

**TITLE:** FORMATION OF BIOFILMS BY *Corynebacterium propinquum* AND PATHOGENICITY IN ANINSECT MODEL

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**ABSTRACT:**

*Corynebacterium propinquum*, gram-positive bacillus before considered as simple contaminant and colonizer of microbiota human, has been highlighted by presenting virulence mechanisms previously not defined for this species. *C. propinquum* has presented multiresistance to antibiotic commonly used in the clinic, thus evolving and becoming a hospital concern, besides it is related to cases of infections in patients immunodeficiency and immunocompetent. Despite the increasing number of hospital cases caused by this emerging microorganism, little is known about the virulence factors of this species. For this reason, this work aims to analyze the biofilm formation on abiotic surfaces and the pathogenicity in *Tenebrio molitor*. *C. Propinquum* strains were isolated from the nasopharynx (n=6) and oropharynx (n=1) of nosocomial patients in Maranhão, Brazil. The assays of biofilm formation were performed in hydrophilic (stainless steel) and hydrophobic (polyurethane catheter) surfaces. Bacterial suspensions were added to glass tubes containing fragments of sterile hospital needles (or catheters) and incubated. The needle segments were washed to remove planktonic bacterial cells, and were subsequently vortexed with sterile sand. The obtained lavage fluid was diluted and inoculated in Petri dishes. Then, quantitative analysis was performed. Catheter segments infected *in vitro* with *C. pseudodiphtheriticum* strains were cultured by using a semiquantative method. The growth of at least 15 colony forming units has been considered evidence of catheter infection. The evaluation of the pathogenicity of the bacterium was performed by means of infection induced in *T. molitor*, and the survival rate was observed. All isolates of *C. propinquum* were able to adhere and form biofilm on surfaces of stainless steel and polyurethane. The oropharynx isolate was the second most adherent to stainless steel and the one most adherent to polyurethane. The results of semiquantitative culture taken from the catheter tips, showed that all had microorganisms growth with  $\geq 15$  colony forming units. The majority of *C. propinquum* isolates significantly reduced the survival of *Tenebrio molitor*. Our study suggests that the presence of biofilm on the catheter surface by *C. propinquum* can become a nidus of bloodstream infection in patients. Future studies increasing knowledge of biofilm formation and host interactions could prevent and decrease this type of infection.

**Keywords:** stainless steel, polyurethane catheter, *Tenebrio molitor*.

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