

Marine Macro-Algal Flora of Orchid Island, Taiwan

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Abstract

The marine benthic macro-algae from Orchid Island, Taiwan, are documented. Of the 162 species listed, 42 of Chlorophyta, 19 of Phaeophyta, 101 of Rhodophyta, 15 are newly recorded, *Derbesia marina*, *Bryopsis ryukyuensis*, *Caulerpa filicoides* var. *andamanensis*, *Rhipilia nigrescens*, *Acetabularia ryukyuensis*, *Cryptonemia denticulata*, *Fauchea* sp., *Platoma* sp., *Sebdenia* sp., *Griffithsia subcylindrica*, *Reinboldiella robusta*, *Acrosorium* cf. *polyneurum*, *Martensia lewisiae*, *Chondria dangeardii*, *Tolypicladia calodictyon*, for Taiwan, and 33 are illustrated.

Key words: Orchid Island, Taiwan, checklist, marine macroalgae, Chlorophyta, Phaeophyta, Rhodophyta

1. Introduction

The marine macroalgal flora of Taiwan, an island bisected by the Tropic of Cancer, is considered both tropical and subtropical, and has been studied by numerous phycologists (summarized in Lewis and Norris 1987). The recorded number of species reaches over 500 (Lewis and Norris 1987; Chiang and Wang 1987; Huang 1990, 1991, 1999a, b, Huang & Chang 1999; Wang and Chiang 1993, Wang et al. 1993; Lin et al. 2002; also see Chiang 1992 for a review). The number of macroalgal species for the region has recently increased due to intensive investigations this past decade (Huang 1991, 1999a, Huang & Chang 1999; Wang et al. 1993), and numerous new species continue to be discovered (Lewis et al. 1996; Lin & Fredericq 2003, Lin et al. 2002, Lin unpublished data).

Orchid Island is a volcanic island, located between Taiwan and the northern Philippines in the warm water of the west Indo-Pacific region (E 121035', N 21055', Fig. 1). The seashore of the island is surrounded mainly by coral reef mixed with rocks, pebbles and sands. The seawater temperature is affected by the Kuroshio current's warm temperature and high salinity. The mean temperature of sea surface is above 26°C year-

round (see <http://duck2.oc.ntu.edu.tw/odbcht.html>).

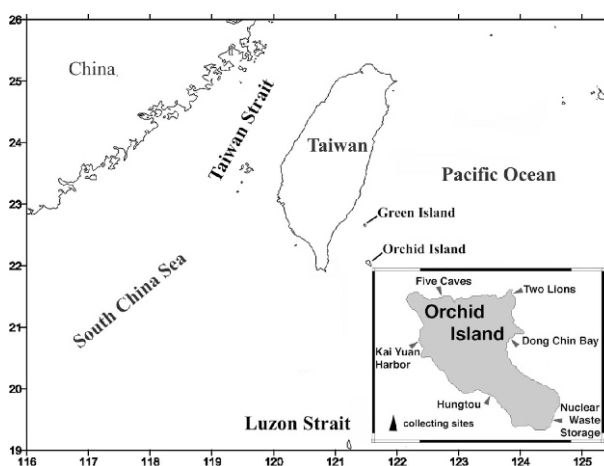


Fig. 1. the map of Orchid Island showing the collecting sites.

The marine benthic flora of Orchid Island is affected by the Kuroshio current.

One-hundred and sixty-two marine benthic macroalgae species (42 of Chlorophyta, 19 of Phaeophyta, 101 of Rhodophyta) are recorded from the author's recent collections from the Island during April 2002 through May 2009. Among the collections, 15 species are previously unrecorded for Taiwan.

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2. Materials and Methods

Collections were made by snorkeling and SCUBA. Collecting sites specimens and materials used in the morphological study were preserved in 5-10 % formalin/seawater, and then stored in 5% formalin/seawater or pressed as herbarium sheets, and stored in the seaweed laboratory of the National Taiwan Ocean University, Keelung.

3. Results and Checklist

***: represents a new record for Taiwan.**

DIVISION CHLOROPHYTA

Family Monostromataceae

Monostroma nitidum Wittrock

Type locality: Australien, China.

Collecting sites: coll. SM Lin, 17.iv.2002., Five Caves; coll. SM Lin, 27.iii.2008, Two Lions; coll. SM Lin, 28.iii.2009, Helmat Rock.

Family Ulvaceae

Enteromorpha prolifera (Müller) J. Agardh

Type locality: Denmark.

Collecting sites: coll. SM Lin, 17.iv.02., Five Caves.

Enteromorpha compressa (Linnaeus) Nees

Type locality: Europe.

Collecting sites: coll. SM Lin, 17.iv.02., Five Caves.

Ulva conglobata Kjellman

Syntype localities: various in Japan.

Collecting sites: coll. SM Lin, 17.iv.02., Five Caves; ; coll. SM Lin, 27.iii.2008 & 22.v.2009, Two Lions; coll. SM Lin, 28.iii.2009 & 22.v.2009, Helmat Rock.

Ulva fasciata Delile

Type locality: Alexandria, Egypt.

Collecting sites: coll. SM Lin, 19.iv.02., Five Caves; ; coll. SM Lin, 27.iii.2008 & 22.v.2009, Two Lions; coll. SM Lin, 28.iii.2009 & 22.v.2009, Helmat Rock.

Ulva lactuca Linnaeus

Type locality: in Oceano.

Collecting sites: coll. SM Lin, 17.iv.02., Five Caves; ; coll. SM Lin, 27.iii.2008 & 22.v.2009, Two Lions; coll. SM Lin, 28.iii.2009 & 22.v.2009, Helmat Rock.

Whole-mount material and hand sections were stained in 1% aniline blue acidified with 1% HCl and mounted in Glycerol (Lin et al. 2001a). Microphotographs were taken on a Polaroid DMC Ie digital camera, on an Olympus BX60 microscope with a Polaroid DMC Ie digital camera, or by using an underwater camera. Digital images were edited and assembled in plates using Photoshop v. 4.0.

Family Anadyomenaceae

Anadyomene wrightii Harvey ex Gray

Type locality: Ryukyuretto, Japan.

Collecting sites: coll. SM Lin, 19.iv.2002, 27.iii.2008 & 22.v.2009, Two Lions.

Microdictyon nigrescens (Yamada) Setchell

Type locality: Taiwan.

Collecting sites: coll. SM Lin, 19.iv.2002, 27.iii.2008 & 22.v.2009, Two Lions.

Valoniopsis pachynema (Martens) Børgesen

Syntype localities: Sumatra, Indonesia.

Collecting sites: coll. SM Lin, 19.iv.2002, 27.iii.2008 & 22.v.2009, Houtou.

Family Cladophoraceae

Chaetomorpha crassa (C. Agardh) Kützinger

Syntype localities: Italy and England.

Collecting sites: coll. SM Lin, 19.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

Chaetomorpha spiralis Okamura

Type locality: Nemoto, Chiba Prefecture, Japan.

Collecting sites: coll. SM Lin, 19.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

Cladophora meridionalis Sakai et Yoshida in Yoshida

Type locality: Okinawa, Japan.

Collecting sites: coll. SM Lin, 19.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

Family Siphonocladaceae

Boergesenia forbesii (Harvey) J. Feldmann

Syntype localities: Ryukyuretto, Japan and Sri Lanka.

Collecting sites: coll. SM Lin, 19.iv.2002, 27.iii.2008 & 22.v.2009, Two Lions.

Cladophoropsis herpestica (Montagne) Howe

Type locality: New Zealand.

Collecting sites: coll. SM Lin, 18.iv.2002, 27.iii.2008 & 22.v.2009, Nuclear Waste Storage.

Family Derbesiaceae

**Derbesia marina* (Lyngbye) Solier 1846

Type locality: Kvivig, Faeroes.

Collecting sites: coll. SM Lin, 19.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

Note: This constitutes a new record for Taiwan. The specimens collected are all gametophytes (= *Halicystis ovalis* stage). The plants are oval, ball shape with rhizoids at base (Fig. 7D), 1.5-1.2 cm in height, greenish in color.

Family Valoniaceae

Chamaedoris orientalis Okamura et Higashi in Okamura (Fig. 2E)

Type locality: Orchid Island, Taiwan.

