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Studies on traditional methods of wild giant freshwater prawn seed collection and their potential impact on the aquatic ecosystem

S.J. MESHRAM*, P.E. SHINGARE and S.T. INGLE
Khar Land Research Station (Dr. B.S. Konkan Krishi Vidyapeeth)
Bander Road, Opposite Court, Panvel - 410 206,
Dist: Raigad, Maharashtra, India

Abstract

Abundance and seasonal variation of *Macrobrachium rosenbergii* seed in the natural water bodies such as creeks and rivers have great influence on freshwater prawn farming. Freshwater prawn farming is still heavily dependent on wild seed in India. Due to traditional collection methods and poor handling, there is immense destruction of non-targeted species of shell fishes and fin fishes. The present study was conducted on Amba river near Wakan dam in Raigad district of Maharashtra. The wooden bamboo strip traps of size 60 cm long with 15 cm outer circumference, locally known as "Bagala" or "Bokshi", were used to collect the wild seed. Approximately, 40 to 70 number of traps were operated by 22 fishermen per day for 4 to 5 months. Mortality of *M. rosenbergii* seed reported during collections was 2 - 3 %, while fish seed (10 - 12%) collected along with prawn seed was used for consumption. It was observed that 53.47% of commercial prawn species was constituted by seeds of *M. rosenbergii*, 35.40% of non-commercial prawn species and 11.01% of other fishes. Seeds of *M. rosenbergii* was used for culture, while non-commercial prawn species and other fish seeds were used for local consumption or destroyed during collection. It is therefore necessary to segregate only *M. rosenbergii* seed and release local species of prawns and fishes back into the natural water bodies to conserve the aquatic fauna.

Introduction

As seed of PL 20 size produced by hatchery owners is in very small quantities and are costly, freshwater prawn farmers prefer to purchase wild – caught seed which is larger in size and cheaper compared to hatchery seed. This intends seed collectors to collect natural seed on large scale which causes heavy loss and destruction of seeds of non-targeted fish and prawn species.

Traditionally the seed of prawn was collected with bamboo strips traps are locally called as bagala or bhokshi. While collecting *M. rosenbergii* seed, the seed of non-

Corresponding author:
E-mail address: prakashshingare@gmail.com

commercial prawn and fish species were also caught. It was observed that there was mass morality in the trap, which causes heavy loss every year. September to December was the major period of seed collection 40-70 traps were operated per day, to collect the seed of *M. rosenbergii*, along with non commercial prawn and fish species (Indulkar, 1995). The medical oxygen was not used by seed collectors tp pack the prawn seed on polythene bags, which caused heavy mortality during transportation. The non-commercial prawn and fish seed of small size was used for local consumption or thrown on the bank of river (Latif, 2002). In this way, the natural fauna was destroyed during collection period.

Therefore the present study was undertaken to find out the level of destruction of non-commercial prawn and fish seed, so as to conserve the natural stock of local fishes and prawns.

Materials and Methods

The survey was conducted on Wakan dam constructed on Amba River of district Raigad in Maharashtra for period of September to December in two consecutive years i.e. 2005 and 2006 (Table 1). The samples were collected fortnightly during new moon and full moon. At each day, twelve samples of traps were selected and observations

Table 1. Observation details of seed collection site, gears and season etc.

Sl. No.	Particulars	Details
1.	Name of the river	Amba river
2.	Name of dam on the river	Wakan dam
3.	Type of gears used	Bagala/Boskki/Mali
4.	Size of gears /traps	Length – 60 cm Outer circumference – 15 cm
5.	Material used to prepared traps	Wooden bamboo strips
6.	Numbers of persons engaged in operation of traps	20 - 22
7.	Season of seed collection	October to Dec. 2005
8.	No. of traps sampled in surveyed Date	12 Nos.
9.	Seed collection time and duration	Night (18 hrs to 5 hrs)
10.	Traps operated in a day	40-70 numbers
11.	Seed packing method	After segregation of fish from prawn catch, seed of prawn was weighed and sold to farmers @ 200 /kg. The seed of prawn is packed in polythene bags with 6 lit. water and oxygen with seed number ranges from 250-300 in each bag.
12.	Average mortality of prawn seed during collection period	2-3%
13.	Mortality of fish seed during collection period	Mortality was nil, however, all the seed of fishes were used for consumption

such as total numbers of traps laid, catch of total juveniles and percentage composition of different species of genus *Macrobrachium* and fish groups were recorded. The samples collected were immediately preserved in 5% buffered formalin and transported to the laboratory for species identification of prawn and fish (Indulkar, 2004; Fisher and Whitehead, 1974). Observations were also made on average mortality of prawn groups and average composition of fish groups.

