

BAIT-FISH AND TUNA CATCHES AT MINICOY ISLAND
(LAKSHADWEEP) IN RELATION TO LUNAR CYCLE
DURING 1983-84 SEASON

MADAN MOHAN AND K. K. KUNHIKOYA
Central Marine Fisheries Research Institute, Cochin.

ABSTRACT

The catches of bait-fish and tuna in relation to moon phases during 1983-84 pole-and-line tuna-fishing season is discussed. Bait-fish and tuna catches for the season as a whole were relatively high during new-moon phase and low during the last quarter of the moon. Tuna catches per kg of bait fish were high during the last quarter of moon and low during newmoon phase. Efforts in both bait fishing and tuna fishing and catches-per-unit-of-effort of bait fishes and tuna were highest during newmoon phase, then decreased gradually and was lowest in the last quarters.

Bait-fish catches at Minicoy have shown fluctation from year to year, creating problems to fishermen of the Island, because bait fish is very essential for successful pole-and-line operations. The fishermen at Minicoy believe that some important bait fishes appear in the lagoon only during certain moon phase.

This study was undertaken during the 1983-84 tuna-fishing season to see whether moon phases really played important role in the availability of bait fishes as well as in the tuna catches at Minicoy.

Data on daily bait-fish catches and the quantity of tunas caught were collected, the former by observing the bait wells or by enquiry from fishermen

of each mechanised boat who were experts in bait fishing and the latter from the commercial pole-and-line-fishery. For the study the bait-fish species all together have been regarded as a simple unit.

The lunar months from 5th November 1983 to 30th April 1984 were divided into four quarters, namely new moon, first quarter, full moon and last quarter. The fishermen being Muslims, Fridays were observed as nonfishing days, Even so these days too have been included in the respective moon phases. Each fishing boat engaged in single-day tuna fishing was considered accordingly.

Moon phases and bait catches: Catch data of bait fishes analysed according to the moon phases are presented in Table 1. It can be seen that in the months of December, January, February and April bait-fish catches were high during the newmoon phase, whereas in November it was high during the last quarter and in March during the first quarter. In November the catch trend was increasing from new moon to last quarter, whereas in January and March decreasing trend was observed. In other months moonphase-wise fluctuation was observed. For the tuna fishing season as a whole the newmoon phase contributed maximum followed by the first quarter, fullmoon and last quarter.

Moon phases and tuna catches: As can be seen from Table I, in December, January, February and April, tuna catches were high during newmoon phase, but in November it was during fullmoon phase and in March during first quarter. For the season as a whole also, tuna catches were maximum during the newmoon phase, followed by a decreasing trend.

While bait catches and tuna catches during the four months of the tuna fishing season were high during newmoon phase, tuna catch per kilogram of bait (CPUB) varied from month to month in different phases. It was high in the newmoon phase during February and April, the first quarter during January, the fullmoon phase during November and March, and the last quarter during December.

Moon phases and catches per unit of effort of bait and tuna: In the first quarter of moon phase, catch per unit of effort for bait fish was maximum during February, March and April, whereas it was in the newmoon phase during January and in the last quarter during November and December. For the season as a whole, catch per unit of effort was highest during newmoon phase and lowest in fullmoon phase. (Table 2).

Catch per unit of effort of tuna was high in newmoon phase during January, February and April, in first quarter during March, in fullmoon phase during November and in last quarter during December. For the whole season, maximum cpue for tunas was during newmoon phase, and it decreased gradually in the subsequent moon phases.

TABLE 1. *Bah catches, tuna catches and tuna cath per kilogram of bait for each moon phase during 1983-84 season*
 CPUB - Tuna catch per kilogram of bait.

