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ZIRCONIUM IMPACT ON FRESHWATER PERIPHYTIC COMMUNITIES

Caroline Doose¹, Soizic Morin², Jacky Vedrenne², Claude Fortin¹

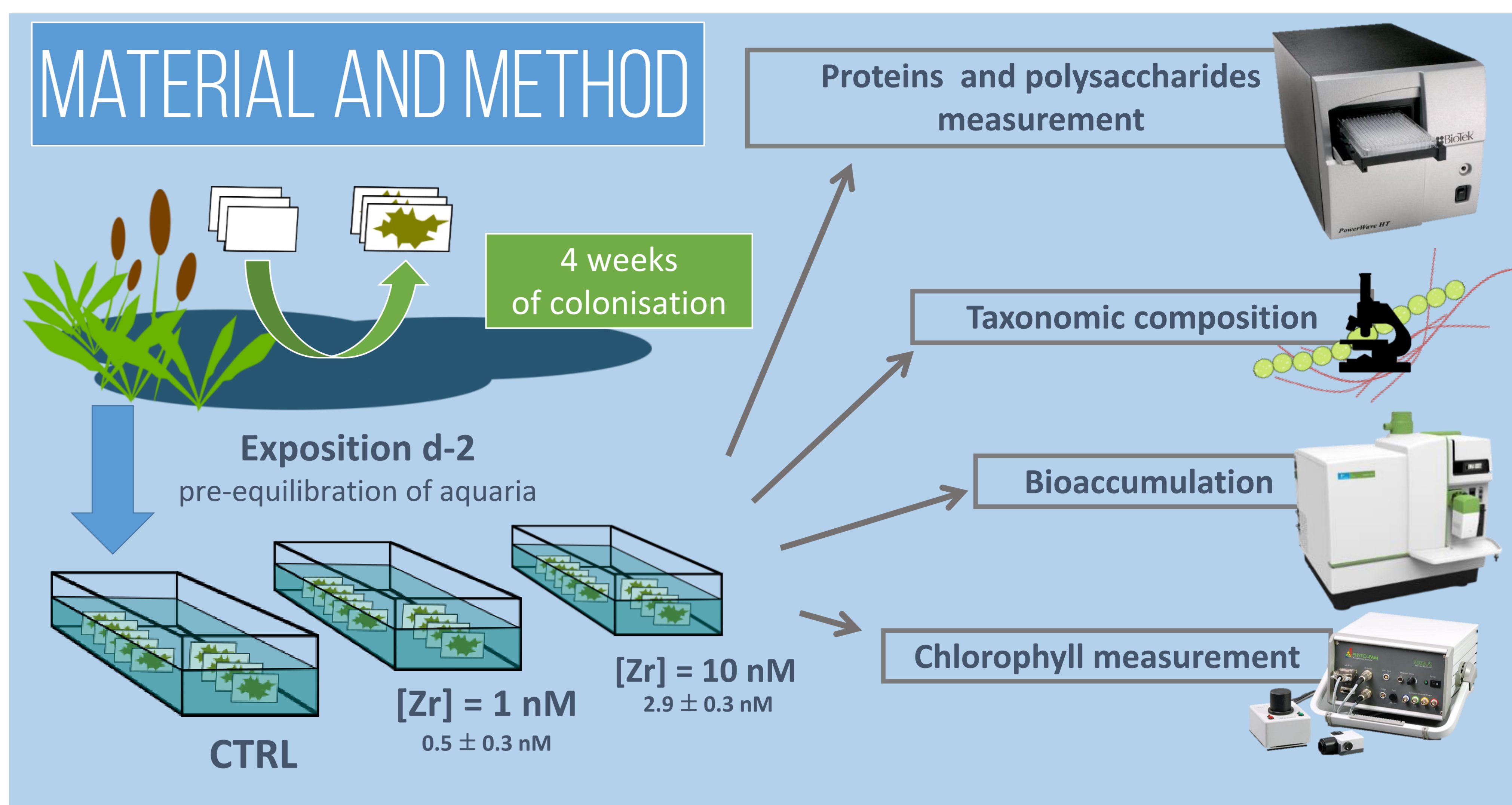
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INTRODUCTION

