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Staphylococcus aureus

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		<i>Staphylococcus aureus</i>							
		. (%)		. (%)		. (%)		<i>S. aureus</i>	
<i>S. aureus</i>		Methicillin (Oxacillin MRSA)				<i>S. aureus</i>			
(%)		(%)		(%)		Methicillin (Oxacillin MRSA)			.(%)

Isolation of *Staphylococcus aureus* from ruminant's milk and their resistance to antibiotics in Ninevah governorate

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Abstract

A bacteriological study was conducted on the isolation of *Staphylococcus aureus* from ruminant milk (Buffaloes, Cow, Sheep, Goat). Four hundred milk samples were collected from these animals (100 samples from each) from different locations in the Ninevah governorate during the period from October 2008 till May 2009. The results showed that the percentage of *Staphylococcus aureus* isolation from the above mentioned animals was as follows: Buffalos (78%), Cow (55%), Sheep (65%), Goat (49%). Sensitivity test applied on the isolated organisms showed different result between milk samples of different animals and within the same species. It is interesting to note that some of our *S.aureus* isolates were resistant to methicillin, and thesis resistance was 50% in buffaloes; 20% in cow and sheep and 20% in goat.

Available online at <http://www.vetmedmosul.org/ijvs>

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Oxacillin Vancomycin Cloxacillin

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Ampicillin Amoxicillin Penicillin %
% Tetracycline
Gentamicin Kanamycin % Chloramphenicol .()
S. aureus
Naldixic acid %
% Vancomycin %
Tetracycline % -
% Ampicillin % Erythromycin
Penicillin % Cloxacillin
Amoxicillin %

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co-agulase

Oxacillin Sulphamethoxazole % Kanamycin
% Chloramphenicol
Gentamicin Norfloxacin .() %
S. aureus
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Penicillin Tetracycline % -

S. aureus
Bioanalyse .()

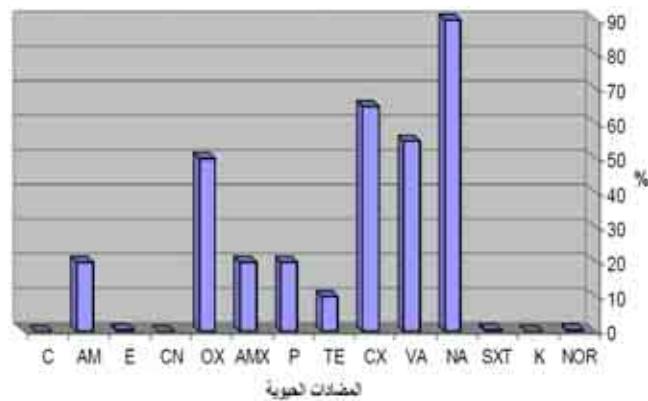
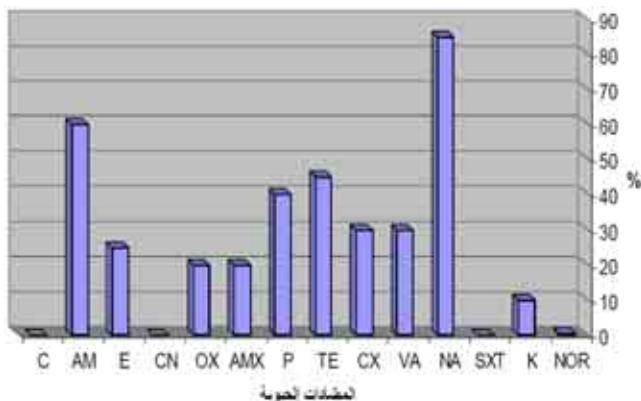
Vancomycin
Oxacillin Amoxicillin % % Cloxacillin
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Chloramphenicol Gentamicin Sulphamethoxazole .() %
S. aureus
Naldixic % % Ampicillin Penicillin acid
% % % Amoxicillin
Oxacillin % Vancomycin Cloxacillin
Norfloxacin % Erythromycin Tetracycline
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Sulphamethoxazole Chloramphenicol .()

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10 NOR Norfloxacin
30 K Kanamycin
24 SXT Sulphamethoxazole
30 NA Naldixic acid
30 VA Vancomycin
1 CX Cloxacillin
30 TE Tetracycline
10 P Penicillin
20 AMX Amoxicillin
1 OX Oxacillin
10 CN Gentamicin
15 E Erythromycin
10 AM Ampicillin
30 C Chloramphenicol