Collecting sites: coll. SM Lin, 19.iv.2002, 27.iii.2008 & 22.v.2009, Two Lions.

Dictyosphaeria cavernosa (Forsskål) Børgesen

Syntype localities: 'Gomfodae' (Al-Qunfudhad), Saudi Arabia; Mokha, Yemen.

Collecting sites: coll. SM Lin, 19.iv.2002, 27.iii.2008 & 22.v.2009, Hungtou.

Dictyosphaeria versluysii Weber-van Bosse

Syntype localities: several reefs in the Malaysian Archipelago.

Collecting sites: coll. SM Lin, 17.iv.2002, 28.iii.2008 & 22.v.2009, Five Caves.

Note: Shen and Fan (1950) cited it as *Dictyosphaeria bokotensis* Yamada.

Valonia aegagropila C. Agardh.

Type locality: Venezia, Italy.

Collecting sites: coll. SM Lin, 19.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

Valonia utricularis (Ruth) C. Agardh

Type locality: Mediterranean.

Collecting site: coll. SM Lin, 17.iv.02., Hungtou; 27.iii.2008 & 22.v.2009, Five Caves.

Ventricaria ventricosa (C. Agardh) Olsen et West

Type locality: Guadeloupe.

Collecting sites: coll. SM Lin, 19.iv.2002, 27.iii.2008 & 22.v.2009, Two Lions.

Order Bryopsidales

Family Bryopsidaceae

Bryopsis harveyana J. Agardh

Type locality: Florida, Friendly Island.

Collecting sites: coll. SM Lin, 17.iv.02., Hungtou; 27.iii.2008 & 22.v.2009, Five Caves.

**Bryopsis ryukyuensis* Yamada 1934 (Fig. 7B)

Type locality: Okinawa, Japan.

Collecting sites: coll. SM Lin, 17.iv.02., Hungtou; 27.iii.2008 & 22.v.2009, Five Caves.

Note: This represents a new record for Taiwan

Family Codiaceae

Codium geppiorum Schmidt

Syntype localities: Kai Islands and Celebes, Indonesia.

Collecting sites: coll. SM Lin, 17.iv.02., Hungtou; 27.iii.2008 & 22.v.2009, Five Caves.

Family Caulerpaceae

**Caulerpa filioides* Yamada var. *andamanensis* W.R. Taylor 1966 (Figs 7A, 7C)

Type locality: Northeast of Ritchie's Archipelago, Andaman Islands.

Collecting sites: coll. SM Lin, 17.iv.02., Hungtou; 27.iii.2008 & 22.v.2009, Five Caves.

Note: This constitutes a new record for Taiwan.

Caulerpa racemosa (Forsskål) J. Agardh var. *macrophysa* (Sonder ex Kützting) Taylor

Type locality: Central America.

Collecting sites: coll. SM Lin, 28.iv.02., 28.iii.2008 & 22.v.2009, Hungtou.

Caulerpa microphysa (Weber-van Bosse) J. Feldmann

Type locality: Macassar, Celebes, Indonesia.

Collecting sites: coll. SM Lin, 19.iv.2002, 27.iii.2008 & 22.v.2009, Two Lions.

Caulerpa peltata Lamouroux

Type locality: Antilles, West Indies.

Collecting sites: coll. SM Lin, 17.iv.02., Hungtou; 27.iii.2008 & 22.v.2009, Five Caves.

Caulerpa serrulata (Forsskål) J. Agardh var. *serrulata* f. *lata* (Weber-van Bosse) Tseng

Syntype localities: Red Sea; Sumbawa, Indonesia; Mariana Islands; Tonga; Guadeloupe, West Indies.

Collecting site: coll. SM Lin, 19.iv.2002, 27.iii.2008 & 22.v.2009, Two Lions.

Caulerpa webbiana f. *tomentella* (Harvey ex J. Agardh) Weber-van Bosse

Type locality: Tonga.

Collecting sites: coll. SM Lin, 19.iv.2002, 27.iii.2008 & 22.v.2009, Two Lions

Family Udoteaceae

Avrainvillea erecta (Berkeley) A. Gepp et E. Gepp

Type locality: Philippine Islands.
Collecting sites: coll. SM Lin, 17.iv.02., Hungtou;
27.iii.2008 & 22.v.2009, Five Caves.

Chlorodesmis fastigiata (C. Agardh) Ducher

Type locality: Mariana Islands.
Collecting sites: coll. SM Lin, 19.iv.2002,
27.iii.2008 & 22.v.2009, Two Lions.

Rhipidosiphon javensis Montagne

Type locality: Leiden Island, Java, Indonesia.
Collecting sites: coll. SM Lin, 28.iv.02., Hungtou;
27.iii.2008 & 22.v.2009, Two Lions.

**Rhipilia nigrescens* Coppejans et Prud'homme van Reine 1990 (Figs 2D, 7E)

Type locality: Tukand Besi Island, Indonesia.
Collecting sites: SML #OI 4-16-2002-8-CY,
17.iv.02., Chai-Yen harbor.

Note: This constitutes a new record for Taiwan.

Tydimannia expeditionalis Weber-van Bosse (Fig. 2C)

Syntype localities: various in Indonesia. Collecting sites: SML #OI 4-16-2002-7-CY, 17.iv.02., Chai-Yen harbor.

Udotea argentea Zanardini (Fig. 2B)

Type locality: Suez, Egypt.
Collecting sites: SML #OI 4-16-2002-4-CY, 17.iv.02., Chai-Yen Harbor.

Udotea fragilifolia Tseng et Dong

Type locality: Xisha Islands, China.
Collecting sites: SML #OI 4-16-2002-32-CY,
16.iv.02., Chai-Yen harbor.

Family Halimedaceae

Halimeda opuntia (Linnaeus) Lamouroux

Lectotype locality: Jamaica.
Collecting sites: SML #OI 4-16-2002-9-CY,
16.iv.02., Chai-Yen harbor; #OI 4-17-2002-4-DCB,
17.iv.02., Dong-Ching Bay. SM Lin, 28.iv.02.,
Hungtou; 27.iii.2008 & 22.v.2009, Two Lions.

Family Acetabulariaceae

**Acetabularia ryukyuensis* Okamura et Yamada in Okamura 1932 (Fig. 2A)

Type locality: Ryukyu, Japan.
Collecting sites: SML #OI 4-16-2002-11-CY,
16.iv.02., Chai-Yen harbor; #OI 4-19-2002-1-HT,
19.iv.02., Hungtou. SM Lin, 28.iv.02., Hungtou;

27.iii.2008 & 22.v.2009, Two Lions.

Note: This represents a new record for Taiwan.

Acetabularia parvula Solms-Laubach

Syntype localities: Tropical India; Celebes, Indonesia.

Collecting sites: SML #OI 4-16-2002-11-CY,
16.iv.02., Chai-Yen harbor; #OI 4-19-2002-1-HT,
19.iv.02., Hungtou. SM Lin, 28.iv.02., Hungtou;
27.iii.2008 & 22.v.2009, Two Lions.

Bornetella nitida Sonder

Type locality: Tonga Islands.
Collecting sites: SML #OI 4-19-2002-25-TL,
17.iv.2002., 27.iii.2008 & 22.v.2009, Two Lions.

Neomeris vanbosseae Howe

Type locality: Sikka, Flores, Indonesia.
Collecting sites: SML #OI 4-29-2002-25-FC,
29.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

DIVISION PHAEOPHYTA

Family Ectocarpaceae

Ectocarpus laurenciae Yamada

Type locality: Orchid Island, Taiwan.
Collecting sites: SML #OI 4-19-2002-25-TL,
17.iv.2002., 27.iii.2008 & 22.v.2009, Two Lions.

Family Scytosiphonaceae

Colpomenia sinuosa (Martens ex Roth) Derbés et Solier

Type locality: Spain.
Collecting sites: SML #OI 4-19-2002-25-TL,
17.iv.2002., 27.iii.2008 & 22.v.2009, Two Lions.

Hydroclathrus clathratus (C. Agardh) Howe

Type locality: uncertain (see Silva et al. 1996).
Collecting sites: SML #OI 4-18-2002-19-NWS,
18.iv.02., Nuclear Waste Storage.

