

GREEN ALGAE (CHLOROPHYTA) OF TANJUNG DATU, SARAWAK

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Abstract: In this present study, a total of 19 species of Chlorophyta, comprising of 9 families and 4 orders was recorded. Seaweeds of the order Bryopsidales was the most dominant in terms of species diversity since more than half of the total number of species (10 species) or 53% of the total species were from this order. On the other hand, Ulvales showed the least number of species since only 2 species or 11% were recorded. Most of the specimens were small in size, within the range of 1-8 cm, with an exception for *Cladophora vagabunda*. Marine macroalgae in Tanjung Datu were commonly found in the rock pools, on dead corals and also on the sandy substrates. Five species of seaweeds from this study were new record for Malaysia. These species were *Acetabularia roxasii*, *Anadyomene stellata*, *Bornetella oligospora*, *Dasycladus* sp and *Codium papillatum*.

Keywords: Macroalgae, Chlorophyta, species diversity, coverage

INTRODUCTION

Marine macroalgae are non-vascular plants which are not differentiated into specialized structure such as flower, root, leaf or stem [5]. Thus the whole plants are called thallus and the size varies according to the species [4]. Seaweeds normally have a simple reproduction system and they differ in colour depending on the pigments they contained.

Chlorophyta is one of the four main divisions of marine macroalgae that are commonly found along the Malaysian coast [2]. Globally, a total of 7000 species of Chlorophyta was recorded in which majority of the species inhabit terrestrial environment. Only 10% of Chlorophyta can be found in the marine environment [6].

Tanjung Datu which is located in the district of Lundu, Sarawak, is facing the South China Sea on the north and sharing a common oceanic boundary with the neighbouring, Kalimantan of Indonesia. Some 1379 hectares of Tanjung Datu had been gazetted as a National Park since 19th May 1994. Tanjung Datu has long sandy beaches with some rocky areas [8]. According to Wolfenden & Haile (1963), Tanjung Datu is characterized as a gently-sloped sandy shore with stony cliff made of the greenstone [13].

To date, no intensive study on the diversity of seaweed communities has been carried out in Tanjung Datu, Sarawak. This preliminary study hopefully will lead way for a better understanding of seaweed communities in Sarawak. The objectives of this study are to identify and to record the occurrence of seaweeds in the studied area and to provide check-list and seaweed inventory for this area.

MATERIALS AND METHODS

Seaweed specimens were collected from July to August 2003 in Tanjung Datu, along the littoral and sublittoral zone. Sandy beaches, rocky area and coral site were among the sampling area suitable for specimen collection. Specimens were then put into specimen bottles or vials before they were ferried to the laboratory. Details observed from the specimens such as habit, shape and colours of the macroalgae were recorded. Photographic images were taken using Olympus digital model C350 dan C3030.

Two types of storing system namely dry specimen and wet specimen had been used. Wet specimens are suitable for small size samples, which is preserved with 4% formalin in the vial/specimen bottle. For larger samples, the specimens were pressed into herbarium specimens [2]. All specimens were kept at UKMB Herbarium for future reference.

Light microscopes were used to observe detailed characteristics of the species. In some cases, cross section of the plant structure was made. 10% hydrochloric acid had been used to detect the presence of any calcite and calcium carbonate in the specimens. Taxonomic study was done using species description and key to species according to standard reference books [7, 9, 11, 12].

RESULTS AND DISCUSSIONS

A total of 19 species from 4 orders and 9 families of Chlorophyta was recorded. The four order of Chlorophyta recorded were Bryopsidales, Cladophorales, Dasycladales and Ulvales (Table 1). Bryopsidales were the dominant order in terms of species diversity since 10 species were recorded from this group. They contributed to 53% of the total samples collected. Families of Udoteaceae and Caulerpaceae were represented by three species each while Codiaceae and Bryopsidaceae were represented by two species each.