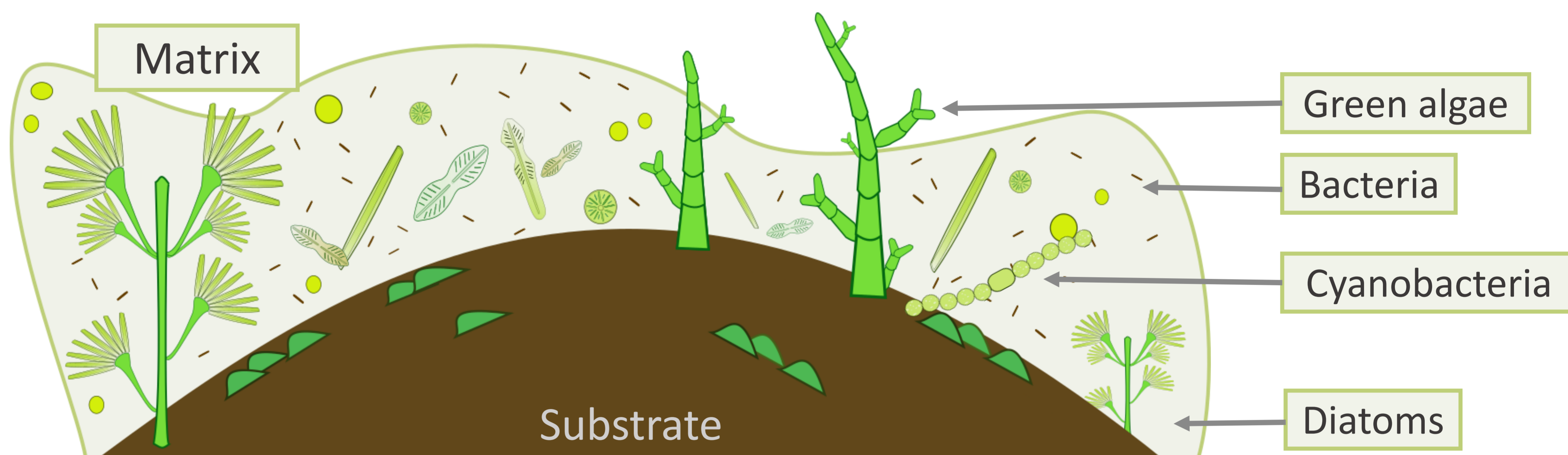
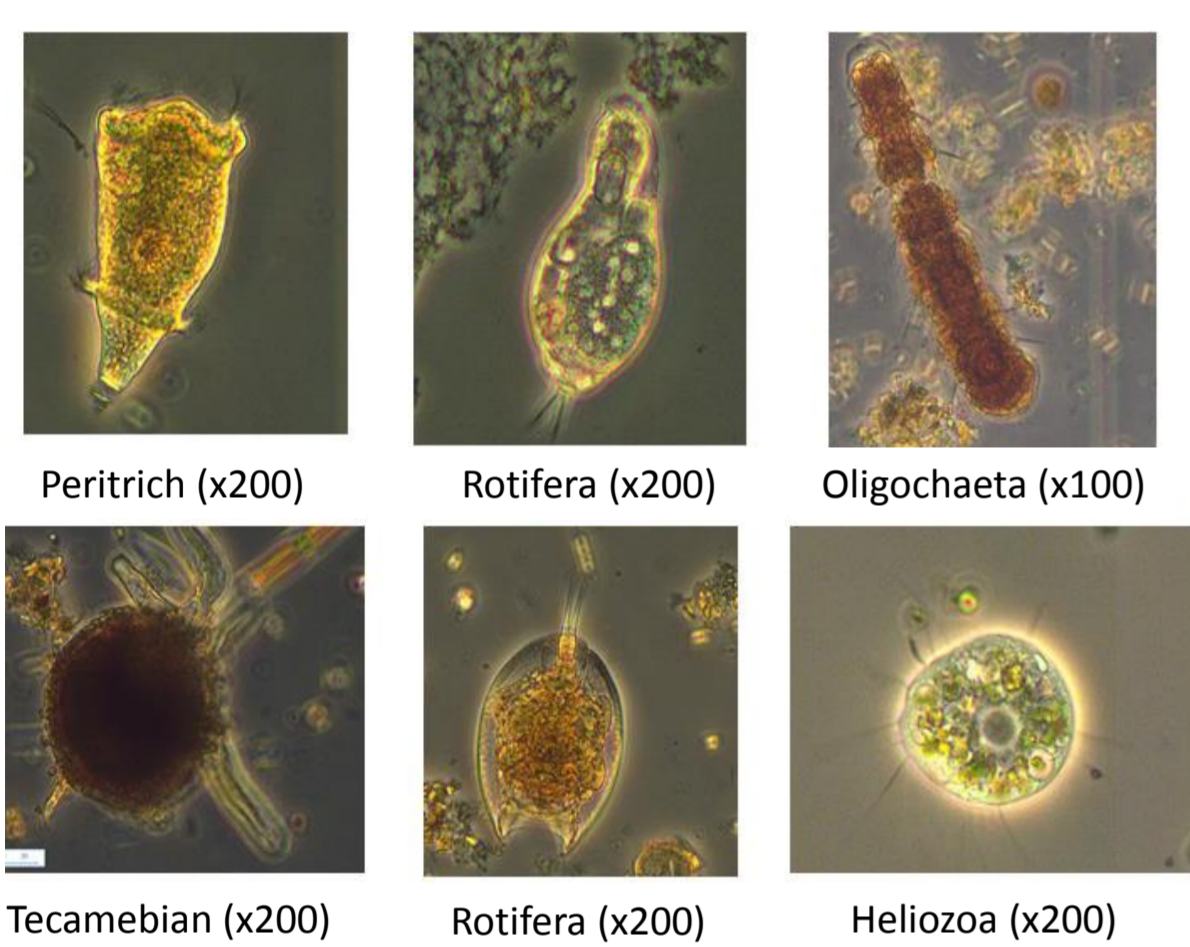
Zirconium (Zr) is a tetravalent element for which the steady increase of global demand could lead to an increase in its mobilization in aquatic systems¹. Benthic microorganism communities (periphyton) have shown good potential as a biomonitoring tool to assess metal exposure of aquatic organisms^{2;4}. The effect of Zr on periphyton biodiversity and biochemistry was investigated to apply this tool to tetravalent metals contamination assessment and to better understand their potential impacts on aquatic ecosystems.

