# CHAPTER I
# INTRODUCTION

*Vibrio parahaemolyticus* is halophilic bacteria that mostly found in coastal marine environment, also in marine organism and seafood. This bacteria is recognized as the leading cause of gastroenteritis in human who consume raw seafood in the United State and an importance food-borne pathogen for the worldwide. In Thailand, *V.parahaemolyticus* has been reported as the number one pathogenic bacteria causing food poisoning in Thai people. To control the food poisoning disease caused by *V.parahaemolyticus*, the rapid method for isolation and characterization of this bacterial strain should be necessarily applied in quality control system for food industries, in particular, seafood industries. To date, both processes have done by conventional cultural methods, following by biochemical identification of isolated strains. This determination has not been satisfied because the process are complicate, laborious, and the most importance reason is, low in selectivity.

In 1970, there was a report about the communication system in bacteria via the chemical signaling known as Quorum sensing (QS). Bacteria used this chemical hormone-like molecules (autoinducer, AI) system for inter- and intraspecies communication. Now, three groups of AI such as AI-1, AI-2 and AI-3 have been found. AI groups which has been widely studied is acyl homoserine lactone (AHL). A number of bacterial species included *V.parahaemolyticus* produce AHL - based QS. Over the last decade, the evidences about QS phenomenon was reported in many pathogenic bacteria, and their applications were mostly in fields of medical science and agricultural science.

Several studies have been reported that AHL-quorum sensing molecules of *V.parahaemolyticus* is 3-hydroxy-C4-HSL. This finding may be a key to the application for alternative *V.parahaemolyticus* determination method based on its AHL production property. There are lots of analysis methods for the AHL-type QS molecules, most of qualitative method, such as bioassay, thin-layer chromatography (TLC) and high-performance liquid chromatography (HPLC), but each method has its own drawback.

However, HPLC could be more definitive method for characterization of AHL structure molecules. Recently, colorimetric assay for quantitative AHL determination has been proposed. This method based on the measurement an absorbance of coloring complex generated from the reaction of AHL.

Therefore, as described above, *V.parahaemolyticus* is the bacteria producing known AHL structure. Through this fundamental data as mentioned above, the main goal of this study was to evaluate and develop alternative methods for *V.parahaemolyticus* determination based on its AHL producing property, using colorimetry and HPLC assay.