

Advances in seaweed cultivation in the Asia Pacific Region: past, present and future prospects



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Processing of nori sheets shown in the traditional picture



Cultivated *Porphyra tenera* strain
Nori in Japanese



Susi



Onigiri



Nori menu



Sennbei



Yakinori



**Oyster shells provided for the settlement of
carpospores**



**Setting poles for nori cultivation
in the sea, Ariake-kai**



Washing nursery nets during low tide



Nori cultivation of pole system in Ariake-kai



Nori cultivation by floating system in off shores
Harvesting by boat



**Nori harvesting by boat at floating cultivated system
in Chiba**



Porphyra cultivation in Korea



Change of *Porphyra* net siz

2.1 m x 100 m

1995s ~ Present



Submerged culture net

Turning over the culture
nets by ship

Exposure culture nets
on the air

With the introduction of this treatment, the production of dried nori sheets and the income of fishermen increased by as much as 144% and 408% respectively (Oohusa, 1993).

New exposure treatment





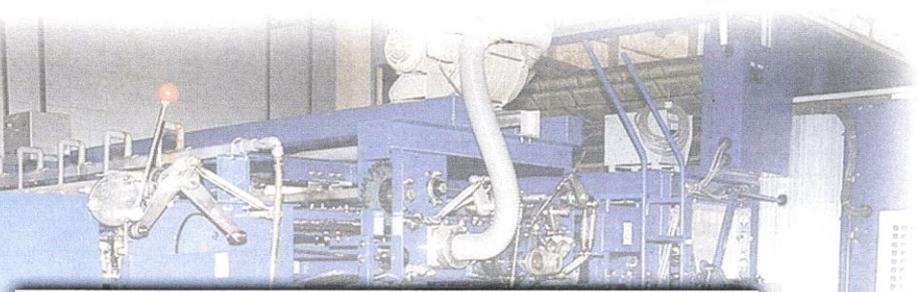
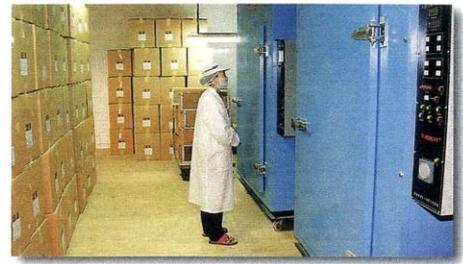
有机紫菜养殖基地



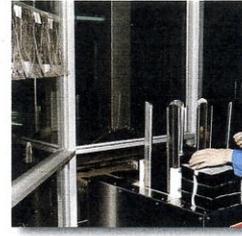
该养殖基地位于A:32° 42' 793N, 121° 10' 755E; B: 32° 11' 020E; C: 32° 41' 910N, 121° 11' 420E; D: 32° 11' 066E



