

# A Guide to the Common Edible and Medicinal Sea Plants of the Pacific Islands

By

**Dr Irene Novaczek**

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## **Preface to the Series**

The majority of Pacific Island countries rely on the sea as a major source of food. While women are not involved in offshore deep sea fishing, they are active in collecting and gleaning shellfish and other edible sea species from the nearshore areas and inside the reef. Women also prepare fish either for sale or home consumption. In this preparation process, women are involved in cleaning, gutting, cooking and selling various seafoods. In many atoll countries, women are also involved in the preservation of seafood by drying or smoking. In view of women's role in fisheries activities and the importance of seafood in the region, it is vital that women learn not only the correct handling methods for seafood, but also how to use marine resources wisely for the future.

This manual is part of the Community Fisheries Training Series, and is designed to meet the wide need for community fisheries training in the Pacific, particularly for women. The series was originally developed for the SPC Community Education Training Centre (CETC). The fisheries course at CETC began in 1999 as a joint effort with the USP Marine Studies Programme. It was a response by the Centre to meet the needs of women in the region to improve their skills in small-scale fisheries activities. The USP Post Harvest Fisheries Project was also working to provide post harvest fisheries training for men and women in the region; hence the joint venture between the two institutions in 1999. The two groups of women who have since been through the course have found the training interesting and useful.

Since its inception in 1999, the course has been taught jointly by the USP Marine Studies Programme staff in Fiji Islands and the SPC Community Fisheries Section staff based in New Caledonia. Funding has come from Canada, New Zealand, Australia and the International Ocean Institute - Pacific Islands.

I wish to acknowledge the assistance of and major contribution by Tony Chamberlain, Lecturer of the USP Marine Studies Programme/Post Harvest Fisheries Project; Patricia Tuara, previous SPC Community Fisheries Adviser; Lyn Lambeth, SPC Community Fisheries Officer and other trainers in previous years.

I am grateful to the Marine Studies Programme technical staff who have given their time to training women and also the USP for facilities and equipment used during the course. I acknowledge Dr Jimmie Rodgers, Senior Deputy Director-General of SPC in Suva and the SPC Management for supporting CETC, by providing facilities and resources towards the implementation of the Fisheries course. We hope you enjoy this manual in the series.

Best wishes for a successful fisheries training programme.

Nu'ufou Petaia  
Principal  
SPC Community Education Training Centre (CETC) Narere, Fiji Islands  
March 2001

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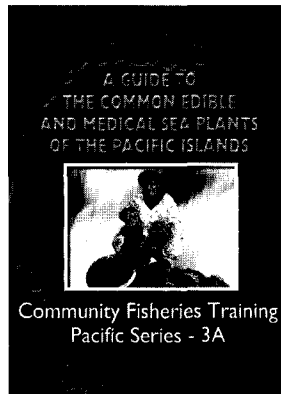
The people of Nakalawaca, Namara and Ucunivanua villages, for providing valuable information and helping to develop and test recipes; and

Fred Mills, Samasoni Sauni and Tony Chamberlain, Marine Studies Programme, USP for editorial and technical assistance.

Cover picture - Salarietta Bolobilo with *Eucheuma*, by Irene Novaczek.

# A Guide to the Common Edible and Medicinal Sea Plants of the Pacific Islands

Community Fisheries Training - Pacific Series 3A



## How to use this book

This book is presented in the form of a supplementary resource to the manual, Sea Plants, Community Fisheries Training Pacific Series - 3. It can be used to identify and learn about the common edible and medicinal sea plants of the South Pacific. It is accompanied by the resource book "Sea Vegetable Recipes for the Pacific Islands".

If, when using this book, you discover the local names for some plants, find a new edible sea plant, or develop a new recipe, we would love to hear from you and include your information in a future edition. Please contact Tony Chamberlain, Marine Studies Programme, USP, Suva, Fiji Islands.

## Introduction

Seaweeds, or algae, are marine plants that form the basis of a complex food web involving all the organisms living within a marine ecosystem. Seaweeds are eaten by fish, molluscs, and crustaceans, which in turn are eaten by other, usually larger animals. In addition, seaweeds convert sunlight and dissolved nutrients into energy-rich organic compounds that other organisms can eat. They also produce oxygen that all animals need to breathe, and provide shelter and protection for many organisms.

In this guide seaweeds are referred to as sea plants, or, when they are edible, as sea vegetables. Sea plants are used by humans for food, medicine, body care products, animal feed, and fertilizer for agriculture. There are more than 500 sea plants in the Pacific Islands, and perhaps over 100 of these are recognized, either locally or in Asia, as being edible. There are three main groups of sea vegetables: red, green and brown. The red ones are the trickiest to identify. Growing in a sunny place they can appear green or yellow, but growing in darker places they look purple, brown or even black. Look carefully at the tips and at the base of a sea plant - if you can see a little pink or red, then it belongs to the red group. Brown sea plants are always brown, greenish brown or yellowish brown. Green sea plants are always green unless bleached white by the sun.

The following guide describes twenty-six genera of edible sea plants, and provides advice on where and when to collect them. Some of these **genera** contain more than one edible species, and each species varies in appearance and preferred habitat. I have tried to provide descriptions that will capture the more common edible species, and to indicate where there are wide differences in appearance, as for example in the **genus** *Caulerpa*. I have indicated briefly how they can be prepared as food, as well as some of the known medicinal uses of each plant. For more detailed sea vegetable recipes, see the companion volume in this series, "Sea Vegetable Recipes for the Pacific Islands" by I. Novaczek and A. Athy.

Information on the geographical distribution of sea plants has been drawn from scientific publications, the marine plant herbarium collection of the University of the South Pacific, and from interviews with local experts. Gaps in our knowledge of distribution are common. If a plant has not been reported from a country such as Tonga or Tuvalu, it does not necessarily mean it does not occur there; more likely it means that it hasn't been scientifically recorded.

Almost all of the sea plants featured in this guide can be assumed to occur throughout the region; however, suitable habitat is a critical factor. Sea plants that grow only on volcanic rock, for instance, will not be found on coral atolls. Similarly, coral reef sea plants will be absent from islands that lack reefs.

When this guide was prepared, a number of sea vegetables were out of season and so couldn't be photographed. We hope to add more sketches and pictures in future editions of this guide.

It is important to acknowledge that there are gaps in our knowledge of local names for many sea plants, and some also lack common names in English. Sometimes one general name is used locally for a number of different **species** (for instance, *vutua* in Fiji is used for many different small brown sea plants). In other cases, one plant may have several different names in different villages of the same country. On occasion, I have taken the liberty of giving a sea vegetable a descriptive name, where I could find none in the literature. Alice Athy has also coined several names in Bislama.

Folklore concerning medicinal effects of sea plants is common in many countries, and, in recent years, science has begun to prove the basis for these traditional remedies, as well as discovering new active components in sea plants. More information on medicinal value and agricultural use of sea plants can be found in the main volume, "Sea Plants" by I. Novaczek. This training guide also provides advice on safe and sustainable harvesting, preservation methods, ideas for small business products based on sea plants and a guide for developing community workshops.

Irene Novaczek, PhD  
March 2001



# Sea Plants Listed by Species Name

## Acanthophora (ay-kan-tho-fer-ah)

Common name: spiny sea plant

Pacific names: kirokiro (Vanuatu) lumi karokaro or lumi karo (Fiji)

Group: Red

Range: Throughout the Pacific Islands: Fiji, New Caledonia, Tonga, Samoa, Solomon Islands, Kiribati and elsewhere in Micronesia.

Description: 20-30 cm tall, **stem** 2-5 mm wide; greenish, golden or purplish brown; slightly stiff, brittle and easily broken; stem is covered in tiny spines (rough to the touch); **branches** are narrow and arching at the tips, spirally arranged around the stem.

Harvesting: Available all year round; abundant on reefs and in tidal pools, river mouths and lower intertidal areas with fine silt; grows in small clumps attached to coral rubble, shells or stones.

Spines get entangled with other small plants, which often grow on top of *Acanthophora*. The cleanest plants are found where there are currents.

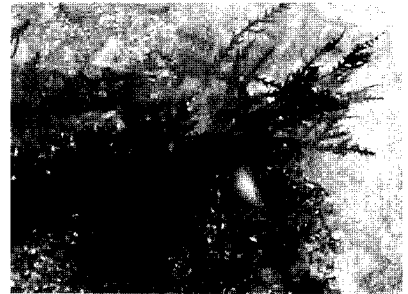
Look for large, clean plants and pinch off the upper portion; leave the base behind; swish briskly in water to shake off dirt and small animals.

Health benefits: Eat fresh or cooked; makes a soft pudding, but not a firm jelly; high in calcium and iron; contains both **agar** and **carrageenan**; helps lower blood **cholesterol** and prevent blood clots.

Recipes: Eat fresh with vinegar or lemon dressing; boil briefly in lemon water or coconut milk; makes sweet or savory puddings; add to soup or stew as a thickener.

Other uses: Mulch or fertilizer; animal feed; makes beautiful pressings on paper - elegant on plain or painted backgrounds.

