

Table S1. PCR primers, conditions and control strains used in this study

Gene	Primer ^a	Sequence (5'-3')	Annealing temperature (°C)	Size (bp)	Reference strain	Reference
<i>qacAB</i>	qacAB_F	ATGCCTTATATTTATTTAATAATAGCC	42	321	ATCC BAA-44 (HPV107)	(1)
	qacAB_R	ATGCGATGTTCGAAAAATGTTTAAAC				
<i>smr</i>	smr_F	ATAAGTACTGAAGTTATTGGAAGT	48	285	<i>S. aureus</i> SM52	(2, 3)
	smr-R	TTCCGAAAAATGTTTAAACGAAACTA				
<i>norA</i>	norA_F	TTCACCAAGCCATCAAAAAAG	45	620	<i>S. aureus</i> COL	(2, 4)
	norA_R	CTTGCCTTTCTCCAGCAATA				
<i>lmrS</i>	lmrS_F	GCAAGCTTATGGCTAAAAGTTGAATTAACAAC	53	1441	<i>S. aureus</i> COL	(5)
	lmrS_R	GCGGATCCTTAAAAATTTCTTCTATTACTTT				
<i>mepA</i>	mepA_F	ATGTTGCTGCTGCTCTGTTC	53	718	<i>S. aureus</i> COL	(2)
	mepA_R	TCAACTGTCAAACGATCAGC				
<i>sepA</i>	sepA_F	GCAGTCGAGCATTTAATGGA	53	103	ATCC51811	(2)
	sepA_R	ACGTTGTTGCAACTGTGTAAGA				

^a F-forward primer; R-reverse primer

References

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5. **Floyd JL, Smith KP, Kumar SH, Floyd JT, Varela MF.** 2010. LmrS is a multidrug efflux pump of the major facilitator superfamily from *Staphylococcus aureus*. Antimicrob Agents Chemother **54**:5406-5412.

Table S2. Prevalence of six biocide resistance genes among 301 *S. aureus* isolates recovered in Angola, Cape Verde and São Tomé and Príncipe (STP).

	<i>qacAB</i> no. (%)			<i>smr</i> no. (%)			<i>norA</i> no. (%)			<i>lmrS</i> no. (%)			<i>mepA</i> no. (%)			<i>sepA</i> no. (%)		
	positive	negative	p-value	positive	negative	p-value	positive	negative	p-value	positive	negative	p-value	positive	negative	p-value	positive	negative	p-value
MRSA	54 (65.9)	28 (34.1)	<0.0001	5 (6.1)	77 (93.9)	0.0779	72 (87.8)	10 (12.2)	0.7106	53 (64.6)	29 (35.4)	0.4289	71 (86.6)	11 (13.4)	0.4005	82 (100)	0 (0.0)	0.0137
MSSA	68 (31.1)	151 (68.9)		6 (2.7)	213 (97.3)		188 (85.8)	31 (14.2)		130 (59.4)	89 (40.6)		198 (90.4)	21 (9.6)		205 (93.6)	14 (6.4)	
Total	122	179		11	290		260	41		183	118		269	32		287	14	
Angola	67 (56.3)	52 (43.7)	<0.0001	7 (5.9)	112 (94.1)	0.1198	97 (81.5)	22 (18.5)	0.0583	59 (49.6)	60 (50.4)	0.0017	92 (77.3)	27 (22.7)	<0.0001	110 (92.4)	9 (7.6)	0.0893
Cape Verde	30 (28.6)	75 (71.4)	0.0021	4 (3.8)	101 (96.2)	1	88 (83.8)	17 (16.2)	0.3794	57 (54.3)	48 (45.7)	0.1074	101 (96.2)	4 (3.8)	0.0053	103 (98.1)	2 (1.9)	0.1495
STP	25 (32.5)	52 (67.5)	0.1072	0 (0.0)	77 (100)	0.0717	75 (97.4)	2 (2.6)	0.0004	67 (87.0)	10 (13)	<0.0001	76 (98.7)	1 (1.3)	0.001	74 (96.1)	3 (3.9)	1

p-values in bold indicate statistically significance at p <0.05.

Table S3. Relation between the six biocide resistance genes carriage and antimicrobial resistance among *S. aureus* isolates