紫菜一次加工



紫菜二次加工









Northern type



Southern type

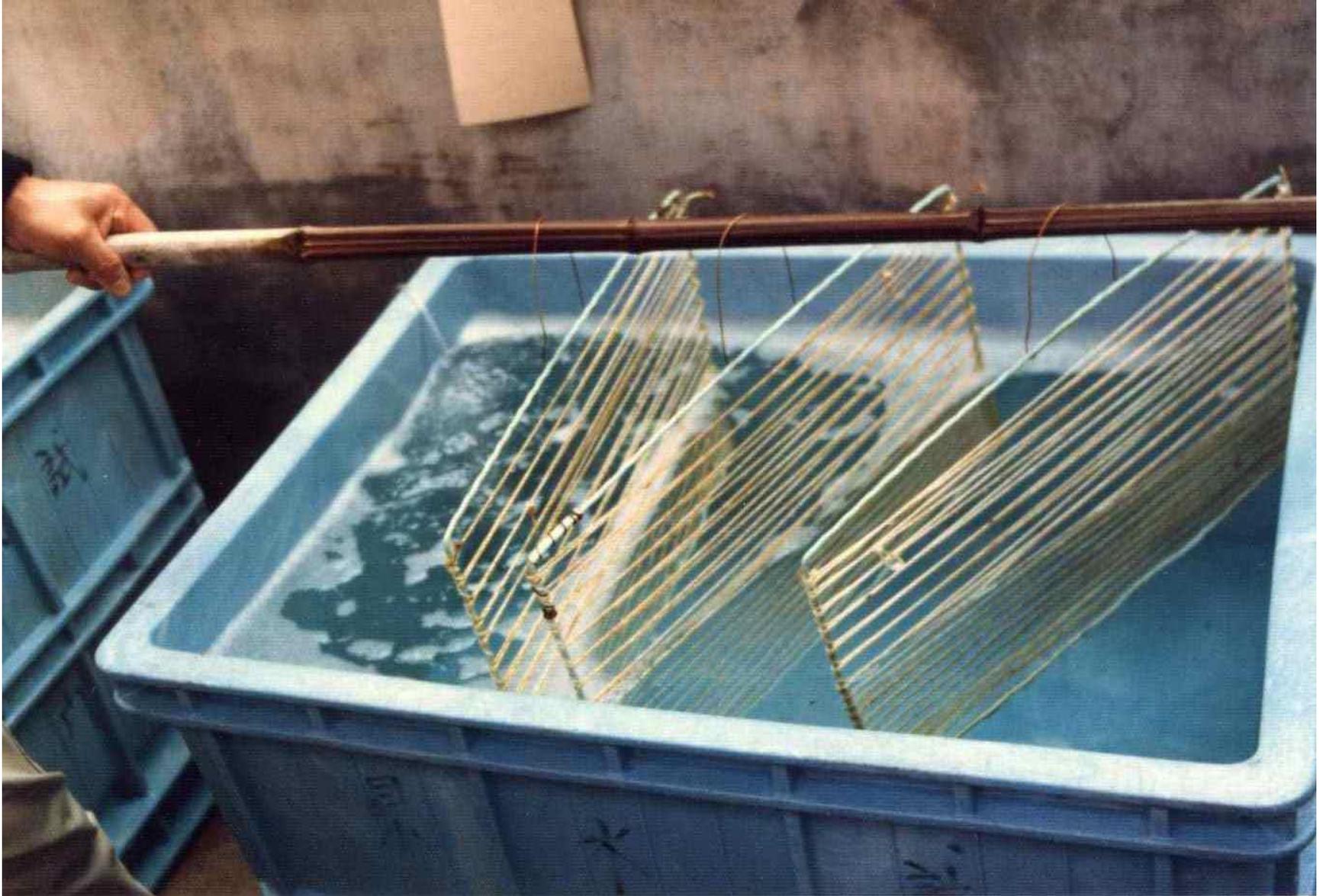
Undaria pinnatifida
