

Isolation and characterization of a new bacteriophage against *Aeromonas salmonicida*, the causative agent of furunculosis

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Aeromonas (A.) salmonicida, a Gram-negative bacteria belonging to the *Aeromonadaceae* family, is a primary fish pathogen that causes furunculosis in salmonids, carp and perch, as well as septicemia in a variety of fish. This species is considered as one of the main bacterial pathogens responsible of important economic losses in aquaculture industry. Large amounts of antibiotics such as oxytetracycline, quinolones and sulfonamides are used to treat this infection, which highly contributes to the emergence of antibiotic-resistant strains. The application of bacteriophages (phages) in aquaculture seems to be a promising solution to control pathogenic bacteria in this field because phages are well adapted to aquatic environments. The aim of this work was to isolate and characterize new lytic phages against *A. salmonicida*. The phage isolation was performed by enrichment method, against the ATCC 7965 strain of *A. salmonicida*. This method consists in mixing a centrifuged and filtered water sample with a bacterial culture in exponential phase. When clarification of the medium is observed, the supernatant of this mixture is spread on the surface of LB agar and covered with a bacterial overlay in exponential phase. Phage present in distinct clear lysis plaques is then purified three times by subculturing. For this purpose, a sampling campaign of water from fish farming ponds in the south of Belgium was carried out in January 2022. Out of 36 water samples, a new lytic phage was isolated. This phage remained active between 4 and 10 units of pH but shows a drop of activity at 37°C. A preliminary host spectrum test showed that this phage was not active against 3 other *A. salmonicida* strains. Further studies are now needed to analyse the genome and to assess the *in vivo* safety and efficacy of this phage.