A STUDY ON DIEL FEEDING RATE AND FEEDING BEHAVIOUR OF SPOTTED SEAHORSE (*Hippocampus kuda*)

LIEW BOON KET

FACULTY OF SCIENCE AND TECHNOLOGY
UNIVERSITI PUTRA MALAYSIA TERENGGANU
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LIEW BOON KET

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APPROVAL AND CERTIFICATION FORM

I certify that the report of this final year project entitled 'A Study on The Diel Feeding Rate and Feeding Behaviour of The Spotted Seahorse (*Hipocampus kuda*)' by LIEW BOON KET metric no. UK3655 have been read and all the alteration and correction recommended by Examiners have been done. This thesis submitted to Department of Biological Science, have been accepted as fulfilment of the requirement for degree of Bachelor Educational Science (Biology) in Faculty of Science and Technology, Kolej Universiti Sains Dan Teknologi Malaysia, Universiti Putra Malaysia..

Mr. Liew Hock Chark
Supervisor
Faculty of Science and Technology
Kolej Universiti Sains Dan Teknologi Malaysia
Universiti Putra Malaysia Terengganu

Date: 17/03/2002

Dr. Siti Aishah Abdullah
Supervisor
Faculty of Science and Technology
Kolej Universiti Sains Dan Teknologi Malaysia
Universiti Putra Malaysia Terengganu

Date: 18/3/2002

Prof. Madya Dr. Sayed Zain S. Hassan
Head of Department Of Biological Science
Faculty of Science and Technology
Kolej Universiti Sains Dan Teknologi Malaysia
Universiti Putra MalaysiaTerengganu

Date.....

ABSTRACT

The spotted seahorse, *Hippocampus kuda* from the family Syngnathidae is a highly valued species in traditional chinese medicine and aquarium trade. Seahorse research in Malaysia is still very new; it is therefore urgent to study them owing to the destruction of its natural habitat and by over fishing activities.

The seahorse, *Hippocampus kuda* were investigated for their feeding patterns from 0700-1800 for five days. Their feeding rate peaked at 0700 in the morning where individual seahorses consumed 4-6 grass shrimps (*Macrobrachium lanchesteri*). The study revealed that this species is a diurnal and visual predator. They actively capture their prey under bright conditions. The percentage of shrimp's weight consumed in proportion to seahorse's body weight show larger male and female seahorses consumed less shrimps compared to smaller male and female seahorses.

The feeding behavior of *Hippocampus kuda* can be divided into three phases: search, preparatory, and expansive phases. During search phase, there was a period of searching in which the seahorse appears to scan the habitat for potential prey items with its eyes. When prey was introduced to the seahorse, successful search led to the second phase of foraging in which the seahorse visually located the prey by using both eyes which oriented independently towards the prey. *Hippocampus kuda* slowly approached the prey within striking distance and slowly flexing its head ventrally. During the expansive phase, prey capture is accomplished by simultaneous elevation of the head and expansion of the buccal cavity.

The feeding pattern of *Hippocampus kuda* was classified into three types. Seahorse slowly maneuvers toward the prey at the bottom in the type A pattern. In type B pattern, the seahorse capture its prey at the water column while in type C

pattern, it swims vertically downward to get the prey at the bottom. Type A feeding pattern appear most frequent while type B pattern was the least time during prey capture activity. Their feeding patterns were related to prey behavior. This seahorse always performed type A and C foraging patterns when prey swim down or stay at the bottom. It showed type B foraging pattern when prey swims or stays at the water column. However, their natural habitat complexity (seagrass bed) may also play an important role to determine their feeding behavior and foraging pattern.

Feeding competition behavior appeared for all categories of group pairs (male-male, male-female and female-female) in *Hippocampus kuda*. Results suggest that feeding competition in male-male group pair is more frequent and aggressive.

ABSTRAK

Kuda laut, *Hippocampus kuda* (family Syngnathidae) merupakan species ikan yang luas digunakan sebagai ubat tradisional di masyarakat cina. Selain itu, kuda laut ini juga dijual sebagai ikan hiasan. Kajian saintifik tentang kuda laut di Malaysia masih kurang diketahui kerana tiada kajian spesifik dijalankan bagi jenis ikan ini. *Hippocampus kuda* dipilih sebagai spesies untuk kajian kali ini kerana habitat semulajadinya semakin diancam akibat aktiviti perikanan.

Kadar pemakanan bagi sebelas kuda laut, *Hippocampus kuda* telah dikaji. Didapati kadar pemakanan *Hippocampus kuda* memuncak (kadar maksimum) pada 0700 waktu pagi. Ia makan sebanyak 4 hingga 6 ekor udang kantung (*Macrobrachium lanchesteri*) pada waktu ini. Kajian ini mendapati kuda laut adalah ikan waktu siang dan pemangsa 'visual'. Kuda laut ini biasanya memburu mangsa dibawah keadaan cahaya yang terang. Menurut nisbah berat udang yang dimakan kepada berat badan kuda laut, didapati kuda laut jantan makan lebih banyak udang daripada kuda laut betina.

Perangai pemakanan *H. kuda* dibahagi kepada tiga fasa iaitu fasa pencarian, fasa persediaan, dan fasa pengembangan. Dalam fasa pencarian, kuda laut mencari mangsa di persekitaran dengan penglihatan mata. Dalam fasa kedua pula, kuda laut bergerak dengan berenang secara perlahan-lahan kemudian membawa kepala ke depan mendekati mangsa. Kuda laut memakan mangsa dengan meninggikan kepala berserentak dengan pembukaan 'buccal cavity'. Terdapat tiga corak pemakanan kuda laut, iaitu jenis A, B dan C. Dalam jenis A dan C, kuda laut berenang ke bawah akuarium untuk mendapatkan mangsa manakala kuda laut makan mangsa dalam ruangan air pada jenis B. Faktor perangai mangsa dan keadaan habitat

semulajadi (habitat rumpai laut) ikan ini memainkan peranan dalam menentukan corak-corak pemakanan ikan ini.

Persaingan untuk mendapatkan makanan muncul dalam kumpulan kuda laut yang terdiri daripada pasangan jantan dengan jantan, jantan dengan betina dan betina dengan betina. Keputusan menunjukkan pasangan jantan dengan jantan melakukan persaingan yang lebih hebat dan agresif di banding dengan kedua-dua pasangan lain.