

RECOMMENDATION OF TEST METHODS FOR DETECTION AND ENUMERATION OF COLIFORMS AND *ESCHERICHIA COLI* IN DRINKING WATER

Background

The 3rd Microbiology Proficiency Testing (PT) scheme evaluation workshop was held on the 1st to 4th November, 2010 in Windhoek, Namibia. During results analysis/discussions, it was observed that there were large variations in the results obtained by the participating laboratories. These variations were thought to be attributable to the various test methods used as much as to the performance of the laboratories in the PT scheme. This made it difficult to compare and perform statistical analysis. It is against this background that participants in the PT evaluation workshop came up with the following recommendation:

Recommendation

Participants recommended that internationally accepted test methods applicable to drinking water be used. The following test methods were recommended:

1. ISO 9308 – 1: 2000 – Water Quality – Detection and enumeration of *E. coli* and coliform bacteria

This is a membrane filtration technique using Lactose TTC agar (Tergitol- 7). Typical Coliforms and *E. coli* produce galactosidase to ferment lactose resulting in acid production (yellow color under the membrane). The presumptive colonies are tested for oxidase and indole. Colonies positive for indole test are further tested for glucuronidase production to confirm them as *Escherichia coli*.

2. Colilert – 18 ® - Enumeration of Total Coliforms and *E. coli*

This is a commercially available Most-probable number (MPN) technique using enzyme-substrate liquid-broth medium that allows for simultaneous detection of total coliforms and *Escherichia coli* (*E. coli*). Two enzyme substrates; a chromogen that reacts with the enzyme found in coliform bacteria (galactosidase) and a fluorogen that reacts with an enzyme found in *E. coli* (glucuronidase).

After 24 hours incubation at 37°C, coliform bacteria turn the medium yellow and *E. coli*-positive reaction causes the medium to fluoresce under a long-wave ultraviolet light (366 nm).

Participants acknowledge that there may be challenges in adopting the recommended methods due to the unavailability of resources. However, the benefits of adopting these recommended methods are long term and outweigh the challenges that may be experienced when introducing the new methods.

Some of the Benefits of using the recommended methods

- Reducing technical barriers to trade;
- Assist new laboratories to correctly select appropriate methods for analysis of drinking water
- Facilitate the provision of technical collaboration and comparability of results among the SADC WATER LABORATORY ASSOCIATION members

For purpose of testing any kind of water for compliance with a limit of 0 *E. coli* in a given volume e.g. 100 ml, this volume should be used for analysis. An MPN technique using only a fraction of that volume should not be considered fit for purpose.

Feed back

Members are encouraged to direct any feedback and/or suggestions to the SADC secretariat at dmasuk@nmisa.org, Private bag X34, Lynnwood Ridge, Pretoria, South Africa.

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