

Ethological observation in a *Calyptogena* colony off Hatsushima Island in Sagami Bay, central Japan

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Ethology of *Calyptogena* clams is analyzed on the basis of a serial video-capture images with three-minutes interval from 14th March to 19th June, 1988 on the Long-term Deep Sea Floor Observatory off Hatsushima Island in Sagami Bay. The video camera was fixed to observe the *Calyptogena* colony (yellow bacteria mat and its surroundings of *Calyptogena* gregarious zone).

During the video-capture working time, more than three mud-flows stroke the colony, but the thickness of mud-flow sediments were maybe not over 10 cm. The *Calyptogena* clams pushed up their shells and escaped from the burial by pushing their foot against underground firm bottom. After the mud-flow blanketed the colony, some *Calyptogena* clams randomly moved and disturbed the reducing bottom breaking the bacteria mat, but its significance is unknown.

It is noteworthy that this serial-images record a complete account of prey/predation processes on a *Calyptogena* clam from beginning to end. *Calyptogena* clams were attacked by large buccinid and small turrid gastropods, which wandered in and around the living *Calyptogena* colony and rode on some clams. *Calyptogena* clams escape or protect from their predation by the following three methods: 1) closing the valves; 2) burrowing into sulphide-rich bottom where is not preferable condition for aerobic animals; and 3) hiding behind large dead shells.

Small gastropod-attacks did not cause dynamic escape activity of *Calyptogena* bivalves. Gregarious small gastropods had swarmed on some living *Calyptogena* clams during over 20 days, but the *Calyptogena* clam only once crawled into the reducing bottom and mainly resists the small-gastropod attacks by closing their valves.

On the other hand, attacks by large buccinid gastropods promptly cause escape actions of *Calyptogena* bivalves. We confirm that a *Calyptogena* clam instantly burrowed into the bottom just after large buccinid-attacks. The *Calyptogena* clam stayed in the black reducing sediments over nine hours. During the burrowing time, buccinid gastropods also burrowed into the sediments with their long siphon above the sediment surface, and struggled and tried to prey the clam. After all some buccinid gastropods gave up and leaved the clam burrowing point although others retained around the point. The *Calyptogena* clam once succeeded in escaping from the predation, but unfortunately the clam received next attack by another buccinid gastropod after the clam rose to the surface. The clam maybe had little reserve of energy to burrow again, and alternatively hid behind a large dead *Calyptogena* shell. This way was not efficient for the protect from their predation. After the hiding, the living *Calyptogena* received intensive attacks by many large and small gastropods. It took about 4 days and a half from the start of intensive attacks to completion of the predation. This predation time suggests that old-aged *Calyptogena* colony has enough potential to attract the high-density gastropod population.

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