

# Supplementary material

## **Antibiotic and heavy metal co-resistant strain isolated from enrichment culture of marine sediments, with potential for environmental bioremediation applications**

**Han-Sheng Zhu<sup>1</sup>, Xiao Liang<sup>1</sup>, Jun-Cheng Liu<sup>2</sup>, Han-Yang Zhong<sup>1</sup>, Yuan-Hang Yang<sup>1</sup>, Wen-Peng Guan<sup>1</sup>, Zong-Jun Du<sup>1,3\*</sup>, Meng-Qi Ye<sup>1,3,4\*</sup>**

<sup>1</sup>Marine College, Shandong University, Weihai, Shandong, 264209, PR China;

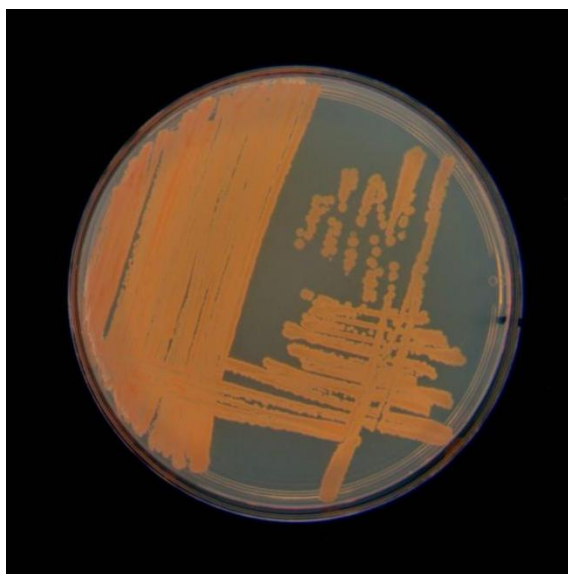
<sup>2</sup>SDU-ANU Joint Science College, Shandong University, Weihai, Shandong, 264209, PR China

<sup>3</sup>Weihai Research Institute of Industrial Technology of Shandong University, Weihai, Shandong, 264209, PR China; Shenzhen Research Institute of Shandong University, Shenzhen, Guangdong, 518057, PR China;

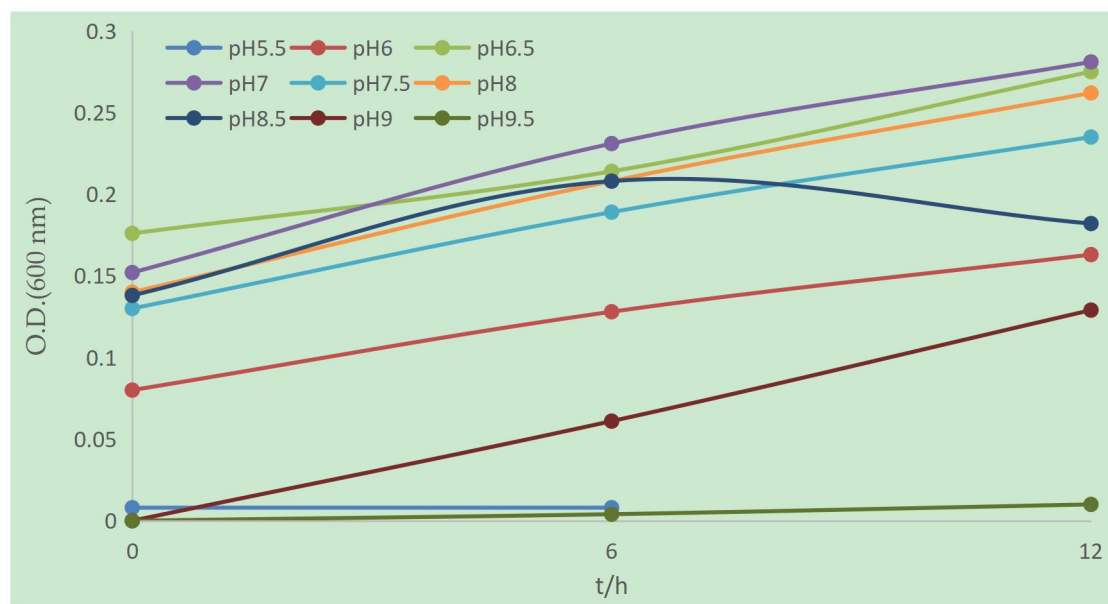
<sup>4</sup>Shenzhen Research Institute of Shandong University, Shenzhen, Guangdong, 518057, PR China;

\*Correspondence: yemengqi@126.com (M.-Q.-Y)