S. aureus

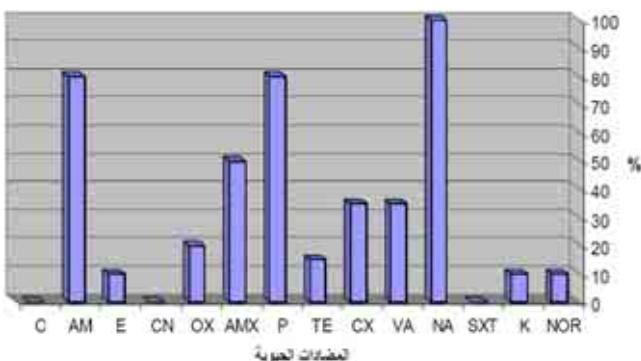
S. aureus
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NOR: Norfloxacin, K: Kanamycin, SXT: Sulphamethoxazole, NA: Naldixic acid, VA: Vancomycin, CX: Cloxacillin, TE: Tetracycline, P: Penicillin, AMC: Amoxicillin, OX: Oxacillin, CN: Gentamicin, E: Erythromycin, AM: Ampicillin, C: Chloramphenicol



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NOR: Norfloxacin, K: Kanamycin, SXT: Sulphamethoxazole, NA: Naldixic acid, VA: Vancomycin, CX: Cloxacillin, TE: Tetracycline, P: Penicillin, AMC: Amoxicillin, OX: Oxacillin, CN: Gentamicin, E: Erythromycin, AM: Ampicillin, C: Chloramphenicol

S. aureus

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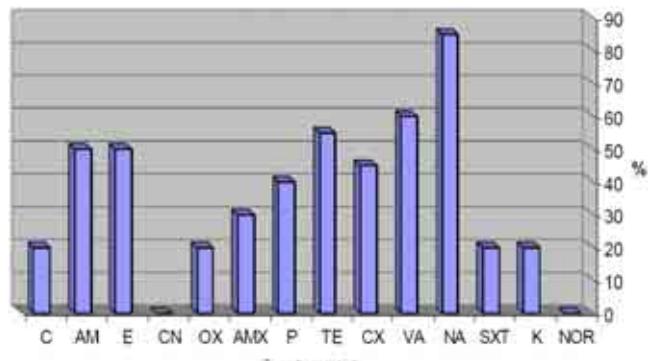
S. aureus

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S. aureus

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NOR: Norfloxacin, K: Kanamycin, SXT: Sulphamethoxazole, NA: Naldixic acid, VA: Vancomycin, CX: Cloxacillin, TE: Tetracycline, P: Penicillin, AMC: Amoxicillin, OX: Oxacillin, CN: Gentamicin, E: Erythromycin, AM: Ampicillin, C: Chloramphenicol



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Gentamicin			Chloramphenicol			Kanamycin			.			%			.		
<i>S. aureus</i>			()														
Chloramphenicol			Tetracycline			Penicillin			Gentamicin			.			()		
%			%			%			Erythromycin			%			<i>S. aureus</i>		
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			<i>S. aureus</i>														
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<i>S. aureus</i>															.		
%			Tetracycline												<i>S. aureus</i>		
%			Ampicillin			Erythromycin									<i>S. aureus</i>		
			()						<i>S. aureus</i>						.		
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Ampicillin			Erythromycin			Tetracycline									<i>S. aureus</i>		
			%			%			%						<i>S. aureus</i>		
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<i>S. aureus</i>															%		
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Kanamycin			Methicillin (MRSA)			Vancomycin (VRSA)			.			.			()		
			%			%			%						<i>S. aureus</i>		
<i>S. aureus</i>						()									<i>S. aureus</i>		
Methicillin			Vancomycin (VRSA)			Kanamycin			(MRSA)			.			()		
			%			%			%						<i>S. aureus</i>		
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13. AL-Kass AMY. Isolation and diagnosis of gram positive bacteria causing mastitis in buffaloes in Ninevah province.M.Sc. Thesis.College of Veterinary Medicine, University of Mosul.2005.
14. Ali L, Muhammad G, Arshad M, Saqib M, Hassan IJ. Bacteriology of mastitis in buffaloes in Tehsil samundri of district Faisalabad, Pakistan.Pakistan Vet J. 2008;28(1):31–33.
15. Roberson JR, Fox LK, Hancock DD, Gay JM, Besser TE. Ecology of *Staphylococcus aureus* isolated from various sites on dairy farms.J Dairy Sci.1994;77:3354 – 3364.
16. Rabello RF, Souza CRV, Duarte RS, Lopes RMM, Teixeria LM, Castro ACD. Characterization of *Staphylococcus aureus* isolates recovered from bovine mastitis in Rio de Janeiro, Brazil. J dairy Sci. 2005;88:3211 – 3219.