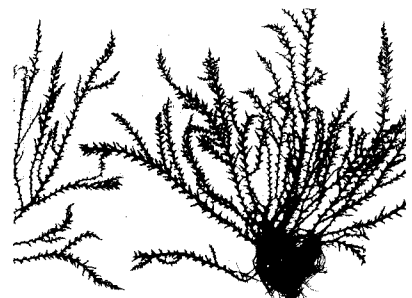
Preservation: Keeps several days in the shade wrapped in taro leaves or inside a sugar sack; sundry or freeze for longer storage; if refrigerated, or if frozen and thawed, the plant wilts, turns dark brown and develops a richer flavour.



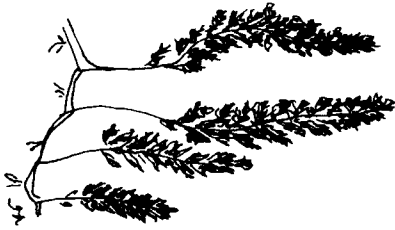
*Acanthophora*.



*Acanthophora* drying on tin.



*Acanthophora*.



*Asparagopsis* sketch.

## Asparagopsis (as-para-gop-sis)

Common name: supreme limu

Pacific names: limu kohu (Hawai'i)

Group: Red

Range: Probably can be found throughout the region. It is small and uncommon in Fiji except around Kadavu where it grows large in summer. Also recorded from Samoa (uncommon), Hawai'i, New Caledonia, Tahiti, and Micronesia. It is particularly abundant in Kiribati.

Description: In the water this sea vegetable looks like a forest of tiny pink trees, about 10-20 cm tall. Sometimes the colour can be yellowish red or dark red. There is a creeping base with rigid upright branches. Each upright branch is covered in many fuzzy, soft, **branchlets** that get shorter towards the top.

Harvesting: *Asparagopsis* is often found on reef edges in water 1 m deep or more. It prefers clean and well flushed waters. Sometimes it is covered in sand and is hard to clean. This plant grows well in the hot season (i.e. early in the year).

To harvest, pinch off the uprights and leave the base to regrow. Shake in seawater to remove dirt and sand. This plant is easily damaged, and the colour runs out if it is bruised, exposed to heat or left in a pail of water. After you pick it, keep it shaded and take it straight home.

Health benefits: *Asparagopsis* is salted and then eaten cooked or raw. It has a peppery flavour and strong fragrance, and so is used as a spice. Because it contains iodine, this plant is good for preventing **goitre**.

Recipes: Clean and soak overnight in fresh water to reduce the bitterness, then mix with salt, pound and store rolled up in an airtight container. Use sparingly for flavour in stew or with fish.

Other uses: This sea plant can be mixed in small amounts with animal feed. Because of its delicate beauty, it is a good plant to use for making pressed sea plant cards.

Preservation: *Asparagopsis* keeps indefinitely if salted and refrigerated; it can also be frozen.



*Asparagopsis*.

# Callophycus (kal-o-fye-kus)

Common name: large wire weed

Pacific names: unknown

Group: Red

Range: Reported from Fiji, Tonga, Samoa and Papua New Guinea and is likely found elsewhere.

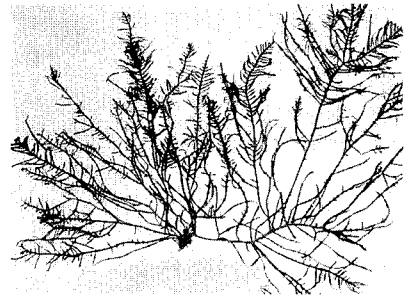
Description: I call this plant large wire weed because it is stiff and rubbery. The branching is opposite, like on a feather and the dark red branches are flattened. It grows to be quite large (10-20 cm tall).

Harvesting: You can find the large wire weed on shallow, surf-washed rock, which can be a rather dangerous and difficult place to collect sea plants. Look for it washed up on shore after a storm.

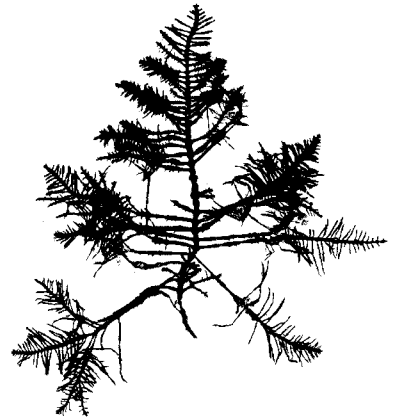
Health benefits: Edible when cooked or after being dried and **rehydrated**. Contains agar, so the jelly has a mild laxative effect.

Recipes: Dry and bleach before rehydrating with boiling water. Use in salad mixed with vinegar, onion, salt and tomato; or boil into jelly with fruit juice and sugar, strain it, and let it set. Fresh plants can also be baked with meat in a ground oven (lovo).

Preservation: Can be refrigerated, frozen or sun-dried. For most purposes it is best to sun dry it and then wet and dry again several times, until the colour is bleached out.



*Callophycus serratus.*



*Callophycus.*



*Caulerpa racemosa*

Some species of *Caulerpa* may cause an allergic reaction (dizziness, numbness at tip of tongue, difficulty in breathing).

## Caulerpa (kaw-ler-pa)

Common name: sea grapes and green sea feathers

Pacific names: nama, nama levulevu, nama keibelo, nama wawa, nama vatu or nama balavu (Fiji); sea feathers are nama draunivi. Other local names include limu fua fua (Samoa, Tonga), ararucip (Hawaii), rimu kai (Maori).

Group: Green

This sea vegetable is commonly sold in markets and is important to the economy of many Pacific Island villages. Although sea grapes are very popular, most people do not eat the closely related sea feathers and other types of *Caulerpa*, which are also delicious.

Range: Probably found in all countries throughout the region. Reported from Fiji, Tahiti, Palau, New Caledonia, Kiribati, Solomon Islands, Federated States of Micronesia, and the Marshall Islands. There are very rich beds of *Caulerpa* in the Yasawa Islands of Fiji, and in Kiribati.

Description: Sea grapes: This plant has **basal runners** (like a root running along the seabed) up to 3 mm wide, anchored by roots. Upright branches are 3-10 cm tall and bear grape-like branchlets. *Caulerpa* is bright green and when seen underwater, may appear **iridescent**. Branchlets are variable in shape: they may be round, or oval or shaped like the end of a trumpet, or be crowded together, or spaced apart. Regardless of the shape or size, all sea grapes are quite delicious. Some are more peppery tasting than others.

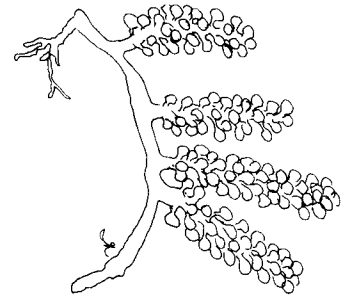
Green sea feathers: As the name suggests, this *Caulerpa* has upright branches that are shaped like feathers. There are two types. One is short (3-6 cm) and the other is much larger (up to 45 cm tall) and yellow-green in colour.

Other *Caulerpas*: Other types have fleshy flat uprights with or without side branches. These are also good to eat.

Harvesting: Sea grapes and sea feathers often grow together in the same habitat. They attach themselves to coral, coral rubble, sand or mud in back reef areas and lagoons, where they creep along the bottom like a vine. *Caulerpa* grows abundantly in the current swept reef channels in Kiribati and around the

Yasawa Islands, Fiji Islands. It may be found all year round, but is more abundant at certain times of the year. In New Caledonia, for example, *Caulerpa* is abundant in November but hard to find in January and February.

When collecting, pinch off the upright branches and leave the runner to regrow. In three to four weeks new uprights will be ready for harvesting. Sea grapes are quite sturdy but other types of *Caulerpa* are more delicate and bruise easily. These should be placed in a bucket of sea water and used as soon as possible.



*Caulerpa racemosa*

Health benefits: *Caulerpa* species are eaten raw or cooked. They contain compounds that help reduce high blood pressure. They are also rich in folic acid and **vitamins** A, B1 and C. In the Philippines these plants are used as a folk remedy for rheumatism.

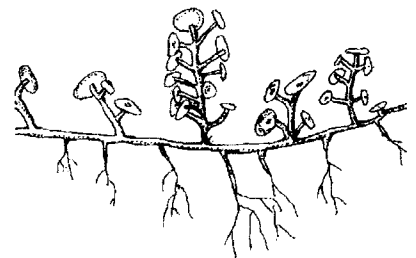
Recipes: Eat fresh on bread, dalo, yam or breadfruit. Use in salads or cook in coconut milk.



*Caulerpa sertularioides* (sea feathers).

Other Uses: These sea plants can be fed to animals, including fish raised in ponds. They also make decorative cards and pictures when pressed and dried on paper.

Preservation: Some people prefer the flavour of sea grapes after two or three days. Keep sea grapes in the shade, in a sack or wrapped in leaves. They cannot be refrigerated or frozen. Other types of *Caulerpa* are more delicate and should be eaten immediately after collecting.



*Caulerpa peltata*

## Chaetomorpha (kee-tow-mor-fa)

Common name: curly fishing line

Pacific names: lumot (Philippines)

Group: Green

Range: Reported from New Caledonia, Fiji, Samoa, Solomon Islands, Kiribati and elsewhere in Micronesia. Probably found throughout the Pacific.

