

National report of China to the 2011 SPRFMO Science Working Group

1. Brief Introduction of China CJM Fishery

China pelagic fishing fleet commenced its CJM fishery in the high seas of Southeast Pacific in 2000. The number of fishing vessels reached 16, however, actually operated in the region was varied between 6 and 13. The fleet consists of 9 factory trawlers greater than 4,000 GRT, around 7,847 tons, and 4 vessels under 4,000 GRT.

Table 1 Chinese CJM fishing fleet composition

year	number of the fishing vessels	Registered tonnage, GRT		gear type
		<4,000	≥4,000	
2004	12	10	2	pelagic trawl
2005	13	11	2	Pelagic trawl
2006	12	6	6	Pelagic trawl
2007	11	4	7	Pelagic trawl
2008	11	4	7	Pelagic trawl
2009	13	4	9	Pelagic trawl
2010	9	0	9	Pelagic trawl
2011	6	0	6	Pelagic trawl

The annual yield of CJM fluctuated between 2,318 and 160,000 t from the year 2000 to 2010 and it is 63,606 t in 2010. It is 20872 t from Feb. to Jun. 2011 and the yield of Chub mackerel is 639 t in the same period.

The catch and effort of CJM of Chinese fishing fleet are presented in Table 2.

Table 2 Catch and effort of CJM by Chinese fishing fleet

year	Catch in tons	fishing day	Average catch per fishing day per vessel in tons	GAM standardized CPUE (ton/hour)
2001	20,090	497	40	3.36
2002	76,261	1,477	52	5.02
2003	94,690	1,569	60	5.42
2004	131,020	2,271	58	4.23
2005	143,000	2,474	58	5.79
2006	160,000	1,811	88	6.85
2007	140,582	2,033	69	6.02
2008	143,182	17,23	83	6.85
2009	117,963	1,567	75	7.20
2010	63,606	921	69	4.60
2011*	20,872	348	60	-

