



## Trading Company, Inc.

www.edwardandsons.com

Mail: P.O. Box 1326 Carpinteria, CA 93014 USA • Tel: (805) 684 8500 • Fax: (805) 684 8220  
Packages: 4420 Via Real • Suite C • Carpinteria, CA 93013 USA • email: edwardsons@aol.com

January 9, 2007

Program Manager  
USDA/AMS/TM/NOP  
Room 4008-So., Ag Stop 0268  
1400 Independence Ave., SW  
Washington, DC 20250

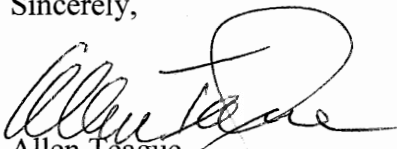
RECEIVED  
USDA NATIONAL  
ORGANIC PROGRAM  
2007 JAN 12 P 12:33

To Whom It May Concern:

Enclosed are two copies of our petition to have a substance included on the "National List" under section 205.606.

Please address any questions or response to the petitioner as listed in the document.

Sincerely,

  
Allen Teague  
Edward & Sons Trading Co.  
P O Box 1326  
Carpinteria, CA 93013  
805-684-8500

**Petitioner**

Edward & Sons Trading Co.  
P O Box 1326  
Carpinteria, CA 93013  
805-684-8500  
805-684-6220 fax  
Attn: Joel Dee, President  
joel@edwardandsons.com

**Petition Statement**

**Wakame** seaweed is a traditional accompaniment to Miso Soup in the Japanese cuisine. Wakame seaweed "*undaria pinnatifida*" is a naturally occurring **Eastern Pacific** sea vegetable the petitioner requests be included on the National List. The petitioner currently uses an "instant" version of "*undaria pinnatifida*" wakame in its instant soup "Miso Cup™" in an amount of approximately 2% or less of the total product. Petitioner has contacted numerous sea vegetable harvesters (see attached letters) and researched extensively to determine to date that an organically certified "*undaria pinnatifida*" is not commercially available.

Maine Coast Sea Vegetables, Inc. sells an organically certified (OCIA-Organic Crop Improvement Association) Atlantic seaweed known as "*alaria esculenta*" as a "wakame" type seaweed. However, aside from producing a different flavor profile to our product, their seaweed is not suitable for instant soup mixes as its instructions direct the consumer to cook for 20 minutes and therefore it is not compatible for an "instant" soup mix. Furthermore, its flavor and texture do not sufficiently match those of traditional Asian wakame seaweed. Petitioner therefore desires to continue to use the instant version of "*undaria pinnatifida*".

**Petition Item A**

Petitioner requests substance **Wakame Seaweed, "*undaria pinnatifida*"** be included on the **National List** under section: **205.606, Non-organic agricultural substances allowed in or on processed products labeled as "organic"**.

**Petition Item B****B.1. Substance's chemical or material common name:**

Wakame seaweed, "*undaria pinnatifida*"

**B.2. Manufacturer or producer contact information:**Producer/Suppliers:

Riken Vitamin Co., Ltd.  
2-9-18 Misakicho, Chiyoda-ku  
Tokyo, Japan  
Yoshiyasu Sakai, President  
Phone: 03-5275-5130  
Fax: 03-3237-1087

Great Easter Sun Trading Company  
92 Mcintosh Road  
Ashville, NC 28806-1406  
Attn: Jan Paige  
Email: prod@great-easter-sun.com  
800-334-5809

**B.3 Intended and current use of the substance Wakame “undaria pinnatifida”:**

The substance is currently used as a traditional ingredient in our organic instant soup mix “Miso Cup™”

**B.4 A list of the crop, livestock or handling activities for which the substance will be used.**

1. Traditional ingredient.

**B.5 Source of the substance and a detailed description of manufacture.**

See **B.2** and attached letters.

The petitioned substance in its raw form has such high moisture content and therefore outside of quick consumption has limited shelf life.

The wakame which petitioner uses undergoes minimal processing, such as cutting and drying (see enclosed flow chart) with only salt being added, which therefore solves the problems of perish ability and transportability.

Enclosed letters from suppliers and producers support petitioners’ inability to locate producers or suppliers of a certified organic “instant” *undaria pinnatifida* that would have the necessary shelf life for the product.

Petitioner acknowledges there are other suppliers of *undaria pinnatifida*, raw, dried or instant. However, to date, petitioner and its suppliers have been unable to locate a “certified organic” version.

Since *undaria pinnatifida* is harvested primarily in Asia, to our knowledge there has been no need or attempt to have natural seafood *undaria pinnatifida* certified organic according to farm ministries or certifying agent standards.

**B.6 Summary of available previous reviews by State or private certification.**

To the best of petitioner's knowledge and efforts, this information does not exist.

**B.7 Information regarding EPA, FDA, and State regulatory authority registrations, including registration numbers.**

To the best of petitioner's knowledge and efforts, this information does not exist.

**B.8 Chemical Abstract Service (CAS) number or other product numbers of the substance and labels of products that contains the petitioned substance:**

A CAS number is not available for the petitioned substance

See attached label.

**B.9 9.a the petitioned substance is a naturally growing sea vegetable not known to possess any negative interactions with other substances used in organic production.**

**9.b the petitioned substance does not possess any toxic elements or demonstrate any negative environmental persistence.**

**9.c petitioner knows of no negative environmental impact from the substances use.**

**9.d the petitioned substance is known to have only positive effects on human health.**

**9.e there are no known negative effects on soil organisms, crops, or livestock.**

**B.10 Safety information about the substance including a Material Safety Data Sheet (MSDS) and substance report from the National Institute of Environmental Health Studies.**

To the best of petitioner's knowledge and efforts, this information does not exist.

**B.11 Research information about the substance that includes comprehensive substance research reviews and research bibliographies, including reviews**

**and bibliographies, which present contrasting positions to those presented by the petitioner in supporting the substance's inclusion on or removal from the National List.**

See attached documents. Also, please note that NO reviews or bibliographies were found presenting contrasting views or positions on the consumption of wakame seaweed, "*undaria pinnatifida*".

- B.12 Items B.12, (A) through (H) do NOT apply as the petitioned substance is an agricultural substance.**
- B.13 Items B.13, (a) through (h) do NOT apply as Edward & Sons Trading Co. has no claim to Confidential Business Information (CBI) or "Trade Secret" information regarding its' use of the petitioned substance.**

**LETTERS FROM HARVESTERS AND SUPPLIERS**

X



92 MONTOSH ROAD • ASHEVILLE, NC 28908 • 800-351-5809 • 828-435-7790  
FAX: 828-457-8051 • E-MAIL: [customersvc@great-eastern-sun.com](mailto:customersvc@great-eastern-sun.com)  
WEB: [www.great-eastern-sun.com](http://www.great-eastern-sun.com)

---

01/09/07

Great Eastern Sun does not currently have a source for certified organic wakame. We will continue to request organic wakame from our sea vegetable suppliers. We can notify you when we are able to supply organic wakame.

Sincerely,

A handwritten signature in cursive script that reads "Jan Paige".

