Short Communication

Yositeru NAKAMURA*: Development of Zoospores in *Ralfsia*-like Thallus, with Special Reference to the Life Cycle of the Scytosiphonales

中村義輝: カヤモノリ, セイヨウハバノリの単子嚢体はイソガワラ類の藻体である

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Small crustaceous dark brown algae are commonly found growing on smooth, somewhat flattened pebbles or stones in the intertidal belt at Muroran, Hokkaido, from late July to December (Fig. 1). This *Ralfsia*-like thallus usually matures from October to December and, as far as the author could examine, produces only unilocular sporangia (Figs. 2, 3). The zoospores liberated from these unilocular sporangia do not develop primarily into minute parenchymatous discs as in other species of *Ralfsia*, but germinate into creeping filaments which are simply or densely branched (Fig. 4). In addition, they usually develop into two kinds of germlings, slender forms (5-6 μ broad) and broader ones (7-8 μ broad), suggesting that the parent plant consists of two different entities.

Fig. 1. Habit. RL, *Ralfsia*-like thallus. R. *Ralfsia verrucosa*. $\times 1/2$

Figs. 2, 3. Cross section of two kinds of *Ralfsia*-like thalli with unilocular sporangia. $\times 100$.

Fig. 4. Germlings grown in Schreiber's solution. b. Broader forms. s. Slender forms. $\times 200$.

Fig. 5. *Scytosiphon lomentarius* (S) and *Petalonia fascia* (P) uni-algally cultured in ES medium. $\times 1$.

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Cultures were started on December 6, 1963, and grown in Schreiber's solution at a culture room temperature of about 14°. The broader germlings developed into minute erect leafy fronds within about three months following cultivation. The more slender germlings, however, did not produce these erect fronds, but crept vigorously on the substratum.

In the following year (1964), cultures were started on November 9th. On November 26th, two types of germlings were isolated from these cultures by capillary pipette. Each germling was transplanted in a sterilized glass tube containing 10 ml of ES medium (Provasoli's enriched sea water) and maintained at about 14°. By the end of December, in these uni-algal cultures, the broader germlings had all developed into erect oblong leafy fronds about 1-2 cm long, and had produced plurilocular sporangia (Fig. 5, P). On the other hand, at the beginning of January (1965), the uni-algal cultures from the more slender germlings had developed into erect tubular filamentous fronds about 5 cm long with plurilocular sporangia (Fig. 5, S). With the exception of their minute habits, these tubular plantlets are apparently identical with *Scytosiphon lomentarius* (Lyngbye) J. Agardh and the other, leafy plantlets are identical with *Petalonia fascia* (Müller) Kuntze. From this, it may be concluded that these *Ralfsia*-like thalli which have unilocular sporangia alternate with the thalli of *Scytosiphon* and *Petalonia*, which bear plurilocular sporangia.

The order Scytosiphonales was established by Feldmann¹⁾ because of its cellular structure and plurilocular sporangia, and especially because of a lack of knowledge about individual plants with unilocular sporangia. The results obtained from the experiments reported here, however, show that these small *Ralfsia*-like thalli with unilocular sporangia should be considered as sporophytes of the genera *Scytosiphon* and *Petalonia* and that they appear to correspond to the *Aglaozonia* phase in the genus *Cutleria*. In *Cutleria*, the frond structure of the *Aglaozonia* phase (sporophyte), as well as that of the *Cutleria* phase (gametophyte), is polystichous, but in *Scytosiphon* and *Petalonia*, the frond of the *Ralfsia*-like phase is haplostichous, although those of the *Scytosiphon* and *Petalonia* phases are polystichous.

Reference

- 1) Feldmann, J., Mem. hors-série Soc. d'Hist. Nat. Afri. Nord **2**: 103 (1949).