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Sugar inhibition of adherence by *Pseudomonas* to canine corneocytes

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Abstract: Adherence is an established prerequisite for microbial colonization and subsequent invasion. The aim of this study was to determine the anti-adhesive properties of three monosaccharides (D-galactose, D-mannose and L-rhamnose). Three strains of *Pseudomonas* obtained from clinical cases of canine otitis externa were used. Corneocytes were collected from the inner aspect of the pinna using an adhesive disc (D-Squame®). A 0.5 ml bacterial suspension in PBS (or sugar PBS solution) was placed over the corneocyte layer and incubated in moist chambers. After incubation the corneocytes were washed and stained. Adherent *Pseudomonas* were quantified using image analysis. The assay and counting methods were validated prior to sugar studies. Each of the three *Pseudomonas* strains were used in each of six dogs at two concentrations of sugars and the anti-adhesive effect calculated as a percentage of the adherence without sugar. All three sugars inhibited adherence by *Pseudomonas* to corneocytes. The percentage surface area covered by the *Pseudomonas* rods was reduced by 14 to 43% depending on replicates and the strain of *Pseudomonas* used. The mean reduction for each sugar was 25.6% (D-galactose), 19.4% (D-mannose) and 30.8% (L-rhamnose). When the three sugars were used in combination the mean reduction was 52.6%. It can be concluded that *Pseudomonas* adheres to canine corneocytes. D-galactose, D-mannose and L-rhamnose all inhibited adherence by *Pseudomonas* to canine corneocytes. When all three sugars were used adhesion was reduced by approximately 50%. The monosaccharides studied have a potential role in the management of *Pseudomonas* infections in dogs.

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