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Diversity and ecology of jellyfish (Scyphozoa and Cubozoa) in Malaysia

Jellyfish are renowned globally for depleting fish stocks, clogging fishing nets, damaging power stations, and affecting coastal tourism, yet they are being harvested extensively in South East Asia as food. In Malaysia, studies on jellyfish diversity and ecology are still at an infancy stage despite being an important fishery commodity since 1970s. In order to fill this knowledge gap, a series of studies was carried out since 2008-2012 to document the diversity and investigate the ecology of jellyfish in Malaysia. At least 16 putative species were recorded, which belong to class Scyphozoa (Semaestomae and Rhizostomae) and Cubozoa (Cubomedusae), that encompassed families Rhizostomatidae, Lobonematidae, Mastigiidae, Catostylidae, Cepheidae, Pelagiidae, Cyaneidae and Chirodipidae. Morphological identification was also complemented with the application of molecular genetic techniques such as DNA sequence analysis of mitochondrial cytochrome oxidase (COI) and 16S genes, and nuclear internal transcribe spacers (ITS1) gene. Phylogenetic analysis showed that there is a possibility of discovering cryptic species, especially when many of the Malaysian jellyfish have yet to be formally described. An ecological study was also performed to investigate the influence of moon phase, diel, and tides on the abundance of jellyfish in the Klang Strait. A total of 1197 individuals which belonged to 8 species of scyphozoan jellyfish were collected, identified and quantified. Jellyfish in the area occurred seasonally, with some species showing overlapping abundance with others. Jellyfish abundance, in terms of catch per unit effort (CPUE: no./net/hour) was at its greatest in January 2011 (CPUE=21.3 ± 2.6), and at the lowest in June 2010 (CPUE= 3.31 ± 1.2). The magnitude of their occurrences was highly influenced by moon phase, as they were least abundant on the first quarter moon (F=3.7842, P< 0.05), and more abundant during flood tide occasion (F=5.0902, P< 0.05). A pattern of vertical migration was observed during neap tide; the jellyfish tended to move to the upper water column during day time, but moved to the bottom during night time.