Electroactive marine actinomycete *Nocardiopsis dassonvillei* accelerates the corrosion of 5083 aluminum alloy

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Abstract: Microbial corrosion based on extracellular electron transfer (EET) has been widely studied on iron-based metals, however, it is still scarce for aluminum alloys. In this study, the corrosion behavior of a novel isolated marine actinomycete, *Nocardiopsis dassonvillei*, against 5083 aluminum alloy (AA5083) was systematically evaluated. The results proved that *N. dassonvillei* biofilm accelerated AA5083 corrosion by increasing the dissolution of oxide layers through chloride accumulation, preventing the re-passivation through oxygen depletion. On metal substratum with the defected oxide film, *N. dassonvillei* accelerated Al dissolution by facilitating inward EET with phenazine as an electron shuttle between metal surface and bacterial cells.

Keywords: Actinomycete, *Nocardiopsis dassonvillei*, AA5083, Oxide film, Electron shuttle, Extracellular electron transfer.

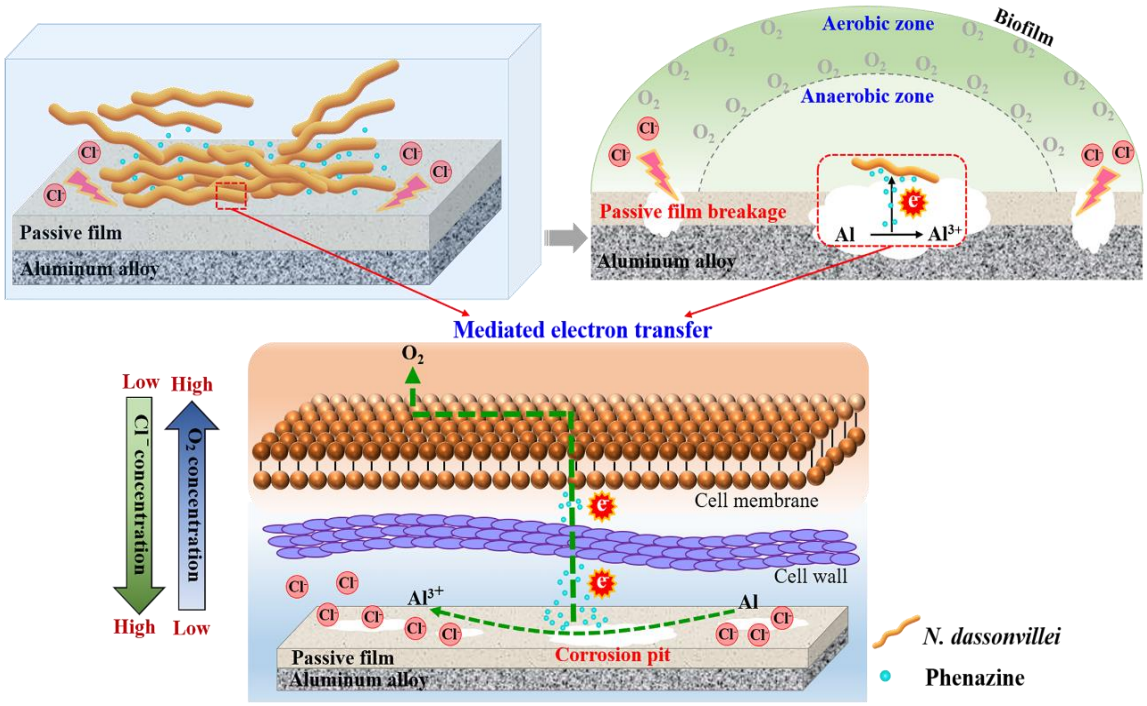

Fig. 1 Schematic diagram of the corrosion mechanism of AA5083 due to *N. dassonvillei* biofilm in the seawater system