

**TITLE:** ANTIBACTERIAL AND ANTIQUORUM SENSING SCREENING OF PERUVIAN SEA CUCUMBER (*Patallus mollis*) METHANOLIC EXTRACTS

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**ABSTRACT:** *Patallus mollis* is a marine invertebrate sea cucumber that lives in deep oceans, being the most representative echinoderm in Peru. Chemical compounds from this species present anti-inflammatory, antiviral, anticancer and antifungal activities. There is a wide variety of extracts used to inhibit phenotypes regulated by quorum sensing (QS), a mechanism of bacterial gene regulation dependent upon cell density. However, no investigations have been reported with the use of sea cucumber extracts. This study aimed to test the antibacterial and antiquorum sensing effects *P. mollis* extracts on *Pseudomonas aeruginosa* PAO1, *Serratia liquefaciens* MG1 and *Chromobacterium violaceum* ATCC12472. *Patallus mollis* samples were collected on the Port of Pucusana (Lima, Peru) on March, 2016. After external cleaning and dissecting, body wall and viscera were collected and dried on a stove at 50°C for 24 hours. Once dried, an extraction was performed with methanol (1:10 / weight:volume) followed by fractionation with methanol, chloroform and water (1:1:1 / volume:volume:volume), obtaining a final methanolic fraction for body wall and viscera, separately. These methanolic extracts were suspended in distilled water, and dilutions for microbiological tests were prepared with Luria Bertani broth. Minimal inhibitory concentration (MIC) and growth curves were determined before antiquorum sensing tests which were composed of violacein production, swarming motility and biofilm formation. Body wall methanolic extract (BWME) had an antibacterial effect on *C. violaceum* in all tested concentrations hampering quorum sensing inhibition tests and viscera methanolic extract (VME) had no effect on violacein production at subinhibitory concentrations. BWME had a MIC of 125 mg/ml on *S. liquefaciens* and the concentrations 62,5 mg/ml and 31,25 mg/ml partially inhibited growth. Swarming motility and biofilm formation inhibition were observed at 31,25 mg/ml and 15,65 mg/ml. On *P. aeruginosa*, BWME had no growth inhibitory effect, meanwhile the MIC with VME extract was 250 mg/ml and subinhibitory concentrations affected its normal growth compared to the control, which likely explain the biofilm formation inhibition we observed. BWME and VME showed an antibacterial effect on the tested strains and we have not observed specific QS inhibition indicating the lack of QS interfering compounds in sea cucumber's body wall and viscera.

**Keywords:** *Patallus mollis*, body wall methanolic extract, viscera methanolic extract, antibacterial effect, quorum sensing inhibition.

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