

Population dynamics of high density clams, *Ruditapes philippinarum*, on the tidal flat at the river mouth in Shirakawa river.

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A clam, *Ruditapes philippinarum*, are edible bivalves that are distributed throughout Japan and have been actively harvested, but, the population has decreased significantly. Therefore, various efforts have been made to recover the population of clams in Japan. In particular, creating sand covers on tidal flats aimed at improving sediments and supplying substrate morphology is effective in restoring the clam populations, and, the method is often used in Japan. In May 2021, it was observed that high density young clams inhabit the sand-covered area on tidal flat in the Shirakawa river. However, the clams can't be caught on this tidal flat. We thought population of clams was not maintained until the catch size due to factors such as deterioration of the habitat, competition and predation during the growth process of clams. Therefore, in this study, we investigated environmental conditions and composition of bottom organisms on tidal flat in Shirakawa river, and aimed to elucidate the factors that cause the clams not being caught in this tidal flat from population dynamics of the clam.

The investigation spots are the sand cover point (St. 1) and the control area (St. 2) on tidal flat in Shirakawa river. In St. 1, from May 2021 to December 2021, and in St. 2, from November 2020 to December 2021, we monitored about environmental conditions and composition of bottom organisms once a month at low tide. About the survey of environmental conditions, water quality meters were installed at both spots to continuously observed the water temperature and salinity. In addition, we collected the sediment for analyzing the particle size composition. About the survey of composition of bottom organisms, we measured the number of individuals and the wet weight of benthos. Furthermore, we measured the shell length of the clams. we drew survival curve and a growth curve by Virtual Population Analysis originated from the clam shell length histogram in St. 1. As a result, it was found that the survival curve of cohort 1 decreased significantly over the three periods, from May to June, July to August, and November to December. The first time, many traces of feeding by *Batoidea* were observed, and it was considered that the density of clams was greatly reduced by large predation of *Batoidea*. The second is due to a low salinity were continued for long term. In this period, heavy rain over 830 mm was observed from August 8 to 18 in Kumamoto Prefecture, and a low salinity less than 10 psu continued on St.1. The third, predation by *Anus platynchos* and *Anas acuta* is thought to be the cause. In 2020, it was confirmed that a large number of *A. platynchos* and *A. acuta* were pecking on the surface of the tidal flat from October to the end of March, and the clam larvae disappeared at the same time. In this study as well, a large number of *A. platynchos* and *A. acuta* were observed to alight near St. 1 from October to December, the clams of cohort 1 decreased at this period. Moreover, clams occupy 85-90% of the benthic community on St.1, and it is very likely that clams was eaten by *A. platynchos* and *A. acuta*. These results suggest that high-density clam do not remain until they grow up catch size due to large predation pressure by *Batoidea*, *A. platynchos* and *A. acuta*, and low salinity caused heavy rain.

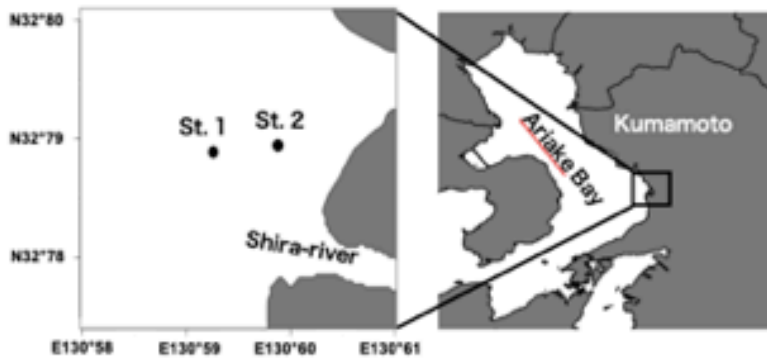


図 1. 調査地点

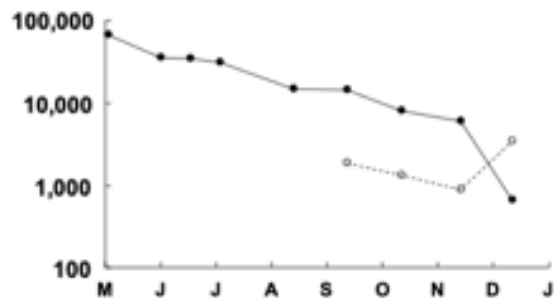
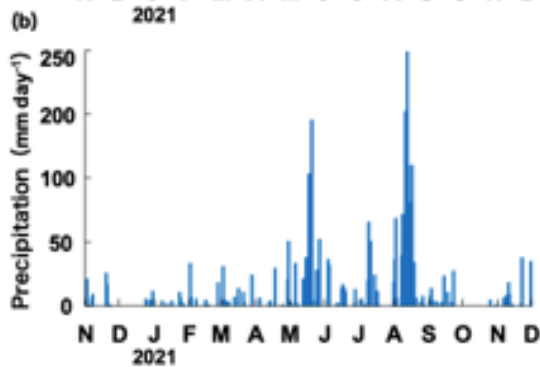
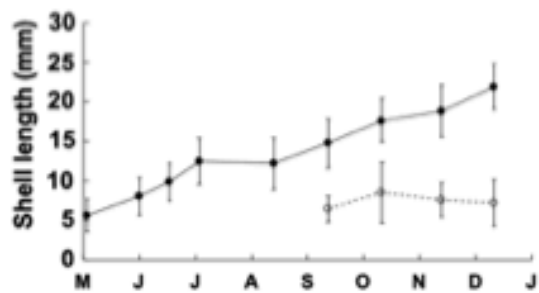
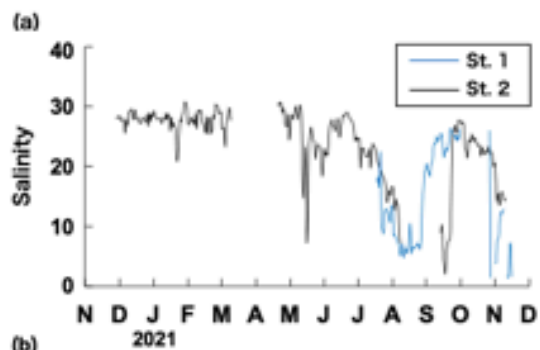


図 3. アサリの成長曲線および生残曲線

図 2. (a) 調査地点における日間平均塩分, (b) 熊本市の日間平均降水量



写真 1. エイの捕食痕



写真 2. 干潟に飛来したカモ