Jan Paige  
VP Operations  
Great Eastern Sun



**Maine Coast Sea Vegetables, Inc.**

3 George's Pond Road  
Franklin, ME 04634  
Tel. (207) 565-2907  
Fax. (207) 565-2144  
E-mail: [Craig@seaveg.com](mailto:Craig@seaveg.com)

01/03/07

Allen Teague  
Edward & Sons Trading Co.  
4420 Via Real  
Suite C  
Carpinteria, CA 93013

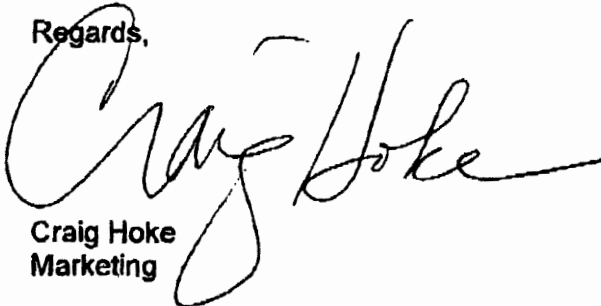
Dear Allen,

Per our dialogue & your request, the primary purpose of this brief communication is to confirm that from among our collection of organically certified North Atlantic marine algae, we (MCSV) do not offer **Wakame/Undaria pinnatifida**. And to the best of my knowledge, I am not personally conscious of any source of an organically certified form of this particular species.

MCSV harvests & markets an organically certified North Atlantic Wakame (*Alaria esculenta*), available in sundried whole leaf form, coarse-milled or an 80 mesh powder.

If you require additional information or have any questions, please contact me.

Regards,



Craig Hoke  
Marketing



## Allen Teague

---

**From:** ohveggies [ohveggies@pacific.net]  
**Sent:** Wednesday, December 20, 2006 3:03 PM  
**To:** sballen@cox.net  
**Subject:** Re: wakame seaweed



distributor prices  
2006.DOC (1...

Hi Allen,

We do not have certified organic wakame, We do have wakame (Alaria marginata). Do you know that the only thing that makes it certified is the handling of the seaweed after it is harvested? It is not the growing in the ocean that makes it certified organic, although one would think this because organic food is grown on organic soil.

We believe that our sea vegetables are of the finest quality on earth. We have the cleanest waters in the Pacific, with no industry and no ports near our coast. We also have the richest upwelling of nutrients from the ocean, as we have a 2 mile shelf which allows the water to be pure, clean and very nutrient rich. We dry our sea vegetables outside in the sun on net tables and then store it in plastic bags.

Please let me know if you would like to find out about ordering our product. We offer a distributor price for amounts over 10 pounds and would be happy to serve you. I have attached our distributor price list.

Thank you,  
Terry Nieves  
Owner  
Ocean Harvest Sea Vegetable Company  
Mendocino, California  
(707)937-1923

----- Original Message -----

**From:** <sballen@cox.net>  
**To:** ohveggies@pacific.net  
**Sent:** Wed, 20 Dec 2006 14:49:21 -0800  
**Subject:** wakame seaweed

- > We are Edward & Sons Trading and use wakame seaweed in some of our
- > Organic packaged food products.
- >
- > We are look for a "certified organic" wakame that we can include in
- > the products. Currently we are using "undaria pinnatifida" that
- > comes from the Pacific Rim, but to date it is not certified organic.
- >
- > If you have this particular variety or know where we can acquire it
- > (certified that is) please let me know. If not would you be willing
- > to write us a letter stating that you do not have it and believe
- > therefor that it is not availble.
- >
- > We need this as backup for our petition to get it certified.
- >
- > Thank you very much for you kind response.
- >
- > Allen Teague
- > Edward & Sons Trading
- > P O Box 1326
- > Carpinteria, CA 93104
- > 805-684-8500, x 108
- > sballen@cox.net

## Allen Teague

---

**From:** Craig Hoke [craig@seaveg.com]  
**Sent:** Thursday, December 28, 2006 11:59 AM  
**To:** sballen@cox.net  
**Subject:** Fw: Wakame Seaweed

**Importance:** High



Organically certified  
'Wakame'...

Hi again Allen,

I've spoken with one of our harvesters/suppliers regarding the question of a source for an organically certified Wakame (specifically, the *Undaria pinnatifida*). This particular supplier has confirmed for me that they do NOT have it & are not personally conscious of any source for it at this time. I have also spoken with another one of our suppliers, and likewise they regrettably don't have it either (& are not conscious of a current source). However, they did state that they do anticipate having it 'eventually' < meaning, within the next 2-3 years. So needless to say, this doesn't help us now.

I am attaching a brief document which as per your request addresses this topic. Given it's in this attachment form, understandably it doesn't demonstrate my signature. Yet I would be happy to forward a signed copy over via fax for your records. Please review the attached copy and confirm for me if in fact it states appropriately what you require...if not, I'll be happy to amend it accordingly.

If you do ultimately want/require a 'signed' copy, please forward a fax number. In any event, please confirm receipt of this message, many thanks Allen!

Regards,  
Craig

Regards,  
Craig Hoke  
Marketing  
Maine Coast Sea Vegetables, Inc.  
craig@seaveg.com  
info@seaveg.com  
www.seaveg.com

> ----- Original Message -----

> From: <sballen@cox.net>  
> To: <info@seaveg.com>  
> Sent: Wednesday, December 20, 2006 4:08 PM  
> Subject: Wakame Seaweed

>

>

>> To: Criag Hoak

>>

>> From: Allen Teague

>>

>> Dear Craig,

>>

>> Thank you again for your information regarding my query on Wakame.

>> And thank you very much for sending your sample. We look forward to  
>> the sample.

Allen Teague  
Edward & Sons Trading Co.  
P.O. Box 1326  
Carpinteria CA 93104

December 20, 2006

Dear Allen Teague

Thank you for your inquiry regarding organic wakame seaweed. The Atlantic equivalent of Pacific wakame is *alaria esculenta*, and you might try Maine Coast Sea Vegetables, phone 207 565 2907 for that. I currently have 160 pounds in stock, and that will have to last me until the new harvest season begins in mid-May. Right now, I could sell all of it for \$25/lb. to a California seaweed company that wants it, but I will reserve it for my loyal customers, my small accounts, because that is the basis for my business.

Back in the 70's, when we said "organic", we meant, "local" and "know your farmer personally". My thousand customers know me personally because I send them a newsletter twice a year, and the door is always open for them to visit me. This house sleeps 20 people, and I offer to take my customers out in the boats during the summer to see the islands, the seals, the ducks, eagles, cormorants and gulls, and, of course, the seaweed beds that I have harvested for the past 35 years. My home is also a retreat center, and I practice deep bodywork. I grow a pretty good garden, and my apprentice, Rick, once was part of a CSA (community supported agriculture) team of four farmers who supplied vegetables to 350 members in Pennsylvania. My partner Karen is a natural foods cook and cooking teacher, so people who come here for retreat are truly in good hands.

I will enclose a letter I sent to my customers because it addresses organic standards. My standards are higher than organic standards (see letter), and that is one of the reasons I refuse to pursue "organic" certification. This is a small business, and like most small farmers, we really can't afford to purchase the label from the certifiers. Small farmers are beginning to believe that the organic certification label was created to squeeze them out of business, and I can truly sympathize with that point of view.