Wakame in Japanese

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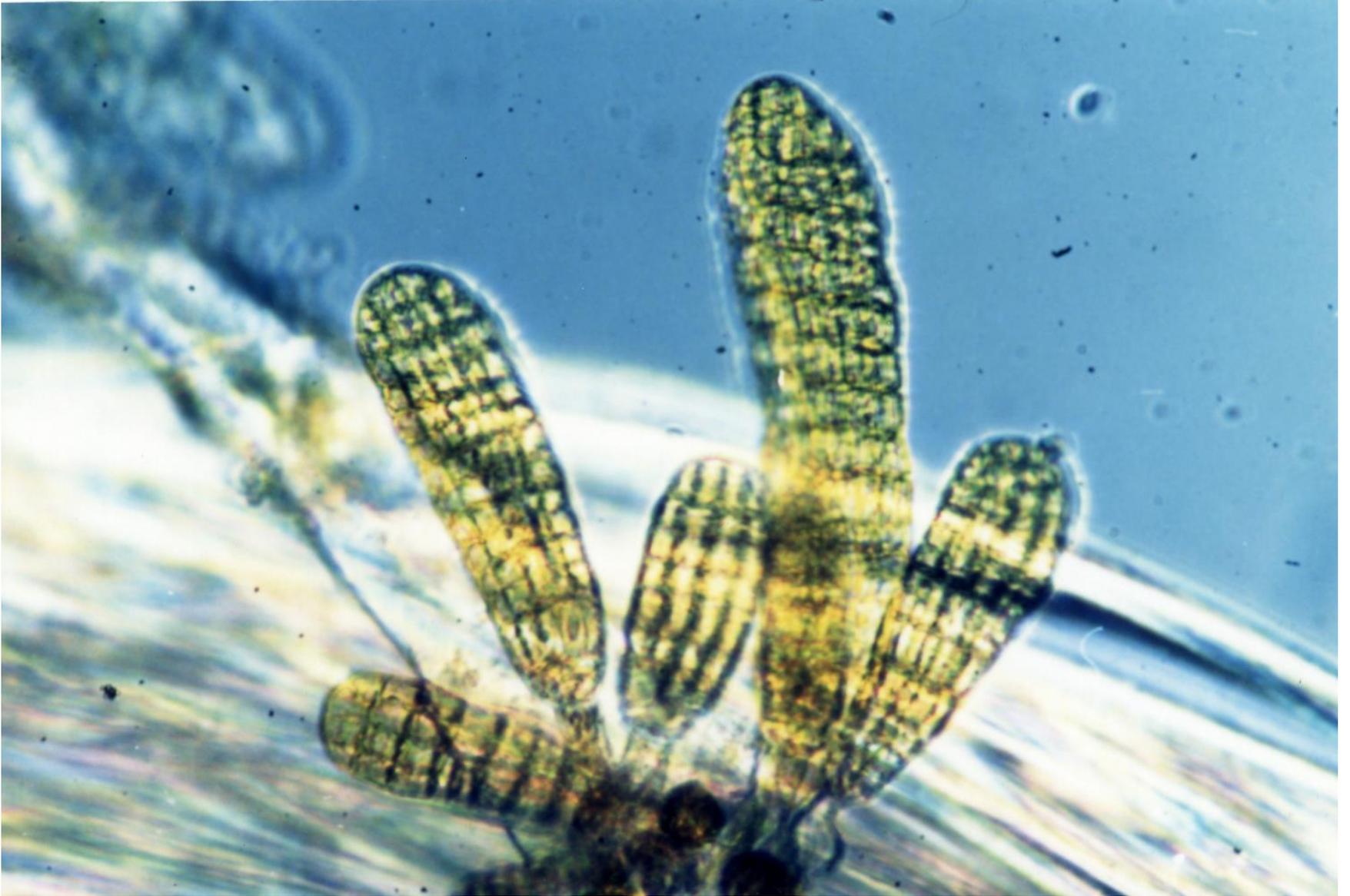
