Appendix 1. Deoxyoligonucleotide primers used for detection and molecular characterization of MRSA isolates.

Primer	Oligonucleotid sequence(5'to3')	Amplicon size(bp)	Annealing	Predenaturation	Denaturation	Extension	Final Extension	cycles	Refrence
mecA			55°C	95 ° C for	95°C for	72°C for	72°C for	34	
mecA-F	AAAATCGATGGTAAAGGTTGGC	533		5min	30 sec	45 sec	7 min		(18)
mecA-R	AGTTCTGCAGTACCGGATTTGC								
nuc			60°C	95 ° C for	95°C for	72°C for	72°C for	32	(17)
nuc-F	GCGATTGATGGTGATACGGTT	270		5min	30 sec	45 sec	7 min		
nuc-R	AGCCAAGCCTTGACGAACTAAAGC								
eta			56°C	94°C for	95°C for	72°C for	72°C for	29	(19**)**
eta-F	GCAGGTGTTGATTTAGCATT	93		5 min	30sec	1 min	7 min		
eta-R	AGATGTCCCTATTTTTGCTG								
etb			56°C	94°C for	95°C for	72°C for	72°C for	29	
etb-F	ACAAGCAAAAGAATACAGCG	226		5 min	30sec	1 min	7 min		
etb-R	GTTTTTGGCTGCTTCTCTTG								
tst			57°C	94°C for	95°C for	72°C for	72°C for	29	
tst-F	ACCCCTGTTCCCTTATCATC	326		5 min	30sec	1 min	7 min		
tst-R	TTTTCAGTATTTGTAACGCC								
sea			60°C	94°C for	95°C for	72°C for	72°C for	29	
sea-F	GGTTATCAATGTGCGGGTGG	102		5 min	30sec	1 min	7 min		
sea-R	CGGCACTTTTTTCTCTTCGG								
seb			50°C	94°C for	95°C for	72°C for	72°C for	29	
seb- F	GTATGGTGGTGTAACTGAGC	164		5 min	30sec	1 min	7 min		
seb-R	CCAAATAGTGACGAGTTAGG								
sec			56°C	94°C for	95°C for	72°C for	72°C for	29	
sec-F	CTTGTATGTATGGAGGAATAACAA	284		5 min	30sec	1 min	7 min		

sec-R	TGCAGGCATCATATCATACCA								
sed			50°C	94°C for	95°C for	72°C for	72°C for	29	(19)
sed-F	CCAATAATAGGAGAAAATAAAAG	278		5 min	30sec	1 min	7 min		
sed-R	ATTGGTATTTTTTTTCGTTC								
hla			56°C	94°C for	95°C for	72°C for	72°C for	29	
hla-F	CTGATTACTATCCAAGAAATTCGATTG	209		5 min	30sec	1 min	7 min		
hla-R	CTTTCCAGCCTACTTTTTTATCAGT								
hld			58°C	94°C for	95°C for	72°C for	72°C for	29	
hld-F	AAGAATTTTTATCTTAATTAAGGAAGGAGTG	111		5 min	30sec	1 min	7 min		
hld-R	TTAGTGAATTTGTTCACTGTGTCGA								
LukS/F-PV			58°C	94°C for	95°C for	72°C for	72°C for	29	
PVL-F	ATCATTAGGTAAAATGTCTGGACATGATCCA	443		5 min	30 sec	1 min	7 min		
PVL-R	GCATCAAGTGTATTGGATAGCAAAAGC								
SCC*mec*									
TypI-F	GCTTTAAAGAGTGTCGTTACAGG	613	60°C	94°C for	94°C for	72°C for	72°C for	45	(20**)**
TypI-R	GTTCTCTCATAGTATGACGTCC			4 min	45 sec	1 min	10 min		
TypII-F	CGTTGAAGATGATGAAGCG	398	60°C	94°C for	94°C for	72°C for	72°C for	45	
TypII-R	CGAAATCAATGGTTAATGGACC			4 min	45 sec	1 min	10 min		
TypIII-F	CCATATTGTGTACGATGCG	280	60°C	94°C for	94°C for	72°C for	72°C for	45	
TypIII-R	CCTTAGTTGTCGTAACAGATCG			4 min	45 sec	1 min	10 min		
$TypIV_a$–F	GCCTTATTCGAAGAAACCG	776	60.5°C	94°C for	94°C for	72°C for	72°C for	45	
$TypIV_a$ –R	CTACTCTTCTGAAAAGCGTCG			4 min	45 sec	1 min	10 min		
$TypIV_b$-F	TCTGGAATTACTTCAGCTGC	493	60.5°C	94°C for	94°C for	72°C for	72°C for	45	
$TypIV_b$–R	AAACAATATTGCTCTCCCTC			4 min	45 sec	1 min	10 min		
$TypIV_c$-F	ACAATATTTGTATTATCGGAGAGC	200	60.5°C	94°C for	94°C for	72°C for	72°C for	45	
$TypIV_c$ –R	TTGGTATGAGGTATTGCTGG			4 min	45 sec	1 min	10 min		

