

Title: ANTAGONISTIC ACTIVITY EXPRESSED BY BACTERIA STRAINS ISOLATED IN AQUACULTURE SYSTEMS

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Abstract:

As in other human activities, antimicrobial agents are widely used in aquaculture for the treatment and prevention of diseases in cultivated species or as a prophylactic food additive. Therefore, the widespread use of antimicrobials results in selective pressures which may result in emergence of new resistant microorganisms, including pathogenic bacteria. In this regard, the search for new antibacterial alternatives has gained strength in recent years. This study aimed to evaluate the production of antagonistic substances by bacteria samples isolated from aquaculture systems. Bacterial strains (n= 201) entitled producers, were tested by the double layer method using three different culture media (Brain Heart Infusion Agar, Mueller Hinton Agar and Nutritive Agar). The production of antagonistic substances by the producers was evaluated against six indicator species selected according to their importance in aquaculture systems and humans infections: *Pseudomonas aeruginosa*, *Aeromonas hydrophila*, *Edwardsiella tarda*, *Enterococcus faecalis*, *Salmonella typhi* and *Staphylococcus aureus*. A total of 3618 tests were performed and 184 inhibition zones were observed. All indicator species were inhibited at least by five different producer bacteria. In the antagonistic assays, *S. aureus* was the most sensitive bacteria, being inhibited by 53 episodes, followed by *E. faecalis* (40 episodes), *P. aeruginosa* (33 episodes), *E. tarda* (30 episodes), *S. tiphy* (23 episodes) and *A. hydrophila* (5 episodes). Although it is recognized that aquaculture may play a relevant role as reservoir of antimicrobial-resistant potentially pathogenic bacteria, it is interesting the prospection of new strategies of infectious disease control, especially considering the aquaculture systems, for which no official politics are available for antimicrobial drug usage. One of these strategies is the bacteriocins, evolved to naturally control microbial populations in several ecosystems. Our results show that bacteria isolated by aquaculture systems are a potential alternative to overcome antimicrobial resistance phenomena.

Keywords: Aquaculture; antagonistic substances, bacteriocin, pathogenic bacteria.

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