

## AN EASY AND EFFICIENT METHOD OF COLLECTING PRAWN AND MULLET SEED FROM THE INTERTIDAL MANGROVE AREAS \*

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### ABSTRACT

The Hooghly-Matlah estuarine complex having a thick mangrove vegetation in the deltaic Sunderbans supports the richest collection grounds for seed of many economically important fish and prawns. Various types of gear set against the tidal currents are used to collect seed of the cultivable species from the coastal waters. However, a device or gear to capture the young ones based on their tendency to settle for feeding and taking refuge in the mangrove vegetation is still lacking. Taking advantage of the above factor, an easy and efficient method of trapping and collecting tiger prawn (*P. monodon*) and mullet (*L. tade* and *L. parsia*) from the intertidal mangrove mud flats in the Sunderban areas of West Bengal (India) has been developed and is described in this communication.

### INTRODUCTION

MANGROVES have universally been recognised as nursery and feeding grounds for most of the euryhaline shell and fin fish. Fringed with a thick mangrove flora, the lower and middle reaches of Hooghly-Matlah estuarine complex besides, contributing nearly 80% to the total estuarine fishery yield of India (Homilton and Snedaker, 1984), also supports one of the richest collection grounds for seed of many economically important fish and prawns (Ravishchandra, 1962; Bhanot, 1971; Gopalakrishnan, 1972; Thakur, 1975; Gopalakrishnan *et al.*, 1975). In the absence a technology of controlled reproduction of *L. parsia* and *L. tade* and non-existence or poor supply of hatchery produced tiger prawn *P. monodon* seed in the country, fish farmers still remain dependant on the 'wild caught'

stocking material for stocking brackishwater impoundments (bheris) and ponds. In order to meet the ever increasing need for *P. monodon* seed, Verghese *et al.* (1979) and Chakraborty *et al.* (1977) attempted to standardise and simplify the techniques for collecting maximum number of live postlarvae. Singh (in press) fabricated a gear for collecting young ones of the species from the shark and ray infested coastal waters. However, a gear based upon the tendency of various shell or fin fish juveniles to settle in the mangrove ecosystems is still lacking.

The author is grateful to Dr. A. V. Natarajan, former Director, CIFRI, Barrackpore for showing keen interest in this study. Thanks are also due to Ms. Deulbari fish production group for providing necessary facilities and to Dr. Janaki Ram for critically going through the manuscript.

\* Presented at the 'Symposium on Tropical Marine Living Resources' held by the Marine Biological Association of India at Cochin from January 12-16, 1988.

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### MATERIAL AND METHODS

Eight pieces of fine meshed nylon netting cloth (25 m long × 2.5 m wide) were joined

together in a linear way and provided with strong nylon head and foot ropes. Thirtythree bamboo poles (3.5 m long) were driven about 6 m. apart into the bottom mud in a semi-circular way for encircling a mangrove zone of the intertidal mud flat along river Thakuran at Shyamnagar, Deulbari (lower Sunderbans). The site has dense mangrove vegetation which is a typical feature of the lower Sunderbans. The vegetation mainly comprised *Avicennia officinalis*, *Suaeda maritima* and *Salicornia* sp. along with grasses like *Portersia coarctata* and *Hemithera compressus*. While the foot rope was firmly tied to lower ends of the bamboo poles and buried in the bottom mud, the head rope was loosely tied to the upper ends of the poles to facilitate easy, quick lowering and raising of the net. Nine pits (1 m × 1 m) were dug about 22 m apart on the inner side of the foot rope and joined together by a narrow trench (25 cm × 25 cm) for retaining water and for trapping fish and prawns alive after receding of the high tide.

along with other shell and fin fish, trapped in the raised net found their way into the dug out pits after receding of the tidal water. Live seed were collected by scooping the pits and transferred to aluminium hundies containing clear creek water. Table 1 gives details of *P. monodon*, *L. parsia*, *L. tade* and *L. calcarifer* seed caught along with other miscellaneous fish during different months, whereas, various physico-chemical parameters of water at the collection site are furnished in Table 2.

