On the Occurrence of Mature Penaeid Prawn *Penaeus merguensis* in a Shallow Solar Salt Works Reservoir along the Okhamandal Coast of Gulf of Kutch and its Spawning in Laboratory

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Penaeus merguensis is so far reported to attain complete maturity and spawn in the sea or deep culture ponds only. Mature specimens of stage III to V collected from a shallow reservoir of solar saltworks were studied and spawned in laboratory. A comparison of spawning of spawner from sea and reservoir is also reported

Cholik, 1975 (as quoted by Alikunhi *et al.*, 1975) reported maturing specimens of *Penaeus merguensis* in deep culture ponds. However, only *Metapenaeus benetae* Racek & Dall is known to attain sexual maturity and spawn naturally in the ponds. During the prawn harvests from a shallow reservoir of solar salt works, the authors collected mature specimens of *Penaeus merguensis* and successfully spawned one of them in the laboratory conditions. The details of the study are presented in this paper.

Materials and Methods

661 maturing specimens of *Penaeus merguensis* were collected and length measurements and the gonadosomatic index (GSI) recorded. Fully mature females were transported to laboratory by road over 50 kilometres in plastic buckets with seawater. Spawning experiments were conducted using standard techniques.

Results and Discussion

Reservoir

The reservoir is a 336 hectare shallow areas with 25-60 cm water depth and bottom with loose silty soil of 20–40 cm depth. The water depth remained erratic depending upon pumping rates and wind transport of water bodies. The salinity ranged from 15‰ in August to 44‰ in June. The temperature ranged from 18.5°C in January to 35.3°C in June. During September 1984, when mature specimens of the species were collected the salinity was 35‰ and temperature 23.5 – 24.0°C.

Spawner population

The species contribute on an average 54% of the prawn seed population of the coast during July to October. However, due to wide fluctuations in salinity and other conditions, their survival from the juvenile stage was poor, the species representing only 2.7% in the harvest. Nevertheless, maturing specimens of the species were collected during September (Table 1). It was observed that 4% of this spawner population consisted of stage IV females with a GSI of 7.93 to 8.36 and the ova diameter was 0.39 mm (Table 2).

Spawning

Experiments on spawning in the laboratory conditions were successful in one case only. Regression of the ovary, possibly due to stress during the road transport from the source to laboratory was observed. The nauplii developed to zoea in 42 h in even time comparable to specimens brought from sea source. However, all zoea perished in the tank due to poor water quality.

Table 1. *Hatchery log of comparative account of spawning of P. merguensis from sea source and reservoir source*

Sea source				Reservoir source			
Date	Time	Stage	Remarks	Date	Time	Stage	Remarks
13–9–84	1800	—		3–6–85	1930	—	
14–9–84	1400	N1		4–6–85	1500	Eggs	
15–9–84	0800	N2			1600	N1	
	1400	N3		5–6–85	0800	N4	
	2200	N4			1730	N5	
				6–6–85	0830	N6	
16–9–84	0845	N6					
	1500	Z1		7–6–85	0830	Z1	All zoea died in tank
18–9–84	0800	Z2					
19–9–84	0815	Z3					
20–9–84	1330	M1					
21–9–84	1500	M2					
22–9–84	2200	M3					
24–9–84	0800	PC1	Raised upto P15 & stocked into rearing ponds				

Table 2. *Showing the gonadosomatic index and ova diameter of the ovary of Penaeus merguensis*

Carapace length	Total length	Weight of prawn	Weight of ovary	Ova diameter	Colour of ovary	Stage of maturity	GSI
mm	mm	g	g	mm			
56	148	33.4	0.8	0.31	Light green	III	2.4
56	158	33.3	—	—	White	V	—
58	162	33.5	2.8	0.39	Dark green	IV	8.36
58	167	35.3	2.8	0.39	Dark green	IV	7.93
58	167	36.9	1.9	0.31	Light green	III	5.15

The present observations indicated that the species showed adaptability and tolerance to the hypersalinity in the reservoir during its sexual maturity. No larvae or postlarvae of the species were collected from the reservoir, thereby the possibility of natural spawning could not be established. However the investigations showed promising source of spawner for hatchery.

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Reference

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