If I do business with any large company, those contracts are negotiated in March before the harvest begins in April. In that way, I can allocate enough time during the spring/summer season to satisfy everyone who is a customer of mine. If you want to continue this conversation, let me know. Otherwise,

Rest in the Light, abide in the Heart.

Larch Hanson, Maine Seaweed LLC, PO Box 57, Steuben ME 04680

↑  
↑  
↑  
LARCH

**REFERENCE FOR ITEM B.5**



				HOME	PRODUCTS	PROFILE	CONTACT US
EMULSIFIER	DIGLYCERINE ESTER	ICE CREAM STABILIZER	NATURAL TOCOPHEROL	NATURAL COLOR	FLAVOR	WAKAME	PLASTIC ADDITIVE

WAKAME: select item

## Seaweed and Wakame (sea vegetables)

### WAKAME

First there was the earth, then the sea, and then in the sea, life. From the original life forms were developed the seaweeds, which would provide the sustenance and shelter for all other life forms to come. Thus it is that the sea, which covers most of the earth's surface, supports every form of life on earth. And the source of the sea's infinite life and energy-the seaweeds and sea vegetables.

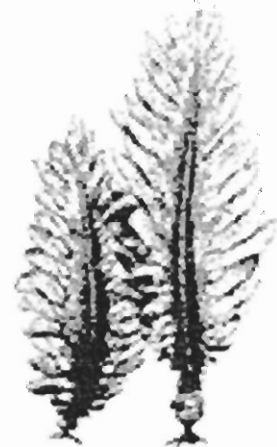
### History

Wakame (*Undaria pinnatifida*) is one of the most popular varieties of seafoods which have been eaten in Japan and Korea for centuries. It is estimated that the first type of seaweed originated one billion years ago. Five hundred million years later, shellfish appeared, and one hundred million years after that, fish. Seaweed, therefore, is one of the oldest forms of life on earth.

Sea vegetables have played an important role in the eating habits of the Japanese people, and excavations have shown these plants to have been consumed as much as ten thousand years ago in Japan. Sea vegetables may even have a longer history as a food than grains such as rice, etc. The oldest existing anthology of Japanese poetry, the Manyoshu (written in the 8th century), contains references to Wakame as a special dish served in sacred services or used as an offering to nobility.

At that time it was not available for daily consumption, and it was only after the 17th century that ordinary people could obtain and eat Wakame. It was then that Wakame gained popular attention as a food, and cookbooks printed during that period contain information on preparing Wakame dishes.

The same pattern of consumption appears to have developed in Korea. In the past, only naturally grown Wakame was eaten, but today it is possible to cultivate and harvest Wakame like other plants, and the volume of cultured Wakame is increasing steadily.



### Ecology

It is estimated that there are more than 8,000 species of seaweed in the world's oceans. Of these, no more than 10 are eaten. And because they are eaten, these species, including Wakame, are more appropriately referred to as "sea vegetables."

Unlike land plants, seaweeds have no leaves, stalks, or roots, so growth is accomplished by



They also respire through their leaflike blades, and absorb minerals from the sea water. Besides the blades, seaweeds comprise a stipe, like a stalk, and a holdfast, like a root. Although seaweeds are attached firmly to the seabed by their holdfasts, no nutrition is absorbed through the holdfasts-all nutrition is absorbed directly from the seawater through the blades' surfaces. Thus they not only absorb and accumulate such essential minerals as calcium, sodium, potassium,

absorption of solar energy.

## Uses

Sea vegetables and seaweeds are widely utilized as food, feed, and fertilizers. In Europe, they are used as raw materials to produce agar, alginic acid, etc. Where Wakame is concerned, it is consumed mainly as a food in Japan and Korea. In Korea, especially, Wakame is an important ingredient in cooking, where it is an indispensable ingredient in soups consumed by women before and after childbirth, and on special occasions such as birthdays. In Japan, the beneficial effects of Wakame have been understood since antiquity, as noted in folk sayings such as, "Wakame is food and medicine combined in one," and, "Wakame purifies the blood."

Recently, obesity has gained attention as a serious health problem in developed countries, stemming from the excessive intake of animal proteins, fats, and sugar.

magnesium and iodine, but also many vitamins.

This problem has even drawn the attention of the United States Senate, which appointed a special committee on nutritional problems that announced a "Recommended Diet to Prevent Geriatric Disorders" in 1977. In addition, many books and research papers concerning sea vegetables have been published, and general eating habits have improved in accordance with the development of bromatology and dietetics. Therefore, the benefits of Wakame as a natural, healthful food are being recognized, and Wakame will undoubtedly gain considerable attention throughout the world in the near future.



© 2002 Riken Vitamin

# COMMERCIAL INVOICE

No. 2005023UC

Date: February 17, 2006

EDWARD & SONS TRADING CO., INC.  
4420 Via Real, Suite C,  
Carpinteria, CA 93013  
U.S.A.

Shipping Mark

No Mark

EDWARD & SONS TRADING CO., INC.  
c/o States Logistics Services, Inc.  
6570 Altura Blvd. Buena Park, CA 90620  
Phone: (714)521-6520 Fax: (714)522-2420

Per  
LIGHTNING  
Los Angeles  
60 days after B/L date

On or About  
February 17, 2006  
Via  
L/C NO.  
Origin  
JAPAN

DESCRIPTION	QUANTITY	UNIT PRICE	AMOUNT
<u>F. O. B. YOKOHAMA</u>			
<b>RICE SNAPS&gt;</b>			
Tamari Sesame	12x12x100g	60 ctns.	J. ¥96.- J. ¥829,440.-
Tamari Seaweed	12x12x100g	36 ctns.	¥96.- ¥497,664.-
No Salt Sesame	12x12x100g	60 ctns.	¥96.- ¥829,440.-
Onion Garlic	12x12x100g	84 ctns.	¥96.- ¥1,161,216.-
<b>POWDER SOUP MIX (MISO CUP)&gt;</b>			
Original	12x12x73.6g	60 ctns.	¥143.- ¥1,235,520.-
Seaweed	12x12x73.6g	115 ctns.	¥143.- ¥2,368,080.-
Seaweed	24x24x20g	12 ctns.	¥36.- ¥248,832.-
<b>SEEDS&gt;</b>			
Instant Wakame Seaweed	5kg	11 ctns.	¥1,439.- ¥79,145.-
<b>GRAND TOTAL:</b>		<b>438 ctns.</b>	<b>J. ¥7,249,337.-</b>

Facility Registration Number:

**RICE SNAPS>**

7110: Sakata Beika Co., Ltd.  
2-24, Ryou-Cho, Sakata-City, Yamagata, 9980832, JAPAN

**POWDER SOUP MIX (MISO CUP)>**

782: Meiji Shokuhin Co., Ltd.  
1544 Koshigoe, Maruko-Machi Chiisagata-Gun Nagano, 386-0403, JAPAN

**Seeds>**

2116: Riken Foods Co., Ltd.  
2-5-60 Miyauchi, Tagajo, Miyagi 985-0844 JAPAN

**WAREHOUSE>**  
5048: Japan Van Lines Co., Ltd Yokohama Br. Honmoku A-3 Warehouse  
No. 6 Honmoku Futo, Naka-Ku Yokohama, Kanagawa 231-0811 JAPAN

**Agent>**  
5820: Edward & Sons Trading Co., Inc.

SAN-ESU INC.

