

Supplementary File S1: Referenced GPS locations of studies of AMR in Antarctica. The GPS coordinates differ in format between studies due to differences in reporting. The locations of seven studies are highlighted in grey because the authors did not provide an exact sample site, but rather plotted their location onto a figure. The GPS coordinates are therefore those close to the identified sampling area or the track of the cruise.

Author	Latitude	Longitude	Author	Latitude	Longitude
Kobori, Sullivan and Shizuya, 1984	77.8590°S	166.6897°E	Retamal et al, 2017	62°13'S	58°56'W
Kobori, Sullivan and Shizuya, 1984	77.6000°S	163.8500°E	Retamal et al, 2017	62°14'00"S	58°46'00"W
De Souza et al, 2007	70°45'30"S	11°38'40"E	Retamal et al, 2017	63°19'S	57°55'W
Lo Giudice et al, 2007	74°41'33"S	164°07'15"E	Retamal et al, 2017	63°19'15"S	57°53'59"W
Lo Giudice et al, 2007	74°43'S	164°16'E	Pantůček et al, 2018	63°48'51"S	57°50'45"W
Bonnedahl et al, 2008	64°50'S	062°33'W	Cerdà-Cuéllar et al, 2019	62° 36' 0" S	60° 30' 0" W
Rahman et al, 2008	69°13'S	039°39' E	Yang et al, 2019	64°46'12.0"S	64°03'00.0"W
Miller, Gammon and Day, 2009	64°10'S	61°50'W	Yang et al, 2019	64°46'12.0"S	64°03'00.0"W
Ushida et al, 2010	63° 55' S	58° 10' W	Yang et al, 2019	64°46'12.0"S	64°03'00.0"W
Timmery, Hu and Mahillon, 2011	75°05'59"S	123°19'56"E	Yang et al, 2019	75.7529°S	168.7595°E
Vigo et al, 2011	62° 15' 0"S	58° 40' 0" W	Yang et al, 2019	75.4580°S	168.997°E
Vigo et al, 2011	63° 23' 0"S	56° 59' 0" W	Yang et al, 2019	75.7559°S	168.2359°E
Hernández et al, 2012	63°19'15"S	57°53'55"W	Yang et al, 2019	74.8002°S	169.3836°E
Hernández et al, 2012	62°28'44"S	59°39'52"W	Ghaly et al, 2019	66°24'36.76"S	110°39'17.40"E
Lo Giudice et al, 2013	74°41.698'S	164°04'214"E	Yuan et al , 2019	62°15.910S	58°52.738W
Lo Giudice et al, 2013	74°41'80.3"S	164°07'80.3"E	Yuan et al , 2019	62°13.021S	58°57.741W
Segawa et al, 2013	80°18'S	81°24'W	Yuan et al , 2019	62°12.666S	58°55.487W
Segawa et al, 2013	80°58'S	82°45'W	Yuan et al , 2019	62°13.710S	58°55.487W
Segawa et al, 2013	79°38'S	88°5'W	Yuan et al , 2019	62°12.667S	58°55.65W
Segawa et al, 2013	78°57'S	90°45'W	Yuan et al , 2019	62°12.867S	58°55.867W
Segawa et al, 2013	69°03'S	40°41'E	Yuan et al , 2019	62°12.200S	58°59.75W
Segawa et al, 2013	70°31'S	44°00'E	Yuan et al , 2019	62°13.200S	58°57.85W
Segawa et al, 2013	73°52'S	43°03'E	Hernández et al, 2019	62° 12'1.65"S	58° 57'36.96"W
Segawa et al, 2013	77°22'S	39°37'E	Hernández et al, 2019	62° 12'5.07"S	58° 57'39.58"W
Gunnigle et al, 2015	78°60'S	164°0'E	Hernández et al, 2019	62° 11'59.37"S	58 °57'31.16"W
Tam et al, 2015	62°12'14.9"S	58°57'47.5"W	Okubo et al, 2019	77°19'S	39°42'E
Tam et al, 2015	62°58'56.3"S	60°39'51.1"W	Laganà et al, 2019	62° 11' 53.5" S	058° 56' 29.6" W
Power et al, 2016	68°.35'S	77°58' E	Miwa et al, 1976	69°00'16"S	39°34'54"E
Stark et al, 2016	68.5764°S	77.9689° E	Wynn-Williams, 1983	54°14' - 67°34'	Not stated
Rabbia et al, 2016	62°12'1.65"S	58°57'36.96"W	Olsen et al, 1996	54°0'0"S	38°2'59"W
Rabbia et al, 2016	62°12'5.07"S	58°57'39.58"W	Palmgren et al, 2000	54°0'0"S	38°2'59"W
Rabbia et al, 2016	62°11'59.37"S	58°57'31.16"W	De Souza et al, 2006	50°S - 65°S	18°E - 30°E
Rabbia et al, 2016	62°12'58.65"S	58°57'35.21"W	Skurnik et al, 2006	Not stated	Not stated
Rabbia et al, 2016	63°19'16.44"S	57°54'5.09"W	Van Goethem et al, 2018	76°58'S	162°0'E
Rabbia et al, 2016	64°49'26.03"S	62°51'26.10"W	Na et al, 2019	62°12'59.70"S	58°57'51.90"W
Rabbia et al, 2016	62°12'47.44"S	58°55'58.70"W	Blanco-Picazo et al, 2020	62°36'S	60°30'W
Retamal et al, 2017	64°49'26"S	62°51'25"W	Jara et al, 2020	62°12'59.70"S	58°57'51.90"W
Retamal et al, 2017	62°32'35"S	59°34'31"W	Na et al, 2021	62°12'59.70"S	58°57'51.90"W

