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Genotypic characterization of *Pseudomonas* species isolated from camels

A Thesis presented by

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Abstract

One of the important livestock economies are camels which adapt with adverse environmental conditions and provide milk, meat, wool, hides, and skin. Gram-negative *Pseudomonas aeruginosa* is harbor multidrug antimicrobial resistance of camel has serious consequences for human health, SO, this study aimed to characterized of *P. aeruginosa* especially extended spectrum β-lactamases (ESBL) producing ones; phenotypically and genotypically. 30 isolates of *Pseudomonas aeruginosa* with a percent of 12% from total of 250 nasal swabs apparently healthy (150) and diseased camels with respiratory manifestations (100) by cetrimide agar medium. The isolates were confirmed biochemically by GN card of Vitek 2 compact system (bioMe´rieux). Suspected ESBL *P. aeruginosa* colonies were 56.6% (17\30) by the double disc synergy test (DDST). Antibiotic sensitivity test showed that the *P. aeruginosa* were (100%) resistance to 3rd generation cefotaxime and 4th generation cefepime, followed by carbapenem: Meropenem and Imipenem (88.2%) and (82.3%), penicillin (82.3%), gentamicin (76.4%), aztreonam (70.5%), erythromycin (29.5%),sulphamethoxazole/trimethoprim (29.5%), and highly sensitive for ofloxacin (100% sensitive) Molecular Detection of virulence genes using *psl*A, *tox*A and *exo*U genes revealed that 29.4%, 23.5% and 17.6% were positive respectively. Detection of ESBLs encoding genes in *P.aeruginosa* recorded that *bla*TEM ,*bla*SHV *and bla*CTXM genes were detected in percentages of 64.7%, 47.0 % and 29.4%, respectively. Finally, ESBL *P. aeruginosa* showing multidrug antimicrobial resistance that detected by *mexR* gene.

Keywords | Antibiotic resistance, Camels, ESBL, *P. aeruginosa*, Virulence genes.

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Abbreviations	Definition
*alg*D	Alginate D
bp	base pair
c	Camelus
CLSI	Clinical and Laboratory Standards Institute
DDST	Double Disc Synergy Test
DNA	Deoxyribonucleic acid
ESBL	Extended-Spectrum beta-lactamase
ESC	Extended-Spectrum Cephalosporin
*exo*A	Exotoxin A
*exo*S	Exoenzyme S
*exo*U	Exoenzyme U
Fig.	Figure
GN Card	Gram-negative fermenting and non-fermenting bacilli card
*gyr*A	DNA Gyrase A
*las*B	Elastase B
*lip*A	lipase A
*lip*C	lipase C
LPS	Lipopolysaccharide
MBL	Metallo β-lactamase
MDR	Multidrug-resistant
Mex	Multidrug efflux
MIC	Minimum inhibitory concentration
OprL	Outer membrane Lipoprotein L
PCR	Polymerase Chain Reaction
TBE	Tris borate EDTA
TEM	Temoneira
*tox*A	Exotoxine A
W H O	World Health Organization