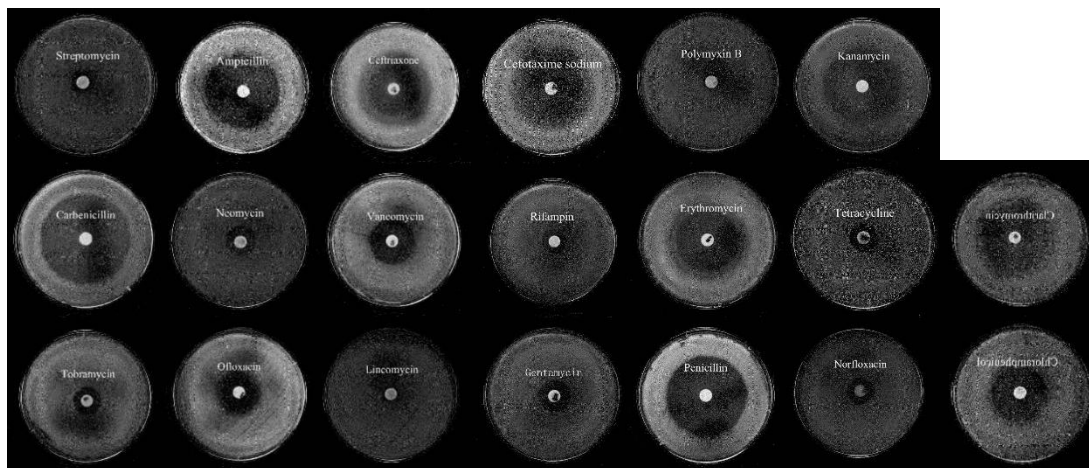
duzongjun@sdu.edu.cn (Z.-J.-D.)



**Figure S1** Colony morphology of strain ZC255



**Figure S2** Growth curve of strain ZC255 at different pH value



**Figure S3** Antibiotics sensitive tests of strain ZC255

**Table S1** Different characteristics of strain ZC255

Strain	ZC255
API 20E	
ONPG $\beta$ -Galactosidase	-
ADH    Arginine dihydrolase	-
LDC    Lysine decarboxylase	-
ODC    Ornithine decarboxylation	-
CIT    Citrate utilization	+
H <sub>2</sub> S    H <sub>2</sub> S production	-
URE    urease	+
TDA    Tryptophan deaminase	+
IND    Indole production	-
VP    Voges-Proskauer reaction	-
GEL    Gelatin	+
GLU    glucose	-
MAN    mannitol	-
INO    inositol	-
SOR    sorbitol	-
RHA    rhamnol	-
SAC    sucrose	-
MEL    melibiose	-
AMY    amygdalin	-

ARA	arabinose	-
Biolog GEN III MicroPlate		
1A	negative-control	w
2A	dextrin	w
3A	D-maltose	+
4A	D-trehalose	+
5A	D-cellobiose	+
6A	gentiobioswe	-
7A	sucrose	+
8A	D-turanose	+
9A	stachyose	+
10A	positive control	+
11A	pH 6	w
12A	pH 5	-
1B	D-raffinose	w
2B	D-lactose	w
3B	D-melibiose	w
4B	$\beta$ -methyl-D-glucoside	w
5B	D-salicin	-
6B	N-acetyl-D-glucosamine	+
7B	N-acetyl- $\beta$ -D-mannosamine	+
8B	N-acetyl-D-galactosamine	+

9B	N-acetyl neuraminic acid	+
10B	1% NaCl	+
11B	4% NaCl	w
12B	8% NaCl	-
1C	$\alpha$ -D-glucose	-
2C	D-mannose	+
3C	D-fructose	+
4C	D-galactose	+
5C	3-methyl glucose	+
6C	D-fucose	+
7C	L-fucose	+
8C	L-rhamnose	+
9C	inosine	+
10C	1% sodium lactate	-
11C	fusidic acid	-
12C	D-serine	-
1D	D-sorbitol	+
2D	D-mannitol	w
3D	D-arabitol	w
4D	myo-inositol	+
5D	glycerol	-
6D	D-glucose-6-PO <sub>4</sub>	-

7D	D-fructose-6-PO <sub>4</sub>	-
8D	D-aspartic acid	w
9D	D-serine	-
10D	troleandomycin	-
11D	rifamycin SV	-
12D	minocycline	-
1E	gelatin	-
2E	glycyl- L-proline	-
3E	L-alanine	w
4E	L-arginine	w
5E	L-aspartic acid	w
6E	L-glutamic acid	w
7E	L-histidine	-
8E	L-pyroglutamic acid	w
9E	L-serine	w
10E	lincomycin	-
11E	guanidine HCl	-
12E	niaproof 4	-
1F	pectin	+
2F	D-galacturonic acid	w
3F	L-galactonic acid lactone	-
4F	D-gluconic acid	+



