***Nisaea sediminum* sp. nov., a heavy metal resistant isolated from marine sediment in the East China Sea**

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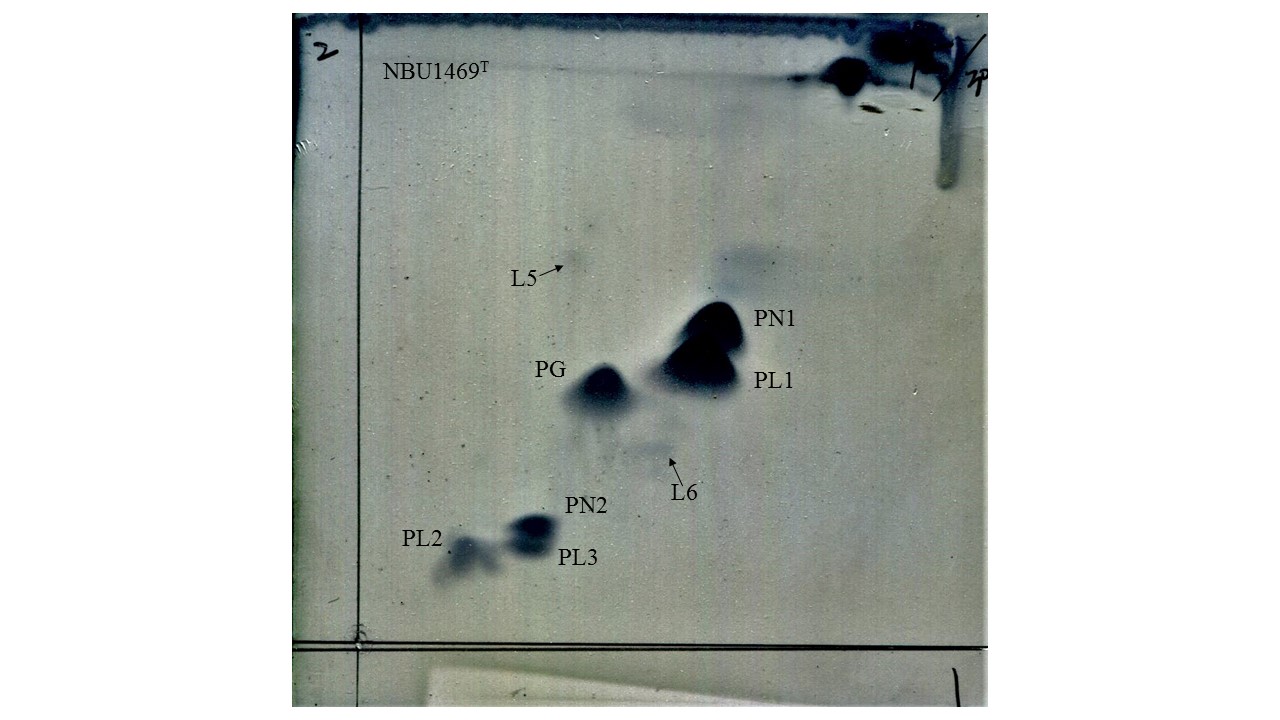
