THE ALGAL COMMUNITIES AROUND SANGROBENGI ISLAND, TAKALAR, SOUTH SULAWESI

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ABSTRACT

An investigation at the Sangrobengi Island, Takalar, South Sulawesi showed the existence of 22 genera of algae with 6 genera of Chlorophyceae, 4 genera of Phaeophyceae and 12 genera of Rhodophyceae. The dominant seaweeds, found during July and August 1993, were *Halimeda opuntia, Caulerpa racemosa, Dictyota dichotoma, Gracilaria lichenoides* and *Hypnea musciformis*. Total density of seaweeds (benthic algae) was 607.82 g wet wt/m^2 with 347.51 g red-algae, 225.62 g green-algae, and 34.69 g brown-algae. A pronounced algal zonation could be seen on Sangrobengi.

INTRODUCTION

Sangrobengi is a small island located at the south-western corner of Sulawesi, off Galesong. Sangrobengi Island consist of coral deposits. The distance from the coast to the reef flat boundary is 50 - 200 m. At low-tide the reef flat is exposed, often exposing the algal areas too. The salinity at Sangrobengi Island is constant (31ppt) and the tide occillates in the range of 2 m.

On the reef flat there were some economic algae, such as *Gracilaria, Hypnea, Gelidium*, and *Eucheuma,* which are consumed by local people. *Eucheuma serra* is one of the favorite food algae of local inhabitants. The distribution of *E. serra* in Indonesia is limited, as opposed to the distribution of other *Eucheuma* species. Besides Indonesia, *E. serra* occurs around Zanzibar (called "Zanzibar weed") and Japan (Levring *et al.*, 1969). The present study deals with taxonomy and distribution of species. It was carrid out with a view to provide baseline data for TMMP studies on food and feeding of herbivorous snails.

MATERIALS AND METHODS

Algae were collected from Sangrobengi Island in June 1993, and placed in a herbarium. The following investigation was made from July to August 1993. Identification was done with reference to Taylor (1960), Dawson (1946), Bosse (1928), and Verheii and Prud'Homme van Reine (1933). Sampling of standing crop was made along transects initiated at the coastline and ending at the fringing coral reef edge. The material was sampled every 30 m in each transect using the square-method with a 5x5 m quadrat. Algae inside the sampling area were harvested, and transferred to a plastic-bag. The depth and the substrate type was noted. Each sample was identified to generic levels and weighed (wet-weight). Dominance was calculated as the square root of the percentage of total densities times the relative densities (Saito *et al.*, 1976).

RESULTS AND DISCUSSION

Diversity and Dominance

The material could readily be separated into 44 taxa of algae which consisted of 22 taxa of red-algae (Rhodophyceae) in 12 genera, 15 taxa of green-algae (Chlorophyceae) in 9 genera, 7 taxa of brown-algae (Phaeophyceae) in 5 genera (Table 1). The algal flora around Sangrobengi Island was very diversified.

The dominant algae at Sangrobengi Island was *Gracilaria lichenoides*, followed by *Caulerpa racemosa, Halimeda opuntia* and *Hypnea*.

Some species of algae at Sangrobengi Island, such as *Gracilaria lichenoides*, *Gelidiopsis* spp., and *Gelidium* spp., *Hypnea musciformis*, and *Eucheuma serra*, all have economic value for local

consumption or trade. Some local inhabitant harvest algae at low tide. Harvesting is done in all seasons of the year.The biggest harvest occurs in July and August. *Eucheuma serra* was harvested in the rainy season from December to February. Other abundant algae were *Ulva* spp., *Halymenia agardhii*, *Gigartina* spp., *Laurentia* spp., *Acanthopora dendroides*, *Amansia glomerata*, *Dictyota* spp., and *Caulerpa* spp.

Table 1. List of Macroalgae from Sangrobengi Island, South Sulawesi.

CHLOROPHYCEAE
Cladophoraceae
Enteromorpha LINK
Enteromorpha intestinalis (L.) LINK
Bryopsidaceae
Bryopsis LAMOUROUX
Bryopsis plumosa (HUDS.) C. AG.
Caulerpaceae
Caulerpa LAMOUROUX
Caulerpa racemosa (FORSSK.) W. v. B.
Caulerpa serrulata (FORSSK.) J. AG.
Codiaceae
Codium STACKHOUSE
Codium isthmocladum VICK
Halimeda LAMOUROUX
Halimeda opuntia LAMX.
Halimeda tuna LAMX.
Udotea LAMOUROUX
Udotea conglutinata C. AG.
Valoniaceae
Valonia GINNANI
Valonia aegagropila C. AG.
Valonia macrophysa KUETZ
Valonia utricularis C. AG.
Boodlea MURR.
Boodlea composita (HARV.) BRAND.
Ulvaceae
Ulva LINN
Ulva expansa (SETCH.) SETCH. & GARD.
Ulva lactuca FORSSK.
Ulva reticulata FORSSK.

