

Landscape Ecological Study for Succession of Asian Clam Fishery Culture in the Huong River in Hue City in the Central Vietnam

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1. Introduction

In Hue City in the central Vietnam, there is an Asian clam eating culture and a traditional Asian clam fishery is conducted in the Huong River. However, in these years, the catch of clams has decreased and it became to be difficult to continue the traditional fishery. Although, it is hoped that the mechanism of the clam decline is clarified for succession of the fishery culture, nobody has studied this fishery and the clam in this area, yet. In this study, I include the clam fishery in the Huong River landscape and evaluate various factors that influence on the clam fishery in various scales. The final goal is to suggest a sustainable harvesting system. In this paper, firstly I investigated the actual situation of the clam fishery, the water quality and the bottom sediment quality of this river, and the distributions of the clams. Then, secondly, I clarified the situation of the clams and examined what factors influencing on them.

2. Methods

This study was conducted in the Huong River in Hue. Its current is through the urban area from the southeast of Hue to the lagoon located at the northeast of the city. A movable barrage for the water management for irrigation was constructed about 1km up from the river mouth in 2008, and the barrage was closed in the dry season and opened in the rainy season. I conducted hearing survey about the situation of clam fishery to the fishermen to get information about fishery area. The survey area was allocated from the mouth of the river to about 14km upper stream. I put 8 lines every 2km and 3 points (right, middle and left side) on the each line, and set up 24 points in all. The water sample, the bottom sediment and the clam collections were conducted in July and October 2010 that corresponded to the dry season and the wet season. I measured the water temperature, water depth, pH, salinity, DO, BOD, COD, T-N, T-P and the concentration of Chlorophyll-a to analyzed the water quality, and the sediment temperature, ORP and the ignition-loss to analyze the bottom sediment quality. And I measured the shell length, the shell width, the shell high and the wet weight

of each clam. Then I analyzed (1) the comparison of the shell length between seasons, (2) the comparison of the shell length by the stream path division, (3) the relationship between the water and bottom sediment quality and the distributional pattern, and (4) the relationship between the population density and the fishing points.

3. Results and Discussion

The upstream of the barrage was fresh water and the downstream was brackish water, and the bottom sediment was a sandy in the river. I identified all clams as *Corbicula fluminea*. This species was distributed among the study area entirely in both seasons. I counted 238 individuals in the dry season and 47 individuals in the wet season. They intensively inhabited from the barrage up to about 3km. The results from 4 analysis are, (1) the ratio of young shell (the shell length was less than 10mm) was high in the dry season and the ratio of adult shell was high in the wet season, (2) the bigger clams inhabited the upstream area and the smaller ones inhabited the downstream area, (3) the interrelation between the water quality and bottom sediment quality and the population density was not confirmed, (4) at the present, the population density was large at the points under the high fishing pressure and it was small at the points under the low fishing pressure. Therefore, distributional pattern was not formed by condition of the water quality and bottom sediment quality. I inferred that the reason why the population density became lower in the wet season, because the small clams were carried from the upstream to downstream and stay upstream of the barrage in the dry season and washed away to the lagoon after opening it and caught by fishermen. I supposed that the distributional pattern was influenced by the extrinsic factors such as the water stream and the fishery because this clam species lives on the bottom sediment and has weak migration ability. In conclusion, in order to suggest the sustainable clam fishery system, it is important to clarify the individual life history and migration and to analyze the impacts upon the distributional pattern by the change of water stream and the operation of the barrage.

