

# Shark Long Lining Experiments in the West Coast of India

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Results of shark long line fishing experiments conducted along the west coast of India are presented in this communication. Specification of experimental gear is described. Results indicate presence of lucrative shark fishing grounds from Angria bank, west of Ratnagiri for commercial exploitation. An overall hooking rate of 7.4% was obtained. Indian flat round bent hooks have been found as effective as Norwegian round bent hooks of size 0/4.

The earliest account on shark fishing in India are that of Hornell (1916, 1938 and 1950), Ayyangar (1922), Sorley (1932 and 1948), Devanesan & Chidambaram (1951), Chacko & Shariff (1955), Chacko *et al.* (1956) Gokhala (1957), John (1946), John *et al.* (1959), Kaikini (1960), Balasubramanyan (1964 a,b) and Thyagarajan & Thomas (1962). George (1981) described the fishing gear of Karnataka with a mention on shark fishing gear of that region. Similar attempt was made by Satyanarayanappa *et al.* (1988). Mohan Rajan (1982) described the economics of sharks long lining. Deshpande *et al.* (1970) reported the results of shark long lining conducted off Veraval. Kartha *et al.* (1973) have reported the results of bottom drift long lines operated off Veraval. Pajot & Weerasooriya (1980) gave an account of the fishing trials with bottom set long lines in Sri Lanka. Arif Mustaffa (1986) reported deep sea spiny Dog fish shark resources off Andamans. Rama Rao *et al.* (1989) reported the present status of shark long line gear of India. The results of shark long line fishing experiments conducted at Angria Bank with the size group caught and hooking rates obtained for each fishing trip are presented.

## Materials and Methods

Long lines consisting of main lines made up of 6 mm dia terylene and 4 mm dia

nylon as branch lines with stainless steel snap clips and steel snood wire of 3 mm dia made up of twisted galvanised spring steel wire were operated from MV Saraswati belonging to CIFE, Bombay. Distance between two branch lines is 50 m. Main lines made up of 6 mm dia PE rope were used at Cochin from MFV Matsyakumari of CIFT Cochin. The distance between two branch lines in this case is 15m. Rigging details are as described by Deshpande *et al.* (1970) and Kartha *et al.* (1973). Fish hooks of size 0/4 of round bent shape of both Indian make and imported Norwegian Mustad, Kirby bent and swan head hooks of Indian make were used for the studies. Whole fish and cut pieces of different fish were used as bait. Fishing operations were conducted in Angria Bank west of Ratnagiri and southwest of Bombay at lat.16°15' to 16°47'N and long.71°45' to 72°18'E. Construction and rigging details of long lines and the shape of different fish hooks used are shown in Figs. 1 and 2 respectively.

## Results and Discussion

A total of 11 operations were conducted during 1985 - 1989, out of which 9 were conducted at Angria Bank. Results of long line fishing experiments with catch details are furnished in Table 1. Table 2 gives the

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Table 1. Results of shark long line fishing experiments  
Vessel : MV Saraswati

Sl. No.	Area of operation		Depth (m)	Size and specific-action of hook	No. of hooks operated	Bait used caught	No. of sharks caught	Weight of sharks (kg)	Hooking rate(%)	No. of hooks broken	Performance of hooks	
	(1)	(2)									(10)	(11)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
		Long.										
1.	20°23'N	69°44'E	79	0/4 round bent Norwegian Indian	50 50 100	Cutpieces of Ghol	1 0	5 0	2% 0 1%			
2.	16°5'N	72°E	300	0/4 round bent Norwegian	70 70 140	Cut pieces of cat fish	3 4 7	375 355 730	4.3% 5.7% 5.0%			
3.	10°05' N	75°45' E	150	0/4 Round bent Indian Kirby bent Swan head	100 91 91 282	Squid	1 0 3 4	7 0 19 26	1.0% 0 3.3% 1.4%	1 1 1 3		One Shark dropped out from round bent while hauling
4.	16°44'N	72°01'E	310	0/4 Round bent Norwegian Indian	48 48 96	Cutpieces of Kalava and ribbon fish	5 6 11	300 400 700	10.4% 12.5% 11.5%	0 1 1		
5.	16°44'N	71°55'E	315	0/4 Round bent Norwegian Indian	48 48 96	Cutpieces of Kalava and Ribbon fish	1 0 1	55 0 55	2.0% 0 1.0%			1 Barracuda of 5 Kg was caught on Indian round bent.
6.	16°44'N	72°00'E	320	0/4 Round bent Norwegian Indian	48 48 96	Cutpieces of Kalava and cat fish.	5 7 12	325 420 745	10.4% 14.6% 12.5%	0 1 1		One hammer headed shark was found eaten away and only the head was left behind on Indian round bent.

Continued.....

Table 1 continued....

