



Cairo University

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Faculty of Veterinary Medicine



Studies on Virulence and Antimicrobial Susceptibility of *Mycoplasma* Species Recovered from Sheep and Goat

A Thesis Presented by

Mona Mahdy Osman Abd Eldaym

Assistant researcher, *Mycoplasma* Department, Animal Health
Research Institute, ARC

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Under Supervision of

Prof. Dr. Kamelia Mahmoud Osman
Professor of Microbiology
Faculty of Veterinary Medicine
Cairo University

Prof. Dr. Mahmoud El-Said Hashad
Professor and head of Microbiology
Department
Faculty of Veterinary Medicine
Cairo University

Prof. Dr. Manal Abu Elmakarm Mohamed
Chief researcher in *Mycoplasma* Department
Animal Health Research Institute, ARC

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Cairo University
Faculty of Veterinary Medicine
Department of Microbiology

Name : **Mona Mahdy Osman Abdel-daym**
Nationality : **Egyptian**
Birth date : **2/9/1984**
Degree : **PhD**
Specification : **Microbiology (Bacteriology, Immunology, Mycology)**
Thesis title : **Studies on virulence and antimicrobial susceptibility of *Mycoplasma* species recovered from sheep and goat**

Supervisors:

Prof. Dr. Kamelia Mahmoud Osman

Professor of Microbiology, Faculty of Veterinary Medicine, Cairo University

Prof. Dr. Mahmoud El-Said Gamel Hashad

Professor and head of Microbiology Department- Faculty of Veterinary Medicine- Cairo University

Dr. Manal Abou El-Makarem Mohamed

Chief Researcher, *Mycoplasma* Department, Animal Health Research Institute, El Dokki, Giza. AHRI. ARC

Abstract

In the present study, a total of 400 samples; collected from sheep and goat; were processed for isolation and identification of *Mycoplasma* species, microbiologically and by molecular techniques. Out of the examined samples, only 43 *Mycoplasma* isolates (10.75%) were identified as *M. ovipneumoniae*, *M. arginini* and untyped *Mycoplasma* species. *M. arginini* showed the highest isolation rate from both sheep and goat with incidences of 58.3% and 58.1%, respectively. While, the incidence of *M. ovipneumoniae* was 11%, and 30% for the untyped *Mycoplasma* species. Confirmation of the isolates was done by PCR then by sequencing of the PCR products. The sequence results of 5 *M. arginini* sheep isolates, 4 *M. arginini* goat isolates, 4 *M. ovipneumoniae* sheep isolates, one *M. ovipneumoniae* goat isolate were all submitted to the Genbank taking the accession numbers; MK291433, MK291434, MK291435, MK291436, MK291437, MK640677, MK640679, MK643127, MK774823, MK300052.1, MK 300042.1, MK 361039.1, MK 361029.1 and MK300051.1, respectively, in addition to one untyped *Mycoplasma* species with the accession number MK910041. The phenotypic virulence traits of sheep and goat isolates including hemolytic activity, biofilm formation, hydrogen sulfide production and catalase enzyme activity were tested. *Mycoplasma* species isolates showed weak adherence ability to the polystyrene multiwall plates. Phenotypically, the hemolytic activity was recorded in 18 sheep isolates and 13 goat isolates. The antibiotic susceptibility testing by MIC showed sensitivity of both sheep and goat isolates to tulathromycin, tylosin, streptomycin and oxytetracycline. All the isolates were resistant to lincomycin. H₂S was detected in eight sheep isolates and 5 goat isolates. Genotypic characterization of the tested positive isolates showed negative results for fluoroquinolone and macrolide resistance genes (*gyrB*, *parC*, *parE*, 23S rRNA D2, 23S rRNA D5, *rplD*, and *rplV*). The present study highlights the role of *Mycoplasma* species affecting sheep, goat. To our knowledge, it is the first record for biofilm production by *Mycoplasma* isolates, also, the first record of studying the hemolytic activity of *Mycoplasma* species of veterinary origin.

Key words: Biofilm, MIC, *Mycoplasma*, PCR, Sequencing.

Contents

Title	Page
1-Introduction.	1
2-Review of literature.	9
General overview	9
Pathogenicity of <i>Mycoplasma</i>	10
Isolation of <i>Mycoplasma</i> species from sheep	20
Isolation of <i>Mycoplasma</i> species from goat	22
Phenotypic virulence determinant	29
Ovine non progressive pneumonia	37
3-The Published.	43
4-Discussion.	65
5-Conclusion and future prospective.	80
6-English Summary.	82
7-References.	86
المخلص العربي	-
المستخلص العربي	-

List of Figures

Fig. No.	Title	Page No.
1	Categories of environmental determinant for disease occurrence	2
2	Diagnosis of infectious respiratory diseases of small ruminants	28
3	<i>M. ovipneumoniae</i> invasion and persistence in bighorn sheep populations: epidemiology and epidemiology	41
4	Environmental factors increasing oxidative stress leading to initiation and progression of respiratory problems.	65

List of Tables

Table No.	Title	Page No.
1	The major pathogenic mollicutes of ruminants	4
2	Details of the geographical distribution and the associated diseases of <i>Mycoplasma</i> species affecting sheep and goats	13

List of Abbreviations

Abbreviation	Complete name
A	<i>Acholeplasma</i>
bp	Base pair
cfu	Colony forming unit
CA	Contagious agalactia
CBPP	Contagious Bovine Pleuropneumonia
CCPP	Contagious caprine pleuropneumonia
DNA	Deoxyribonucleic acid
LC	Large colony
MAKePS	Mastitis ,arthritis ,keratoconjunctivits ,pneumonia
Ma	<i>Mycoplasma agalactia</i>
Mcc	<i>Mycoplasma capricolum</i> subspecies <i>capricolum</i>
MCCP	<i>Mycoplasma capricolum</i> subspecies <i>capripneumoiea</i>
Mmc	<i>Mycoplasma mycoides</i> subspecies <i>capri</i>
MmmLC	<i>Mycoplasma mycoides</i> subspecies <i>mycoides</i> Large colony
Mp	<i>Mycoplasma puterificiens</i>
OIE	Office International des Epizooties
ORC	Ovine respiratory complex
PPLO	Pleuropneumonia like organism
PCR	Polymerase chain reaction
QRDRs	Quinolones resistant determining regions
ROS	reactive oxygen species
rRNA	Ribosomal ribonucleic acid
SOD	superoxide dismutase