

Title: CHARACTERIZATION OF BACTERIOCIN-LIKE SUBSTANCES SYNTHESIZED BY *Parabacteroides distasonis* STRAINS ISOLATED FROM BROILES FECES

Authors: Oliveira, A.G.G.¹, Oliveira, J.S.¹, Oliveira, P.L.¹, Carvalho, M.A.R.¹, Nicoli, J.R.¹, Bemquerer, M.P.², Magalhães, P.P.¹, Farias, L.M.¹

Institutions: ¹UFMG - Universidade Federal de Minas Gerais (Avenida Antônio Carlos 6627, Pampulha, CEP 31270-901, Belo Horizonte, MG), ²Embrapa Recursos Genéticos e Biotecnologia (Parque Estação Biológica - PqEB s/nº, CEP 70770-901, Brasília, DF)

Abstract:

Parabacteroides distasonis is considered as a member of the indigenous microbiota of humans and other animals and has been associated with the etiopathogenesis of several infectious diseases. Bacteriocins are proteinaceous antimicrobial substances synthesized by a wide range of bacteria that play an essential role in the ecological relationships between bacteria and exhibit a great potential for biotechnological applications. We searched for production of bacteriocin-like substances by *P. distasonis* strains and subsequently we aimed to purify and partially characterize one of these substances. A total of 78 *P. distasonis* strains isolated from fecal specimens of broiler chickens were included in the study. Antagonism expression by 50% of our study group was detected, exclusively against Gram negative indicators. Hetero-, iso-, and autoantagonism phenomena were observed. One of the strains that exhibited antagonistic activity was employed for the next step of the investigation. Antagonism expression by three bacterial proteic extracts was detected, as follows: intracellular extract precipitated with ammonium sulfate at 30% (C30) and 50% (C50) saturation and also extracellular fraction precipitated at 50% salt saturation (S50). C50 showed more stability and therefore was selected for characterization. The extract was inactivated by proteases and high temperatures, but remained active after exposure to organic solvents and over a broad pH range. Minimum inhibitory concentration and minimum bactericidal concentration values demonstrated that C50 expressed bacteriostatic activity against *P. distasonis* ATCC 1295. C50 was purified by successive chromatographic steps. Taken together data generated by mass spectrometry and SDS-PAGE indicated the detection of three ions, with molecular masses of about 10 kDa, one of which identified as a histone-like H1 peptide. This is the first characterization of an antagonistic substance produced by *P. distasonis*. It is plausible to hypothesize that the substance plays a relevant ecological role and also displays potential biotechnological applicability.

Keywords: antagonistic substance, bacteriocin, *Parabacteroides distasonis*, broiler chicken, protein purification

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