PHAEOPHYCEAE
Dictyotaceae
Dictyota LAMOUROUX
Dictyota dichotoma (HUDS.) LAMX.
Padina ADAMSON
Padina australis HAUCK.
Sargassaceae
Sargassum C. AGARDH
Sargassum histrix J. AG.
Sargassum spp.
Turbinaria LAMOUROUX
Turbinaria ornata (TURNER) J.AG.
Turbinaria conoides (J.AG.) KUETZ.
Punctariaceae
Hydroclathrus (BORY)
Hydroclathrus clathratus (BORY) HOWE

RHODOPHYCEAE
Rhodomelaceae
Acanthophora LAMOUROUX
Acanthophora dendroides HARV.
Acanthophora spicifera (VAHL.) BOERG.
Amansia LAMOUROUX
Amansia glomerata C. AG.
Laurencia LAMOUROUX
Laurencia diegoensis DAWSON
Laurencia spelendens HOLL.
Laurencia nidifica AG.
Galaxauraceae
Galaxaura LAMOUROUX
Galaxaura cohaerens Kjell.
Corralinaceae
Amphiroa LAMOUROUX
Amphiroa foliacea LAMX
Gelidiaceae
Gelidium LAMOUROUX
Gelidium rigidum (VAHL.) GREV.
Gelidium cartilagineum (L.) GREV.
Gelidiopsis SCHM.
Gelidiopsis rigida (VAHL.) W.v.B.
Grateloupiaceae
Halymenia C. AG.
Halymenia agardhii DE TONI
Gracilariaceae
Gracilaria GREVILLE
Gracilaria blodgettii HARV.
Gracilaria confervoides (LINN.) GREV.
Gracilaria lichinoides (LINN.) HARV.
Hypneaceae
Hypnea LAMOUROUX
Hypnea cervicornis J. AG.
Hypnea musciformis (WULF.) LAMX.
Hypnea valentiae (TURN.) MONT.
Solieriaceae
Eucheuma J.AG.
Eucheuma edule KUETZ.
Eucheuma serra J. AG.
Gigartinaceae
Gigartina STACKHOUSE
Gigartina sp.

Algal density and relative frequency of classes

Total algal density from the transect was 607.82 g/m^2 wet-weight from which red-algae made up 347.51 g/m^2, green-algae 225.62 g/m^2, and brown-algae 34.69 g/m^2. (Table 2; Fig.1).

Table 2. Total density(g/m²), relative density (%), frequency (%), and taxa dominating at the Sangrobengi Island in terms of standing crop.

TAXA	Density (g/m²)	(%)	Frequency (%)	Dominating
Rhodophyceae				
Achantophora	42.01	6.91	25.00	13.04
Amansia	17.82	2.93	12.50	6.05
Amphiroa	19.09	3.14	50.00	12.53
Eucheuma	49.01	8.06	6.25	7.10
Galaxaura	1.25	0.20	6.25	1.11
Gelidiopsis	14.00	2.30	37.50	9.29
Gigartina	1.27	0.21	6.25	1.15
Gracilaria	77.33	12.72	68.75	29.57
Halomenia	41.37	6.80	25.00	13.04
Hypnea	56.96	9.37	43.75	20.25
Laurencia	21.64	3.56	31.25	10.55
Rhodymenia	7.00	1.15	12.50	3.79
Phaeophyceae				
Dictyota	21.32	3.51	25.00	9.37
Hydroclathrus	1.91	0.31	6.25	1.39
Padina	4.56	0.83	6.25	2.01
Sargassum	11.47	1.88	12.50	4.85
Chlorophyceae				
Bryopsis	0.64	0.13	6.25	0.47
Caulerpa	113.29	18.73	37.50	26.50
Codium	6.36	1.05	12.50	3.62
Enteromorpha	1.59	0.26	6.25	1.27
Halimeda	88.47	14.55	37.50	23.36
Ulva	15.27	2.51	50.00	11.20

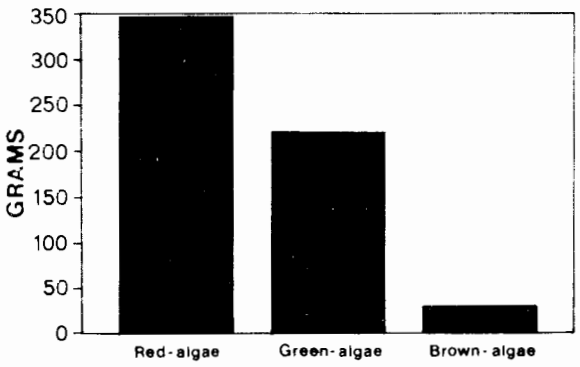

Figure 1. Density comparisons of red-algae, green-algae, and brown-algae at the Sangrobengi Island.

