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A SUMMARY OF THE KOREAN TUNA FISHERY OBSERVER PROGRAMME FOR THE PACIFIC OCEAN IN 2005

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Korea began to develop its observer program for distant-water fisheries including tuna fisheries in 2002. The purpose of this program is to meet the requirements of relevant regional fisheries bodies such as the WCPFC and therefore the mission of trained observers are similar to those set out in the convention of the fisheries bodies. Before the official observer program was launched, Korea had irregularly dispatched NFRDI scientists aboard commercial tuna vessels to monitor fisheries and collect reliable catch statistics including biological samples, which were unobtainable by the regular data collection system. During the past 10 years, a total of 11 scientific observations were conducted for tuna fisheries operating in the Western and Central Pacific where the majority of Korean tuna purse seiners and longliners were active.

In 2005, 4 observers were deployed to monitor tuna fisheries in the Pacific Ocean, of which 3 observer trips were summarized in this report.

Purse seine fishery

The Western and Central Pacific Ocean (WCPO) serves as a usual fishing ground for the Korean tuna purse seine fishery since the early 1980s. To monitor this fishery, one trained observer was placed aboard Korean tuna purse seine vessel (979 GRT) targeting skipjack and yellowfin tuna during November 21-December 24, 2005.

The purse seiners were equipped with radars, color video and scanning fish founders, doppler sonar current meter, net depth recorder and so on and were operating auxiliary boats consisting of a skipper boat, net boat and one speed boat. To locate tuna schools, Korean tuna purse seiners usually carry helicopters. The purse seine net used by the monitored Korean purse seiners was about 2,000 m in length and it was deployed about 180-200 m in depth.

During the 34 days of the observation period, a total of 43 purse seine sets were monitored in the waters off the east Papua New Guinea, between 8°12'S-11°55'S and 152°33'-160°54'E (Fig. 1).

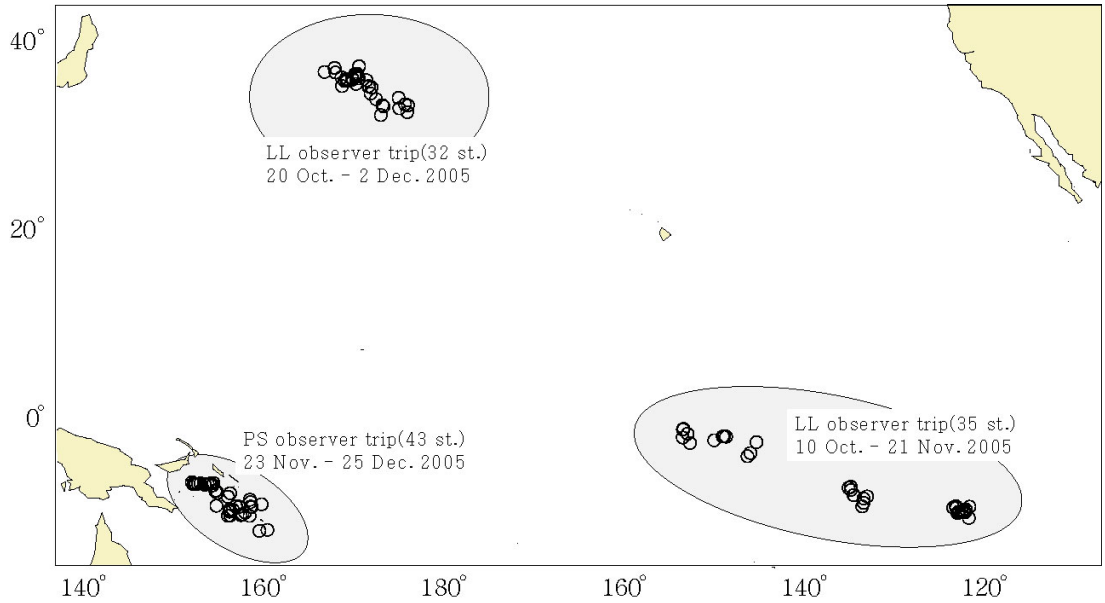

Fig. 1. Purse seine and longline observation points

The sets consisted of 40 free-swimming school sets and 3 log-associated school sets (Table 1). The success rate of operating sets with 5.0mt or more of tuna catch were 53% for free-swimming school sets and 100% for log-associated school sets. Total observed catches were 1,368mt for target species and 8.0mt for bycatch species. Catch composition for target species averaged 89% for skipjack and 11% for yellowfin. Catch per unit effort (CPUE, mt/set) of this fishery was 31.88 mt/set on average and CPUE of log-associated school sets was much higher than that of free-swimming school sets.