$TypIV_d$ –F $TypIV_d$ – R	CTCAAAATACGGACCCCAATACA TGCTCCAGTAATTGCTAAAG	881	60.5°C	94°C for 4 min	94°C for 45 sec	72°C for 1 min	72°C for 10 min	45	
Typ V-F TypV –R	GAACATTGTTACTTAAATGAGCG TGAAAGTTGTACCCTTGACACC	325	60°C	94°C for 4 min	94°C for 45 sec	72°C for 1 min	72°C for 10 min	45	
Spa –F Spa - R	AAAATCGATGGTAAAGGTTGGC AGTTCTGCAGTACCGGATTTGC	variable	62°C	94°C for 4 min	94°C for 45sec	72°C for 1min	72°C for 10min	30	(23)
ERIC-1 ERIC-2	ATGTAAGCTCCTGGGGAATTCAC AAGTAAGTGACTGGGGTGAGCG		55°C	95°C for 5min	94°C for 55sec	72°C for 55min	72°C for 8min	36	(24)

Appendix 2. Distribution of oxacillin MIC in OR-MRSA, OS-MRSA and MSSA isolates collected from healthy children in Ardabil, Northwest Iran.

MIC(µg/ml)	OR-MRSA* N=31, No. (%)	OS-MRSA N=59, No. (%)	MSSA N=69, No. (%)
0.125	-	-	1(1.4)
0.25	-	10(17)	37(54)
0.5	-	25(42)	23(33)
1	-	16(27)	2(3)
2	-	8(13.5)	2(3)
4	13(42)	-	-
8	6(19)	-	-
16	5(16)	-	-
32	2(6.4)	-	-
64	2(6.4)	-	-
128	1(3.2)	-	-
256	2(6.4)	-	-

* MIC ≥ 4 µg/mL considered as oxacillin resistant

Appendix 3. Antibiotic resistance profile of OR-MRSA, OS-MRSA and MSSA isolated from nostrils of healthy children in Ardabil, northwest Iran.

S. aureus	Phenotypic resistance pattern	No. of antibiotics	No.(%) of isolates	No. (%) of antibiotic classes	Total No. (%)	MDR* No. (%)
OR-MRSA (N= 31)	P-AMC-CZ-CRO-IPM	5	5(16)	1	5 (16)	18(58)
	P –AMC-CZ-CRO-IPM –E	6	3(9.6)	2	8(26)	
	P-AMC-CZ-CRO-IPM-MUP	6	1(3.2)	2		
	P- AMC-CZ-CRO-IPM –TE	6	3(9.6)	2		
	P- AMC-CZ-CRO-IPM- TOB-K	7	1(3.2)	2		
	P- AMC-CZ-CRO-IPM- MUP-E	7	2(6.4)	3	9(29)	
	P- AMC-CZ-CRO-IPM –CC-E	7	4(13)	3		
	P- AMC-CZ-CRO-IPM –E-TOB-K	8	1(3.2)	3		
	P- AMC-CZ-CRO-IPM –E-TOB-K-GM	9	2(6.4)	3		
	P- AMC-CZ-CRO-IPM- RA-MUP-E	8	1(3.2)	4	5(16)	
	P- AMC-CZ-CRO-IPM –TE-MUP-E	8	1(3.2)	4		
	P AMC-CZ-CRO-IPM –CC-RA-MUP-E	9	3(9.6)	4		
	P –AMC-CZ-CRO-IPM –TE-CC-E-SXT	9	2(6.4)	5	2(6.4)	
	P- AMC-CZ-CRO-IPM- TE-CP-CC-E-K	10	1(3.2)	6	2(6.4)	
	P- AMC-CZ-CRO-IPM –C-TE-CP-CC-E	10	1(3.2)	6		
OS-MRSA (N=59)	P- AMC-CZ-CRO-IPM	5	13(22)	1	13(22)	29(49)
	P- AMC-CZ-CRO-IPM- TE	6	2(3.4)	2	17(29)	
	P- AMC-CZ-CRO-IPM- MUP	6	1(1.7)	2		
	P- AMC-CZ-CRO-IPM –K	6	1(1.7)	2		
	P AMC-CZ-CRO-IPM –E	6	13(8)	2		
	P- AMC-CZ-CRO-IPM- MUP-TOB	7	1(1.7)	3	17(29)	
	P- AMC-CZ-CRO-IPM- CC-E	7	12(20.3)	3		
	P- AMC-CZ-CRO-IPM- E-K	7	2(3.4)	3		
	P- AMC-CZ-CRO-IPM –MUP-E	7	1(1.7)	3		
	P- AMC-CZ-CRO-IPM- E-TOB-K-GM	9	1(1.7)	3		
	P- AMC-CZ-CRO-IPM- TE-CC-E	8	1(1.7)	4	7(12)	
	P- AMC-CZ-CRO-IPM- CC-E-SXT	8	1(1.7)	4		

