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PREDATION ON MUSSELS IN CULTURE BY SILVER BREAM, *RHABDOSARGUS SARBA*

K. K. APPUKUTTAN

Rhabdosargus sarba shoals, as observed in Vizhinjam area during 1979, play havoc to the cultured mussels. 250 ropes containing good quantity of harvestable mussels are reported to have been completely destroyed by predation by this fish. Attempts to control predation did not yield results. In addition to lobster predation noticed commonly in the area, *Rhabdosargus sarba* has added a new dimension to the problem.

INTRODUCTION

Davies (1970, *Proc. Symp. on Mollusca*, 3 : 873-884, M.B.A. India¹), while dealing with mussel as world food resource has discussed various problems in culture and attached great significance to the predation caused by animals in the farm. Important among them are crabs, fish, and also flat-fishes from European waters. He has also mentioned about damages caused by diving ducks and oyster catchers preying on intertidal mussels and pointed out that in the development of mussel culture in new areas, completely different predation problems may arise, for example midwater predation, and concludes that raft culture is not a sure remedy for predation.

OBSERVATIONS

Experiments on floating raft culture at Vizhinjam Bay from 1976 showed that predation by fishes was not a serious problem till 1979. While examining the seeded ropes in 1976 browsing of mussels by fishes was noticed. Fish traps were kept in the rafts to collect these fishes in the vicinity of the raft area. *Diodon hystrix*, *Arius* sp., *Arothron nigropunctatus*, *Ostracion* spp., *Chaetodon* spp., and *Acanthurus* sp., were collected and the stomach contents of these fishes were examined. It was found that the first three species of fishes feed on young mussels of 20 to 30 mm size. Out of 16 numbers of *Diodon hystrix* collected during October (ranging from 175-295 mm in total length) 8 specimens had mussels in

their stomach. All the three specimens of *Arius* sp. had stomach full of mussels and out of 5 specimens of *Arothron nigropunctata*, two had mussels. However, samples of fishes collected in subsequent months failed to reveal mussels in the stomach contents. The damage caused to the seed on the ropes was observed to be very negligible. In 1977 and 1978 also only the three species mentioned above caused minor damage to the seed.

During January 1979, 250 seeded ropes released in the floating rafts inside the bay, were attacked by a shoal of silver bream, *Rhabdosargus sarba*. Efforts to catch the fishes by hook and line did not succeed. However fish traps kept in the bay enabled collection of fishes ranging from 360 to 470 mm in total length during the first week of February. Examination of the stomach contents revealed stomach full of crushed mussels, clearly indicating that these fishes were heavily feeding on mussels on the rope. By the end of February, the entire stock of seeded mussels was eaten up by the shoals of fish (Plate I, a). Control of predation by gill netting was tried but it was not effective. It was also understood that 1500 seeded ropes kept in the floating rafts of the Pilot Project on mussel culture of Kerala State Fisheries Department were also reported to have been completely destroyed by the shoals of the same species, *Rhabdosargus sarba* by the end of April.

Full grown mussels on ropes kept suspended from rafts in the Bay were also not spared from predation. The fishes crushed the shells and fed upon the flesh

