# Why Some Pseudoalteromonas Species Will Die During 10 Days Cultivation?

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**Background & Objectives:** The genus Pseudoalteromonas consists of marine Gram negative bacteria and belongs to the class γ-proteobacteria. Some Pseudoalteromonas species including *P. citrea, P. aurantia, P. denitrificans, P. rubra, and P. luteoviolacea* are able to synthesize autotoxic, high-molecular-weight polyanionic substances so these strains need to be subcultured on marine agar at least once per week. In this study, for the first time we have attempted to introduce the sixth strain of Pseudoalteromonas genus capable to produce auto-toxic antibiotic, Pseudoalteromonas piscicida, and also to determine intra-/extra-cellular location of antibiotic produced by *Pseudoalteromonas piscicida* PG-02 (Accession Number: JF509137).

**Methods:** The strain PG-02 was isolated from a coastal sediment sample collected from the Bushehr port (North region of Persian Gulf, Iran). During our studies on this strain for its antibiotic-producing capability, we have observed that when this strain was stored on marine agar plates or slants at 4 °C or even at 25 °C for 7-10 days its culture was inactive, that is to say, bacteria will die after a given period of time. In order to find the possible intra-cellular location of the intended active compounds, 5 ml of un-centrifuged broth culture (containing the whole cell) was harvested form 3 day's age culture and then followed by sonic treatment at 120 MHz for 40 s at 4 °C. 1 ml of this sonicated sample was filter-sterilized. Also, a control (un-sonic treated) sample was prepared. Finally, for antibacterial assay, 35 µl of both samples was tested against Methicillin-resistant *Staphylococcus aureus* (MRSA) using disc diffusion methods.

**Results:** After sonication, the size of the zone of inhibition for MRSA was increased from 16 mm to 22 mm. Based on sonication results, due to cell lysis and leave of some antibiotic that remained inside the cell, an increasing was observed in the antibacterial activity of the marine isolate against MRSA, so this antibiotic has two accumulation sites (both intra- and extra-cellular).

**Conclusion:** So, it can be suggested that the death of some *Pseudoalteromonas* species after a given period of time will result from gradually increasing in the intra-cellular level of antibiotic so that after reaching the threshold level death will occur.

**Keywords:** Auto-Toxic Antibiotic; *Pseudoalteromonas*; Intra-Cellular Antibiotic