91,2 40
Zr
Zirconium

MATERIAL AND METHOD



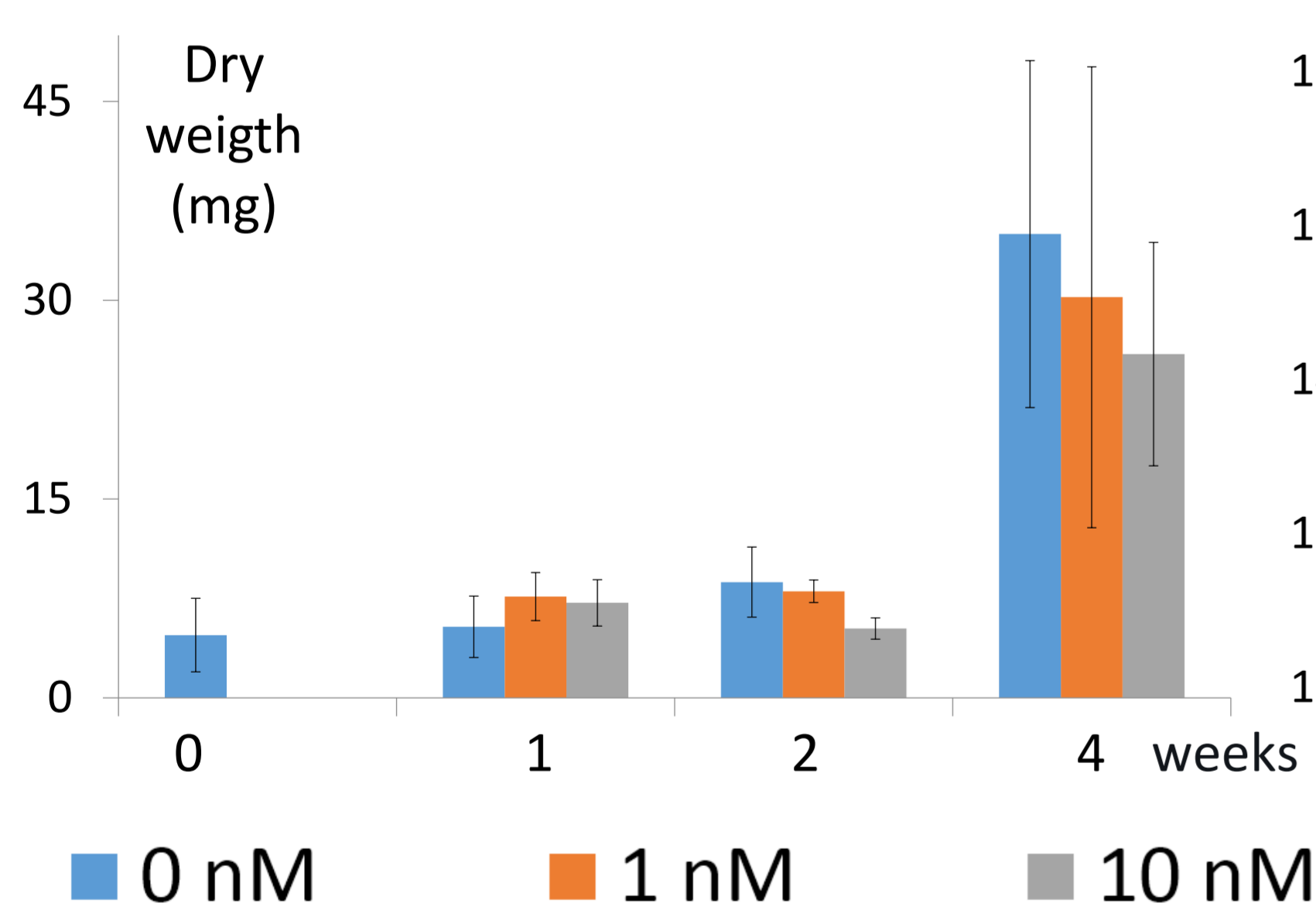
PERIPHYTON



