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Influence of Turning Over Pond Soil on Growth of the Hard Clam, *Meretrix lusoria*

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ABSTRACT

In this experiment the soil in which clams were reared was turned over periodically to see whether the treatment benefited the growth of the clams. After having been reared for 126 days, the growth of clams in the group treated every half a month did not differ significantly from that of the group treated every month. Further the results of both groups were better than that of the untreated group. It was inferred from observations of three large collections of the clams that a few of the clams might have injured their own foot by suddenly closing their shells when frightened by the turning over of the pond soil. However, no significant increase in mortality occurred in the treated groups. The clams of the treated groups burrowed more deeply into the soil than did those of the untreated group. Vertical crawls of the clams might improve the condition of the substratum.

Key words: *Meretrix lusoria, Culture, Pond soil.*

INTRODUCTION

The hard clam, *Meretrix lusoria*, is an important cultured shellfish in Taiwan. Culturing is mainly performed in ponds, and secondarily on tidal flats. The total culture area and the annual production were 5472.97 ha and 26679 metric tons in 1998 (Taiwan Fishery Bureau, 1999), respectively. The stocking density was 0.96-1.58 million individuals per hectare (Wu *et al.*, 1983). Average market size was 15 g per individual. The estimated mean survival rate was only 25.6%, which means that mass mortality frequently occurs. Mass mortality occurring in tidal flat culture was mainly attributed to pollution from industrial waste water (Jeng and Chan, 1975). However, no report has discussed the factors causing the mass mortality of pond-cultured clams. And no report has described the contribution of epidemics.

Usually there is a large quantity of detrital uneaten food, feces, carcasses, and dead plants on the pond bottom. Microorganisms feeding this organic matter will deplete the dissolved oxygen, thus producing high concentrations of NO_2^-, H_2S, NH_3, CH_4, and so on (Patrick *et al.*, 1976; Ram, 1981; Boyd, 1982). These toxins can retard the feeding and growth of the benthos, even causing death (Rappaport and Sarig, 1979; Ram *et al.*, 1981; Nix and Ingols, 1981; Shilo and Rimon, 1982; Liao *et al.*, 1985). In Taiwan, hard clams are all cultured at extremely high densities. Natural food sources can usually not satisfy the demand. To maintain good growth, it is necessary to apply artificial food and fertilizer (Chen, 1984). This fosters large numbers of benthic animals and the formation of thick organic deposit which leads to a low redox potential and high concentration of sulfide in the pond soil (Su, 1988). Evidences showed that outside of shells of the clams were in deep

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