

INTRODUCTION

Contact lens (CL) cases become contaminated with microbes during use [1,2]. Microbial contamination of CL cases may result in biofilm formation [3]. Bacteria within a biofilm are less susceptible to antimicrobials and multipurpose contact lens disinfection solutions [4]. The biofilm can then serve as a source of bacteria to contaminate contact lenses during storage [5]

AIM

To evaluate bacterial transmission to worn contact lenses from biofilms in contact lens storage cases during disinfection.

METHODS

- Forty two experienced contact lens wearers aged 22-24 years were recruited.
- Etafilcon A or senofilcon A contact lenses worn for up to 8 hours were collected.
- Biofilms of *Pseudomonas aeruginosa* 071 or *Staphylococcus aureus* 031 were grown in lens cases for 24 hours.
- Worn and unworn lenses were placed in biofilm laden lens storage cases and disinfected with a contact lens disinfection solution containing Povidone-Iodine (PI) (cleadew, Ophtecs Corporation, Japan) for 4 hours.
- The number of bacteria in lens storage cases and contact lenses was estimated by culture.

RESULTS

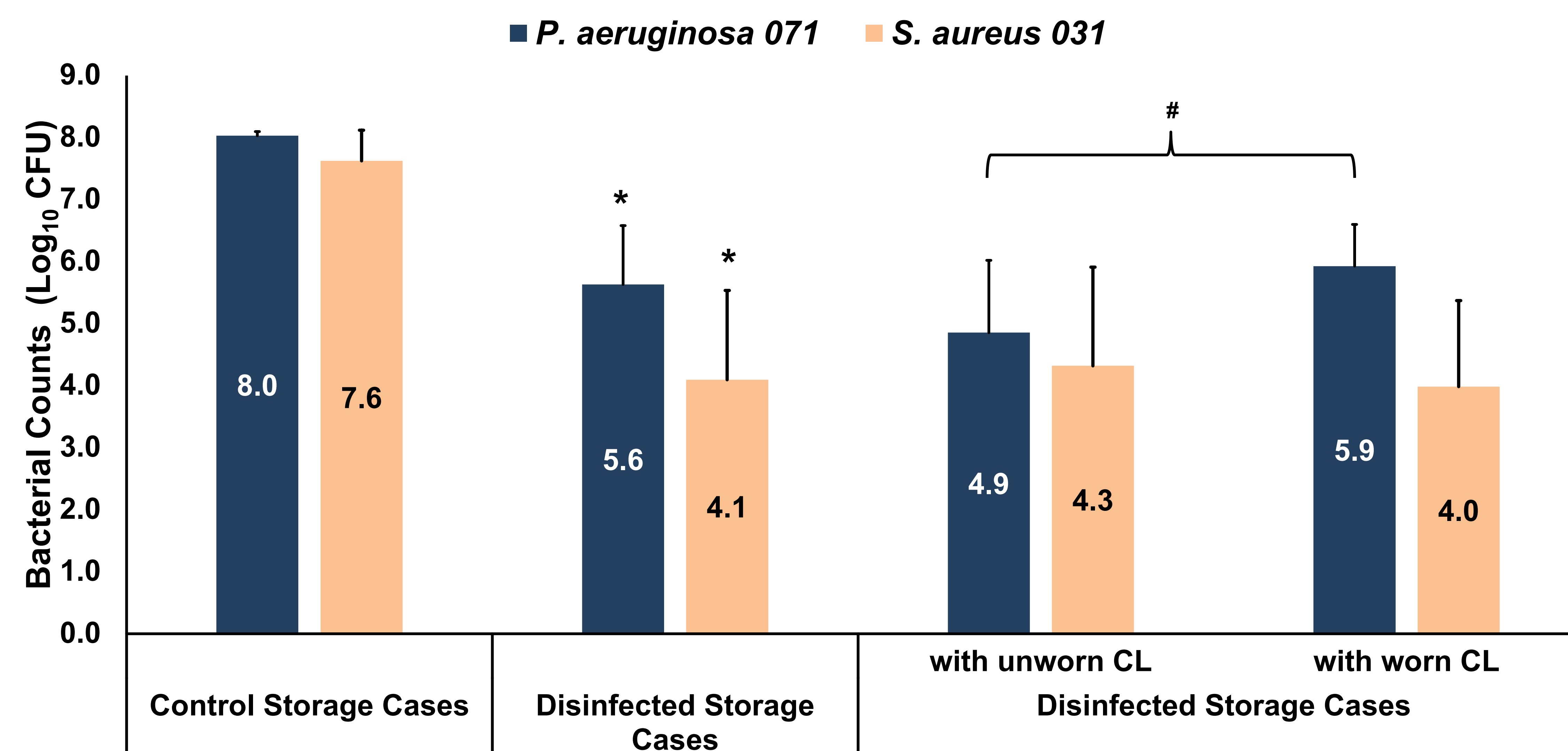


Figure 1: Number of bacteria (Mean ± SD) isolated from contact lens storage cases
* - $p < 0.01$ - Compared to Untreated Cases; # - $p < 0.05$ - Compared to cases with worn contact lenses

