Supplementary Table 2. Signature DNA pair sequences used for resistance gene search and plasmid replicon typing.

Gene Description	Primer labels	Sequence (5'-3')	Function (Ambler Class)	Reference
Beta-lactamases				
bla CTX-M-1 group	CTX-M Gp1.F CTX-M Gp1.R	GGAATCTGACGCTGGGTAAA GGTTGAGGCTGGGTGAAGTA	ESBL Ambler A	(3)
bla CTX-M-9 group	CTX-M Gp9.F CTX-M Gp9.R	GGTGATGAACGCTTTCCAAT TCAATTTGTTCATGGCGGTA	ESBL Ambler A	(3)
bla CTX-M group	CTX-M-U1 CTX-M-U2	ATGTGCAGYACCAGTAARGTKATGGC TGGGTRAARTARGTSACCAGAAYCAGCGG	ESBL Ambler A	(1)
bla CTX-M group 1 including CTX-M-1, CTX-M-3 and CTX-M-15	MultiCTXMGp1 F MultiCTXMGp1-2 R	TTAGGAARTGTGCCGCTGYA CGATATCGTTGGTGGTRCCAT	ESBL Ambler A	(2)
bla CTX-M group 2 including CTX-M-2	MultiCTXMGp2 F MultiCTXMGp1-2 R	CGTTAACGGCACGATGAC CGATATCGTTGGTGGTRCCAT	ESBL Ambler A	(2)
bla CTX-M group 9 including CTX-M-9 and CTX-M-14	MultiCTXMGp9 F MultiCTXMGp9 R	TCAAGCCTGCCGATCTGGT TGATTCTCGCCGCTGAAG	ESBL Ambler A	(2)
bla CTX-M group 8/25 (CTX-M-8, CTX-M-25, CTX-M-26 and CTX-M-39 to CTX-M-41)	CTX-Mg8/25 F CTX-Mg8/25 R	AACRCRCAGACGCTCTAC TCGAGCCGGAASGTGTYAT	ESBL Ambler A	(2)
bla TEM	TEM-164.SE TEM-165.AS	TCGCCGCATACACTATTCTCAGAATGA ACGCTCACCGGCTCCAGATTTAT	ESBL Ambler A	(10)
bla TEM variants including TEM-1 and TEM-2	MultiTSO-T F MultiTSO-T R	CATTTCCGTGTCGCCCTTATTC CGTTCATCCATAGTTGCCTGAC	ESBL Ambler A	(2)
bla SHV	bla SHV.SE bla SHV.AS	ATGCGTTATATTCGCCTGTG TGCTTTGTTATTCGGGCCAA	ESBL Ambler A	(11)
bla SHV-5/12	SHV-5/12.F SHV-5/12.R	AGCTGCTGCAGTGGATGGT CAATGCGCTCTGCTTTGTTA	ESBL Ambler A	(3)
bla SHV variants including SHV-1	MultiTSO-S F MultiTSO-S R	AGCCGCTTGAGCAAATTAAAC ATCCCGCAGATAAATCACCAC	ESBL Ambler A	(2)
bla VEB1	VEB.F VEB.R	CAAATGCACAAGGATTGGAA ATTCCGGAAGTCCCTGTTTT	ESBL Ambler A	(3)
bla VEB-1 to VEB-6	MultiVEB F MultiVEB R	CATTTCCCGATGCAAAGCGT CGAAGTTTCTTTGGACTCTG	ESBL Ambler A	(2)
bla GES-1 to GES-9 and GES-11	MultiGES F MultiGES R	AGTCGGCTAGACCGGAAAG TTTGTCCGTGCTCAGGAT	ESBL Ambler A	(2)
bla GES-1 to GES-9 and GES-11	MultiGES F MultiGES R	AGTCGGCTAGACCGGAAAG TTTGTCCGTGCTCAGGAT	ESBL Ambler A	(2)
bla PER-1 and PER-3	MultiPER F MultiPER R	GCTCCGATAATGAAAGCGT TTCGGCTTGACTCGGCTGA	ESBL Ambler A	(2)
