TITLE: ACTIVITY OF MOLECULES PRODUCED BY HUMAN GUT MICROBIOTA IN THE VIRULENCE OF *PSEUDOMONAS AERUGINOSA*

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ABSTRACT

Pseudomonas aeruginosa is an aerobic gram-negative bacillus that presents ubiquitous distribution and high metabolic versatility, besides several virulence factors. This microorganism is one of the main infectious agents in nosocomial infections and it is associated with resistance to multiple antibiotics and with chronic infections in wounds and skin burns. On the other hand, much has been studied about the human microbiota and its beneficial role to the individual, for instance, by stimulating the immune system and reducing infectious processes through microbial antagonism by means of secondary metabolites. In this context, the aim of this study was to observe the activity of metabolites produced by the gut microbiota on some of the virulence factors of *P. aeruginosa*. For this purpose, nineteen strains isolated from patients with *P. aeruginosa* wound infection were used to perform phenotypic tests such as motility, presence of pigment and biofilm production. To perform the motility test, Luria Bertani medium (LB) with different concentrations of agar was used to observe different patterns of motility, such as twitching (1% agar), swarming (0,6% agar) and swimming (0,3% agar). Pigment production was visualized after visualised after growth of cultures on LB agar and biofilm production assay was performed by growing cultures in a 96-well microplate for 24 hours, followed by staining with 0,1% safranin. Visualization of pigment presence showed that, among the thirteen strains studied, only four presented green coloration in their colonies. As for the motility test, there was a greater dispersion in the swimming conditions, with 6 strains growing an average of more than 4 cm and 3 strains growing an average of less than 4 cm. In the swarming test, 1 strains had a mean growth above 4 cm and growth of 10 strains was below or equal to 2 cm. In the twitching test, there was no significant difference. In biofilm production it was observed that two strains had a decrease in production for the two studied molecules (hydroquinolone and m-toluylacetic acid). In other strains, significant reductions was only seen for the m-toluylacetic acid compound. With these results, we could observe that *P. aeruginosa* strains have different phenotypic characteristics, and that more studies are needed to investigate the effect of these molecules on the virulence of this microorganism and to verify potential antivirulence activities that may be used for therapeutic purposes.

Keywords: Microbiome, Gut metabolome, Antivirulence, Bioactive small molecules, *Pseudomonas aeruginosa*

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