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ORIGINAL PAPER

Impact of different environmental stress factors upon the expression of adherence ability in *Escherichia coli* strains isolated from marine waters

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Abstract:
Objective. The purpose of the present study was to investigate the expression of cell-associated virulence factorsin 100*E. coli*strains isolated from Black Sea Coast, in different cultivation conditions simulating different environmental stress factors.**Material and methods.**The bacterial adherence to HeLa cells was investigated in variable incubation temperatures, salinities, pH and O_2concentration, followed by PCR detection of genes codifying proteins involved in adherence:*aggR*,*aafI /II*and*EAST /1*.**Results.**The tested strains developed the ability to grow at 22°C, 37°C, 44°C, irrespective to the salinity, pH and glucose concentration, in aerobic and anaerobic conditions.The adherence capacity to a cellular substratum with a predominantly localized pattern was significantly influenced by the variation of the NaCl concentration. An adherence index of 100% was noticed at pH of 7.2 and9.6 at 37°C, in aerobiosis.The expression of various adherencepatternswas highlighted for bacteria grown atacidpH (5.2) and respectively basic (9.6).

Key words*:* decompensate *E. coli*, PCR, cell-associated, environmental stress factors.

Introduction

Fecal contamination of surface waters is a serious environment and public health issue. In complex systems, fecal pollution can come from several sources, including wastewater discharge, agricultural and urban pluvial spills. Identifying and eliminating the source of contamination is not simple, because evaluating fecal pollution generally relies on a limited number of surface water samples to measure the density of fecal indicators (Gordon et al. 2002; Byappanahalli et al., 2003).

Escherichia coli is a fecal coliform bacteria that exists in the animal and human intestine. The presence of the *Escherichia coli* bacteria in water is a strong indicator of recent contamination with animal dejection or wastewaters. During rains, melting snow or other precipitation, these bacteria can be carried in bays, rivers, lakes or groundwater, and when these waters are used as drinking water and not treated or inadequately treated, the bacteria can get into the drinking water (Llopis et al., 2004).