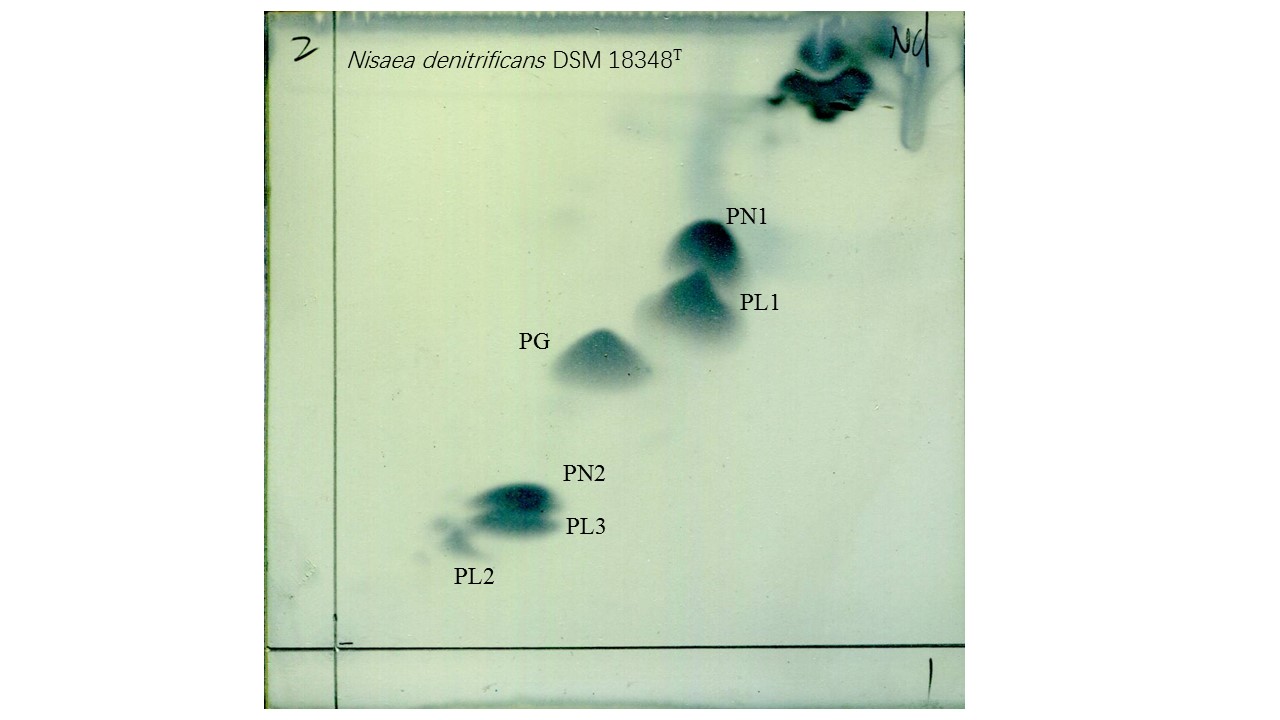
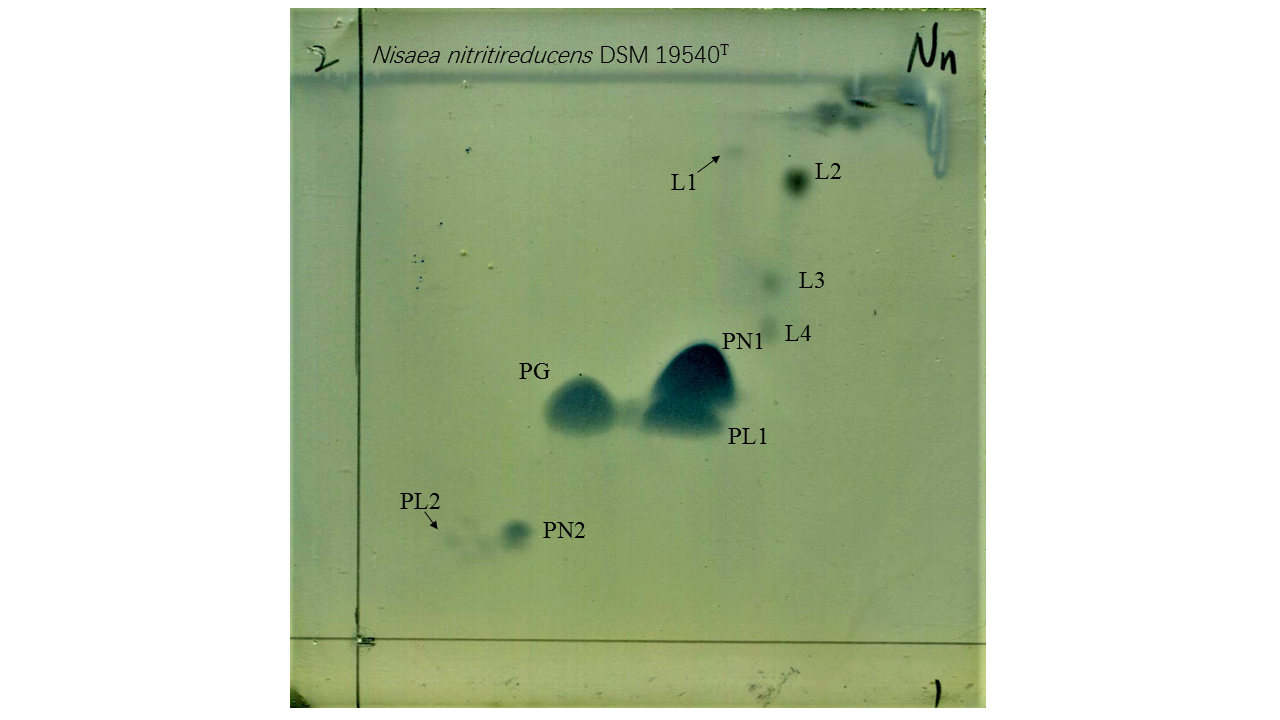
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**Table S1.** The same characteristics of strain NBU1469T andrelated type strains of the genus *Nisaea*.

