

Identification and Isolation of E. Coli O₁₅₇:H₇ From Water and Wastewater of Shahrood and Neka Cities by PCR Technique

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Abstract : One of the most important intestinal pathogenic strains is E. coli O₁₅₇:H₇. This pathogenic bacterium is transmitted to humans through water and food. E. coli O₁₅₇:H₇ is the main cause of Hemorrhagic colitis (HC), Hemolytic Uremic Syndrome (HUS), Thrombotic Thrombocytopenic Purpura (TTP) and in some cases death. Since E. coli O₁₅₇:H₇ can be transmitted through the consumption of different foods, including vegetables, agricultural products, and fresh dairy products, this study aims to identify and isolate E. coli O₁₅₇:H₇ from wastewater by PCR technique. One hundred twenty samples of water and wastewater were collected by Falcom Sterile from Shahrood and Neka cities. The samples were checked for colony formation after appropriate centrifugation and cultivation in the specific medium of Sorbitol MacConkey Agar (SMAC) and other diagnostic media of E. coli O₁₅₇:H₇. Also, the plates were observed macroscopically and microscopically. Then, the necessary phenotypic tests were performed on the colonies, and finally, after DNA extraction, the PCR technique was performed with specific primers related to rfbE and stx2 genes. The number of 5 samples (6%) out of all the samples examined were determined positive by PCR technique with observing the bands related to the mentioned genes on the agarose gel electrophoresis. PCR is a fast and accurate method to identify the bacteria E. coli O₁₅₇:H₇. Considering that E. coli bacteria is a resistant bacteria and survives in water and food for weeks and months, the PCR technique can provide the possibility of quick detection of contaminated water. Moreover, it helps people in the community control and prevent the transfer of bacteria to healthy and underground water and agricultural and even dairy products.

Keywords : E. coli O₁₅₇:H₇, PCR, water, wastewater

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