

THE OCCURRENCE OF MILKFISH CHANOS CHANOS FRY IN
PANDAN BAY, ANTIQUE, FROM 21 MAY TO 25 JUNE, 1975

by

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Abstract

Milkfish fry were collected at the Pandan shoreline and 500 meters offshore. While shore-caught fry were uniform in size those captured offshore varied in size and stage of development.

Introduction

The culture of milkfish, Chanos chanos, is a major industry in many Southeast Asian countries particularly Indonesia, Philippines and Taiwan. For centuries, milkfish fry have been captured along the shoreline and reared to marketable size in fish ponds and more recently in net enclosures.

A great deal is known about the yearly fluctuations in fry abundance and the climatic and oceanographic conditions prevailing during the peak seasons of their occurrence in various geographic regions of Southeast Asia and the Pacific Islands. Similarly, the culture of milkfish has been well documented and there are several ongoing research programs designed to assist the industry.

In contrast to available knowledge on milkfish in captivity, very little is known of its life cycle in nature. To assist in overcoming this lack of knowledge, the Aquaculture Department of the Southeast Asian Fisheries Development Center (SEAFDEC), has undertaken a concentrated study of Chanos chanos in the wild. From 13 May to 26 June, 1975, SEAFDEC stationed a study team at Mag-aba, Antique, Philippines (Fig. 1) to survey the occurrence of milkfish in Pandan Bay and to lay the groundwork for future studies. The selection of this site was prompted by the fact that 75% of the milkfish fry captured in Panay Island come from Antique Province (Villaluz, 1975) and with the existence of one otoshi-ami, a large Japanese-designed bag net (Manacop, 1975), with a 30-m-deep bag located in 30m deep and 500m offshore from Mag-aba, Pandan Bay. In

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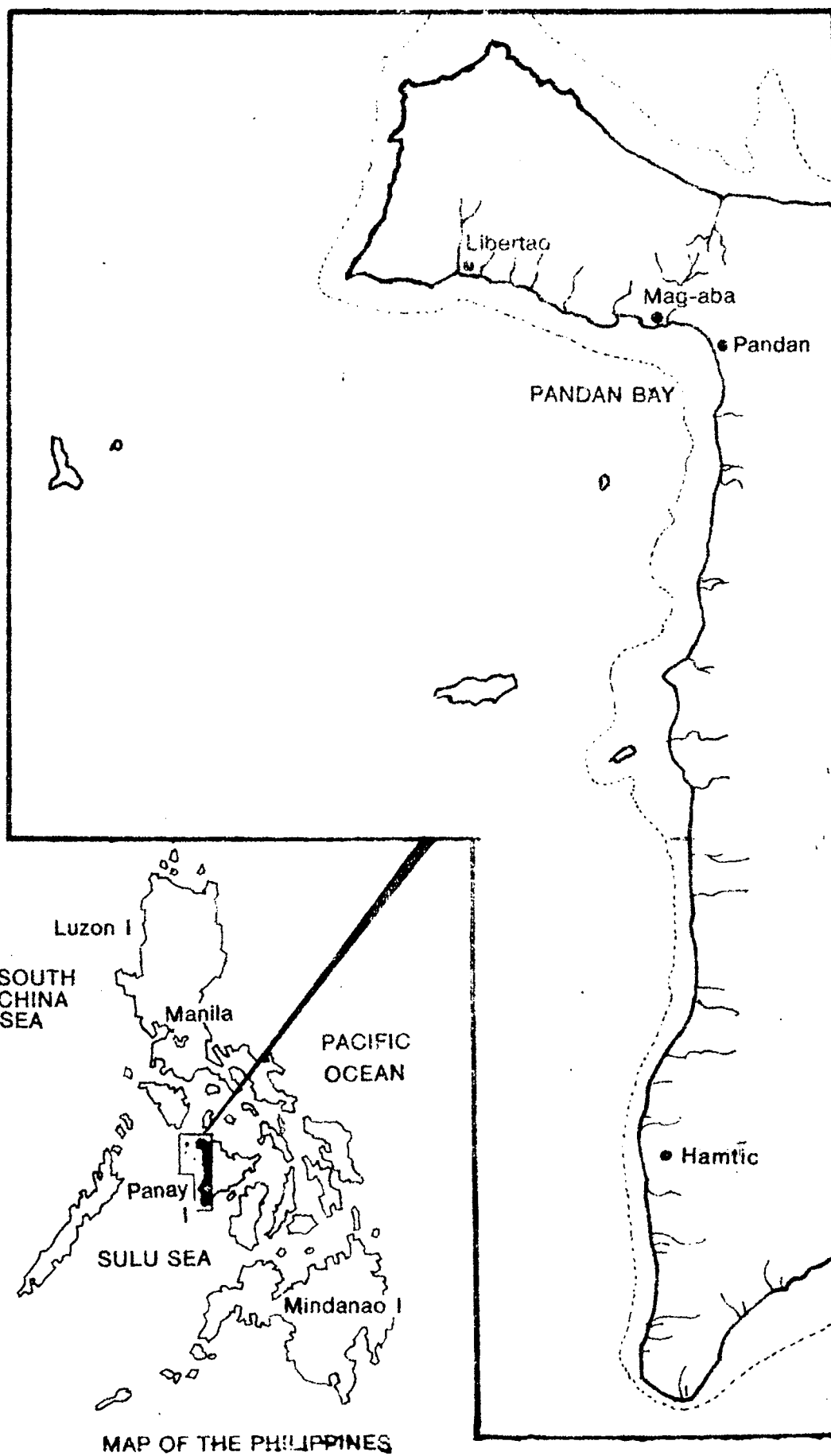


