

NOTES ON MARINE ALGAE OF TAIWAN^(1,2)YOUNG-MENG CHIANG⁽³⁾

Abstract: Twenty-one species of benthic marine algae are listed as new for Taiwan and its offshore islands, consisting of six Chlorophyceae, six Phaeophyceae and nine Rhodophyceae.

INTRODUCTION

Marine algae on the coasts of Taiwan and its offshore islands often show interesting distribution patterns because typically southern species are absent or rarely found in northern regions and some northern species do not occur in southern waters. In recent years the author has collected many marine algal specimens along the coasts of Taiwan and its offshore islands (Fig. 1) and have found many species which have not been previously recorded in this region.

The following list of algae supplements the lists of Chiang (1960, 1962a and b) and Shen and Fan (1950) by recording species that have not previously been col-

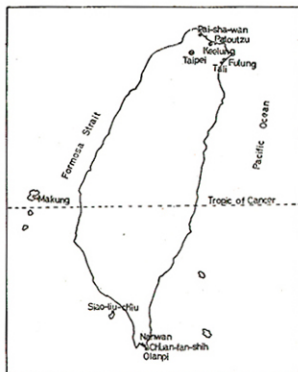


Fig. 1. Map of Taiwan showing collecting localities

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- (3) Institute of Oceanography, National Taiwan University.

lected in Taiwan and its offshore islands. All specimens are in the herbarium of the National Taiwan University unless otherwise indicated.

LIST OF SPECIES

CHLOROPHYCOPHYTA

Chaetophoraceae

Endophyton ramosum Gardner was found as an endophyte within the basal portion of the blade of *Gracilaria* sp. growing on rocks in a shaded area of the upper littoral region on the western side of Patoutzu, May 20, 1968 (Chiang 68049). This alga grows within the cortical portion of the host thallus, which in external view is irregularly shaped, expanded, and has dark-green spots. It was originally described from San Francisco, California (Gardner, 1909), and has not been recorded in the western Pacific.

Ulvaceae

Ulva japonica (Holmes) Papenfuss was collected at Tali, April 20, 1962 (Chiang 811) and May 2, 1972 (Chiang 72073). This was growing on rocks under about 1.5 to 2 meters of water in a shaded quiet place. The external shape of my plants are quite different from the Japanese plants which are illustrated by Okamura (as *Letterstedtia japonica*, 1936) and Chihara (1970). The plants at hand are generally oblong to elliptical in outline and usually irregularly lobed. This alga is monoecious and sexual reproduction is isogamous. Gametes were released after the plant was kept in enriched seawater for 3 days. Kamura (1963) thinks that Okinawa-jima, Ryukyu is perhaps the northern limit of its geographic distribution.

Ulva angusta Setchell et Gardner was collected on rocks of the upper littoral region at Ch'uan-fan-shih, April 7, 1972 (Chiang 72017). This species was originally described from Northern California to Central California. Chihara (1969), based on Japanese material, published a new species *Ulva arasakii* which is, according to his discussion, very closely related to *U. angusta* in many internal and external characters. From my specimens as well as from the figures and descriptions of these two species given by Setchell and Gardner (1920) and Chihara (1969) respectively I doubt that the characters which were used by Chihara are sufficient for separating these two species of *Ulva*. I, therefore, am inclined to believe that these two species are the same, and the differences exhibited by them are merely due to ecological conditions.

Monostromaceae

Monostroma latissimum (Kützting) Wittrock was found growing on rocks in exposed areas of the upper littoral region at Nanwan, October 18, 1971 (Chiang 71083). Two species of *Monostroma*, i.e. *M. nitidum* and *M. latissimum*, have been found in Taiwan. It is interesting to find that the geographical distribution of these two species in Taiwan is very different. So far the former has been found growing only in northern Taiwan during January to March and the latter is limited only to the southern part of the Island.

Caulerpaceae

Halimeda macrotoba Decaisne was collected at Ch'uan-fan-shih, October 18, 1971 (Chiang 71049) and Nanwan, September 9, 1972 (Chiang 72241, young plants). It was found growing in sandy, tidal pool of the upper littoral zone. This green

alga was originally described from the Red Sea and is widely distributed in tropical Indian and Pacific Oceans (cf. Womersley *et al.*, 1970, p. 282). Southern Taiwan is perhaps the northern limit of its geographic distribution.

Codiaceae

Codium reediae Silva was found growing on rocks in the lower littoral zone at Ch'uan-fan-shih, April 7, 1972 (Chiang 72021). This species was originally described from Oahu, Hawaii and this is the first time that this alga has been collected from the western Pacific.