Bycatch were observed in 2 log-associated school and 4 free-swimming school sets. However, it was not possible for us to list all bycatch species to the species level due to the lack of data from the observer. Three billfish, 11 sharks and some miscellaneous fish species (i.e. file fish, rainbow runner, etc.) were recorded. In addition, one olive ridley sea turtle was caught aboard and released alive.

Length frequency data of skipjack and yellowfin tuna was also collected by the observer. A total of 104 skipjack and 68 yellowfin tuna were measured onboard (Fig. 2). The fork length of target species ranged 32-76cm (mean 56.4cm) for skipjack tuna and 25-160cm (mean 87.7cm) for yellowfin tuna, respectively. As the continuation of

a small voluntary tagging program by NFRDI, the observer in cooperation with fishermen placed tags on yellowfin and skipjack tunas and released them.

Table 1. Catch (mt) and CPUE (mt/set) by school types of the Korean tuna purse seine fishery during the scientific observation in 2005

school types	No. of set	Success rate (%)	skipjack tuna		yellowfin tuna		Subtotal (skj+yft)		Total	
			catch	CPUE	catch	CPUE	catch	CPUE	catch	CPUE
Free-swimming school	40	53%	992	24.80	219	5.48	1,211	30.28	1,210	30.23
Log-associated school	3	100%	122	40.67	35	11.67	157	52.33	161	53.67
total	43	56%	1,114	25.91	254	5.91	1,368	31.81	1,376	31.88

