

# Virus Toxicity in Shellfish Waters

Marjorie P. Kraus

*Algal Research Center, 317 London Tract, Landenberg, PA, USA*

A host-range plaque-morphology assay has been used with success for over two decades to monitor both fresh and saline waters for toxic effects. From 1989 to 1991, 42 stations in both Rehoboth and Indian River Bay were monitored. More recently, shellfish meats and shellfish-producing waters in Delaware Bay have been examined.

Our institution has established a set of bacteria-free cyanobacterial hosts capable of detecting genetic differences in terms of cyanophage host-range-plaque morphology specificities expressed by various infectious viruses carried into the waters and picked up in the shellfish.

At present, the range of hosts consists of about ten individual hosts, covering four species of algae: *Schizothrixcaldicola*, *Plectonemaboryanum*, *Elliposporum*, and several species of nostoc. Specific interactions with this panel of hosts can identify individual viruses. Cyanophages for nostocacean forms have been most numerous and are also those strains found to be associated with human disease. Instances of human disease identified by nostocacean hosts could be traced, in turn, to inadequately treated sewage which tested positive for coliforms at above the permitted value. (Since this was an unusual occurrence at that sewage plant, it appears that coliform counts, in general, may be performing an adequate function.)

Human disease (conjunctivitis) was specifically traced, and plaqued, as a virulent protein entity, on algal host agar plates. This virulence also produced, and released, a blue protein which can be characterized and provides rapid identification.

Currently, host-range, plaque-morphology data is being obtained on shellfish beds in Delaware Bay in cooperation with the Delaware Division of Public Health, which monitors shellfish stations for water quality and tests shellfish meats for *Vibrio vulnificus*.