#### RESULTS AND DISCUSSION

A gradual shift in culture practices in the brackishwater impoundments (bheris), replacing the age-old system of wild culture with a more selective stocking of postlarvae of tiger prawn collected from the wild, in addition to the natural entry of shell and fin fish larvae during tidal ingress; has resulted in everincreasing demand for stocking material of the species. Thousands of fishermen are engaged in opera-

TABLE 1. Numbers of various shell and fin fish seeds collected during different months of the year 1985

Month	<i>P. monodon</i>		<i>L. parsia</i>	<i>L. tade</i>	<i>L. calcarifer</i>	Others	Remarks
	Juveniles	Postlarvae					
Jan.	11	42	169	—	—	200	
Feb.	16	69	419	—	—	360	
March	31	211	207	—	—	650	
April	88	702	47	—	—	980	
May	101	1,332	9	—	—	1,400	<i>M. monoceros</i> , <i>M. brevicornis</i> and
June	219	1,008	—	7	21	2,150	<i>P. styliferus</i> among prawns, while
July	52	341	—	3	43	2,600	<i>M. gulio</i> and gobids dominated
Aug.	14	63	—	19	99	1,350	the miscellaneous fish catches.
Sept.	31	17	—	96	46	1,900	
Oct.	38	41	—	39	6	3,000	

The net kept in a lowered position during low as well as rising spring tide periods, was raised quickly just before the turn of the tide (beginning of low tide) with the help of a small boat. Tiger prawn, mullet and bhetki seed

ting various types of nets during different months of the year for collecting seed of commercially important prawn and fish species. Unfortunately, after picking up *P. monodon* postlarvae, the seed collectors simply throw

away large quantities of other prawn and fish larvae without returning them to the estuary. According to Karim (1986), *P. monodon* postlarvae usually form less than 1% of the total seed caught and the remaining fry are left to die on the river banks in Satkhira

(*L. parsia* and *L. tade*) and many other fishes and prawns.

TABLE 2. Monthly average values of river water salinity and temperature during 1985

Month	Salinity ‰	Temperature (°C)
Jan.	14.0	18.5
Feb.	16.0	20.0
March	17.5	24.5
April	20.0	28.0
May	24.5	31.0
June	16.0	32.0
July	9.5	31.0
Aug.	7.0	30.5
Sept.	8.0	30.0
Oct.	11.5	29.5

(Bangladesh). The same is true in Indian part of the Sunderbans. This wanton killing of larvae has not only endangered the balance of natural population in adjacent waters, but also resulted in almost a total disappearance of other economically important species of fish like *L. parsia*, *L. tade*, *M. gulio*, etc. and prawns like *M. monoceros*, *M. brevicornis* and *P. styliferus*. Bhimachar (1962) reported that out of an estimated production of 225-680 kg/hectare from bheris and paddy fields in West Bengal; mullets (*L. parsia* and *L. tade*), *L. calcarifer* and *M. gulio* form bulk of the catches, while prawns amounted only to 20%. According to Pakrasi *et al.* (1966), four species of grey mullets occur in the bheris, *L. parsia* forming bulk of the catches followed by *L. tade*. However, the indiscriminate killing of prawn and fish larvae and a recent shift in the cultural practices have endangered the natural seed of the much esteemed mullets

Despite high culture potential and good market demands, mullet seed has not been exploited to significant levels. Fry of *L. parsia* and *L. tade* are usually collected using shooting nets or scooping the intertidal kits and pools (Anon., 1972; Bhanot and Gopalakrishnan, 1972; Gopalakrishnan, 1972; Thakur 1975). Intertidal pits with grassy vegetation were, however, found to harbour large number of mullet fry and scooping these pits resulted in better seed collections (8,729 nos/31 days) as against only 544 in 66 days of shooting net operations (Anon., 1972). Gopalakrishnan *et al.* (1975) reported pit collection to be the common method adopted by fishermen for collecting *L. parsia* and *L. tade* seed from the intertidal zones of the Hooghly-Matlah Estuary. Mangroves have also been identified as natural nursery grounds for *P. monodon* (Motoh, 1984; Primavera, 1985; MacNae, 1974). A large number of tiger prawn postlarvae and juveniles settle in the intertidal creeks and lagoons having luxuriant growth of marginal vegetation (Anon., 1977). Sambasivam (1985), correlated the abundance of prawn juveniles with mangrove vegetation in Pichavaram mangroves. The large number of *L. parsia*, *L. tade* and *P. monodon* juveniles along with various other species of prawn and fish collected in the present method may be attributed to the virgin mangrove ecosystem which attracts the shell and fin fish for food and shelter.

However, pits and pools do not occur in large numbers especially in the mangrove rich middle and lower zones of the Sunderbans. Since digging of new pits is highly labour oriented, the intertidal mud flat with dense mangrove vegetation was encircled in the present method using a narrow meshed nylon netting cloth. Besides being simple and efficient, the method enables collection of seed during both the tides (24 hrs cycle), since juveniles which get trapped during the night tide, get

accumulated in small pits specially dug for the purpose, from where they can be collected alive in the following morning. Yet another advantage offered by the technique to the fisherman is ensuring simultaneous operation

of another gear (shooting and stake or a push net) during the rising and receding tides before finally attending to the fixed net presently described, thereby almost doubling the number of seed caught per man/day.

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