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Influence of bacteriophages cocktail on European eel (*Anguilla anguilla*) immunity and survival after experimental challenge

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Abstract

Inland fishery belongs to those branches of animal production that use very large amounts of chemotherapeutics, in particular antibiotics. The accumulation of chemotherapeutic agents in bottom sediments is a direct threat to the aquatic environment and directly affects the condition and health of the fish. Finding a preparation that could be used both prophylactically to increase the resistance of fish and therapeutically in case of infection with pathogenic bacteria, without side effects for fish and aquatic environment could be a great solution to this problem. Our aim was to determine influence of BAFADOR[®] the new bacteriophage-based preparation on European eel immunity and survival after experimental challenge. Application of BAFADOR[®] increased total protein level, immunoglobulin level, lysozyme activity and ceruloplasmin level in European eel serum. Potential killing activity and metabolic activity of spleen phagocytes as well as pronephros lymphocyte proliferation of was higher compared to control. The preparation also reduced mortality after experimental infections with the pathogenic bacteria *Aeromonas hydrophila* and *Pseudomonas fluorescens*. Our results showed that preparation BAFADOR[®] is well tolerated by the fish organism causing stimulation of cellular and humoral immunity parameters and reduces the mortality of the European eel after experimental challenge.

Keywords: innate immunity, *Aeromonas hydrophila*, *Pseudomonas fluorescens*, bacterial lipopolysaccharide, immune response

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1. Introduction

Aquaculture is one of the fastest growing food-production sectors in the world nowadays. The global demand for aquaculture products is driven by the growing world population, stagnation in the procurement of fishery products and the growing awareness of the positive impact of fish consumption on human health. Currently, aquaculture is a lucrative industry. However, the intensification of this type of production requires breeding at high densities, which promotes the occurrence of diseases, including infectious ones. Along with the increase in restocking, the number of pathogens is also growing, which increases the risk of epidemics. Fish infectious diseases are considered one of the main limiting factors in aquaculture [1]. To protect fish health the hygienic plans of livestock farms were developed as a permanent part of the production procedures. As the basis for their implementation the

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