Adhesive proteins from *Bathymodiolus azoricus*: functional and structural characterization

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The anchoring of mussels to foreign surfaces in seawater is due to role of adhesive proteins known as mussel foot proteins (Mfps). The post-translationally modified tyrosine, 3,4-Dihydroxyphenylalanine (DOPA), present in Mfps, is involved in several types of chemical interactions and catechol crosslinking, which results in the ability of Mfps to solidify and bind tightly to various types of surface substrates, originating adhesive plaques with high interfacial binding strength, durability and toughness. Inspired by these remarkable wet adhesive properties, several natural Mfps have been extracted and analyzed from different species of mussels aiming at the creation of biomedical adhesives and drug carriers for therapeutic uses. Other mussels, namely *Bathymodiolus azoricus* mussel, are expected to present different properties of adhesive proteins in comparison with shallow water mussels, once this mussel subsists at vent sites in an extreme environment such as unusual levels of heavy metals, pH, temperature, CO_2, methane and sulfide. These conditions require unique anatomical and physiological adaptations.

Here, we propose the identification and functional and structural characterization of adhesive proteins from *Bathymodiolus azoricus* mussel and the comparison of adhesive proteins of this species with the already described adhesive proteins from *Mytilus galloprovincialis*. This characterization will be performed by Fourier-transform infrared spectroscopy (FTIR), Circular dichroism (CD), High Performance Liquid Chromatography (HPLC) and SDS-PAGE. The produced knowledge is relevant for the design of innovative bioadhesives for biomedical application.