

## DETECTION AND ESTIMATION OF NUTRIENT SHOCK EFFECTS IN BACTERIA

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Background and aims: The notion of nutrient shock has arisen from observations such as that rich-nutrient media are inadequate for plating bacteria from low nutrient environments. The purpose of this work is to confirm that the higher heterotrophic plate counts obtained in low-nutrient media when recovering bacteria from low-nutrient environments are due to a nutrient shock and develop a method to assess the importance of a nutrient shock for each bacterium. Methods: Two strains isolated from tap water and identified by 16S rRNA sequencing and two type strains (*E. coli* CECT 434 and *Pseudomonas fluorescens* ATCC 13525) were exposed both to low and high nutrient conditions for 24 hours. The bacteria were plated with time in one low nutrient medium (R2A) and one rich nutrient medium (TSA). The average percentage of improvement (A.P.I.) of recovery between R2A and TSA with time was calculated to more simply assess the difference obtained in culturability between each medium. Results: For all bacteria, A.P.I. was higher when cells were plated after being exposed to water than when they were recovered from high-nutrient medium (Table 1). Conclusions: This study proved that a nutrient shock happens when a bacterium is recovered from a low nutrient environment to a nutrient rich medium. The method used here might serve as a way to indicate which bacteria are more prone to nutrient shocks.

Table 1. The A.P.I. and P-values of significance for R2A versus TSA obtained for different bacteria when being recovered from water and from nutrient-rich medium

Bacterium	A.P.I in water	P value for water	A.P.I in medium	P value for medium
<i>S. capsulata</i>	147	<0.001	38	0.065
<i>E. coli</i> CECT 434	6.25	<0.001	-1.62	1.000
<i>Methylobacterium</i> sp.	8.71	<0.001	-1.09	1.000