Supplemental File S2: Summarised data of studies on King George Island. The table shows the locations of AMR studies on King George Island, including details of the class of antibiotics resistance was found to, the antibiotic names and their nature, i.e., whether they are natural, semi-synthetic or synthetic antibiotics. The GPS coordinates differ in format between studies due to differences in reporting. Code to colours: red: synthetic resistance; yellow: semi-synthetic; red: synthetic; green: natural and semi-synthetic. No locations with (i) natural resistance, (ii) natural and synthetic or (iii) synthetic and semi-synthetic combinations were found.

Author	Latitude	Longitude	Antibiotic Class	Antibiotic	Antibiotic Nature
Tam et al, 2015	62°12'14.9"S	58°57'47.5"W	β -lactam, aminoglycoside, cephalosporin, fluoroquinolone, lincosamide, macrolide, aminocoumarin, sulfonamide, glycopeptide antibiotic, quinolone, polymyxin and broad-spectrum antibiotics	Carbenicillin, ceftazidime, cefixime, ceftiofur, cephalothin, ciprofloxacin, clarithromycin, clindamycin, erythromycin, fusidic acid, gentamicin, latamoxef, lincomycin, metronidazole, mupirocin, nitrofurantoin, novobiocin, rifampicin, spectinomycin, sulfonamides compound, trimethoprim, vancomycin, ampicillin, nalidixic acid, chloramphenicol, kanamycin sulfate, tetracycline hydrochloride, and polymyxin B sulfate	Natural, Semi-synthetic and Synthetic
Yuan et al, 2019	62°15.910'S	58°52.738'W	Possible ARG-carrying plasmids for multidrug resistance and chloramphenicol	Possible ARG-carrying plasmids for multidrug resistance and chloramphenicol	Semi-synthetic
Yuan et al, 2019	62°13.021'S	58°57.741'W	Possible ARG-carrying plasmids for multidrug resistance and chloramphenicol	Possible ARG-carrying plasmids for multidrug resistance and chloramphenicol	Semi-synthetic
Yuan et al, 2019	62°12.666'S	58°55.487'W	Possible ARG-carrying plasmids for multidrug resistance and chloramphenicol	Possible ARG-carrying plasmids for multidrug resistance and chloramphenicol	Semi-synthetic
Yuan et al, 2019	62°13.710'S	58°55.487'W	Possible ARG-carrying plasmids for multidrug resistance and chloramphenicol	Possible ARG-carrying plasmids for multidrug resistance and chloramphenicol	Semi-synthetic
Yuan et al, 2019	62°12.667'S	58°55.65'W	Macrolide, rifampin, oxazolidinone and β -lactam	Erythromycin, rifampin, ampicillin, penicillin and cefazolin	Natural and Semi-synthetic
Yuan et al, 2019	62°12.867'S	58°55.867'W	Macrolide, rifampin, oxazolidinone and β -lactam	Erythromycin, rifampin, ampicillin, penicillin and cefazolin	Natural and Semi-synthetic
Yuan et al, 2019	62°12.200'S	58°59.75'W	Macrolide, rifampin, oxazolidinone and β -lactam	Erythromycin, rifampin, ampicillin, penicillin and cefazolin	Natural and Semi-synthetic