Fig.1 Area of study

addition, there are two otoshi-ami offshore from Libertad, 20km west of Mag-aba and several fish corals in the area. Both the otoshi-ami and the fish corals capture adult milkfish or sabalo during the fishing season from January to June.

This note is based on a comparison of data on milkfish fry captured along the Mag-aba shoreline with those captured in the otoshi-ami near Mag-aba from 21 May to 25 June, 1975.

Materials and Methods

From 21 May to 25 June, 1975, mixed species of fry were collected daily by means of a 3 meter long by 1 meter deep seine net 3m x 1m along 50m of the Mag-aba shoreline between 0800 and 0900 hours dragged by two men. At 1200 hours and again in 1600 hours, mixed species of fry collected with a scoop net fitted with NGG-54 nylon meshed scoop net from the otoshi-ami at Mag-aba as the commercial fishermen hauled it to the surface. Salinity and temperature of water sampled at 5, 15 and 30m depth below the otoshi-ami during the 1200 lifting of the net were noted and reported elsewhere (Tiro et.al., 1976). All fry samples were preserved in 5% seawater formalin for one to three days prior to sorting and measuring the milkfish fry. Also, some of the "shore-caught" milkfish fry obtained on 11 June were placed in an aquarium containing sea water (32 o/oo) and fed with a mixture of polished rice washings and mixed plankton obtained from plankton tows along the shoreline. Fifty per cent of the volume of water in the aquarium was changed daily and sub-samples of these fry were examined every second day until 25 June.

Results and Discussions

During the period from 21 May to 25 June, 1975, 522 milkfish fry ranging in total length from 11 to 14.3mm were captured along the shoreline and 1500 fry ranging in length from 5.8 to 14.6mm were obtained from the otoshi-ami (Figs. 2 and 3).

