Prevalence of *pasteurella* spp. apparently healthy cattle and buffaloes herd in Baghdad governorate, Iraq

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Abstract

Most bacteria species rather *Pasterurella* and *Mannheimia* species are found on the mucosa of the upper respiratory tract of animals and it can relatively survive in the inconsistent environment. The study was conducted to estimate *Pasteurella spp*. prevalence in upper respiratory traction cattle and buffalo herd in Baghdad city. 36 nasal swab;10 cows and 26 buffaloes in Baghdad, were taken and cultured on the Blood agar and Mac Conkey sugar and diagnosed by biochemical test and staining. The results revealed 14(38.88%) isolated *Pasteurella* spp. which were 6 (60.00%) from cows and 8 (30.76%) from buffalo. *Pasteurella multocida* prevalence was 3 (30.00%) in cattle and 6 (23.07%) in buffaloes while, *Mannheimia haemolytica* Prevalence was 3 (20.00%) and 2 (7.69%) in cows and buffalo respectively without significant difference at p>0.05. The study concluded that *Pasteurella* spp. were more prevalent in cattle than in buffalo.
Key words: Nasal swab, cattle, buffalo, *Pasteurella multocida*, *Mannhemia Haemolytica*.
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أنتشار *pasteurella spp.* في قطيع الأبقار والجاموس في محافظة بغداد، العراق

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الخلاصة

معظم أنواع البكتيريا منها أنواع *Pasterurella* و *Mannheimia* تتواجد على الغشاء المخاطي للجهاز التنفسي العلوي من الحيوانات، ويمكنها البقاء على قيد الحياة في بيئة غير ملائمة. وقد أجريت الدراسة للكشف عن *Pasteurella* spp. ومدى انتشار المرض في الجهاز التنفسي العلوي في قطيع الأبقار والجاموس في مدينة بغداد. أخذت 36 مسحة من الأنف، منها 10 عينات من الأبقار و26 عينة جاموس، ثم زرعت العينات على الأوساط الزرعية الدم والمكونكي وتم تشخيصها عن طريق اختبارات الكيمياء الحيوية. وكشفت النتائج ان النسبة الكلية 14(38.88٪) من *Pasterurella* المعزولة. حيث كانت النسبة 6 (60٪) من الأبقار و8 (30.76٪) من الجاموس. كان انتشار *Pasteurella multocida* 3 (30.00٪) في الأبقار و6 (23.07٪) في حين الجاموس، بينما كانت نسبة انتشار *Mannheimia haemolytica* 3 (20٪) و2 (7.69٪) في الأبقار والجاموس على التوالي دون وجود فروق معنوية P>0.05 تستنتج الدراسة إلى أن *Pasteurella spp.* كانت أكثر انتشارا في الأبقار مما كانت عليه في الجاموس وتم عزل *Pasterurella* و *Mannheimia* من الجيوب الأنفية والجزء العلوي من الجهاز التنفسي بزرعها على أوساط زرعية خاصة بها.

الكلمات المفتاحية: مسحات أنفية، أبقار، جاموس، *Pasteurella multocida*، *Mannhemia Haemolytica*.

Introduction

Pasteurellosis is one of the important economic diseases in ruminants, especially in cows and buffaloes. It is caused by *Pasteurella multocida* and occasionally by *Mannheimia haemolytica* (1). These two species are found in the nasopharynx and tonsils of apparently healthy animals (2). Disease constraints like respiratory diseases contribute to the great financial losses and the socio-economic development of poor farmers in the area. These diseases cause a large mortality and morbidity (3). Respiratory tract infections are of common occurrence in various species of domestic

animals. However, pneumonic pasteurellosis, also known as respiratory mannheimiosis, is most common example with a wide prevalence in ruminants. The disease in its typical clinical form, is highly infectious, often fatal and with very serious economic mortality in many animals in which the disease accounts for approximately 30% of the total cattle deaths worldwide (4). *Pasteurella multocida* and *Mannheimia haemolytica* were main causative agent in outbreak of pneumonic pasteurellosis in mountain goats, gazalles and deer's in social sector field, were isolated 43(68.3%) strain from 63nasopharynx swab from infected animals and 8 (20.51%) of 39 nasopharynx swab from apparently healthy goats (5). Hemorrhagic septicemia (HS) caused by *Pasteurella multocida* is a disease which is acute, febrile and lethal. The condition sets in rapidly and is capable of killing susceptible animals in less than 36 to 48 hours (6). Livestock, especially cattle and buffaloes are of significant economical importance to many countries in the world (7). The disease remains a significant obstacle to sustainable livestock production in most parts of topical Asia and Africa (8). The disease is manifested by an acute and highly fatal septicemia principally in cattle and water buffaloes (9). In Iraq an outbreak occurred in vaccinated herd of domestic water buffaloes (*Bubalus bubalis*) with mortality 27.5% and morbidity 100% at Thi Qar province (10). This study was conducted to the determine *pasturella* spp. prevalence in the upper respiratory tract of cattle and buffalo herds in Baghdad.