Results

The average percentage of prawn and fish groups sampled in traps is shown in table 2 and fig 1. It was recorded that 53.47% *Macrobrahium rosenbergii* spp. were caught in traps as compared to other non commercial prawns (35.40%) and fish groups (11.01%). In *Macrobrachium* genera, *M .rosenbergii* contributed highest (53.47%) followed by *M. idella* (24.94%), *M. scabriculam* (6.84%) and *M. bombaynsis* (3.62%) respectively. While in fish groups, *Puntius sarana* showed highest percentage of catch. Abundance of *M. rosenbergii* was more in September and October months as compared to other groups. During the collection period, average mortality of prawn seed was 2-3%, while mortality of fish seed was nil, and it was used for local consumption.

Table 2. Average percentage of species, prawns groups and fish groups sampled in traps

Sl.No.	Species Percentage	Specie wise Average percentage in total catch	Percentage Composition of prawn groups (%)	Percentage composition of fish groups
1.	*Macrobrachium rosenbergii*	53.47	60.05	-
2	*Macrobrachium idella*	24.94	28.09	-
3	*Macrobrachium scabriculam*	6.84	7.74	-
4	*Macrobrachium bombansis*	3.62	4.08	-
5	*Puntius sarana*	4.38	-	38.73
6	*Garra gotyla*	2.16	-	18.17
7	*Danio spp.*	1.25	-	10.73
8	*Ompok bimaculatus*	1.21	-	12.51
9	*Ambassis gymnocephalus*	0.70	-	6.36
10	*Aplocheilus lineatus*	1.29	-	13.01

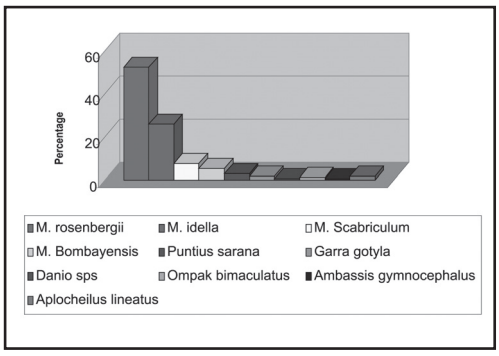

Figure 1. Percentage composition of each species in total catch

Discussion

Due to demand by aqua farmers for *M. rosenbergii* seed collectors are trying to collect natural seed to the maximum extent. The traps used for collection of seed of *M. rosenbergii* in natural water also allowed to enter the non-commercial prawn and fish species in the trap. This resulted into destruction of 46.41% of non-targetteed fish and prawn groups among the total wild catch. The seed collectors expressed their views that natural stock of fish and prawn species is decreasing every year since last 8 to 10 years. Bhoumik et al.(1993) estimated that 181.4 million undersized seed of fish and shell fish were destroyed at the time of selective collection of tiger prawn in Hoogly estuary of West Bengal, India. At study area, 53.47% of prawn seeds collected were used for culture purpose, while 46.41% seed of non-commercial species collefcted from wild during the season was unnecessarily harvested and destroyed. Hence aqua culturists may reduce their dependency on wild seed by buying hatchery-reared seed. Latif et al. (2002) reported that an estimated quantity of 90 billion other living organisms are incidentally killed each year during shrimp seed harvesting. 1. to educate fishermen about importance of conservation of non-targeted fish and prawn species during collection of commercial *M. rosenbergii* seed. 2. To encourage the prawn farmers to prefer hatchery seed and 3. To train the seed collectors to segregate. *M. rosenbergii* seed from the wild catch.

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