

Supplementary Materials

Shallow-Water Hydrothermal Vents as Natural Accelerators of Bacterial Antibiotic Resistance in Marine Coastal Areas

Erika Arcadi*, Eugenio Rastelli*, Michael Tangherlini, Carmen Rizzo, Monique Mancuso, Marilena Sanfilippo, Valentina Esposito, Franco Andaloro, Teresa Romeo

This file includes:

Supplementary Tables S1–S2

Supplementary Figure S1

Table S1. Concentrations of HMs in the sediments collected in this study. Reported are average values (in $\mu\text{g g}^{-1}$) and SDs.

	"Hot" vent	"Cold" vent	Bottaro Crater
Al	10767 \pm 1365	9675 \pm 650	5333 \pm 351
As	13.4 \pm 1.5	15.3 \pm 3.4	87.8 \pm 64.0
Cd	0.03 \pm 0.00	0.03 \pm 0.01	0.04 \pm 0.01
Cr	5.6 \pm 0.7	6.4 \pm 0.5	17.8 \pm 2.0
Fe	17333 \pm 577	15250 \pm 1258	18401 \pm 11961
Mn	71.8 \pm 8.9	81.5 \pm 11.1	550 \pm 564
Hg	0.06 \pm 0.01	0.09 \pm 0.05	0.12 \pm 0.07
Ni	3.3 \pm 0.6	3.5 \pm 0.4	3.2 \pm 1.7
Pb	7.7 \pm 0.8	9.0 \pm 1.2	27.7 \pm 3.0
Cu	19.1 \pm 3.4	18.5 \pm 1.3	6.1 \pm 4.3
V	61.4 \pm 6.4	66.1 \pm 6.0	118.4 \pm 62.8
Zn	20.5 \pm 5.0	20.1 \pm 0.8	38.1 \pm 13.0

Table S2. List of primers used in this study, with details of gene function, primer sequence, annealing temperature, amplicon size and detailed related references.

Name	Gene function	Primers sequences (5'-3')	Annealing temperatures (°C)	Amplicon size (bp)	References
<i>arsB</i>	Arsenite efflux ATP ase	GGTCTATGCGCTGGAGCAATTGAA TGCTGGGCATGTTGTTCAATACCG	46	500	Bouskill et al., 2007
<i>czcA</i>	Cobalt/Zinc/Cadmium efflux protein	GTTACCTTGCTCTTCGCCATGTT ACAGGTTGCGGATGAAGGAGATCA	63	320	Bouskill et al., 2007
<i>copA</i>	Copper translocating ATPase	CGGTCTCTA CGAATACCGCTTCAA GAAATAGCTCATTGCCGAGGCGTT	55	300	Bouskill et al., 2007
<i>merA</i>	Hg reductase	GAAGCGGGTGAAGTATCC TCGTCAGGTAGGGGAACAAC	53	500	Larose et al., 2013
<i>pbrT</i>	Pb uptake protein	AGCGCGCCCAGGAGCGCAGCG TCTTGGCTCGAAGCCGTCGAGRTA	55	450	Roosa et al., 2014

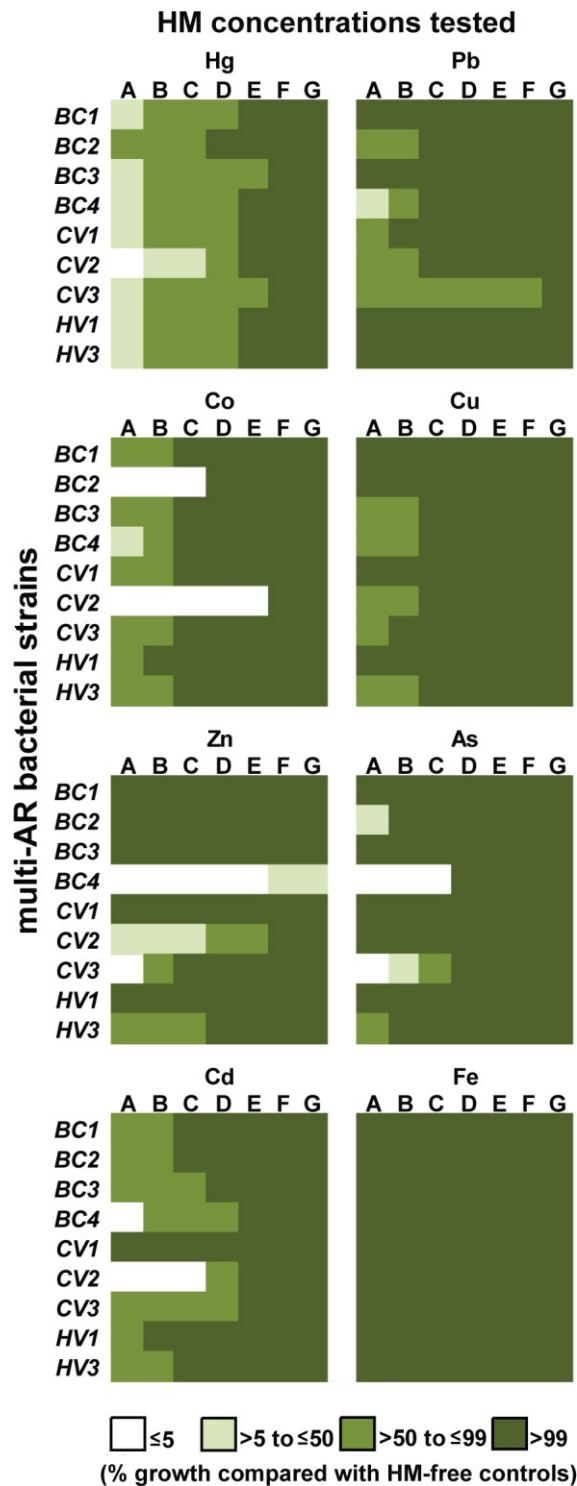


Figure S1. Results of the physiological tests conducted on the multi-AR bacterial strains identified in this study, to assess their tolerance/resistance to different heavy metals. Letters form A to G indicate the different concentrations at which each HM was tested (A=10000 ppm, B=5000 ppm, C=1000 ppm, D=500 ppm, E=100 ppm, F=50 ppm, G=10 ppm). The color legend shows the different growth levels of each strain at each of the concentrations tested, compared with growth in the respective HM-free controls.