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ANTIBACTERIAL EFFICACY OF HUMAN TEARS AND COMMERCIAL EYE DROPS AGAINST *Bacillus cereus* ISOLATED FROM EYEGLASS SURFACES

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Bacillus cereus, a spore-forming environmental bacterium, is capable of persisting on frequently handled surfaces, such as eyeglasses, potentially posing a risk of ocular contamination. However, its prevalence on personal eyewear and the antimicrobial properties of human tears in controlling such bacteria remain poorly studied. This study evaluated the prevalence of *Bacillus cereus* in eyeglasses and the antibacterial effectiveness of human tears and selected commercial eye drops against the bacterium. Thirty samples were collected using sterile cotton swabs from the nose pads, ear clips, and eyeglass lenses worn by 10 individuals, and each was analysed individually. The samples were cultured in Luria-Bertani (LB) broth and subsequently plated on LB agar plates. The most frequently observed bacterial morphology was sub-cultured, and pure isolates were subjected to Gram staining, catalase, and slide coagulase tests for biochemical characterisation. Molecular identification confirmed the morphotype as *Bacillus cereus*. Human tears (60 µL per person) were collected from three individuals using Schirmer strips and tested separately. Antibacterial sensitivity testing was performed using the Kirby-Bauer disc diffusion method on Mueller-Hinton Agar. Discs were impregnated with the tears collected and three commonly available commercial eye drops containing amoxicillin-clavulanic acid, gatifloxacin, and ciprofloxacin. Distilled water was used as a negative control, and three replicates per treatment were performed. The plates were incubated at 37 °C for 24 hours. Gatifloxacin exhibited the highest mean inhibition zone (29.8±1.0 mm), followed by amoxicillin-clavulanic acid (29.4±1.1 mm) and ciprofloxacin (28.6±0.5 mm). Tears demonstrated notable antibacterial activity, with a mean inhibition of 26.5±0.2 mm, although it was slightly lower than that of the tested commercial eye drops. No inhibition zones were observed in the negative control. A significant difference was observed among the treatments (p = 0.034). This study reveals frequent *B. cereus* presence on eyeglasses and the notable antimicrobial activity of tears, in comparison with commercial eye drops.

Keywords: Antibacterial sensitivity test, Bacterial contamination, Ocular infections, Tears