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## Utilization of Coral Mucus by Crustacea living in Reef (Extended Abstract)

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A previous observation showed that the surface of coral blanches was unexpectedly clean and almost nothing was attached on them (Fukami, unpublished data). There are many individuals of Crustacea living in the vicinity of coral blanches. It was often observed that they picked up something from surface of coral. Judging from these findings, it is supposed that corals excreted mucus continuously and released it for self-cleaning (Ducklow and Mitchell, 1979), probably in order to prevent themselves from the infection of microorganisms. This fact, on the other hand, suggests that mucus from coral is an important food for Crustacea living on the coral blanches. This study aimed to clarify the possibility that small shrimps and crabs living on the coral take up and utilize coral mucus.

A couple of communities of *Acropora nobilis* were sampled from reef edge of Heron Island, Great Barrier Reef. This species seemed to produce much amount of mucus when it received some physical shock. Mucus produced by the coral and floating to the water surface in a bucket was collected into a glass bottle by using a syringe. Appropriate amount of <sup>14</sup>C-glucose was added into the bottle containing mucus and it was incubated for several hours. During incubation, bacteria in the seawater took up <sup>14</sup>C-glucose and attached and/or grew onto the mucus, which resulted in the preparation of radio labelled mucus.

We used two species of shrimp, *Periclimenes spiniferus* and *Thor amboinensis*, for the experiment. Both were predominated species in coral reef area (J. G. Greenwood, personal communication). Several ten individuals of these species were collected from corals and were kept them in seawater in a tray for 6 hr for starvation in the laboratory. Each individual was then put into a 50ml vial for tests and 1 ml of radio labelled mucus prepared previously was added into each vial. Shrimps with mucus were incubated for 5 hr. As blanks, cool-killed individuals, which were prepared by keeping them in a refrigerator for 10 to 15 minutes, were used. After incubating both tests and blanks, each shrimp was picked up with forceps, rinsed thoroughly in filtered seawater and then crashed by a glass rod in a scintillation vial. Radio activities of both test and blank samples were finally measured with a liquid scintillation counter.

The results showed that the amount of radio activities taken up by living shrimps, *P. spiniferus*, were  $10267 \pm 4309$  (mean  $\pm$  SD) dpm and those of blanks were  $1093 \pm 1243$  dpm. On another shrimp, *T. amboinensis*, living individuals took up a little bit small radio activities of  $4804 \pm 3248$  dpm, however, activities were  $343 \pm 116$  dpm in blanks. In both species of shrimps, living individuals (test) took up significantly higher radio activities than dead ones (blank). There are no relationships between radio activities taken up by living shrimps and body weight of individuals, while radio activities of blank seemed to have some positive relationship to the body weight. These results suggest that small shrimps living in the coral surface were one of the most important mucus consumers, and that there is a special energy flow from coral

to Crustacea by way of mucus in coral reef ecosystems.

### References

DUCKLOW, H. W. and R. MITCHELL, 1979. Bacterial populations and adaptations in the mucus layers on living corals. *Limnol. Oceanogr.*, **24**, 715-725.

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