  
Authorized Signature

# Production process of Instant Wakame

Receiving Wakame → Preparation (add salt) → Have spinning sieve (Remove small fish or foreign object)

Visual sorting → First Washing → Cutting

Second Washing → Adjust salinity → Dehydration

Drying → Sorting by wind force (Remove heavier object)

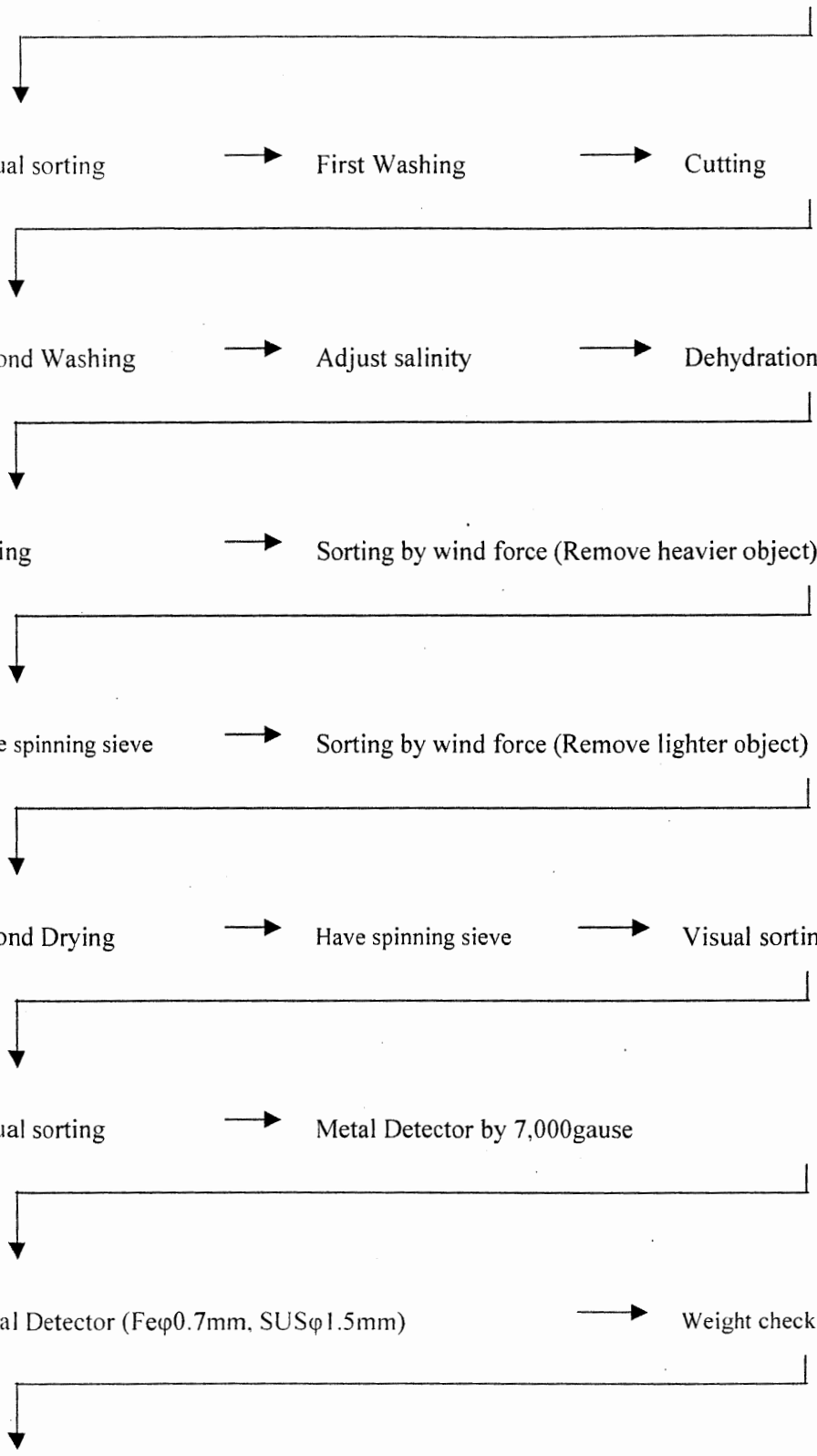
Have spinning sieve → Sorting by wind force (Remove lighter object)

Second Drying → Have spinning sieve → Visual sorting by color

Visual sorting → Metal Detector by 7,000gauss

Metal Detector (Feφ0.7mm, SUSφ1.5mm) → Weight check

Packaging → Weight check





**REFERENCE FOR ITEM B.8**

### The story of Miso-Cup™

Miso (pronounced mee-so) has deliciously nourished the Asian people for thousands of years. Originally reserved exclusively for nobility, miso was later shared more widely, and became a valued staple in kitchens throughout the Orient.\*

Recently discovered in the West, miso soup is now enjoyed worldwide, thanks to its wonderful flavor and unique nutritional profile.

To make **Organic Miso-Cup™ Traditional Soup with Miso**, our miso craftsmen age certified

organic soybeans and organic rice with a special starter culture. Sea salt is used to regulate this

natural aging process. Next, we freeze-dry the fresh

unpasteurized organic miso to retain its maximum benefits. We add select natural ingredients including

organic tofu (another great soyfood) to make Organic Miso-Cup™ complete.

Much like yogurt, miso is considered to be a living food. That is why Edward & Sons takes extra care to use costly

freeze-drying methods which maintain, as much as possible, the naturally occurring living

cultures for which fresh miso is prized.

Miso-Cup™ boasts a rich, satisfying flavor which may replace meat or poultry as the foundation for soups, stews, or gravies. Since Miso-Cup™ is a



vegetarian soy food, it is totally free from cholesterol and saturated fats and is a source of isoflavones.

Like all Edward & Sons products, Miso-Cup™ offers the discerning consumer true "Convenience

Without Compromise™!" Perhaps the first "convenience health food", Miso-Cup™ has been

nourishing people on the go since 1978, and has become internationally famous as America's leading

natural instant soup!

\*SOURCE: THE BOOK OF MISO, by W. Sturteff & A. Aoyagi, 10 Speed Press. For more book information, contact: Soyfoods Center, Box 234, Lafayette, CA 94549

### Organic Miso-Cup™ Soup

**DIRECTIONS:** Add contents of one envelope to 8 oz. of hot water—stir—enjoy. (At home, you may use leftover water from steamed vegetables for added flavor and nutritional content.)

### RECIPE: Organic Party Dip

Mix one Miso-Cup™ envelope with 6-8oz. organic sour cream. Stir well. Serve with chips or raw veggies.

**Allergens:** Contains soy. If you have food sensitivities, please contact us for additional information and consult your physician to be sure this product meets your dietary guidelines.

**Product of USA/Produit des EU**

### Nutrition Facts

Serving Size 1 envelope (9.3g)  
Servings Per Container 4

Amount Per Serving	Calories from Fat 10
<b>Calories 35</b>	<b>%Daily Value*</b>
<b>Total Fat 1g</b>	<b>2%</b>
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 480mg	20%
Total Carbohydrates 4g	1%
Dietary Fiber less than 1g	3%
Sugars less than 1g	
<b>Protein 2g</b>	
Vitamin A 2%	Vitamin C 2%
Calcium 2%	Iron 4%

\*Percent Daily Values are based on a diet of 2,000 calorie diet.