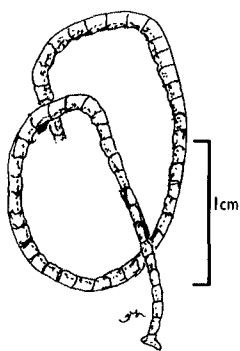
Description: This bright green or dark green plant is a simple unbranched thread less than 1 mm wide but can be 10-50 cm long. It is springy and curls around itself and other plants, forming a tangled ball that looks like green fishing line. It may be attached to a small stone or shell but is often free floating or entangled with other plants.

Harvesting: You will find *Chaetomorpha* on shallow reef flats near the low tide mark. It is usually found in scattered clumps, tangled with other plants. Shake it loose from the other plants. Any little bit you leave behind will grow into a new plant.

Health benefits: Edible raw. Contains vitamins C and A. Medicinal properties not known.

Recipes: *Chaetomorpha* is eaten raw, either salted or in salads, in the same way as *Enteromorpha*.

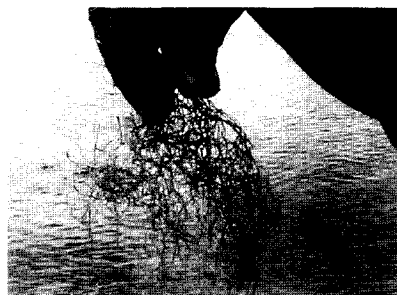
Preservation: This plant should be eaten fresh. It will keep well if wrapped in a leaf or refrigerated in a plastic bag.



*Chaetomorpha* sketch.



*Chaetomorpha*



*Chaetomorpha*

# Cladosiphon (Klad-oh-sy-fun)

Common name: slender slippery weed

Pacific names: tangau (Tonga)

Group: Brown

Range: This plant requires cool water and so is found only in Tonga and New Caledonia.

Description: This sea vegetable is slender, pale brown, sparsely branched, slippery, floppy (not stiff) and jelly-like. Branches are 1-1.5 mm wide and the plant can reach a length of at least 30 cm. The branching pattern may be alternate (first to one side, then to the other) or irregular.

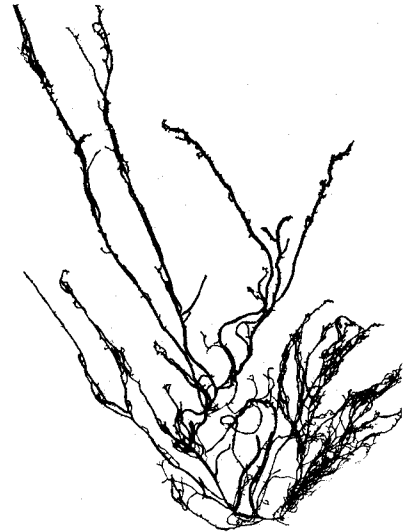
Harvesting: *Cladosiphon* is commonly found growing on top of seagrass or attached to rocks in shallow, sheltered water. Large plants are cast up on the beach together with *Sargassum*, after a storm.

Health benefits: Like other brown sea plants, *Cladosiphon* contains **algin** and **micronutrients** and is a preventative medicine for heart disease.

Recipes: Eat raw as a salad vegetable. This sea vegetable is highly prized in Japan.

Other uses: *Cladosiphon* is good for making sea plant pressings on paper as it sticks to paper very well.

Preservation: *Cladosiphon* can keep for several days if wrapped in a leaf or refrigerated. In Tonga, plants are frozen individually for export to Japan.



*Cladosiphon.*

## Codium (ko-dee-um)

Common name: reindeer limu

Pacific names: totoyava, sagati (Fiji), limu wawae'iole (Hawai'i)

Group: Green

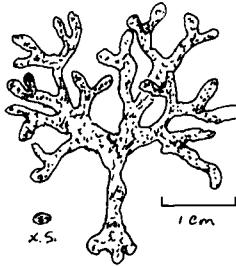
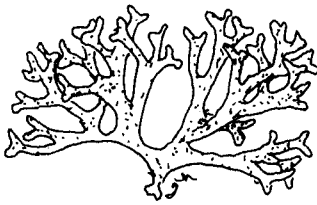
Range: Reported from Fiji, Solomon Islands, New Caledonia, Samoa, Tahiti, Marshall Islands, Kiribati, and elsewhere in Micronesia. There are a number of edible *Codium* species, and probably at least one in every South Pacific country. The largest branching form of *Codium* (*Codium platyclados*) seems to occur only in harbours in Fiji and Samoa, and may be an exotic form brought in by ships.

Description: Small branching *Codium*: This plant has compact clusters of slender, dark green branches 1-4 mm wide, and up to 8 cm tall. It feels smooth and furry when you pick it, spongy when you squeeze it, and tender when you bite it. As the plant grows, each branch splits into two new branches. Branches are round, and often stick to the bottom or to one another at irregular intervals.

Large branching *Codium*: This plant is up to 18 cm tall, growing from a basal disc attached to a rock. Branches may be rounded near the top but are flattened lower down.

Harvesting: *Codium* grows attached to coral reefs and rocks and other stable surfaces, and sometimes grows on top of other sea plants. It can be found in sheltered or wave exposed areas, but prefers to have a current or strong tidal flow. Common on reef crests in Fiji, in shallow water. In Fiji, small branching *Codiums* are most commonly found after July and especially from October to December. Even in season, *Codium* is scattered in small clumps and does not form extensive mats. When harvesting, leave a bit behind to regrow. Select clean upper branches. Rub plants well in seawater to remove any sand.

Health benefits: *Codium* is eaten raw or cooked and is a good source of vitamin A. At least one species is known to contain compounds that are active against **tumours**. Some types help to remove intestinal worms.



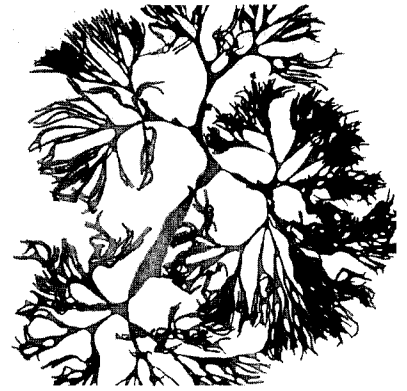
*Codium*.



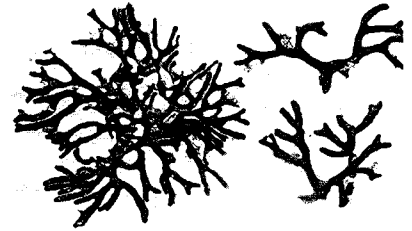
Recipes: Eat raw with lemon juice, as a side dish with fish, add it to sea plant pickles or make into a salad. The larger plants can be **blanched** before use to make them more tender. *Codium* can also be tossed into soups and stews. Pound together with salt until it wilts and weeps, and mix with raw fish or sea urchin roe.

Other Uses: A third form of *Codium* is flat, dark and rubbery and resembles a squashed green cushion. This has been used in the past for scrubbing pots clean. The branching forms stick well to paper when pressed and can be used to make cards and souvenirs.

Preservation: Eat *Codium* when it is fresh. This plant cannot be dried or frozen and keeps only a few days in a refrigerator. It wilts easily and then becomes stringy.



*Codium platyclados*



*Codium*

## Colpomenia (kole-poh-mee-nee-ah)

Common name: papery sea bubble

Pacific names: unknown

Group: Brown

Range: Reported from Fiji, New Caledonia, Tahiti, Solomon Islands and parts of Micronesia. Probably found throughout the Pacific.

Description: *Colpomenia* is solitary, golden or yellow-brown, globular and hollow. It has a smooth to irregular surface and is up to 10 cm wide. It feels papery and dry.

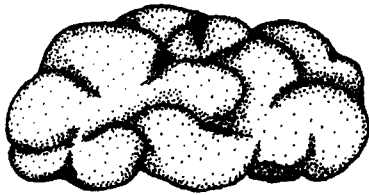
Harvesting: *Colpomenia* is found in shallow depths on rocks, rubble or coral flats and in tide pools on moderately exposed shores and fringing reefs. It often grows on top of *Sargassum* and *Turbinaria*, and grows large in more sheltered areas. *Colpomenia* is found only during the dry season. When harvesting, select only the clean, pale, younger plants.

Health benefits: This plant contains algin, **laminarin** and **folic acid**. Laminarin is good preventive medicine for heart disease, and folic acid is good for pregnant women. *Colpomenia* also contains anti-tumour compounds.

Recipes: Chop up and add to any salad, stir fry, soup or stew. Use for making dried flavour flakes.

Other uses: *Colpomenia* can be fed to animals or used as garden fertilizer if abundant.

Preservation: This plant is eaten fresh, but can also be sun dried and crisped and crumbled into flakes, like *Padina* or *Sargassum*.



*Colpomenia*.