RESULTS

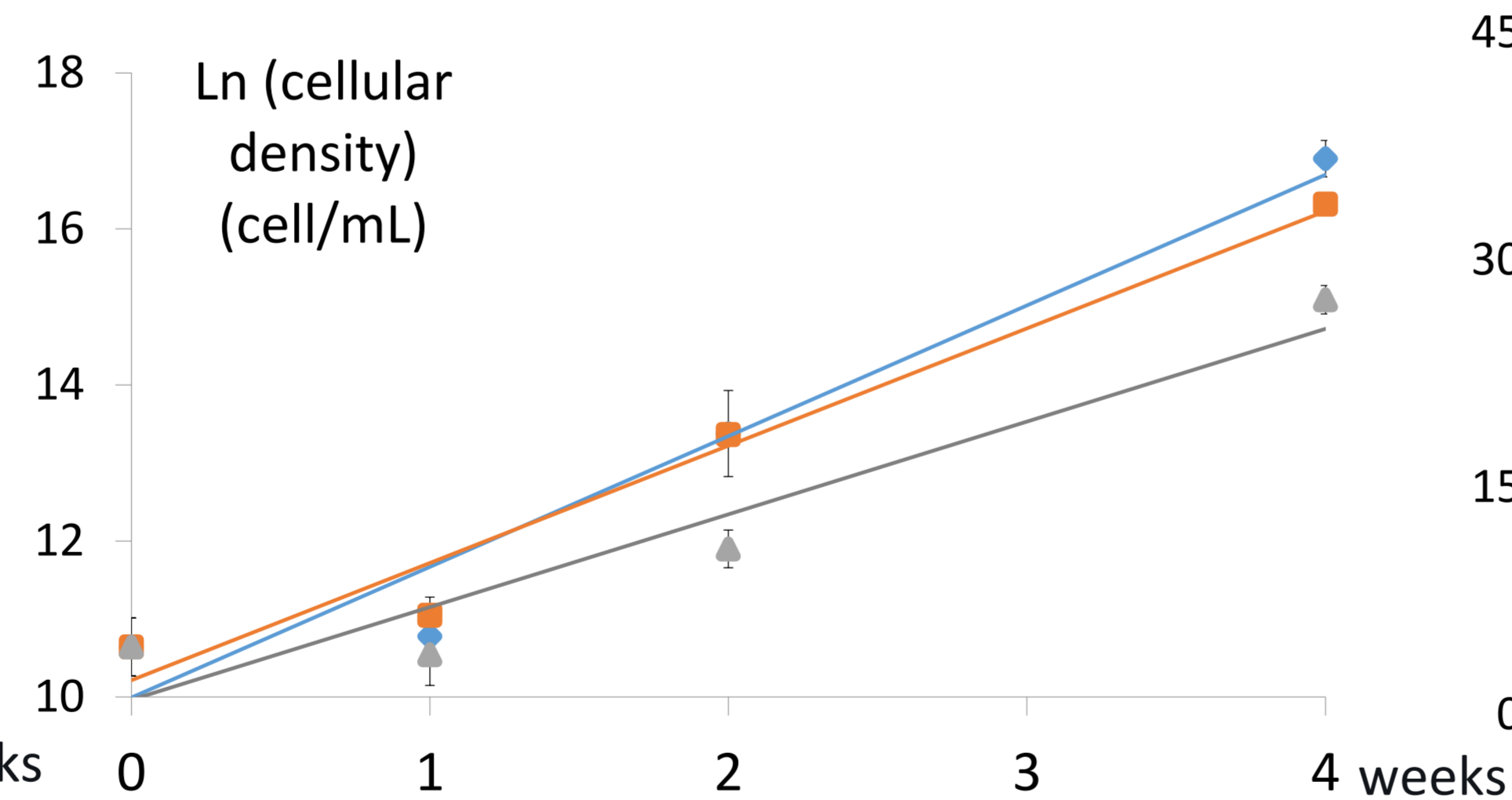
BIOMASS

→ Increase between 2 and 4 weeks