**Ingredients:** Freeze-dried Organic Miso (Organic Soybeans, Cultured Organic Rice, Sea Salt), Freeze-Dried Organic Tofu (Water, Organic Soybeans, Calcium Sulfate, Nigari [Magnesium Chloride]), Organic Onion Powder, Organic Onions, Wakame Seaweed, Organic Parsley.

Dist. by/par Edward & Sons Trading Co., Inc.

P.O. Box 1326  
Corpinheria, CA 93014 USA  
[www.edwardandsons.com](http://www.edwardandsons.com)

Certified organic by QAI, USA  
Certifié biologique par QAI, EU.



**REFERENCE FOR ITEM B.11**

**§ 205.606 Nonorganically produced agricultural products allowed as ingredients in or on processed products labeled as organic or made with organic ingredients.**

The following nonorganically produced agricultural products may be used as ingredients in or on processed products labeled as "organic" or "made with organic (specified ingredients or food group(s))" only in accordance with any restrictions specified in this section.

Any nonorganically produced agricultural product may be used in accordance with the restrictions specified in this section and when the product is not commercially available in organic form.

- (a) Cornstarch (native)
- (b) Gums - water extracted only (arabic, guar, locust bean, carob bean)
- (c) Kelp - for use only as a thickener and dietary supplement
- (d) Lecithin - unbleached
- (e) Pectin (high-methoxy)



About 570 bean plants make up a 12 ounce jar of bean salad dressing



Search

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Browse by Audience

Information For...

Browse by Subject

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- Laws and Regulations
- Marketing and Trade
- Natural Resources and Environment
- Research and Science
- Rural and Community Development
- Travel and Recreation
- USDA Employee Services

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Search Results

undaria pinnatifida

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powered by

All USDA

Results 1 - 2 of about 3 (0.12 seconds).

Sort by: Date /

Did you mean: **under** pinnatifida?

National Standard of the People's Republic of China [PDF]  
 ... 24 16 Salt (calculated as NaCl), g/ 100g Dried sea belt and **undaria pinnatifida** products Dried sea grass and purple seaweed products 18 8 ...  
[www.fas.usda.gov/ffpd/WTO\\_SPS\\_TBT\\_Notifications/Fishery\\_Products...](http://www.fas.usda.gov/ffpd/WTO_SPS_TBT_Notifications/Fishery_Products...) - 2004-03 Version

Module 19. Botanicals Generally Recognized As Safe  
 ... pyrifera, Petalonia fascia, Scytosiphon lomentaria, **Undaria. pinnatifida**. RED ALGAE: Gloiopeltis furcata, Porphyra spp., Rhodymenia spp. ...  
[www.ars-grin.gov/duke/syllabus/gras.htm](http://www.ars-grin.gov/duke/syllabus/gras.htm) - 27k - 1998-08-18 - Cached

*In order to show you the most relevant results, we have omitted some entries very similar to those already displayed.  
 If you like, you can repeat the search with the omitted results included.*

Last Modified: 01/04/2007



Seaweed

## Kelp

### Kelp forests

New Zealand's largest seaweeds are collectively called kelps and belong to the brown group. Because beds of kelp have such a complex structure and are able to modify their environments, Charles Darwin likened them to forests. Kelp forests may be over 20 metres tall, and support an understory of smaller brown and red seaweeds as well as rich populations of both grazing and immobile animals.

### Bladder kelp

The country's largest kelp is *Macrocystis pyrifera*, known as bladder kelp in New Zealand, but giant kelp elsewhere. It can grow to 50 metres in length and 100 kilograms in mass. Bladder kelp forms large forests in the deep sheltered waters of southern New Zealand, and is easily identified by the gas-filled floats at the base of each frond. These help to hold the kelp upright, maximising the amount of sunlight the blades receive.

### Common kelp

In northern waters common kelp (*Ecklonia radiata*) dominates marine forests. This seaweed is about 1 metre in length and has a bunch of fronds arising from a central supporting stem. It is the preferred food of the sea urchin, kina (*Evechinus chloroticus*), which sometimes mass together and munch through an entire forest. Following such large-scale habitat destruction, other seaweeds may dominate for a while, but in northern New Zealand, at least, common kelp grows rapidly and soon replaces itself.

#### Marine invaders

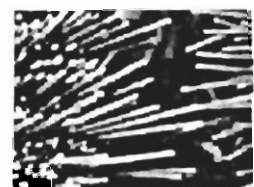
Seaweeds have been stowaways to New Zealand on the bottom of vessels or in ballast water for years. A few arrived with sealers and whalers in the late 18th and early 19th centuries, but did not pose a threat to native marine life. The situation changed when *Undaria* arrived. At two months of age it can release millions of spores into the sea. Germinating spores will colonise any firm surface – ropes, buoys, vessel hulls, floating plastic as well as rocky reefs – and grow rapidly, displacing native seaweeds.

### Bull kelp

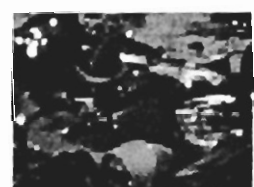
Bull kelp or rimurapa (*Durvillaea* species) is the most striking seaweed of the exposed coasts. Its tough, flexible fronds are secured to intertidal rocks



Bladder-kelp forest



A kina barren



Bull kelp (1st of 2)



Bull kelp's  
honeycombed  
structure



Wakame in soup

by a solid disc-shaped holdfast capable of withstanding tremendous forces when storm waves crash onto reefs and cliffs. The seaweed grows to 10 metres in length and can live for 10 years. Bull kelp forests are highly productive systems, contributing vast quantities of organic matter and nutrients to coastal food chains.

Four species of bull kelp are found around New Zealand, and the most common, *Durvillaea antarctica*, also grows around the subantarctic islands and southern coasts of South America. In northern New Zealand it grows only on very exposed headlands and becomes more common in the cooler waters south of Cook Strait. Fronds of *Durvillaea antarctica* have an internal honeycomb-like tissue, full of air, which keeps the blade buoyant. The form of the frond differs according to conditions: the more exposed the site, the more divided the fronds.

## Asian kelp

Asian kelp (*Undaria pinnatifida*) arrived in New Zealand waters in the 1980s and quickly made itself at home in sheltered harbours. Although it is farmed and eaten in Japan, where it is known as wakame, this fast-growing, 2-metre-tall kelp is unwelcome in New Zealand as it can change the structure and composition of native marine communities.

