

Isolation and Molecular Identification of Phages Effective on *Yersinia ruckeri* Isolates, Associated with Red Mouth Disease of Rainbow Trout in West Azerbaijan

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Background & Objectives: Yersiniosis is one of the most important bacterial diseases in rainbow trout farms. In many cases of Yersiniosis outbreaks, antibiotic administration is the first therapeutic and preventive measure, which it can causes severe problems such as developing antibiotic resistance. The application of bacteriophages against bacterial infections has been suggested before the discovery and use of antibiotics. Therefore, bacteriophages can be used as an alternative against bacterial infections. The present study was undertaken in order to isolating bacteriophages which are effective on *Yersinia ruckeri*, isolated from clinical cases of disease in rainbow trout and investigating the genetic variation of isolated bacteriophages.

Methods: Fish samples were collected from farms belonged to the southern part of west Azerbaijan; those were suspected to infection with *Yersinia ruckeri*. Identification and biotype discrimination of the *Yersinia ruckeri* isolates were performed using biochemical tests and the genus of isolates as *Yersinia* were confirmed by polymerase chain reaction (PCR). The sensitivity of *Yersinia ruckeri* isolates to antibiotics was examined. For detecting and isolating lytic bacteriophages, environmental samples from fish farms, dams, rivers and urban sewage treatment centers were collected in a period of six months. After detection of bactericidal effect of phages, they were titrated using two-layer agar methods. Genomic DNA was extracted from isolated phages and they were digested using MspI endonuclease.

Results and Conclusion: Bacteriophages effective against *Yersinia ruckeri* was only isolated from urban sewage treatment centers. The maximum and minimum phage titers were belonged to Marageh and Urmia sewage treatment centers, respectively. All isolated phages had a genomic DNA smaller than genomic DNA of Lambda phage and all showed similar genomic DNA digestion patterns. In conclusion, the present study highlighted the importance of bacteriophages isolated from sewage treatment centers for controlling bacterial infection.

Keywords: Bacteriophage; *Yersinia ruckeri*; MspI