bla KPC-1 to KPC-5	MultiKPC F MultiKPC R	CATTCAAGGGCTTTCTTGCTGC ACGACGGCATAGTCATTTGC	Carbapenemase Ambler A	(2)
bla LAT-1 to LAT-3, BIL-1, CMY-2 to CMY-7, CMY-12 to CMY-18 and CMY-21 to CMY-23	CITMF CITMR	TGGCCAGAACTGACAGGCAAA TTTCTCCTGAACGTGGCTGGC	Cephalosporinase Ambler C	(13)
bla LAT-1 to LAT-3, BIL-1, CMY-2 to CMY-7, CMY-12 to CMY-18 and CMY-21 to CMY-23	MultiCaseCIT F MultiCaseCIT R	CGAAGAGGCAATGACCAGAC ACGGACAGGGTTAGGATAGY	Cephalosporinase Ambler C	(2)
bla FOX-1 to FOX-5	MultiCaseFOX F MultiCaseFOX R	CTACAGTGCGGGTGGTTT CTATTTGCGGCCAGGTGA	Cephalosporinase Ambler C	(2)
bla MOX-1, MOX-2, CMY-1, CMY-8 to CMY-11 and CMY-19	MultiCaseMOX F MultiCaseMOX R	GCAACAACGACAATCCATCCT GGGATAGGCGTAACTCTCCCAA	Cephalosporinase Ambler C	(2)
bla DHA	DHAMF DHAMR	AACTTTCACAGGTGTGCTGGGT CCGTACGCATACTGGCTTTGC	Cephalosporinase Ambler C	(13)

bla DHA-1 and DHA-2	MultiCaseDHA F MultiCaseDHA R	TGATGGCACAGCAGGATATTC GCTTTGACTCTTTCGGTATTCG	Cephalosporinase Ambler C	(2)
bla ACC-1 and ACC-2	MultiCaseACC F MultiCaseACC R	CACCTCCAGCGACTTGTTAC GTTAGCCAGCATCACGATCC	Cephalosporinase Ambler C	(2)
bla ACT-1 and MIR-1	MultiCaseEBC F MultiCaseEBC R	CGGTAAAGCCGATGTTGCG AGCCTAACCCCTGATACA	Cephalosporinase Ambler C	(2)
bla IMP	imp-BE1 imp-BE2	CAYGGTTTGGTGGTTCTTGTAA CCTTTAACVGCCTGYTCTYMT	Carbapenemase (MBL) Ambler B	(5)
bla IMP variants except IMP-9, IMP-16, IMP-18, IMP-22 and IMP-25	MultiIMP F MultiIMP R	TTGACACTCCATTTACDG GATYGAGAATTAAGCCACYCT	Carbapenemase (MBL) Ambler B	(2)
bla VIM	Vim-F Vim-R	GATGGTGTTTGGTCGCATA CGAATGCGCAGCACCAG	Carbapenemase (MBL) Ambler B	(4)
bla VIM variants including VIM-1 and VIM-2	MultiVIM F MultiVIM R	GATGGTGTTTGGTCGCATA CGAATGCGCAGCACCAG	Carbapenemase (MBL) Ambler B	(2)
bla NDM1	NDM.F NDM.R	CTTCCAACGGTTTGATCGTC ATTGGCATAAGTCGCAATCC	Carbapenemase (MBL) Ambler B	(3)
bla OXA-1, OXA-4 and OXA-30	MultiTSO-O F MultiTSO-O R	GGCACCAGATTCAACTTTCAAG GACCCCAAGTTTCCTGTAAGTG	OXA beta-lactamase Ambler D	(2)
bla OXA-48-like	MultiOXA-48 F MultiOXA-48 R	GCTTGATCGCCCTCGATT GATTTGCTCCGTGGCCGAAA	OXA carbapenemase Ambler D	(2)

Non-beta-lactamases

Gene Description	Primer labels	Sequence (5'-3')	Gene Function	Reference
qnrA	qnrAF qnrAR	ATTTCTCACGCCAGGATTTG GATCGGCAAAGGTTAGGTCA	Quinolone resistance, plasmid	(8)
