**TITLE:** ACTIVITY OF 1,10-PHENANTHROLINE-BASED DRUGS AGAINST BIOFILM FORMED BY CLINICAL STRAINS OF *ACINETOBACTER BAUMANNII*

**AUTHORS:** VENTURA, R.F[1].; GALDINO A.C.M.[2].; SCHUENCK, R.P[1].; DEVEREUX, M[3].; MCCANN, M[4].; SANTOS, A.L.S[2].; NUNES, A.P.F[1].

**INSTITUTION:** [1]UNIVERSIDADE FEDERAL DO ESPÍRITO SANTO, VITÓRIA, ES (AV. MARECHAL CAMPOS, 1468, CEP 29.040-090, VITÓRIA – ES, BRAZIL), [2]INSTITUTO DE MICROBIOLOGIA PAULO DE GOES - UNIVERSIDADE FEDERAL DO RIO DE JANEIRO, RIO DE JANEIRO, RJ. [3]THE INORGANIC PHARMACEUTICAL AND BIOMIMETIC RESEARCH CENTRE, FOCAS RESEARCH INSTITUTE, DUBLIN INSTITUTE OF TECHNOLOGY, DUBLIN, IRELAND; [4]CHEMISTRY DEPARTMENT, MAYNOOTH UNIVERSITY, NATIONAL UNIVERSITY OF IRELAND, MAYNOOTH, IRELAND.

ABSTRACT:

Outbreaks of *Acinetobacter baumannii* have shown increasing relevance in recent years and are particularly associated with nosocomial infections as severe pneumonia, meningitis, urinary tract and bloodstream infections. In addition, *A. baumannii* isolates exhibit great metabolic versatility, acquiring adaptive or resistance abilities to hostile conditions on both biotic and abiotic surfaces for long periods, and the ability to express important virulence factors to establish an infectious process. In the hospital setting, biofilm formation is the most important virulence factor in the context of antimicrobial resistance. Unfortunately, the current therapeutic arsenal proves to be ineffective for the control of these widespread infections, often caused by multidrug resistant (MDR) bacterial strains. Against this background, search for new antimicrobial agents or new therapies have become essential and urgent, leading us to evaluate the effects of 1,10-phenanthroline (phen), 1,10-phenantroline-5,6-dione (phendione), $[Ag(phendione)_2]^+$, $[Cu(phendione)_3]^{2+}$ on biofilm-growing *A. baumannii*. Twenty-six clinical isolates of *A. baumannii* were used in all the experiments. The effect of test compounds on planktonic-growing *A. baumannii* cells was previously determined. The effect on biofilm formation was evaluated by crystal violet incorporation (biomass determination) and XTT (viability assay). Mature biofilm disorganization was evidenced by staining with crystal violet. The pretreatment of bacteria with phen, phendione, Ag-phendione and Cu-phendione at 0.5×MIC value inhibited biofilm formation, which significantly reduced both biomass (79%, 76%, 61% and 57%, respectively) and viability (73%, 66%, 43% and 56%, respectively). The compounds studied also disrupted mature biofilm in a dose-dependent manner, especially Cu-phendione and Ag-phendione ($IC_{50}$ = 13.54 and 22.05 mM, respectively). The phenanthroline-based derivatives, mainly $[Ag(phendione)_2]^+$ and $[Cu(phendione)_3]^{2+}$ presented a potent anti-*A. baumannii* biofilm action. Financial support: CAPES, FAPES, FAPERJ and CNPq.

**Keywords:** *Acinetobacter baumannii*, biofilm, 1,10-phenantroline, coordination compounds

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