Yuan et al, 2019	62°13.200S	58°57.85W	Macrolide, rifampin, oxazolidinone and β -lactam	Erythromycin, rifampin, ampicillin, penicillin and cefazolin	Natural and Semi-synthetic
Hernández et al, 2019	62° 12'1.65"S	58° 57'36.96" W	β -lactam, aminoglycoside, tetracycline, trimethoprim, sulfonamide and quinolone	Ampicillin, tetracycline, trimethoprim, sulfonamide, cefoxitin, streptomycin, nalidixic acid and cefotaxime	Natural, Semi-synthetic and Synthetic
Hernández et al, 2019	62° 12'5.07"S	58° 57'39.58" W	β -lactam, aminoglycoside, tetracycline, trimethoprim, sulfonamide and quinolone	Ampicillin, tetracycline, trimethoprim, sulfonamide, cefoxitin, streptomycin, nalidixic acid and cefotaxime	Natural, Semi-synthetic and Synthetic
Hernández et al, 2019	62° 11'59.37"S	58°57'31.16" W	β -lactam, aminoglycoside, tetracycline, trimethoprim, sulfonamide and quinolone	Ampicillin, tetracycline, trimethoprim, sulfonamide, cefoxitin, streptomycin, nalidixic acid and cefotaxime	Natural, Semi-synthetic and Synthetic
Laganà et al, 2019	62° 11' 53.5"S	058° 56' 29.6" W	β -lactam, cephalosporin, macrolide, fosfomicin, oxazolidinone, glycopeptide inhibitor, quinolone and phenicol derivative	Cefuroxime, erythromycin, fosfomicin, lincomycin, linezolid, methicillin, oxacillin, penicillin, teicoplanin, vancomycin, amoxicillin, azithromycin, carbenicillin, cefazolin, cinoxacin, chloramphen and mezlocillin,	Natural and Semi-synthetic
Rabbia et al, 2016	62°12'1.65"S	58°57'36.96"W	β -lactam, cephalosporin, aminoglycoside, quinolone, broad-spectrum antibiotics, sulofnamide and trimethoprim	Ampicillin, cephalothin, cefoxitin, cefotaxime, ceftazidime, cefepime, streptomycin, gentamicin, nalidixic acid, ciprofloxacin, tetracycline, sulfonamide and trimethoprim	Natural, Semi-synthetic and Synthetic
Rabbia et al, 2016	62°12'5.07"S	58°57'39.58"W	β -lactam, cephalosporin, aminoglycoside, quinolone, broad-spectrum antibiotics, sulofnamide and trimethoprim	Ampicillin, cephalothin, cefoxitin, cefotaxime, ceftazidime, cefepime, streptomycin, gentamicin, nalidixic acid, ciprofloxacin, tetracycline, sulfonamide and trimethoprim	Natural, Semi-synthetic and Synthetic
Rabbia et al, 2016	62°11'59.37"S	58°57'31.16"W	β -lactam, cephalosporin, aminoglycoside, quinolone, broad-spectrum antibiotics, sulofnamide and trimethoprim	Ampicillin, cephalothin, cefoxitin, cefotaxime, ceftazidime, cefepime, streptomycin, gentamicin, nalidixic acid, ciprofloxacin, tetracycline, sulfonamide and trimethoprim	Natural, Semi-synthetic and Synthetic
Rabbia et al, 2016	62°12'58.65"S	58°57'35.21"W	β -lactam, cephalosporin, aminoglycoside, quinolone, broad-spectrum antibiotics, sulofnamide and trimethoprim	Ampicillin, cephalothin, cefoxitin, cefotaxime, ceftazidime, cefepime, streptomycin, gentamicin, nalidixic	Natural, Semi-synthetic and Synthetic

