# Proceedings of the

## 23rd International Pig Veterinary Society (IPVS) Congress

## VOLUME II

23rd IPVS CONGRESS
MEXICO 2014

June 8 – 11, 2014
Cancun, Quintana Roo, Mexico

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## Volume 2

## Poster presentations


**June 8 – 11, 2014**
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**P.264**

# Different profiles of pathogenicity among eight isolates of *P. multocida* A on the experimental reproduction of pneumonia and pleuritis in pigs

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## Introduction

*Pasteurella multocida* (PmA) is one of the bacterial agents most commonly isolated from pneumonic lesions in pigs. However, its role as a primary agent of pneumonia remains unclear (2). The present study aimed to evaluate the clinical and pathological picture of the disease in specific pathogen-free pigs (SPF) challenged with eight different PmA strains.

## Materials and Methods

The experiment complied with Ethical Principles in Animal Experimentation, and was approved by the Ethics Committee on Animal Experimentation (CEUA/CNPSA) (Protocol #005/2010). Sixty-four pigs of approximately 120 days of age, from an SPF herd free of PmA and D, *B. bronchiseptica*, *A. pleuropneumoniae* (App), *H. parasuis* (Hps), *M. hyopneumoniae* (Mhyo) and influenza A virus were equally distributed into eight groups **(G1 a G8)**. Each group was challenged with an isolate of PmA obtained from animals with lesions of pneumonia (A to H) assigned to six experimental groups (E): **E1**: G1-A e G2-B; **E2**: G3-C e G4-D; **E3**: G5-E; **E4**: G6-F; **E5**: G7-G; e **E6**: G8-H. Two control pigs were included in each experimental group (G0) and inoculated with sterile saline (total of 12 pigs). Each pig from groups G1 to G8 received 3.0 mL (1.5 mL/nostril) of the respective inoculum with $10^7$ CFU/mL of PmA, administered by slow intranasal drip. All pigs were clinically evaluated twice daily (rectal body temperature - TR, dyspnoea and coughing), starting from the 3th day before inoculation until the 5th day post-inoculation (5dpi) when they were euthanized by electrocution, bled and necropsied. Several organs portion were collected to histopathological and bacteriological assays.

## Results

There were not clinical changes in all animals in the pre-challenge period. Fever (TR $\geq$ 40 º C) and dyspnoea were the most frequent clinical sign presented by animals in the challenged groups, with the exception of G0, G6 and G8 that remained healthy. Three distinct patterns at necropsy were observed, associated or no: 1. fibrinonecrotic cranioventral bronchopneumonia-Bp (G1, G3, G7); **2.** Diffuse pleuritis associated or no with pericarditis and peritonitis (G3, G5, G7); **3.** Locally extensive necrosuppurative pleuropneumonia (G1, G2; G3, G4, G7). The severity of clinic pathological changes classified the PmA strains in: highly pathogenic (A, B, C e G); low pathogenicity (D e E); and not pathogenic (H e F). Septicemia occurred in several pigs of G1, G2, G3 e G7, characterized by septic microthrombi in liver and kidneys, with isolation of PmA. Additionally, two animals presented otitis interna with profuse isolation of PmA.

## Conclusions and Discussion

Herein it was demonstrated that PmA may act as a primary agent of bronchopneumonia and polyserositis in pigs, evolving to septicaemia. Although PmA has been considered as a secondary agent of pneumonia in pigs. (2), animals challenged with eight different strains of PmA showed three different pathogenic profiles: highly pathogenic strains (A, B, C e G); low pathogenicity (D e E); and not pathogenic (H e F). Besides the classic lesions already described of cranioventral fibrinosupurative bronchopneumonia and pericarditis by PmA (3), lesions similar to those of Hps and App were also found (1). In Brazil, pneumonia is very prevalent in finishing pigs and is characterized by high mortality and lesions of septicemia, including necro-hemorrhagic pneumonic lesions. This study showed differences in pathogenicity between PmA strains isolated from outbreak in Brazil. Collectively, these results indicate the need of laboratorial assays to define the etiology of pneumonia in finishing pigs in the conditions of Brazilian herds.

## Acknowledgments

Coordination of CAPES for the scholarship; Embrapa for funding the research project

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