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Commentary

## The thyroid, iodine and breast cancer

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Outline

**Abstract**

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A renewal of the search for a link between breast cancer and thyroid disease has once again demonstrated an increased prevalence of autoimmune thyroid disease in patients with breast cancer. This is the most recent of many studies showing an association between a variety of thyroid disorders and breast cancer. Such an association is not surprising as both diseases are female predominant with a similar postmenopausal peak incidence. The significance of the presence of thyroid autoantibodies, particularly thyroid peroxidase antibodies, in serum from patients with breast cancer is unknown, but it has been suggested that antibody positivity is associated with better prognosis. One area in which thyroid and breast functions overlap is in the uptake and utilization of dietary iodide. Experimental findings showing the ability of iodine or iodine-rich seaweed to inhibit breast tumour development is supported by the relatively low rate of breast cancer in Japanese women who consume a diet containing iodine-rich seaweed. However, there is as yet no direct evidence that iodine, iodinated compounds, or a combination of iodine and selenium is the antimammary carcinogenic element in the Japanese diet. It remains to be resolved whether the perceived breast cancer-thyroid disease relationship is thyroid or iodine related or, in the case of thyroid autoantibodies, is the consequence of an immune response to the carcinoma. Is this response breast specific and does it relate to iodine status? These and many other questions await resolution before a definitive role in the natural history of breast carcinoma can be assigned to the thyroid.



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In this issue of *Breast Cancer Research* Turken and coworkers [1] describe an association between breast cancer and autoimmune thyroid disease (AITD), showing not only an increased prevalence of thyroid peroxidase (TPO) antibodies in patients with breast cancer but also a significantly increased rate of goiter (diffuse 8%, nodular 50%) as compared with control individuals (4% and 26%, respectively). This finding is in agreement with previous studies [2,3] that showed both increased goiter rates and increased prevalence of thyroid enlargement by ultrasound in patients with breast cancer [4]. This association represents yet another page in the continuing saga of the perceived coincidence between breast cancer and diseases of the thyroid gland. The fact that both breast cancer and thyroid disease predominantly affect females and that both have a postmenopausal peak incidence has inevitably resulted in a search for an association between the two diseases [5,6]. Although many studies have shown such an association, evidence of specific causal linkage between thyroid breast cancer and thyroid disease continues to be elusive.

One of the earliest reports on the association of breast cancer with thyroid disease was that from Beatson [7] in 1896, who used oophorectomy and thyroid extract to treat breast cancer. Since that report there have been many studies showing an association of breast cancer with hyperthyroidism, hypothyroidism, thyroxine replacement therapy and thyroiditis [5,6]. Equally, other reports showed no significant association. Where an association between thyroid disease and breast cancer was shown to exist, hypothyroidism was the most frequently observed finding. In fact, many reports considered hyperthyroidism to be protective against breast cancer because progression of such cancers was more frequently observed when the hyperthyroidism was treated [5].

The increased frequency of thyroid autoantibodies, TPO antibodies and thyroglobulin antibodies described by Turken and coworkers [1] in breast cancer patients as compared with control individuals supports earlier findings [8-11]. Such differences were not observed for other autoimmune antibodies [9]. The use of specific immunoassays for TPO antibodies and thyroglobulin antibodies [12] revealed an increased prevalence of TPO antibodies in breast cancer. Although the presence of circulating TPO antibodies in asymptomatic individuals has been implicated as conferring an increased risk for future hypothyroidism [13], there is no agreement on the significance of its association with breast cancer [14]. A fivefold excess in breast cancer has been reported in Japanese patients with AITD [8]. However, no significant association between breast cancer and Hashimoto's thyroiditis was reported in a study from the Mayo Clinic in the USA [15]. Thus, like other reported associations, the relationship between AITD, iodine intake and breast cancer is far from clear. Equally, there is little agreement on the significance of any published association between a range of thyroid disorders and breast cancer [5,6].

The possibility that hypothyroidism might in itself have been beneficial in terms of outcome of breast cancer has been suggested [16]. Recent reports from our laboratory [11] have shown that the presence of TPO antibodies is associated with a significant improvement in both disease-free and overall outcome in breast cancer patients, and that the magnitude of this prognostic effect was of a similar order of magnitude to well established prognostic indices for breast cancer such as axillary nodal status or tumour size. Thus, we have the anomalous situation in which the presence of TPO antibodies, while being associated with breast cancer, also appears to confer prognostic benefits. A recent review that contained a meta-analysis of published work on breast-thyroid associations [14] found no significant association between the two disorders and attributed any positive findings of such an association to 'selection or institutional referral bias'. This negative finding was immediately followed by communications [1,17] reaffirming the association of breast cancer with hypothyroidism and AITD. It is therefore apparent that the argument about breast-thyroid associations is far from resolved.

The association of thyroid antibody positivity, sometimes with transient thyroid dysfunction, has been reported in the course of immunotherapy with recombinant cytokines interleukin-2 and interferon- $\alpha$  for various cancers [18,19]. Thyroid antibody related hypothyroidism has been suggested as being associated with a favourable tumour response to such therapies. In a recent report [19] it was shown in metastatic renal cell carcinoma that the presence of a positive thyroid antibody titre, either pre-existing or

cytokine induced, was a highly significant independent prognostic factor. In the case of thyroid autoantibodies being associated with better disease outcome in breast cancer, renal carcinoma or melanoma, it is possible that the immune response to thyroid and tumour tissue might be similarly regulated in that it might be directed against both tumour and thyroid antigens. Another possibility is that both tumour and thyroid share the same antigens because expression of the sodium-iodide symporter has been demonstrated in both thyroid and breast tissues [20-22].

One area in which thyroid and breast functions overlap is in the uptake and utilization of iodide. In the thyroid, I<sup>-</sup> is required for thyroid hormonogenesis whereas in the breast I<sup>-</sup> is needed in breast milk as a source of neonatal nutrition. Both organs require a method of oxidizing I<sup>-</sup> to I<sub>2</sub> (organification) in order to produce iodoproteins [23,24]. This involves the presence of H<sub>2</sub>O<sub>2</sub> as an oxidizing agent catalyzed by TPO in the thyroid and by lactoperoxidases in the breast. Apart from the requirement for iodide as a nutrient in breast milk, there is no known role for iodine in the normal or diseased breast. However, a breast requirement for I<sub>2</sub> rather than I<sup>-</sup> has been suggested [25]. It has been postulated that formation of iodolipids such as iodolactones or iodoaldehydes represents a form of thyroidal autoregulation [26], which may be the mode of action of iodide inhibition of thyroid function in the Wolff-Chaikoff effect [27-29].

In addition to their role in inhibiting thyroid function, these compounds may act as antiproliferative agents in the thyroid [26]. Iodinated compounds (so-called XI) may exert inhibitory effects on adenylate cyclase, NADPH (nicotinamide adenine dinucleotide phosphate, reduced form)-oxidase and TPO activities [27]. This effect seems to require oxidation of I<sup>-</sup> to I<sub>2</sub> because inhibitors of TPO or I<sup>-</sup> trapping can reverse the inhibitory effect [29]. It has also been suggested that such inhibitory actions of iodo-compounds on cell proliferation might play a role in the breast [30,31]. Some support for a role for iodine in the human breast is provided by our own findings [20], which showed that tissue iodine levels were relatively low in patients with breast cancer as compared with normal tissues or benign breast tumours (fibroadenomata). We have also recently shown <sup>125</sup>I uptake blocking effects in sera from 19% of 105 patients with breast cancer [20], as compared with a published prevalence of 30.7% of such blocking activity, believed to be of immunogenic origin, in Graves' disease [32]. The ability of the breast to express sodium-iodide symporter [20-22] and, at least in lactation, to take up significant amounts of iodide has led to studies of the potential for use of <sup>131</sup>I ablative therapy in breast cancer, analogous to that employed in the treatment of hyperthyroidism or thyroid cancer.