17. Haveri M, Taponen S, Vuopio – Varkila J, Salmenlinna S, Pyorala S. Bacterial genotype affects the manifestation and persistence of bovine *Staphylococcus aureus* intramammary infection. J clinical Microbiol. 2005;43(2):959 – 961.
18. Fitzgerald JR, Meaney WJ, Hartigam PJ, Smyth CJ, Kapur V. Fine – structure molecular epidemiology analysis of *Staphylococcus aureus* recovered from cows. Epidemiol Infect. 1997;119:261 – 269.
19. Zschock M, Sommerhauser J, Castaneda H. Relatedness of *Staphylococcus aureus* isolated from bovine mammary gland suffering from mastitis in a single herd.J Dairy Res. 2006;67:429 – 436.
20. da Silva ER, do Carmo LS, da Silva N. Detection of enterotoxins A, B and c genes in *Staphylococcus aureus* from goat and bovine mastitis in Brazilian dairy herds.Vet Microbiol. 2005;106(1–2):103–107.
21. de Sousa MA, Paeente ESR, da Motta OV, Bonna CF, Silva DA, de Leucastro H. Characterization of *Staphylococcus aureus* from buffalo, bovine, ovine and caprine milk samples collected in Rio de Janeiro state, Brazil. Applied and Environmental microbial. 2007;73(12):3845 – 3849.
22. Mah MW , Memish ZA. Antibiotic resistance an impending crisis Saudi medical. J Saudi Arabia. 2000;21:1125 – 1129.
23. Fetrow JS, Stewart S, Farnsworth R, Bey R. Mastitis: An economic consideration ,p:3 – 47.In National mastitis council meeting proceeding. National mastitis council, Inc., Madison,Wis, 2000.
24. Moon JS, Lee AR, Kang HM, Lee ES, Joo YS, Park YA, Kim MN, Koo HC. Antibiogram and coagulase diversity in staphylococcal enterotoxin producing *Staphylococcus aureus* from bovine mastitis. J Dairy Sci.2007;90:23 – 25.
25. Leeumen V, Melles DC, Alaidan A, Al-Ahdal M, Boelens HA, Snijders SV, Wertheim H, Duijkeren EV, Peeters JK, der Spek PJ, Gorkink R, Simons G, Verbrugh HA, van Belkum A. Host and tissue – specific pathogenic traits of *Staphylococcus aureus*. J Bacteriol. 2005;187:4584 – 4591.

1. Moroni P, Pisoni G, Vimercati C, Rinaldi M, Castiglioni B, Cremonesi P, Boettcher P.Characterization of *Staphylococcus aureus* isolation from chronically infected dairy goats. J Dairy Sci. 2005;88:3500 – 3509.
2. Bergomier D, de Cremoux R, Rupp R, Lagriffoul G, Berthelot X.Mastitis of dairy small ruminants.Vet Res.2003;34:689 – 716.
3. Mork T, Tollersrud T, Kvitle B, Jorgensen HJ, Waage S. Comparison of *staphylococcus aureus* genotypes recovered from cases of bovine, Ovine and Caprine mastitis. J of clinical Microbiol.2005;43(8):3979 – 3984.
4. Mork T, Waage S, Tollersrud T, Mosdol G, Sviland S. Bacteria causing clinical mastitis in ewes in Norway. Nor Vet Tidsskr.2004;81:98–826.
5. Bocklisch H, Wetzstein D. Clinical, diagnostic laboratory, therapeutic studies of mastitis in large sheep breeding flock. Tierarztl Prax. 1994 a;22:524 – 528.
6. Stein T, Sehested E. Twenty years experience with simultaneous selection for production and functional traits in Norway. GIFT workshop, breeding goals and selection schemes in wageningen. November 7 –9th 1999.
7. Nelson PW, Stephen NC. Wining the fight against mastitis.Westfalia Surge, Inc.USA. 2003;pp:1-33.
8. Dingwell RT, Leslie KE, Duffield TF, Schukken YH, De costeaux L, Keefe GP, Kelton DF, Lissemore KD, Shewfelt W, Dick P, Bagg R.Efficacy of intramammary tilmicosin and risk factors for cure of *Staphylococcus aureus* infection in the dry period.J Dairy Sci. 2003;86:159 – 168
9. Baddie RL, Nickerson SC. Reduction of mastitis caused by experimental challenge with *Staphylococcus aureus* and *Streptococcus agalactiae* by use of quaternary ammoniums and halogen mixture teat dip J Dairy Sci.2002;85:285 – 262.
10. Dinsmore RP, English PB, Gonzales RN, Sears PM.Use of augmented cultural techniques in the diagnosis of the bacterial cause of clinical mastitis. J Dairy Sci. 1992;75:2706 – 2712.
11. Quinn PJ, Carter ME, Markey B, Carter GR. Clinical Veterinary microbiology. USA:Mosby, an imprint of Elsevier limited. 2004.
12. Buzzola FR, Quelle L, Gomes MI, Catalano M, Steele-Moore L, Berg D, Gentilini E, Denamiel G, Sordelli DO. Genotype analysis of *Staphylococcus aureus* from milk of dairy cow with mastitis in Argentina.Epidemiol Infect. 2001;126:445 – 452.