## Dictyota (dik-tee-oh-ta)

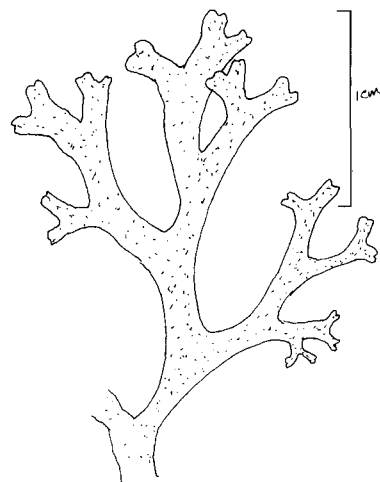
Common name: brown ribbon weed

Pacific names: vutua (Fiji)

Group: Brown

Range: Reported from Hawai'i, Fiji, Tahiti, Cook Islands, Nauru and Palau. Probably common throughout the Pacific.

Description: There are several species of *Dictyota*. Some are tiny (2-5 mm wide) others are more than 10 mm wide and 20 cm long. All are golden to dark brown with flat **blades**, and have a Y-shaped form of branching (that is, dividing into two). Sometimes the blades are also spirally twisted. Some species shine with iridescent colours when seen underwater. Smaller species often grow in clumps, while the larger ones may grow as separate, scattered plants.



*Dictyota*

Harvesting: *Dictyota* is found on shallow reefs, in lagoons and in seagrass beds, often growing together with *Acanthophora* and *Gracilaria*. This plant is available all year.

Health benefits: Many types of *Dictyota* are eaten in Asian countries. The small plants commonly found in Fiji, however, are bitter. *Dictyota* contains algin and other compounds typical of brown sea plants, making it a preventive medicine for heart disease and stroke. The iodine content is high, which is why it is bitter. The iodine content makes it a good medicine for goitre.

Recipes: If you like the bitter flavour you can eat *Dictyota* raw with a vinegar or lemon juice dressing, or cook the fresh plants in stir fry, soup or stew. To reduce bitterness, the sea plants can be soaked overnight in fresh water. Remove from the water, squeeze dry and sprinkle with salt. Store in the fridge until you want to use it as a spice.

*Dictyota* can also be dried for long term storage. To make flavour flakes, crisp the dried plants over medium heat. Crumble into flakes for use as a seasoning for salad, omelette, soup, cooked vegetables etc.



Dictyota

Other uses: A snorkeller can clean his or her face mask by rubbing the glass with a handful of *Dictyota*. This prevents the mask from fogging up. Because they are often abundant year round, *Dictyota* may be fed to animals and used as garden mulch and fertilizer.

Preservation: Smaller types of *Dictyota* go bad quickly if squashed or left in the heat in a plastic bag. This plant should be handled gently. It wilts when refrigerated or frozen.

# Enteromorpha (en-ter-o-mor-fah)

Common name: tubular green weed

Pacific names: ele'ele (Hawai'i), lulua, lumi boso (Fiji), nalumlum malekesa (Vanuatu)

Group: Green

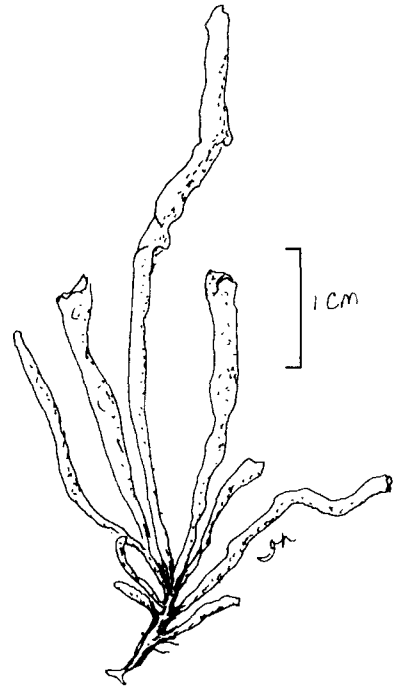
Range: Found throughout the region. Various species reported from New Caledonia, Fiji, Hawai'i, Tahiti, Samoa, Solomon Islands, Marshall Islands, Kiribati and elsewhere in Micronesia.

Description: There are several types of *Enteromorpha*. Some are pale green, soft and clearly tubular, being several millimetres wide, sometimes filled with gas, and floating on the surface of the sea. Others are much more slender and look like green hair. Threads can be a metre long and may be simple, or have branches near the bottom. When picked up, the plant is floppy, not stiff. If you squeeze the water out of it, and then pull it apart it is like cotton wool.

Harvesting: *Enteromorpha* is found in many different habitats, ranging from extremely sheltered bays to the open sea. It may be found in isolated clumps or covering large areas of bottom with a thick mat of green threads. It grows attached to small stones and shells but it may come loose and float in dense mats on the surface of the water as it gets older.

*Enteromorpha* grows best in bays close to a river or some source of fertilizer, and is one of the rapidly growing weeds of the sea plant world. After rain brings soil and nutrients to the sea from the land, *Enteromorpha* may suddenly grow up and cover other sea plants. Sometimes an abundance of *Enteromorpha* is a signal that the water is polluted with sewage, so be careful where you harvest it from.

Because it is a slender tube, small animals and bits of dirt are easily trapped inside the plant. You must shake it well in clean sea water after picking it, and then clean it again carefully when you reach home. It can be washed in fresh water without damaging it. If you think your harvesting area is polluted by sewage or animal manure, you should blanch the sea vegetable with boiling hot water before using it in salads.



*Enteromorpha*.

Health benefits: *Enteromorpha* is edible raw, dried or cooked. Like other green sea plants, it contains carotene, which your body uses to make vitamin A. It also has B vitamins, vitamins C and E, and is a good source of calcium. Anti-tumour compounds have been found in this sea plant.

Recipes: Eat fresh in salads, cook lightly in coconut milk or salt it for use as a spice. Add to sea plant pickles, fried rice, soups and stews. *Enteromorpha* can also be dried for long-term storage. The broad, tubular form can be dried to a crisp then crumbled and used as a seasoning for a salad, omelette, soup, cooked vegetables, etc. Dried *Enteromorpha* flakes are called ao-nori in Japan, where they are sold commercially.

Other uses: If it is growing near a river that provides nutrients, *Enteromorpha* can collect large amounts of nitrogen, making it a valuable fertilizer and mulch for your garden. Because it can be gathered in large amounts, it is also useful for feeding animals, including fish grown in ponds. Some fishermen use it as bait to catch herbivorous fish, such as rabbitfish.

Preservation: *Enteromorpha* will keep for several days wrapped in a taro leaf. It may also be kept in a bowl of water or dry in a plastic bag in the refrigerator. If salted, it will keep for very long periods in the fridge. It can also be frozen for long-term storage, or sun dried.

### The legend of lumi boso



*Enteromorpha*

On Gau Island, Fiji, lumi boso is a famous traditional food. People say that on Gau it can be found all year round, but elsewhere it is seasonal. There is a legend that long ago the chief of Gau flew to another island and stole a piece of this lumi from there. He folded it in a via leaf tied together with wa lie, then flew home. As he was arriving in Gau the chief of the other island noticed that the lumi boso had been stolen. He threw one stone to Gau, which hit the chief of Gau and knocked the lumi out of his hand, into the sea. That is why it is still growing in Gau to this day.

When Fijians see a person from Gau they often call him or her lumi boso. Boso means long and slender.

# **Eucheuma** (yew-kew-ma) or **Kappaphycus** (kap-ah-fy-kus)

Common name: thorn grass, elkhorn (*Eucheuma*), brown licorice algae, tambalang (*Kappaphycus*)

Pacific names: unknown

Group: Red

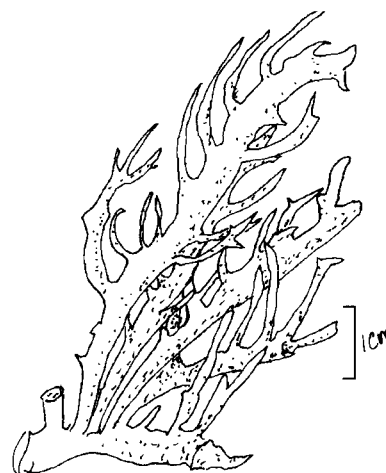
There are a number of different species of *Eucheuma* and the closely related *Kappaphycus* that have been introduced to the Pacific region for aquaculture. The plants are farmed in the sea, and dried and sold to large companies. The companies extract carrageenan jelly from this sea plant, for use in food processing, cosmetics and drugs.

Range: At various times, *Eucheuma* or *Kappaphycus* have been grown commercially in most South Pacific countries.

Description: *Eucheuma* and *Kappaphycus* are large, fleshy plants up to 50 cm long, or forming mats or balls several metres wide. Stems may be 1-2 cm in diameter, other species have slender branches. Some are stiff, with short thorn-like branches, others are slippery or floppy. Colour varies amongst the species, from pale yellow, bright green, pink or deep red.

Harvesting: These plants can only be found in areas near current or past aquaculture sites.

Health benefits: *Eucheuma* and *Kappaphycus* can be eaten raw or cooked. Depending on the species, these plants may contain carrageenan or agar or both. *Eucheuma* is reported to lower blood sugar levels and blood pressure. The plants are medicine for heart disease, bronchitis, stomach ulcer, colds and flu, and may help with stomach problems, diarrhoea and **constipation**. Carrageenan also binds with saxitoxin (shellfish poisoning) and helps remove it from the body. It is commonly used to make diet drinks. Because carrageenan inactivates the HIV virus that causes AIDS, researchers are now testing carrageenan-based contraceptive gels as protection against HIV infection.