Family Dictyotaceae

Dictyopteris repens (Okamura) Børgesen

Type locality: Truk Islands, Caroline Islands.
Collecting sites: SML #OI 4-18-2002-11-NWS,
18.iv.02., Nuclear Waste Storage.

Dictyopteris undulata Holmes

Type locality: Japan.
Collecting sites: SML #OI 4-29-2002-25-FC,
29.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

Dictyota divaricata Lamouroux

Type locality: Mediterranean coast of France.
Collecting sites: SML #OI 4-29-2002-25-FC,
29.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

Dictyota sp.

Collecting sites: SML #OI 4-29-2002-25-FC,
29.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

***Lobophora variegata* (Lamouroux) Womersley ex Oliveiria**

Type locality: Antilles, West Indies.

Collecting sites: SML #OI 4-29-2002-25-FC,
29.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

***Padina australis* Hauck**

Type locality: Cape York, Queensland, Australia.

Collecting sites: SML #OI 4-16-2002-16-CY,
16.iv.02., Chai-Yen harbor; #OI 4-17-2002-13-FC,
29.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

***Padina minor* Yamada**

Type locality: Cape O-luan, Taiwan.

Collecting sites: SML #OI 4-17-2002-12-FC,
29.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

***Zonaria stipitata* Tanaka et Nozawa**

Type locality: Japan.

Collecting sites: SML #OI 4-16-2002-15-CY,
16.iv.02., Chai-Yen harbor.

Family Sargassaceae

***Sargassum crassifolium* J. Agardh**

Syntype localities: Cape of Good Hope, South
Africa; New Ireland; New Zealand.

Collecting sites: SML #OI 4-17-2002-19-FC,
29.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

***Sargassum cristaeifolium* C. Agardh**

Type locality: Unknown (see Silva et al. 1996:
665).

Collecting sites: SML #OI 4-17-2002-18-FC,
29.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

Note: *Sargassum duplicatum* (J. Agardh) J. Agardh
is regarded as a synonym of *S. cristaeifolium* by
Silva et al. (1996).

***Sargassum polycystum* C. Agardh**

Type locality: Sunda Strait, Indonesia.

Collecting sites: SML #OI 4-17-2002-20-FC,
29.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

***Sargassum siliquosum* J. Agardh**

Syntype localities: Jakarta, Java, Indonesia;
Singapore.

Collecting sites: SML #OI 4-17-2002-17-FC,
29.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

***Turbinaria conoides* (J. Agardh) Kützting**

Syntype localities: ad oras Hindostaniae; China; Sri
Lanka; Western Australia.

Collecting sites: SML #OI 4-18-2002-8-NWS,
18.iv.02., Nuclear Waste Storage.

***Turbinaria trialata* (J. Agardh) Kützting**

Syntype localities: Brazil; West Indies.

Collecting sites: SML #OI 4-17-2002-4-HT,
17.iv.02., Hungtou.

***Turbinaria ornata* (Turner) J. Agardh**

Type locality: not specified (see Silva et al. 1996)

Collecting sites: SML #OI 4-17-2002-3-DCB,
17.iv.02., Dong-Ching Bay.

Family Cystoseiraceae

***Hormophysa cuneiformis* (J.F. Gmelin) Silva**

Type locality: Suez, Egypt.

Collecting sites: SML #OI 4-19-2002-2-HT,
19.iv.02., Hungtou.

RHODOPHYTA

Family Liagoraceae

***Ganonema farinosum* (Lamouroux) Fan et Wang**

Type locality: Suez, Egypt.

Collecting sites: SML #OI 4-18-2002-1-CY,
18.iv.02., Chai-Yen harbor.

***Liagora boergesenii* Yamada**

Type locality: Yonakuni Island, Ryukyu Islands.

Collecting sites: SML #OI 4-18-2002-2-CY,
18.iv.02., Chai-Yen harbor.

***Izziella kuroshioensis* Lin, Yang & Huisman**

Type locality: Hai Kuo, Pingtung Co., S Taiwan

Collecting sites: SML #OI 4-28-2002-1-HT,
28.iv.02., Hungtou.

***Liagora setchellii* Yamada**

Type locality: Naha, Ryukys Islands, Japan.

Collecting sites: SML #OI 4-28-2002-4-HT,
17.iv.02., Hungtou.

***Yamadaella cenomyce* (Decaisne) Abbott**

Type locality: Manila, Luzon, Philippines

Collecting sites: SML #OI 4-17-2002-30-FC,
29.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

Family Galaxauraceae

***Actinotrichia fragilis* (Forsskål) Børgesen**

Type locality: Mokha, Yemen.

Collecting sites: SML #OI 4-16-2002-27-CY,
16.iv.02., Chai-Yen harbor; #OI 4-17-2002-11-
HT, 17.iv.02., Hungtou.

***Galaxaura filamentosa* Chou**

Type locality: Clari?n Island, Revillagigedo
Archipelago, Mexico.

Collecting sites: SML #OI 4-17-2002-59,
17.iv.02., Hungtou.

***Galaxaura marginata* (Ellis et Solander)**

Lamouroux

Type locality: Bahamas.

Collecting sites: SML #OI 4-16-2002-31-CY, 16.iv.02., Chai-Yen harbor; #OI 4-17-2002-21-HT, 17.iv.02., Hungtou.

***Galaxaura obtusata* (Ellis et Solander)**

Lamouroux

Type locality: Bahamas.

Collecting sites: SML #OI 4-16-2002-30-CY, 16.iv.02., Chai-Yen harbor.

***Tricleocarpa fragilis* (Linnaeus) Huisman et Townsend**

Type locality: West Indies.

Collecting sites: SML #OI 4-16-2002-34-CY, 16.iv.02., Chai-Yen harbor; #OI 4-17-2002-16-HT, 17.iv.02., Hungtou.

***Tricleocarpa cylindrica* (J. Ellis et Solander)**

Huisman et Borowitzka

Type locality: West Indies.

Collecting sites: SML #OI 4-28-2002-HT, 28.iv.02., Hungtou.

Family Bonnemaisoniaceae

***Asparagopsis taxiformis* (Delilie) Trevisan**

Type locality: Alexandria, Egypt

Collecting sites: SML #OI 4-17-2002-10-DCB, 17.iv.02., Dong-Ching Bay; #OI 4-17-2002-12-HT, 17.iv.02., Hungtou.

Family Gelidiaceae

***Gelidiella acerosa* (Forsskål) J. Feldmann et G. Hamel**

Type locality: Mokha, Yemen

Collecting sites: SML #OI 4-17-2002-22-FC, 29.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

***Gelidium cf. pusillum* (Stackhouse) Le Jolis**

Type locality: Devon, England.

Collecting sites: SML #OI 4-16-2002-28-CY, 16.iv.02., Chai-Yen harbor.

***Gelidium* sp.**

Collecting sites: SML #OI 4-17-2002-51-FC, 29.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

Family Gigartinaceae

***Chondrocanthus intermedius* (Suringar)**

Hommersand in Hommersand et al.

Type locality: "in mari japonica".

Collecting sites: SML 28.iv.2002, Hungtou.

Unplaced genus of the Gigartinales

***Corynocystis prostrata* Kraft in Kraft et al. (Fig. 2F)**

Type locality: Bulusan, Luzon, Philippines

Collecting sites: SML #OI 4-18-2002-41-NWS, 18.iv.02., Nuclear Waste Storage.

Note: This species was first reported from the Kenting National Park, southern Taiwan, by Lin (2002).

Family Halymeniaceae

***Carpopeltis mailardii* (Montagne et Millardet) Chiang**

Type locality: R?union.

Collecting sites: SML #OI 4-17-2002-48-FC, 29.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

***Chrysomenia okamurae* Yamada et Segawa**

Lectotype locality: Jachijo-jima, Izu-shoto, Japan.

Collecting sites: SML #OI 4-17-2002-6-HT, 29.iv.2002, 27.iii.2008 & 22.v.2009, Hungtou.

Note: Huang (1991) cited it as *Cryptarachne okamurae* (Yamada & Segawa) Zhang & B.M.Xia.

****Cryptonemia denticulata* J. Agardh (Fig. 3A)**

Type locality: Atlantic coast of Africa.

