



## Viral infection plays a key role in extracellular DNA dynamics in marine anoxic systems

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**ABSTRACT:** To investigate the role of viruses in extracellular DNA production through cell lysis, we selected two systems where viruses are expected to be the main component controlling prokaryote dynamics. These systems include anoxic subsuperficial coastal sediments and water and sediments of two deep-hypersaline anoxic basins (i.e., DHABs) of the eastern Mediterranean. Viral production was high in both places. Viruses were responsible for 10- 60% of prokaryote mortality in anoxic sediments and up to 100% in deep-anoxic waters. The daily contribution of DNA released by viral lysis to the total extracellular DNA pool was 2-11% in anoxic sediments and more than 100% in the brines of both deep-sea basins. Extracellular DNA released by viral infection was rapidly degraded by deoxyribonucleases (DNases), which were also high in permanently anoxic conditions. Overall, our data suggest that DNA released by viral lysis, because of its high lability and fast turnover, may represent an important mechanism of trophic supply for prokaryotes, particularly in systems characterized by limited availability of external trophic sources.

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