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Binding of Avian Excreta-Derived Enteroccoci to a Streptococcocus mutans: Implications for Avian to Human Transmission

Authors : Richard K. Jolley, Jonathan A. Coffman

Abstract : Since Enterococci has been implicated in oral disease, we hypothesized the transmission of avian Enterococci to humans via fecal-oral transmission facilitated by adherence to dental plaque. To demonstrate the capability of Enterococci to bind to a dental plaque we filtered avian excreta and incubated the filtrate on a sucrose-induced, Streptococcus mutans biofilm. The biofilm was washed several times with a detergent to remove bacteria binding non-specifically to the biofilm, DNA was isolated from the biofilm, 16S rDNA was amplified, sequenced by Ion Torrent DNA sequencing and analyzed with bioinformatics. Enterococci and other known bacterial pathogens were shown to adhere to the biofilm. Culturing the washed biofilm with Bile Esculin Azide (BEA) agar also confirmed the presence of Enterococci as verified with Sanger sequencing. The results suggest that Enteroccoci in avian excreta has the ability to adhere to human dental plaque and may be a mechanism of entry when humans encounter contaminated aerosols, water or food.

Keywords : Enterococci, avian excreta, dental plaque, NGS
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