Eucheuma.



Bleached Eucheuma.



*Eucheuma*

**Recipes:**

These plants are wonderful for making any sort of pudding or jelly, and when mixed with lemon or orange juice, make a soothing tonic for people with a sore throat, cold or flu. They can also be prepared in salads and pickles or made into candy. Use as a substitute for fat in gravies and to thicken soups and stews.

**Preservation:**

Fresh plants keep well for days if wrapped in leaves or refrigerated. Plants can be frozen but will be limp when thawed. It is best to sun dry these large plants for long-term storage. Repeated wetting and drying will bleach them if you want to make white puddings. You can also prepare a basic jelly and refrigerate it for future cooking needs.



# Gelidiella (Jel-id-ee-el-ah)

Common name: little wire weed

Pacific names: unknown

Group: Red

Range: Very common throughout the Pacific region. Reported from Hawai'i, Cook Islands, Fiji, Tahiti, New Caledonia, Samoa, Solomon Islands and Micronesia.

Description: This plant is dark brown or black at the base and often pale green or greenish yellow on top. It feels rubbery and springy when fresh. The creeping branches arch, forming humps or extensive mats on rocks and other solid surfaces. The main branches are 0.5-1 mm wide, rigid and flattened. The branching pattern is opposite (like a feather) or sometimes irregular. Branchlets are very slender, pointed and only a few millimetres long. When dried, this sea plant feels extremely harsh and wiry.

Harvesting: *Gelidiella* is common on intertidal and shallow reef flats. It is a sea plant that likes surf and fast currents. In sheltered habitats, it may be covered by other sea plants such as *Enteromorpha* and *Acanthophora*. Only harvest it where it grows big and clean, and is abundant. Pluck off only the upper branches. Lower branches are often fouled by sponges and small shells, and are difficult to clean.

Health benefits: Edible when cooked or raw, but the texture when raw is very tough. Contains high levels of calcium and potassium and is a source of high quality agar jelly.

Recipes: Add to soups and stews or blanch then add to pickles. Make into a salad with tomatoes, onion, vinegar and salt. Boil with fruit juice or tomato juice to make jelly, strain and chill in a pan or mold.

Preservation: Can be refrigerated or frozen. Most commonly this plant is dried and wetted repeatedly until bleached, then rehydrated using boiling water before use.



*Gelidiella*.



*Gelidiella*.



*Gelidiella*.

## Gracilaria (grass-ill-ay-ree-ah)



Gracilaria

Common name: sea moss

Pacific names: lumi wawa, lumi yara (Fiji), limu aau (Samoa), limu manaua (Hawai'i), ogo (Japan and Hawai'i)

Group: Red

Range: Probably found throughout the region. Various species reported from Hawai'i, Fiji, Tahiti, Cook Islands, Samoa, New Caledonia, Solomon Islands, Tonga and Micronesia.

Description: There are many species of *Gracilaria*, and all are edible. Some are very short (to 10 cm), stiff and heavily branched. Others are very long (to 60 cm), slender (branches up to 3 mm wide), floppy and may be hardly branched at all. Branches may be cylindrical (circular in cross section) or flattened, and often are more slender at the tips. Colour ranges from bright green through brownish-yellow to pink, depending on the species, habitat and season. When you bite *Gracilaria* the texture is rubbery.

Harvesting: Some of the most common and easily harvested *Gracilarias* grow in shallow waters or between the tides on reef flats and in lagoons. They grow attached to coral rubble, shells and stones or may be lying loose on sand or silty bottoms. These types tolerate fresh water inflow and prefer to be sheltered from waves.

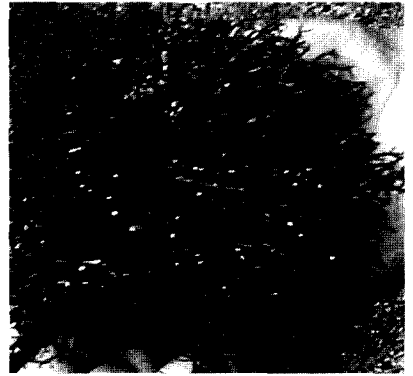
Other *Gracilarias* grow on rocks and reefs where they are exposed to waves. These are typically more sturdy and form compact humps 5-10 cm tall.

In Fiji, the main season for *Gracilaria* is June through August, but plants may be found all year round. To harvest *Gracilaria*, pinch off the clean tops and leave the base behind.

Health benefits: *Gracilaria* is edible raw or cooked. It contains agar, which is a mild laxative. *Gracilaria* is a good source of vitamins C, A, and B2, calcium, iron and other micronutrients.

Recipes: *Gracilaria* is eaten in salads, cooked as a vegetable, made into candy and pickles, fried in batter or boiled together with lemon juice to provide a soft jelly. Because the fresh plant has a rubbery texture

it is often blanched before being eaten. Use it to thicken soups and stews. Different types of *Gracilaria* may have more or less jelly in them, and the amount of jelly will also vary with the season. When making puddings you may have to adjust the amounts suggested in recipes to suit your local resource.



*Gracilaria*.

Other uses: *Gracilaria* can be farmed to provide a source of agar for industry. It can be used as animal feed or garden fertilizer.

Preservation: *Gracilaria* can be kept fresh by wrapping in leaves for several days. It keeps well in the refrigerator after blanching and can also be frozen. Sun dry this plant for long-term storage. To rehydrate dried plants, soak in water for 30 minutes.

## Halymenia (hal-ee-mee-nee-ya)

Warning! In Samoa *Halymenia* is not harvested from some locations because it is poisonous for some unknown reason. There may be toxic phytoplankton growing on its surface.



*Halymenia*.

Common name: red sea lettuce

Pacific names: limu lepe 'ula'ula (Hawai'i), akiro matua (Vanuatu), a'au (Samoa)

Group: Red

Range: Probably found throughout the region but may be small or rare in some countries, such as Fiji, although it is large and common in Vanuatu and Samoa. Recorded from Hawai'i, Vanuatu, Samoa, Fiji, New Caledonia and Micronesia.

Description: Blades are up to 1 metre wide, commonly 5-50 cm, with toothed or lobed margins. Dark magenta or purple colour. Shape highly variable, may have slender branches coming from a broad blade, or be branched throughout its length.

Harvesting: *Halymenia* is most often in deep water, below 1 m. It tolerates turbid water and low salinity, likes high nutrient conditions and prefers wave exposure. It floats when dislodged by waves and is then often picked up by fishermen.

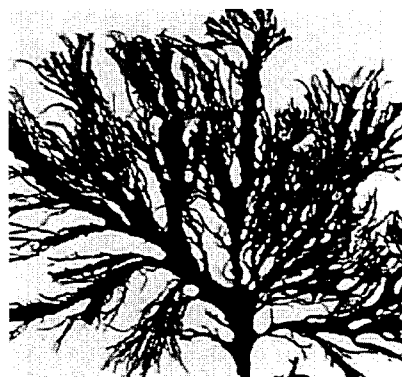
*Halymenia* is very perishable when fresh. It turns orange and melts away if exposed to fresh water or heat, and breaks down quickly if left in a pail of water.

Health benefits: Edible fresh, cooked or dried. High in potassium and vitamin B2. This plant contains a jelly that is neither agar nor carrageenan. Recent research suggests it may contain anti-cancer compounds.

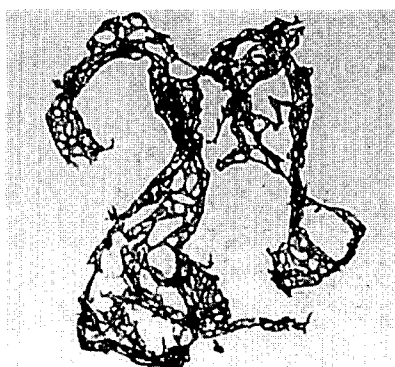
Recipes: In Samoa, *Halymenia* is included with fish in the ground oven, or cooked as a vegetable with coconut milk. In Vanuatu it is eaten fresh or sun-dried, and used as a thickener and flavoring in seafood soup or stew. The fronds may also be cooked in coconut milk with local herbs and eaten as a vegetable. Dry fronds can be eaten as a snack. Fresh *Halymenia* is also sliced thin and eaten as a salad vegetable.

Other uses: *Halymenia* is a very beautiful and colourful sea plant that looks spectacular when pressed and dried onto paper. The pressing can then be framed and hung on the wall as a decoration.

Preservation: Keeps well if dried rapidly and stored in a jar; cannot be frozen. In Vanuatu (Efate and other nearby islands) people dry this sea plant by spreading it out on a clean coconut mat or on banana leaves in the sun. *Halymenia* must be frequently turned over so it does not stick to the mat.



*Halymenia*



*Hydroclathrus.*

## Hydroclathrus (Hi-drow-klath-rus)

Common name: south sea colander

Pacific names: rimu oma (Maori)

Group: Brown

Range: Reported from Samoa, Fiji, New Caledonia, Tahiti, Tonga, Cook Islands, Solomon Islands, Hawai'i, Marshall Islands and elsewhere in Micronesia. Common all over the region in dry season.

