

The Fourth Indian Fisheries Forum, Proceedings

24-28 November, 1996

held at

**School of Marine Sciences
Cochin University of Science and Technology
Kochi 682 014
Kerala, India**

Asian Fisheries Society, Indian Branch

1999

Collection and Transportation of Groupers for Farming

V.S.RENGASWAMY, R. MARICHAMY, S. RAJAPACKIAM and D.SUNDARARAJAN

Central Marine Fisheries Research Institute, Kochi.

Abstract

The occurrence of commercially important groupers in high percentages in the nursery ground near Vellapatti, North of Tuticorin in Gulf of Mannar Coast reveals the resources of the species for collection and scope for farming. *Epinephelus tauvina* dominates the catches of mini-shore-seine, popularly known as 'Ola-valai'. The peak season for the collection of young ones in the size range 70 - 200 mm is October - January, though it is observed round the year. The estimated catch, effort, species composition and size distribution are presented in the paper. The monthly catch of this valuable species is estimated to be 15,000. The techniques employed in the collection of adult, matured size specimens of the size range 530 - 850 mm, weighing 2 - 12 kg are described. The feeding strategy and conditioning of the collected specimens in holding tanks / cages are discussed. The technology evolved for the transportation of young specimens as well as broodstocks to different culture sites are highlighted. The present observations reveal the scope for large scale farming of groupers in cages and coastal ponds as well as to promote the export trades of live specimens.

Introduction

The grouper belonging to the genus *Epinephelus* of the family Serranids are commercially important marine food fish in many countries especially in Southeast Asia and the Middle East. Many species attain 25 - 100 cm in length and more than 10 kg in weight. Most of them are coral reefs and rocky habitats, while some prefer for seagrass beds as well as sandy and muddy bottoms. The rapid development of culture in countries like Thailand, Malaysia, Hongkong, Singapore, Philippines, Taiwan and Kuwait was mainly due to the availability and the techniques developed for collection of seed of this good quality fish. A small scale culture of groupers was carried out experimentally in CMFRI at Mandapam (Hamsa and Kasim, 1992). Although the result is not comparable to the practices in other countries, it shows the possibility of developing grouper culture on a viable basis in India also. Induced breeding of *Epinephelus tauvina* and *E. malabaricus* have already achieved success in Malaysia, Singapore and Kuwait. With the knowledge on the techniques and the potentials for getting spawners at Tuticorin area, it becomes possible to develop induced breeding of these species in India.

Materials and Methods

Programme on seed survey and collection of commercially important groupers was carried out during 1995 - 96. A resourceful ground in the inshore waters of Vellapatti Village north of Tuticorin was identified. This nursery ground at depth of 6 - 8 m line is enriched with beds of seaweeds, mostly the eel grass in clay mixed sandy bottom. A wide variety of juvenile fishes assemble here. Mini shore-seine locally called as 'Olavali' is widely employed by a limited group of fishermen. This conical mini shore-seine is made out of nylon mesh having the length of 54 metres with a breadth of 8m at mouth and 1m at tail end. Both ends of the net are attached with coir rope to a length of 500m. The mesh size of the net is 28mm and at the

cod end it measures 18 mm. The hauling duration is for an hour and the catches are sorted out in the sandy beach. *Epinephelus tauvina* is the most common species gathered among groupers. Only active specimens were collected in 100 liter plastic containers and kept under aeration in filtered sea water. The stocking density varied according to the size of specimens. The seed were acclimatized for a few days in wet laboratory before releasing the stock in culture ponds / tanks. The commercial catches of adult groupers caught by drag nets locally called as 'Thallumadi' revealed the scope to obtain healthy live specimens from these catches with the cooperation of local fishermen. A laudable system has been developed by M/s Scanet Acqua Exports Ltd established at Tuticorin to collect the adult live groupers from deep sea in Gulf of Mannar through the catches of hook and line. Skilled fishermen were trained to handle the catches by employing a unique technique, wherein the air bladder is punctured soon after hauling the fish to the deck. 15 - 20 tons of groupers (*E. tauvina*, *E. malabaricus*, *E. undulosus*) were gathered for holding in floating cages anchored near Vanthevu Island for shipment. Spawner specimens in the size 530 - 850 mm weighing 2 - 12 kg were obtained from this source to develop this broodstock for induced spawning and seed production in the Institute.

