# AETIO-PATHOLOGY OF RESPIRATORY INFECTIONS

# IN PIGS IN SRI LANKA

MYTHILI DILEEPAN

For the degree of MASTER OF PHILOSOPHY

UNIVERSITY OF PERADENIYA

Department of Veterinary PathoBiology

Faculty of Veterinary Medicine and Animal Science

June- 2002

## ABSTRACT

Pig husbandry is a thriving biological enterprise, supplying a popular protein source to consumers and providing employment in Sri Lanka. Diseases, mainly respiratory conditions affect the performance and quality of the meat thus proper diagnosis, treatment, prevention and control of the infections are considered vital. Among respiratory infections in pigs, mycoplasma pneumonia of swine (MPS) is considered as the most important because it causes immunosuppression, which is followed by an economically important complex pneumonic syndrome due to secondary infections. A preliminary study by Wettimuny and Seneviratne in 1968 in Sri Lanka and frequent detection of anteroventral pneumonic lesions at abattoir along with complaints of farmers on respiratory infections were instrumental to the current study.

A total of 81 pigs, managed either under an intensive (61) or extensive system (20), slaughtered at Colombo municipal abattoir were examined for lung lesions during a 3-month period in 1998 and appropriate samples were collected for laboratory investigations.

Pneumonic lesions were found in 43% (35/81) of lungs examined. Typical histopathological MPS like lesions were present in 22% (18/81) of pigs in which peribronchiolar and perivascular lymphocytic hyperplasia together with alveolar infiltration of lymphocytes and macrophages were observed. Macroscopically, MPS like lesions, such as red-purple consolidation areas with clear lobular demarcation, were largely confined to the cranioventral region of lungs. Embolic pneumonia was seen in two lungs and interstitial pneumonia observed in one. Parasitic pneumonia due to *Metastrongylus* species was found in 8 lungs (23%) and six of them had lesions of both broncho- and parasitic- pneumonia (17%). There was no statistically significant association between the prevalence of the types of pneumonia and the systems of management ($P>0.05$).

*Pasteurella multocida* was isolated predominantly from pneumonic lesions (43%) and among the isolates the "virulent" serotype, A: 3 was the most common (47%) in MPS suspected lungs. *Streptococcus* spp., *Klebsiella* spp., *Staphylococcus* spp and *Escherichia coli* were the other organisms frequently isolated. The pulmonary consolidation scores were higher in the lungs with *P. multocida* infection. Eighty-five isolates of *P. multocida* were tested for toxigenic strains by mouse inoculation, ELISA and PCR. None of the isolates examined were positive for the presence of toxin-producing *Pasteurella multocida* and this finding supports the absence of clinical atrophic rhinitis among pigs in the Western and Northwestern provinces.

Thirty-seven (29/79) percent of the sera examined were positive for antibodies to *Mycoplasma hyopneumoniae*. Swine managed under intensive system showed higher seroprevalence (24/59; 41%) than pigs reared under extensive system (5/20; 25%). The concordance between seropositivity and the presence of histological lesions in the lungs was marginal (Kappa statistic=0.224).

Culturing of broth on Friis agar medium, showed granular type colonies characteristic of *M. hyopneumoniae*. Prolonged Giemsa staining showed pinkish purple organisms with coccoids and rings with characteristic bipolars. Polymerase chain reaction was used to identify and confirm the mycoplasmal species as *M. hyopneumoniae* in four lung tissues, one tracheal tissue and three broth cultures.

For the first time, this study showed the evidence of MPS infection in Sri Lanka by pathological, cultural and serological techniques. Further, the presence of *M. hyopneumoniae* was confirmed by PCR. Data from this study indicates that proper control measures should be taken in Sri Lanka to minimize the losses caused by MPS.