

## In-Vitro Evaluation of Topical Biocide and Antimicrobial Susceptibility of *Staphylococcus pseudintermedius* from Dogs

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### ABSTRACT

In response to the rise in antibiotic resistance, topical biocides are emerging as alternatives in the case of diseases like canine pyoderma. This study found that several topical products, including an AHP®-based shampoo, effectively inhibit growth of *Staphylococcus pseudintermedius* in-vitro.

### BACKGROUND

*Staphylococcus pseudintermedius* bacteria causes pyoderma in dogs, which is a superficial skin infection. With the rise of drug-resistant forms of these bacteria (methicillin-resistant *S. pseudintermedius*, or MRSP), antimicrobial resistance is becoming an increasing concern for the treatment of canine pyoderma. As a result, healthcare practitioners are needing to find alternate forms of treatment, such as topical biocides and antimicrobials. This study aims to evaluate these emerging treatments by testing a variety of topical antimicrobials against *S. pseudointermediates* isolates.

### STUDY

Twenty-five MRSP isolates and 25 methicillin-susceptible *S. pseudintermedius* isolates were collected from infected dogs. Each isolate was grown on sheep blood agar and treated with biocide. Minimal inhibitory concentrations (MICs) of the following products were evaluated:

- Chlorhexidine digluconate

- Benzalkonium chloride (a quaternary ammonium compound)
- Triclosan
- Accelerated Hydrogen Peroxide® (AHP®, in the form of Pure Oxygen Derma Wash shampoo)
- Geranium oil
- Tea tree oil
- Grapefruit seed extract

### RESULTS

The triclosan demonstrated excellent results, with no growth at even the lowest concentration tested. On the other end of the spectrum, the grapefruit seed oil did not inhibit growth at even the highest concentration tested. The MIC<sub>50</sub> for AHP® was 32 µg/mL, meaning that half of the tested samples showed no growth at this concentration.

### CONCLUSION

Most tested products achieved efficacy against bacterial isolates in vitro, including the AHP® shampoo.

### IMPLICATIONS FOR AHP®

These findings show promise for the application of AHP®-based topical products as alternatives to oral antibiotics. The MIC<sub>50</sub> concentration measured in this study is much lower than in-use concentrations, so we can reasonably infer that in-use concentrations would likely result in complete elimination of growth.

Further work should be done to evaluate concentrations of AHP<sup>®</sup> that more accurately reflect clinical use.

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#### REFERENCE

Valentine BK, Dew Y, Yu A, Weese JS. (2012). In-vitro evaluation of topical biocide and antimicrobial susceptibility of *Staphylococcus pseudintermedius* from dogs. *Vet Dermatol.* 23: 493-e95.