Results and Discussion

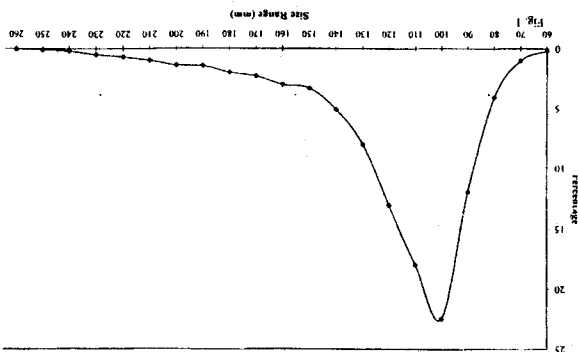
In mini shore seinies mostly the young ones of *Epinephelus tauvina* were caught. The total number of units operated in this potential ground in the stretch of 1.5 km along the shore varied from 42 - 130 with an average of 86 units / month. The occurrence of Juvenile groupers was found more common in the northern zone of the ground and fishing was regulated strictly by the local fishermen only during the restricted days from Thursday - Saturday. During the rest of the days they concentrate on the southern side where the catches of groupers are comparatively low. The estimated catches of *E. tauvina* varied from 156 - 682 kg in this unit and constituted

for farming in ponds and tanks. 70-150 mm were sent to Mandapam and Cochlin research centres during transportation. 300-500 active seed in the size range of to minimize the water temperature and metabolic activities according to the size of the seed. 1 kg ice slices are also placed maximum size before tying up. 10-15 specimens were packed vigorously aerated with oxygen and the bags are inflated to useful for packing. After releasing the seed in the bag, it is double jacketed polythene bags of 10 litre capacity were found Mandapam and Cochlin for farming. Filtered sea water filled in collected from Tuticorin coastal waters were transported to the accepted feed from third day onwards. Seed of *E.tauvina* utilized for growing in coastal ponds in the inter tidal zone at Tuticorin. The seed normally do not accept any feed during the period of conditioning. Fresh supply of sardines appeared to be 30-50 specimens were lifted to wet laboratory. Part of this is lifted to the wet lab. Depending upon the size of seed, about in containers of clean sea waters with aeration facilities and happa. The active specimens alone are segregated and placed in landing centres are placed in

Cropper seed gathered in landing centres are placed in basic facilities to carry these specimens on board the vessel. extending upto Kanyakumari. This firm has provided all the form trained fishermen who catch these group from deep seas period before export trading. Live active specimens are gathered up a pioneering venture to culture groupers in cages for a short Scanner Aqua Exports Ltd. Tuticorin have come forward to take Based on the ample scope of the natural resource, *M/s* production of groupers in this gear was estimated as 10647 kg. during September - December. The monthly average rate of group of 320 - 540 mm *E. malabaricus* was common in catches during Sep - Nov. 95 and in January - March 96 at the size peak in March 96. *E. undulosus* was predominant in catches was observed to be August - November 95 with a secondary The peak season for *E.tauvina* in the size 420 - 880 mm

malabaricus are the dominant catches of this gear. Tuticorin to Kanyakumari. *E.tauvina*, *E. undulosus* and the collection of adult grouper. In deeper waters extending from Hook and lines are the other major gear employed for

Fig. 1. The percentage composition of different size groups of *E. Tauvina*



Hook and lines are the other major gear employed for the collection of adult grouper. In deeper waters extending from Tuticorin to Kanyakumari. *E.tauvina*, *E. undulosus* and *malabaricus* are the dominant catches of this gear. The peak season for *E.tauvina* in the size 420 - 880 mm was observed to be August - November 95 with a secondary peak in March 96. *E. undulosus* was predominant in catches during Sep - Nov. 95 and in January - March 96 at the size group of 320 - 540 mm *E. malabaricus* was common in catches during September - December. The monthly average rate of production of groupers in this gear was estimated as 10647 kg. Based on the ample scope of the natural resource, *M/s* Scanner Aqua Exports Ltd. Tuticorin have come forward to take up a pioneering venture to culture groupers in cages for a short period before export trading. Live active specimens are gathered from trained fishermen who catch these group from deep seas extending upto Kanyakumari. This firm has provided all the basic facilities to carry these specimens on board the vessel. Cropper seed gathered in landing centres are placed in containers of clean sea waters with aeration facilities and happa. The active specimens alone are segregated and placed in landing centres are placed in

