

## ABSTRACT

Tonle sap lake (TSL) in Cambodia is the largest lake on the Indochinese Peninsula, with floating village communities living on the lake and surrounding floodplains. The lack of proper treatment of sewage discarded leads to water contamination. Microbiological water analysis is used to estimate the number of microbes present in any water supply. This study aims to evaluate the presence of *E. coli* in the Tonle Sap Lake (TSL) Cambodia. The analysis was focused on the presentation of genes common to enteropathogenic *E. coli* (EPEC), enteroaggregative *E. coli* (EAEC), enterotoxigenic *E. coli* (ETEC), enteroinvasive *E. coli* (EIEC), and enterohaemorrhagic / shiga-toxin *E. coli* (EHEC/STEC). The 671 of *E. coli* strains isolated from TSL were subjected for testing the presence of virulence genes (VGs) by polymerase chain reaction technique. The result showed that 17% of total *E. coli* isolated were pathogenic. Based on the type of virulence genes detected, the pathotypes of *E. coli* were distributed into *eltB* and *estA*, carried by ETEC was detected the highest presence of isolates, 42.5%, respectively. The EPEC gene, *bfp* was detected in 13.3% of isolates. The *pCVD* and *aggR*, carried by EAEC pathotypes, were frequently detected 12.4% in *E. coli* isolates. In addition, EIEC virulence gene *ipaH* and *invE* were also detected in 12.4% of isolates. 11.5% were carrying two or more virulence genes and could be placed under more than one pathotype. Most of pathotype detected in dry season samples. The results of this study highlight the widespread occurrence of potentially diarrheagenic pathotypes in the lake water ecosystems.

**Keywords** : Water quality, water contamination, *Escherichia coli*, Pathogenic *Escherichia coli*, lake water.

## INTISARI

Danau Tonle Sap (TSL) di Kamboja adalah danau terbesar di Semenanjung Indochina, dengan komunitas desa terapung yang tinggal di danau dan anak sungai di sekitarnya. Kurangnya penanganan yang tepat terhadap limbah rumah tangga dapat menyebabkan terjadinya kontaminasi air danau. Analisis air secara mikrobiologi dilakukan untuk memperkirakan jumlah mikroba yang ada dalam sampel air. Penelitian ini bertujuan untuk mengevaluasi keberadaan *E. coli* di Danau Tonle Sap (TSL) Kamboja. Analisis difokuskan pada presentasi gen pada patogenik *E. coli* yang umum pada EPEC, EAEC, ETEC, EIEC, dan EHEC/STEC. *E. coli* (n = 671) yang diisolasi dari TSL diuji keberadaan gen virulensi menggunakan teknik *polymerase chain reaction*. *eltB* dan *estA*, dibawa oleh ETEC terdeteksi dengan prevalensi tertinggi, 42,5%. Gen *bfp* dari EPEC terdeteksi pada 13,3%. *pCVD* dan *aggR*, yang dibawa oleh patotipe EAEC, sering terdeteksi 12,4% pada isolat *E. coli*. Selain itu, EIEC membawa *ipaH* dan *invE* juga terdeteksi pada 12,4% isolat. 11,5% membawa dua atau lebih gen virulensi dan dapat ditempatkan di bawah lebih dari satu patotipe. Sebagian besar patotipe terdeteksi pada sampel musim kemarau. Hasil penelitian ini menyoroti luasnya kejadian patotipe berpotensi diaregenik di ekosistem air danau.

**Kata kunci** : Kualitas air, Kontaminasi air, *Escherichia coli*, *Pathogenic Escherichia coli*, air danau.