Sl. No.	Area of operation	Depth (m)	Size and specific-action of hook	No. of hooks operated	Bait used	No. of sharks caught	Weight of sharks caught (kg)	Hooking rate (%)	No. of hooks broken	No. of hooks bent	Performance of hooks Other remarks
(1)	(2)	(3)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
7.	16°52'N 71°55'E	600	0/4 Round bent Norwegian	50 60 110	Cutpieces of cat fish	1 1 2	120 140 260	2.0% 1.7% 1.8%			
8.	16°44'N 72°00'E	300	0/4 Round Bent Norwegian Indian	50 60 110	Cutpieces of cat fish	8 12 20	950 1330 2280	16.0% 20.0% 18.0%		0 3 3	3 sharks escaped from Indian round bent while hauling.
9.	16°43'N 72°01'E	350	0/4 Round bent Norwegian Indian	50 60 110	Cutpieces of catfish	4 6 10	270 400 670	8.0% 10.0% 9.0%		0 1 1	
10.	16°57'N 71°47'E	267	0/4 Round bent Norwegian Indian Swanhead Kirby Bent	18 26 25 94	cutpieces of catfish and Ribbon fish	0 1 0 1	0 15 0 15	0 3.8% 0 1.0%			
11.	16°53'N 71°59'E	390	0/4 Round bent Norwegian Indian Swanhead Kirby bent	25 25 25 100	cutpieces of catfish	3 2 1 6	280 190 100 570	12.0% 8.0% 4.0% 6.0%	0 0 0 1 1	0 2 0 2	1 shark lost as snood splice gave way.
<b>Summary</b>											
				Total No. of observations			: 11				
				Total No. of Hooks operated			: 1334				
				Total No. of sharks caught			: 76				
				Total weight of sharks caught			: 6061 kg.				
				Average hooking rate			: 6.3%				
				Hooking rate from Angria Bank			: 7.4%				

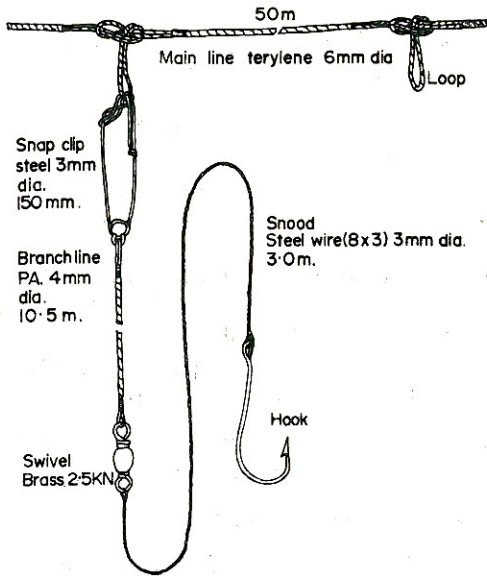


Fig. 1. Rigging of Shark long line in M.V. SARASWATHI

composition of shark species caught by the gear.

An average hooking rate of 7.4% was obtained from Angria Bank which is found to be very productive for shark fishing. Indian made round bent hook were found Table 2. *Composition of shark species caught by long lines*

Name of shark	Percentage
1. <i>Carcharhinus limbatus</i>	65.8%
2. <i>Carcharhinus melanopterus</i>	27.6%
3. <i>Zygaena blochi</i>	3.9%
4. <i>Galeocerdo</i> sp.	2.7%

Table 3. *Length groups of sharks caught by long lines*

Length in mm	frequency
Less than 1000	Nil
1001 - 1500	13%
1501 - 2000	5%
2001 - 2500	54%
2501 - 3000	5%
3001 - 3500	21%
3501 - 4000	2%
	<u>100%</u>

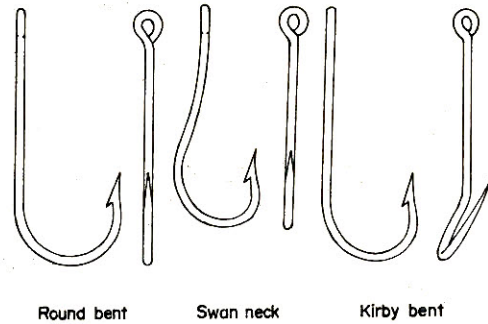


Fig. 2. Profile of different types of hooks

as efficient as Norwegian Mustad hooks of size 0/4. However, few Indian made round bent hooks were found as bent and broken when compared with Norwegian round bent hooks. Comparatively large size groups of sharks ranging between 2000 mm to 3500 mm length and 50 kg to 150 kg each were caught. Length groups and weight range of sharks caught are given in Tables 3 and 4. Larger size groups of sharks were mainly caught from Angria Bank indicating their abundance in this area for commercial exploitation.

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Table 4. *Size groups of sharks caught by long lines (by weight)*

Weight range in kg.	Frequency
Less than 5	0
5 - 25	9.2%
26 - 50	10.5%
51 - 75	17.0%
76 - 100	35.5%
101 - 125	17.0%
126 - 150	9.2%
151 - 175	0
176 - 200	1.6%
201 -	0
	<u>100.0%</u>

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