PHAEOPHYCOPHYTA

Scytosiphonaceae

Scytosiphon lomentarius (Lyngb.) J. Agardh was collected at Patoutzu, Keelung, May 16, 1972 (Chiang 72057). It was found growing on rocks of the middle littoral region.

Dictyotaceae

Padina durvillei Bory was collected at Ch'uan-fan-shih, April 7, 1972 (Chiang 72023). This alga was growing on rocks in the tidal pool of the lower littoral zone. Dawson (1944) found that this alga is perennial in the Gulf of California and is adaptable to great variations of water temperature known to exist in its habitats. This species was originally reported from Chile and is widespread along the whole coast from Costa Rica to the Gulf of California. In the western Pacific this alga has been previously recorded from Hong Kong by Setchell (1931).

Spatoglossum pacificum Yendo was found cast ashore at Pai-sha-wan, July 7, 1968 (Chiang 68041). This species has not been reported south of Japan before.

Cystoseiraceae

Hormophysa triquetra (C. Agardh) Kützinger was collected at Siao-liu-ch'iu Island, September 8, 1972 (Chiang 72169). This species is widely distributed in the Red Sea, Indian and Pacific Oceans. In the western Pacific it has been collected from the South China Sea, Phillipine Islands, and Ryukyu Archipelago (cf. Papenfuss, 1967).

Sargassaceae

Sargassum glaucescens J. Agardh was collected at Ch'uan-fan-shih, April 7, 1972 (Chiang 72019) and Nanwan, April 7, 1972, (Chiang 72049). It is frequently found cast ashore in quantity or drifting in great masses along the coast between Nanwan and Ch'uan-fan-shih during April and May.

Sargassum serratifolium C. Agardh was collected at Ch'uan-fan-shih, April 7, 1972 (Chiang 72022). This alga was found growing on rocks of the lower littoral region or cast ashore.

RHODOPHYCOPHYTA

Chaetangiaceae

Galaxaura oblongata (Ellis et Solander) Lamouroux was found growing on rocks of the lower littoral region at Oluanpi, March 20, 1971 (Chiang 71210). Only one plant has been collected. It is a gametophyte and its internodes are 0.3 to 0.8 cm long and 0.5 to 0.7 mm in diameter.

Galaxaura tenera Kjellman was collected at Makung, Penghu, July 30, 1960 (Chiang 720) and Ch'uan-fan-shih, October 18, 1971 (Chiang 71055). This alga was growing separately on rocks of the lower littoral region. This species was formerly reported as *Galaxaura clavigera* Kjellman and *G. reprecula* Kjellman in Taiwan.

Corellinaceae

Dermatolithon tumidulum Foslie was found growing abundantly on the thallus of *Grateloupia ramosissima* at Fulung, June 25, 1971 (Chiang 71039).

Cryptonemiaceae

Grateloupia okamuraii Yamada was collected at Tali, April 20, 1970 (Chiang 7056), March 4, 1974 (Chiang 71183) and Patoutzu, March 16, 1972 (Chiang 72041). This alga was found growing abundantly on rocks of the middle littoral region. The shape and size of this plant is very variable depending on the locality where the algae grow. Some of my plants are very similar to *Grateloupia phuquocensis* Tanaka et Phạm-hoàng in external features, therefore, I believe that *G. phuquocensis* may be only a variant of *G. okamuraii* caused by different environmental conditions.

Polyopes polyideoides Okamura was found growing abundantly on exposed rocks of the upper and middle littoral regions at Fulung, June 25, 1971 (Chiang 71038).

Endocladaceae

Gloiopeltis tenax (Turner) J. Agardh was collected at Tali, March 4, 1971 (Chiang 71179) and was found growing on exposed rocks of the middle littoral region.

Gracilariaceae

Gracilaria arcuata Zanardini was collected at Nanwan, September 9, 1972 (Chiang 72246). This alga which grown on rocks in the tidal pool of upper and middle littoral regions has previously been known from Ryukyu Islands, South Vietnam and the Red Sea.

Gracilaria euchemooides Harvey was found creeping in crevices of coral of the middle littoral region at Nanwan, September 9, 1972 (Chiang 72247). This alga also has been recorded from Ryukyu Islands and South Vietnam.

Gracilaria incurvata Okamura was collected at Nanwan, September 9, 1972 (Chiang 72248). This alga was found growing on rocks in the tidal pool of middle littoral region. This species seems quite common in southern Taiwan.

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