	P- AMC-CZ-CRO-IPM- CC-MUP-E	8	1(1.7)	4		
	P -AMC-CZ-CRO-IPM -CC-E-TOB	8	1(1.7)	4		
	P- AMC-CZ-CRO-IPM- CC-CP-E	8	1(1.7)	4		
	P- AMC-CZ-CRO-IPM- CC-TE-E	8	1(1.7)	4		
	P- AMC-CZ-CRO-IPM- C-TE-CC-E	9	1(1.7)	4		
	P- AMC-CZ-CRO-IPM- CC-SXT-MUP-E	9	1(1.7)	5	1(1.7)	
	P- AMC-CZ-CRO-IPM- C-TE-CP-CC-E	10	2(3.4)	6	3(5)	
	P- AMC-CZ-CRO-IPM- CC-CP-E-SXT-K	10	1(1.7)	6		
	P- AMC-CZ-CRO-IPM- C-TE-CP-CC-MUP-E	11	1(1.7)	7	1(1.7)	
MSSA (N=69)	P	1	22(32)	1	26(38)	29(42)
	MUP	1	1(1.4)	1		
	P-AMC	2	3(4.3)	1		
	P-E	2	8(11.5)	2	14(20)	
	P-TE	2	1(1.4)	2		
	P-K	2	1(1.4)	2		
	CC-MUP	2	1(1.4)	2		
	P-AMC-CC	3	1(1.4)	2		
	P-GM-K	3	1(1.4)	2		
	P-AMC-E	3	1(1.4)	2		
	P-E-K	3	1(1.4)	3	20(29)	
	P-TE-E	3	1(1.4)	3		
	P-CC-E	3	18(26)	3		
	P-C-CC-E	4	1(1.4)	4	5(7.2)	
	C-TE-CC-E	4	1(1.4)	4		
	P-TE-CC-E	4	1(1.4)	4		
	P-CC-E-TOB	4	1(1.4)	4		
	P-TE-MUP-E	4	1(1.4)	4		
	P-TE-MUP-E-SXT	5	1(1.4)	5	1(1.4)	
	P-C-TE-CP-CC-E	6	2(2.8)	6	2(3)	
	P-C-TE-CP-CC-E-K	7	1(1.4)	7	1(1.4)	

*resistant to ≥ 3 antibiotic classes

OR-MRSA, oxacillin resistant methicillin resistant *S. aureus*; OS-MRSA, oxacillin susceptible- methicillin resistant *S. aureus*; MSSA, methicillin susceptible *S. aureus*.

P, Penicillin G; E, Erythromycin; MUP, Mupirocin; TE, Tetracycline; AMC, Amoxiclav; TOB, Tobramycin; K, Kanamycin; CC, Clindamycin; CZ, Cefazolin; RA, Rifampicin; GM, Gentamycin; CRO, Ceftriaxone; SXT, Trimethoprim sulfamethoxazole; CP, Ciprofloxacin; C, Chloramphenicol; V, Vancomycin

Appendix 4. Distribution of virulence gene profiles in OR-MRSA, OS-MRSA and MSSA isolates collected from healthy children in Ardabil, Northwest Iran.

