territories!

The theme for the 37th SIL Congress is **"Building bridges between science and society to reduce the effects of fragmentation and degradation of inland waters".** By bringing together researchers, policymakers, and stakeholders, it aims to reconcile the multiple uses of the water with the challenges for conservation in the face of climate change and human pressures. In this regard, the main issue we want to address is the legacy that we will need to leave in a fragmented world, where indigenous and non-indigenous people need to work together for a sustainable land.

In Brazil, indigenous people say "Never again a Brazil without us". After the 37th SIL we expect to address this claim, indicating that the world needs to break the barriers between science and society to reduce impacts under the water resources over the world. This is the greatest challenge and certainly will be a legacy for the next generations.

To maintain and restore our water resources, we will need to work together on a common path! This conciliation embraces the challenges that the global south scientists and societies have been facing to sustain water bodies conservation. This challenge permeates the history of limnology in Latin American and the Caribbean and represents an excellent opportunity to meet developed and developing countries in bilateral and mutual support.

Join us for SIL 2024, May 5-9! Brazil, Latin America and the Caribbean are waiting for you! Let's make the world an indigenous land again!

Luciana Barbosa
President of Brazilian Limnology Association and Leader of Latin American and Caribbean Limnology Network and Chair SIL 2024

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1498

Having IMPACT on monitoring aquatic parasite diversity – presenting a new pipeline evaluating eDNA as an integrative tool for studying parasites

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Parasites are usually presented as biological villains due to threats posed to human health and wildlife conservation. However, most metazoan parasites have no zoonotic potential and are instead known to be crucial organisms that contribute to the health and functioning of ecosystems and make up an overwhelming proportion of current biodiversity. Nonetheless, parasites remain the most neglected components of biodiversity monitoring and management strategies, and have only recently begun to be considered in conservation discussions. Monitoring of parasite biodiversity is hampered by inefficient tools for detecting parasites, with current methods involving the sacrifice of many hosts to quantify parasite biodiversity, and still, parasites occurring in low prevalence may be difficult to detect. Thus, for ethical reasons and amid a potential 6th mass species extinction, it is necessary to develop less invasive and non-lethal monitoring methods. Environmental DNA (eDNA) offers a potential solution, particularly for studying aquatic parasites by allowing them to be monitored in environmental matrices without the need to sacrifice hosts. Recent literature reviews show that eDNA has proven useful in the detection of single parasite species. However, very few studies targeted multiple parasite species within and across defined parasite groups at once. Given that eDNA is increasingly used in aquatic biodiversity monitoring worldwide, it offers a great opportunity for obtaining parasite diversity data in existing monitoring programs. Here, we present a methodological pipeline for the simultaneous detection of multiple fish parasite groups using eDNA that will be tested within the framework of the newly acquired project IMPACT.

1645

Application of eDNA metabarcoding to phytoplankton research in freshwater and saline lakes

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Freshwater lakes have been heavily altered by multiple stressors for decades, including a wide range of harmful human activities. Similarly, it is estimated that most of continental saline lakes will have undergone changes in their functioning by 2025. In the European Water Framework Directive (WFD), the ecological status assessment of lakes is based on the survey of key communities (i.e., Biological Quality Elements, BQEs). Due to its ecological features, phytoplankton is one of the key BQEs required by the WFD. In current assessments, phytoplankton is studied using a standardised microscopy approach. The advent of methods based on molecular techniques (e.g., eDNA metabarcoding) provides an alternative to overcome issues associated with microscopy-based assessment. The aim of our study was to compare phytoplankton data obtained by microscopy approach with eDNA metabarcoding based on the 23S RNA marker gene. Water was sampled in eight sites: four sites in Savsko lake (urban freshwater lake) and four sites in Plava Banja (saline clay pit pond) during spring, summer, and autumn 2023. The water quality analyses showed that nutrient concentrations (especially total nitrogen), chlorophyl a and conductivity were several times lower in the freshwater lake than in the saline lake. The very high total dissolved mineral content in Plava Banja had a substantial impact on the phytoplankton composition The results of lake species inventories obtained using both approaches will be presented. Particular attention will be paid to the level of congruence between the floristic lists. This study is a part of the EU funded BIOLAWEB project.

1663

Evaluation on the use of eDNA metabarcoding in microbial communities as potential bioindicators of ecosystem integrity in a tropical river with anthropogenic pollution gradient.

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Aquatic bioindicators are a valuable tool that provide insights into various aspects of water quality beyond what physicochemical analysis can reveal, like the ecological status of rivers, and are cost-effective. Microorganisms, including bacteria and protozoa, play crucial roles in nutrient cycling and productivity but have not been used widely as bioindicators because their use requires taxonomic expertise and specialized equipment for organism collection. Environmental DNA (eDNA) can be used to characterize aquatic communities and identify a wide range of microorganisms that are difficult to detect through other methods. This study used eDNA metabarcoding to assess the potential of microbial communities in a tropical river in Mexico City as bioindicators of the ecosystem integrity along a gradient of human influence. Community diversity and abundance of identified groups decreased with increased human influence. In forests and rural sites, bacterial communities are dominated by Cyanobacteria, Planctomycetota, and Verrucomicrobiota, while eukaryotic microbial communities by Diatomea, Cercozoa, and Arthropoda. Urban sites with high human influence show a dominance of Campilobacterota, Fusobacterota, and Firmicutes (bacteria) and Chlorophyta, Ciliophora, and Oligohymophorea (eukaryotes). This approach can help connect ecological integrity studies with public health implications. The study demonstrated that microbial communities are influenced by human impact and seasonality, making them suitable for biomonitoring.

1861

Diversity of planktonic microeukaryotes by metabarcoding in the Araguaia River floodplain, Brazil

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Phototrophic planktonic microeukaryotes are organisms that play a fundamental role in sustaining life on Earth. The diversity and composition of their communities are primarily influenced by the environment, and can be analyzed from three main aspects: alpha diversity, beta diversity, and gamma diversity. The use of NGS tools, such as the molecular technique of metabarcoding, has become common for obtaining diversity and community composition data, due to the precision and effectiveness of the method. Here, we investigate the diversity of planktonic microeukaryotes (phytoplankton) across 121 lakes in the floodplain of the Araguaia River, one of the most important rivers in the Central-West region of Brazil. For this, we sequenced the 18S-V4 gene from water samples collected and filtered with a 0.45µm membrane. The PIMBA pipeline was used for bioinformatic analyses. We calculated alpha, beta (turnover and nestedness) diversity indices, gamma diversity, and the relative abundance of identified Operational Taxonomic Units (OTUs). In total, we obtained 6122 OTUs, of which 4443 could be taxonomically assigned. The total OTU richness was 3293, varying between 1 and 120 OTUs per lake. Shannon diversity ranged from 2.46 to 5.93 across locations, presenting a total richness of 6.04. Simpson diversity varied from 0.71 to 0.99, with a total richness of 0.99. Beta diversity obtained through the Sorensen index (β SOR) was 0.97, and in terms of partitioning, 0.95 was attributed to turnover and 0.01 to species nestedness. The results indicate that the lakes exhibit high turnover, meaning the environments have distinct OTUs.