

SYNERGISTIC EFFECT BETWEEN 2,2-DIBROMO-3-NITRILOPROPIONAMIDE AND MEROPENEM AGAINST MULTIDRUG-RESISTANT *Pseudomonas aeruginosa* STRAINS

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ABSTRACT

Pseudomonas aeruginosa is an opportunist microorganism responsible for infecting patients with low immunity. Pseudomonal infections are treatable and potentially curable, but bacteremia, pneumonia, sepsis, burn wound infections and meningitis generally have high mortality rates. Due to increasing bacterial resistance to multiple antibiotics, there is concern on searching for new drugs and new therapeutic schemes. 2,2-dibromo-3-nitrilopropionamide (DBNPA) is known as an industrial slimeicide used in several applications. In this way, the aim of present study was to evaluate the synergistic effect of 2,2-dibromo-3-nitrilopropionamide (DBNPA) in combination with meropenem against multiresistant *Pseudomonas aeruginosa* strains. All strains used in this study was obtained in our laboratory collection (Laboratório de Fisiologia e Bioquímica de Micro-organismos – LFBM). Initially, it was determined the antimicrobial activity of DBNPA and meropenem against 12 strains of *Pseudomonas aeruginosa* by microdilution broth at concentrations ranging from 1024 to 2 $\mu\text{g.mL}^{-1}$ and incubated at 37 °C for 24 h, in order to determine the minimum inhibitory concentration (MIC). The study of the interaction between DBNPA and meropenem against the five most resistant strains was carried out by the checkerboard method. The microbial growth was verified by the addition of resazurin 0.01%. The criteria used to evaluate the synergistic activity were defined by the Index of Fractional Inhibitory Concentration (FIC index). All strains showed meropenem MICs ranging from 4 a 1024 $\mu\text{g.mL}^{-1}$ and DBNPA showed MICs ranging from 128 a 512 $\mu\text{g.mL}^{-1}$. A synergistic effect was observed between DBNPA and meropenem against all strains (FIC_i values ranging from 0.14 – 0.5). The reduction percentage of oxacillin MIC was equal to 93.75%. The DBNPA combined with meropenem acts synergistically by inhibiting multidrug-resistant *Pseudomonas aeruginosa* strains.

Keywords: *Pseudomonas aeruginosa*, DBNPA, drugs combined.

Development agency: Universidade Federal de Pernambuco (UFPE); Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES)