TITLE: *Chryseobacterium sp.* kr6 BIOACTIVE COMPOUNDS OBTAINED FROM FEATHER KERATIN HYDROLYSIS

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ABSTRACT:

Phosphatidylcholine nanoliposomes were developed to co-encapsulate a flexirubin-type pigment and bioactive peptides obtained from *Chryseobacterium* sp. kr6 growing on chicken feathers. The strain genome was also analyzed for annotation of genetic clusters responsible for the pigment synthesis. The pigment was extracted from the bacterial biomass using acetone and the peptides were obtained from the supernatant of the strain cultured in mineral medium with chicken feathers. The average size and the polydispersity index were determined by dynamic light scattering, the surface charge of the liposomes was determined in terms of zeta potential. FTIR analysis was performed to evaluate interactions between the encapsulated compounds and the nanoliposomes. The antioxidant activity was evaluated by the ABTS radical scavenging assay. For the genomic sequence assembling of the strain, the complete genome of *C. indologenes* was used as reference. Control empty nanoliposomes showed mean diameter of 168.5 nm, changing to 185.4, 102.0 and 98.5 nm after encapsulation of the peptide, the pigment, and their co-encapsulation, respectively. All formulations had relatively monodisperse size distribution, and the zeta potentials of bioactive-loaded liposomes were -30 mV or higher in magnitude, while the control presented -20.9 mV. FTIR revealed typical phosphatidylcholine spectrum, suggesting the incorporation of both compounds within the nanoliposomes. ABTS assay showed no synergic effect upon co-encapsulated but the process maintains the antioxidant capacity of the compounds. Thus, we suggest that the encapsulation into phosphatidylcholine nanoliposomes is a suitable alternative for application of natural antioxidant agents. Through secondary metabolite gene clusters analysis, six genetic clusters involved in the production of bacteriocins, siderophores, microviridin and flexirubin, were found. The latter has 3 ORFs identified, encoding for glycerol acyltransferase, dialkylrecorsinol condensing (DarA) and StlD/DarB family beta-ketosynthase enzymes, with coverage of 75% and 100% identity with those genes from *C. arthrosphaerae*. These results indicate that kr6 strain is a promising and interesting alternative for production of natural bioactive compounds using poultry wastes as carbon source.

Key words: nanoliposomes, flexirubin, peptide, antioxidant, feather bioconversion

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