Prevalence and quantification of Vibrio parahaemolyticus in raw salad vegetables at retail level

ABSTRACT

The purpose of this study was to investigate the biosafety of Vibrio parahaemolyticus in raw salad vegetables at wet markets and supermarkets in Malaysia. A combination of the most probable number-polymerase chain reaction (MPN-PCR) method was applied to detect the presence of V. parahaemolyticus and to enumerate their density in the food samples. The study analyzed 276 samples of common vegetables eaten raw in Malaysia (Wild cosmos=8; Japanese parsley=21; Cabbage=30; Lettuce=16; Indian pennywort=17; Carrot=31; Sweet potato=29; Tomato=38; Cucumber=28; Four-winged bean=26; Long bean=32). The samples were purchased from two supermarkets (A and B) and two wet markets (C and D). The occurrence of V. parahaemolyticus detected was 20.65%, with a higher frequency of V. parahaemolyticus in vegetables obtained from wet markets (Wet market C=27.27%; Wet Market D=32.05%) compared with supermarkets (Supermarket A=1.64%; Supermarket B=16.67%). V. parahaemolyticus was most prevalent in Indian pennywort (41.18%). The density of V. parahaemolyticus in all the samples ranged from <3 up to >2,400 MPN/g, mostly <3 MPN/g concentration. Raw vegetables from wet markets contained higher levels of V. parahaemolyticus compared with supermarkets. Although V. parahaemolyticus was present in raw vegetables, its numbers were low. The results suggest that raw vegetables act as a transmission route for V. parahaemolyticus. This study will be the first biosafety assessment of V. parahaemolyticus in raw vegetables in Malaysia.

Keyword: Vibrio parahaemolyticus; Most Probable Number (MPN), Polymerase Chain Reaction (PCR); Raw vegetables; Prevalence; Quantification