* from Feb. to Jun. 2011

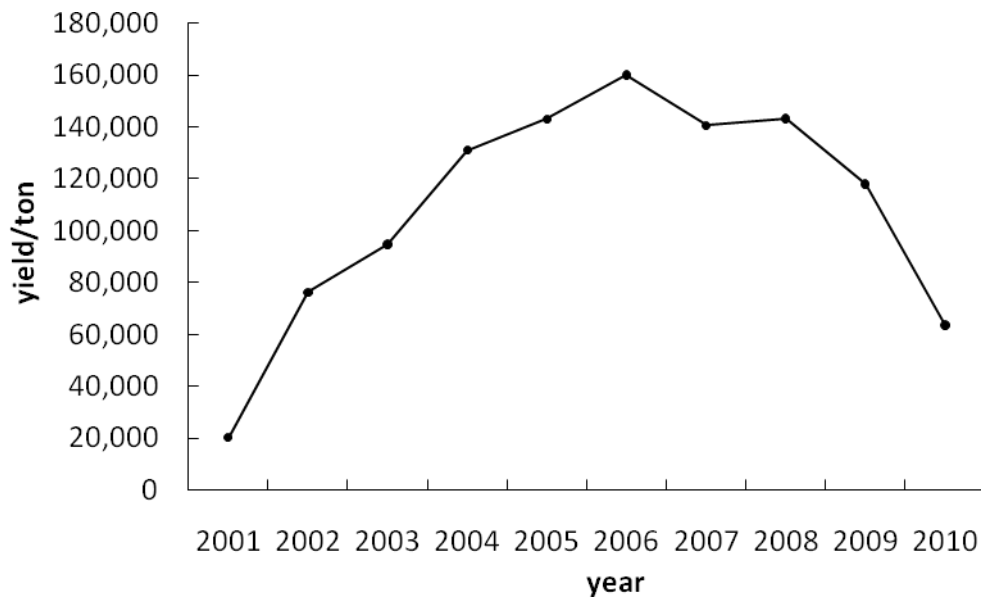
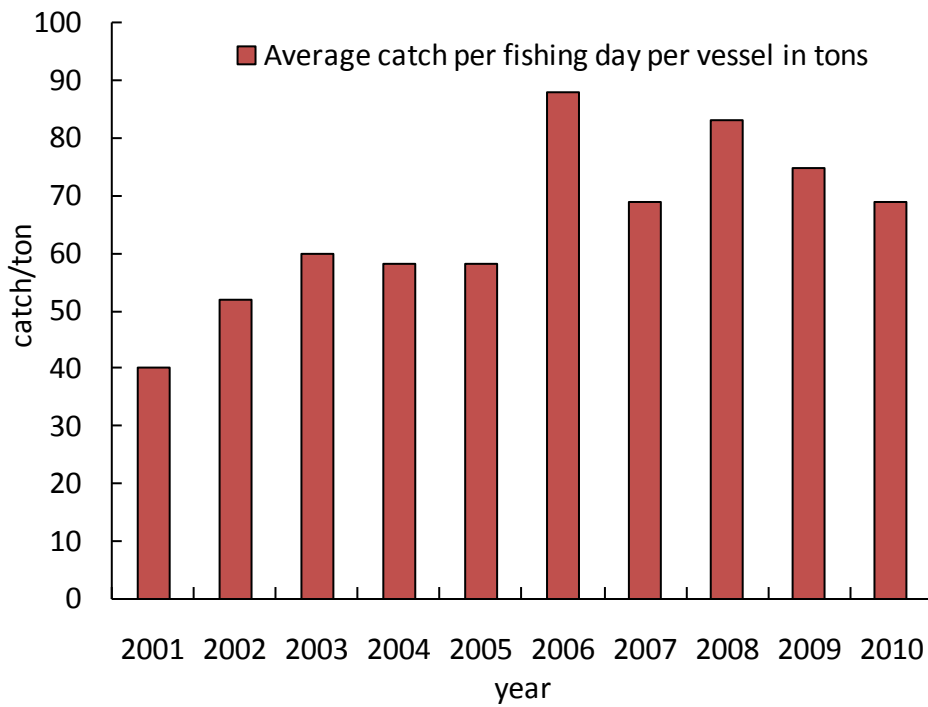
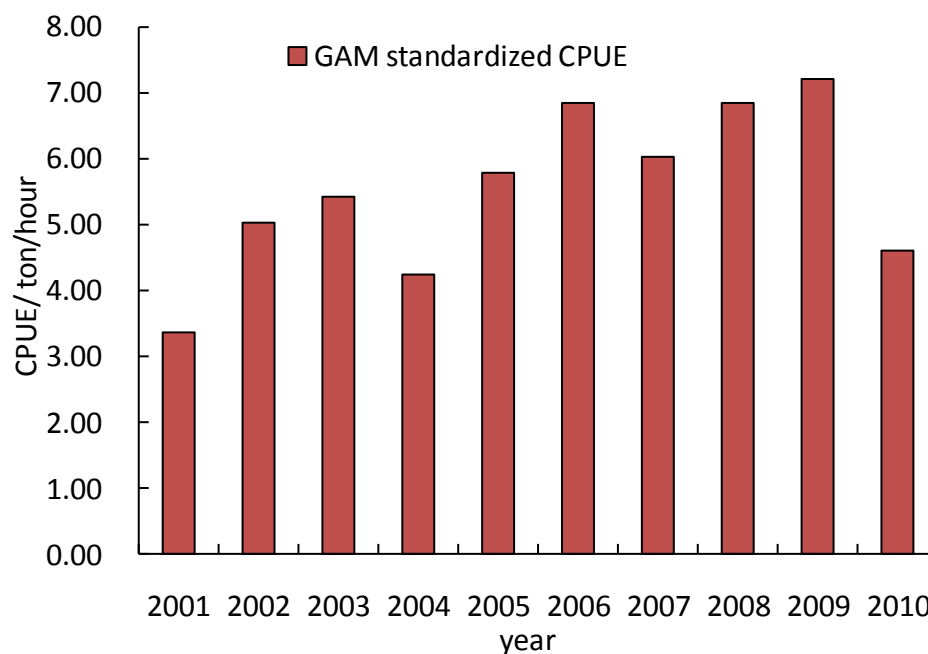


Fig. 1 The annual yield of CJM of Chinese fleet



a



b

Fig. 2 The fishing effort of CJM of China fleet

The annual average catch per fishing day per vessel fluctuated between 40-88 ton and the GAM standardized CPUE fluctuated between 3.36t and 7.20 t from the year 2001 to 2010. All of them declined in 2010.

