

Hirotohi YAMAMOTO and Jun SASAKI: On the pseudocystocarp of *Gracilaria verrucosa* (HUDS.) PAPENF. (Gracilariaceae)

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On both main axis and branches of a frond, which were incubated under unialgal and isolated conditions from a tetraspore of *Gracilaria verrucosa* collected at Shinori in Hakodate, Hokkaido, cystocarp-like swellings (pseudocystocarps, see BIRD and McLACHLAN, 1982, p. 560) appeared without the presence of spermatia. The pseudocystocarps were so abundant as to count 50 per cm along a main axis of 2 mm diam. The number was much larger than those on a frond which was cultured together with spermatangial plants (Fig. 1).

One of the tetraspore-derived fronds, cultured until approximately 3 mm long in a deep petri dish, was transferred into a flask of 100 ml to be incubated alone. This culture was continued under the conditions of 20-21°C, about 4000 lux of white fluorescent lamp and a photocycle of 14 (light)-10 (dark). PROVASOLI'S ES medium without vitamin was applied with aeration throughout the culture.

The external appearance of the pseudocystocarps is almost the same as those developed by fertilization except their smaller size, up to 0.45 mm high, up to 0.6 mm wide. A longitudinal section shows features of a pericarp with a single ostiole at its top that are similar to a normal one. However, neither gonimoblast tissue nor carposporangia occur, so the cavity is empty except some hair-like filaments rising from the bottom cells. Although a carpogonial branch is formed, a fusion cell, which can be seen frequently in a normal cystocarp, is not found. These observations suggest

that the pericarp and ostiole can be formed regardless of the existence of a gonimoblast. It is not known what kinds of factors induce the development of this abnormal cystocarp.

The possible autogamy and mixture of spermatia of the same or different species during culture were reviewed and not considered feasible because other fronds which were incubated under the same conditions failed to form such pseudocystocarps. Since the cultured fronds from other localities did not develop such abnormalities, the

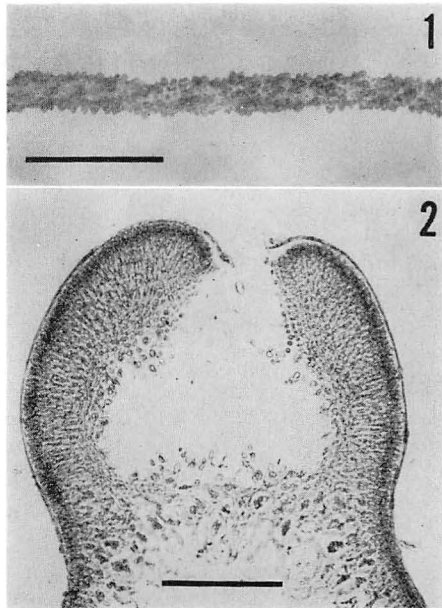


Fig. 1. Pseudocystocarps developed in main axis, showing crowded occurrence. Scale: 1 cm.

Fig. 2. Longitudinal section of pseudocystocarp, showing a normal pericarp with an ostiole. Scale: 200 μ m.

fronds from Shinori had a different set of characters.

If these pseudocystocarps resulted from fertilization, their lack of a fusion cell and gonimoblast tissue is very interesting, because the formation of a fusion cell has been recognized as the first step in the developmental process of cystocarps in this family (Gracilariaceae). We have never found such a cystocarp in the field.

A similar pseudocystocarp is reported in the crossing experiment between distinct species (McLACHLAN *et al.*, 1977; BIRD and McLACHLAN, 1982). McLACHLAN *et al.* describe their pseudocystocarp to be filled with small and round cells resembling cortical cells, and exceptionally with non-viable spores. They also suggest, on the basis of some supporting experiments, that they

were a result of syngamy rather than merely a chemical stimulation. BIRD and McLACHLAN, however, remark that their pseudocystocarp was empty or with abortive carposporangia.

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References

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山本弘敏*, 佐々木潤**: オゴノリの偽嚢果について

北海道函館市志海苔産のオゴノリの四分胞子を単離培養したところ、体全体に嚢果様の突起(偽嚢果, pseudocystocarp)が形成された。偽嚢果はかなり小さい(高さ 0.45 mm まで, 巾 0.6 mm まで)が, 外観上通常の嚢果と変わらない。これを縦断面で見ると, 果皮は頂端に一つの果孔を持ち正常な嚢を呈するが, 融合細胞, 造胞系柔組織, 果孢子嚢を欠き中空である。このような偽嚢果を誘起した要因は不明であるが, 興味深い現象である。(*041-16 北海道南茅部町字白尻 北海道大学水産学部白尻水産実験所, **041 北海道函館市港町北海道大学水産学部水産植物学講座)