Preliminary insights into macroinvertebrate communities associated with floating islands in two rivers under distinct anthropogenic pressures.

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INTRODUCTION & AIM

Floating islands are Nature-Based Solutions designed to replicate natural riparian habitats and enhance ecological functions in degraded aquatic systems. By increasing habitat complexity, they may promote macroinvertebrate colonization and improve ecological quality [1].

Within the Bio Ilhas project, floating islands were installed in two rivers with contrasting pressures: the Fervença River (urban and highly modified) and the Côa River (agricultural-natural landscape with dam fragmentation). This study compares macroinvertebrate communities associated with floating islands and adjacent control areas, assessing taxonomic composition, richness, relative abundance, and functional feeding groups. Water-quality parameters were integrated to contextualize biological patterns [2].

METHOD

Macroinvertebrates were sampled directly from the floating islands, with separate collection and analysis of organisms associated with cork platforms and polystyrene platforms.

In the laboratory, specimens were sorted and identified to the lowest possible taxonomic level. Taxonomic richness, relative abundance, and functional feeding groups were determined for each substrate type.

Physical, chemical (dissolved oxygen, nutrients, temperature, pH, conductivity), and microbiological parameters were also analyzed to characterize environmental conditions.

RESULTS & DISCUSSION
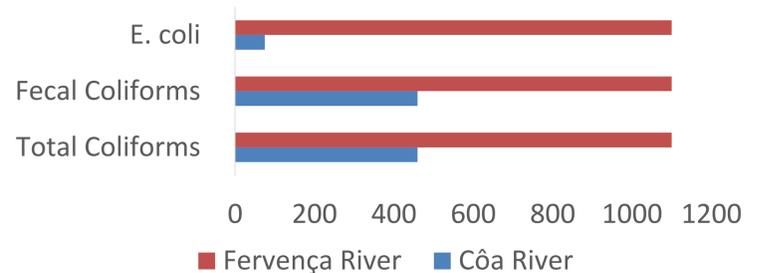
Comparison between the Côa River and the Fervença River

- Physical and Chemical Parameters

Côa Bio Ilhas · Fervença Bio Ilhas
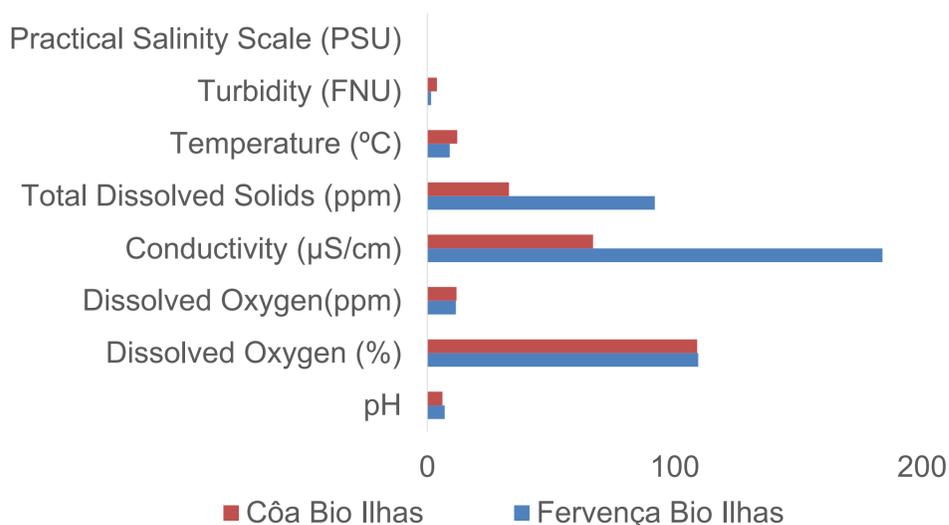
RESULTS & DISCUSSION

- Microbiological analyses (CFU/100 mL):

The Fervença River showed significantly higher levels of fecal contamination and *E. coli*, based on MPN results (>1100 CFU/100 mL).

Fervença River · Côa River

- Macroinvertebrate Communities

The Fervença River presented higher taxonomic richness, with eight recorded taxa (*Aeshnidae, Asellidae, Baetidae, Chironomidae, Coenagrionidae, Corixidae, Phisa,* and *Polycentropodidae*). The community structure was heterogeneous, with multiple co-occurring taxa and no single group reaching extreme dominance.

In contrast, the Côa River was exclusively represented by *Astacidae*, no additional taxa were identified, resulting in extremely low richness.

CONCLUSION

The results show two distinct ecological scenarios:

Fervença showed greater fecal contamination and urban influence, but supported greater macroinvertebrate richness and complexity (8 taxa). Côa showed lower microbiological pressure and lower water mineralization, but revealed an extremely simplified community dominated by *Astacidae* (invasive species).

Thus, ecological quality is not explained solely by physical-chemical or microbiological parameters. The dominance of invasive species can significantly reduce biological complexity, even in systems with good oxygenation and lower fecal contamination.

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