

## Evaluation of cloves (*Syzygium aromaticum*) against antibiotics resistant *Vibrio parahaemolyticus* on seafood

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### Abstract

*Vibrio parahaemolyticus* is a main foodborne disease in seafood and generally seafood is easily deteriorates in quality of color and flavor. In this study, clove (*Syzygium aromaticum*) extract shows potent antibacterial activity against growth of antibiotics resistant *Vibrio parahaemolyticus* on seafood samples (cockles and shrimps). *Vibrio parahaemolyticus* was artificial contaminates on the samples with 10<sup>6</sup> CFU/ml. The samples were treated with different concentration of cloves extract with 10 mg/ml which are 0.5%, 5% and 10% concentration from methanol food grade extraction in 0 hr, 5 min, 10 min, 15 min, 30 min, 60 min and 120 min. Tap water and deionized water were selected as a negative control. As a result, the amount of 10 % cloves managed to mitigates the number of *V. parahaemolyticus* on seafood samples in 5 minutes and 15 min on both samples. Therefore, our results signify the fact that cloves can be apply as natural sanitizer which could meet consumer demands for safe and traditionally consumed either raw without any undesirable effect when applied in the seafood system industries.

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### Keywords

Cloves

*Syzygium aromaticum*

*Vibrio parahaemolyticus*

Cockles

Shrimps

### Introduction

*Vibrio parahaemolyticus* is a bacterium which causes mild gastroenteritis in humans on consumption of seafood (Oliver and Kaper, 1997). According to Feldhusen (2000), *V. parahaemolyticus* caused about 25% of total foodborne diseases in comparison to other *Vibrio* species. In Japan, a variety of seafood has been traditionally consumed and raw or lightly cooked seafood is highly selected as favourite. This habit of eating seems to provide a justification for many cases of foodborne illness by *V. parahaemolyticus* in the country. Moreover, this Japanese style of cuisine of eating raw and lightly cooked seafood is increasingly popular in Europe, United States even Asian countries and seems to be also adopted in the local cuisines with globalization of food.

Nowadays, microorganisms have become resistance to many antibiotics due to increase use of drugs, and decrease the drug efficiencies. Therefore, it has become necessary to find out new antimicrobial agents. Spices and herbs have been used as food additives since ancient times, both as flavouring agents and as natural food preservatives. They have many functional components such as phytochemicals, phenols, polyphenols, essential

oils and micronutrients (Cowan, 1999). The study from Elexson *et al.* (2013) has demonstrates cloves contained the lower Minimum Inhibition Concentration at 19.531 µg/ml to inhibit and killed antibiotics resistant *V. parahaemolyticus* from seafood.

In addition, this was in agreement with the memorandum between Forest Research Institute Malaysia (FRIM) and Malaysia Agriculture Research and Development Institution (MARDI) to boost the herbal industry in Malaysia and to encourage research collaboration and sharing scientific knowledge between these two institutions (Star Online, 2013). Therefore, the objectives of this research is to evaluate the effectiveness of clove (*Syzygium aromaticum*) on seafood samples to mitigate the growth of antibiotic resistant *Vibrio parahaemolyticus*.

### Materials and Methods

#### Collection of seafood samples

Freshly samples (shrimps and cockles) were collected from wet market nearby Serdang, Selangor and transported to the laboratory where they were analyzed within 5 hours upon collection.

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