5F	D-glucuronic acid	-
6F	glucuronamide	-
7F	mucic acid	w
8F	quinic acid	w
9F	D-saccharic acid	w
10F	vancomycin	-
11F	tetrazolium violet	-
12F	tetrazolium blue	-
1G	$\rho$ -hydroxy-phenylacetic acid	-
2G	methyl pyruvate	-
3G	D-lactic acid methyl ester	w
4G	L-lactic acid	w
5G	citric acid	-
6G	$\alpha$ -keto-glutaric acid	w
7G	D-malic acid	w
8G	L-malic acid	w
9G	bromo-succinic acid	-
10G	nalidixic acid	-
11G	lithium chloride	-
12G	potassium tellurite	-
1H	tween-40	-
2H	$\gamma$ -amino-butyric acid	-

3H	$\alpha$ -hydroxy-butyric acid	-
4H	$\beta$ -hydroxy-D, L-butyric acid	w
5H	$\alpha$ -keto-butyric acid	-
6H	acetoacetic acid	+
7H	propionic acid	-
8H	acetic acid	+
9H	formic acid	-
10H	aztreonam	-
11H	sodium butyrate	-
12H	Sodium bromate	-

#### API 50 CH

1	GLY	+
2	ERY	-
3	DARA	-
4	LARA	-
5	RIB	+
6	DXYL	-
7	LXYL	-
8	ADO	-
9	MDX	-
10	GAL	+
11	GLU	+

12	FRU	+
13	MNE	+
14	SBE	-
15	RHA	-
16	DUL	-
17	INO	-
18	MAN	-
19	SOB	-
20	MDM	-
21	MDG	+
22	NAG	+
23	AMY	+
24	ARB	+
25	ESC	+
26	SAL	+
27	CEL	+
28	MAL	+
29	LAC	+
30	MEL	+
31	SAC	+
32	TRE	+
33	INU	-

34	MLZ	+
35	RAF	+
36	AMD	+
37	GLYG	+
38	XLT	-
39	GEN	+
40	TUR	+
41	LYX	-
42	TAG	+
43	DFUC	-
44	LFUC	-
45	DARL	-
46	LARL	-
47	GNT	-
48	2KG	-
49	5KG	+

#### API ZYM

1	2-Naphthyl phosphate	-
2	2-Naphthyl butyrate	-
3	2-Naphthyl octanoate	+
4	2-Naphthyl tetradecanoate	+
5	L-Leucinyl-2-naphthylamine	-

6	L-Valinyl-2-naphthylamine	-
7	L-Cystinyl-2-naphthylamine	-
8	N-Benzoyl-DL-argininyl-2-naphthylamine	-
9	N-Shodanoyl-phenylalanine2-naphthylamine	-
10	N-Naphthyl-phosphate	+
11	Naphthol-AS-BI-phosphate	-
12	6-Bromo-2-naphthyl- $\alpha$ D-galactopyranoside	-
13	2-Naphthyl- $\beta$ D-galactopyranoside	-
14	Naphthol-AS- $\beta$ -mono-D-glucuronide	-
15	2-Naphthyl- $\alpha$ D-glucopyranoside	-
16	6-Bromo-2-naphthyl- $\beta$ D-glucopyranoside	-
17	1-Naphthyl-N-acetyl- $\beta$ D-glucosamine	-
18	6-Bromo-2-naphthyl- $\alpha$ D-mannopyranoside	-
19	2-Naphthyl- $\alpha$ L-fructopyranoside	-

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Table S2 Reference standard of Susceptibility testing

Antibiotics	Drug content (ug/disk)	Bacteriostatic circle diameter (mm)		
		Resistance	Intermedi	Susceptibl
Lincomycin	2	12	13-15	15
Carbenicillin	100	19	20-22	23
Vancomycin	30	14	15-16	17
Norfloxacin	30	12	13-16	17
Kanamycin	30	13	14-17	18
Ofloxacin	5	12	13-17	18
Ampicillin	10	13	14-16	17
Penicillin	10	14		15
Polymyxin B	300	8	10	12
Ceftriaxone	30	13	14-20	21
Erythromycin	15	13	14-22	<u>≥23</u>
Chloramphenicol	30	12	13-17	18
Streptomycin	10	11	12-14	15
Clarithromycin	10	13	14-17	18
Rifampin	5	16	17-19	20
Cefotaxime sodium	30	14	15-25	26
Neomycin	30	13	14-18	19
Tobramycin	10	12	13-14	15

Tetracycline	30	14	15-18	19
Gentamycin	10	12	13-14	15

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