



Isolation and Identification of Bacteria from the Lungs of Buffalo in Southern Region of Rajasthan

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ABSTRACT

The present study was conducted on the lungs of buffalo in the southern region of Rajasthan including different districts like Udaipur, Dungarpur, Chittorgarh and Rajsamand. A total of 27 buffalo were selected whose lungs were showing the pneumonic lesions and swab samples were taken under aseptic conditions. The duration of study was from January 2021 to November 2021. A total of 20 isolates were identified viz. *E. coli* (40%), *Proteus* spp. (30%), *Klebsiella* spp. (20%), *Pasteurella* spp. (10%), *Staphylococcus* spp. (5%) and *Pseudomonas* spp. (5%). *E. coli* isolates (8) were sent National Salmonella and Escherichia Centre, Kasauli for serotyping. The serotypes were O11 (62.5%), O26 (25%) and O121 (12.5%).

HIGHLIGHTS

- To isolate possible pathogens in pneumonic lungs of buffalo.
- O11, O26 and O121 serotypes of *E. coli* were found.

Keywords: Buffalo, Bacteria, Pneumonic lesions, Serotypes

Buffalo is believed to be originated in the Indian sub-continent from the Wild Arni (*Bubalus arnee*) which are still found in the forests of Assam. Buffalo production makes an important contribution to economic development, rural livelihood, poverty alleviation and meets the fast-growing demand for animal protein requirement. The rapidly growing world population will be consuming two-thirds more animal protein by 2050 than it does today (Naveena and Kiran, 2014). Buffalo milk plays an important role in human nutrition particularly in the developing countries. Compared with cow milk, buffalo milk is richer in almost all the main milk nutrients. Also, some milk products such as Mozzarella cheese and ghee are the specialities of buffalo milk (El-Salam and Shibiny, 2011). It is quite difficult to maintain this species at high production because of poor management and health issues. In which Lung affections are one of the most fatal and frequent health issues. As they are susceptible to many bacterial infections, for example; Pasteurellosis, Tuberculosis, Colibacillosis. Most lethal

form of bovine respiratory disease is severe bacterial pneumonia. After rendering all available literature on lung lesions of buffalo, it was found that there are only few reports on lung lesions of buffalo in the Southern region of Rajasthan. So the present study is planned to describe different bacterial isolates in different pneumonic lesions in lungs of buffalo.

MATERIALS AND METHODS

The bacterial isolation and identification study was carried out in Department of Veterinary Microbiology at College of Veterinary and Animal science, Navania, Vallabhnagar, Udaipur, Rajasthan. At the time of slaughter/necropsy,

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the microbiological swabs collected from various lung lesions and transported to the laboratory at 4°. The swabs were inoculated in Nutrient broth and incubated at 37° for 24 hours. Then, the broth culture material showing bacterial growth was examined by Gram's staining. Accordingly, they were further inoculated into the Blood agar, MacConkey agar, Mannitol salt agar and EMB Agar. Isolation and characterization of bacteria and the biochemical tests like catalase, oxidase, indole, methyl red, Voges Proskauer and citrate tests were employed as per the methods described by Quinn *et al.* (1994). *E. coli* isolates recovered from buffalo lung samples were sent to National *Salmonella* and *Escherichia* Centre (NSEC), Central Research Institute (CRI), Kasauli, H. P., India for serotyping based on their somatic (O) antigens and the samples were sent as nutrient agar slant to CRI Kasauli.

RESULTS AND DISCUSSION

In the present study, 27 samples were collected from the pneumonic lungs for bacterial isolation. A total of 20 bacteria were isolated from the 27 samples of bronchopneumonia from both type suppurative and fibrinous. The bacteria isolated viz. *E. coli* (8), *Pasteurella* spp. (2), *Klebsiella* spp. (4), *Proteus* spp. (6), *Staphylococcus* spp. (1) and *Pseudomonas* spp. (1).



Fig. 1: Photograph showing metallic sheen of *Escherichia coli* colonies on Eosine Methylene Blue Agar (EMB agar)

E. coli isolates (8) were sent National *Salmonella* and *Escherichia* Centre, Kasauli (Himachal Pradesh) for

serotyping. The serotypes were O11 (5), O26 (2) and O121 (1). Similar the high incidence of *E. coli* was noted by Lehreena *et al.* (2010). Sharma *et al.* (2020) isolated 14 isolates of *E. coli* from the lungs of buffalo at LUVAS, Hisar with different serotypes. Histopathologically, bronchopneumonia and interstitial pneumonia was noted.



Fig. 2: Photograph showing biochemical tests viz. Methyl red, Voges Proskauer and Citrate utilization for *E. coli*. (A. Indole positive B. MR positive C. VP negative D. Citrate negative)

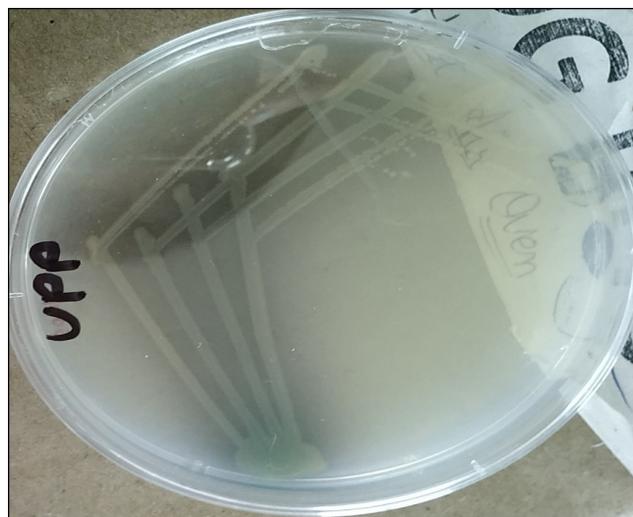


Fig. 3: Photograph showing the pigmented colonies of *Pseudomonas* spp. on Nutrient agar

Pasteurella spp. was isolated mainly from bronchopneumonia. Similar results were observed by Karimkhani *et al.* (2011), Kumar *et al.* (2011), Mondal *et al.* (2013) and Praveena *et al.* (2014).