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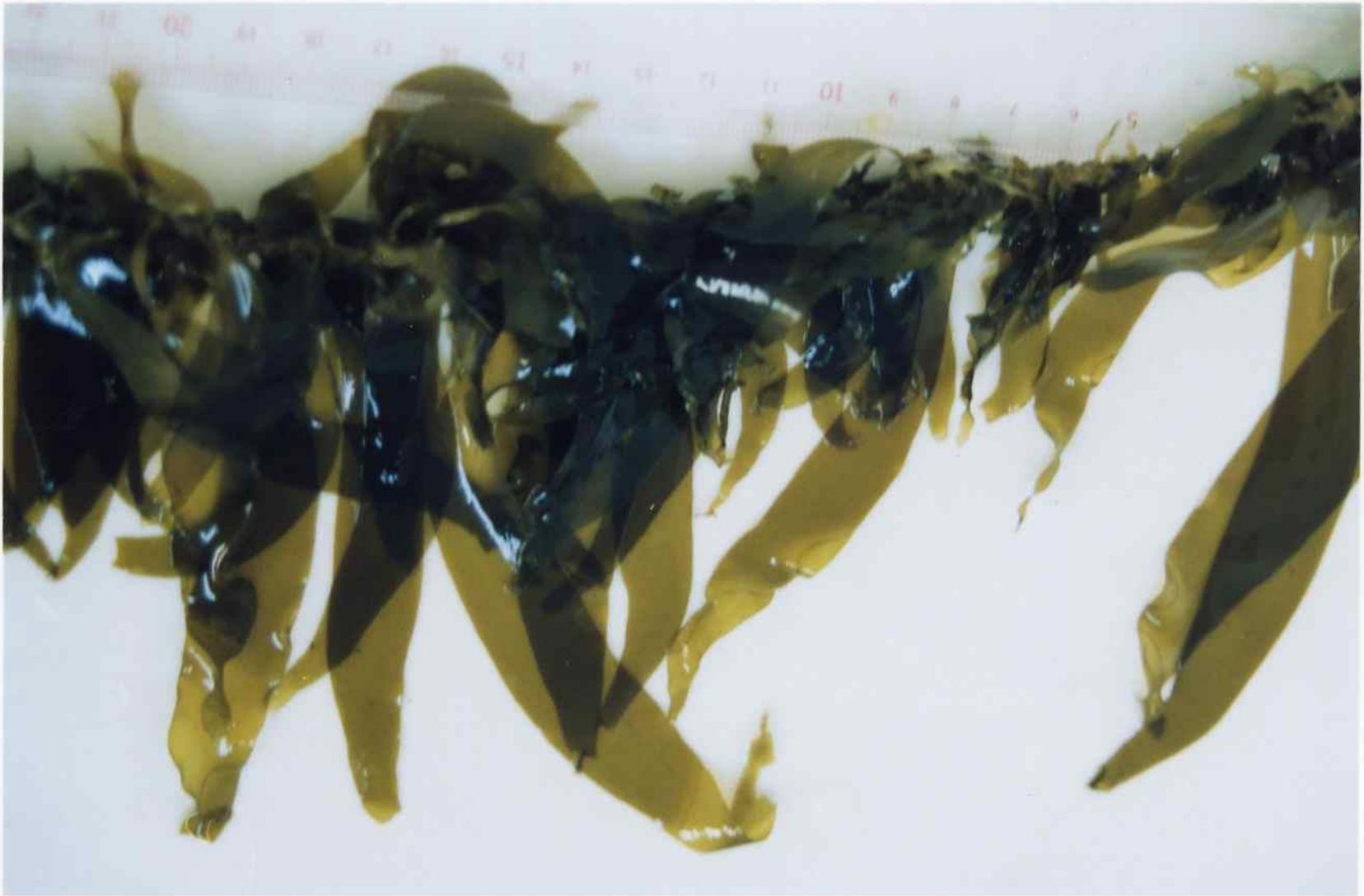
Wakame soup and salad



