

Letters to the Editor

Growth of *Pseudomonas aeruginosa* in solutions of esters of *p*-hydroxybenzoic acid

SIR,—During experiments with preservatives for eye-drops we have found that *Pseudomonas aeruginosa* NCTC 7244, originally isolated from an infected human eye, will grow readily, without previous adaption, in solutions of esters of *p*-hydroxybenzoic acid.

Two categories of experiment were performed, all at 37°. In one, rates of growth, as measured by changes in optical density of the culture, were made in a medium containing the esters in the same final concentration as in solution for eye-drops B.P.C. but supplemented with salts as % final concentration thus, (NH₃)₂HPO₄ 0.06, NaCl 0.1, FeSO₄·7H₂O 0.001, KH₂PO₄ 0.04, MgSO₄·7H₂O 0.04, and compared with the growth rate in a similar medium containing 1% glucose in place of the esters (Table 1). In the second experiment growth in solution for eye-drops (methyl *p*-hydroxybenzoate, 0.0229%, propyl *p*-hydroxybenzoate, 0.0114% in purified water B.P.) was followed by means of viable counts. Thus at time intervals 0, 24, 48, 72 and 96 hr, the counts were 6, 24, 68, 120 and 270 × 10⁴ organisms/ml.

TABLE 1. GROWTH OF *Pseudomonas aeruginosa* IN MINERAL MEDIUM WITH GLUCOSE OR ESTERS OF *p*-HYDROXYBENZOIC ACID AS SOLE CARBON SOURCE

Carbon source %	Optical density at 420 mμ after (hr)						
	0	18	24	40	50	62	72
Glucose 0.1	0	0.155	0.225	0.40	0.57	0.64	0.64
Methyl <i>p</i> -hydroxybenzoate 0.0229	0	0.020	0.040	0.19	0.36	0.43	0.43
Propyl <i>p</i> -hydroxybenzoate 0.0114	0	0	0	0	0	0	0
None	0	0	0	0	0	0	0

In the first experiment the rate of growth in the benzoate medium during the logarithmic phase was equal to that obtained with glucose as a carbon and energy source, the differences being that whereas with glucose a lag phase of 8 hr ensued before logarithmic growth commenced, with the benzoates, the lag phase was 26 hr; also the final optical density (cell crop) was greater with glucose.

The second experiment, which more nearly represented conditions likely to be met in practice, showed that this organism, even without mineral supplementation, grew in solution for eye-drops B.P.C.

In view of the current interest in eye-drop formulation (Editorial, 1963) we felt that these experiments might be of interest.

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Reference

Editorial (1963). *Pharm. J.*, **191**, 575-576.