	New Moon			First Quarter			Full Moon			Last Quarter		
	Bait	Tunas	CPUB	Bait	Tunas	CPUB	Bait	Tunas	CPUB	Bait	Tunas	CPUB
Nov	117.0	1,278.5	10.88	152.5	16561	116.22	152.5	29628.5	19f18	161	8778	54.52
Dec	245.5	22054.5	89.83	132.5	7796.8	58.84	134.5	6246	, 46.44	187.5	18025.5	96.14
Jan	419.5	30478.7	72.65	190	16979.2	89.36	127.5	4580	35.92	20.0	7571.5	37.86
Feb	129.0	20749.5	160.85	97.5	6295	63.91	67.0	4088	61.01	86.5	13952	146.09
Mar	45.5'	4215	86.91	126.5	19447.1	153.73	75.0	, 11619.8	154.93	36.5	4498	123.23
Apr	180.0	20366.5	113.15	147.5	8980	60.88	106.0	5289.5	49 91	52.0	1875	36 06

TABLE 2. *Catch per unit of effort for bait fishes and tunas for each moon phase during 1983-84 season*

	New Moon			First Quarter			Full Moon			Last Quarter			% m in
	No. of units	CPUE of bait in kg	CPUE of tunas in kg	No. of units	CPUE of bait in kg	CPUE of tunas <nkg	No. of units	CPUE of bait in kg	CPUE of tunas in kg	No. of units	CPUE of bait in kg	CPUE of tunas in kg	
Nov	65	1.81	19.67	88	1.62	188.19	96	1.56	308.63	86	1.87	102.07	
Dec	110	2.23	200.50	84	1.58	92.82	59	2.28	105.86	64	2.93	281.65	
Jan	106	3.96	287.53	104	1.83	163.26	101	1.26	45.35	67	0.30	113.01	
Feb	91	1.42	228.02	67	1.47	93.95	66	1.01	61.94	69	1.38	202.20	
Mar	49	0,99	86.02	70	1.81	277.81	71	1.06	163.66	47	0.78	95.70	
Apr	100	2.00	203.66	55	2.68	163.27	47	2.25	112.54	21	2.48	36.06	
Total	521	2.19	194.02	468	1.79	162.52	440	1.50	139.66	354	1.56	99 00	

Fishermen of Minicoy Island catch the live bait from the lagoon either in the morning or in the evening, but not in the night, using light, as is prevalent in Hawaiian Islands and other Pacific Islands (Baldwin 1977). It may be because the light attracts the Engraulids which form the bulk of the bait catches in Pacific Islands. At Minicoy, bait fishes belonging to the family Dussumieridae, Pomacentridae, Lutjanidae and Atherinidae are mainly caught. Since sprat forms bulk of the baitfish catches at Minicoy, light fishing at night may enhance the bait production, as the fish is likely to be attracted by light (Baldwin 1977). But Wilson (1977) has reported that at Palau Islands *Spratelloides delicatulus* is seldom caught in commercial quantities at night. On the contrary, Kikawa (1977), during his bait resources survey in the western and southwestern Pacific Ocean, collected both sprat species from different places during night with fish-luring lamps. Further, Lee (1973) has stated that both sprat species figured prominently in the baitfish catches taken at night by using light in Fiji.

There has been a tendency noticed for baitfish catches to be high during those moon phases in which tuna catches are relatively high. Here it is necessary to state that the same boats which are collecting live-bait fish from the lagoon are being engaged for tuna fishing also. Therefore, the effort for the bait fishery is in direct correlation with the effort for tuna.

At Papua New Guinea, the bait catches are stated to be lower during fullmoon phase (Kearney 1977). But, at Minicoy, bait catches are highest during newmoon phase and lower during the last quarter. During the newmoon phase tuna shoals are seen in very good concentrations very near to the surface, so that the CPEUs of both bait fishes and tunas are expectingly equally high during this period. However, sometimes, when the lagoon conditions are adverse owing to rough weather, bait fishes are difficult to be caught regardless of moon phases, causing a decline in the effort for bait fishes. This in turn affects the effort for tunas, which depend directly on the availability of bait fishes.

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