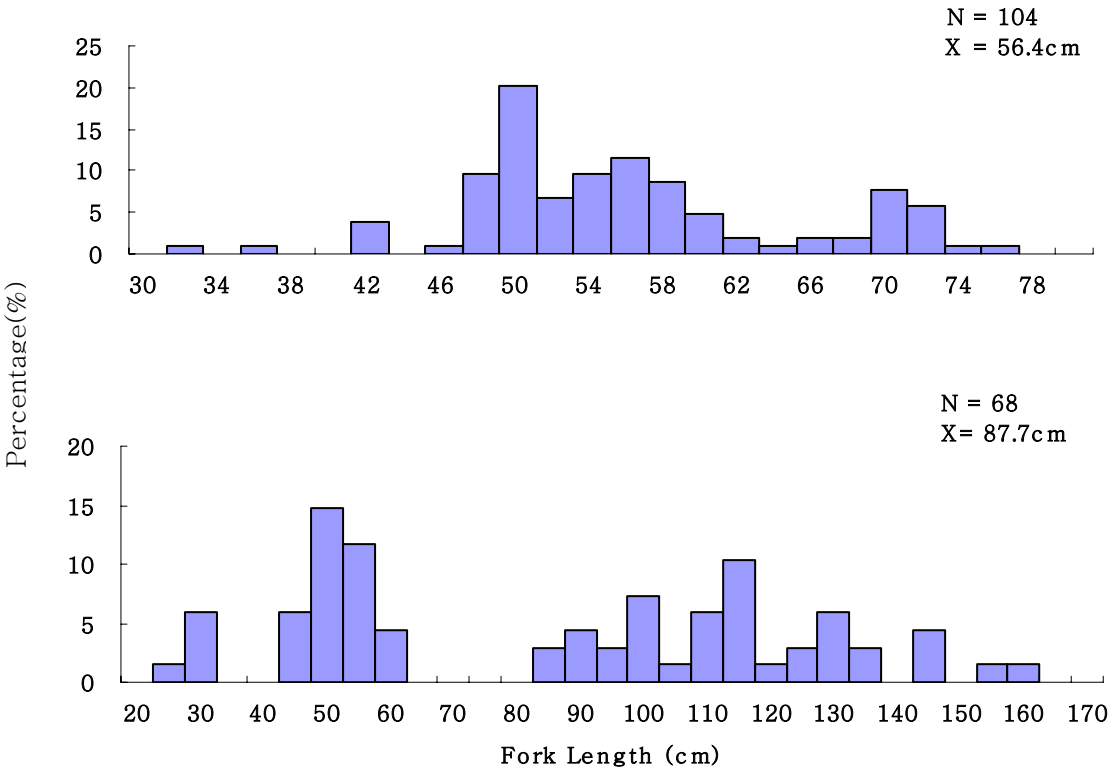

Fig. 2. Length frequency distributions of skipjack (top) and yellowfin (bottom) tunas.

Longline fishery

To monitor the Korean tuna longline fishery operated in the Pacific, two trained observers were deployed to two Korean longliners (419 and 426 GRT) fishing in the Western Central Pacific Ocean (hereinafter WCPO area), between 32°45' -36°43'N and 167°35'-175°24'E and in the Eastern Pacific Ocean (hereinafter EPO area), between 2°17' -12°10'S and 121°29'-153°11'W, respectively. (Fig. 1).

WCPO area

During the 43 days of the observation period from October 20 to December 2, 2005 , a total of 32 longline sets (one set per day) were monitored. Because this fishing boat targeted albacore, the fishing operations were mainly focused on the northern area of the WCPO. The average number of baskets used for each set was 196 and hooks used ranged from 2,210 to 2,640 (average 12-13 hooks per basket). Mean length of main line was 101km and those of buoy line were 30m for 18 times and 35m for 14 times. Branch line ranged between 38-48 and 8-10m length of leather was used. Leather material was either nylon or monofilament. The fishing vessel mainly used no.3.8 hooks.

Longline setting began at around 6:30am in the morning and finished by noon and after about 4 hours of soaking, the longline sets were hauled until the following early morning by 5:00 am. Thirty haulings were started at the finished point of setting while two haulings were done at the starting point of setting. A total of 78,093 hooks were observed by the on-board observer.

Catches sampled by the observer were 33.5 mt of tuna and billfishes, of which albacore was the dominant tuna species accounting for 46.6% of the total catch in weight, followed by bigeye tuna at 14.0mt (42.0%), and yellowfin tuna at 0.5mt (1.6%) (Table 2). Billfishes incidentally caught were striped marlin (6.4%), swordfish (2.8%) and blue marlin (0.5%) (Table 2).

A total of 17 bycatch species (732 in number) were observed during the trip, among which billfishes, sharks and fishes of escolar and lancetfish were most common and some other fish species were also observed . In addition, three olive ridley turtle were caught aboard and released alive after biological measurement. Two turtles were hooked in the mouth and the other was hooked in the throat (Table 3).

Length frequency data for the sampled tuna and billfishes were collected. The fork length of albacore ranged from 70cm to 128cm (mean 104cm) and that of bigeye tuna ranged from 72cm to 174cm (mean 117 cm) with mode at 80 cm and 120 cm. On the

other hand the fork length of yellowfin tuna ranged from 78cm to 150cm (mean 119 cm) but the small sized fish were dominant (Fig. 3)

Table 2. Catch and CPUE of tunas and billfishes

Species	WCPO area						EPO area					
	Catch				CPUE (100hooks)		Catch				CPUE (100hooks)	
	No.	%	Wt.(kg)	%	No	Kg	No.	%	Wt.(kg)	%	No.	Kg.
Albacore	734	59.9	15,542	46.6	0.94	19.9	69	8.0	1,180	3.5	0.07	1.3
Bigeye	398	32.5	14,077	42.0	0.51	18.0	603	69.7	25,045	75.0	0.65	27.1
Yellowfin	17	1.4	549	1.6	0.02	0.70	41	4.7	1,554	4.7	0.04	1.7
Skipjack	2	0.2	25	0.1	0.00	0.03	19	2.2	182	0.5	0.02	0.2
Bluefin	-	-	-	-	-	-	2	0.2	104	0.3	0.00	0.1
Blue marlin	1	0.1	156	0.5	0.00	0.20	16	1.9	1,620	4.8	0.02	1.8
Striped marlin	52	4.2	2,160	6.4	0.19	2.77	3	0.3	156	0.5	0.00	0.2
Swordfish	22	1.7	966	2.8	0.03	1.24	82	9.5	3,109	9.3	0.09	3.4
Shortbill spearfish	-	-	-	-	-	-	30	3.5	459	1.4	0.03	0.5
Total	1,226	100	33,475	100	1.57	42.87	865	100	33,409	100	0.92	36.3