Description: Yellow-brown to dark brown, net-like, convoluted blade full of holes. The edges around the holes curl inwards. It is attached to the bottom by slender threads at several points when young, and may become separated from the bottom with age. This plant feels soft and almost gelatinous. It can be up to 40 cm across and 1-2 cm thick, with holes 2-11 mm wide.

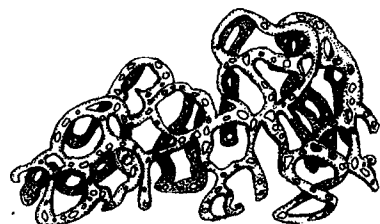
Harvesting: Found during the dry season only (July to Sept in Fiji), on shallow reef flats, in lagoons and on reef crests. It is often found together with *Colpomenia* and *Rosenvingia*.

Health benefits: This sea plant is edible, rich in calcium and iron, and contains iodine, mannitol, algin, fucoidan, laminarin and folic acid (naturally occurring substances with a range of health benefits). This makes it preventative medicine for heart disease and a good food for pregnant women.

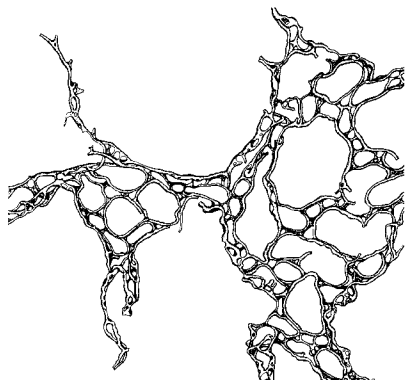
Recipes: Cover in batter and make seaweed fritters, eat fresh or blanch for 2 minutes and use in a salad.

Other uses: Use as food for animals or as fertilizer. It has been found to be good for promoting growth of corn and mung beans (as a liquid fertilizer sprayed at 2 week intervals).

Preservation: Dry to a crisp and crumble for use in flavour flakes.



*Hydroclathrus drawing.*



*Dried Hydroclathrus.*

# Hypnea (hip-nee-ah)

Common name: maidenhair

Pacific names: limu huna (Hawai'i), lumi cevata, lumi tabia, lumi vakalolo (Fiji).

Group: Red

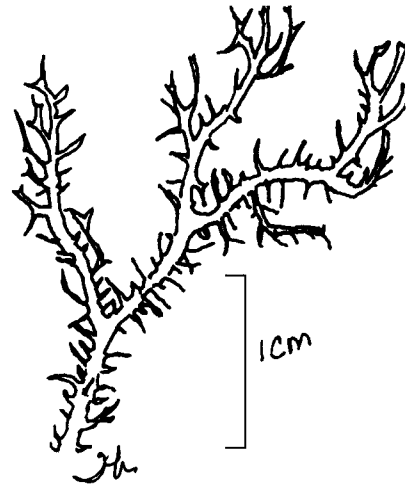
Range: Probably occurs throughout the Pacific region, but is seasonal. Reported from Fiji, New Caledonia, Tonga, Samoa, Vanuatu, Tahiti, Cook Islands, Solomon Islands, Hawai'i, Marshall Islands, Kiribati and elsewhere in Micronesia.

Description: This pale pink, greenish, brownish or yellowish, highly branched plant creeps along the bottom. It forms tangled mats that are often iridescent in the sun. The plant is generally floppy, entangled and loose lying. The cylindrical branches are only about 0.5-1 mm wide. Branches alternate and taper at the tips. Branchlets are short, stubby spines. The plant feels fluffy and light like cotton threads. *Hypnea* is tolerant of brackish water. It grows big in Fiji and Tonga, but is smaller in Samoa.

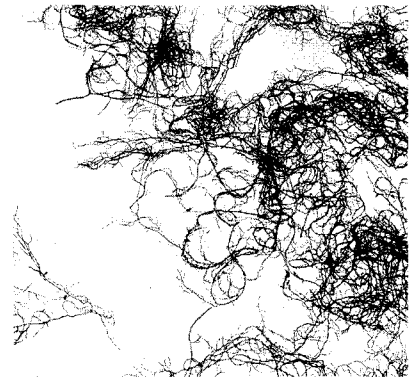
Harvesting: *Hypnea* is found on coral rubble, shell fragments or sand in sheltered back reef areas, and also in fine, silty intertidal areas. It likes cool, clear, current swept water. To harvest, pinch off upper branches and store them in a sack. *Hypnea* is hard to clean; pick only the cleanest looking parts of large plants. In Fiji this sea plant grows best during periods of cool weather. It can be found almost any time, often hidden under other plants, but is large and abundant after June, reaching its peak in August or September.

Health benefits: This edible plant is used to make jellies. It has a mild flavour and delicate texture. *Hypnea* is high in carrageenan, which can thin the blood and lower cholesterol, helping to prevent strokes. It is also used against diarrhoea. Compounds that stop the growth of tumours have been found in *Hypnea*.

Recipes: Make jelly with coconut and fish or use to make sweet puddings and jellies. Cook in a batter to make fritters. Chop fresh for use in salads. Use as a thickener for gravy, soup or stew.



*Hypnea.*



*Hypnea.*



*Hypnea.*

Other uses: When abundant, this sea plant can be used as animal feed or fertilizer.

Preservation: *Hypnea* can be kept for 4-5 days wrapped in a taro leaf in the shade or kept in a bowl of seawater. It is easy to dry for long-term storage. When you want to use the dried plant it can be crumbled directly into any liquid and cooked to produce a firm jelly.



## Laurencia (law-rens-ee-ah)

Common name: flower limu

Pacific names: limu pe'epe'e (Hawai'i), layalaya (Philippines)

Group: Red

Range: Various edible species are found throughout the region. Reported from New Caledonia, Fiji, Solomon Islands, Tahiti, Samoa, Tonga, Cook Islands, Hawai'i, Palau, Marshall Islands, Kiribati and elsewhere in Micronesia.

Description: The plants form small clumps or sometimes an expanse of turf. They may be mistaken for *Acanthophora*, which often grows on top of *Laurencia*. However, these plants feel less prickly than *Acanthophora* and are shorter and more branched. The branches may be cylindrical or a bit flattened. Usually the main stems are covered in short, knobby branchlets. There is a depression (pit or groove) at the tip of each branchlet. The colour may be red, pink, purple, yellowish-green or black depending on the species. Branches are 1 - 4 mm wide. Some types of *Laurencia* are only 3-6 cm tall (*L. succisa*) but other species can be 10-25 cm. When picked, the plants feel somewhat rubbery.

Harvesting: *Laurencia* may be found on sand, rock or eroded coral in shallow water or exposed at low tide. It is often entangled with other species (*Gelidiella*, *Hypnea*, *Acanthophora*, *Enteromorpha*) or covered in silt or sand. To harvest, pinch or cut off upright branches and shake them thoroughly in salt water to remove dirt.

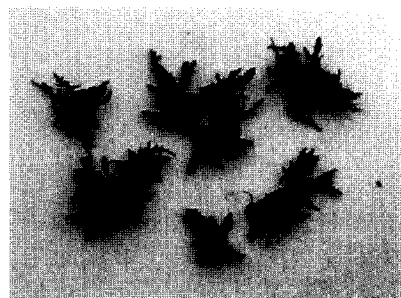
Health benefits: *Laurencia* is edible raw. Medicinal uses are not known.

Recipes: Some types have a very peppery flavour and are chopped and salted for use as a spice. Others are sweet and used as vegetables in salads or cooked dishes.

Preservation: Cannot be preserved; must be eaten when fresh.

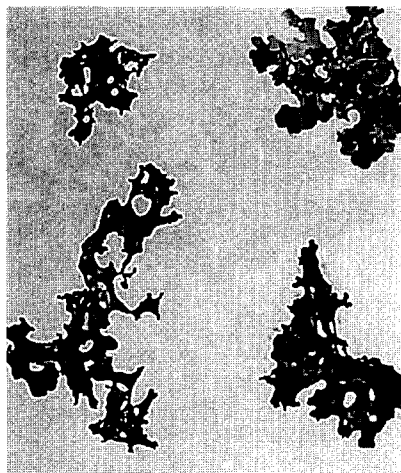


*Laurencia*.



*Laurencia papillosa*.

## Meristotheca (mer-iss-tow-thee-kah)



*Meristotheca*

Common name: rosy pudding plant

Pacific names: lumu mie'ta (Rotuma)

Group: Red

Range: This plant has been recorded only in Rotuma, Fiji and in the Cook Islands, but may be more widely distributed.

Description: Rubbery, fleshy, swollen and firm, irregularly lobed blades. Deep pink to dark red in colour, with an iridescent sheen. Up to 12 cm across. Not slimy. These fleshy blades are prostrate (lying flat along the seabed) and often grow attached to coral at various points by cylindrical outgrowths.

Harvesting: *Meristotheca* has been found lying like a cushion at the base of the branches of *Acropora* coral, or underneath *Sargassum*. It grows in shallow water (0.5-10 m deep) but especially in water less than 1 m deep at low tide. It is common on reef crests, in shallow lagoons and in tide pools.

Health benefits: Edible raw or cooked. Medicinal value unknown.