Collecting sites: SML #OI 4-16-2002-26-CY, 16.iv.02., Chai-Yen harbor; #OI 4-17-2002-27-FC, 29.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

Note: This constitutes a new record for Taiwan.

****Fauchea* sp. (Fig. 3B)**

Collecting sites: SML #OI 4-17-2002-28-FC, 29.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

Note: This constitutes a new record for Taiwan and may represent a new species.

***Halymenia durvillei* Bory de Saint-Vincent**

Type locality: New Ireland, Papua New Guinea.

Collecting sites: SML #OI 4-17-2002-7-DCB, 17.iv.02., Dong-Ching Bay; #OI 4-17-2002-19-HT, 17.iv.2002, 27.iii.2008 & 22.v.2009, Hungtou.

***Yonagunia formosana* (Okamura) Kawaguchi et Masuda (Fig. 3C)**

Type locality: Kotosho [Hung-t'uo] (= Orchid Island), Taiwan.

Collecting sites: SML #OI 4-17-2002-8, 17.iv.02., Dong-Ching Bay; #OI 4-17-2002-35-FC, 29.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

Note: Wang and Chiang (1993) cited it as *Carpopeltis formosana* Okamura. Kawaguchi et al (2004) recently transferred *Carpopeltis formosana* to the genus *Yonagunia*.

Family Hypneaceae

Hypnea cervicornis J. Agardh

Type locality: unknown (see Abbott 1999, p. 115).

Collecting sites: SML #OI 4-17-2002-49-FC, 17.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

Hypnea charoides Lamouroux

Type locality: Nov. Holl. (= Australia).

Collecting sites: SML #OI 4-19-2002-12-TL, 19.iv.02., 27.iii.2008 & 22.v.2009, Two Lions.

Note: Okamura (1931) cited it as *Hypnea seticulosa* J. Agardh.

Hypnea pannosa J. Agardh

Type locality: San Agustín, Mexico.

Collecting sites: SML #OI 4-17-2002-13-DCB, 17.iv.02., Dong-Ching Bay; #OI 4-17-2002-18-HT, 17.iv.02., Hungtou.

Note: Okamura (1931) cited it as *Hypnea nidulans* Setchell.

Family Dumontiaceae

Dudresnaya japonica Okamura

Type locality: Japan.

Collecting sites: SML #OI 4-16-2002-23-CY, 16.iv.02., Chai-Yen harbor.

Gibsmithia hawaiiensis Doty (Fig. 3G)

Type locality: Honolulu, Oahu, Hawaiian Archipelago.

Collecting sites: SML #OI 4-16-2002-47-CY, 16.iv.02., Chai-Yen harbor.

Family Schizymeniaceae

**Platoma* sp. (Fig. 3E)

Collecting sites: SML #OI 4-16-2002-49-CY, 16.iv.02., Chai-Yen harbor.

Note: This constitutes a new record for Taiwan and may represent a new species.

Titanophora weberae Børgesen

Type locality: Salee Strait, Irian Barat, Indonesia.

Collecting sites: SML #OI 4-16-2002-50-CY, 16.iv.02., Chai-Yen harbor.

Note: Wang et al. (1993) cited it as *Titanophora pulchra* Dawson.

Family Peysonneliaceae

Peyssonnelia conchicola Piccone et Grunow

Type locality: Red Sea.

Collecting sites: SML #OI 4-16-2002-6-CY, 16.iv.02., Chai-Yen harbor.

Note: Yoshida (1998) regarded *P. rubra* sensu

Okamura as the synonym of *P. conchicola*.

Peyssonnelia caulifera Okamura (Fig. 4A)

Type locality: Japan.

Collecting sites: SML #OI 4-16-2002-38-CY, 16.iv.02., Chai-Yen harbor; #OI 4-167-2002-2-DCB, 17.iv.02., Dong-Ching Bay.

Peyssonnelia distenta (Harvey) Yamada

Type locality: Japan.

Collecting sites: SML 28.iv.02., 27.iii.2008 & 22.v.2009, Hungtou.

Family Phylloporaceae

Ahnfeltiopsis flabelliformis (Harvey) Masuda

Type locality: Bay of Bengal, India.

Collecting sites: SML #OI 4-17-2002-45-FC, 17.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

Family Rhizophyllidaceae

Portieria hornemannii (Lyngbye) Silva in Silva, Meñez et Moe

Type locality: Red Sea

Collecting sites: SML #OI 4-16-2002-2-CY, 16.iv.02., Chai-Yen Harbor; #OI 4-17-2002-8-DCB, 17.iv.02., Dong-Ching Bay.

Family Sarcodiaceae

Sarcodia ceylanica Harvey ex Kützinger

Type locality: Sri Lanka.

Collecting sites: SML #OI 4-29-2002-5-FC, 29.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

Family Sebdeniaceae

**Sebdenia* sp. (Fig. 3A)

Collecting sites: SML #OI 4-17-2002-1, 17.iv.02., Dong-Ching Bay.

Note: This represents a new record for Taiwan and is being studied separately.

Family Solieriaceae

Eucheuma serra (J. Agardh) J. Agardh

Type locality: Mauritius Island.

Collecting sites: SML #OI 4-19-2002-16-TL, 19.iv.2002, 27.iii.2008 & 22.v.2009, Two Lions.

Meristotheca coacta Okamura

Type locality: Japan.

Collecting sites: SML #OI 4-19-2002-12-HT, 19.iv.02., Hungtou.

Family Plocamiaceae

***Plocamium serrulatum* Okamura (Fig. 3F)**

Type locality: Hungtou, Orchid Island, Taiwan.
Collecting sites: SML #OI 4-16-2002-48-CY, 16.iv.02., Chai-Yen harbor; #OI 4-17-2002-9-DCB, 17.iv.02., Dong-Ching Bay; #OI 4-19-2002-12-HT, 19.iv.02., Hungtou.

Family Corallinaceae

***Amphiroa dilatata* Lamouroux**

Type locality: Australasie.
Collecting sites: SML #OI 4-17-2002-5-DCB, 17.iv.02., Dong-Ching Bay.

***Amphiroa foliacea* Lamouroux in Quoy et Gaimard**

Type locality: Iles Mariannes.
Collecting sites: SML #OI 4-16-2002-33-CY, 16.iv.02., Chai-Yen harbor.

***Cheilosporum acutilobum* (Decaisne) Piccone**

Type locality: Mauritius Island.
Collecting sites: SML #OI 4-16-2002-24-CY, 16.iv.02., Chai-Yen harbor; #OI 4-17-2002-10-HT, 17.iv.02., Hungtou.

***Jania adhaerens* Lamouroux**

Type locality: Mediterranean.
Collecting sites: SML #OI 4-16-2002-41-CY, 16.iv.02., Chai-Yen harbor.

***Jania decussatodichotoma* (Yendo) Yendo**

Type locality: Japan.
Collecting sites: SML #OI 4-17-2002-8-HT, 17.iv.02., Hungtou; #OI 4-17-2002-44-FC, 17.iv.02., Five Caves.

***Mastophora rosea* (C. Agardh) Setchell**

Type locality: Guam.
Collecting sites: SML #OI 4-17-2002-6-DCB, 17.iv.02., Dong-Ching Bay; #OI 4-17-2002-13-HT, 17.iv.02., Hungtou..

***Mesophyllum mesomorphum* (Foslie) Adey**

Type locality: Bermuda.
Collecting sites: SML #OI 4-17-2002-47-FC, 17.iv.2002, 27.iii.2008 & 22.v2009, Five Caves.

***Mesophyllum simulans* (Foslie) Lemoine**

Type locality: Ko Darlak, Ko Chang Archipelago, Thailand.
Collecting sites: SML #OI 4-16-2002-29-CY, 16.iv.02., Chai-Yen harbor.

Family Gracilariaceae

***Gracilaria coronopifolia* J. Agardh**

Type locality: Oahu, Hawaiian Islands.

Collecting sites: SML #OI 4-29-2002-19-FC, 29.iv.2002, 27.iii.2008 & 22.v2009, Five Caves.

***Gracilaria spinulosa* (Okamura) Chang et Xia (Fig. 4C)**

Type locality: Tainan, Taiwan.

Collecting sites: SML #OI 4-17-2002-53-FC, 17.iv. 2002, 27.iii.2008 & 22.v2009, Five Caves.