EPO area

During the 42 days of the observation period from October 10 to November 21, 2005 , a total of 35 longline sets (one set per day) were monitored. This fishing boat was targeted for bigeye tuna and main fishing depth ranged from 250 to 320m. The average number of baskets used for each set was 157 and hooks used ranged from 2,380 to 3,026 (average 2,637 hooks). Longline setting began at around 7:00am in the morning and finished by 1:00pm and after about 3 hours of soaking, the longline sets were hauled until the following early morning by 6:00 am. Twenty seven haulings were started at the finished point of setting while eight haulings were done at the starting point of setting. A total of the 92,312 hooks were observed by the on-board observer.

Number of hooks between two baskets were usually 17 but it changed to 16 according to the increased number of baskets. Mean length of main line was 133.7km and those of buoy line were 45m for 7 times and 40m for 28 times. The fishing vessel mainly used the hooks of no. 4 (kuboda type) and no.3.8 (terasima type). The baits were consist of sardine, jack mackerel, squid, common mackerel and milk fish and especially baits of squid were filled with krill. The baits of the first (no. 1) and the last (no. 17) hooks between two baskets were usually artificial squids.

Catches sampled by the observer were 33.4 mt of tuna and billfishes, of which bigeye tuna was the dominant tuna species accounting for 75.0% of the total catch in weight, followed by yellowfin tuna at 1.5mt (4.7%), and albacore at 1.2mt (3.5%) (Table 2). Billfishes incidentally caught were swordfish (9.3%), blue marlin (4.8%) and shortbill spearfish (1.4%).

A total of 26 bycatch species (760 in number) were observed during the trip, among which billfishes, sharks (8 species) and fish of escolar were most common and some other fish species were also observed (Table 3).

Length frequency data for the sampled tuna and billfishes were collected. The fork length of bigeye tuna ranged from 70cm to 200cm (mean 131cm) and that of yellowfin tuna ranged from 78cm to 166cm (mean 134 cm). The mean fork length of albacore was 98.4 cm and consisted of similar size fish . The mean fork length of skipjack tuna was 77.8cm and about 90% of the catch consisted of 70cm to 80 cm size class (Fig. 4).

To prevent the incidental catch of seabirds, the vessel was implementing several measures, recommended by various international societies, such as the use of thawed bait, bait casting machine and weighted branch line. Consequently there was no catch of seabird during this observer trip.

Table 3. List of bycatch species (billfish not included)

Species	WCPO area		EPO area	
	No. of fish	%	No. of fish	%
Blue shark	121	18.4	34	5.4
Salmon shark	-	-	39	6.2
Bigeye thresher shark	-	-	15	2.4
Oceanic white-tip shark	-	-	27	4.3
Smooth hammerhead shark	-	-	6	1.0
Shortfin mako shark	16	2.4	2	0.3
Velvet dogfish shark	-	-	5	0.8
Crocodile shark	-	-	10	1.6
Dolphin fish	18	2.7	46	7.3
Wahoo	6	0.9	29	4.6
Escolar	201	30.6	225	35.9
Oilfish	51	7.8	1	0.2
Snake mackerel	13	2.0	53	8.4
Pomfrets (Angelfishes)	38	5.8	58	9.3
Opah	31	4.7	6	1.0
Pelagic stingray	13	2.0	10	1.6
Longnose Lancetfish	141	21.5	56	8.9
Molas	1	0.2	2	0.3
Crested oarfish	4	0.6	-	-
Sea turtle	3	0.4	-	-
Razorback scabbardfish	-	-	2	0.3
Tapertail ribbonfish	-	-	1	0.2
Total	657	100	627	100

