

Characterization of survival stages of enteric bacteria in natural aquatic ecosystems

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Differentiation between culturable and non-culturable (somnicells) enteric bacteria in natural waters have attracted very much attention in last years (Barcina *et al.*, 1989; Roszak & Colwell, 1987). Until now, that classification have been studied only for enteric bacteria inoculated in aquatic ecosystems in the absence of natural microbiota (Barcina *et al.*, 1989; Roszak & Colwell, 1987), and numbers of CFU (colony-forming-units) on selective culture media were the single parameter estimated when natural microbiota were present (Mc Cambridge & Mc Meekin, 1981; Rhodes & Kator, 1988).

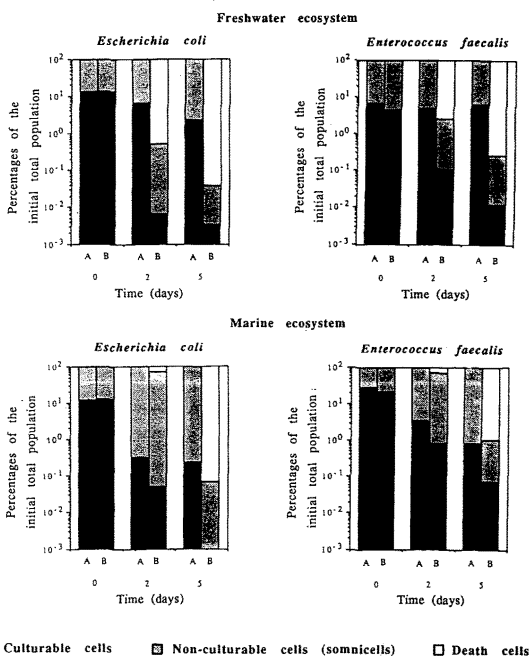


FIGURE 1. Characterization of survival stages of *Escherichia coli* and *Enterococcus faecalis* in freshwater and marine ecosystems when natural microbiota were absent (A) and present (B).

This study was undertaken to differentiate between culturable and non-culturable cells of enteric bacteria inoculated in natural aquatic systems both in the presence and in the absence of natural microbiota. To reach this objective, enteric bacteria were stained with rhodamine isotiocyanate (Landry *et al.*, 1987). So, these labelled cells maintained their culturability. Similar counts of CFU were obtained with both the evolution of stained and non-stained enteric bacteria in the water samples. Fractions of culturable, non-culturable and death enteric bacteria were determined throughout the experiences (Figure 1). From these results, the real effect of natural protozoa on the elimination of inoculated enteric bacteria can be estimated from the difference between direct counts of rhodamine stained bacteria in the absence and presence of natural microbiota. An important fraction of somnicells were detected in the presence of natural microbiota (Figure 1) and that lead us to deduce the inadequacy of plate counts on selective culture media to estimate numbers of enteric bacteria, which remain in natural waters.

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