

## **Laminaria Digitata or Kombu**

Related Ingredients: PHYCO R 75, PHYCOJUVENINE

Laminaria comes from the Latin *Lamina*, meaning the “blade”, in reference to the lashes of the alga. Digitata comes from *Digitus*, the “finger” in Latin: this makes reference to the shape of the thallus of Laminaria Digitata, compared to a hand.

Kombu means “happiness” in Japanese: this alga is considered, in the Eastern tradition, as a health plant which brings longevity.

Synonyms: Tangle, Kelp (Kombu), Oarweed, Sea wand (English), Dashima (Korea), Haidai (China), Laminaire, Fouet de Sorcier (French)



## BOTANICAL

Botanical Family: Laminariaceae

*Laminaria digitata* is a large, tough, glossy kelp, which can grow from 1 to 3 meters in size, and up to 4 meters in optimum conditions. Its color ranges from dark brown to golden brown to olive brown to olive green.

The broad frond or blade is large, lacks a midrib, and is shaped like the palm of a hand with a number of more or less regular finger-like segments (hence the Latin name for this seaweed).

The number of frond digits extends almost to the base of the frond, and vary with amount of exposure. In shelter these are few and short, but with increasing exposure, they are more numerous (up to 10 or 12). The length of the frond varies with season, age of plant and location, and can reach lengths of 1 to 1.5 meters in suitable conditions.

The smooth and flexible stipe (stem, or stalk) is oval in cross-section, can be 3 to 4 centimeters in diameter, smooth, flexible, non-sticky, and is usually free of epiphytes, although old stipes which have become slightly roughened may support a few epiphytes, particularly *Palmaria palmata*.

*Laminaria digitata* attaches to anchor stones and rocky substrates by freely branched haptera, which spread out to form a shallow dome-shaped, claw-like holdfast. The spreading root-like protrusions are called rhizoids.



## BIOTOPE

This perennial species lives for 3 to 6 years, and in some cases reaches 10 years. *Laminaria digitata* grows more slowly from late summer to January, and then experiences rapid growth from February through July. It is one of the deepest growing edible seaweeds, and may only be accessible a few days out of every month on the lowest new and full moon tides.

*Laminaria digitata* is found in rock pools and attached to rocks, bedrock or other suitable hard substrata in the lower intertidal and subtidal or sublittoral fringe, down to a maximum depth of 20 meters in clear waters. It can be found higher up on the shore in areas of intense wave action.

The *Kombu* clings to the rocks as the full force of the ocean flows through its fingers in heavy waves, swells, and surf, and flourishes in moderately exposed areas or at sites with strong water currents. With its flexible stipe and deeply divided blade, it is well adapted to fast, turbulent water flow and multidirectional forces.

In the upper sublittoral, this alga grows in masses and forms extended uniform kelp beds or meadows. When it does become occasionally exposed at extreme low tide, it lies flat on the seabed with the uppermost blades covering the lower ones, protecting them against desiccation from wind and sun.

The extension of *Laminaria digitata* beds into greater depths of the mid-sublittoral zone is restricted by the occurrence of *Laminaria hyperborea*, thus *Laminaria digitata* can often be found as a belt above *Laminaria hyperborea*. Its distribution is also limited by salinity, wave exposure, temperature, desiccation and general stress.