**Seed collectors culture in tank
gametophyte phase**



Germling on the seeding string



Young fronds on the seeding string



Juvenile fronds inserted between the strand of the main rope



Undaria cultivation ground by floating system
in Naruto



Harvesting of *Undaria* fronds from the site of the boat



Boiling of fronds in outdoor facilities





신준오

243-9422











**Cultivated *Laminaria* fronds (4 m of length)
in Naruto, warm waters**



Konbumaki

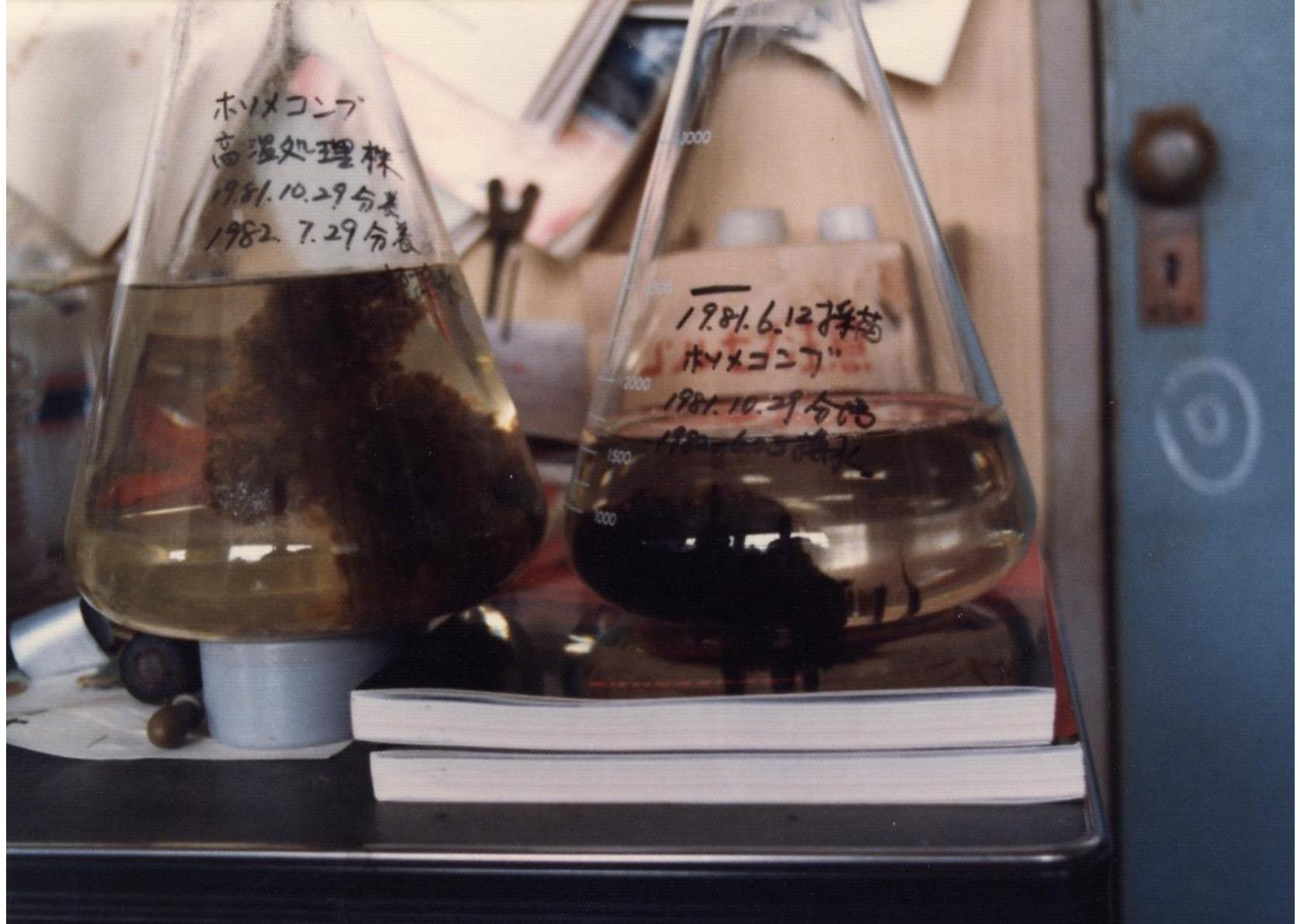


Oboro-konbu

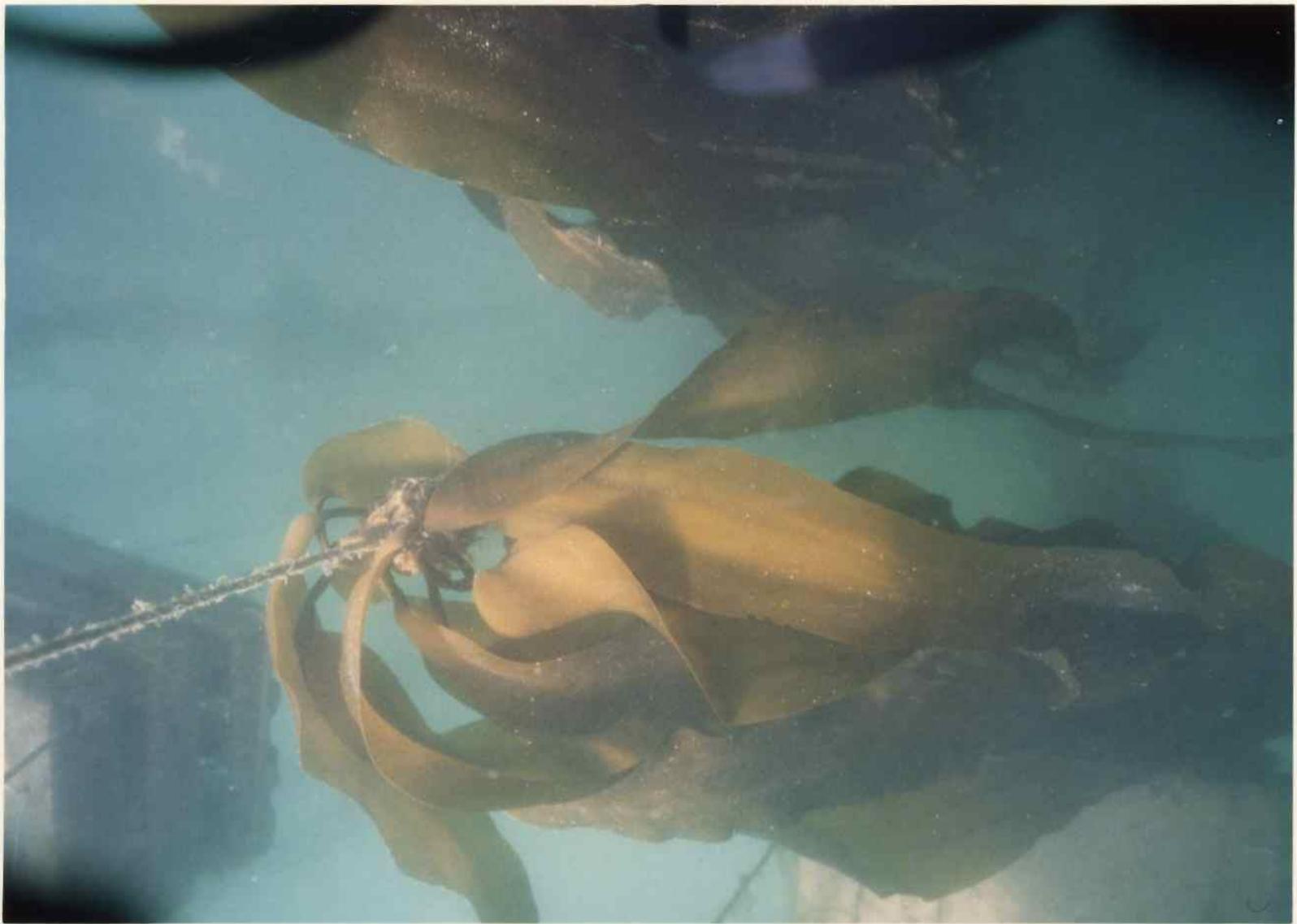


Konbu-tukudani

Konbu dishes



**Gametophyte phase free living culture
for the strain keeping**



Laminaria cultivation by rope system



**Harvesting of force-cultivated *Laminaria japonica*
in Hakodate, Hokkaido, cold waters**



Figure 18. *Laminaria* cultivation. A: Culture ground, B: Harvesting, C: Processing of *Laminaria* by salting, D: Sun-drying.





Monostoroma nitidum
Hitoegusa in Japanese



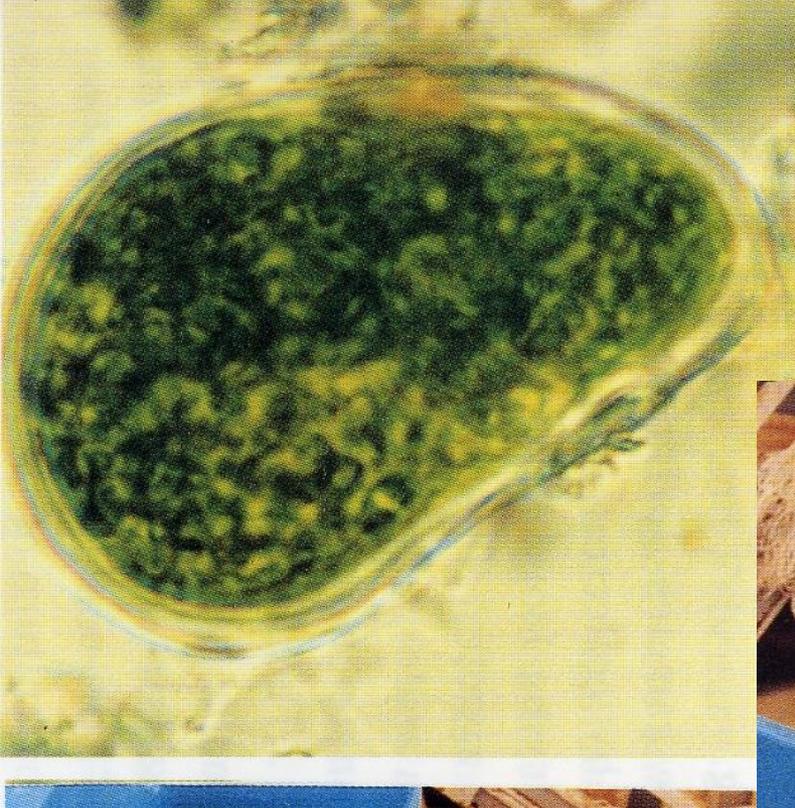
*Nori-tukudani
Boiling with
soy sauce and
sugar*



