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EFFECT OF XYLITOL ON VIRULENCE OF *Pseudomonas aeruginosa* and *P. paraaeruginosa* ISOLATES

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Pseudomonas aeruginosa (PA) is an opportunistic pathogen that causes severe acute and chronic infections in various parts of the body such as the urinary tract, respiratory tract and skin. The pathogenicity of PA is attributed to its ability to produce a battery of virulence factors (VFs) that cause inflammation and damage to host cells. In addition, PA is difficult to eradicate due to its multiple resistance mechanisms to antibiotics and its ability to form biofilms. *Pseudomonas paraaeruginosa* (PPA), is a recently described species closely related to PA. Xylitol (Xy), a 5-carbon polyol, is a non-antibiotic small molecule with proven antimicrobial activity against *Streptococcus pneumoniae* and *S. pneumoniae* mutants. Xy also can inhibit adhesion and disperse established biofilms of some bacterial species. The aim of this work was to further investigate the effect of Xy on the virulence of PA by analysing certain VFs produced by different PA strains isolated from various clinical infections. Seven PA and three PPA strains were characterised. The PA strains were: three PAO1 reference strains, two clinical isolates from cystic fibrosis patients (FQ), one clinical isolate from an outbreak (O) and one clinical isolate from an otitis externa patient (OM1). The PPA strains were: three clinical isolates from burned patient injuries (Q). To evaluate the effect of Xy on the viability of the different strains, growth curves were performed in LB medium using different concentrations of Xy. Besides, the effect of Xy was investigated on different VFs: swarming motility on LB 0.5% (w/v) agar plates, in vitro adhesion using the crystal violet technique, pyocyanin production by organic extraction from the bacteria-free supernatant and HCN production using a colorimetric assay. The growth curves showed that 7% (w/v) Xy has a sub-inhibitory effect and is therefore suitable for evaluating the effect of the compound on the bacteria virulence. Regarding swarming motility, it was found that both the motility itself and the effect of Xy on it varied from one strain to

another. Two of the PAO1 strains exhibited a shift in their swarming pattern, displaying a transition from a slimy to a dendritic colony formation as the Xy concentration increased. Regarding in vitro biofilm formation, the results showed that 7 % (w/v) Xy effectively reduced the adhesion of all the PA strains, but not of the PPA strains. Our results also showed that both the production of pyocyanin and the effect of Xy on it differed among strains. The addition of 7 % (w/v) Xy led to a decrease in pyocyanin production in all three PAO1 strains and in one of the FQ isolates. We are currently conducting experiments to evaluate the effect of Xy on HCN production. The results of our study showed that both the production of the different VFs and the response to Xy vary among the different strains tested. Moreover, this work is relevant since it introduces the investigation of Xy mechanism of action on PA and PPA virulence.

Palabras clave: Pseudomonas - VIRULENCE - NON-ANTIBIOTIC MOLECULE - XYLITOL