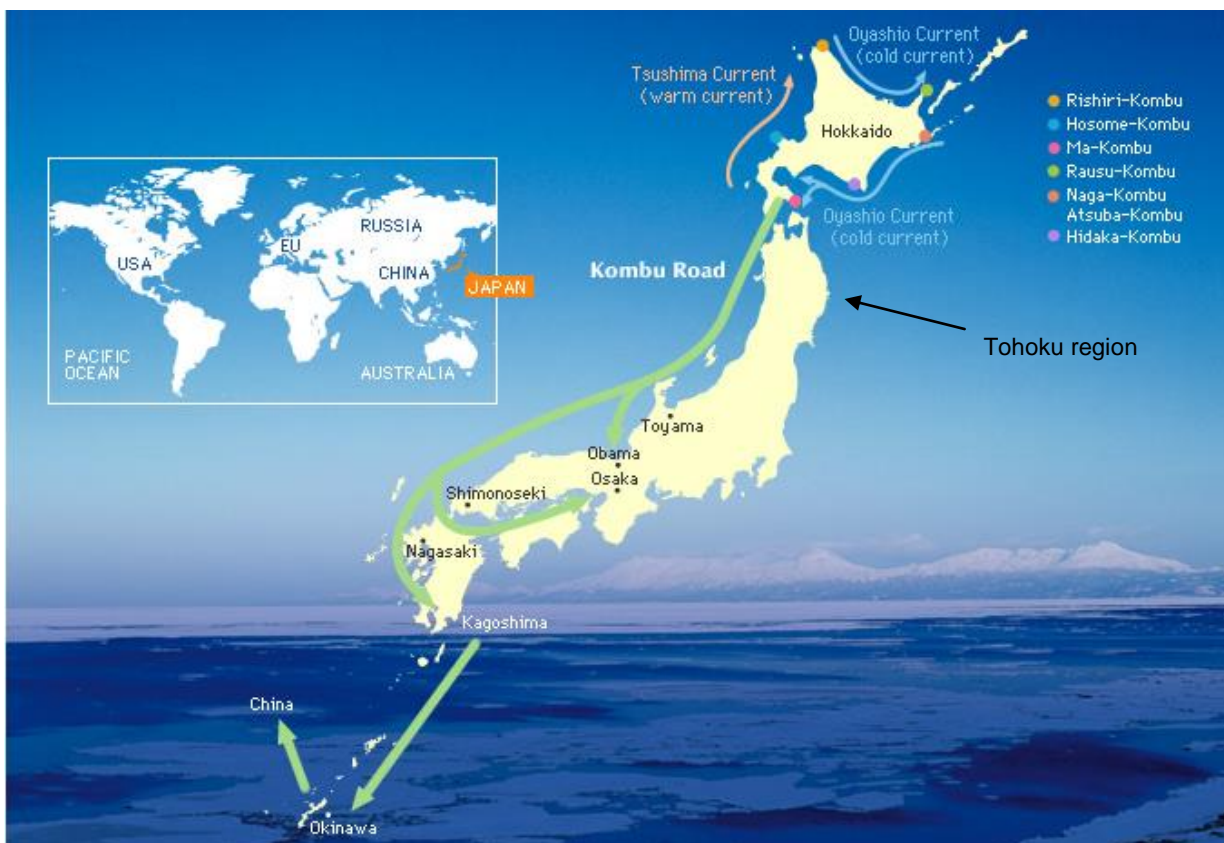
## HISTORY

The earliest written record of *Kombu* appeared in **Shoku Nihongi** (text about Japanese history, following the Chronicles of Japan) in 797 as a gift and tax from the **Tōhoku Region**, North-East region of Japan. Its use is believed to have begun much earlier, probably dating back to the **Jōmon period**, one of the fourteenth traditional subdivisions of Japanese history covering the period from tenth millennium before J.-C. However, as it easily decomposes, no archaeological evidence can be found.

During the **Muromachi period**, between 1336 and 1573, a newly developed drying technique allowed *Kombu* to be stored for more than a few days, and *Kombu* became an important export from the Tōhoku area.

By the **Edo period**, between 1600 and around 1868, as **Hokkaidō** was colonized and shipment routes were organized, the use of *Kombu* became widespread throughout Japan. Traditional Okinawan cuisine relies heavily on *Kombu* as a part of the diet; this practice began in the Edo period. Okinawa uses more *Kombu* per household than any other prefecture. In the 20<sup>th</sup> century, a way to cultivate *Kombu* was discovered and it became cheap and readily available.