CJM is the main target species in the catch in 2000 to 2011. Chub mackerel (*Scomber japonicus*) as by-catch was found 0% -10% in the catch in 2010 to 2011, and also a few of other species, such as jumbo flying squid (*Dosidicus gigas*), pacific scad (*Scomberomorus sierra*), yellowtail (*Seriola laland*), lanternfishes (*Myctophidae*) etc.

2 Fisheries Data Collection and Research Activities

China Fisheries Association (CFA) and Shanghai Ocean University (SHOU) jointly take charge of the JM fisheries data collection and research activities. The fisheries data collection was carried out by China fishing fleet cooperating with the China fishery scientific observers program. And a full log books collection program have been carried out from 2007 and delivered to SHOU for statistics and study purpose.

The biological data and environment data were measured and collected on board by the fishery scientific observers. And the catch data were collected from log books or directly sampled from the catch. Data from log book mainly are catch per tow, fishing time and positions, towing speed etc. Environment data about fishing ground are also collected including wind direction and speed, SST, and data of STD etc.

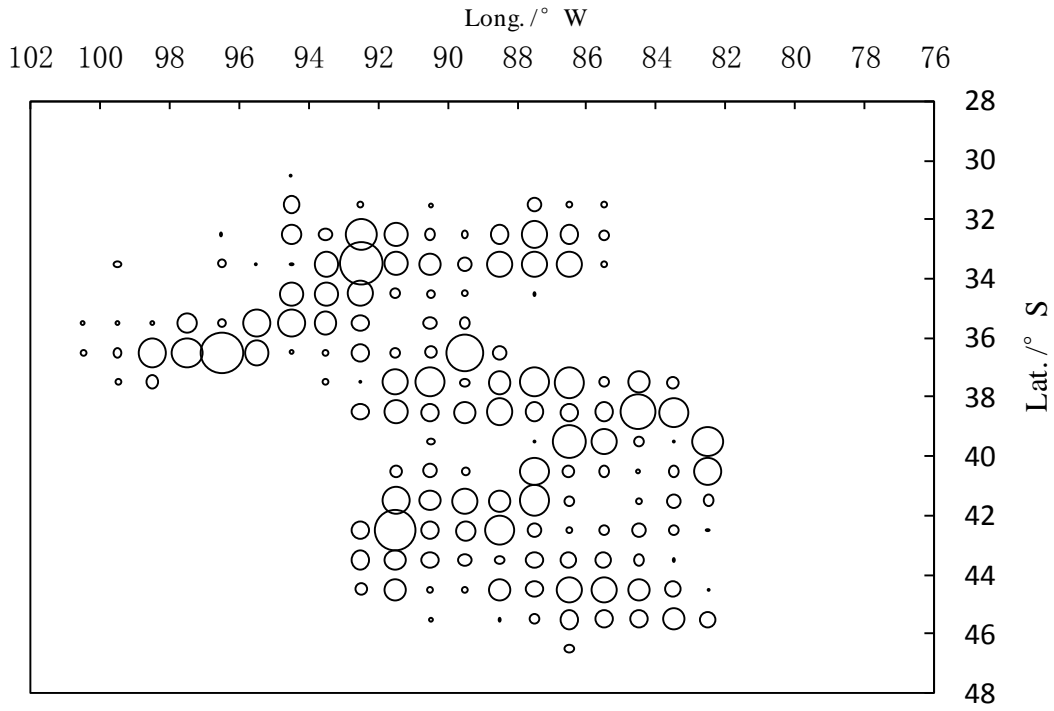


Fig 3 1°×1° Catches of CJM by Chinese fishing fleet in 2008 in Southeast Pacific Ocean (FAO Area 87)