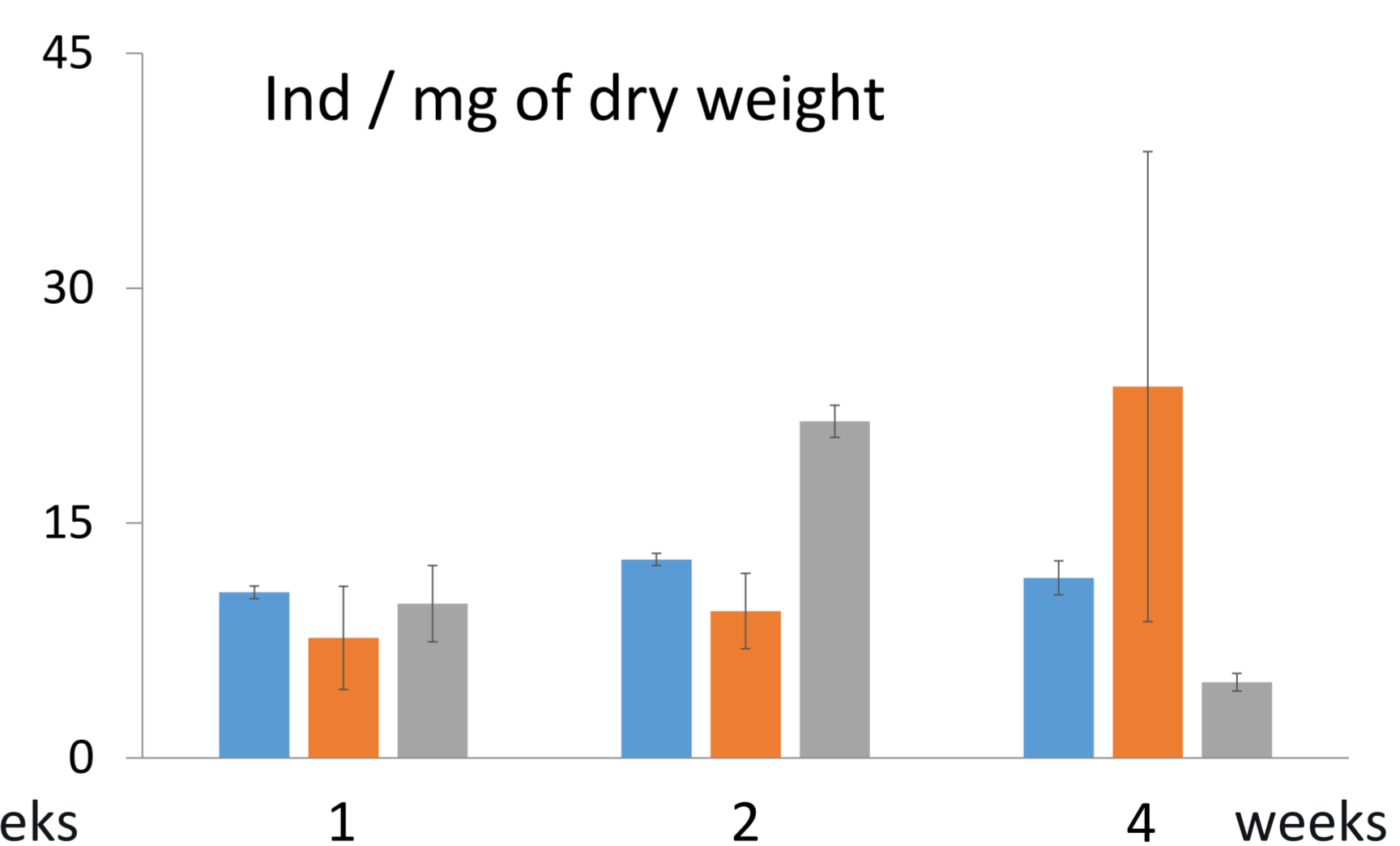
ALGAL GROWTH

→ Algal growth lower at 10 nM Zr (ANCOVA, R² = 0,97)



