

EPIPHYTIC FAUNA IN SEAGRASS BED

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TERENGGANU

1997

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LP 45 FSGT 1 1997



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EPIPHYTIC FAUNA IN SEAGRASS BED

By

PATRICIA NATIN

**This project report is submitted in partial fulfilment of the requirements for the
degree of Bachelor of Fisheries Science**

**FACULTY OF APPLIED SCIENCE AND TECHNOLOGY
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DEDICATION

My Beloved Family

Supervisor

Colleagues of 1994-97

Friends

Someone...

HRC, PEACE AND LOVE MOTHER NATURE

ACKNOWLEDGEMENT

I am deeply indebted to GOD for the strength and blessings in being able to complete this project. This would be impossible without the support and encouragement from my beloved family (Mom, Dad, Zerry and Sarah Anne).

I would like to express my deepest appreciation and sincere gratitude to my supervisor Dr. Japar Sidik b. Bujang, for his advice, guidance, criticism, valuable suggestion and patience throughout the duration of this project.

A special thanks to Cik Muta Harah bt. Zakaria @ Ya, for her helpful advice and discussions. My appreciation is also recorded to Encik Mansorruddin b. Alias, for his assistance during the field trip.

Financial support by Biasiswa Kerajaan Negeri Sabah (BKNS) and The Ministry of Science, Technology and Environment Malaysia, under the scheme 'Intensified Research in Priority Area' (IRPA) and Universiti Putra Malaysia (UPM) for facilities provided are acknowledged.

Last but not least, I wish to extend my gratitude to the staff of aquatic laboratory and library and also to my friends, who had assisted me one way or the other throughout the project.

ABSTRACT

The study of the epiphytic fauna was carried out in *Halodule pinifolia*-*Halophila ovalis* dominated seagrass bed of Merchang, Terengganu, Malaysia. The seagrass sampling was conducted for 3 months (August, September, November, 1996), by using the quadrat method. A total of 21 species of epiphytic fauna were found to grow epiphytically and associated to the seagrass bed. Out of 21 species, 18 and 15 species were found in *Halophila ovalis* and *Halodule pinifolia*, respectively.

The distribution of the epiphytic fauna on the vegetative parts of the seagrass and its substrate were not random. In *Halophila ovalis*, the dominant epiphytic fauna generally preferred the above ground vegetative parts e.g. leaves and petioles, rather than the below ground parts such as rhizomes and roots. This preference was shown in epiphytes such as *Batillaria zonalis*, *Cerithidea cingulata*, *Clithon oualaniensis* and *Nassarius hepaticus*. The less dominant one *Diogenes* sp., *Cerithium patulum*, *Cerithium morus* and *Subulina* sp. were found inhabiting the below ground vegetative parts. In *Halodule pinifolia*, there was no consistent trend in the distribution of epiphytes associated with the above ground parts. More epiphytes were associated with the below ground vegetative parts and the substrate.

There was significant difference ($p < 0.05$) between leaf density for each seagrass species with time. In *Halophila ovalis*, the highest leaf density ($3,405 \text{ cm}^{-2}$) was observed in November while lower value occurred in September ($2,415 \text{ cm}^{-2}$) and August ($2,086 \text{ cm}^{-2}$). In *Halodule pinifolia*, the highest leaf density ($2,861 \text{ cm}^{-2}$) was

observed in September while lower value occurred in August (1,790 cm⁻²) and November (1,784 cm⁻²).

The correlation between the leaf density and the above ground epiphyte density were correlated. In *Halophila ovalis*, the linear regression established is $Y = 2.1627 + 0.0385 X$ ($p < 0.05$, $r^2 = 0.17$). In *Halodule pinifolia*, the linear regression established is $Y = -4.9211 + 0.0865 X$ ($p < 0.05$, $r^2 = 0.23$).

The biomass for each species of seagrass, showed significant difference ($p < 0.05$) between time. In *Halophila ovalis*, relatively higher biomass (6964.80 mg cm⁻²) was observed in November while lower biomass occurred in September (3428.20 mg cm⁻²) and August (1780.20 mg cm⁻²). In *Halodule pinifolia*, relatively higher biomass (12870.5 mg cm⁻²) was observed in August while lower biomass occurred in September (10804.9 mg cm⁻²) and November (4044.0 mg cm⁻²).

The correlation between the above ground biomass and above ground epiphyte density were highly correlated. In *Halophila ovalis* the linear established is $Y = 5.7263 + 0.0848 X$ ($p < 0.05$, $r^2 = 0.32$). In *Halodule pinifolia*, the linear regression established is $Y = 2.9978 + 0.0716 X$ ($p < 0.05$, $r^2 = 0.60$).

Leaf grazing were high *Halophila ovalis* ranging from 29.81 % to 51.76 %. The correlation between the percentage total grazed and the epiphyte density on leaves, were negatively correlated where the linear regression established is $Y =$

$0.4755 + 0.0539 X$ ($p < 0.05$, $r^2 = 0.45$). Leaf grazing in *Halodule pinifolia* was not analysed since grazing was not visible or undeletable.

