SURVIVAL OF PATHOGENIC *ESCHERICHIA COLI* O55B5 IN BRACKISH WATER

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Abstract
Our study investigated survival and virulence of *Escherichia coli* O55:B5 incubated in brackish water microcosms (Bizerte lagoon, northern coast in Tunisia). Thus, Microcosms were exposed to natural sunlight or maintained in darkness. Results showed survival time prolonged for strain maintained in darkness with modifications in biochemical profiles. Virulence, studied using vero cell test, was maintained during brackish water survival.
Keywords: Bacteria, Brackish Water, Pathology

Introduction
Survival of enteric bacteria reviews pointed out solar radiation and osmotic stress as the most alteration factors of bacteria (Rozen and Belkin, 2001). Else, enteric bacteria survival in seawater depends on their ability to retain their virulence characteristics (Du et *al.*, 2007). Here we tried to test the survival of virulent enterobacteria.

Materiel and methods
A cell suspension of *E.coli* O55:B5, washed three times, inoculated in microcosms ($\approx 10^6$ cells mL^{-1}) during the period from 18 to 30 April, where microcosms were exposed to sunlight (12 days) or maintained in dark condition (21 days). The total number of cells (TC) and the altered cells (AC) were counted by using respectively the DAPI (4', 6-diamide-2-phenylindole-Sigma) and the Live/Dead® *Bac*Light™ kit. The virulence of *E.coli* was studied using the vero cell test (Al-Gallas et *al*., 2002).

Result and discussion
In light conditions experiment (Fig.1a), TC abundances decrease was not significant. By the end of 12th day, abundances were lower than 10cfu mL^{-1} on TSA agar and 1cfu mL^{-1} on DL agar. Else, the AC increased during at first of experiment and then stabilized. In darkness, TC abundances showed limited decrease (Fig.1b). Culturable counts decreased progressively and stabilized at a high level (10^5 cfu mL^{-1}) by the 9th day, with slow increase in abundance of AC until the 4th day. The membrane alteration process appeared to affect the *E.coli* strain in light and in darkness (lower fraction of cell population) conditions. Membrane alteration involved the degradation of several vital processes linked to the role of cytoplasmic membrane and depended mainly on sunlight intensity (Fiksdal and Tryland, 1999). Nevertheless, we noted limited changes in carbohydrates assimilation, for darkness experiments. *E.coli* conserved its capacity to survive in non-host environment which can give to virulent serotype a competitive advantage compared to other *E. coli* serotypes and may have severe consequences for human exposed to potential contamination through shellfish consumption.

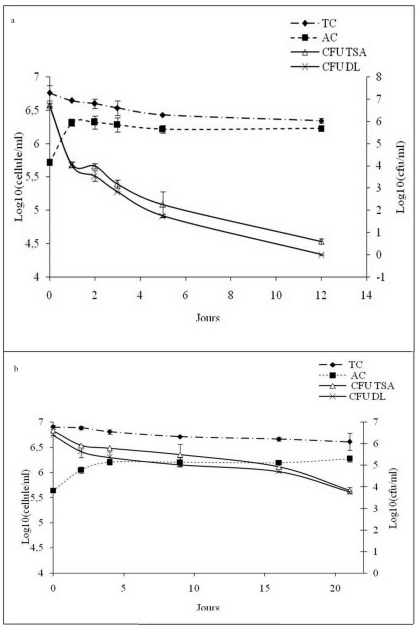

Fig. 1. Changes in culturable (CFU), total cell (TC) and altered cells (AC) of *E.coli* O55B5 exposed to sunlight (a) and in darkness (b). TSA: Trypcase-soy agar, DL: Desoxycholate Lactose agar

References
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