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LABORATORY EXPERIMENTS ON THE INTERSPECIFIC RELATION IN THE COLONY FORMATION OF SOME HYDROZOAN SPECIES[1)]

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The writers have been interested in the ecology of the marine animals, especially hydrozoan species, appearing in the marine plant community composed of sargassum or of marine flowering plants such as *Sargassum* spp. or *Zostera marina*.

As Hirai and Kakinuma (1957, 1958, 1960) have studied the life history of various hydrozoan species and the taxonomics of the same kinds of animals, the writers were fortunate in their ecological work of these animals.

Katô, Hirai and others (1961) described the distribution pattern of Hydrozoa on seaweed and the interspecific relation between hydrozoan species was supposed in the developmental course of their colonies. Namely, influenced by *Obelia dichotoma*, *Clytia volubilis* shifts its position from the normal location to the more distal or proximal situation of the branch of the seaweed and in the case of *Sertularella* and *Orthopyxis*, each species has a tendency to decrease the colony size and the number of polyps in the latter tends to decrease when these two species develop their colonies in the same situation of the seaweed.

The laboratory work was necessary in order to clarify the above-mentioned so-called coaction among hydrozoan species. Fortunately the rearing method by using Petri-dish had been already established by Hirai and Kakinuma (1957). A hydroid colony placed in a Petri-dish supplied with sea-water soon extends the newly grown stolons, if the sea-water is renewed frequently and as food the larvae of the brine shrimp are supplied sufficiently.

1) Contributions from the Marine Biological Station of Asamushi, Aomori Ken, No. 296.

Applying the Hirai-Kakinuma method the laboratory work was done (Katô and others, 1962). A piece of the hydroid colony of each species set on the bottom of a Petri-dish regenerates radially several new stolons accompanied with hydropolyps and thus the growing stolons become anastomosed upon each other and the luxuriant colony develops to fill up the dish.

But when two pieces from respective colonies of two species coexist in a Petri-dish, one of them becomes weak in activity though the other grows normally. For exmaple, the hydroid colony of each of *Clytia* and *Orthopyxis* is inactivated by the existence of the *Bougainvillia* colony and after removing the latter the former regains its activity. Therefore it may be said that *Bougainvillia* sp. dominates over each of *Clytia* and *Orthopyxis* in the course of the colony formation.

The writers undertook the more detailed laboratory work concerning the above-mentioned coaction (unpublished). Hirai and Kakinuma (unpublished) succeeded in the culture of a piece of coenosarc which develops into a hydroid colony. In the present work the coenosarc was squeezed from the stolon under a binocular microscope and thus obtained tissue was divided into small pieces. If the mass of these tissue pieces is set on the bottom of a Petri-dish, several new stolons regenerate radially from it and a hydroid colony develops normally.

The similar experiment to the previous work was carried out applying the above-mentioned treatment using *Bougainvillia* and *Clytia*.

The mass of tissue pieces of *Bougainvillia* or *Clytia* regenerates its normal hydroid colony, but if the mixed mass of tissue pieces of these two species is set on the bottom of a Petri-dsih, the *Cyltia* colony which has several small stolons soon becomes inactivated, that is, the proximal portion of the radially grown stolon becomes degenerated leaving the empty periderm and only the distal portion of the stolon extends avoiding the *Bougainvillia* colony.

Instead of the above-mentioned "evasion action" ,*Coryne* continues to be an "atrophied body" in the case of the mixed mass of tissue pieces of *Coryne* and *Bougainvillia*, though the latter species grows normally.

From the above it may be supposed that there are at least two types in the coaction among hydrozoan species.

Now it may be necessary to analyse the mechanism in the above-mentioned interspecific coaction which remains unclarified and the physiological and ecological analysis of this problem seems to be in need of the large amount of the hydroid colony. For this purpose the glass-aquariums (20 cm × 15 cm in bottom surface and 30 cm in height) of the circulation system were prepaired in the room with an air conditioner. It seems that by this rearing method the hydroid colony grows in the fairly satisfactory condition, and therefore the further results of the investigation concerning the coaction among hydrozoan species may be obtained in the near future.

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