***Gracilaria punctata* (Okamura) Yamada**

Type locality: Japan.

Collecting sites: SML #OI 4-17-2002-23-FC, 17.iv. 2002, 27.iii.2008 & 22.v2009, Five Caves.

***Gracilaria taiwanensis* S.-M. Lin, L.-C. Liu & Payri (Fig. 4B)**

Type locality: New Caledonia.

Collecting sites: SML #OI 4-17-2002-50-FC, 17.iv. 2002, 27.iii.2008 & 22.v2009, Five Caves.

Note: Okamura (1931) cited it as *G. denticulata* (Kützinger) Weber-van Bosse. However, Shen and Fan (1950) treated it as *G. purpurascens* J. Agardh.

***Gracilaria* sp. (Fig. 4D)**

Collecting sites: SML 29.iv.02., Five Caves.
Note: This may represent a new species and is being under study.

Family Champiaceae

***Champia parvula* (C. Agardh) Harvey**

Type locality: Cadiz, Spain.
Collecting sites: SML 28.iv. 2002, 27.iii.2008 & 22.v2009, Hungtou.

Family Rhodymeniaceae

***Asteromenia peltata* Huisman et Millar**

Type locality: Venezuela.
Collecting sites: SML #OI 4-16-2002-46-CY, 16.iv.02., Chai-Yen harbor.
Note: This species was recorded from southern Taiwan by Huisman and Millar (1996).

***Botryocladia skottsbergii* (Børgesen) Levring**

Type locality: Easter Island.
Collecting sites: SML 28.iv. 2002, 27.iii.2008 & 22.v2009, Hungtou.

***Ceratodictyon spongiosum* Zanardini**

Syntype localities: Madagascar; New Caledonia; Singapore.

Collecting sites: SML #OI 4-17-2002-11-DCB, 17.iv.02., Dong-Ching Bay.

***Gelidiopsis repens* (Kützinger) Weber-van Bosse**

Type locality: Wagap, New Caledonia.

Collecting sites: SML #OI 4-18-2002-10-NWS, 18.iv.02., Nuclear Waste Storage.

***Gelidiopsis variabilis* (Greville) Schimitz**

Type locality: Madras, India.

Collecting sites: SML #OI 4-17-2002-21-FC, 17.iv. 2002, 27.iii.2008 & 22.v2009, Five Caves.

Family Ceramiaceae

***Balliella crouanioides* (Itono) Itono et Tanaka (Fig. 4E)**

Type locality: Kagoshima, southern Japan.

Collecting sites: SML #OI 4-16-2002-19-CY, 16.iv.02., Chai-Yen harbor; #OI 4-17-2002-56-FC, 17.iv. 2002, 27.iii.2008 & 22.v2009, Five Caves.

Note: This was first reported from Taiwan by Lin (2002).

***Centroceras clavulatum* (C. Agardh) Montagne**

Type locality: Callao, Peru.

Collecting sites: SML #OI 4-16-2002-19-CY, 16.iv.02., Chai-Yen harbor; #OI 4-18-2002-23-NWS, 18.iv.02., Nuclear Waste Storage.

***Centroceras minutum* Yamada**

Type locality: Ant Atoll, central Pacific.

Collecting sites: SML #OI 4-17-2002-14-HT, 17.iv. 2002, 27.iii.2008 & 22.v2009, Hungtou.

***Sciurothamnion* sp. (Fig. 5B)**

Collecting sites: SML #OI 4-16-2002-1-CY, 16.iv.02, Chai-Yen Harbor.

Note: This may represent a new species and is being under study separately.

***Ceramium cimbricum* Peterson in Rosenvinge**

Lectotype locality: Ejerslev R?n, Limfjorden, Denmark.

Collecting sites: SML #OI 4-16-2002-44-CY, 16.iv.02., Chai-Yen harbor.

***Ceramium flaccidum* (Kützinger) Ardissonne**

Type locality: County Clare, Ireland.

Collecting sites: SML #OI 4-16-2002-18-CY, #OI 4-16-2002-43-CY, 16.iv.02., Chai-Yen harbor; #OI 4-17-2002-52-FC, 17.iv. 2002, 27.iii.2008 & 22.v2009, Five Caves.

***Dasyphila plumaroides* Yendo**

Type locality: Orchid Island, Taiwan.

Collecting sites: SML #OI 4-16-2002-5-CY, 16.iv.02., Chai-Yen Harbor; #IO 4-19-2002-11-HT, 19.iv.02., Hungtou.

****Griffithsia subcylindrica* Okamura 1930 (Figs 4F, 7F, 7G)**

Type locality: Hachijo-jima, Izu-shoto, Japan.

Collecting sites: SML #OI 4-16-2002-20-CY, 17.iv.02., Chai-Yen harbor; #OI 4-19-2002-23-TL, 19.iv. 2002, 27.iii.2008 & 22.v2009, Two Lions.

Note: This constitutes a new record for Taiwan.

***Haloplegma duperreyi* Montagne**

Type locality: Martinique, West Indies.

Collecting sites: SML 28.iv.2002, Hungtou.

****Reinboldiella robusta* Itono 1977 (Fig. 5A)**

Collecting sites: SML #OI 4-16-2002-21-CY, 16.iv.02., Chai-Yen harbor; #OI 4-17-2002-20-HT, 17.iv. 2002, 27.iii.2008 & 22.v2009, Hungtou.

Note: This represents a new record for Taiwan.

This diminutive species, 2-3 mm in height, is commonly epiphytic on *Halymenia durvillei* and *Portieria hornemannii*.

***Wrangelia tanegana* Harvey**

Type locality: Tanega-shima, Osumi-shoto, Japan.

Collecting sites: SML #OI 4-16-2002-39-CY, 16.iv.02., Chai-Yen harbor; #OI 4-17-2002-54-FC, 17.iv. 2002, 27.iii.2008 & 22.v2009, Five Caves.

***Wrangelia velutina* (Sonder) Harvey**

Type locality: Western Australia.

Collecting sites: SML #OI 4-16-2002-3-CY, 16.iv.02., Chai-Yen Harbor.

Family Dasyaceae

***Heterosiphonia crispella* (C. Agardh) Wynne**

Type locality: St Croix, Virgin Islands.

Collecting sites: coll. S-M Lin, 16.iv.02., Chai-Yen Harbor.

Note: this species was first reported from the Kenting National Park, southern Taiwan, by Lin (2002).

Family Delesseriaceae

****Acrosorium cf. polyneurum* Okamura 1936 (Fig. 5C)**

Collecting sites: SML #OI 4-18-2002-17-NWS, 18.iv.02., Nuclear Waste Storage.

Note: this species represents a new record and genus for Taiwan.

***Claudea batanensis* Tanaka**

Type locality: Batan Island, Philippines.

Collecting sites: SML #OI 4-16-2002-36-CY, 16.iv.02., Chai-Yen harbor; #OI 4-19-2002-17-HT, 19.iv.02., Hungtou.

***Drachiella liaoi* Lin, Lewis et Fredericq (Fig. 5D)**

Type locality: Banana Bay, Kenting National Park, Taiwan

Collecting sites: SML #OI 4-18-2002-15-NWS, 18.iv.02., Nuclear Waste Storage.

Note: This species was recently described by Lin et al. (2002) based on the collections from the Kenting National Park, southern Taiwan and southern Philippines.

****Martensia lewisiae* Lin, Hommersand et Fredericq (Fig. 5E)**

Collecting sites: SML #OI 4-18-2002-16-NWS, 18.iv.02., Nuclear Waste Storage.

Note: Lin et al. (2004) recently described it from Sail Rock, Kenting National Park, southern Taiwan.

***Nitophyllum hommersandii* Lin et Fredericq (Fig. 5F)**

Type locality: Sail Rock, Kenting National Park, Taiwan.

Collecting sites: SML #OI 4-18-2002-30-NWS, 18.iv.02., Nuclear Waste Storage.

Note: Lin and Fredericq (2002) recently described it as new to science.

***Vanvoorstia coccinea* Harvey ex J. Agardh**

Type locality: Sri Lanka.

Collecting sites: SML #OI 4-18-2002-11-CY, 18.iv.02., Chai-Yen harbor.