qnrB	qnrBF qnrBR2	GATCGTGAAAGCCAGAAAGG ATGAGCAACGATGCCTGGTA	Quinolone resistance, plasmid	(8)
qnrC	qnrCF qnrCR	GGGTTGTACATTTATTGAATCG CACCTACCCATTTATTTTCA	Quinolone resistance, plasmid	(8)
qnrS	qnrSmF qnrSmR	GCAAGTTCATTGAACAGGGT TCTAAACCGTCGAGTTCGGCG	Quinolone resistance, plasmid	(8)
qep	qepAF qepAR	AACTGCTTGAGCCCGTAGAT GTCTACGCCATGGACCTCAC	Quinolone efflux pump, plasmid	(8)
gyrA	gyrAWF gyrAWR	AAATCTGCCCGTGTCGTTGGT GCCATACCTACGGCGATACC	Quinolone resistance, chromosomal (topoisomerase II)	(8)
parC	parCWF parCWR	CTGAATGCCAGCGCCAAATT GCGAACGATTTCGGATCGTC	Quinolone resistance, chromosomal (topoisomerase IV)	(8)
3aac(6')-Ib	aac6'-A aac6'-B	TTGCGATGCTCTATGAGTGGCTA CTCGAATGCCTGGCGTGTTT	Aminoglycoside acetyltransferase	(9)
aac(6')-Ib-cr	aac(6')-Ib-cr F aac(6')-Ib-cr R	GCAACGCAAAAACAAAGTTAGG GTGTTTGAACCATGTACA	Aminoglycoside acetyltransferase plus ciprofloxacin resistance	(12)
aac(6')-Ic	aac6'-Ic (F) aac6'-Ic (R)	CTACGATTACGTCAACGGCTGC TTGCTTCGCCCACTCCTGCACC	Aminoglycoside acetyltransferase	(7)
aac(6')-Id	aac6'-Id (F) aac6'-Id (R)	TGGCTGCAACTTCGTTTTCTCC GGTGAAATCTATGGCTTTCCG	Aminoglycoside acetyltransferase	(7)
aac(6')-Ie	aac6'-Ie (F) aac6'-Ie (R)	ACATTATACAGAGCCTTGGG CTCGTGTAATTCATGTTCTGGC	Aminoglycoside acetyltransferase	(7)
aac(6')-Ig	aac6'-Ig (F) aac6'-Ig (R)	CCTATTCCGATCACCAAGC TTGTTTTGCCCACACTTCG	Aminoglycoside acetyltransferase	(7)
aac(6')-Ih	aac6'-Ih (F) aac6'-Ih (R)	ATTGGCTTATACCGACACC GGCTGATCTGATTATCCAACGC	Aminoglycoside acetyltransferase	(7)
aac(6')-Ii	aac6'-Ii (F) aac6'-Ii (R)	AAGAATATGGAGACAGCTCGGC ACAGGTCCGTTTGACTTAACG	Aminoglycoside acetyltransferase	(7)
aac(6')-Ij	aac6'-Ij (F) aac6'-Ij (R)	CATGACGAGGCACATTTACAGG GGCTAATACGATTATCGAGGGC	Aminoglycoside acetyltransferase	(7)
aac(6')-Il	aac6'-Il (F)	TGCTTGGGAATATGTCTGG	Aminoglycoside	(7)

	aac6′-Il (R)	TTGTTGGGCTGTTCTTCCTAGC	acetyltransferase	
aac(6′)-IIb	aac(6′)-IIb (F) aac(6′)-IIb (R)	CGCTTGTTGATTTGCTGTTCGC TTGAAACGACCTTGACCTTCCG	Aminoglycoside acetyltransferase	(7)
ant(3″)-Ia	ant(3″)-Ia (F) ant(3″)-Ia (R)	TCGACTCAACTATCAGAGG ACAATGGTGACTTCTACAGCG	Aminoglycoside acetyltransferase	(7)
armA	armA F armA R	AGGTTGTTTCCATTTCTGAG TCTCTTCCATTCCCTTCTCC	Aminoglycoside resistance (16S rRNA methylase)	(15)