Antibiotic		<i>qacAB</i>				<i>smr</i>				<i>norA</i>			
		positive (%)	negative (%)	p-value	OR (95% CI)	positive (%)	negative (%)	p-value	OR (95% CI)	positive (%)	negative (%)	p-value	OR (95% CI)
Cefoxitin	R (n=82)	54 (65.9)	28 (34.1)	< 0.0001	4.43 (2.55-7.70)	5 (6.1)	77 (93.9)	0.3177	1.97 (0.58-6.65)	72 (87.8)	10 (12.2)	1	1.10 (0.50-2.41)
	S (n=188)	57 (30.3)	131 (69.7)			6 (3.2)	182 (96.8)			163 (86.7)	25 (13.3)		
Penicillin	R (n=261)	108 (41.4)	153 (58.6)	0.7408	1.41 (0.35-5.77)	11 (4.2)	250 (95.8)	1	0.87 (0.05-15.94)	228 (87.4)	33 (12.6)	0.3294	1.97 (0.39-9.91)
	S (n=9)	3 (33.3)	6 (66.7)			0 (0)	9 (100)			7 (77.8)	2 (22.2)		
Ciprofloxacin	R (n=28)	13 (46.4)	15 (53.6)	0.5499	1.27 (0.58-2.79)	3 (10.7)	25 (89.3)	0.0935	3.51 (0.87-14.09)	23 (82.1)	5 (17.9)	0.3814	0.65 (0.23-1.84)
	S (n=242)	98 (40.5)	144 (59.5)			8 (3.3)	234 (96.7)			212 (87.6)	30 (12.4)		
Gentamicin	R (n=30)	21 (70.0)	9 (30.0)	0.0013	3.89 (1.71-8.86)	4 (13.3)	26 (86.7)	0.0236	5.12 (1.40-18.68)	26 (86.7)	4 (13.3)	1	0.96 (0.32-2.95)
	S (n=240)	90 (37.5)	150 (62.5)			7 (2.9)	233 (97.1)			209 (87.1)	31 (12.9)		
Clindamycin	R (n=15)	9 (60.0)	6 (40.0)	0.1762	2.25 (0.78-6.52)	1 (6.7)	14 (93.3)	0.4733	1.75 (0.21-14.66)	14 (93.3)	1 (6.7)	0.7012	2.15 (0.27-16.92)
	S (n=255)	102 (40.0)	153 (60.0)			10 (3.9)	245 (96.1)			221 (86.7)	34 (13.3)		
Erythromycin	R (n=56)	27 (48.2)	29 (51.8)	0.2274	1.44 (0.80-2.60)	3 (5.4)	53 (94.6)	0.7027	1.46 (0.37-5.69)	48 (85.7)	8 (14.3)	0.8231	0.87 (0.37-2.03)
	S (n=214)	84 (39.3)	130 (60.7)			8 (3.7)	206 (96.3)			187 (87.4)	27 (12.6)		
Tetracycline	R (n=50)	27 (54.0)	23 (46.0)	0.0553	1.90 (1.02-3.53)	3 (6)	47 (94)	0.4328	1.69 (0.43-6.62)	38 (76)	12 (24)	0.0176	0.37 (0.17-0.81)
	S (n=220)	84 (38.2)	136 (61.8)			8 (3.6)	212 (96.4)			197 (89.5)	23 (10.5)		
Rifampicin	R (n=94)	54 (57.4)	40 (42.6)	< 0.0001	2.82 (1.68-4.72)	2 (2.1)	92 (97.9)	0.3390	0.40 (0.09-1.91)	76 (80.9)	18 (19.1)	0.0358	0.45 (0.22-0.92)
	S (n=176)	57 (32.4)	119 (67.6)			9 (5.1)	167 (94.9)			159 (90.3)	17 (9.7)		
SXT ^a	R (n=106)	67 (63.2)	39 (36.8)	< 0.0001	4.69 (2.77-7.92)	3 (2.8)	103 (97.2)	0.5358	0.57 (0.15-2.19)	95 (89.6)	11 (10.4)	0.3570	1.48 (0.69-3.16)
	S (n=164)	44 (26.8)	120 (73.2)			8 (4.9)	156 (95.1)			140 (85.4)	24 (14.6)		
Fusidic acid	R (n=7)	5 (71.4)	2 (28.6)	0.1277	3.70 (0.71-19.45)	0 (0)	7 (100)	1	1.46 (0.08-27.24)	7 (100)	0 (0)	0.5999	2.33 (0.13-41.73)
	S (n=263)	106 (40.3)	157 (59.7)			11 (4.2)	252 (95.8)			228 (86.7)	35 (13.3)		
Cloramphenicol	R (n=14)	10 (71.4)	4 (28.6)	0.0244	3.84 (1.17-12.57)	0 (0)	14 (100)	1	0.74 (0.04-13.13)	11 (78.6)	3 (21.4)	0.4027	0.52 (0.14-1.98)
	S (n=256)	101 (39.5)	155 (60.5)			11 (4.3)	245 (95.7)			224 (87.5)	32 (12.5)		

Table S3. (cont.)