***Zellera tawallina* Martens (Fig. 6A)**

Type locality: Klein Tawalli Island, Halmahera, Indonesia.

Collecting sites: SML #OI 4-16-2002-22-CY, 16.iv.02., Chai-Yen harbor.

Family Rhodomelaceae

***Acanthophora aokii* Okamura**

Type locality: Taiwan.

Collecting sites: SML #OI 4-18-2002-18-NWS, 18.iv.02., Nuclear Waste Storage.

***Acanthophora spicifera* (Vahl) Børgesen**

Type locality: St. Croix, Virgin Islands.

Collecting sites: SML 29.iv. 2002, 27.iii.2008 & 22.v2009, Five Caves.

***Acrocystis nana* Zanardini**

Type locality: Cape Datu, boundary between Sarawak, Malaysia and West Kalimantan, Indonesia.

Collecting sites: SML 28.iv.2002, 27.iii.2008 & 22.v2009, Hungtou.

***Bostrychia tenella* (Lamouroux) J. Agardh**

Type locality: St. Croix, Virgin Islands.

Collecting sites: SML #OI 4-17-2002-15-HT, 17.iv. 2002, 27.iii.2008 & 22.v2009, Hungtou.

***Chondria armata* (Kützting) Okamura**

Type locality: "Insula Wagap", New Caledonia.

Collecting sites: SML #OI 4-19-2002-24-TL, 19.iv. 2002, 27.iii.2008 & 22.v2009, Two Lions.

****Chondria dangeardii* Dawson**

Type locality: Dakar, Senegal.

Collecting sites: SML #OI 4-18-2002-33-NWS, 18.iv.02., Nuclear Waste Storage.

Note: this species represents a new record for Taiwan.

***Chondria* sp. 1 (Fig. 6C)**

Collecting sites: SML #OI 4-19-2002-14-HT, 19.iv.2002, 27.iii.2008 & 22.v2009, Hungtou.

***Chondria* sp. 2 (Fig. 6B)**

Collecting sites: SML #OI 4-16-2002-35-CY, 16.iv.02., Chai-Yen harbor.

***Chondrophyucus papillosus* (C. Agardh) Garbary & Harper**

Type locality: Mochhae, Red Sea.

Collecting sites: SML #OI 4-29-2002-7-FC, 29.iv. 2002, 27.iii.2008 & 22.v2009, Five Caves.

***Chondrophyucus undulatus* (Yamada) Garbary et Harper**

Type locality: Japan.

Collecting sites: SML 29.iv.2002, 27.iii.2008 & 22.v2009, Five Caves.

***Digenea simplex* (Wulfen) C. Agardh**

Type locality: Trieste, Italy.

Collecting sites: SML #OI 4-19-2002-9-HT, 19.iv.2002, 27.iii.2008 & 22.v2009, Hungtou.

***Herposiphonia subdisticha* Okamura**

Type locality: Chiba, Japan.

Collecting sites: SML #OI 4-17-2002-9-HT, 17.iv.2002, 27.iii.2008 & 22.v2009, Hungtou.

***Laurencia palisada* Yamada**

Type locality: Kotosho (Orchid Island), Taiwan.

Collecting sites: SML #OI 4-19-2002-10-TL, 19.iv.2002, 27.iii.2008 & 22.v2009, Two Lions.

***Laurencia pinnata* Yamada**

Type locality: Kotosho (Orchid Island), Taiwan.

Collecting sites: SML #OI 4-28-2002-DCB, 28.iv.02., Dong-Chin Bay.

***Laurencia tropica* Yamada**

Type locality: Saipan, Micronesia.

Collecting sites: SML #OI 4-29-2002-FC,

29.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

***Melanamansia glomerata* (C. Agardh) R. Norris**

Type locality: Hawaii.

Collecting sites: SML #OI 4-17-2002-26-FC,
17.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

***Neurymenia fraxinifolia* (Martens ex Turner) J. Agardh**

Type locality: East Indies.

Collecting sites: SML #OI 4-17-2002-38-FC,
17.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.;
#OI 4-18-2002-3-NWS, 18.iv.02., Nuclear Waste
Storage.

***Osmundaria obtusiloba* (Martens ex C. Agardh)
R. Norris**

Type locality: Brazil.

Collecting sites: SML #OI 4-17-2002-24-FC,
17.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

***Polysiphonia* sp.**

Collecting sites: SML #OI 4-16-2002-37-CY,
16.iv.02., Chai-Yen harbor.

***Spirocladia barodensis* Børgesen (Fig. 6D)**

Type locality: India.

Collecting sites: SML #OI 4-16-2002-40-CY,
16.iv.02., Chai-Yen harbor; #OI 4-19-2002-16-HT,
19.iv.02., Hungtou.

Note: this species was recently reported from the
Kenting National Park by Lin (2002).

****Tolypocladia calodictyon* (Harvey ex Kützinger)
Silva (Fig. 7H)**

Type locality: Tonga.

Collecting sites: SML #OI 4-17-2002-42-FC,
17.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

Note: This species represents a new record for
Taiwan.

***Tolypocladia glomerulata* (C. Agardh) Schmitz**
Type locality: Western Australia.

Collecting sites: SML #OI 4-17-2002-43-FC,
17.iv.2002, 27.iii.2008 & 22.v.2009, Five Caves.

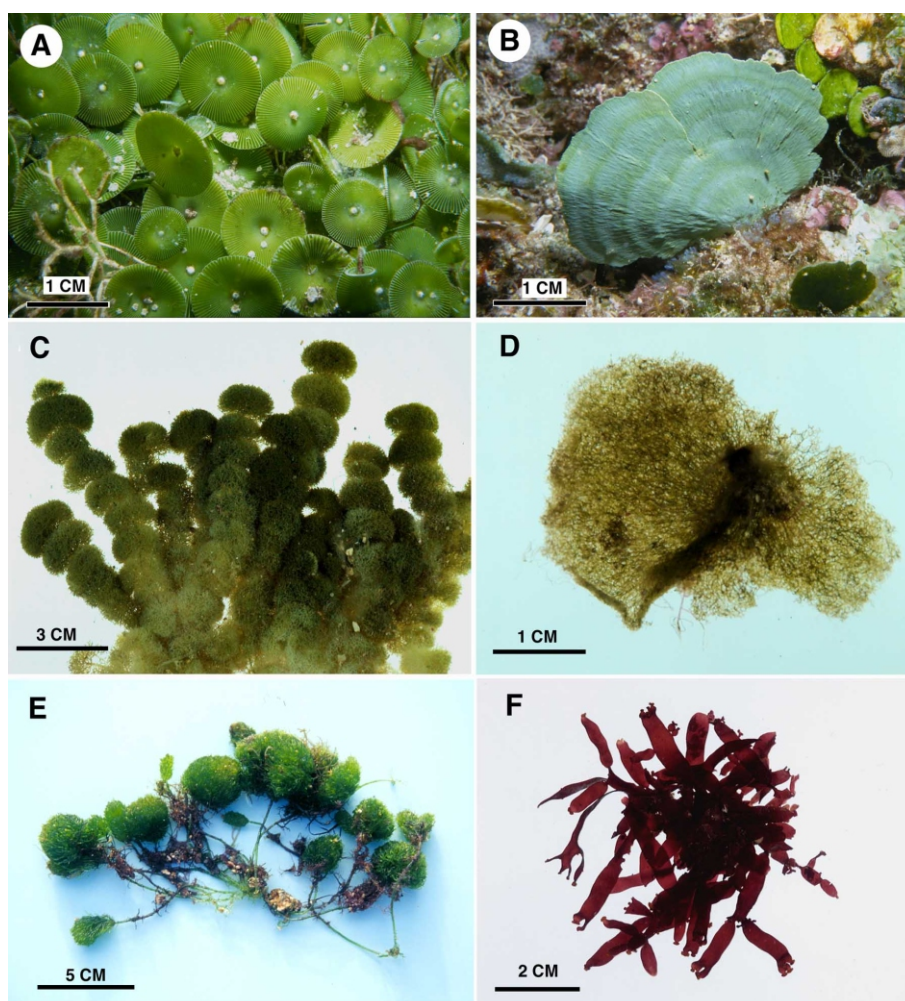


Fig. 2. A. an underwater shot of *Avrainvillea ryukyuensis*. B. an underwater shot of *Udotea argentea*. C. *Tydemania expeditionis*. D. *Rhipilia nigrescens*. E. *Chamaedoris orientalis*. F. *Corynocystis prostrata*.