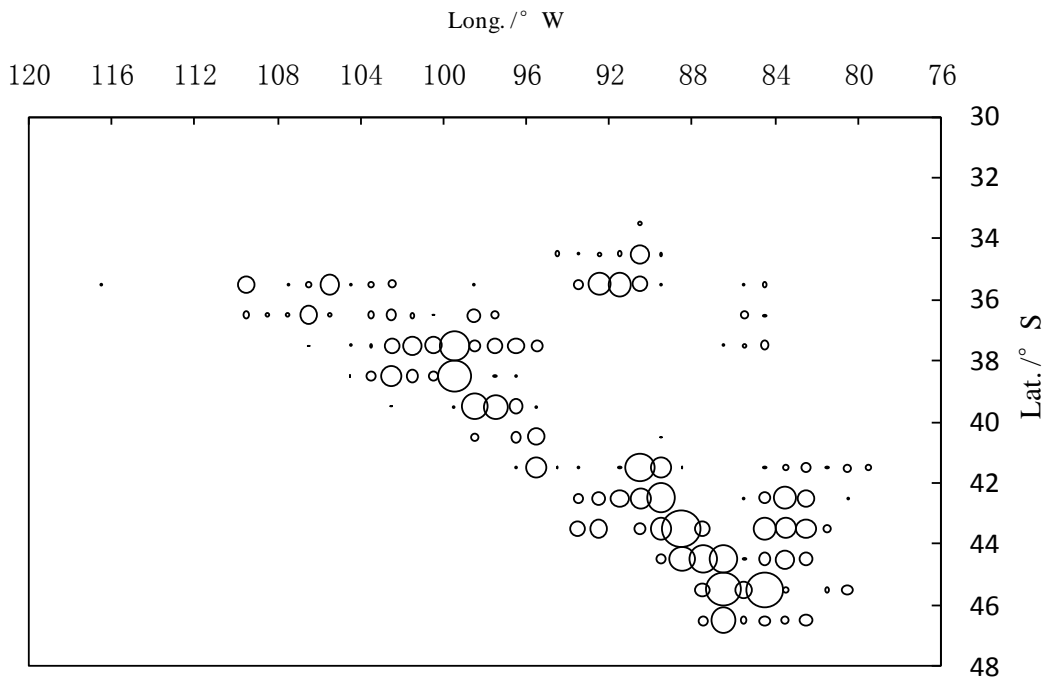


Fig 4 1°×1° Catches of CJM by Chinese fishing fleet in 2009 in Southeast Pacific Ocean (FAO Area 87)