An anticarcinogenic role for iodine in experimental animals was suggested by the work of Funahashi and coworkers [33], who found that administration of Lugol's iodine or iodine-rich Wakame seaweed to rats treated with the carcinogen dimethyl benzanthracene suppressed the development of mammary tumours. In further studies [34], the same group demonstrated that seaweed induced apoptosis in human breast cancer cells with greater potency than that of fluorouracil, a chemotherapeutic agent used to treat breast cancer. This finding led the authors to speculate that 'seaweed may be applicable for prevention of breast cancer'.

This hypothesis is in accord with the relatively low breast cancer rate reported in Japan [35], where the normal diet is seaweed rich, and with increasing breast cancer rates in Japanese women who emigrate [36] or consume a western style diet [37]. Interestingly this finding applies to rates of breast cancer in both males and females [38]. This evidence favours the low rate of breast cancer being environmental rather than genetic in origin. One of the main dietary differences between Japanese and western women is the consumption of large amounts of iodine-rich seaweeds by the former, yielding a dietary iodine intake of several milligrams per day in Japanese women as compared with microgram quantities in western women [31]. Of course it must be stressed that all this evidence is circumstantial because the contribution, if any, of dietary iodine intake to these findings is unknown. Equally, the possibility that this protective effect may be lost in patients with AITD [8] remains to be explored.

The frequent coexistence of iodine and selenium deficiencies and the importance of replacing both to maintain thyroid function is well established [39]. It has also been suggested that a combined iodine-selenium deficiency may facilitate the development of breast cancer [31]. Selenium deficiency results in diminution of selenium-containing

antioxidative enzymes such as glutathione peroxidase, deiodinases and thioredoxine reductases [39,40], leading to increased levels of reactive oxygen species. These oxidants can inactivate many enzymes, are a feature of lipid peroxidation and DNA damage, and have been shown to be associated with carcinogenesis in the breast [41]. On the other hand, increased serum levels of antioxidants have been associated with reductions in breast cancer risk [42]. There is also some evidence that iodide itself may act as an antioxidant [43]. Selenium deficiency is associated with AITD perhaps as a result of increased inflammatory activity arising from decreased activity of selenium containing antioxidative enzymes such as glutathione peroxidase [39], whereas increasing dietary selenium or administration of selenomethionine have also been reported to diminish TPO antibody levels [44,45].

Although there is as yet no definitive evidence of a role for the thyroid in the natural history of breast cancer, the continuing reports of an association such as that in this issue of *Breast Cancer Research* [1] should not be ignored. In particular, the question of whether the presence of TPO antibodies in serum of patients with breast cancer is breast specific or part of a generalized immunogenic response needs to be explored. Also requiring study are the involvement of iodide transport in the breast and additional roles for iodinated compounds within the mammary glands, with their accompanying benefit of providing a new therapeutic pathway for radioiodine ablative therapy. Finally, it remains to be established whether iodide or selenium treatment has prophylactic potential. Whatever the future study pathways, there is little doubt that the perceived association of two of the most common female disorders will continue to intrigue investigators.

## Competing interests

None declared.

## Abbreviations

AITD = autoimmune thyroid disease; TPO = thyroid peroxidase.

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## Wakame Seaweed Profile

Also known as- Alaria Marginata

### Introduction

Wakame is a seaweed that looks and tastes like a slippery spinach. Wakame can be used in the same ways as kombu in soup and as an addition to green or fruit salads. When dried wakame is soaked in water it expands to at least 10 times its dried size.

### Constituents

Mucilages, fucoidan.

### Parts Used

The whole plant, dried. Wakame should be chopped after it is reconstituted.

### Typical Preparations

Dried wakame is reconstituted before use. Place up to 1 oz (30 grams) of wakame in a large bowl or pan you have filled with water and allow to soak for 30 minutes. After the wakame has swollen to a much greater size, remove the seaweed from the soaking water and place on a cutting board with the stem facing you. Cut off the leaves and discard the stem (or save for use in soup stock). Chop the leaves into bite-sized pieces and dip briefly into boiling water to bring out their color before use.

### Summary

There is no doubt that eating small amounts of wakame prevents constipation. Recent research has found that some of the fibers in wakame help prevent colon cancer by providing antioxidants in addition to preventing the "fermentation" and oxidation of food as it passes through the large intestine. The fucoidan sugars in wakame are antiviral against cytomegalovirus and herpes; a study published in BMC Complementary and Alternative Medicine reported that taking an extract of wakame prevented and reduced the severity of recurrent herpes outbreaks. Daily consumption of small amounts of the reconstituted seaweed (a tablespoon of reconstituted seaweed prepared by soaking one-quarter teaspoon of dried seaweed) may lower blood pressure. The Japanese Journal of Cancer Research reports preliminary findings that daily consumption of small amounts of wakame may be more beneficial in treating certain kinds of breast cancer in women than chemotherapy.

### Precautions

Avoid excessive consumption. Consuming large amounts (more than 3-1/2 oz/100 g) of dried seaweed every day (a very large volume of reconstituted seaweed, several plates full) can cause hypothyroidism, which reverses if there is no consumption of iodine-rich seaweeds for 3-4 months. Use of a few grams (up to 1/4 oz) of dry wakame per day will not have an adverse effect on thyroid function.

For educational purposes only

This information has not been evaluated by the Food and Drug Administration.