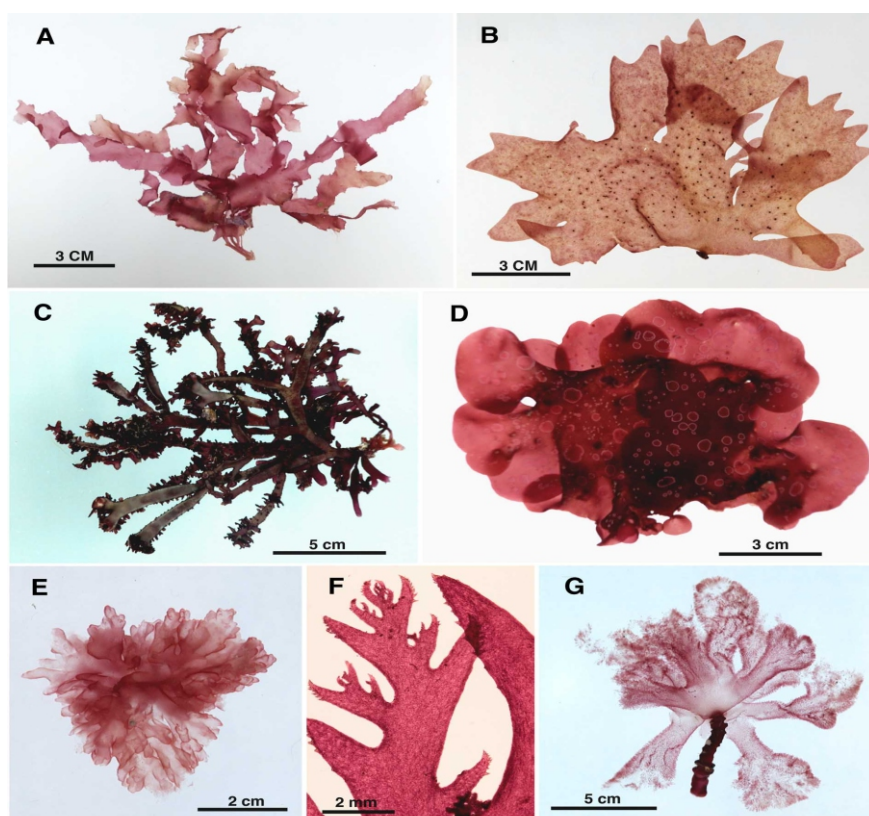


Fig. 3. A. *Cryptomenia denticulata*. B. *Fauchea* sp. C. *Yonagunia formosana*. D. *Sebdenia* sp. E. *Platoma* sp. F. *Plocamium serrulatum*. G. *Gibsmithia hawaiiensis*.

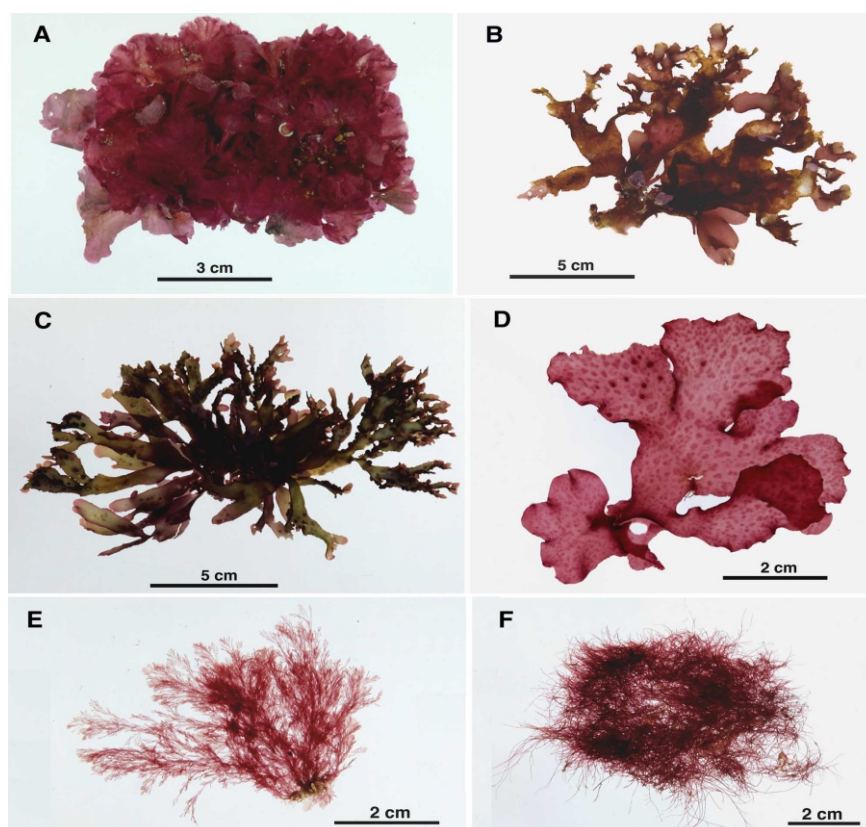


Fig. 4. A. *Peyssonnelia caulifera*. B. *Gracilaria taiwanensis*. C. *Gracilaria spinulosa*. D. *Gracilaria punctata*. E. *Balliella crouanioides*. F. *Griffithsia subcylindrica*.

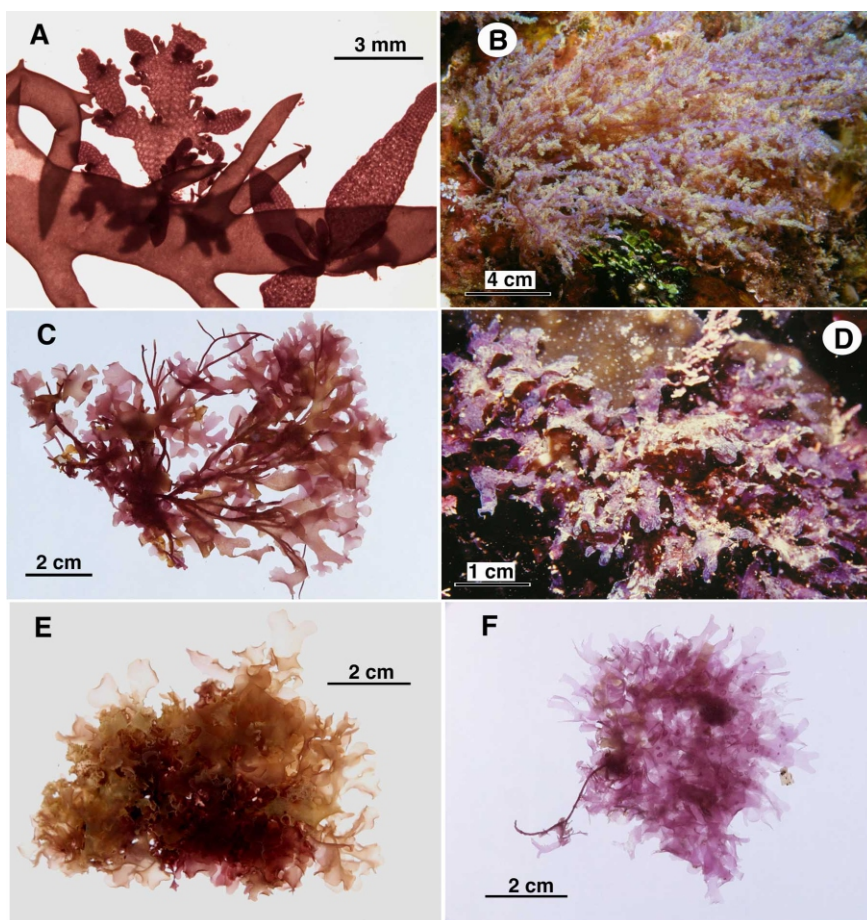


Fig. 5. A. *Reinboldiella robusta*. B. *Scrurothamnion* sp. C. *Acrosorium* cf. *polyneurum*. D. *Drachiella liaonii*. E. *Martensia lewisiae*. F. *Nitophyllum hommersandii*.