rmtA	rmtA F rmtA R	CTAGCGTCCATCCTTTCCTC TTTGCTTCCATGCCCTTGCC	Aminoglycoside resistance (16S rRNA methylase)	(15)
rmtB	rmtB F rmtB R	CCCAAACAGACCGTAGAGGC CTCAAACTCGGCGGGCAAGC	Aminoglycoside resistance (16S rRNA methylase)	(15)
rmtC	rmtC F rmtC R	CGAAGAAGTAACAGCCAAAG ATCCCAACATCTCTCCCACT	Aminoglycoside resistance (16S rRNA methylase)	(15)
catA1	CAT F CAT R	AAGTTGGCAGCATTCACCCG TCGTGGTATTCACTCCAGAGCG	Chloramphenicol resistance	(12)
tetA	TetA F TetA R	GGTCTTGCTCGTCTCGCTGG AACGCCATCCATCCCCGTG	Tetracycline resistance	(12)
tetB	TetB F TetB R	CCTTATCATGCCAGTCTTGC ACTGCCGTTTTTTCGCC	Tetracycline resistance	(12)
tetC	TetC F TetC R	ACTTGGAGCCACTATCGAC CTACAATCCATGCCAACCC	Tetracycline resistance	(12)
tetD	TetD F TetD R	TGGGCAGATGGTCAGATAAG CAGCACACCCTGTAGTTTTC	Tetracycline resistance	(12)
tetE	TetE F TetE R	TTAATGGCAACAGCCAGC TCCATACCCATCCATTCCAC	Tetracycline resistance	(12)
tetY	TetY F TetY R	ACCGCACTCATTGTTGTC TTCCAAGCAGCAACACAC	Tetracycline resistance	(12)
aphA1-Ia	Aph F Aph R	AACGTCTTGCTCGAGGCCGCG GGCAAGATCCTGGTATCGGTCTGC	Aminoglycoside (neomycin/kanamycin) resistance	(12)
aadB	AadB F AadB R	GGGCGCGTCATGGAGGAGTT TATCGCGACCTGAAAGCGGC	Adenyltransferase Trimethoprim and low-level streptomycin resistance	(12)
strA	StrA F StrA R	CCAATCGCAGATAGAAGGCAAG ATCAACTGGCAGGAGGAACAGG	Streptomycin resistance	(12)
dfrA1	dfr1-F dfr1-R	TGGTAGCTATATCGAAGAATGGAGT TATGTTAGAGGCGAAGTCTTGGGTA	Dihydrofolate reductase Trimethoprim resistance	(6)
dfrA5	dfr5-F dfr5-R	AGCTACTCTTTAAAGCCTTGACGTA GTGTTGCTCAAAAACAACTTCG	Dihydrofolate reductase Trimethoprim resistance	(6)
dfrA7, dfrA17	dfr7/17-F dfr7/17-R dfr7-R dfr17-R	ACATTTGACTCTATGGGTGTTCTTC AAAACTGTTCAAAAACCAAATTGAA ACCTCAACGTGAACAGTAGACAAAT TCTCTGGCGGGGGTCAAATCTAT	Dihydrofolate reductase Trimethoprim resistance	(6)
dfrA12	dfr12-F dfr12-R	GAGCTGAGATATACACTCTGGCACT GTACGGAATTACAGCTTGAATGGT	Dihydrofolate reductase Trimethoprim resistance	(6)
sul1	Sul1-F Sul1-R	TGGTGACGGTGTTCGGCATTC GCGAGGGTTTCCGAGAAGGTG	Sulfonamide resistance	(14)
sul2	Sul2-F Sul2-R	CGGCATCGTCAACATAACC GTGTGCGGATGAAGTCAG	Sulfonamide resistance	(14)
sul3	Sul3-F Sul3-R	CATTCTAGAAAACAGTCGTAGTTCG CATCTGCAGCTAACCTAGGGCTTTGGA	Sulfonamide resistance	(14)

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