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Research Highlight

# PCR: AN EFFICIENT AND FAST DETECTION METHOD FOR *Escherichia coli*

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Gastroenteritis | bacterial toxins | *Escherichia coli* | polymerase chain reaction | DNA hybridization technique | glucuronidase | uidA gene

*Escherichia coli (E. coli)* is a a facultative anaerobic and gram negative bacteria which belongs to the family Enterobacteriaceae[1]. This bacteria is reponsible for many diseases and disorders. Gastroenteritis is a one of the disorder caused by *E. coli* which leads towards inflammation of the stomach as well as intestines due to bacterial toxins or viral infection and ultimately causes vomiting and diarrhoea. Some harmful strains of *E. coli* can also cause food poisoning in their hosts[2].

These bacteria flourish and develop in the pollution produced from human and animal waste, that's why *E. coli* is often termed as faecal indicator. Therefore, rapid identification of these bacteria through reliable method is needed.

In recent times, effective cultivation media to observe *E. coli* in freshwaters have been established. Those procedures are normally used in a quantitative way to guess the actual concentration of *E. coli*. However, with these methods, differentiation can't be done. Therefore, techniques for the immediate detection as well as differentiation of *E. coli* populations in aquatic environments are needed.

Currently, the Polymerase Chain Reaction (PCR) has been proliferated due to its simplicity, rapidity, reproducibility, reliability, sensitivity as well as specificity to examine microorganisms. It is actually a molecular-biological procedure that is being used efficiently in almost every area of medicine and natural sciences. PCR has also confirmed suitable to support the conventional bacteriological procedures as well as DNA hybridization technique[3].

This situation urged scientists for performing a new experiment to evaluate conventional methods and PCR assay for detection and differentiation of *E. coli* strains in environmental samples.

For this purpose, scientists isolated the organism through conventional bacteriological methods. Afterwards, identification of the nucleic acid sequence of the organism was confirmed by means of PCR based detection assay. In the PCR assay, a pair of primers derived from uidA gene of *E. coli*, encoding glucuronidase specific for *E. coli* was employed[4].

Results showed that conventional isolation and identification is the most precise technique for detection of an active organism in environmental samples. But, it is tiresome, difficult and time consuming process. On the other hand, it was concluded that polymerase

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chain reaction is a reliable, fast, sensitive and specific assay to examine *E.coli* strains. Last but not the least, it is recommended that PCR should be used for the detection and identification of *E. coli*.

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