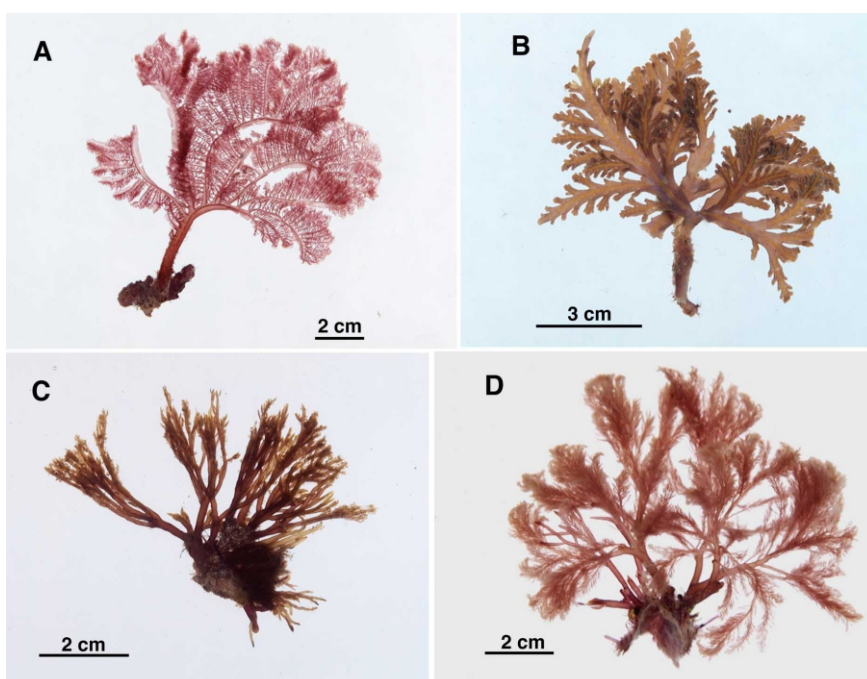


Fig. 6. A. *Zelleria tawallina*. B. *Chondria* sp.1. C. *Chondria* sp.2. D. *Spirocladia calodictyon*.

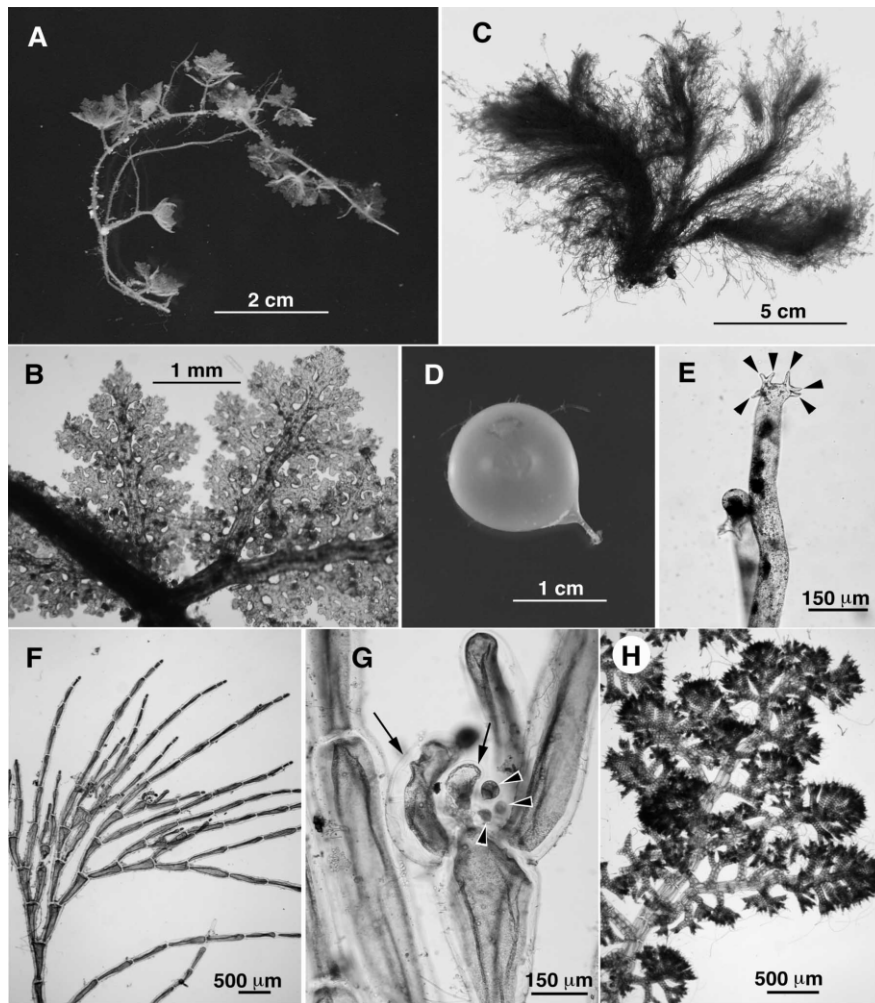


Fig. 7. A-B. *Caulerpa filicoides* var. *andamanensis*. A. Habit. B. Close up of partial whirl branches. C. *Bryopsis ryukyuensis*. D. *Derbesia marina*, "Halicystis ovalis" stage. E. *Rhipilia nigrescens*, close-up of tenacula showing 6 prongs (arrowheads). F-G. *Griffithsia subcylindrica*. F. Close up of upper part of branches showing cylindrical cells. G. Close-up of tetrasporangia (arrowheads) surrounded by involucral cells (arrows).

4. #Discussion

The first comprehensive report on the marine benthic flora of Orchid Island was made by Okamura (1931) in which 92 species were recorded, including 29 Chlorophyta, 16 Phaeophyta and 47 Rhodophyta. Since then, the marine macroalgal flora of the island was also studied by several phycologists (Yamada 1931a, b; Ishijima 1941, 1942; Tanaka 1936, 1944; Okamura 1936; Shen and Fan 1950; Wang and Chiang 1993, Wang et al. 1993; Huang and Chang 1999). Shen and Fan (1950) recorded another two species new to Orchid Island [*Spermothamnion cladophorae* Chiang (1993) reported 110 species of marine

Yamada et Tanaka, *Carpopeltis angusta* (Okamura) Okamura] and added some previously recorded species [*Sargassum rostratum* J. Agardh ex Okamura, *Erythrotrichia biseriata* Tanaka, *Galaxaura elongata* J. Agardh (=G. rugosa), *Galaxaura veprecula* Kjellman (= G. marginata), *Rhodopeltis borealis* Yamada, *Rhodopeltis? gracilis* Yamada, *Laurencia palisada* Yamada] reported by Japanese phycologists (Yamada 1931a, b; Okamura 1936; Tanaka 1936, 1944). Wang et al. (1993) added three new records, *Udotea fragilifolia* Tseng et Dong, *Porphyra vietnamensis* Tanaka and *Titonophora pulchra* Dawson, for Taiwan from Orchid Island. Later, Wang and algae from Lan Yu (= Orchid Island). Huang and Chang (1999) added one new record, *Avrainvillea*

riukiensis Yamada, for Taiwan from Lan Yu. These yielded 160 recorded species from Orchid Island (see Wang and Chiang 1993; Huang and Chang 1999). Appendix I is the species found by Wang and Chiang (1993) but not the author, whereas Appendix II is the taxa listed by Okamura (1931) but not the author neither Wang and Chiang (1993). The total up-to date account of the marine macroalgae from Orchid Island is now reached 221 species, including 64 Chlorophyta, 28 Phaeophyta and 129 Rhodophyta.

Previous studies have shown that the extant distribution of the marine macroalgal flora in southeastern Taiwan is mainly affected by the Kuroshio Current (Lewis and Norris 1987; Wang and Chiang 1993, 2001; Lin 2002). This study reinforces the notion that the species composition of the marine flora in southeastern Taiwan shares many species with that of the northern Philippines and the Indo-Pacific basin (see Kraft et al. 1999; Coppejans et al. 1999; Silva et al. 1996; Yoshida 1998). Undoubtedly, the number of marine macroalgae in Taiwan will continue to increase as more collecting is carried out and unidentified specimens on herbarium shelves are critically examined.

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