This information is not intended to diagnose, treat, cure, or prevent any

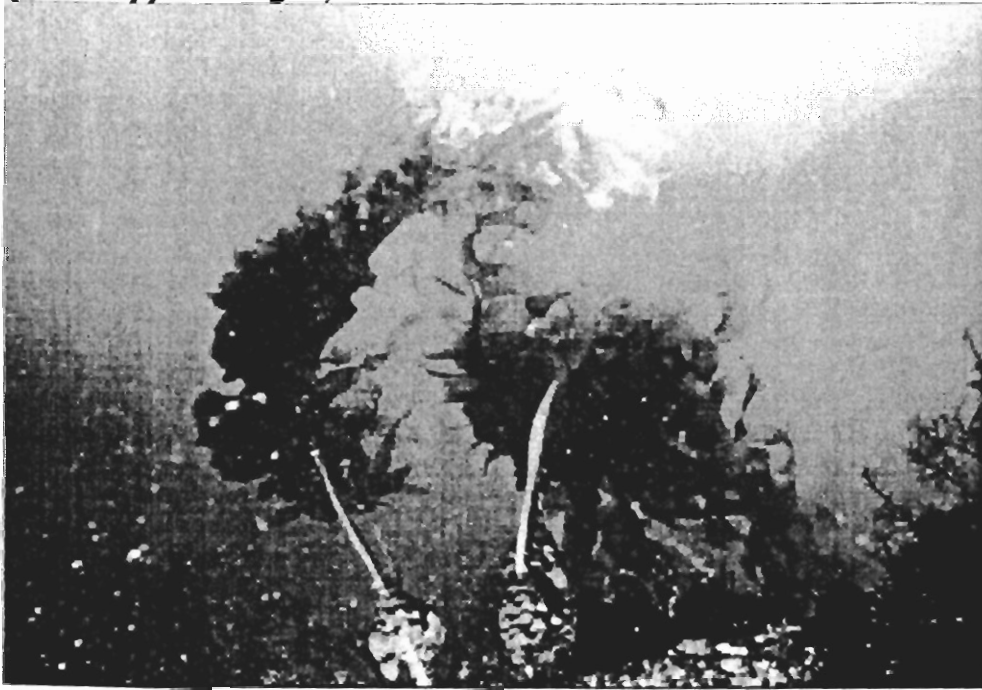


## Wakame (Japanese)

Known Introduction  
to Australia

### *Undaria pinnatifida*

(Harvey) Suringer, 1873



CRIMP, CSIRO Marine Research

### Taxonomy

**Division:** Heterokontophyta

**Class:** Phaeophyceae

**Order:** Laminariales

**Family:** Alariaceae

**Genus:** *Undaria*

### Description

*Undaria pinnatifida* is a brown seaweed that can reach an overall length of 1-3 metres. It is an annual species with two separate life stages. The macroscopic stage (the sporophyte), usually present through the late winter to early summer months and a microscopic stage (the gametophyte), present during the colder months. The sporophyte is golden-brown in colour, with a lighter coloured stipe. The stipe has small pinnae at the top (at the beginning of the blade) and during the reproductive season, a distinctive convoluted sporophyll at the base.

### Diagram

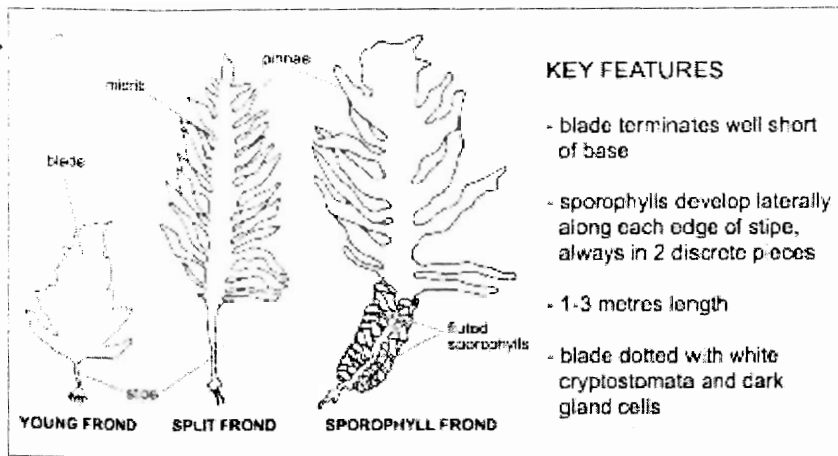


Diagram - Sanderson 1990

## Similar Species

*Alaria esculenta* (Linnaeus) Greville, 1830

*Saccorhiza polyschides* (Lightfoot) Batters, 1902

*Undaria undarioides* (Yendo) Okamura, 1915

*Undariella peterseniana* (Kjellman) Y. Lee, 1998

[MORE \(Common Names, Synonyms, Identification Notes, Similar Species, Morphology\)...](#)

## Reproduction and Growth

*U. pinnatifida* has a complicated life cycle. The macroscopic plant (the sporophyte) produces microscopic zoospores that eventually settle, germinate and grow into microscopic gametophytes. Once all the spores are released, the sporophyte dies. Individual plants can release up to 100 million spores over the spring/summer period. When conditions are favourable, the gametophyte releases sperm and eggs which then fertilise and grow into an macroscopic plant. Temperature, light and depth are all important developmental cues. Plants can grow up to 3m in length, but typically grow to 1.5-2m in less than a year.

[MORE \(Reproduction, Life Cycle\)...](#)

## Habitat

*U. pinnatifida* is an opportunistic alga that has the ability to rapidly colonise disturbed or new surfaces. It is found mostly on sheltered reef areas which are subject to oceanic influence, rarely in highly exposed areas. The seaweed will grow in the intertidal zone down to the subtidal zone, to a depth of 15-20 metres. It does not tend to become established successfully in areas with high wave action and an abundance of local vegetation.

[MORE \(Habitat, Survival\)...](#)

## Feeding Preferences

Trophic status: Primary Producer

*U. pinnatifida* produces its own food through photosynthesis.

[MORE \(Food, Competitors\)...](#)

## Predators

In Australia, *U. pinnatifida* has few predators. Observations of fish and sea urchins grazing on algae that has begun to die off have been made in areas of dense *U. pinnatifida* populations.

[MORE \(Predators\)...](#)

## Impacts

*U. pinnatifida* is highly invasive, grows rapidly and has the potential to overgrow and exclude native algal species. The effects on the marine communities it invades are not yet well understood, but it is possible that the presence of *U. pinnatifida* may alter the food resources of herbivores that would normally consume native species. In areas of Tasmania it has become a very common species, growing in large numbers around areas in which sea urchins have depleted stocks of native algae. *U. pinnatifida* also has the potential to become a problem for marine farms by increasing labour costs due to fouling problems.

[MORE \(Impact information\)...](#)

## Vectors

Fisheries

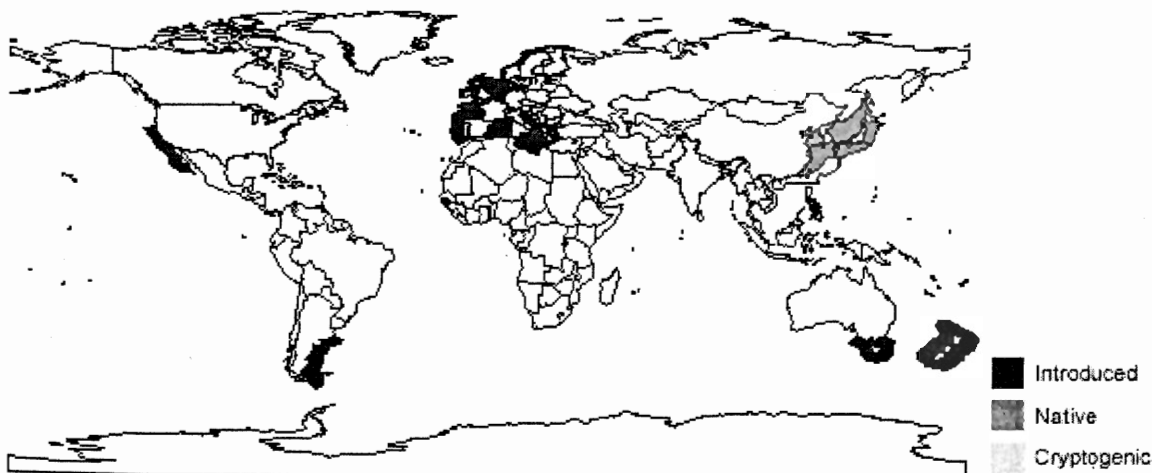
- Fisheries: accidental with deliberate translocations of fish or shellfish

Shipping

- Ships: accidental as attached or free-living fouling organisms

## Distribution

Click on map for more information.



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[About these maps](#)

## Control Options

Click here to enter the [Rapid Response Toolbox](#) to search for potential control options.

## Additional Information

[MORE \(Other additional information available\) ...](#)

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MORE - References...

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