In Vitro Efficiency Test of a Disinfectant, Virusnip, to Mycoplasmas

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Introduction

Mycoplasma is the small pathogen caused diseases to human and animals. In pig and poultry, there are several species of mycoplasma including Mycoplasma hyopneumoniae, M. hyosynoviae, M. hyorhinis, and M. gallisepticum cause respiratory problems as well as other systemic diseases such as polyserositis-arthritis and lameness from breeder to fattening. Because of the variation of antigenicity and certain particular biological characters of Mycoplasmas, it leads to result variation of eradication and medication programs use in the field (2,5,6,7). The biosecurity program including the disinfection of animal environment will be one of the key strategies to control the diseases from mycoplasma. There are a lot of disinfectants available but the proving efficiency has to be determined. However, information of disinfectant efficaciy for mycoplasma is limited as well as efficacy for Rickettsiae and Chlamydiae (1). The objective of this study is to evaluate the efficiency of Virusnip disinfectant against three species of porcine mycoplasma field strains and M. gallisepticum, avian mycoplasma field and reference strains isolated in Thailand.

Materials and Methods

Three field isolation of each Mycoplasmas; M. hyopneumoniae, M. hyosynoviae and M. hyorhinis collected during 2008-2009 and a reference and two field strains of M. gallisepticum collected in 2006 were stored at –80°C as stock bacteria. The test procedure was modified from Senterfit, L.B. (1983). In brief, mycoplasmas from the stock were adjusted to 10⁷ – 10⁸ CCU/ml in their appropriated broth and incubated at 35°C for 2 hours. The MICs were performed in microtitration plates. The Virusnip was serially two-fold diluted from 40 mg/ml to 0.039 mg/ml to determine the MIC being bactericidal effect to each mycoplasma. Therefore, the color of the test mixture in the first three columns was acidic and change to yellow, resulting in interfering the result reading. To overcome this problem, the plates were incubated at 37°C for 18 hour. Then growth of mycoplasmas was detected by re-inoculation of each column into fresh appropriated media, incubation for 4 days and observation of color change compared with the control tube. The lowest concentrations of Virusnip that inhibited growth of Mycoplasma spp. showed by no visible color change were reported.

Results

The MICs are showed in Table 1.

<table>
<thead>
<tr>
<th>Mycoplasma</th>
<th>No. of isolate</th>
<th>MIC (mg/ml)</th>
<th>Dilution of Virusnin</th>
<th>MIC range of virusnin against all Mycoplasma tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>M. hyopneumoniae</td>
<td>3</td>
<td>2.5</td>
<td>1:400</td>
<td>2.5-5</td>
</tr>
<tr>
<td>M. hyosynoviae</td>
<td>3</td>
<td>5</td>
<td>1:200</td>
<td></td>
</tr>
<tr>
<td>M. hyorhinis</td>
<td>3</td>
<td>5</td>
<td>1:200</td>
<td></td>
</tr>
<tr>
<td>M. gallisepticum</td>
<td>3</td>
<td>5</td>
<td>1:200</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

MIC of Mycoplasmas in porcine and poultry derived from Thai farms in present study is not only the inhibited concentration but also the bactericidal concentration because of the re-inoculation of mycoplasmas in broth from every column. Previous study reported that M. mycoides and M. bovis need high concentration and longer exposure time of sodium hypochlorite for bactericidal activity (3). Virusnip contains sodium dichloroisocyanurate as a chlorine source and oxidising agent, potassium monopersulphate with sulfamic acid is to maintain the appropriate pH for protection of chlorine gas evaporation. The different contents can cause the different efficiency to Mycoplasma spp. as the present study. In conclusion, Virusnip shows its in vitro efficiency of mycoplasmacidal effect to porcine and avian mycoplasmas.

Acknowledgement

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References