Month	Effort (Units)	Total catch (Kg)	<i>E.tauvina</i> catch (Kg)	Percentage composition
Aug. '95	63	2797	357	12.8
Sep. '95	130	2522	390	15.5
Oct. '95	125	3837	650	16.9
Nov. '95	130	2554	682	26.7
Dec. '95	90	2210	550	24.9
Jan. '96	48	1184	200	16.9
Feb. '96	88	2079	330	15.8
Mar. '96	80	2265	330	14.6
Apr. '96	95	2600	350	13.5
May '96	80	2735	360	13.1
Jun. '96	66	2882	286	9.9
July '96	42	1810	153	8.6
Total	1037	29475	4641	15.7

Table 1. The seed resource potential of *Epinephelus tauvina* in the mini-shore seine catch

This observation indicate the resource potentials of sub-adult groupers and it may become possible to gather the live specimens from this ground with the helps and cooperation of fishermen involved in this fishing. Provision of suitable tanks with battery run aerators, small scoop nets etc. to the fishermen may provide a chance to get live specimens in healthy conditions.

In slightly deeper waters at depths of 6 - 10 mm and 2 - 3 km away from shore, drag nets locally called as "Thallumadi" is operated mainly for tiger prawn. In the same gear the other catches like groupers, crabs, Lobster, *Lethrinus*, *Callyodon*, *Stiganus* etc, are also entangled, in negligible quantity. *E.tauvina* dominate among other groupers and measured in the size range 160 - 300 mm. About 1000 adult specimens are normally collected in such gears in a month.

The length frequency distribution of *E.tauvina* caught in minishore seine is depicted in Fig. 1. The specimens were in the range 62 - 260 mm with peak group at 100 - 110 mm. Highest concentration was observed among 90 - 120mm size groups. It is significant to record that the occurrence of juveniles of this species more or less in the same pattern and size group probably indicate the migration of young ones to this particular fertile ground during nursery phases.

The length frequency distribution of *E.tauvina* caught in minishore seine is depicted in Fig. 1. The specimens were in the range 62 - 260 mm with peak group at 100 - 110 mm. Highest concentration was observed among 90 - 120mm size groups. It is significant to record that the occurrence of juveniles of this species more or less in the same pattern and size group probably indicate the migration of young ones to this particular fertile ground during nursery phases. was noticed in November 95. The maximum estimated catch of 30944 was 15000/ month. The maximum estimated average catch weather and fall in the efforts. The estimated average catch total catch was noticed and it may be attributed to the rough weather and fall in the efforts. The estimated average catch total catch was favourable in January 96, a fall in the Although the season was favourable in January 96, a fall in the In subsequent months, decline in the fishery was noticed. *Penaeus semisulcatus* were recorded in this same peak season. 1995 coinciding with the NE monsoon. Significant catches of maximum catches were noticed during October - December between 3.7 - 6.1 Kg during 1995 - 96. As seen in table 1, to 8.6 - 26.7% in the total catch. The catch per unit effort varied

The seed survey conducted during 1995-96 period for collecting live grouper seed as well as spawners helped to locate areas of abundance for seed and spawners. According to Nammalwar *et al.*, (1986), the fry and fingerlings of *Epinephelus* spp. are available from January to April. But in the present studies, it was found to be available throughout the year with peak during October to January. In Malaysia, the seed of *E.tauvina* are collected from September to January period by using seine nets in the coastal waters (Bensam, 1993). At Tuticorin though the traps and shore-seines are operated for collecting seabass and groupers, the hook and line catch is a good source for collecting the spawners. At Mandapam area the juveniles of *E.tauvina* were collected a live from dragnet and special perch trap (Hamsa and Mohamed Kasim, 1992).

Acknowledgments

The authors are grateful to Dr. M. Devaraj, Director, Central Marine Fisheries Research Institute, Kochi for all the guidance given and keen interest shown in this study.

References

- Ameer Hamsa, K.M.S. Mohamed Kasim, H., 1992. Growth and production potential of young grouper, *Epinephelus tauvina* (Forsk.) reared in fixed net cages. *J.Mar. Biol.Ass. India*, 34 (1 and 2): 271 - 276.
- Bensam. P., 1993. Prospects of farming, groupers in India. *Mar. Fish. Infor. Ser.* T and E.Ser. 123: 1-4.
- Nammalwar. P., 1986. Survey of prawn and fish seed resources from the estuaries around Madras. Proc. National symp. Estuarine Biology, Annamalai University.
- Nammalwar. P., Marhchamy. R., Mohan Raj. G., Rengaswamy, V.S., Raju, A. and Gandhi. V., 1994. Aquaculture for 2000 AD; Proc. of the Nat. symp, Madurai Kamaraj University, November, 1994.