20th International Pig Veterinary Society Congress

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Durban
South Africa

We are delighted that the International Pig Veterinary Society Congress 2004, decided to select South Africa as the host country for the 20th IPVS Congress. The Pig Veterinarians of South Africa will ensure that this congress lives up to the best traditions of previous congresses; incorporating an interesting and topical scientific programme, fascinating accompanying persons tours and an excellent social programme, allowing delegates the opportunity to network with their overseas colleagues.

This, the first IPVS congress on the African continent, will undoubtedly be of enormous benefit in generating solutions to the emerging pig veterinary challenges, especially those related to exotic and changing viral diseases, decreased use of antimicrobials and nutritional advances. The congress is important to further pig veterinary science in South Africa, to encourage younger veterinarians to join the pig industry, as a vehicle to generate funds for research and to improve the pig industry in Southern Africa.

South Africa is a magnificent and beautiful country, and offers tourists value for money. Thus, pre and post congress tours will be a major attraction for delegates to come to South Africa. Durban, in KwaZulu Natal, is a vibrant multi-cultural city with magnificent beaches, easily accessible game parks, theme villages and a moderate winter climate making it an ideal tourist destination. We urge our colleagues throughout the world to use this opportunity to get a glimpse of the continent’s rich and fascinating wonders and to enjoy the hospitality of their African friends.

Dr Peter Evans
Chairman: Local Organising Committee: IPVS 2008
HAEMOPHILUS PARASUIS PRODUCES BIOFILM IN VITRO

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Introduction
There is an increasing concern about biofilm production by pathogenic bacteria, and its effect on infection progression. The biofilm, a polysaccharide matrix containing a large number of bacteria, mediates adhesion to solid surfaces and confers resistance to antimicrobial agents and macrophages phagocytosis (1), being therefore an important pathogenicity factor. Haemophilus parasuis is the aetiological agent of a systemic disease, Glässer’s disease, characterized by fibrinous polyserositis, arthritis and meningitis in pigs. Factors involved in pathogenicity of H. parasuis remain largely unknown (2, 3). Several human pathogens have been shown to produce biofilms (1). However, few reports on biofilm formation by pathogens of veterinary interest are available in the literature. The objective of this study was to determine if Haemophilus parasuis can produce biofilm under in vitro conditions and whether strain origin can affect it.

Materials and Methods
The panel of H. parasuis strains (n=19) tested consisted of:
Three reference strains: Nagasaki (serotype 5), SW114 (serotype 3) and 174 (serotype 7); 14 field strains recovered from unrelated outbreaks of acute disease in growing pigs: eight isolates from lung (-L), three from brain (-B), two from bronchi (-BC) and one from joint (J); two from nasal cavity (-NC) of asymptomatic animals.

Biofilm production was tested in 96-well microtitre plates using a crystal violet staining method (4). Two different culture media were tested in parallel: Mueller-Hinton broth supplemented with NAD (factor V) (40 mg/l) (medium A), and Mueller-Hinton broth supplemented with NAD (40 mg/l) and glucose (8 g/l) (medium B). Undiluted and three 10-fold serial dilutions of every inocula were tested in duplicate. After 5 days of incubation, biofilm production was evaluated by visual inspection and scored accordingly.

Results
Biofilm formation was evidenced in 12 out of 19 H. parasuis strains tested, most of them being field isolates (Table 1). However, substantial variability in the biofilm yield was observed (Figure 1 and Table 1).

Table 1 Biofilm production by reference and field strains of Haemophilus parasuis.

<table>
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<th>Strain</th>
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<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>A</td>
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<tr>
<td>SW114</td>
<td>-</td>
<td>+</td>
<td>68062-L</td>
</tr>
<tr>
<td>Nagasaki</td>
<td>+</td>
<td>+</td>
<td>18916-B</td>
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<td>174</td>
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<td>+</td>
<td>69009-B</td>
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<tr>
<td>66871-L</td>
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<td>+</td>
<td>52190-B</td>
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<tr>
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<td>-</td>
<td>+</td>
<td>64046-B</td>
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<td>61807-B</td>
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<tr>
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<tr>
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<td>+</td>
<td>+</td>
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<td>68834-L</td>
<td>+</td>
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<td>58586-N</td>
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a Biofilm-retained stain measurement by visual inspection: -, negative; +, weak; ++, moderate; ++++, strong

Discussion
This study demonstrates that H. parasuis can produce biofilm in vitro. This biofilm production could be a pathogenicity factor for the species, as has been stated for other bacteria (1). Little is known about the factors that confer pathogenicity in H. parasuis (2), even though big differences exist in pathogenicity between its strains. Recently, its capacity of adhesion and invasion to vascular cells has been demonstrated (3).

Substantial variability seems to exist among H. parasuis strains in their ability to grow as biofilms, as has been described for other bacteria (4, 5). These differences were not related to the site of isolation. Biofilm production is known to be dependant on environmental factors, including media composition (4). In the two media tested in our study, differing in glucose presence, no significant difference was found in favoring H. parasuis biofilm formation. Similar results were obtained for Haemophilus influenzae when different carbohydrates were analyzed (5).

Haemophilus parasuis is a well-known fastidious bacteria. After several attempts in media formulation and experimental conditions, it was found that, to test H. parasuis biofilm production capability, a heavy inocula and a long incubation time were needed (data not shown).

In conclusion, an important proportion of Haemophilus parasuis field isolates are able to show a sessile behaviour and live as biofilm communities in vitro.

References

Figure 1 Biofilm production (a, b and d) by: a, an Actinobacillus pleuropneumoniae strain (positive control) (medium A); b, strain 46879 (medium B); d, strain 58586 (medium B). No biofilm production (c) by: strain 46064 (medium B).