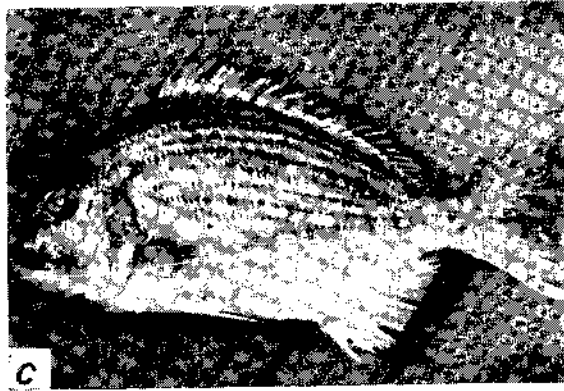
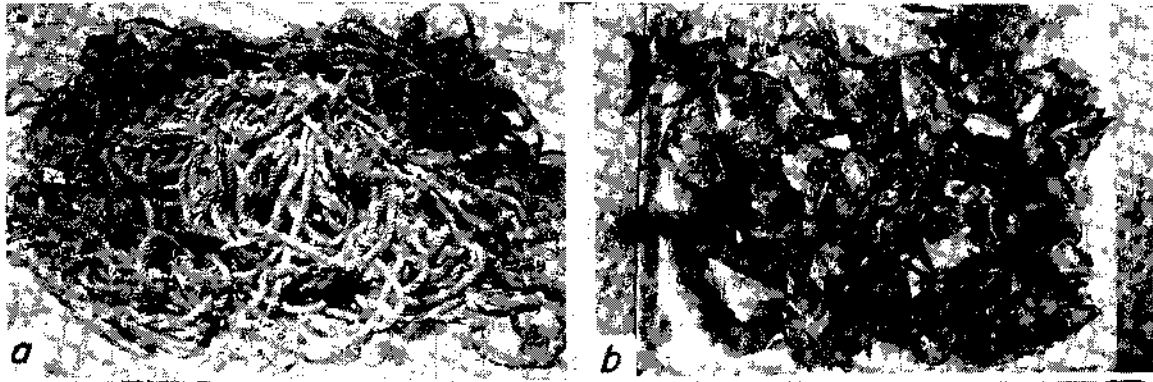


PLATE I. a. Damaged mussel ropes. b. Crushed shells of full grown mussels. c. *Rhabdosargus sarba*.

leaving remnants of empty shell still attached to ropes (Plate I, b).

This Silver bream, locally called 'Thavanupara' (family : Sparidae) are carnivorous, inhabiting shallow waters. The body is silvery with golden longitudinal lines along scale rows. A yellow streak across belly is present. (Plate I, c). In the upper and lower jaw, rows of compressed incisors and rounded molars are present. Posterior molar in each jaw greatly enlarged. The teeth structure is well adapted for crunching hard objects.

REMARKS

It may be of interest to mention here that this fish does not form significant fishery in this area. The only fish so far been reported as causing damage to mussel in natural bed is flat fishes (Davies, 1970¹) in European waters. The present report shows that silver bream may pose serious problems for mussel culture at Vizhinjam area. It may not be out of place to mention that during experiments on mussel culture inside the bay it was observed that lobsters also cause damage to cultured mussels on a minor scale. Lobster cages were kept in the farm and found that during November to January period number of lobsters could be collected from the farm area. In the natural bed around Vizhinjam also mussel predation by lobsters was observed. They cut the live shells and eat away the flesh leaving the broken shells attached to substratum. It may be of interest to note that the lobster fishermen keep mussels collected from the natural bed inside the

cages as bait, for luring lobsters into the trap. It is understood from fishermen that mussels are considered as the best bait for lobster fishing.

Mahadevan (Personal communication) has stated that unusually large shoals of *Drepane punctata* appear in the pearl banks during pearl fishery times attracted by the rotting flesh of the pearl oysters at the bottom, discarded earlier by fisher-folk cutting open oysters while the fishing is in progress. Similarly the probable reason for the entry of shoals of silver bream in the area can be attributed to the dynamiting for fishing in this area. During January and February the local fishermen were dynamiting around the breakwater area for mackerel and caranx shoal. There is every possibility of the silver bream shoal being disturbed from the natural habitat and accidentally entering the mussel culture area. As the fishermen could collect only a fraction of the fishes by dynamiting, the rest get battered attracting pugnacious feeding by the silver bream.

Several methods have been developed in foreign countries to solve the problem of large scale predatory attacks. Hanson (1974, *Open Sea Mariculture*, Dowden, Hutchinson & Ross. Inc. 410 pp.) lists, air barriers, electrical barriers, acoustical barriers, chemical controls and animal barriers amongst them. It has to be seen whether the present instance of predation by *Rhabdosargus* is an isolated event or is a perennial nuisance in the area before we can think of suggesting measures, within the frame-work of practicability to overcome the attacks.