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Brief Communication

Antimicrobial Susceptibility of *Mycoplasma hyorhinis* in a Liquid Medium Compared to a Disc Assay

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Mycoplasma hyorhinis is a common cause of infections in swine (*Kobisch & Friis* 1996) and antimicrobial agents are sometimes used for treatment of the infections. Isolates with decreased susceptibility to macrolides have been reported (*Kobayashi et al.* 1996), but only a very limited number of studies on the susceptibility of *M. hyorhinis* to antibiotics has been reported. There are at present no international guidelines for susceptibility testing or interpretation of isolates as being resistant or susceptible, but problems in and methods for susceptibility testing have previously been discussed (*Kenny* 1996, *Bébéar & Robertson* 1996). The present study was conducted to examine the inhibitory effect of some commonly used antimicrobials on *M. hyorhinis* using both determination of Minimal Inhibitory Concentration (MIC) in liquid medium and a disc diffusion test on solid medium.

Six field isolates of *M. hyorhinis* were isolated from clinical material by cultivation (*Kobisch & Friis* 1996); they were filter-cloned and stored as culture at -80°C. All the isolates were identified by cultural characteristics and serologically in the Disc Growth Inhibition test using type and reference rabbit antisera. The reference strain GDL (NCTC 10121) and the type strain BTS-7 (NCTC 10130) were also included.

MIC-determinations and disc diffusion testing were performed for the following antimicrobial agents: enrofloxacin, lincomycin, tetracycline, tiamulin, and tylosin as previously described (*Friis & Szancer* 1994) for other porcine mycoplasmas. Inhibition in liquid medium was regarded as significant by a difference from control values of pH 0.4 to 0.5 as estimated visually. On solid medium a zone of inhibition of the colonies of 5 mm or more was regarded as positive.

The MIC-values for the *M. hyorhinis* isolates tested are given in Table 1. All 5 antimicrobials were able to inhibit the growth of all 6 field isolates and the reference strains. Tetracycline showed the highest activity, followed by tiamulin, enrofloxacin, tylosin and lincomycin. Very close correspondence between MIC-determination in liquid medium and disc diffusion testing on solid medium was observed.

The MIC-values obtained for field isolates and reference strains in the present study were in general found at the same level as those reported by other investigators, despite some variations in the methods used (*Hannan et al.* 1989, *ter Laak* et *al.* 1991, *Kobayashi et al.*

Table 1. Minimal inhibitory concentrations and inhibiting disc values for 5 antimicrobial agents of 6 *Mycoplasma hyorhinis* field isolates and 2 reference strains.

M. hyorhinis isolate	Enrofloxacin			Lincomycin			Tetracycline			Tiamulin			Tylosin		
	i	f	d	i	f	d	i	f	d	i	f	d	i	f	d
Type strain*	0.5	0.5	1.0	0.25	1.0	3.0	0.05	0.1	0.3	0.05	0.1	0.3	0.25	0.5	0.3
GDL strain**	0.5	0.5	1.0	0.5	1.0	3.0	0.05	0.1	0.1	0.1	0.25	0.3	0.25	0.5	1.0
11	0.5	0.5	0.3	0.5	1.0	3.0	0.025	0.05	0.1	0.1	0.25	1.0	0.25	0.5	1.0
28	0.5	1.0	1.0	0.5	1.0	3.0	0.05	0.1	0.3	0.1	0.25	1.0	0.25	0.5	1.0
105	0.5	0.5	1.0	1.0	1.0	3.0	0.025	0.05	0.1	0.05	0.25	1.0	0.25	0.5	1.0
445	0.5	1.0	1.0	0.25	0.5	3.0	0.025	0.05	0.1	0.05	0.25	0.3	0.25	0.5	1.0
489	0.5	0.5	1.0	1.0	5.0	10.0	0.05	0.1	0.1	0.1	0.25	1.0	0.25	0.5	1.0
747	0.5	0.5	1.0	0.5	0.5	3.0	0.05	0.1	0.1	0.1	0.25	0.3	0.25	0.5	1.0
MIC_{50} for field isolates	0.5	0.5	1.0	0.5	1.0	3.0	0.025	0.05	0.1	0.1	0.25	1.0	0.25	0.5	1.0

*: BTS-7 (NCTC 10130)
**: GDL (NCTC 10121)
i,f = initial and final µg/ml values; d = disc values in µg per disc, giving inhibition

1996). However, in the study by ter *Laak et al.* (1991) tiamulin, tetracycline, and tylosin were in general found slightly more active than in the present study. In the study by *Kobayashi et al.* (1996), the MIC values for tetracycline showed a relatively wide range.

MIC determinations in liquid medium may be too laborious for routine diagnostic work. In the present study, as in the study by *Friis & Szancer* (1994), relatively good agreement between MIC values obtained in liquid medium and the disc values obtained in the disc diffusion was observed. Thus, disc diffusion testing might be of value for the routine diagnostic laboratory.

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