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Remediation techniques for toxic/persistent contaminants in groundwater are often technologically difficult. Nanoparticles (NP) such as nZVI (Zero-Valent Iron) applicable as *in-situ* reduction or oxidation agents for groundwater treatment give promising results. However, they may also represent an additional contamination. Our study aims to assess the impact of nZVI on the denitrifying activity, the abundance and the structure of a planktonic nitrate-reducing bacterial community.

Pre-culture of the denitrifying bacterial community was carried out from groundwater samples. It was then allocated in reactors containing substrate (sodium acetate), nitrates and a range of nZVI concentrations (from 0 to 300 mg $Fe.L^{-1}$). Physical (pH, redox potential), chemical (NO_3^- concentrations) and biological (DNA, RNA) parameters were monitored during one week. The size distribution of nZVI and the mortality of bacteria (Live&Dead observations) were also evaluated. Then the bacterial cultures were transplanted in fresh substrates without nZVI to assess the resilience of the bacterial community.

Denitrification activity was stopped in the presence of nZVI at concentrations higher than 30 $mg.L^{-1}$, demonstrating the toxic effect of nZVI. Live&Dead observations revealed that the viability of bacteria was lower for lower nZVI concentrations. The presence of NP aggregates was higher for higher nZVI concentrations. They could then result in a lower toxicity for bacteria, even if nZVI concentration is high. DNA and RNA analyses allowed us to observe the impact of nZVI on the activity (*narG* gene), abundance and structure of bacterial community. Finally, resilience was worst for concentrations ranging from 50 to 200 $mg.L^{-1}$.