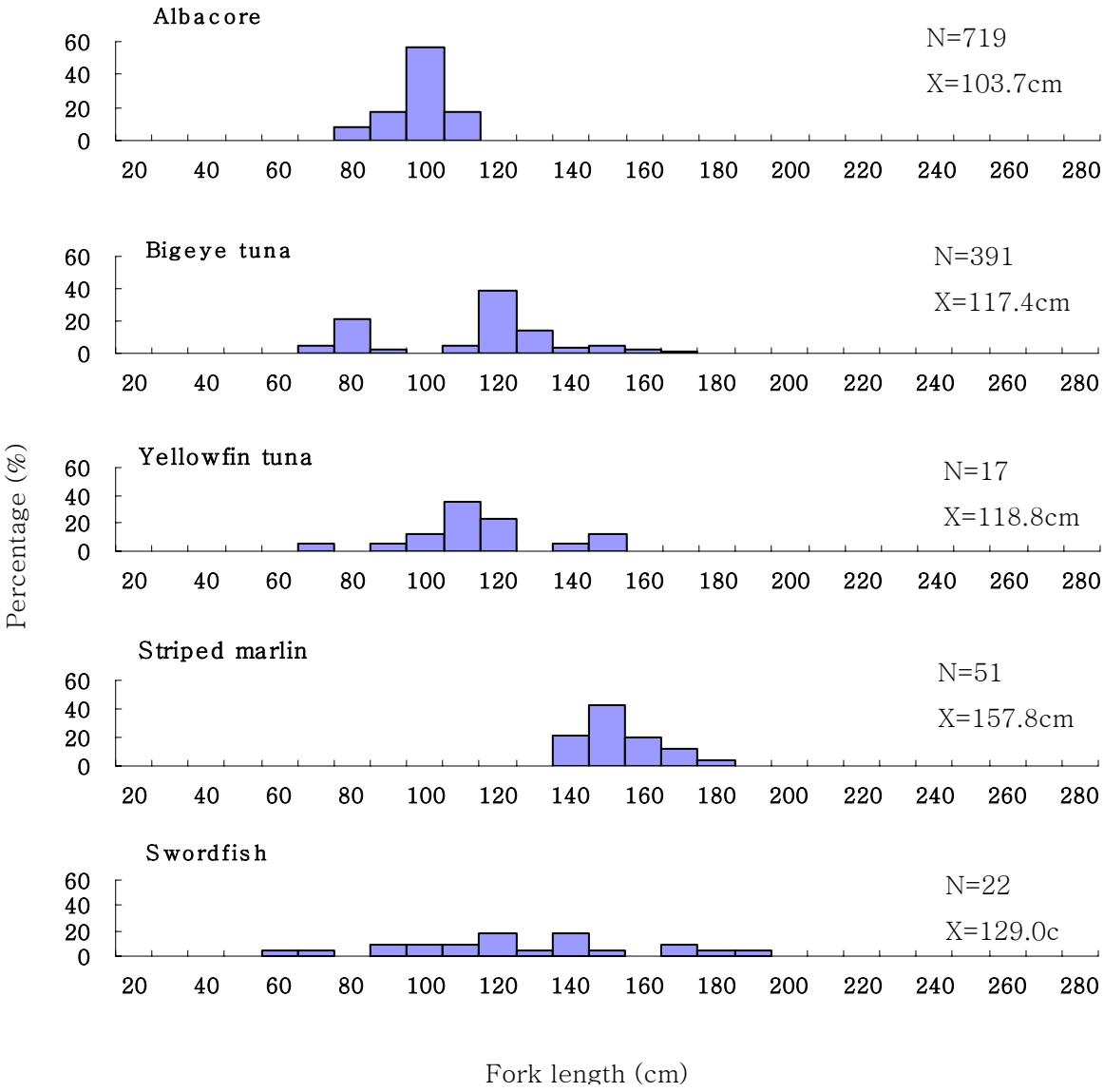

Fig. 3. Fork length frequencies of tunas and billfishes in the WCPO area.

