

COLIPHAGES DETECTION BY PCR AS A FECAL INDICATOR IN WATER

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Human pathogens, which are excreted with human and animal feces, can be cause an infection to human through water sources. Coliphage detection can be useful to monitor water sources as an indicator in a fecal analysis because many waterborne pathogens are enteric viruses and coliphages have some similarities for life cycle and characteristics with enteric viruses. Fecal samples were collected from each 10 human, cows, and chickens, respectively, in 2010. In these fecal samples, coliphage concentration was determined by plaque assay. Viral DNAs were extracted from water and fecal samples, and presence of coliphage was determined by PCR, followed by sequence analysis of the amplicons. The mean concentration of coliphages in cows were 3.7 plaque forming units (PFU)/g, and in chickens were 4.8 PFU/g., whereas coliphages were not detected from 7 of 10 human fecal samples. In cow and chicken samples, 27 of 38 (71.0%) and 12 of 48 (25.0%) plaques were positive for somatic coliphage, respectively. However, all plaques were negative in human fecal samples. Compared with those available in the GenBank databases using the NCBI BLAST program, 9 of 10 plaques from cow were closely related to coliphage NC6 (nucleotide accession no. DQ079907) which is one of Microviridae G4-like strains, and all 6 plaques were related to coliphage NC28 (nucleotide accession no. DQ079875) belongs to Microviridae -like strains. These results suggested that viral contamination from feces of cows and chickens can be easily detected with coliphages, Microviridae group, by PCR assay. In this context, coliphages, Microviridae group, can be proposed as a fecal indicator for specific animals in water environments.

Keywords: enteric virus; coliphage; fecal indicator, cow, chicken, PCR assay