Recipes: *Meristotheca* has a nutty flavour and a texture like soft pudding when cooked. Boiled in coconut milk with lemon juice, onion, vegetables and fish.

Preservation: Not known, but probably can be dried for long-term storage.

## Padina (pah-dye-nah)

Common name: sea fan

Pacific names: unknown

Group: Brown

Range: Common throughout the Pacific region. Reported from New Caledonia, Fiji, Tahiti, Cook Islands, Samoa, Tonga, Solomon Islands, Marshall Islands, Palau, Kiribati and elsewhere in Micronesia.

Description: The golden to dark brown, fan-shaped blades of *Padina* grow in clusters. On one side of the blade are concentric, or curved, rows of white lines, where the plant produces chalk.

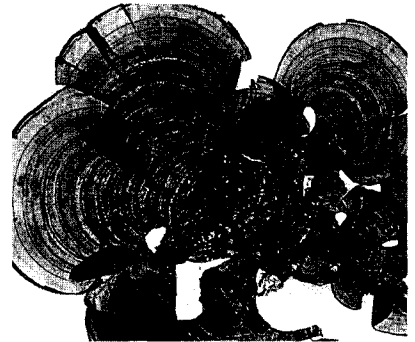
Harvesting: If harvesting for food, select tender young blades and wash them well, rubbing each one with your fingers to clean them. Throw away the bottom stem where it attaches itself to rocks or shells.

Health benefits: *Padina* contains algin. The chalk on its surface makes it crunchy, and the blades are rather tough when fresh, but it is edible and is a good source of calcium.

Recipes: Vinegar or lemon juice can be used to remove the chalk from the surface of the blade. Add the sea plant to soups, stews, fritters and salads, or stir-fried together with other vegetables. Dried *Padina* flakes can be sprinkled on salads, omelettes, potatoes or any other dish to add calcium, other **minerals** and flavour.

Other uses: *Padina* is reasonably large and commonly available, and so can be collected and fed to animals or used as garden mulch and fertilizer. The fan-shaped blades of young *Padina* are delicate and beautiful when pressed onto cards.

Preservation: The plants dry very quickly in the sun for long-term storage. Sun-dried plants can then be heated briefly in a dry pan over medium heat to make them crisp. Crumble them into flakes with your finger tips and store them in a jar.



*Padina*



*Padina*



*Padina*

## Roseningea (row-zen-vin-gee-ah)

Common name: slippery cushion

Pacific names: unknown

Group: Brown

Range: Probably common, in season, throughout the region. Reported from Fiji, Cook Islands, Samoa, Marshall Islands and elsewhere in Micronesia.

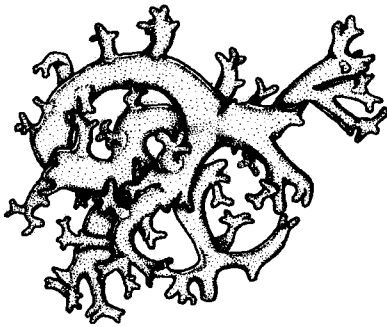
Description: *Roseningea* is light golden-brown, prostrate (lying flat along the seabed), branched and hollow. It has many branches that are somewhat flattened, entangled and stuck to one another to form a cushion. Branches are 1-9 mm wide, and are often more slender at the tips. The cushions may be 5-20 cm across, and have a distinctive strong smell. *Roseningea* has a soft, papery texture and is more smooth and gooey than *Colpomenia*.

Harvesting: Look for *Roseningea* on sheltered back reefs together with *Colpomenia* and *Hydroclathrus*, in the dry season. It may grow on coral rock or on top of other plants.

Health benefits: *Roseningea* has the same edible and medicinal value as *Colpomenia* and *Hydroclathrus*, making it a good preventative medicine for heart disease and a healthy food for pregnant women

Recipes: Add fresh chopped *Roseningea* to any salad, soup or stew. Crisp the dried plants to make flavour flakes.

Preservation: This plant is usually eaten fresh but may be dried for long-term storage.



*Roseningea*.

## Sargassum (sar-gas-um)

Common name: sea oak

Pacific names: lecau, mokusoi (Fiji), limu vaovao (Samoa), kala (Hawai'i), rimu akau (Maori)

Group: Brown

Range: There are many species of *Sargassum*, all of which have similar properties. They are found throughout the Pacific region and have been reported from New Caledonia, Hawai'i, Fiji, Vanuatu, Tahiti, Cook Islands, Tonga, Samoa, Solomon Islands, Palau and elsewhere in Micronesia.



Sargassum

Description: This large, dark brown plant with golden-brown tips has a long central stem and branches with blades that resemble oak tree leaves. The plant may be a metre or more in length. Blades have toothed edges and the larger ones are rather tough. Leaves at the bottom are large, compared with the ones near the top. The stem also has many small grape-like bladders attached to it, which are filled with air and hold the plant up in the water.

Harvesting: *Sargassum* is found attached to rocks and reefs, often in wave-swept areas. Young *Sargassum* plants begin growing late in the year (October - December) and grow rapidly, reaching adult size by February or March. They are removed from the rocks by waves, and are found washed up on beaches in large amounts, or floating around on the surface of the sea. Harvesting *Sargassum* for food is best done when they are young and growing rapidly (November - February) when the pale yellow tips are very clean and tender. Older plants and their bases contain more algin than young tips.

Health benefits: *Sargassum* is edible raw or cooked, and has many medicinal properties. It contains high levels of iodine, which prevents goitre. It also has algin, fucoidan and laminarin, substances which act as a preventative medicine for heart disease and stroke. Algin can help remove poisonous metals such as lead and radioactivity from your body. *Sargassum* can be made into a tea that promotes weight loss. Basal parts rich in algin, can be dried for use as a dressing for cuts and burns.

Recipes: Fresh young tips are used in soups or eaten fresh, dressed with soya sauce. Fresh or dried plants can be cooked with garlic, spices, green onion



*Fresh Sargassum.*



*Cleaning Sargassum.*

(scallion), and hot red peppers, then served as a main dish. *Sargassum* can also be added to tomato sauce and served with spaghetti noodles.

Use young leaves to stuff baked fish. Add to sea vegetable fritters or sun dry the tips and eat as a crispy snack. Sprinkle dried *Sargassum* flakes on salads, omelettes, soups and cooked vegetables.

**Other uses:**

*Sargassum* is large and abundant for much of the year, and can be used as feed for animals, mulch or fertilizer. It is also ground into powder for use in massage and other health treatments. Dried plants are worn as decoration by dancers in Rotuma. In Hawai'i, *Sargassum* is used as a gift when people who have argued want to make friends again.

**Preservation:**

Tips will stay fresh overnight wrapped in a taro leaf. They can be salted and kept in the fridge or frozen for later use in soups and stews. The tips and whole plants can also be sun-dried for long-term storage, or crisped and crumbled to make flavour flakes.

## Scinaia (sin eye ah)

Common name: glassweed

Pacific names: unknown

Group: Red

Range: Reported from Fiji and New Caledonia but is probably found elsewhere.

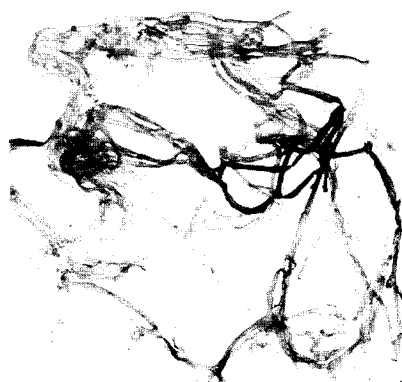
Description: This very slender, branched sea plant is commonly pink, yellowish or greenish but can also be very pale or even pure white, looking like shiny glass threads. Branches are not stiff, but floppy. *Scinaia* is similar to *Gracilaria* in length (30 cm or more), but is more delicate. Branches frequently stick to one another, so that when you pick it up it may be in the form of a tangled mat. Stems are plump and tender and, when bitten, pop softly in your mouth, releasing a delicious liquid.

Harvesting: Look for this plant below the low tide mark in lagoons and reef flats, attached to rock and shells.

Health benefits: Unknown.

Recipes: This is one of the finest fresh sea vegetables for eating raw, with or without salad dressing. It can also be cooked lightly in coconut milk.

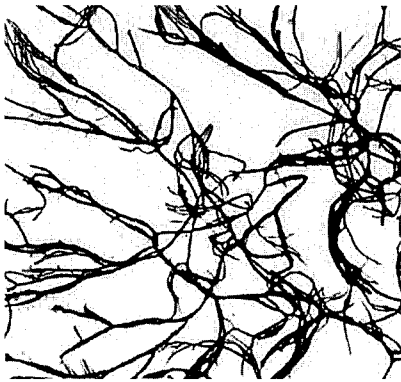
Preservation: *Scinaia* will keep for a day or two wrapped in leaves. It is not suitable for long-term storage.



Scinaia.



Fresh Scinaia.



Dried *Solieria robusta*.

## Solieria (so lee ree ah)

Common name: tender golden weed

Pacific names: lumi tamana (Fiji)

Group: Red

Range: Reported from Fiji and New Caledonia. Probably more widely distributed but not often reported.

