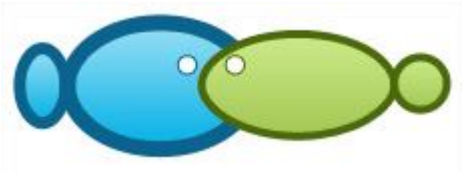

Morphometric allometry of horseshoe crab, *Tachypleus gigas* at west part of Sarawak waters, Borneo, East Malaysia

A. Raman Noor Jawahir, Mohamad Samsur, Mohd L. Shabdin, Khairul-Adha A. Rahim

Department of Aquatic Science, Faculty of Resource Science and Technology, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia. Corresponding author: noorjawahir@gmail.com

Abstract. A study was conducted at west part of Sarawak waters in Borneo, Malaysia to compare the morphometric allometry of coastal horseshoe crab, *Tachypleus gigas* obtained from two different locations, Pasir Putih Village and Gerigat Beach. The specimens were collected by using hand manually and monofilament gill netting during March 2014 to April 2014. All measurements of body parameters of male and female *T. gigas* from Gerigat Beach were recorded higher compared to specimens from Pasir Putih Village. All body parameters between male and female *T. gigas* from both locations showed significant different when $p < 0.05$. Allometric analysis was used to compare BW-TL/CW of *T. gigas* in log transform by using Pearson correlation and regression analysis. Male and female *T. gigas* from both locations revealed negative allometric growth for all body parameter relationships since 'b' value was less than 3 excluding BW-CW and TEL-TL of female from Gerigat Beach. Two way ANCOVA analysis indicated significant differences in BW-CW and BL-TL relationships of both sexes from two locations. The dissimilar size of *T. gigas* from different locations in west Sarawak waters is probably due to two discrete populations.

Key Words: *Tachypleus* gigas, width-weight relationship, length-weight relationship, horseshoe crab, Borneo).

Introduction. Horseshoe crab is known as the "living fossil" after the declaration that their external morphology only slightly changed since the Cambrian period (Rudkin et al 2008). In the current era, only three out of the four species of the horseshoe crab can be obtained in the Asian waters, namely *Tachypleus tridentatus*, *Tachypleus gigas* and *Carcinoscorpius rotundicauda* (Sekiguchi & Nakamura 1979; Chiu & Morton 2003; Faridah et al 2015). It was also found that horseshoe crab is actually highly similar to spider and scorpion, although the name falls under the family of crab (Hickman et al 2007).

The major physical characteristics of the four species types of horseshoe crab demonstrated certain degree of similarities among each other. Therefore, the effective method to describe the differences among closely related species is by conducting a morphometric study (Hussain et al 2009; Srijaya et al 2010). According to Huxley & Tessier (1936), allometry analysis can be carried out for morphometric analysis to describe the changes of size, shape, and relationship between different body parameters belonged to the same organism. In more detail, an allometric correlation enhances the knowledge of morphometric variations within in the population origin (Chatterji et al 1988). Previous studies showed that the variation of horseshoe crab size was influenced by the changes in habitat, *in-situ* physico-chemicals parameters, diets, stage of maturity, and genetic (Krumholz & Cavanah 1968; Gaspar et al 2002; Graham et al 2009; Shuster & Sekiguchi 2009).

The aim of this study is to determine the morphometric variations of *T. gigas* in term of different habitats, Pasir Putih Village and Gerigat Beach and to highlight the effects of different ecological habitat to the growth of *T. gigas*.