

The Living Fossil (Horseshoe crab)

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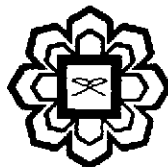
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Table of Contents

Chapters	Titles	Page No
1.	Global distribution and Taxonomy of extant horseshoe crabs..... (5410/18557)	1
2.	Limiting factors on the global distribution of horseshoe crabs..... (5410/18558)	11
3.	Site selection and nesting behaviour of horseshoe crabs with special reference to <i>Limulus polyphemus</i> (3575/18560)	19
4.	Distribution of horseshoe crabs at their nesting grounds, East coast of Peninsular Malaysia..... (5410/18560)	27
5.	Hydrology of horseshoe crab nesting ground at Pahang coast –Part 1..... (3575/18563)	35
6.	Hydrology of horseshoe crab nesting ground at Pahang coast –Part 2..... (3575/18566)	47
7.	Physicochemical parameters relationship at the horseshoe crab nesting grounds of Pahang coast, Malaysia..... (5410/18567)	57
8.	Macrobenthic diversity at the Horseshoe Crab nesting ground, Balok station, Pahang, Malaysia – Part 1 (3575/18568)	69
9.	Macrobenthic diversity at the Horseshoe Crab nesting ground, Balok station, Pahang, Malaysia – Part 2 (3575/18570)	83
10.	Macrobenthic diversity at the Horseshoe Crab nesting ground, Pekan station, Pahang, Malaysia – Part 1 (5410/18571)	95
11.	Macrobenthic diversity at the Horseshoe Crab nesting ground, Pekan station, Pahang, Malaysia – Part 2 (3575/18573)	109
12.	Influence of physicochemical parameters on the macrobenthic diversity and abundance in horseshoe crab nesting grounds, East coast of Peninsular Malaysia. (5410/18574)	127
13.	<i>In-vitro</i> study on the effect of salinity on the hatching success of Malaysian Horseshoe crab eggs..... (3575/18575)	137
14.	Effects of salinity on the early growth of <i>Tachypleus gigas</i> larvae - An <i>In-vitro</i> study..... (3575/18577)	147

15. Sediment characteristics of horseshoe crabs nesting ground at Balok station, Pahang, Malaysia	(5410/18579)	155
16. Sediment Profiling of the Estuarine Nesting Ground of Horseshoe Crabs at East Peninsular Malaysia	(3575/19587)	165
17. Bioaccumulation of some essential metal concentration in Malaysian horseshoe crabs (<i>Tachypleus gigas</i>).....	(5410/18584)	175
18. Cu and Cd Bioaccumulation in Malaysian Horseshoe Crab	(5410/18585)	183
19. Metal concentration in horseshoe crab nesting ground along Pahang coast, Malaysia.....	(5410/18586)	193
20. Bionomics of Malaysian horseshoe crabs <i>Tachypleus gigas</i>	(5410/19718)	203
21. Feeding Ecology of Mangrove horseshoe crab <i>Carcinoscorpius rotundicauda</i>	(5410/19717)	213
22. Emerging interest on DNA barcoding technology and its application for high-tech biodiversity studies using COI gene as a reference sequence	(3575/19716)	225
23. Can DNA barcode accurately delineate living fossil (Horseshoe crab) and its different developmental stages?.....	(5410/19715)	237
24. Revision on the molecular phylogeny of horseshoe crabs – Part 1.....	(5410/19717)	251
25. Revision on the molecular phylogeny of horseshoe crabs – Part 2.....	(5410/19720)	267
26. Genetic Diversity of <i>Tachypleus gigas</i> Population from West coast of peninsular Malaysia	(3575/19727)	275
27. Does continental drift influence in the genetic variability among the horseshoe crab population?	(3575/19727)	287
28. Evolution of horseshoe crabs – paleontological and Molecular viewpoint.....	(3575/19731)	297
29. Factors involving in the clot formation of horseshoe crab blood.....	(5410/19711)	307
30. Methods for bacterial endotoxin quantification in reference to horseshoe crab blood studies	(5410/19740)	317
31. ENDO SENSOR (TAL) production from Malaysian Horseshoe crab blood.....	(5410/19744)	325
32. Characterization of <i>Tachypleus</i> Amebocyte Lysate (TAL).....	(3575/19759)	333

33. Environmental and Pharmaceutical applications of Amebocytes Lysate (LAL/TAL) from Horseshoe crabs	(5410/19751)	343
34. <i>Tachypleus gigas</i> mortality due biomedical bleeding process	(3575/19756)	351
35. Conservation measures on horseshoe crab population – A global view.....	(5410/19759)	359
Glossary.....		369

CHAPTER – 23

Can DNA barcode accurately delineate living fossil (Horseshoe crab) and its different developmental stages?

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Abstract

Immatured egg, fertilized egg, Pre trilobite and trilobite larvae of Malaysian horseshoe crabs (*Tachypleus gigas* and *Carcinoscorpius rotundicauda*) was sequenced for Cytochrome C Oxidase subunit I (COI) gene (DNA barcode) to check the efficiency of DNA barcode in delineating species irrespective of its different life stages. COI gene sequences of different life stages of horseshoe crabs were subjected to pair-wise distance analysis, nucleotide sequence diversity estimation, phylogenetic and BOLD analysis. The pair-wise distance estimate revealed that intra-specific variations within the barcode sequences of same species were lower when compared with its conspecifics. The constructed phylogram clearly showed that the DNA barcoding using partial COI gene would provide an accurate delineation of species irrespective of their different life stages. However, its efficiency in precise delineation of different developmental stages is still controversy.

Key words: horseshoe crab, developmental stages, DNA barcoding Living fossils. COI gene.

Introduction

Only a small fraction of all species existing in this biosphere has been formally described, between 1.5–1.8 million out of an estimated 10 million (Kamaruzzaman *et al.*, 2010). In the face of dwindling numbers of trained taxonomists, fast identification methods are needed to assist the species inventories. In this context, Hebert *et al.* (2003) proposed the use of a small fragment of