				acid, ciprofloxacin, tetracycline, sulfonamide and trimethoprim	
Jara et al, 2020	62°12'59.70"S	58°57'51.90"W	β-lactam, aminoglycoside, quinolone, and cephalosporin	Ampicillin, cefalotin, cefuroxime, cefotaxime, ceftazidime, cefepime, streptomycin, kanamycin, amikacin, gentamicin, nalidixic acid, ciprofloxacin, tetracycline, chloramphenicol	Natural, Semi-synthetic and Synthetic
Na et al, 2019	62°12'59.70"S	58°57'51.90"W	Sulphonamide and fluoroquinolone	Detected sul1, sul2 and qnrs in some samples	Synthetic
Na et al, 2021	62°12'59.70"S	58°57'51.90"W	Sulphonamide and fluoroquinolone	-	Synthetic

Supplementary File S3: Locations of studies that found resistance markers for β -lactams and aminoglycosides in Antarctica. The GPS coordinates differ in format between studies due to differences in reporting. Colour code: orange: studies which detected resistance to β -lactams only; blue: resistance to aminoglycosides only and green: resistance to both aminoglycosides and β -lactams.

Author	Latitude	Longitude
Kobori, Sullivan and Shizuya, 1984	77.8590°S	166.6897°E
Kobori, Sullivan and Shizuya, 1984	77.6000°S	163.8500°E
Hernández et al, 2012	63°19'15"S	57°53'55"W
Hernández et al, 2012	62°28'44"S	59°39'52"W
Pantůček et al, 2018	63°48'51"S	57°50'45"W
Yuan et al, 2019	62°12.667S	58°55.65W
Yuan et al, 2019	62°12.867S	58°55.867W
Yuan et al, 2019	62°12.200S	58°59.75W
Yuan et al, 2019	62°13.200S	58°57.85W
Yang et al, 2019	64°46'12.0"S	64°03'00.0"W
Yang et al, 2019	64°46'12.0"S	64°03'00.0"W
Yang et al, 2019	64°46'12.0"S	64°03'00.0"W
Yang et al, 2019	75.7529°S	168.7595°E
Yang et al, 2019	75.4580°S	168.997°E
Yang et al, 2019	75.7559°S	168.2359°E
Yang et al, 2019	74.8002°S	169.3836°E
Laganà et al, 2019	62° 11' 53.5"S	058° 56' 29.6"W
Blanco-Picazo et al, 2020	See Fig. S4	See Fig. S4
Power et al, 2016	68° .35' S	77°58' E
Stark et al, 2016	68.5764° S	77.9689° E
Okubo et al, 2019	77°19'S	39°42'E
De Souza et al, 2006	50°S-65°S	18°E-30°E
De Souza et al, 2007	70°45'30"S	11°38'40"E
Lo Giudice et al, 2013	74°41.698'S	164°04'214"E
Lo Giudice et al, 2013	74°41'80.3"S	164°07'80.3"E
Tam et al, 2015	62°12'14.9"S	58°57'47.5"W
Tam et al, 2015	62°58'56.3"S	60°39'51.1"W
Rabbia et al, 2016	62°12'5.07"S	58°57'39.58"W
Rabbia et al, 2016	62°11'59.37"S	58°57'31.16"W
Rabbia et al, 2016	62°12'58.65"S	58°57'35.21"W
Retamal et al, 2017	63°19'15"S	57°53'59"W
Hernández et al, 2019	62° 12'1.65"S	58° 57'36.96"W
Hernández et al, 2019	62° 12'5.07"S	58° 57'39.58"W
Hernández et al, 2019	62° 11'59.37"S	58 °57'31.16"W