

## Review Article

# A Brief Review on the Antioxidants and Antimicrobial Peptides Revealed in Mud Crabs from the Genus of *Scylla*

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Received 20 February 2017; Revised 19 April 2017; Accepted 22 May 2017; Published 18 June 2017

Academic Editor: Robert A. Patzner

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Mud crab from the genus *Scylla* is also known as mangrove crab, which has been well-accepted as a good source of protein. Recently, the antioxidant properties present in mud crabs have been reported to have a part in the protection of cells against free radicals. Meanwhile, numerous antimicrobial peptides from mud crabs have managed to be characterized through the display of antimicrobial activities against Gram-positive and Gram-negative bacteria. Hence, this paper is an effort to collect recent literatures on antioxidant and antimicrobial properties in every part of mud crabs which include muscle tissue, hemolymph, and crab shell. Moreover, the effort to understand the biological properties of mud crabs is important to enhance its production in aquaculture industry. Therefore, this review hoped to attract the attention of natural product researchers to focus on the potential therapeutic applications of mud crabs.

## 1. Introduction

Mud crabs are also referred as mangrove crabs due to their wide distribution in mangrove areas. Mud crabs are consumed due to their high nutritional quality for marine lives as well as for human. Mud crabs from genus *Scylla* have been known to be commercially important worldwide, thus causing them to be cultured in many Asian countries such as Malaysia, Indonesia, Philippines, Taiwan, Sri Lanka, Vietnam, India, and China [1]. Mud crab that originates from genus of *Scylla* can be easily found in shallow water with the optimal salinity of 20 to 30 gL<sup>-1</sup>, particularly in mangrove areas and estuaries [2]. The genetic data and morphological characters suggest that *Scylla* is made of four distinct species, namely, *Scylla paramamosain*, *Scylla serrata*, *Scylla olivacea*, and *Scylla tranquebarica*. The two morphological characters that are important in determining the species are frontal lobe spines and chelipeds [3]. Ikhwanuddin et al. [4] have studied the biological information as well as population features of mud crab in Malaysia at Sematan mangrove forest which is situated along coastal water. In the same study, two common

mud crab species in the South China Sea managed to be found which are known as *S. tranquebarica* and *S. olivacea*. Mud crabs are commonly sold in many areas due to their delightful and good taste in soup making. Interestingly, mud crabs have been reported to exhibit the potential as an antioxidant and antimicrobial agents [5] despite their tasty meat and nutritional richness [6]. Elderly in Malaysia tend to consume mud crab soup as traditional remedy and folk medicine for the purpose of reducing the symptoms of dengue fever. Comprehensively, mud crabs are marine invertebrates that protect themselves against pathogen by solely relying on their innate immune system. Particularly, the defense system includes both humoral and cellular responses [7]. In addition, antimicrobial peptides present in the hemolymph of mud crab serve as humoral immunity, while antioxidants system benefits as the cellular response towards infectious diseases or pathogens [8]. The immune system of crustacean also plays a role when the organisms are exposed to abiotic stress or pollutions. Apart from that, it is reported that the immune system of mud crabs is also modulated based on the changes of environmental temperature and salinity [9].