Description: *Solieria* grows up to 30 cm long and the colour can be grey-red, brownish-red, grayish-yellow or green. It is attached to the bottom by a fibrous **holdfast**. Branches are cylindrical, sparse and irregularly placed, and are fleshy, 1-5 mm wide and narrowed at the bottom where they meet the stem. The branches also may have more slender tips. This plant feels smooth and velvety and when bitten, it melts in your mouth. Compared to *Gracilaria*, *Solieria* is shorter, fatter, less branched and much more tender.

Harvesting: Look for this plant below low tide level on shallow reef flats and in lagoons. It often grows together with *Gracilaria*, and in Fiji it is most abundant from June through August. It prefers growing near a river mouth, in slightly fresh water.

Health benefits: Unknown.

Recipes: Make into pickles or relish, use in salads, or cook in coconut milk. Prepare as a vegetable, like *Gracilaria*, *Hypnea* or *Acanthophora*. Chop into 0.5-1 cm bits and mix with salted raw fish.

Preservation: Should be eaten fresh.



# Turbinaria (tur-bin-ay-ree-ah)

Common name: spiny leaf

Pacific names: limu lautalatala (Samoa), rimu taratara (Maori)

Group: Brown

Range: Several species are common throughout the region. Reported from New Caledonia, Fiji, Hawai'i, Tahiti, Cook Islands, Samoa, Solomon Islands, Marshall Islands, Nauru, Palau, Kiribati and elsewhere in Micronesia.

Description: Erect, dark brown plant with yellowish tips, *Turbinaria* may be stubby or grow to 30 cm tall, depending on the species and habitat. It is irregularly branched and bearing very crisp, toothed, succulent blades that are prickly to the touch. In some species, the blades look rather like trumpets.

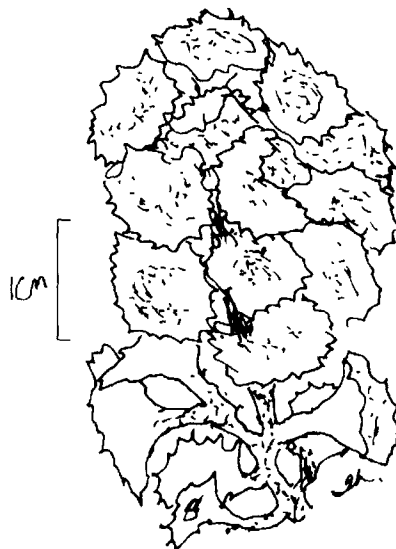
Harvesting: *Turbinaria* grows on shallow and intertidal rock flats. It can be found in wave exposed areas or sheltered back reefs, often mixed with *Sargassum*. When harvesting, take the tips and leave the base attached to the rock to regrow.

Health benefits: Nutritional and medicinal value is the same as for *Sargassum*. This is a very useful sea plant.

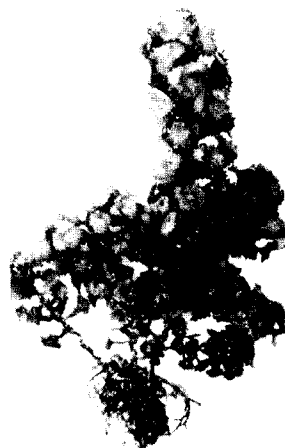
Recipes: Use *Turbinaria* in any pickle, fritter, soup or stew, omelette or stir fry. When chopped fine it can be added to salads. Dried plants can be crisped and pounded into a powder for use as seasoning.

Other uses: *Turbinaria* can be used as animal feed or fertilizer.

Preservation: *Turbinaria* keeps well in the fridge or wrapped in leaves. It can be dried or frozen for long-term storage.



*Turbinaria* sketch.



*Turbinaria ornata*.



*Turbinaria* sketch.



*Turbinaria*.



*Ulva* sketch.

## **Ulva** (ul vah)

Common name: sea lettuce

Pacific names: gamgamet (Philippines), rimu miti (Tahiti)

Group: Green

Range: *Ulva* prefers cooler waters and is rare or reaches only a small size in many of the South Pacific islands. It is known to occur in Fiji, Cook Islands, Tahiti, Kiribati and other parts of Micronesia, but is more common in the cooler waters of Hawai'i, New Caledonia and Tonga.

Description: *Ulva* has broad, flat or ruffled, pale green to dark green blades. It is not a thick or fleshy plant; you can almost see through it if you hold it up to the sun. Sometimes the blades have holes in them. It may be round in shape or rather long and narrow.

Harvesting: *Ulva* is most common in moderately exposed places on rocks, woodwork, or attached to other sea plants, in pools and quiet shallow waters near the low tide mark. It grows well close to rivers and in bays that have organic pollution. Harvest the younger, smaller blades for taste and tenderness. Drifting plants can be harvested if they appear fresh and green.

Health benefits: This sea vegetable is eaten raw or cooked and has many other uses. *Ulva* is high in iron, iodine, vitamins A, B and C. Eating this plant will help prevent goitre. Blades are applied to burns to speed healing. *Ulva* is also used as worm medicine. As a folk remedy it is used for gout.

Recipes: Fresh plants are rather coarse and tough in texture and so must be chopped finely before adding to salads. *Ulva* may also be cooked with shellfish, meat, and noodles, cooked with other vegetables or used in soups. It can be made into relish mixed with chili, onion, soya sauce and sugar. It can also be brewed into a tea. Half-dried balls are fried and mixed with small pieces of meat. Sun-dried blades can be crisped and turned into flavour flakes or powder.

**Other Uses:** Where it is abundant, *Ulva* can be used for animal feed, fish food or garden fertilizer. To use in the garden, dig fresh plants into the soil, compost them or dry them for later use. The broad blades are used to cover fish, *Caulerpa* and other products to keep them fresh for market.

**Preservation:** Wash well in fresh water, drain, and sun dry. *Ulva* will also keep well in a container in the fridge and can be frozen.



*Ulva*



*Ulva*

## Words and Their Meaning

- Agar** - a complex carbohydrate found in many red sea plants, which forms a jelly at room temperature. Agar can be extracted by boiling sea plants in water with a small amount of acid (lemon juice, vinegar). It is used for many industrial purposes, including production of agar plates for microbiology.
- Algin** - also called alginate, a carbohydrate jelly found in brown sea plants, which is extracted for industrial purposes. One use is to produce dressings for burn victims, because algin promotes the healing of damaged skin. Algin can absorb and remove heavy metals and radioactivity from our bodies. Algin also lowers blood cholesterol levels when it is included in the diet, and helps to prevent constipation.
- Basal** - forming or belonging to a base.
- Blades** - the flattened, leaf-like structures of sea plants.
- Blanch** - to immerse briefly in boiling water before using.
- Branches** - as with land plants, this refers to the structures growing out from the main stem or runner of sea plants.
- Branchlets** - small branches.
- Carrageenan** - a complex carbohydrate jelly found in many red sea plants. Carrageenan is widely used in food processing, cosmetics and medicines to thicken, to stabilise, and to help liquids stay mixed together without separating. When eaten, carrageenan helps to reduce blood cholesterol levels and also thins the blood, helping to prevent clots that cause strokes.
- Cholesterol** - a fatty substance that can build up on the walls of blood vessels and cause heart disease and stroke. Some sea plants contain substances that help reduce cholesterol in the blood.
- Constipation** - a condition in which your bowel is clogged with hard solids and you cannot pass them from your body. Some sea plants contain jellies (algin, agar) that when eaten can relieve constipation.
- Folic acid** - an important nutrient for pregnant women, folic acid helps to prevent spina bifida and other serious birth defects of the spine.
- Genera or genus** - genera is the plural of genus, a system of classification of living organisms, according to common characteristics.
- Goitre** - a disease related to the functioning of the thyroid gland, which may result in a large swelling on the neck. Goitre can be prevented by including iodine in the diet.
- Holdfast** - the structure of some sea plants, resembling the root system of land plants. The main function of the holdfast is to fasten the sea plant to the bottom.

<b>Iridescent</b>	- shining with many colours that seem to change when seen from different angles.
<b>Laminarin</b>	- a compound found in brown sea plants that helps thin the blood, preventing blood clots that can cause strokes.
<b>Micronutrients</b>	- substances which the body needs in very small amounts. Because the body does not produce these itself, micronutrients must be provided by foods. Micronutrients are essential for the body to maintain its normal functions. All vitamins and most minerals are micronutrients.
<b>Minerals</b>	- inorganic substances that are used by our bodies and which are obtained from the foods we eat. These include common elements such as potassium, iron and iodine.
<b>Rehydrate</b>	- to soak a dried sea plant in a small amount of water so that it absorbs water and swells up to its normal size and shape.
<b>Runners</b>	- the part of some sea plants that resembles a creeping stem, laying along the sea bed.
<b>Species</b>	- a further classification of living organisms, according to similar characteristics and the ability to interbreed or exchange genes.
<b>Stem</b>	- also known as the stipe, the flexible structure of sea plants to which the blades are attached.
<b>Tumour</b>	- a type of cancerous growth. Some sea plants contain anti-tumour compounds.
<b>Vitamins</b>	- organic substances that are essential for normal growth and nutrition and are required in small quantities in the diet because they can not be synthesised, or made, by the body.

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