While this report covers a period of only 36 days the trend in the data presented in Fig. 2 suggests that the daily number of fry caught by the otoshi-ami was greater one to two days prior to the new and full moons whereas the greater daily catch along the shoreline occurred two to three days after the new and full moons. Miyagami (1971), Carbine (1948), and Kuronuma and Yamashita (1962), reported that the peak in the number of fry captured along the shoreline do in fact follow the lunar cycle with the greatest abundance occurring from one to two days before and up to three days after the new and full moons. This pattern is modified with

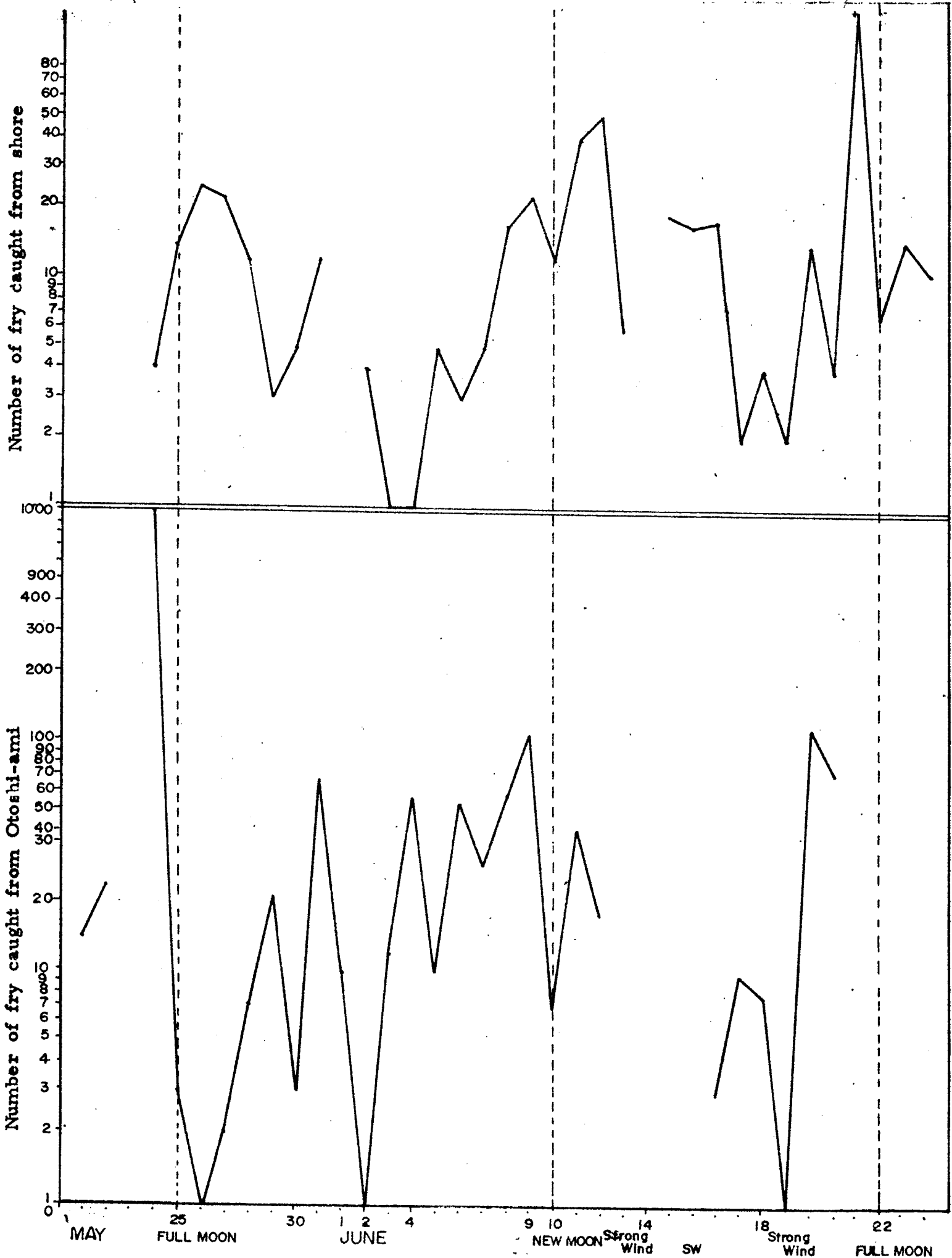