ABSTRAK

Kajian mengenai epifitik fauna telah dijalankan di kawasan rumput laut yang dikuasai oleh spesies *Halodule pinifolia* dan *Halophila ovalis* di Merchang, Terengganu, Malaysia. Penyampelan rumput laut telah dijalankan selama 3 bulan (Ogos, September, November, 1996). Sejumlah 21 spesies epifitik fauna telah dijumpai membesar secara epifitik dan berhubung kait dengan kawasan rumput laut. Dari 21 spesies, sebanyak 18 dan 15 spesies telah dijumpai masing-masing, pada rumput laut *Halophila ovalis* dan *Halodule pinifolia*.

Taburan epifitik fauna pada bahagian vegetatif rumput laut serta substratnya adalah tidak rawak. Di dalam *Halophila ovalis*, spesies epifitik fauna yang dominan secara amnya, memilih bahagian 'above ground' bahagian vegetatif seperti rhizom dan akar. Pemilihan ini telah ditunjukkan dalam epifit seperti *Batillaria zonalis*, *Cerithidea cingulata*, *Clithon oualaniensis* dan *Nassarius hepaticus*. Spesies dominan iaitu *Diogenes* sp., *Cerithium patulum*, *Cerithium morus* dan *Subulina* sp. telah dijumpai menduduki bahagian 'below ground' bahagian vegetatif. Bagi *Halodule pinifolia* pula, tidak terdapat corak konsisten di dalam taburan epifitik yang berhubung dengan bahagian 'above ground'. Kebanyakan epifit didapati berhubung dengan bahagian vegetatif 'below ground' dan substrat.

Terdapat perbezaan jelas ($p < 0.05$) di antara kepadatan daun untuk setiap spesies rumput laut berbanding dengan masa. Di dalam *Halophila ovalis*, kepadatan daun tertinggi ($3,405 \text{ cm}^{-2}$) didapati dalam bulan November, manakala nilai yang

rendah wujud pada bulan September ($2,415 \text{ cm}^{-2}$) dan bulan Ogos ($2,086 \text{ cm}^{-2}$). Bagi *Halodule pinifolia* pula, kepadatan daun tertinggi ($2,861 \text{ cm}^{-2}$) didapati dalam bulan September manakala nilai yang rendah didapati pada bulan Ogos ($1,790 \text{ cm}^{-2}$) dan November ($1,784 \text{ cm}^{-2}$).

Terdapat perhubungan korelasi di antara kepadatan daun dan kepadatan 'above ground' epifit. Persamaan regresi linear bagi *Halophila ovalis* adalah $Y = 2.1627 + 0.0385 X$ ($p < 0.05$, $r^2 = 0.17$) manakala bagi *Halodule pinifolia* pula, persamaan regresi linearnya adalah $Y = -4.9211 + 0.0865 X$ ($p < 0.05$, $r^2 = 0.23$).

Bacaan biomass untuk setiap spesies rumput laut, menunjukkan perbezaan jelas ($p < 0.05$) berbanding dengan masa. Di dalam *Halophila ovalis*, bacaan biomass tertinggi ($6964.80 \text{ mg cm}^{-2}$) didapati dalam bulan November manakala bacaan biomass yang rendah didapati pada bulan September ($3428.20 \text{ mg cm}^{-2}$) dan Ogos ($1780.20 \text{ mg cm}^{-2}$). Bagi *Halodule pinifolia* pula, bacaan biomass tertinggi ($12870.5 \text{ mg cm}^{-2}$) didapati dalam bulan Ogos manakala bacaan biomass yang rendah didapati pada bulan September ($10804.9 \text{ mg cm}^{-2}$) dan November ($4044.0 \text{ mg cm}^{-2}$).

Terdapat perhubungan korelasi di antara bacaan 'above ground' biomass dan kepadatan 'above ground' epifit. Persamaan regresi bagi *Halophila ovalis* adalah $Y = 5.7263 + 0.0848 X$ ($p < 0.05$, $r^2 = 0.32$) manakala bagi *Halodule pinifolia* pula, persamaan regresi linearnya adalah $Y = 2.9978 + 0.0716 X$ ($p < 0.05$, $r^2 = 0.60$).

Nilai ragutan daun adalah tinggi pada *Halophila ovalis*, iaitu berjulat dari 29.81% hingga 51.76%. Terdapat perhubungan korelasi negatif di antara peratus jumlah ragutan dan kepadatan epifit pada daun di mana persamaan regresi linear adalah $Y = 0.4755 + 0.0539 X$ ($P < 0.05$, $r^2 = 0.13$). Ragutan daun di dalam *Halodule pinifolia* pula tidak dapat dianalisa kerana kesan ragutan tidak kelihatan dan tidak dapat dikesan