MICROMEIOFAUNA

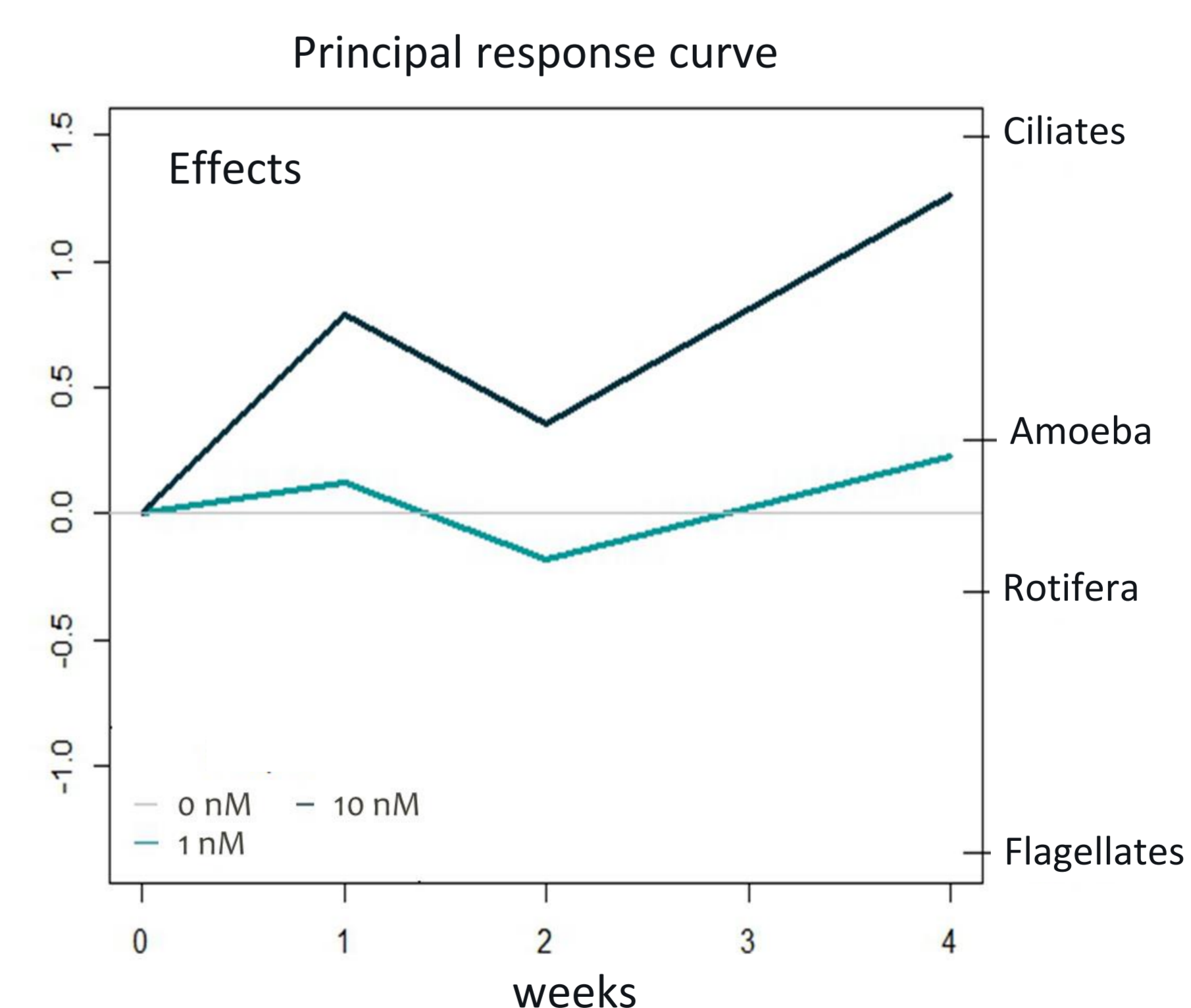
→ Effects at 10 nM Zr: number of individuals lower at week 4



→ Combined effect of time and concentration (ANOVA, p < 0,05)

CONCLUSION

Impacts on algal growth and on micromeiofauna at low concentrations (2.9 ± 0.3 nM) show that Zr could affect the periphyton structure and its essential function on aquatic ecosystems. Zr bioaccumulation still need to be determined (Ti interferences during ICP-MS analysis). Enzymatic analyses linked to oxidative stress responses and organic matter degradation are in progress.



→ Impact on the composition of the micromeiofauna (ANOVA, p < 0,001)

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