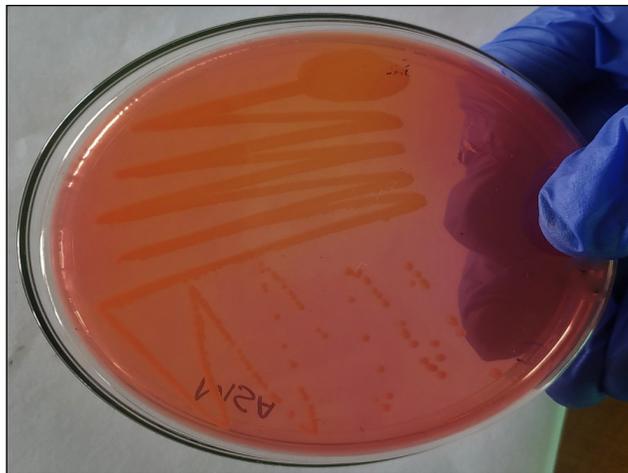


Fig. 4: Photograph showing the colonies of *Staphylococcus* spp. on Mannitol Salt Agar (MSA)

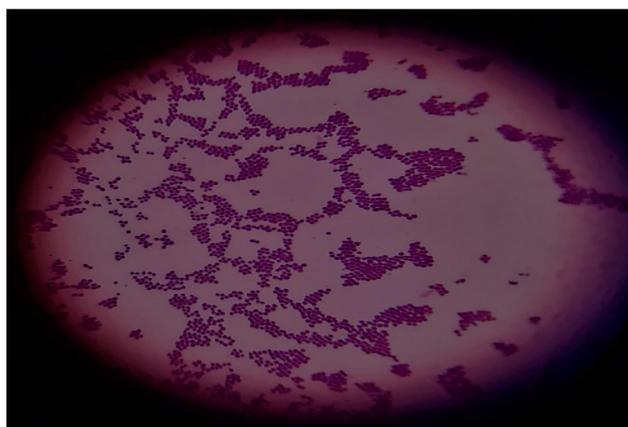


Fig. 5: Photograph showing the bunch like colonies of gram positive bacteria *Staphylococcus* spp. (Gram's Iodine Staining, 1000X)

Klebsiella spp., *Staphylococcus* spp., and *Pseudomonas* spp. from the suppurative and fibrinous bronchopneumonia. These findings were in correlation with Sushma *et al.* (2016) in buffalo at LUVAS, Hisar and Reddy *et al.* (2018) in bovines at TVCC, N.T.R, college of veterinary science, Gannavaram.

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REFERENCES

- El-Salam, M.H.A. and El-Shibiny, S. 2011. A comprehensive review on the composition and properties of Buffalo milk. *Dairy Sci. Technol.*, **91**: 663-699.
- Karimkhani, H., Zahraie, S.T., Sadeghi, Z.M.H., Karimkhani, M. and Lameyi, R. 2011. Isolation of *Pasteurella multocida* from cows and buffaloes in Urmia's slaughter house. *Arch. Razi Inst.*, **66**(1): 37-41.
- Kumar, A., Shekhar, P., Choudhary, M.K. and Kumar, A. 2011. An outbreak of haemorrhagic septicaemia in bovines and its management. *Intas Polyvet*, **12**: 292-293.
- Lehreena, R.G. and Nehra, V. 2010. Microbiological and pathological studies on hepatic and lung disorders in bovine calves. *Haryana Vet.*, **49**: 40-44.
- Mondal, M., Maiti, S.K. and Ghosh, R.C. 2013. An outbreak of Haemorrhagic Septicaemia in bovines and its management. *Intas Polivet*, **14**(1): 76-77.
- Naveena, B.M. and Kiran, M. 2014. Buffalo meat quality, composition and processing characteristics: contribution to the global economy and nutritional security. *Anim. Front.*, **4**(4): 18-24.
- Praveena, P.E., Periasamy, S., Kumar, A.A. and Singh, N. 2014. Pathology of experimental infection by *Pasteurella multocida* serotype A: 1 in buffalo calves. *Vet. Pathol.*, **51**(6): 1109-1112.
- Quinn, P.J., Carter, M.E., Markey, B.K. and Carter, G.R. 1994. *Clinical veterinary microbiology*. Wolfe Publishing, Mosby-Year Book Europe Lynton House, 7-12. Tavistock Square, London WCH 9LB, England.
- Sharma, C., Nehra, V., Lather, D., Chhabra, R., Kumal, A., Narang, G. and Gupta, R.P. 2020. Aetio-pathological study of respiratory affections in buffalo calves. *Haryana Vet.*, **59**(1): 42-46.
- Sreenivasa Reddy, P., Vaikunta Rao, V., Lakshmi Rani, N. and Subramanyam, K.V. 2018. Clinico- diagnostic studies on bacterial pneumonia in buffaloes. *Buffalo Bulletin*, **37**(3): 329-341.
- Sushma, Nehra, V. and Lather, D. 2016. Aetio- pathological studies of digestive and respiratory affections in buffalo calves. *Haryana Vet.*, **55**(2): 170-175.

