Effect of sodium perchlorate on lipid accumulation of Daphnia magna

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Why Perchlorates?
• Widely used in society
• High water solubility (Acevedo-Barrios et al., 2018)
• Persistent contaminant in aquatic environment (Zhou et al., 2021)
• Alter metabolism, reproduction, development, & absorption

Why Daphnia magna?
• Pollutant sensitivity (Acevedo-Barrios et al., 2018)
• Shares most genes with humans (Jordao et al., 2016)
• Perchlorate increased lipid droplet accumulation in stickleback fish (Gardell et al., 2017)
• Transparent carapace
• TBT or tributyltin disrupted lipid metabolism (Jordao et al., 2016)

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Methods & Materials:
• Adult D. magna
• perchlorate treatments: 0, 10, & 100 mg/L
• Food levels: low (10 ul) & high (100 ul) instant algae
• Exposure times: 3 & 5 days
• Fluorescent microscope
• Nile red staining
• Sonication & Microplate reader analysis

Results:
Qualitative assay in figure 4 exhibited lipid accumulation in 0 and 10 mg/L in which it was difficult to count individual droplets. Quantitative assay showed 100 mg/L treatment had the most lipid accumulation.

Conclusion:
Qualitative analysis illustrated mixed results. Quantitative analysis showed 100 mg/L had the most lipid accumulation. Further research is necessary.

References: