

Faits divers

Unusual form of *Ecklonia stolonifera* OKAMURA
(Laminariales, Phaeophyta)*

Masahiro NOTOYA** and Yusho ARUGA**

Three types of unusual form of *Ecklonia stolonifera* OKAMURA were found by one of the authors (M.N.) during the ecological studies of this species along the Japan Sea coast and the Tsugaru Channel coast in Aomori Prefecture, Japan.

The specimens A and B in Fig. 1 were collected on March 16, 1983 at Tanosawa, Fukaura, on the Japan Sea coast. The specimen A collected from 20 m depth is normal of this species. In *E. stolonifera* the thallus is made up of three parts; holdfast, stipe and blade. In vegetative propagation stipe and blade are produced from stoloniferous haptera. Holdfast is branched and verticillately arises. Stipe is cylindrical, about 5.2 mm in diameter and 10 cm long. Blade is linear or lanceolate with secondary serrulate bladelets.

The specimen B is unusual, having blade-like flattened stipe. It was collected from 20 m depth. Blade is about 30 cm long and 15 cm wide. The flattened stipe is about 1.2 mm thick, 10 cm long and 2 cm wide at the broadest portion, being curved with smooth surface and slightly thicker than the central part of a normal blade. Blade is issued from short stipe-like cylindrical part at the top of the flattened stipe. Blade and holdfast with stoloniferous haptera and newly produced shoots are completely normal in their form. This specimen is three years old judged from holdfast system.

The specimens C and D (Fig. 1) were collected at Ohma, Shimokita Peninsula, on

the Tsugaru Channel coast. The specimen C, collected on November 1, 1988 from 8.5 m depth, has two blades; one is 26.5 cm long and 5.4 cm wide and the other 9.8 cm long and 3.5 cm wide. It has a long stipe of 13.6 cm long with a short branched stipe of 0.7 cm long. This specimen is two years old. The blades have no zoosporangial sori.

The specimen D was collected on July 8, 1987 from a community of small thalli in shallow water of 5.2 m. It has a blade with small stipe issued vegetatively from margin of the mother blade at its serrulate portion. The mother blade is 8.6 cm long and 7.3 cm wide with stipe of 1 cm long and the daughter blade is 3.5 cm long and 3.3 cm wide with stipe of 0.5 cm long. The mother thallus is two years old and has two normal young thalli vegetatively produced from stoloniferous haptera.

There have been several reports on unusual forms in many species of Laminariales from Japan (KINOSHITA 1933, HASEGAWA and FUKUHARA 1956, TOKIDA *et al.* 1956, 1958, FUNANO 1974, YABU and HOMURA 1981, KAWABATA 1959, KAWASHIMA 1987). However, we have not known reports on unusual form of *Ecklonia stolonifera*. Similar types of unusual form have been reported in other species of Laminariales. KAWASHIMA (1987) reported two blades with branched stipe in *Alaria angusta*, *Costaria costata*, *Nereocystis luetkeana* and *Postelsia palmaeformis*. Thallus with second stipe and blade issued from the first blade was reported by FUNANO (1974) in *Laminaria ochotensis*. Unusual form of blade-like stipe has not been reported yet. The above-mentioned abnormal thalli were found together with normal thalli in the *E. stolonifera* population of

* Received January 15, 1992

** Laboratory of Phycology, Tokyo University of Fisheries, Konan-4, Minato-ku, Tokyo, 108 Japan

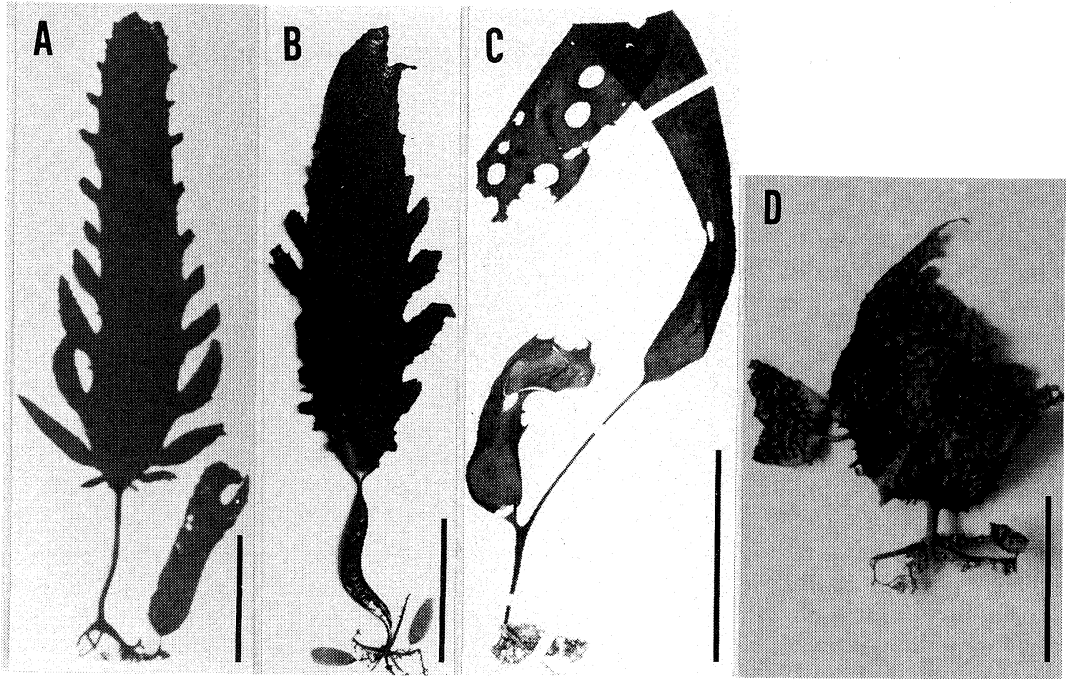


Fig. 1. *Ecklonia stolonifera* OKAMURA thalli of usual or unusual form collected from the coasts of Aomori Prefecture, Japan. (A) Thallus of usual form collected at a depth of 20 m at Tanosawa, Fukaura on the Japan Sea coast on March 16, 1983. (B) Thallus with flattened stipe collected at a depth of 20 m at Tanosawa on March 16, 1983. (C) Thallus with branched stipe and two blades collected at Ohma, Shimokita Peninsula, on the central part of the Tsugaru Channel coast on November 1, 1988. (D) Thallus with a daughter blade on stipe issued from mother blade margin, collected at Ohma on July 8, 1987. (Scale bar: 10 cm)

several years old. They had normal shoots from stoloniferous haptera. Therefore, it is inferred that the thalli of unusual form might not be under genetic control.

Recently, we have reported in the experiments of tissue culture of Laminariales seaweeds that, in addition to callus, thalli differentiated from the blade tissue collected in the field or from a piece of the juvenile blade of Laminariales (NOTOYA 1988, 1990, NOTOYA and ARUGA 1989, 1990). This suggests the possibility that also in nature thalli of unusual form can be produced from the wounded part of thallus tissue.

References

- FUNANO, T. (1974): On the deformed plant found from transplanting *Laminaria ochotensis* in cultivation at the coast of Shikabe, Hokkaido. Monthly Rep. Hokkaido Reg. Fish. Lab. **31**(9): 1-2. (in Japanese)
- HASEGAWA, Y. and E. FUKUHARA (1956): Notes on the abnormal *Laminaria* fronds found in Hokkaido and Aomori Pref. Monthly Rep. Hokkaido Reg. Fish. Lab. **13**(2): 19-20. (in Japanese)
- KAWABATA, S. (1959): A list of the marine algae in the vicinity of the Marine Laboratory for Biological Education, Hokkaido Gakugei University, situated at Shirikishinai Village, Oshima Province, in Hokkaido (1). J. Hokkaido Gakugei Univ. B **10**: 285-296. (in Japanese)

- KAWASHIMA, S. (1987): Malformed frond of Laminariales. *Heredity* **41**(9): 36-40. (in Japanese)
- KINOSHITA, T. (1933): On the change of midrib number of *Costaria costata* from Japan. *Ten-day Rep. Hokkaido Fish. Exp. St.* (213): 91-92. (in Japanese)
- NOTOYA, M. (1988): Tissue culture from the explant of *Ecklonia stolonifera* OKAMURA (Phaeophyta, Laminariales). *Jpn. J. Phycol.* **36**: 175-177.
- NOTOYA, M. (1990): Tissue culture of macroalgae, Laminariales (Phaeophyta). *Kaiyo Monthly* **22**: 728-736. (in Japanese)
- NOTOYA, M. and Y. ARUGA (1989): Tissue culture from the explant of *Ecklonia cava* KJELLMAN (Laminariales, Phaeophyta). *Jpn. J. Phycol.* **37**: 302-304.
- NOTOYA, M. and Y. ARUGA (1990): Tissue culture from the explant of stipe of *Eisenia bicyclis* (KJELLMAN) SETCHELL (Laminariales, Phaeophyta). *Jpn. J. Phycol.* **38**: 387-390.
- TOKIDA, J., H. OHMI and M. IMASHIMA (1958): A chimera of *Alaria* and *Laminaria* frond in nature. *Nature* **181**: 923-924.
- TOKIDA, J., H. OHMI and T. MASAKI (1956): On a malformed *Laminaria* with a spirally twisted lamina. *Monthly Rep. Hokkaido Reg. Fish. Lab.* **13**(9): 26-29. (in Japanese)
- YABU, H. and K. HOMURA (1981): A malformed frond of *Laminaria japonica* ARE SCHOU from Hakodate, Hokkaido. *Collecting and Breeding* **43**: 655. (in Japanese)

ツルアラメの通常見られない形態

能登谷正浩・有賀 祐勝

要旨: 青森県沿岸のツルアラメ群落から通常の形態とは異なる藻体3個体を採集した。すなわち、茎状部が扁平の藻体、茎状部が枝分れして2つの葉状部をもつ藻体、葉状部縁辺の鋸歯の一部から茎状部を生じ、その先に葉状部を形成した藻体である。これらの藻体は、それらから栄養繁殖によって発出した幼体ならびに同一群落内の他の藻体がいずれも通常の形態であったので、遺伝的なものではなく、体組織の分化異常によるものと推察される。