

# Lawrence Berkeley National Laboratory

## Recent Work

### Title

CHEMOTACTIC AND GROWTH RESPONSES TO EXPLOSIVES OF *DESULFOVIBRIO VULGARIS* H. AND SULFATE-REDUCING BACTERIA ISOLATED FROM TROPICAL MARINE SEDIMENTS

### Permalink

<https://escholarship.org/uc/item/74p5f4g7>

### Authors

Ramos-Hernandez, N.

Chakraborty, R.

Joyner, D.

et al.

### Publication Date

2006-08-20

Bombing sites used for military training activities can have considerable amounts of contaminants and pose significant risks for people and the environment. Until 2003, the eastern part of Vieques (Puerto Rico) was used by the US Navy as a bombing range. Currently, leaching of explosive compounds from unexploded ordnance represents a serious threat to the marine ecosystem. The contribution of microorganisms in natural attenuation of explosives, including sulfate-reducing bacteria (SRB) has been demonstrated in soils but little is known about their contribution in marine environments. Characterization assays were employed to assess the effects of explosive compounds (TNT, RDX, HMX) on *Desulfovibrio vulgaris* Hildenborough and five novel SRB isolated from marine sediments in coastal waters of Vieques. Pure cultures were combined with media in a covered 96-well micro plate and the opacity was monitored in real time as the bacteria grew in a temperature-controlled plate reader. A dose-response curve was used to estimate minimum inhibitory concentrations (MICs) for TNT, RDX and HMX in 0, 1.5 and 3.0% (w/v) NaCl media. Some of the bacterial isolates grew better in explosive-containing environments than in regular media while at low salt *D. vulgaris* grew without inhibition at saturated RDX levels. Higher salt concentrations (1.5 and 3.0%) did not support *D. vulgaris* growth in the presence of RDX. However, this organism did tolerate high levels of TNT at different NaCl concentrations. Elucidating the diversity and behavior of SRBs to explosive compounds in tropical sediments could help us understand the role of these microbial populations in contaminated marine environments.