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Eradication of Pseudomonas biofilm by disinfectants and some plants extracts

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Abstract:
In the present study, three isolates belonging to *Pseudomonas* sp and one reference strain of *P. aeruginosa* ATCC 27853 were tested for biofilm formation on two types of support (glass and polystyrene), using two cultures medium Tryptone Soy Broth (TSB) and Modified Biofilm Broth (MBB). The results showed that the quantity of biofilm formed depends on the nature of culture medium, where the rate of the adherent bacteria was more significant in TSB medium. Polystyrene was more favorable to bacteria for adherence compared to glass. We examined the effectiveness of three types of disinfectants, sodium hypochlorite, hydrogen peroxide and temperature on a biofim formed by the studied bacteria. Sodium hypochlorite reached good levels of biofilm eradication using all isolates adhered on the two types of support. Hydrogen peroxide exerted less significant effect compared to sodium hypochlorite, eliminating approximately 56% from the biofilm adhered on polystyrene at concentration of 3%. The elimination of biofilm temperature (80°C) was rather weak compared with the two chemical disinfectants. Our study included the testing of extracts of three plants: *Allium sativum*, *Aloe vera* and *Lawsonia inermis* on biofilm eradication formed by *P. aeruginosa* ATCC 27853. The effect of these plant extracts on planktonic cells was also studied. The results showed that *Allium sativum* and *Lawsonia inermis* inhibit both bacterial growth and biofilm formation and no activity was detected for *Aloe vera* extract.
Keywords: *Pseudomonas aeruginosa, Allium sativum , Aloe vera, Lawsonia inermis*, biofilm