

Table 5. The distribution of resistant genes among each isolate

Isolates No.	Resistant Genes							
	<i>nuc</i>	<i>mecA</i>	<i>ermA</i>	<i>ermB</i>	<i>ermC</i>	<i>femA</i>	<i>msrA</i>	<i>linA</i>
4	-	+	-	-	+	+	+	+
17b	-	+	-	-	+	+	+	+
22b	-	-	-	-	-	+	+	+
24	+	-	-	-	+	+	+	+
27a	-	+	-	-	+	+	+	+
39a	+	+	-	-	+	+	+	+
47a	+	+	-	-	+	+	+	+
50	+	+	-	-	+	+	+	+
81a	-	+	-	-	+	+	+	+
91b	-	+	-	-	+	+	+	+
95b	-	+	-	-	+	-	-	+

Based on the molecular results, four isolates were confirmed as *S. aureus*, as they were positive for *nuc* gene. However, only one of them was coagulase positive isolate. From 100 nail swab samples collected, these four *S. aureus* were isolated from 4 students. Out of these four isolates, three were confirmed as MRSA as they were positive for *mecA* gene, indicating that MRSA was isolated from 3 students. One of the isolates that possesses *nuc* gene did not contain *mecA* gene but contained other resistant genes (*ermC*, *msrA*, *linA* and *femA*). Therefore, it was categorized as multi-resistant *Staphylococcus aureus*. Six of the CoNS also possessed *mecA* gene; thus, they were categorized as methicillin-resistant coagulase-negative staphylococci. One of the CoNS was

with neither *erm* genes nor *mecA* gene detected. Thus, it was non methicillin-resistant CoNS.

Comparison of antibiogram and other tests with PCR assay

Discrepant results were observed in our study. The antibiogram typing failed to detect methicillin resistance in seven isolates (77.8%), eight isolates (88.9%) for oxacillin resistance, one isolate (10% with *erm* genes and 11.1 with *msrA* gene) for erythromycin resistance. The sensitivity and specificity of the antibiogram typing compared with the PCR identification is shown in table 6 while the findings of comparison (sensitivity and specificity) other test compared to PCR assay (Golden standard) are shown in table 7.

Table 6. Sensitivity and specificity of the antibiogram typing compared to PCR detection of resistant genes in the isolates

Antibiogram Typing Result		PCR results		% Sensitivity	% Specificity
		Positive	Negative		
Methicillin	Positive	2	0	100	22.2
	Negative	7	2		
Oxacillin ^a	Positive	1	0	100	20
	Negative	8	2		
Erythromycin ^b	Positive	9	1	90	0
	Negative	1	0		
Erythromycin ^c	Positive	8	1	88.9	50
	Negative	1	1		

^a: molecular detection of oxacillin resistant is based on the detection of *mecA* gene, ^b: comparison of erythromycin-resistant with the *erm* genes, ^c: comparison of erythromycin-resistant with the *msrA* gene