Table 1: List of Species (* new record)

ORDER	FAMILI	SPESIES
Bryopsidales	Bryopsidaceae	<i>Bryopsis indica</i>
		<i>B. pennata</i>
	Caulerpaceae	<i>Caulerpa serrulata</i>
		<i>C. sertularioides</i>
		<i>C. taxifolia</i>
	Codiaceae	<i>Codium papillatum*</i>
		<i>Tydemaniania expeditionis</i>
	Udoteaceae	<i>Avrainvillea erecta</i>
		<i>Avrainvillea</i> sp.
		<i>Udotea javensis</i>
Cladophorales	Cladophoraceae	<i>Chaetomorpha minima</i>
		<i>Cladophora vagabunda</i>
	Anadyomenaceae	<i>Anadyomene stellata*</i>
Dasycladales	Dasycladaceae	<i>Bornetella oligospora*</i>
		<i>Dasycladus</i> sp.*
		<i>Neomeris van-bosseae</i>
	Polyphysaceae	<i>Acetabularia roxasii*</i>
Ulvales	Ulvaceae	<i>Enteromorpha flexuosa</i>
		<i>E. intestinalis</i>

Macroalgae from the order Cladophorales were classified into two families, Cladophoraceae and Anadyomenaceae. Cladophoraceae was represented by two species from the genus *Chaetomorpha* and *Cladophora* while Anadyomenaceae was represented by one species from the genus *Anadyomene*. There were two families of Dasyclades, namely Polyphysaceae and Dasycladaceae. Cladophorales was represented by four species from the genus *Bornetella*, *Dasycladus*, *Neomeris* and *Acetabularia*.

As shown in Table 1, Ulvales showed the least number of species since only 2 species or 11% of the total number of species, were recorded. Both species were from the family *Ulvaceae*, genus *Enteromorpha*. A total of five species were new record for Malaysia. These species were *Acetabularia roxasii*, *Anadyomene stellata*, *Bornetella oligospora*, *Dasycladus* sp. and *Codium papillatum*.

Study by Jenifer (1999) on the seaweeds community in Pantai Lido had recorded only six species of Chlorophyta. This showed that Tanjung Datu have quite a generous number of species despite the small area covered in this study. However, Chlorophyta in Desaru and Pulau Pinang had almost the same number of species as in Tanjung Datu. Both Desaru and Pulau Pinang recorded 16 species while Tanjung Datu recorded 19 species [1, Norziana, 1998]. Study on macroalgae in Malaysian water by Asmida (2002) thus far recorded the highest number of species of Chlorophyta [3]. She has recorded 22 species of Chlorophyta in which majority of them could be found in Pulau Aur, Johore.

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REFERENCES

1. Abang Al-Amin Abang Razali. 1997. Kajian kepelbagaian dan taburan rumpai laut di sekitar Desaru, Johor. Tesis SmSn (kep.) Jabatan Botani, Universiti Kebangsaan Malaysia, Bangi, Selangor. 106 hlm. (Unpublished).
2. Ahmad Ismail. 1995. *Rumpai Laut Malaysia*. Kuala Lumpur: Dewan Bahasa & Pustaka.
3. Asmida Ismail. 2002. Kajian taksonomi, ekologi dan numerical rumpai laut di perairan Malaysia. Tesis SSn (kep.) Jabatan Botani, Universiti Kebangsaan Malaysia, Bangi, Selangor. 126 hlm. (Unpublished).
4. Boney, A.D. 1966. *A Biology of Marine Algae*. London: Anchor Press.
5. Chapman, V.J. 1962. *The Algae*. London: Robert Maclehose and Co.
6. Dawes, C.J. 1981. *Marine Botany*. USA: John Wiley & Sons, Inc.
7. Durairatnam, M. 1961. Contribution to the study of the Marine Algae of Ceylon. *Fisheries Research Station, Department of Fisheries, Ceylon*. Bulletin No. 10: 10-181.
8. Nakashizuka, T. and Stork, N. 2002. *Biodiversity Research Methods: IBOY in Western Pacific and Asia*. Melbourne: McPherson's Printing Group. hlm. 169-174
9. Phang, S. M. 1984. Seaweed Resources of Malaysia. *Wallaceae*. 33: 3-8
10. Teo, L.W & Wee, Y. C. 1983. *Seaweeds of Singapore*. Singapore: Singapore University Press.
11. Trono, G.C & Ganzon-Fortes, E.T. 1988. *Philippine Seaweeds*. Quezon City: Kalayaan Press Mktg. Ent., Inc.

12. Tseng, C.K. 1984. *Common seaweeds of China*. Beijing: Science Press.
13. Wolfenden, E.B. and Haile, N.S. 1963. Sematan and Lundu Area, West Sarawak. Report 1. Geological Survey Department, British Territories in Borneo. Kuching. Government Printing Office.