

**Study of the pathogenesis and development of diagnostic methods and control of pneumonic pasteurellosis in pigs** - Morés N.<sup>1</sup>, Morés M.A.<sup>1</sup>, Oliveira Filho J.X.<sup>2</sup>, Klein C.S.<sup>1\*</sup>, Caron L.<sup>1</sup>, Coldebella A.<sup>1</sup>, Rebelatto R.<sup>1</sup>, Sluszz T.<sup>1</sup>, Guedes R.M.C.<sup>3</sup>, Alberton G.C.<sup>4</sup>, Dutra V.<sup>5</sup>, Moreno A.H.<sup>6</sup>, Sobestiansky J.<sup>7</sup>, Matos M.P.C.<sup>3</sup>, Barcellos D.S.N.<sup>2</sup>

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The Swine Respiratory Complex has a multiple etiology and *Pasteurella multocida* (*Pm*), present in most cases it is understood as a secondary agent. However, the association between severe pneumonic/ pleuritis/ pericarditis lesions with certain strains of *Pm* has been verified in the field and pilot tests conducted in SPF (Specific Pathogens Free) pigs at Embrapa Swine and Poultry. Our hypothesis is that certain Strains of *Pm* alone (as the primary pathogen) are capable of inducing severe pathological pneumonia/ pleuritis/ pericarditis in pigs. Actions are underway to isolate samples of *Pm* and check the other respiratory agents involved in clinical field cases in seven Brazilian states by histopathology, immunohistochemistry and molecular technics. Six samples of *Pm* isolated from pigs with pneumonia/ pleuritis/ pericarditis are being tested to assess their pathogenic potential in absence of other respiratory agents. Also, *Pm* isolates of pigs will be submitted to phenotype, genotype and minimum inhibitory concentration (MIC) studies. Many samples of *Pm* are isolated from cases of field/ slaughterhouse, pigs with respiratory problems and additional tests for other respiratory pathogens are in progress. Four samples of these *Pm* have been tested in SPF pigs. Of these, two were highly pathogenic, one was moderately pathogenic and one was not pathogenic. If our hypothesis is proven, three of them (the most pathogenic) will be studied in terms of immunogenicity with a view to developing a vaccine. These knowledge will provide a better support for field veterinarians in regard to the control of the disease outbreaks in different regions.

Key-words: swine, *Pasteurella multocida*, bronchopneumonia

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## Study of the pathogenesis and development of diagnostic methods and control of pneumonic pasteurellosis in pigs

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### INTRODUCTION

The Swine Respiratory Complex has a multiple etiology and *Mycoplasma hyopneumoniae* (Mhyo), *Pasteurella multocida* (Pm), *Actinobacillus pleuropneumoniae* (App), and *Haemophilus parasuis* (Hps) are the most commonly bacterial agents found in lung lesions, and *P. multocida* (Pm), present in most cases, it is regarded as a secondary agent. However, the association between severe pneumonic, pleurisy and pericarditis lesions with certain strains of Pm has been verified in the field and pilot tests conducted in SPF (Specific Pathogens Free) pigs at Embrapa Swine and Poultry. Our hypothesis is that certain strains of Pm alone (as a primary pathogen) are able to induce these severe pathological findings in pigs.

### METHODOLOGY

We have been performing collection of clinical samples from pigs in seven Brazilian states, each state being sampled in swine herds with clinical cases of respiratory disease and have been collecting fragments of lung samples with pneumonic lesions at slaughterhouse from swine with polyserositis.

From the samples collected will be performed laboratory tests for the agents of respiratory complex of pigs, including Pm (Figure 1a), by histopathology, immunohistochemistry (IHC) (Figure 1b) and molecular techniques. Moreover, some of Pm isolates from pigs will undergo the study of minimum inhibitory concentration (MIC) against the use of antimicrobials.

Currently, we have been implementing and validating the genotypic characterization of Pm by multiplex PCR in order to detect virulence factors, capsular typing and species-specific genes portions, following by sequencing. The Pm samples containing virulence factors will be submitted to fingerprint DNA by pulsed-field gel electrophoresis (PFGE) and restriction endonuclease analysis (REA). Sequencing of the complete genome of the highly pathogenic Pm samples will be performed.

Six samples of Pm isolated from swine with pneumonia, pleuritis and pericarditis will be tested to evaluate their pathogenic potential in the absence of other respiratory agents.

### RESULTS & DISCUSSION

Until the present, several samples of Pm have been isolated from swine with respiratory problems, in cases of field and slaughterhouse. All strains are being characterized phenotypically (Figure 1a), and then will be done genotypic characterization.

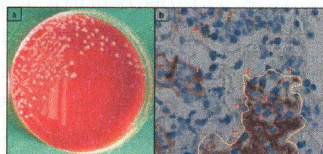


Figure 1. Morphological characteristics of the colonies on bacteriological culture (a) and the result of immunohistochemical test positive, labeled with arrows and contoured (b) to *P. multocida* serotype A.

Four samples of Pm isolates were tested in SPF pigs (Figure 2a). Of these, two were highly pathogenic (Figure 2b), one was moderately pathogenic and the other was not pathogenic. If our hypothesis is proven, three of them (the most pathogenic) will be studied in terms of immunogenicity with a view to developing a vaccine.

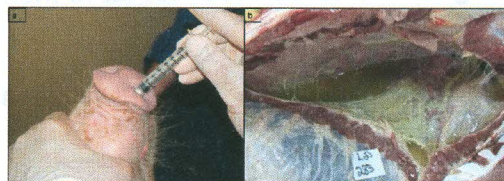


Figure 2. Inoculation of SPF swine (a) and lesions of the thoracic cavity of porcine by experimental reproductive of disease (b) with Pm A pneumonic sample

### CONCLUSION

These knowledge will provide a better support for field veterinarians in regard to the control of the disease outbreaks in different regions.

