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ESCHERICHIA COLI ATCC 8739 ADAPTS SPECIFICALLY TO SODIUM CHLORIDE, MONOSODIUM GLUTAMATE, AND BENZOIC ACID AFTER PROLONGED STRESS

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ABSTRACT

Escherichia coli lives in the human intestine and any form of adaptation may affect the human body. The effects of food additives on *E. coli* have been less studied compared to antibiotics. A recent study has demonstrated that *E. coli* is able to adapt to food additives by demonstrating global stress response. This study continues to study the evolution of *E. coli* in different food additives (sodium chloride, benzoic acid, monosodium glutamate) in different concentrations, singly or in combination, for over 83 passages. Adaptability of the cells was estimated with generation time and cell density at the stationary phase. Polymerase Chain Reaction (PCR)/ Restriction Fragments Length Polymorphism (RFLP) were used to analyze the adaptation at genomic level. Our results show that adaptation started to slow down and the gradients of generation time against passage are less steep compared with previous study, suggesting that most adaptive mutations occurred within the first 500 generations. In the genomic level, ecological specialization is observed as we find that the cells adapted through a different mechanism and diverge from each other although the resulting effect of the medium is the same. It suggests that different concentrations of food additives cause different types of chemical stress, instead of different levels of chemical stress.

Keywords: Escherichia coli, ATCC 8739, food additive, chemical stress

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