Identification and characterization of Cyanophages in Kuwaiti Seawater using Polymerase Chain Reaction (PCR) Technology and Nanoscopy

Viruses in general and Bacteriophages infecting cyanobacteria (cyanophages) in particular, are abundant in the marine environment and are of major ecological significance. Marine phytoplankton's are photosynthetic free floating organisms that are major contributor to primary productivity in marine environment as a part of the balance of the marine ecosystem. Many phytoplankton's can cause occasional blooms (such as red tides caused by dinoflagellates) that might be of harmful effects on the environment, and even have economical effects on fisheries and the fish industry. Such red tides, that kill fish in a huge number, have been reoccurring in Kuwaiti seawater in the past decade and it might be seen again in the future. Viruses are considered to be a major controlling factor for phytoplankton populations and blooming. This cyanophages were successfully detected and phage DNA molecules were isolated by using polymerase chain reaction (PCR) technology in as little as 1 ul of Kuwaiti seawater directly. Specific primers were used in PCR mix, and 6% polyacrylamide gel electrophoresis (PAGE) was used to visualize the amplified phage DNA bands. Nanoscopy was used to detect and study the structure of the isolated phages and it was identified to be a virulent strain of phage, with T4 being the type species of the family of contractile tailed ds DNA phages composing the family *Myoviridae.*