The economically important algae had the following densities: *Gracilaria* 77.33 g/m² (12.72% of total density/m²), *Hypnea* 56.96 g/m² (9.37%), *Eucheuma* 49.01 g/m² (8.06%), and *Gelidiopsis* 14.00 g/m² (2.30%) (Fig. 2).

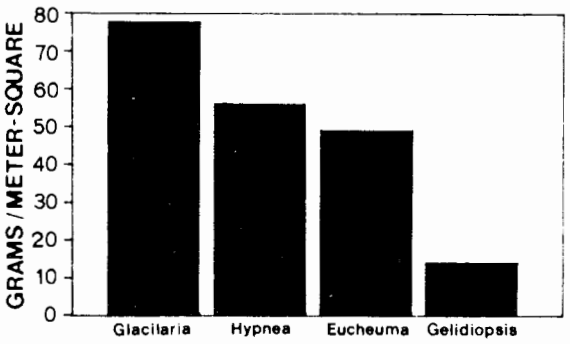

Figure 2. Economically valuable macroalgae at the Sangrobengi Island

The relative frequency of the various classes with respect to the number of genera was red-algae 50%, green-algae 34%, and brown-algae 16%.In terms of relative wet-weight the red-algae made up 57%, green-algae 37%, and brown-algae 6%.

Zonation

The algal zonation at the Sangrobengi Island was determined by the type of substrate: sand, dead-coral reef, or live-coral reef. In the present study area, the inner side of the coral reef edge had a marked algal ridge. The width of the sand zone was about 50-100 m. The algal ridge in the dead-coral zone was about 25-200 m wide, fading towards the living-coral area on the coral reef edge.

The algae that lived on the sand were: *Hypnea, Gracilaria, Ulva, Halimeda, Caulerpa, Boodlea,* and *Enteromorpha*. Behind the sand zone some seagrasses were found: *Enhalus acroides, Halodule triata, Thalassia* sp., and *Cymodocea* sp. Almost all the dominant algae occurred in the dead-coral zone, such as *Gracilaria lichenoides, Hypnea musciformis, Gelidiopsis* spp., and *Acanthophora dendroides*. The species *Laurencia* spp., *Gigartina* sp., *Rhodymenia palmata, Amansia glomerata, Halymenia agardhii*, and *Amphiroa foliaceae* were also found here. *Eucheuma serra* was found on the coral rocks, at the fringing coral reef edge.

The border between the living-coral reef and the dead-coral zone was dominated by *Gracilaria lichenoides*. This algae sticks to seagrass such as *Amphibolis* sp., a marine Spermathopyta growing in the wave-break area.

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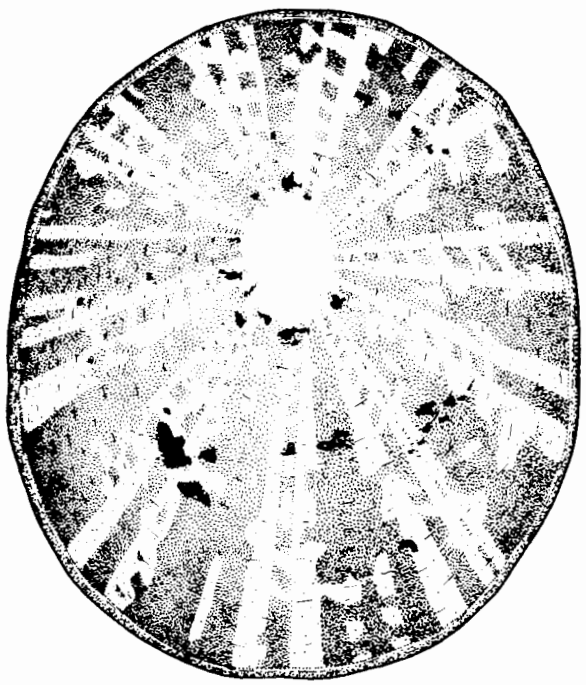

Callana tudinaria (L., 1758). PMBC 1464.
Drawing by Patairat Singdam.