Taxa: 1, strain NBU1469T; 2, *N. nitritireducens* DSM 19540T; 3, *N. denitrificans* DSM 18348T. All data were taken from this study unless otherwise indicated. Data marked with a was taken from Urios *et al.* [1]. -, negative; +, positive; R, resistant; S, susceptible.

|  |  |  |  |
| --- | --- | --- | --- |
| Characteristic | 1 | 2 | 3 |
| Cell morphology  Pigmentation | Rods  Cream | Rodsa  Creama | Rodsa  Creama |
| Oxidase and catalase activities | + | + | + |
| H2S production  Voges-Proskauer, methyl red | +  - | +  - | +  - |
| Hydrolysis of:  Starch, casein, tween 40, 60, 80 | - | - | - |
| API 20NE test results:  Indole production, fermentation of D-glucose,  arginine dihydrolase, gelatin hydrolysis,  aesculin hydrolysis, *β*-galactosidase | - | - | - |
| API ZYM test results:  Alkaline phosphatase, esterase (C4),  esterase lipase (C8), leucine arylamidase,  valin arylamidase, acid phosphohydrolase,  naphtol-AS-BI-phosphohydrolase  *N*-acetyl-*β*-glucosaminidas, lipase (C14),  cystin arylamidase, trypsin, *α*-fucosidase,  *α*-chymotrypsin, *α*-galactosidase,  *β*-glucuronidase, *β*-glucosidase,  *α*-mannosidase, *β*-galactosidase, *α*-glucosidase | +  - | +  - | +  - |
| API 50CH  L-Arabinose, D-xylose, L-rhamnose,  D-fucose, 2-ketogluconate  Erythritol, D-adonitol, D-mannose,  *β*-methyl-D-xylopyranoside, dulcitol,  *α*-methyl-D-mannopyranoside,  D-sorbitol, *α*-methyl-D-glucopyranoside,  arbutin, aesculin, melibiose, inulin, starch,  D-xylitol, gentiobiose, D-turanose,  D-tagatose, L-arabitol, D-gluconic acid | +  - | +  - | +    - |
| Susceptibility to |  |  |  |
| Lincomycin, bacitracin, nystatin  Kanamycin, ofloxacin, amikacin,  rifampicin, novobiocin, minocycline | R  S | R  S | R  S |

**Fig. S1** Polar lipid profile of strains NBU1469T, *N. nitritireducens* DSM 19540T and *N. denitrificans* DSM 18348T. All data were taken from this study. First dimension (left to right) was developed with chloroform-methanol-water (65:25:4) and second dimension (bottom to up) was developed with chloroform-acetic acid-methanol-water (80:15:12:4). PG, phosphatidylglycerol; PN, amino-phospholipids; PL, phospholipids; L, unidentified lipids. The following pictures used phosphomolybdic acid (5 g phosphomolybdic acid hydrated in 100 ml ethanol) to reveal the total polar lipid.

**Fig. S2** Phylogenetic tree based on 16S rRNA gene sequences using maximum-likelihood method. Bootstrap values higher than 50% are indicated at branch-points. Bar, 0.02 substitutions per nucleotide position.

*Nisaea nitritireducens* DR41\_18T (DQ665839)

*Nisaea denitrificans* DR41\_21T (AUFM01000008)

***Nisaea sediminum* NBU1469T (MT525301)**

*Thalassobaculum fulvum* HSF7T (KP976094)

*Thalassobaculum litoreum* DSM 18839T (FNBW01000025)

*Thalassobaculum salexigens* DSM 19539T (AUIR01000004)

*Oceanibaculum pacificum* MCCC 1A02656T (LPXN01000088)

*Oceanibaculum nanhaiense* L54-1-50T (MPOB01000022)

*Oceanibaculum indicum* P24T (AMRL01000052)

*Kaistia dalseonensis* B6-8T (AM409364)

*Kaistia adipata* Chj404T (AY039817)