Ochazuke



***Monostroma* processing (nori-tukudani) and cooking**



Zoosporangia



**Zoosporangia and
plastic settlement boards with attached zygotes**



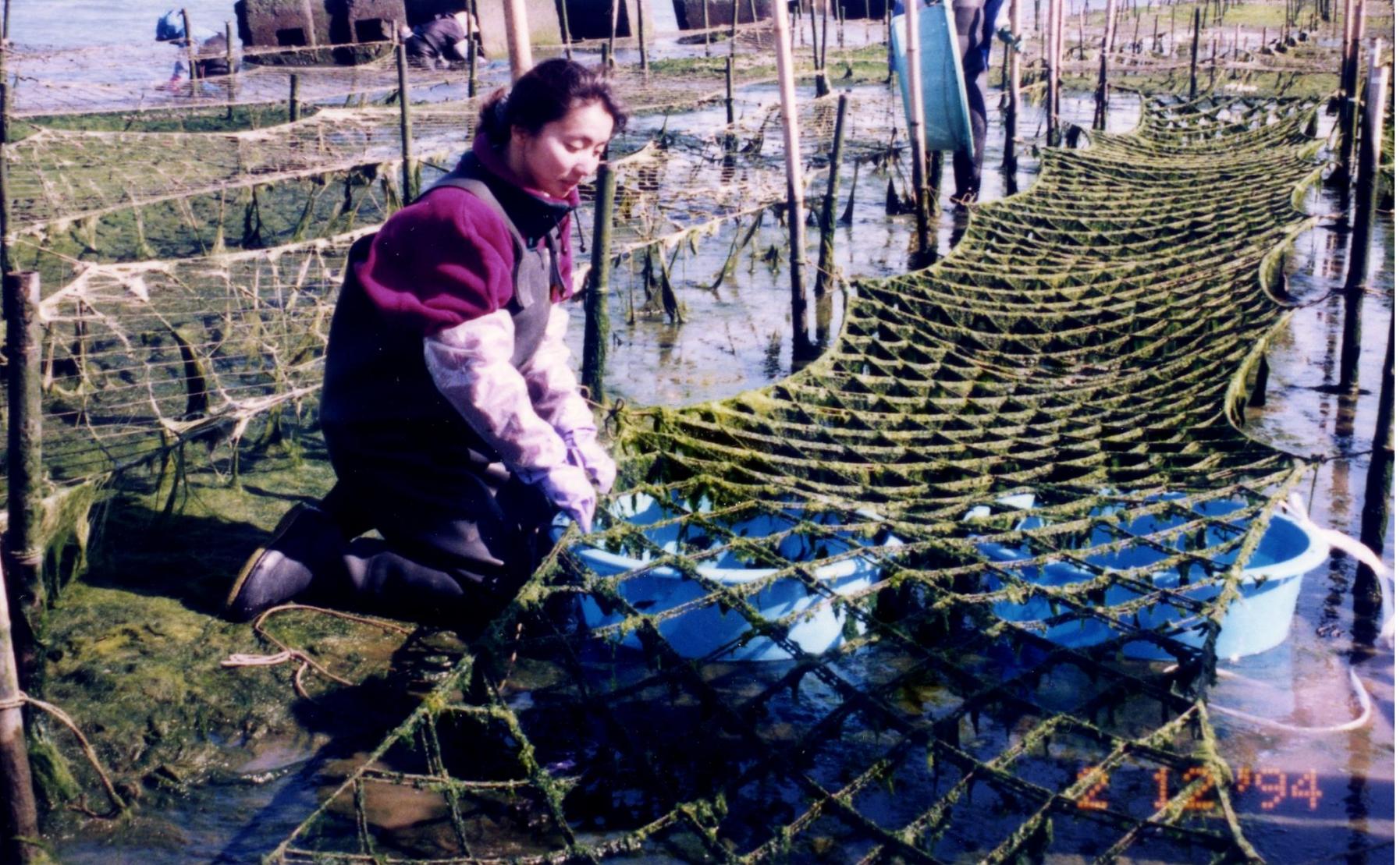
Zygote culture in the tank in summer season



Seeding nets attached zoospores kept for one night



***Monostroma* cultivation by pole system in brackish waters of the river**



Harvesting fronds by hand during low tide



Drying fronds in outdoors by sunlight

New seaweed cultivation since 1990



New utilization with *Enteromorpha*



Seaweed salad with *Cladophora*



Drying *Enteromorpha* fronds
Aonori in Japanese



Enteromorpha prolifera **fronds cultivated**



Harvesting of *Enteromorpha* fronds cultivated by floating system in the brackish waters, Yoshino River