Fig. 2. Occurrence and abundance of Chanos fry at two stations

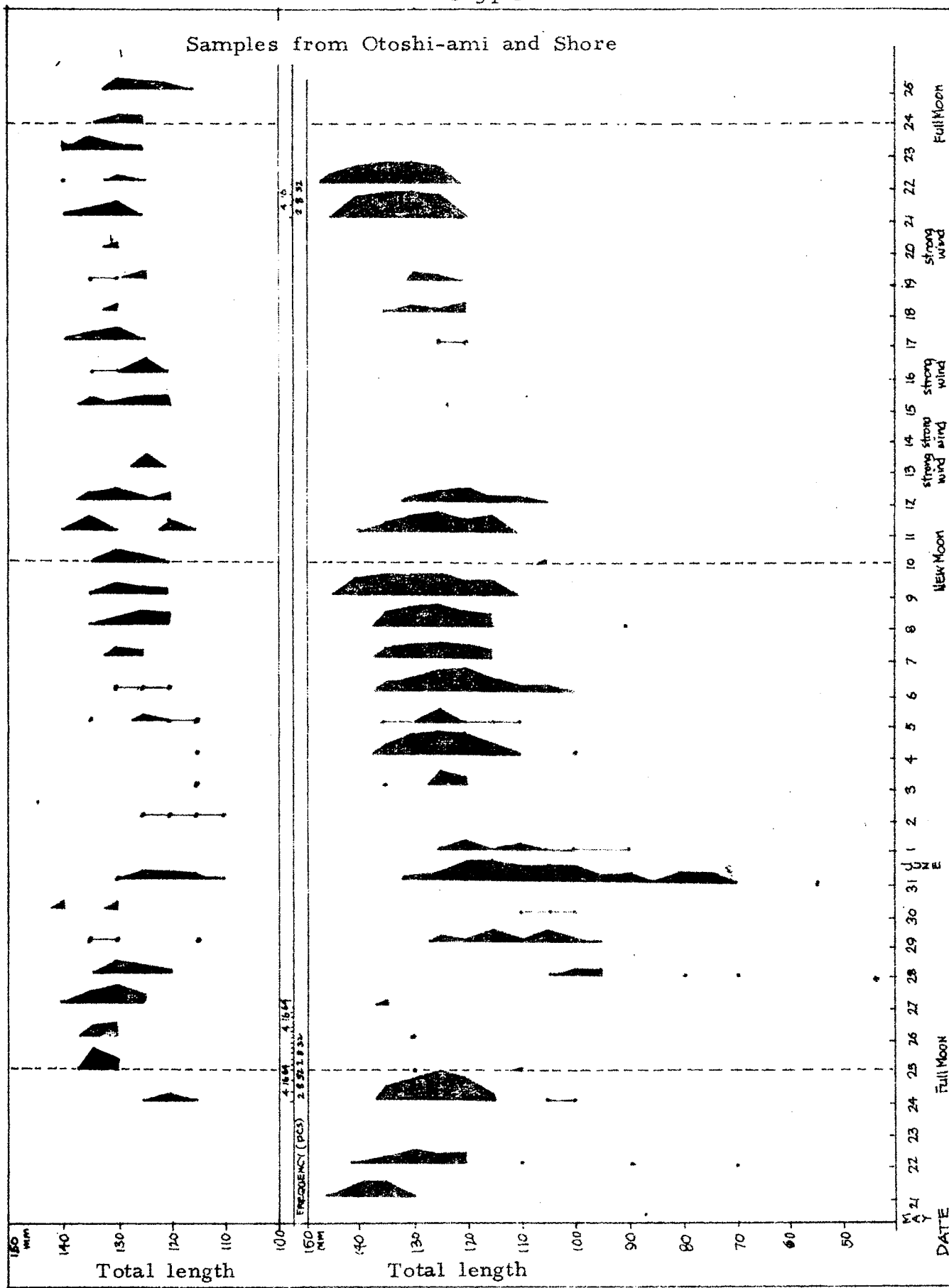


Fig. 3. Length and frequency of Chanos fry

the abundance of fry being lower during these periods when there is a large movement of surface water toward the shore if the high tides are accompanied by high offshore winds. In contrast to the above reports, local fry collectors and fisheries officers in Southeastern Luzon Island and Antique Province on the West coast of Panay Island state that the peaks in fry gathering usually occurs two to three days after the new and full moons. While these observations may be local situations, they are supported by the present findings.