*Kombu seaweed* from Hokkaido has long been distributed around the country as an important commercial commodity. *Kombu* harvested in Hokkaido was transported by ship in earlier times, moving westward along the Japanese Sea coast to Osaka, which has been a commercial center since those days. For this reason, *Kombu* wholesalers and processors are mainly found in or around Osaka. The route that *Kombu* took from Hokkaido to its destination is called the **Kombu Road**. It extended as far as China via Okinawa.



*The Kōmbu Road*

In 1867 the word "*Kombu*" first appeared in an English-language publication - "A Japanese and English Dictionary," by James Curtis Hepburn (American physician, 1815-1911).

Sources: [www.eol.org](http://www.eol.org) / [www.kurakonusa.com](http://www.kurakonusa.com)

## GEOGRAPHICAL DISTRIBUTION

*Kombu* can be found in Pacific and North-Antarctic Oceans: in Japan, Russia, China, Tasmanian Islands, Australia, or South Africa. Most of Japan's *Kombu* is harvested in Hokkaido, accounting for around 90% of all production.

*Laminaria digitata* is also found in North Atlantic and Arctic-cold-temperate Oceans. It is found along both coasts of the English Channel; the southernmost occurrence of this species in European waters is on the southern coasts of Brittany. This alga grows along most coasts of Britain and Ireland, and along the North Sea coasts of Scandinavia. It is also present in Iceland, the Faeroes, southern Greenland, the eastern coasts of North America (Cape Cod), and as far as Canada.

## TRADITIONAL USES

Economically, *Laminaria digitata* has primarily been used as a source of algin. This alga, both harvested and collected from the shore, was also traditionally used as an agricultural fertilizer or surface cleanser. In the 18<sup>th</sup> century it was burnt to extract the potash it contained for use in the glass industry. In the 19<sup>th</sup> and 20<sup>th</sup> centuries it was used for the extraction of iodine. Both these uses died out when cheaper sources for these products became available.

## DIETARY USES

*Laminaria digitata* contains minerals, vitamins and trace elements, making it an excellent food product. These include iodine, calcium, potassium, iron, carotene, alginic acid, laminaran, mannitol, protein, carotene, niacin, phosphorus, the B complex vitamins, vitamin C and many other trace elements.

*Kombu* is also a good source of glutamic acid, an amino acid responsible for umami, the Japanese word used for one of the five basic tastes in addition to salt, sweet, sour, and bitter, identified in 1908.

That's why this alga is extensively used in Japanese and Chinese food, particularly to make dashi, a soup stock.

It can also be eaten:

- as a sea vegetable: snacks, flavoring and seasoning, slaw,
- with vegetables such as beans and lentils, which enables to accelerate their cooking time, and improve their digestibility,
- fresh in sashimi or sushi,
- as a dried shred (*boro kombu* or *shiraga kombu*),
- sliced to make tsukudani (*kombu* simmered in soy sauce and mirin),
- pickled in vinegar (*su kombu*),
- in flakes or powder,
- in nutritional supplements and energy drinks, etc.



On the left: Tsukudani; on the right: Sushi

## MEDICINAL USES

*Laminaria Digitata* has long been used as a folk remedy for lowering high blood pressure.

As mentioned above, this alga possesses important minerals such as magnesium, potassium, calcium, iron, and vitamins A and B, and organic iodine and amino acid. This brings to this alga a lot of properties which help to fight against:

- Inflammation,
- Oxidation of the skin: alga known to revitalize tired looking skin and to be an effective anti-oxidant helping repair damage caused by free radicals,
- Bones and Joints problems,
- Digestive disorders,
- Iodine Deficiency,
- Lethargy,
- Atherosclerosis (disease consisting in the build up of a waxy plaque on the inside of blood vessels),
- Mineral, vascular, vitamin deficiencies, etc.

Rich in trace-elements, *Laminaria Digitata* is also used in dietary regimes. It is a good natural remedy against obesity, with its appetite suppressant action.

## COSMETIC USES

Several years ago, this alga began to be commercially harvested in Brittany for alginate production. Its use is expanding to thalassotherapy and balneotherapy and other specialty products. The extraction of alginic acid contributes to applications such as the manufacture of toothpastes and cosmetics.