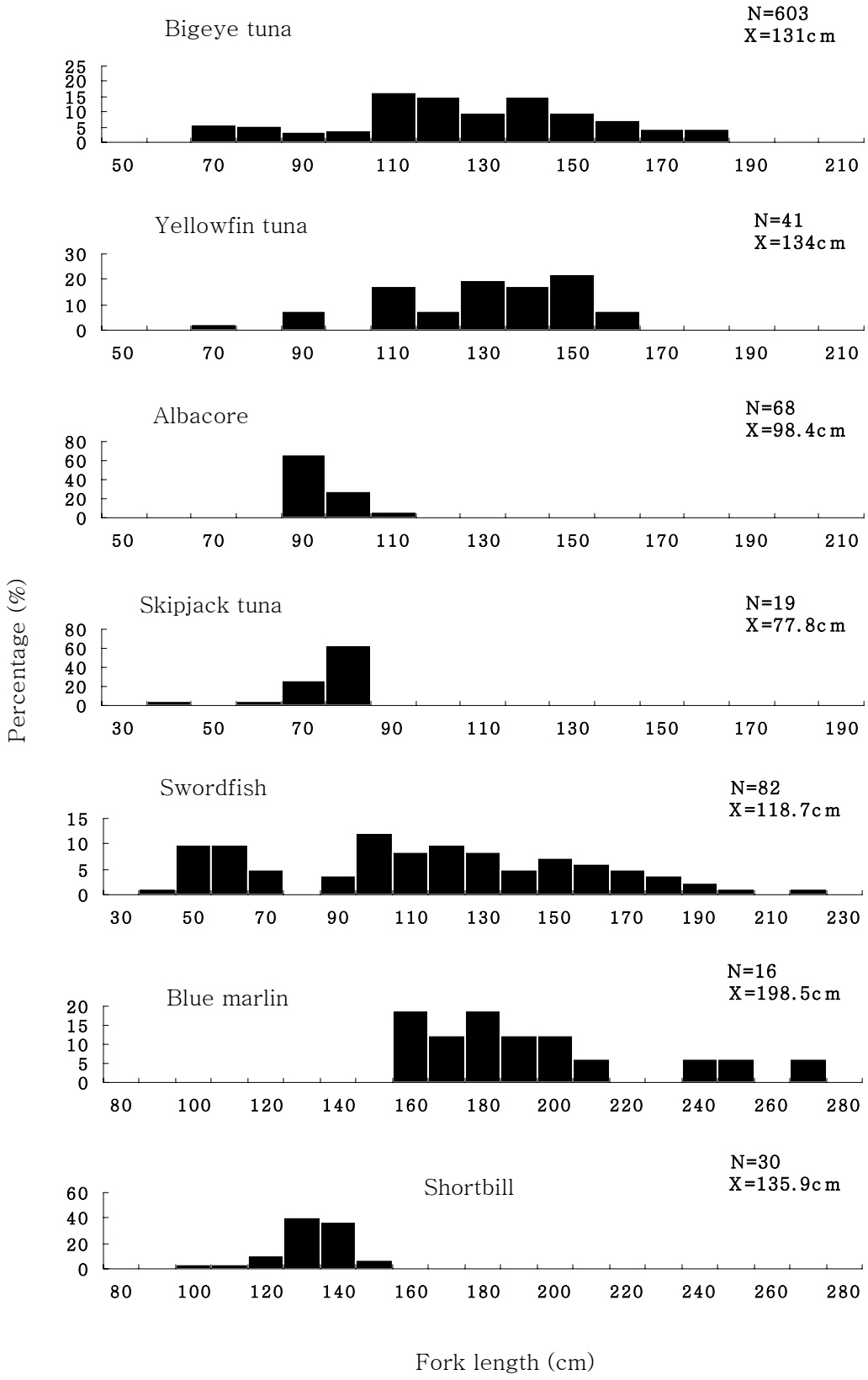

Fig.4. Fork length frequencies of tunas and billfishes in the EPO area.