

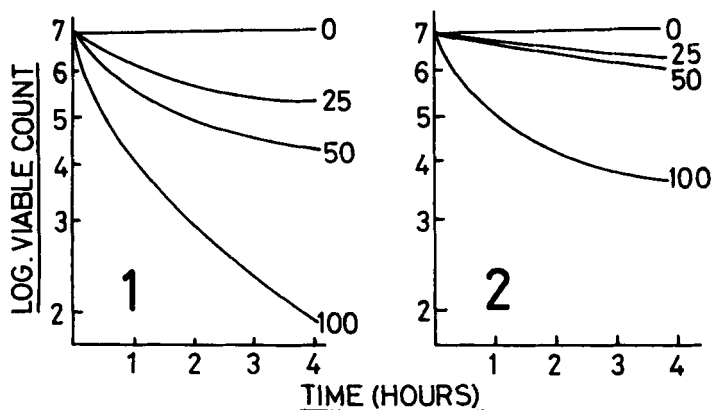
## EFFECT OF GROWTH RATE ON THE RESISTANCE OF PSEUDOMONAS AERUGINOSA TO BELZALKONIUM CHLORIDE

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The effect of growth rate on the sensitivity to polymyxin and EDTA of Pseudomonas aeruginosa, grown in a chemostat under conditions of nutrient limitation has been reported (Finch & Brown 1975). This present work investigated the resistance to benzalkonium chloride (BZK) of P.aeruginosa grown at two growth rates on a complete medium in a chemostat (Medium inflow rate controlled growth rate).

P.aeruginosa samples were harvested washed twice in 0.9% sterile saline and challenged with sterile BZK (25, 50 and 100  $\mu\text{g/ml}$ ). The control was treated similarly except there was no challenge with BZK. All tests were carried out at 37°C in a shaking water bath. Aliquots, removed from the reaction mixtures at intervals, were diluted through inactivating medium and sterile saline and counted by surface plating. The results are illustrated in Figures 1 and 2.

The culture having the lower growth rate (doubling time=3h 28 min) was more sensitive to all concentrations of BZK than the culture grown at the higher growth rate (doubling time = 1h 23 min). This indicates that under conditions of adequate nutrient supply the faster growing cells were more resistant to the action of BZK. Similar results were obtained using respiration rates (Anderson & Richards 1981). If essential nutrients are lacking it might be expected that the faster cells grow the lower their resistance to chemical attack. This was shown by the EDTA lysis of carbon limited cells (Finch & Brown 1975). It is interesting to note that the highest concentration of BZK used was not capable of killing the P.aeruginosa within 4h. This indicates that log phase P.aeruginosa cells grown in a defined complete medium are more resistant to BZK than cells grown overnight in Oxoid No.2 broth. Approximately  $10^6$  cells  $\text{ml}^{-1}$  of the latter culture were killed within 1h by 100  $\mu\text{g/ml}$  BZK at 22-23°C (Richards & Mizrahi, 1978).



Figures 1 and 2. Log viable counts of P.aeruginosa treated with 25, 50 and 100  $\mu\text{g/ml}$  BZK at 37°C. Figure (1) doubling time = 3h 28 min and Figure (2) doubling time = 1h 23 min. Each line is the result of 8 counts.

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