Materials and Methods

- **Sample collection**: Thirty six nasal swab samples were collected from nasal cavity by sterile cotton swab from (10) cattle and (26) buffalo, which were used for isolation and identification of *pasturella multocida* and *Mannheimia haemolytica*.
- **Culturing and Biochemical tests**: All samples were cultured on sheep blood and Mac Conkey agar then pure isolation of colonies of *pasturella* were diagnosed and identified using colonial morphological and biochemical features. (Catalase test, oxidase test, indole test, growth on MacConkey and hemolysis on blood agar) (11).
- **Direct smear**: Pure colonies of *pasturella* were subjected to gram stain and staining by methylene blue stain to investigate bipolarity of organism before performing of biochemical tests.
- **Statistical analysis:** The statistical analysis system- SAS (12) was used to study the effect of different factors in study parameters. Chi-square test was used to compare between percentages in this study.

Results and Discussion

Out of 36 nasal samples (10 cattle and 26 buffaloes) which were collected from apparently healthy animals, 14(38.88%) samples were positive. *P. multocida* and *p. haemolytica* from healthy animalsin Baghdad province included 6(60.00%) cattle and 8(3.76%) buffaloes, 3 isolates from each species 3/9 (30.00%) and 3/5 (20.00%) were recovered from cattle herds, while 6/9 (23.07%) and 2/5 (7.69%) in buffaloes were *P. multocida* and *P. haemolytica* respectively, without significant difference at p>0.05 (Table 2).

Table (1) Prevalence of *pasteurella* spp. in cattle and buffaloes

Animals	No. of samples	No. positive & percentage
Cattle	10	6(60.00)
Buffalo	26	8(30.76)
Total	36	14(38.88)

Table (2) Distribution of *p. multocida* and *p. haemolytica* isolated from nasal swabs in cows and buffaloes

Animals	*p. multocida*	*p. haemolytica*	Total
Cattle	3(30.00)	3(20.00)	6(60.00)
Buffalo	6(23.07)	2(7.69)	8(30.76)
Total	9(25.00)	5(13.88)	14(38.88)

Pasteurellosis is one of the important economic diseases in ruminants, especially in cows and buffaloes. It is caused by *Pasteurella multocida* and occasionally by *Mannheimia haemolytica* (1). The theory of infection of susceptible hosts subsequent to the dissemination of the resting pathogens from the respiratory tract of convalescents, as well as non-clinical carriers, together with the rigours of nature, has been given wide acceptance (13). It is stabilized in experimental study that however the organisms regularly are transferring from their local site in nasopharynx to lung via air flow, but in a healthy animal, with this high exposure to nasal flora and contaminated air, the lung keeps sterile with defensive mechanisms, both, *Pasteurella multocida* and *Mannheimia haemolytica* are the flora but only *Pasteurella multocida* could be isolated from nasal samples and *mannheimia haemolytica* rarely could be isolated from cattle and buffalo nasal samples (14). In the present study, the prevalence of *Pasteurella* spp. was 14 (38.88%) this finding was lower than that of (15) who reported 63.8%. also, (16) who found that 50.2% of 329 samples from animals (185 nasal swab clinic and 144 lung tissues abattoir) was positive with *pasteurella* and *Mannheimia* species, while (17) Tilaye (2010) who reported 28.4%, this may attributed to the number of animal sample which taken, geographical variabilities, stage of the disease and time of the study. As well as (18) reported that *P. haemolytica*was present in the upper respiratory system of sheep, it was isolated from 140 swab (70 nasopharyngeal and 70 tonsillar swab), taken from sheep in Baghdad and Mosul at 23.57% of strain of *P. haemolytica* were isolated from taken swabs of it samples. The results showed that the prevalence of *P. multocida* and *M. haemolytica*was 9(25.00%) and 5(13.88%) from cattle and buffaloes, respectively. this result is higher than that of (19)who reported 11.4% of *P. multocida* and *M. haemolytica* was 14.3% which is lower than of the same report when isolated from healthy Holstein cattle while, (40.0%) and (100.0%) isolated from unhealthy cattle, respectively. This difference may be due to type of sample taken from animal, species of animal and healthy state of animals in the current study area. The prevalence of *Pasteurella multocida* and *Mannheimia hemolytica* in buffalo was (30.76%) this finding was higher than that of (20) who reported 2.5% when their study was conducted on 100 lung samples collected from slaughtered buffaloes at Mosul city, for identification of the causative agents of pathological lesions. While, the percent was lower than mentioned by (10) who reported 100% morbidity and 27.5% mortality in outbreak of hemorrhagic septicemia in a herd of domestic water buffalo (*Bubalus bubalis*) at Thi Qar province, Iraq whereas (5) isolated *P. haemolytica* 8(20.51%) from nasopharynx swab from apparently healthy goats and did not isolate from three healthy gazelles. (21), isolated *M. haemolytica* from respiratory tract was from 2.30% and 2.80% of apparently healthy cattle and buffalo, respectively, whereas they were isolated from diseased animals in a percent 8% of cattle and 20% of buffalo, as well as they demonstrated that a relatively high number of apparently healthy animals seem to carry the potentially pathogenic *M. haemolytica*. In case of buffaloes, the recovery rate of *P. trehalosi* was higher than that in cattle (*P. trehalosi* are rare in cattle). The study determined that *P. multacida* and *P. haemolytica* are found in the upper respiratory tract of apparently healthy animals, this results play important an role to prevalence of disease among animals herds. The percentage of *pasturella* spp. in cattle was higher than that in buffaloes; this statement needs more investigations to clearance the situation in buffaloes as well as the study on environmental and host conditions associated with bacterial virulence factors.

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