

Identification of Elizabethkingia meningoseptica from American bullfrog (Rana catesbeiana) farmed in Sabah, Malaysia using PCR method and future management of outbreak

Abstract

Aims: High demand for frog meat in Malaysia especially the American bullfrog (*Rana catesbeiana*) has promoted intensive farming of the animal. However, the farming of American bullfrog is restricted by the occurrence of diseases. This study reports the first isolation of *Elizabethkingia meningoseptica* from specimens of American bullfrog that suffer from cataract and 'red-leg' syndrome. Methodology and Result: The pathogen was isolated from eyes and internal organs (liver, kidney and spleen) of the diseased bullfrog specimens. All the bacterial isolates were subjected to phenotypic characterization and antibiotic susceptibility assay, and further identified by using the 16S rDNA sequencing analysis. We designed two pair of specific PCR primers (22-25 mers) which are complimentary to the β -lactamase gene in the reference strain of *E. meningoseptica* ATCC49470. The result showed all the bacterial isolates shared similar phenotypic characters and antibiotic susceptibility. BLAST analysis of the 16S rDNA sequences indicated that the bacterial isolates had very high sequence homology (100%) with *E. meningoseptica* ATCC49470 and *E. meningoseptica* isolates from mosquito. The two PCR primers were very specific to *E. meningoseptica* isolates of this study. Conclusion, significance and impact of study: This is the first isolation and characterization of bacterial pathogen, *E. meningoseptica* in cultured American bullfrog (*Rana catesbeiana*) that suffered from eye cataract and 'red-leg' syndrome in Sabah, Malaysia. It is suspected that one of the possible transmission routes of the bacterial pathogen could be via mosquito bites. The findings suggest that there is urgent requirement for standard guideline of good farming practice to be adopted in frog farms throughout the country. Such a guideline can help in minimizing economic losses, preventing transmission of the zoonotic bacterial pathogen to farm workers, and sustaining the industry in Malaysia and upgrading frog meat quality for international market.