

Effect of different physico-mechanical factors upon the growth and expression of virulence in *Escherichia coli* strains isolated from drinking and sea water

Received for publication, april, 15, 2014.

Accepted, june, 15, 2014

Emilia PANUS¹, Coralia BLEOTU², Natalia ROSOIU³

¹*I.P.H. (Institute of Public Health) Constantza, e-mail: TEmilia2@yahoo.com*

²*Institute of Virology St.Nicolau, Bucharest*

³*Ovidius" University Faculty of Medicine, Department of Biochemistry, Constantza, Romania; Academy of Romanian Scientists 54 SplaiulIndependentei 050094, Bucharest*

Abstract.

The purpose of the present study was to investigate the growth ability and expression of different virulence factors in 100 aquatic *Escherichia coli* strains isolated in Romania from drinking and sea water submitted to temperature and mechanical stress.

Material and methods. The isolated strains were investigated for cell-associated and soluble virulence factors, before and after exposure to freezing temperature for one month and respectively, after microbial culture centrifugation at 10000 rpm for 10 minutes.

Results. All tested strains produced haemolysins and lipase and exhibited also high positively levels for the production of DN-ase, esculinase and gelatinase. After the temperature and mechanical shock, 32% for the sea strains and only 2% of the drinking water strains were recovered and the virulence factors expression was drastically decreased.

Keywords: *Escherichia coli*, virulence factors, the temperature and mechanical shock.

1. Introduction

Contamination of surface waters by fecal pollution constitutes a serious environmental and public health threat. In large complex systems, fecal pollution can be introduced from multiple sources, including sewage overflows, agricultural runoff, and urban stormwater. Identifying and eliminating the source of contamination is not straightforward because assessment of fecal pollution generally relies on a limited number of surface water samples to measure fecal indicator organism densities (Byappanahalli et al., 2003; Gordon et al., 2002).

E. coli is a type of fecal coliform bacteria commonly found in the intestines of animals and humans. The presence of *E. coli* in water is a strong indication of recent sewage or animal waste contamination. During rainfalls, snow melts, or other types of precipitation, *E. coli* may be washed into creeks, rivers, streams, lakes, or ground water. When these waters are used as sources of drinking water and the water is not treated or inadequately treated, *E. coli* may end up in drinking water (Llopis et al., 2004).