Antibiotic		<i>lmrS</i>				<i>mepA</i>				<i>sepA</i>			
		positive (%)	negative (%)	p-value	OR (95% CI)	positive (%)	negative (%)	p-value	OR (95% CI)	positive (%)	negative (%)	p-value	OR (95% CI)
Cefoxitin	R (n=82)	53 (64.6)	29 (35.4)	0.7844	1.11 (0.65-1.90)	71(86.6)	11 (13.4)	0.6826	0.81 (0.37-1.77)	82 (100)	0 (0)	0.0115	12.69 (0.74-216.3)
	S (n=188)	117 (62.2)	71 (37.8)			167 (88.8)	21 (11.2)			175 (93.1)	13 (6.9)		
Penicillin	R (n=261)	163 (62.5)	98 (37.5)	0.4919	0.48 (0.10-2.33)	230 (88.1)	31 (11.9)	1	0.93 (0.11-7.67)	248 (95)	13 (5)	1	0.97 (0.05-17.55)
	S (n=9)	7 (77.8)	2 (22.2)			8 (88.9)	1 (11.1)			9 (100)	0 (0)		
Ciprofloxacin	R (n=28)	18 (64.3)	10 (35.7)	1	1.07 (0.47-2.41)	24 (85.7)	4 (14.3)	0.7558	0.79 (0.25-2.42)	27 (96.4)	1 (3.6)	1	1.41 (0.18-11.27)
	S (n=242)	152 (62.8)	90 (37.2)			214 (88.4)	28 (11.6)			230 (95)	12 (5)		
Gentamicin	R (n=30)	20 (66.7)	10 (33.3)	0.6943	1.20 (0.54-2.68)	25 (83.3)	5 (16.7)	0.3727	0.63 (0.22-1.79)	29 (96.7)	1 (3.3)	1	1.53 (0.19-12.18)
	S (n=240)	150 (62.5)	90 (37.5)			213 (88.8)	27 (11.3)			228 (95)	12 (5)		
Clindamycin	R (n=15)	10 (66.7)	5 (33.3)	1	1.19 (0.40-3.58)	14 (93.3)	1 (6.7)	1	1.94 (0.25-15.26)	15 (100)	0 (0)	1	1.73 (0.10-30.43)
	S (n=255)	160 (62.7)	95 (37.3)			224 (87.8)	31 (12.2)			242 (94.9)	13 (5.1)		
Erythromycin	R (n=56)	32 (57.1)	24 (42.9)	0.3519	0.73 (0.40-1.34)	45 (80.4)	11 (19.6)	0.0607	0.45 (0.20-0.99)	56 (100)	0 (0)	0.0769	7.57 (0.44-129.4)
	S (n=214)	138 (64.5)	76 (35.5)			193 (90.2)	21 (9.8)			201 (93.9)	13 (6.1)		
Tetracycline	R (n=50)	29 (58)	21 (42)	0.4224	0.78 (0.42-1.45)	37 (74)	13 (26)	0.0024	0.27 (0.12-0.59)	48 (96)	2 (4)	1	1.26 (0.27-5.89)
	S (n=220)	141 (64.1)	79 (35.9)			201 (91.4)	19 (8.6)			209 (95)	11 (5)		
Rifampicin	R (n=94)	43 (45.7)	51 (54.3)	< 0.0001	0.33 (0.19-0.55)	74 (78.7)	20 (21.3)	0.0007	0.27 (0.13-0.58)	89 (94.7)	5 (5.3)	0.7721	0.85 (0.27-2.67)
	S (n=176)	127 (72.2)	49 (27.8)			164 (93.2)	12 (6.8)			168 (95.5)	8 (4.5)		
SXT ^a	R (n=106)	68 (64.2)	38 (35.8)	0.7969	1.09 (0.65-1.81)	90 (84.9)	16 (15.1)	0.2469	0.61 (0.29-1.28)	106 (100)	0 (0)	0.0021	18.98 (1.11-323.0)
	S (n=164)	102 (62.2)	62 (37.8)			148 (90.2)	16 (9.8)			151 (92.1)	13 (7.9)		
Fusidic acid	R (n=7)	6 (85.7)	1 (14.3)	0.2650	3.62 (0.43-30.54)	7 (100)	0 (0)	1	2.11 (0.12-37.77)	7 (100)	0 (0)	1	0.81 (0.04-14.92)
	S (n=263)	164 (62.4)	99 (37.6)			231 (87.8)	32 (12.2)			250 (95.1)	13 (4.9)		
Cloramphenicol	R (n=14)	8(57.1)	6 (42.9)	0.7773	0.77 (0.26-2.30)	10 (71.4)	4 (28.6)	0.0693	0.31 (0.09-1.04)	14 (100)	0 (0)	1	1.61 (0.09-28.43)
	S (n=256)	162 (63.3)	94 (36.7)			228 (89.1)	28 (10.9)			243 (94.9)	13 (5.1)		

Total number of isolates included: 270. There was no data regarding Cape Verde isolates from 1997, which were excluded from the analysis. p-values in bold indicate statistical significance at $p < 0.05$ and OR 95% CI does not include 1.

^a SXT - Trimethoprim-sulfamethoxazole