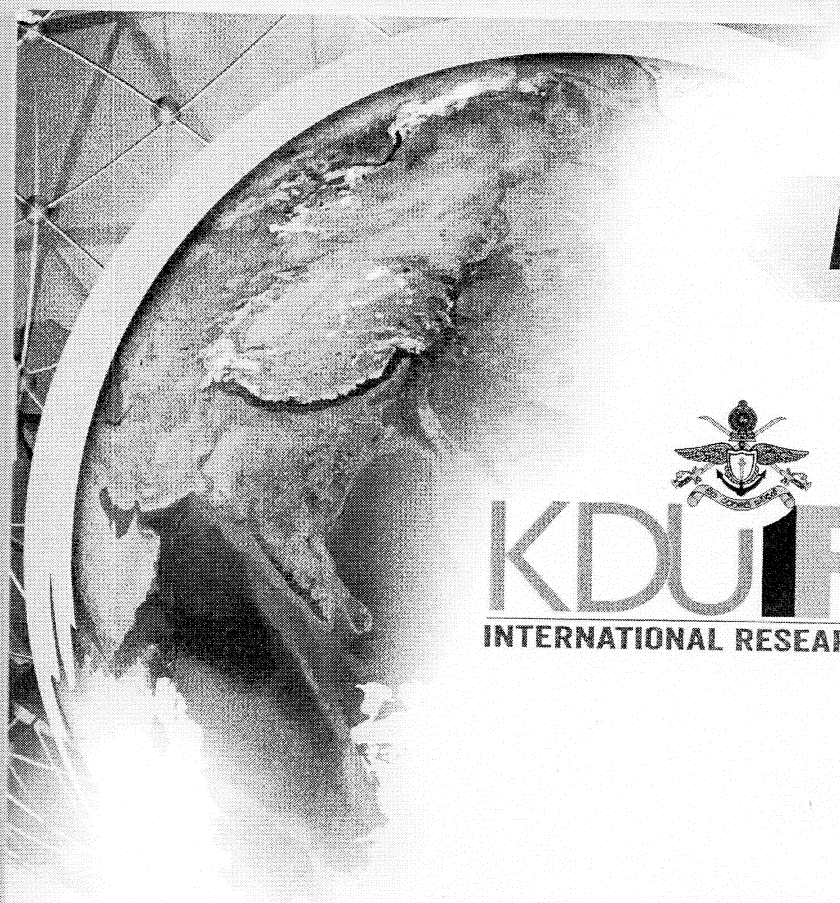

ABSTRACTS

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Sri Lanka

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3rd - 4th August 2017

'Changing Dynamics in the Global Environment: Challenges and Opportunities'

EFFECT OF LABORATORY CULTURE MEDIA, CITRATE ENCAPSULATED AND CURCUMIN ENCAPSULATED LAYERED DOUBLE HYDROXIDES ON IN-VITRO PSEUDOMONAS AERUGINOSA BIOFILM GROWTH

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Objective of this study was to determine the efficacy of four routine laboratory culture media on biofilm formation of *Pseudomonas aeruginosa* and the antibiofilm effect of two layered double hydroxide (LDH) nano hybrids. Influence of culture medium on P. aeruginosa (ATCC®27853™) adhesion as the first step of biofilm formation in the presence of four culture media (Nutrient Broth (NB), Brain Heart Infusion (BHI) broth, Luria-Bertani (LB) broth and RPMI 1640) was quantified using MTT (3-[4, 5-dimethylthiazol-2-yl]-2, 5-diphenyltetrazolium bromide) assay after 90 minutes adhesion. *P. aeruginosa* biofilms were developed and the growth was quantified using MTT metabolic activity at 48 hour time intervals in the presence of four culture media. The effect of citrate encapsulated LDH (concentrations ranged from $1*10^{-5}$ g/mL to 1 g/mL) and curcumin encapsulated LDH (concentrations ranging from $1*10^{-3}$ g/mL to 2 g/mL) nano-hybrids on biofilms were determined using sterile 96-well microtiter plate biofilm model. The MBIC50 and killing time for matured biofilms were determined by MTT (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) assay. Scanning Electron Microscopy (SEM) was performed to assess the ultra-structural changes. P. aeruginosa exhibited their maximum adhesion in the presence of RPMI 1640. Biofilms exhibited the maximum growth in BHI broth during 96 hour experiment period. MBIC50 for curcumin-LDH was 0.1 g/mL and Citrate-LDH was 0.01 g/mL. Killing time of curcumin-LDH and Citrate-LDH were 6-12 h and less than 3h, respectively. SEM images confirmed MTT readings.The maximum planktonic and biofilm growth was achieved with BHI broth. Bacterial adhesion was enhanced in the presence of RPMI 1640. The curcumin and Citrate intercalated LDHs have a potential antibiofilm activity against *P.aeruginosa*. Further, there is a maximum antibiofilm activity against their matured biofilms within a short period of time of the treatment (3-12hours).

Keywords: Biofilms, Antibiofilm, Encapsulated layered double hydroxides