ABSTRACT

Exposure of a bacterial suspension to a temperate bacteriophage will result in lysis of many cells and lysogenic conversion of some that contain a prophage plasmid or prophage element integrated into the host bacterial chromosome. The result is a bacterial clone of variable stability that may express genes from the acquired prophage. In this study, the lysogenic bacteriophage VHS1 produced very few, relatively unstable lysogenic clones of V. harveyi. These unstable clones produced both infected (lysogenic) and uninfected (non-lysogenic) progeny clones in the same culture. The uninfected clones were very stable and showed no lytic plaques when lawns were challenged with VHS1. However, they did show turbid plaques in dot plaque assays. Thus, they differed phenotypically from the original parental isolate, suggesting that interaction with VHS1 resulted in permanent genetic change. Despite this, the clones failed to show evidence of genetic material from VHS1 by Southern blot hybridization and PCR assay, suggesting that the change had occurred in the host genome. Such clones may be called pseudolysogenic since they show some phenotypic characteristics of lysogenic clones but do not contain phage genes. This phenomenon has not been previously reported and the mechanism for it is unknown. Experiments revealed that V. harveyi clones lysogenized by VHS1 carried the prophage as an episome that did not integrate into the host chromosome. The VHS1 prophage could be detected by both Southern blot hybridization and by polymerase chain reaction (PCR) assay. This situation explained the rapid loss of virulence of lysogenic isolates on continuous subculture in the laboratory.

KEY WORDS: BACTERIOPHAGE/VHS1/ VIBRIO HARVEYI