Crushed machine for *Enteromorpha* powder



***Enteromorpha* powder is used many Japanese cakes**



Cladosiphon okamuranus
Mozuku in Japanese



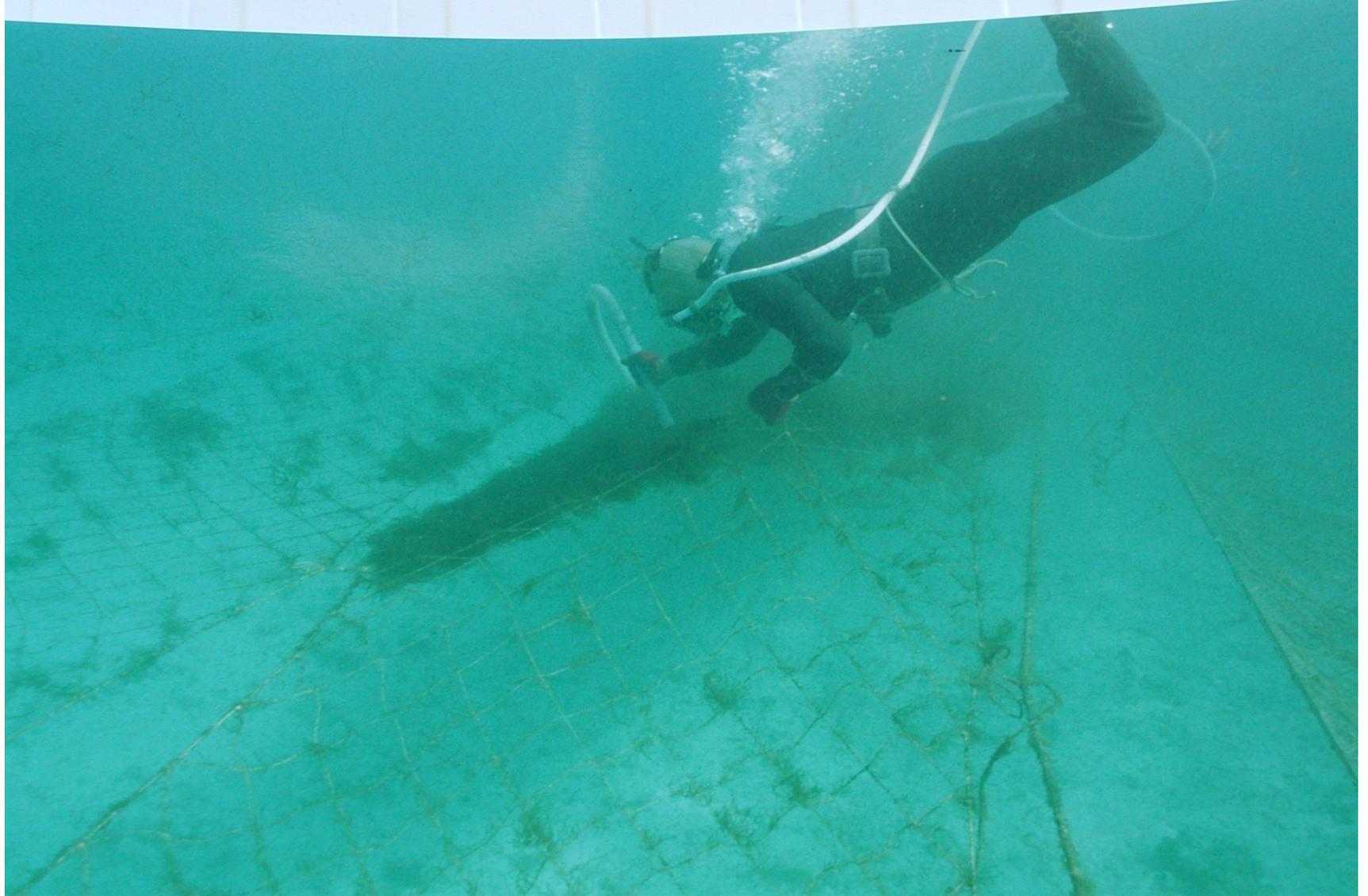
Seaweed salad with *Cladophora* fronds



Cladosiphon cultivation ground in the coral reef,
tropical waters, Okinawa



Cladosiphon cultivated nets fixed at the bottom
of 1-2 m depth



Suction pump for harvesting



Harvest stored in a large basket , floating a boat



Washing and cleaning



Salting fronds at the processing factory