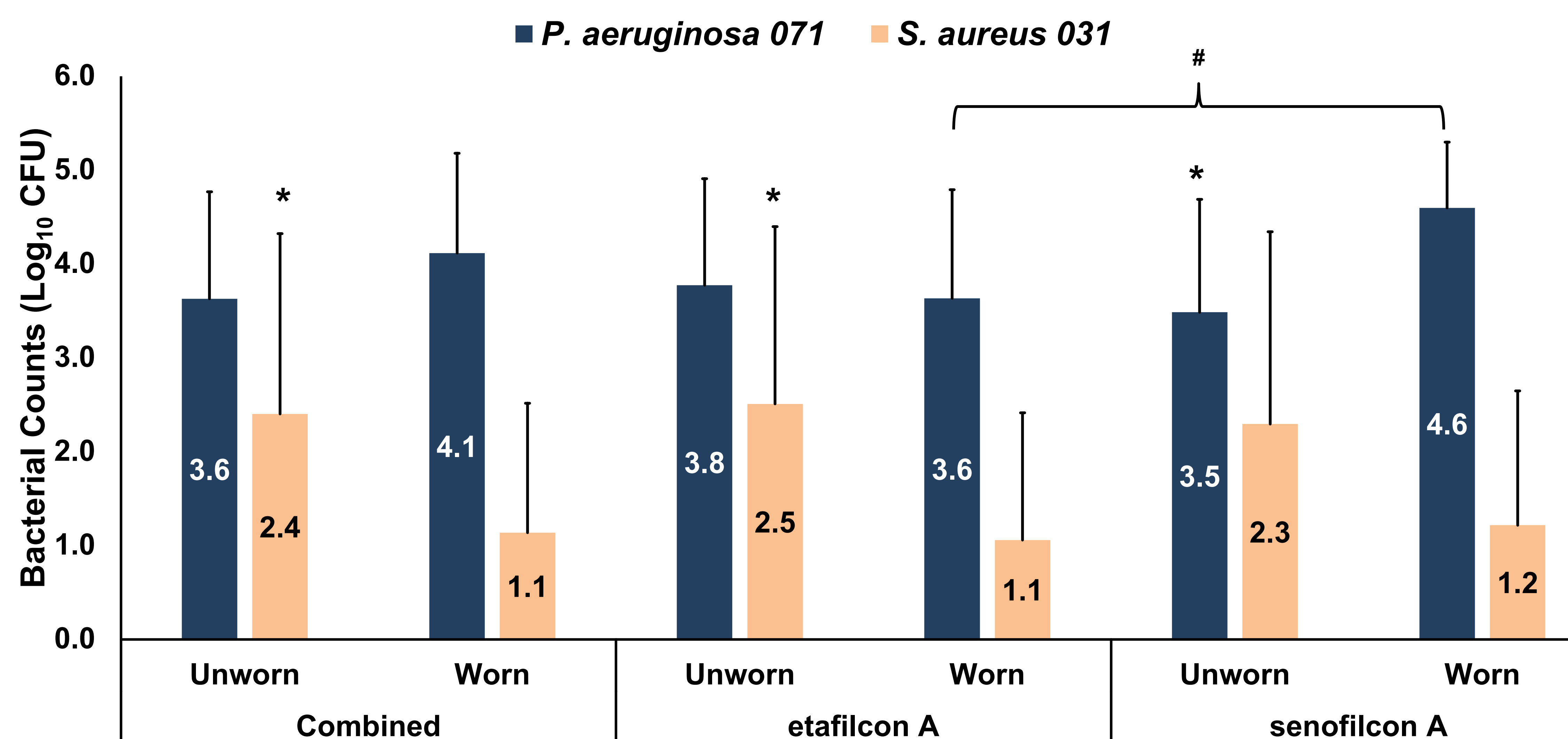


Figure 2: Comparison of bacterial transmission (Mean ± SD) to etafilcon A and senofilcon A contact lenses from biofilms in lens storage cases during disinfection
* - $p < 0.05$ - unworn Vs. worn lenses; # - $p < 0.05$ etafilcon A Vs. senofilcon A

RESULTS

- Cleadew disinfected storage cases had significantly less viable *P. aeruginosa* (-2.5 log₁₀ CFU) and *S. aureus* (-3.5 log₁₀ CFU; Figure 1).
- Significantly more *P. aeruginosa* (Figure 1) remained in storage cases disinfected in the presence of worn contact lenses.
- 5% of the bacteria were transmitted to the contact lenses from storage cases during disinfection.
- Worn senofilcon A lenses bound significantly more *P. aeruginosa* (1.1 log₁₀ CFU) than unworn senofilcon A and worn etafilcon A lenses (1.0 log₁₀ CFU; Figure 2).
- Worn etafilcon A lenses bound significantly less *S. aureus* (-1.4 log₁₀ CFU) compared to unworn lenses (Figure 2).

CONCLUSION

Cleadew is very effective at reducing bacterial biofilm in lens storage cases. However, bacteria can be transferred to contact lenses during storage case disinfection. Lens wear influences bacterial transfer that varies according to the contact lens material.

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