

TITLE: CHARACTERIZATION OF BIOFILM FORMATION BY *Staphylococcus pseudintermedius* IN SUTURE MATERIALS

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ABSTRACT:

Health care-associated infections (HCAIs) represents a concerning problem difficult to eradicate. This occurs, mainly because they may be associated with biofilm-forming bacteria. The genus *Staphylococcus* is responsible for the most HCAIs in humans. This could also be a reality with animal health care facilities. *Staphylococcus pseudintermedius* is the major cause of pyoderma and surgical site infection (SSI) in dogs. The capacity of biofilm formation is the main reason of persistent SSI. The *ica* operon is responsible for slime production of biofilm. In the operon, coexpression of *icaA* and *icaD* is required for full slime synthesis. The presence of biofilm in medical devices can directly impact the treatment of a SSI. Methicillin resistant *S. pseudintermedius* (MRSP) emerged rapidly in companion animals causing HCAIs, which limits treatment options. MRSP can also be considered a public health problem, since zoonotic transmission can occur. The aim of the study is evaluate the capacity of biofilm formation by *Staphylococcus pseudintermedius* in suture materials commonly used in small animal surgery, as well as evaluate genetically the biofilm formation. Four types of sutures were tested. Suture was cut aseptically into 1cm segments and incubated in tryptone soy broth supplemented with 1% glucose of standard suspensions of eight *S. pseudintermedius* isolates, in 24 well plate overnight. The biofilm production was measured by the optical density (OD) after vortexing of each suture segment stained with safranin, in triplicate. The genes associated with biofilm formation (*icaA* and *icaD*) were identified by PCR. All isolates were classified as nonbiofilm producers in nylon suture, but all were able to form biofilm in suture of polyglycolic acid, classified as weak biofilm producer. In cotton, 75% (6/8) were biofilm producer and 25% (2/8) were biofilm producer in polypropylene suture. PCR revealed the presence of the two genes (*icaA* and *icaD*) in all the isolates. Suture material that allows the biofilm formation makes difficult to prevent and treat a surgical site infection. So is convenient to prioritize materials that do not predispose biofilm formation, such as nylon suture. It could also be significance the development of new preventive and therapeutic measures.

Keywords: *Staphylococcus pseudintermedius*, biofilm formation, medical devices, MRSP, suture material

Development Agency: Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – CAPES.