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相模湾初島沖のシロウリガイ類遺骸殻に残された捕食痕
Predation marks on *Calyptogena* dead shells off Hatsushima Island, Sagami Bay, central Japan

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Predation pressure is one of the important factors controlling community structure and evolution, but only few attempts have so far been made to quantitatively estimate predation pressure in chemosynthetic communities.

We analyzed breaking pattern of *Calyptogena* dead shells in a living colony at a cold-seepage site off Hatsuhima Island, Sagami Bay, central Japan. The sampling site is located at 856 m in bathymetrical depth, on slope of western side of Sagami Bay. The dead shells were collected by submersible *KAIKO 7000II* (Dive #546, KR12-05 cruise) using a Kumade-sampler with 15 cm x 18 cm mouth, 13 cm depth, and 7.6 to 7.8 mm sieve openings.

The dead shell assemblage consists of a mixture of various conditions from complete conjoined valves to abraded shell fragments. Among them, we paid attention to open valves with umbo intact, some of which are not abraded, preserved sharp and fresh break edge, and show remarkable contrast in preservation between the right and left valve. Almost all part of one valve (right or left) is missing except for the strong hinge and dorsal margin connected with ligament, whereas the other valve is nearly complete with notch-like injury in ventral margin. This breaking pattern is difficult to be explained only by non-biological factors. We judge the shell breaking pattern to be a predation mark, and estimate the predator as decapod crab *Paralomis multispina*, which were frequently observed to gregariously habit around the sampling site. *P. multispina* was reported to catch and eat Calyptogena by Fujikura et al. (2008), who attached the photograph showing that *P. multispina* inserted its right crusher chelae into the ventral margin of a *Calyptogena* shell and tried wrenching open it.

In order to quantitatively estimate the contribution of predation to all death causes, we calculate the ratio of numbers of predation-mark specimens to all attached valves in each shell size class. We exclude detached or fragment specimens in the calculation because it is difficult to judge whether the specimens are results of predation crush or physical break.

Total 75 attached valves are examined. The predation marks are recognized from young to gerontic *Calyptogena* clams, shell length of which varies from about 2 cm to over 12 cm. The ratio of predation-mark specimens in each shell size class varies from 17 to 83%, and its average is 40%. This data shows no size-selective feeding behavior, and that the predators have crushing force enough to break the stout shells of gerontic *Calyptogena* clams. The predator, maybe *Paralomis multispina*, contributes 40% to all death cause of *Calyptogena* clams.

These suggest that *Calyptogena* colonies off Hatsuhima Island have been maybe under high predation pressure in spite of the deep-sea condition. Methane-seep sites are deep-sea oases not only for chemosynthetic animals but also for the predators.

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