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Isolation and identification of E coli O157:H7 lytic bacteriophage from environmental sewage

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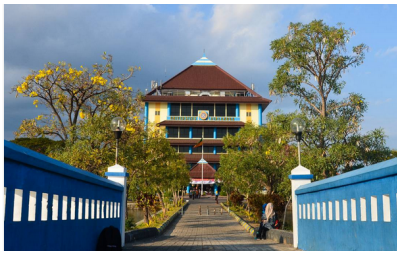
Abstract

E. coli O157:H7 is one of pathogenic bacteria causing foodborne disease. Raw cow's milk and raw beef are primary reservoirs. E. coli O157:H7 could cause diseases by toxin releasing called shiga-like toxin (stx) which could result in food poisoning. Foodborne disease case reduction is one of the main objectives of national and international food safety programs. The use of lytic bacteriophages can be a good solution to overcome the disease. Becoming part of environmental system, is also more beneficial for it is more specific and natural to reduce and control the growth of pathogenic bacteria. This study aim to isolate lytic bacteriophages from environmental sewage against E. coli O157:H7 bacterial cells. The smple used in this study was 8 bacteriophages, and the technique used in identyfing E. coli O157:H7-carriers of the stx1 and stx2 gene was PCR, meanwhile the technique used in identyfing bacteriophage was double layer plaque, the bacteriophages was determined by the plaque morphology, and bacteriophage host range. The result obtained from morphology observation shows a clear zone with the size of 0.7 to 3.5 mm diameter. Lytic bacteriophages could infect E. coli O157:H7 by titers of 1.3 x 103 to 10 x 1010 PFU/ml. The conclusion obtained from this study is that lytic bacteriophages from environmental sewage could lyse E. coli O157:H7 and Atypical Diarrheagenic E. Coli, but otherwise with Salmonella sp. and Shigella sp. Therefore it could be an alternative biocontrol agent to E. coli O157:H7 that contaminates food causing foodborne disease.

Biography

Tessa Sjahriani is a medical students of Universitas Airlangga, Surabaya, East Java, Indonesia, has currently pursuing postgraduate education at Medical Faculty of Universitas Airlangga, Surabaya, Indonesia. Eddy Bagus Wasito is a professor on Department of Microbiology of Dr. Soetomo General Academic Hospital, Surabaya, East Java, Indonesia and had been published about 13 papers on Scopus journals, with h-index of 6, and has been serving as a reviewer of reputed journals. Wiwiek Tyasningsih is a doctor of Faculty of Veterinary Medicine on Universitas Airlangga, Surabaya, East Java, Indonesia, had been published about 22 papers on Scopus journals, with h-index of 7.



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