*Tistlia consotensis* DSM 21585T (FZNU01000061)

*Fodinicurvata halophila* BA45ALT (HG764424)

*Fodinicurvata sediminis* DSM 21159T (ATVH01000016)

*Fodinicurvata fenggangensis* DSM 21160T (JMLV01000013)

*Hypericibacter terrae* R5913T (MG271952)

*Hypericibacter adhaerens* R5959T (MH450230)

*Aliidongia dinghuensis* 7M-Z19T (KX426600)

*Lacibacterium aquatile* LTC-2T (HE795994)

*Azospirillum thermophilum* CFH 70021T (CP029357)

*Azospirillum humicireducens* SgZ-5T (CP015285)

*Azospirillum oryzae* COC8T (AB185396)

100

88

100

100

91

100

100

79

100

90

99

95

95

86

64

65

74

0.02

**Fig. S3** Phylogenetic tree based on 16S rRNA gene sequences using the maximum-parsimony method. Bootstrap values higher than 50% are indicated at branch-points. Numbers at branching points refer to bootstrap values based on 1000 resamplings.

*Nisaea nitritireducens* DR41\_18T (DQ665839)

*Nisaea denitrificans* DR41\_21T (AUFM01000008)

***Nisaea sediminum* NBU1469T (MT525301)**

*Thalassobaculum fulvum* HSF7T (KP976094)

*Thalassobaculum litoreum* DSM 18839T (FNBW01000025)

*Thalassobaculum salexigens* DSM 19539T (AUIR01000004)

*Oceanibaculum pacificum* MCCC 1A02656T (LPXN01000088)

*Oceanibaculum nanhaiense* L54-1-50T (MPOB01000022)

*Oceanibaculum indicum* P24T (AMRL01000052)

*Lacibacterium aquatile* LTC-2T (HE795994)

*Azospirillum thermophilum* CFH 70021T (CP029357)

*Azospirillum humicireducens* SgZ-5T (CP015285)

*Azospirillum oryzae* COC8T (AB185396)

*Hypericibacter terrae* R5913T (MG271952)

*Hypericibacter adhaerens* R5959T (MH450230)

*Aliidongia dinghuensis* 7M-Z19T (KX426600)

*Kaistia dalseonensis* B6-8T (AM409364)

*Kaistia adipata* Chj404T (AY039817)

*Tistlia consotensis* DSM 21585T (FZNU01000061)

*Fodinicurvata halophila* BA45ALT (HG764424)

*Fodinicurvata sediminis* DSM 21159T (ATVH01000016)

*Fodinicurvata fenggangensis* DSM 21160T (JMLV01000013)

92

100

62

94

99

100

100

73

64

83

100

62

100

81

59

96

100

**Fig. S4** Phylogenomic tree was generated by Type (strain) Genome Server (TYGS), showing the phylogenomic relationships of strain NBU1469T and related taxa having genome sequences available.

0.02

100

100

100

100

100

100

100

100

100

***Nisaea sediminum* NBU1469T (JACZCQ000000000)**

*Nisaea denitrificans* DSM 18348T (AUFM00000000)

*Nisaea nitritireducens* DSM 19540T (JACZFS000000000)

*Thalassobaculum fulvum* HSF7T (BMZS00000000)

*Thalassobaculum salexigens* DSM 19539T (AUIR00000000)

*Thalassobaculum litoreum* DSM 18839T (FNBW00000000)

*Oceanibaculum pacificum* MCCC 1A02656T (LPXN00000000)

*Oceanibaculum indicum* P24T (AMRL00000000)

*Oceanibaculum nanhaiense* L54-1-50T (MPOB00000000)

*Tistlia consotensis* DSM 21585T (FZNU00000000)

*Aliidongia* *dinghuensis* 7M-Z19T (BMJQ00000000)

*Hypericibacter adhaerens* R5959T (CP042582)

*Hypericibacter terrae* R5913T (CP042906)

*Fodinicurvata sediminis* DSM 21159T (ATVH00000000)

*Fodinicurvata fenggangensis* DSM 21160T (JMLV00000000)

81

77

100

*Azospirillum thermophilum* CFH 70021T (CP029352)

*Azospirillum* *humicireducens* SgZ-5T (CP015285)

*Azospirillum oryzae* COC8T (CP054619)

**Fig. S5** The prediction of secondary metabolite gene clusters of strain NBU1469T.