Efficacy of Virusnip\textsuperscript{®} disinfectant against *Isospora suis* oocysts in vitro

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Introduction

Porcine neonatal coccidiosis is a disease caused by an obligate intracellular apicomplexan protozoan *Isospora suis* (or *Cystoisospora suis* as the recent taxonomic revision) (1,2). The suckling piglets are susceptible to infection by presenting clinical signs of yellowish to grayish diarrhea between 1 to 2 weeks of age (3). The unsporulated oocysts are shed in the feces then become infective in warm and humid environment similarly to the farrowing crates. Hygiene, rigorous attention to sanitation and anti-coccidial drugs have been implicated as important control measures for this devastating disease. Since the piglets acquire environmentally resistant sporulated oocysts via fecal-oral contamination, a number of strategies have been recommended to combat with tenacious oocysts in reducing the transmission. Steam-cleaning and chemical disinfectants have been reported to use in pig farms such as bleach, ammonia compounds and cresol-based products (3-5). Virusnip\textsuperscript{®} (Potassium monopersulphate) disinfectant appeared to be effective in disrupting thick cyst wall of *Balantidium coli* in vitro (6). The aim of this study is to evaluate the in vitro efficacy of Virusnip\textsuperscript{®} in destroying and inhibiting sporulation of *I. suis* oocysts.

Materials and Methods

*I. suis* oocysts were freshly harvested from the diarrheic feces of naturally infected piglets by using centrifugal floatation technique as previously described (7). After collecting and washing oocysts from the floatation solution, five thousands oocysts were resuspended in distilled water and aliquoted into 1.5 ml-sized eppendorfs. They were then incubated with Virusnip\textsuperscript{®} at different final dilutions (1:1000, 1:200, 1:100, 1:50, 1:10) and varying exposure times (60, 15, 5 min) at room temperature (25±5\textdegree C). For the untreated control, distilled water was used for 60 min incubation. Each incubation was set up in duplicate. To terminate the contact time, excessive amount of water was added and removal of disinfectant was performed by centrifugation at 200xg to discard supernatant followed by rigorously washing the oocysts with distilled water. This procedure was repeated three times to diminish the disinfectant to negligible residues. After oocysts were incubated with 2.5% potassium dichromate to allow sporulation for 6 days with periodic aeration at room temperature, they were qualitatively and quantitatively examined under 100x magnification of the light microscope using McMaster chamber technique. Three different types of oocysts were classified: unsporulated, sporulated and damaged oocysts. The statistical analysis was performed by using the *t* test.

Results

![Graph showing percentage of damaged *Isospora suis* oocysts post treatment with Virusnip\textsuperscript{®}](image)

![Graph showing % Efficacy of Virusnip\textsuperscript{®} against sporulation of *Isospora suis* in vitro](image)

Discussion

Based on the results, almost all dilutions of Virusnip\textsuperscript{®} tested had damaging effect and prevented unsporulated oocysts from becoming sporulated (*). Although the increase in damaging effect and in efficacy of Virusnip\textsuperscript{®} seemed to be inversely correlated upon the decrease of exposure time, the differences were not statistically significant among the same dilution (*p*<0.05).

References