

MARINE BENTHIC GREEN ALGAE OF THE NORTHERN COAST OF PAPUA NEW GUINEA

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Introduction

During the Keiten-maru expeditions to Papua New Guinea in 1989, 1990 and 1991, the present authors investigated the phytogeographical distribution of marine benthic macroalgae of Papua New Guinea. Field observations of marine algae were also carried out for the development of marine algal resources. Algal collection and field observation were made at 18 stations on the northern coast of the mainland. This paper provides a preliminary checklist of the marine benthic green algae and an outline of the field observations of marine algal habitats on the northern coast of Papua New Guinea.

These expeditions were conducted by Kagoshima University Research Center for the South Pacific, and collaborated with the University of Papua New Guinea. The field work at Madang was supported by the Christensen Research Institute.

There has been little investigation carried out on marine benthic macroalgae of Papua New Guinea (HEYDRICH, 1892 ; SCHMIDT, 1928 ; ENOMOTO and AJISAKA, 1984 ; COPPEJANS and MEINESZ, 1988 ; AJISAKA, 1990 ; ENOMOTO, 1990). Recently KING (1990) reported the macroalgal flora associated with the mangrove vegetation of Papua New Guinea.

Materials and Methods

On the northern coast of the Papua New Guinea, algal collections and field observations were made in November 1989 and 1991. Investigated stations and dates were shown in Table 1.

Field works were made by SCUBA diving or snorkeling. Collected materials were immediately fixed with formalin and transported to Japan for analysis. Most of the collected materials were then preserved as dried specimens. All of the specimens are deposited in the herbarium of the Marine Biological Station, Faculty of Science, Kobe University.

Results and Discussion

1. The marine benthic green macroalgae which were collected at each station are listed in Table 2. The present paper presents 44 taxa of Chlorophyceae from the northern coast of mainland Papua New Guinea. In this area, many species of *Halimeda* and *Caulerpa* were observed, while the species of *Microdictyon*, *Cladophoropsis*, and *Acetabularia* which have often been found in tropical waters were not found in the present survey.

The marine green algal flora of the northern coast of Papua New Guinea is similar to that of Southeast Asia, the Micronesian Islands, Philippines, Formosa and the southern part of Japan.

2. The field observations at each investigated area are briefly noted as follows :

- 1). Finschhafen : The sea-water was relatively clear. The biomass of marine macroalgae

Table 1. Investigated station and date

No.	Investigated Station	Date
01.	Finschhafen (2 points), Morobe	Nov. 24, 1989
02.	Salamaua Peninsula (3 points), Morobe	Nov. 26, 1989
03.	Dallman Passage, Madang	Nov. 27, 1989
04.	Nagada Harbour, Madang	Nov. 28, 1989
05.	Kranket Island, Madang	Nov. 29, 1989
06.	Wonad Island, Madang	Nov. 29, 1989
07.	Tab Island, Madang	Nov. 29, 1989
08.	Masamoz Island, Madang	Nov. 14, 1991
09.	Yazi Island, Madang	Nov. 14, 1991
10.	Tab Island, Madang	Nov. 14, 1991
11.	Rasch Pass (2 points), Madang	Nov. 15, 1991
12.	Nagada Island, Madang	Nov. 16, 1991
13.	Wongat Island, Madang	Nov. 16, 1991
14.	Jais Aben R. H. , Madang	Nov. 17, 1991
15.	Cape Moem (4 points), Wewak	Nov. 22, 1991
16.	Muschu Island (2 points), Wewak	Nov. 23, 1991
17.	Kairiru Island (2 points), Wewak	Nov. 25, 1991
18.	Muschu Island, Wewak	Nov. 25, 1991

was rather poor. Only small growths of marine algae such as *Halimeda*, *Anadyomene*, *Dictyosphaeria*, *Sargassum*, and *Tubinaria* were found. Useful marine algae were not observed.

- 2). Salamaua : The sea-water was clean. The marine algae were fairly abundant at the northern point of the peninsula, while at the southern part, algal growth was quite poor. In this region, useful marine algae were not observed.
- 3). Madang : The sea-water was generally clear. In shallow water, the algal biomass was extremely poor. At a depth of 5-25m, green algae such as *Halimeda*, *Chlorodesmis*, *Dictyosphaeria*, and *Caulerpa* were observed. Useful red algae such as *Hypnea* and *Euchuma* were found, although their biomass was extremely small.
- 4). Wewak : At Cape Moem, sea-water was relatively clear. Large amounts of brown algae, such as *Sargassum* and *Padina* were found while other marine algae were scarce. On Kairiru Island and Muschu Island, the sea-water was very clean. Twenty-seven taxa of green algae were collected, and their biomass found to be relatively rich. However, useful algae were not observed.
3. The present investigation reveals that along the northern coast of Papua New Guinea the useful marine macroalgae for algal fishery resources are very poor in both quality and quantity. The seacoast of the northern mainland drops so steeply that there are few wide and broad intertidal and subtidal zones where marine algae normally grow abundantly.

We have investigated the presence of the algal resources which are used for food and industry, such as *Gracilaria*, *Hypnea*, *Euchuma* etc. which are utilized as the material of carageenan, and also *Caulerpa*, *Meristotheca* etc. used as aliment. The useful algal

population throughout the investigated areas is too poor in both of quantity and quality to be considered as algal resources. However, the poor growth of algae does not seem to be caused by the marine environmental factors; temperature, water quality, light conditions, salinity and nutrients, but by the topographical factors. Therefore, by using mariculture, a moderate harvest yield of useful algae could be expected, if suitable sites are chosen, adequate facilities are provided and suitable algal species are selected. Due to the fact that on the northern coast of Papua New Guinea the seacoast drops very steeply, it seems that the pumping-up deep-water system or the OTEC system would be suitable for algal mariculture in this area. The successful result of mariculture of an edible marine alga *Laminaria* with the pumped-up deep-water system was reported in Japan (FUJITA, 1990).

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