

# MALE-SPECIFIC (F+) COLIPHAGE



The Australian Water Quality Centre (AWQC) is dedicated to ensuring and responding to the public health requirements relating to the provision of water and wastewater services for communities in Australia and across the world.

— Specialist water services

Ensuring public health

## Introduction

Human faecal wastes can harbor pathogenic human enteric viruses such as hepatitis A virus, enteroviruses, adenoviruses, and noroviruses, as well as bacterial and protozoan pathogens.

Bacteria such as *E. coli* and coliforms are used as indicators of water quality however they do not reflect the presence of enteric viruses or protozoa. Enteric viruses are particularly problematic as not only are they causal agents for diarrhoeal disease but they have characteristics that allow them to survive in the environment for long periods of time and tolerate changing environmental conditions.

AWQC has developed a test for the detection and enumeration of F-specific ribonucleic acid (RNA) bacteriophages that provides a more accurate and cheaper detection solution and can be applied to all kinds of water, sediments and sludge for the detection of enteric viruses.

### Value of the Test

Bacteriophages are non-pathogenic to man and animals but act as indicators of faecal contamination and of the virological quality of water. Direct testing of water for enteric viruses is expensive, time consuming, and technically difficult. Instead, regulatory programs use bacterial indicators of faecal contamination. Enteric viruses however survive better than faecal indicator and pathogenic bacteria in water and treatment is often inadequate to prevent contamination of the water. Bacteriophages are more human enteric virus-like in size and shape and also in their persistence in water therefore are much more reliable indicators.

This test is particularly versatile and can be conducted on all water types including ground water, sediments and sludge and would be particularly useful for wastewater treatment plants (WWTPs), environmental monitoring including bathing areas, recreational bodies of water and storm waters.

### Methodology

Coliphage numbers (male specific (F+)) are determined using a 2-step enrichment process. The sample is mixed with semi-solid nutrient medium to which a culture of host strain is added. This is then plated on a solid nutrient medium. Following incubation circular zones of clearing indicate the presence of coliphages.

#### Sampling Requirements:

- Sterile 600 mL PET bottle, Sodium thiosulphate dosed
- Air gap essential
- Transport and store at 4°C
- Process within 6 hrs of collection up to max 24hrs (AS/NZS 2031)

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