The total length of the fry (Fig. 3) were 1.5 to 2mm shorter than those reported by Delsman (1929) at most stages of development. While our fry of 5.8mm total length appeared identical to Delsman's 6.0mm fry, our fry of 8, 9 and 10mm from the otoshi-ami and our 11 to 14.6mm fry also from the otoshi and from the shoreline were similar to his pelagic larvae of 10, 11 and 12mm and his shore-caught fry of 13mm.

Although Delsman obtained larvae of 6 to 12mm total length in surface plankton hauls, we were unable to obtain any milkfish larvae or fry by this method in the vicinity of the otoshi-ami or further offshore from it. Because of shallow water over a coral reef we were unable to tow our plankton nets closer than 500m from the shore. However, we did obtain larvae and fry at different stages of development from the otoshi-ami after the bag was lifted through 30m of water. From our limited observations, it appears that milkfish fry and larvae collected from Mag-aba 500m or more offshore, are located somewhere in the mid-water layers and that they drift in this layer from the breeding grounds towards the shore while growing to a total length of 9 to 10mm. At this size they have well developed dorsal and anal fins and probably air bladder and float to the surface near the edge of the coral reef. The fry are then carried to the shore by tidal currents and winds and collected along the shoreline as 11 to 14mm fry.

As reported by Delsman (1929), and confirmed in this study, ventral fins are absent from newly captured shoreline fry. These fins, however, were present in some specimens after 10 days and in all specimens after 14 days of aquarium rearing (Table 1).

References

- Carbine, W.F. 1948. Bangos culture in the Philippines. *Prog. Fish-Cult.*, 10(4): 187-197.
- Delsman, H.C. 1929. Fish eggs and larvae from the Java Sea. *Treubia*, 11(2): 275-286.
- Kuronuma, K. and M. Yamashita. 1962. Milkfish fry in Eastern Coast of Vietnam. *J. Oceanogr. Soc. Japan*, 20th Anniversary Volume: 679-686.
- Manacop, P.R., Sr. 1975. Some observations on the sabalo fishery in the Philippines. *Proc. National Bangos Symposium, Philippine Village Hotel-Punta Baluarte*, 25-28 July: 34-55.
- Miyagami, K. 1917. Milkfish culture. *Taiwan Shorusakyoku Shuppan*.
- Tiro, L.B., Jr., A.C. Villaluz and W.E. Vanstone. 1976. Morphological measurements, gonadal development and estimated age of adult milkfish, Chanos chanos, captured in Pandan Bay from 10 May - 16 June, 1975. *International Milkfish Workshop-Conference, Tigbauan, Iloilo, Philippines*, 19-22 May, 1976.
- Villaluz, D.M., Jr. 1975. The bangos fry fishery of Panay Island. *Proceedings National Bangos Symposium, Philippine Village Hotel-Punta Baluarte*, 25-28 July: 125-131.

Table I. Length measurement mean of three samples and development of ventral fins of aquarium reared milkfish fry.

Date	Days in Aquarium	Total Length (mm)	Pre-dorsal Length (mm)	Preanal Length (mm)	PDL TL	PAL TL	Remarks
1975 June 11	0	13.1	-	-	-	-	
	13	13.3	7.8	9.2	0.582	0.688	
	15	12.6	7.5	8.7	0.597	0.689	
	17	13.0	7.5	8.9	0.572	0.683	
	19	13.5	7.8	9.2	0.581	0.680	
	21	13.3	7.9	8.9	0.594	0.673	Ventral fins present in some fish
	23	13.4	8.1	9.3	0.606	0.689	
	25	14.0	8.1	9.6	0.582	0.684	All specimens have ventral fins