Virulance genes profile	**OR-MRSA N=31; No. (%)**	**MSSA N=69; No. (%)**	**OS-MRSA N= 59; No. (%)**	**Total N=159; No. (%)**	
sea,hla	-	-	1(2)	1(0.6)	4(2.5)
sea,tst	1(3)	-	-	1(0.6)	
tst,hla	2(6)	-	-	2(1.2)	
sea,hla,hld	-	3(4)	3(5)	6(4)	13(8)
tst,hla,hld	-	1(1.4)	-	1(0.6)	
sec,hla,hld	1(3)	1(1.4)	-	2(1.2)	
sea,eta,tst	-	1(1.4)	-	1(0.6)	
seb,tst,hla	-	-	1(2)	1(0.6)	
pvl,hla,hld	1(3)	-	-	1(0.6)	
sea,sec,hla	-	1(1.4)	-	1(0.6)	
sea,tst,hla,hld	7(22.5)	14(20)	12(20)	33(21)	50(31)
sea,seb,hla,hld	-	-	2(3.4)	2(1.2)	
sea,pvl,hla,hld	-	2(3)	1(2)	3(2)	
sea,seb,eta,hld	-	-	1(2)	1(0.6)	
sea,sec,hla,hld	1(3)	3(4)	2(3.4)	6(4)	
sec,tst,hla,hld	2(6)	-	-	2(1.2)	
tst,pvl,hla,hld	-	1(1.4)	1(2)	2(1.2)	
sec,etb,hla,hld	-	1(1.4)	-	1(0.6)	
sea,seb,sec,hla,hld	1(3)	-	1(2)	2(1.2)	52(33)
sea,sec,tst,hla,hld	4(13)	10(14)	2(3.4)	16(10)	
sea,sec,pvl,hla,hld	-	1(1.4)	1(2)	2(1.2)	
sea,seb,tst,hla,hld	-	3(4)	6(10)	9(5.6)	
sea,sed,tst,hla,hld	-	1(1.4)	-	1(0.6)	
sea,tst,pvl,hla,hld	3(10)	5(7)	4(7)	12(7.5)	
sea,etb,pvl,hla,hld	-	2(3)	-	2(1.2)	
sea,eta,tst,hla,hld	-	1(1.4)	-	1(0.6)	
sea,seb,sec,tst,hld	-	1(1.4)	-	1(0.6)	
sea,seb,etb,hla,hld	1(3)	-	-	1(0.6)	
sec,tst,pvl,hla,hld	1(3)	-	2(3.4)	3(2)	
seb,sec,tst,hla,hld	1(3)	-	-	1(0.6)	
seb,tst,pvl,hla,hld	-	1(1.4)	-	1(0.6)	
sea,seb,sec,tst,hla,hld	-	1(1.4)	4(7)	5(3)	28(18)
sea,seb,sec,pvl,hla,hld	-	2(3)	-	2(1.2)	
sea,seb,sed,tst,hla,hld	-	-	1(2)	1(0.6)	
sea,seb,tst,pvl,hla,hld	-	1(1.4)	3(5)	4(2.5)	
sea,sec,tst,pvl,hla,hld	1(3)	5(7)	1(2)	7(4)	
sea,sec,etb,tst,hla,hld	1(3)	1(1.4)	1(2)	3(2)	
sea,sed,tst,pvl,hla,hld	1(3)	1(1.4)	-	2(1.2)	
sea,sec,sed,tst,hla,hld	-	1(1.4)	-	1(0.6)	
sea,seb,etb,tst,hla,hld	1(3)	-	-	1(0.6)	
sea,etb,tst,pvl,hla,hld	-	-	1(2)	1(0.6)	
sec,sed,tst,pvl,hla,hld	-	-	1(2)	1(0.6)	
sea,seb,sec,sed,tst,hla,hld	-	1(1.4)	1(2)	2(1.2)	11(7)
sea,seb,sec,tst,pvl,hla,hld	1(3)	1(1.4)	3(50	5(3)	
sea,seb,sec,etb,tst,hla,hld	-	1(1.4)	1(2)	2(1.2)	
sea,seb,etb,tst,pvl,hla,hld	-	-	2(3.4)	2(1.2)	
sea,sec,eta,etb,tst,hla,hld	-	1(1.4)	-	1(0.6)	