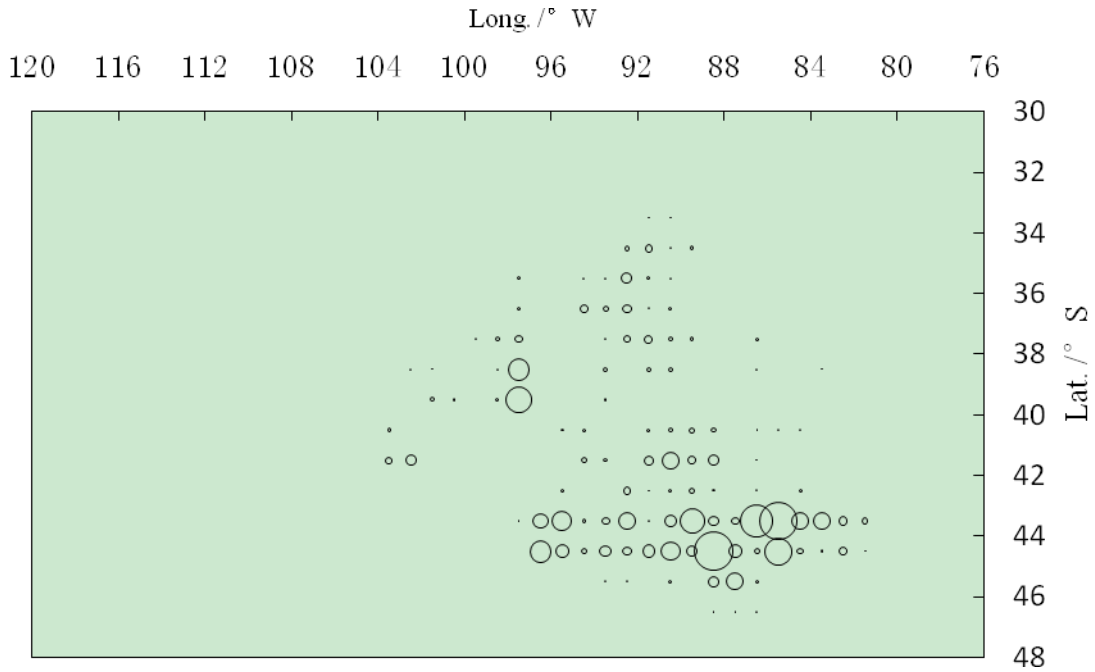


Fig 5 1°x1° Catches of CJM by Chinese fishing fleet in 2010 in Southeast Pacific Ocean (FAO Area 87)

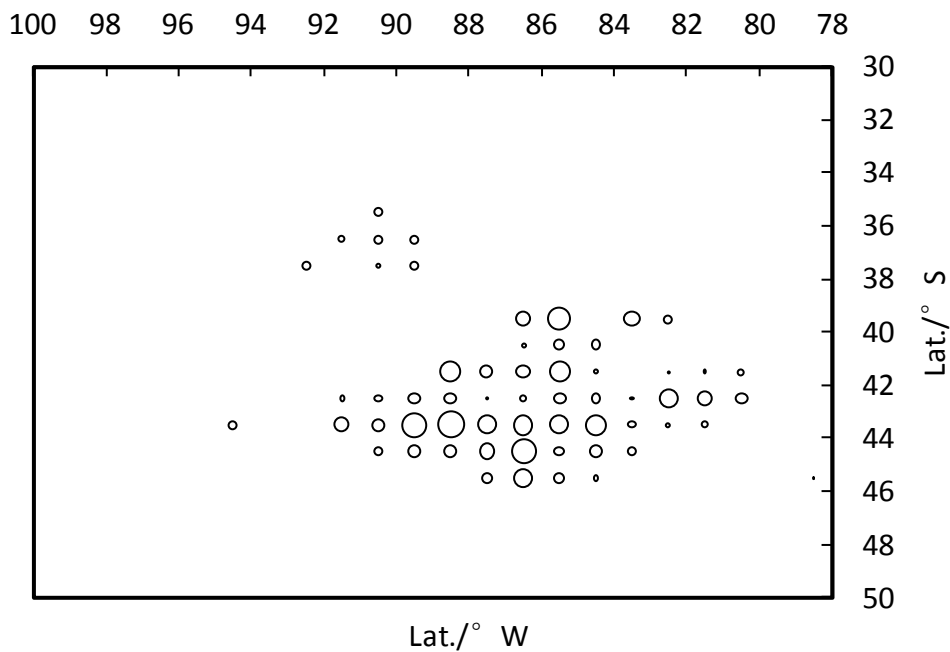


Fig 6 1°x1° Catches of CJM by Chinese fishing fleet in Mar. to Jun. 2011 in Southeast Pacific Ocean (FAO Area 87)

Biological items measured on broad by the random sampling are fork length, body height, width and girth, body weight and net weight with organs, sex, germ cells maturity, contains in the stomach etc.

Depth of fish school inhabited in the water and temperature related were recorded by the echo sounder, net sounder and sonar.

The otolith collected on board and delivered to the SHOU laboratory for appraisal age. The maturity situation of germ cells and stomach containing were observed and sorted in six grades and five grades respectively according with the national standards of the Chinese marine fish survey.

Plankton and botany were collected in predetermined positions, and identified according to marine fishery survey standard.

The studies on CJM take by Chinese scientists were mainly in the fields of biological characteristic, distribution of stocks and population, fishing ground, oceanic environment, DNA, etc.. The major research activities in the future will be CJM resource survey, stock assessment, DNA tests and so on.

3. Biological Sampling and Length / Age Composition of CJM

Altogether 18,062 CJM samples have been collected in the past years, the measurements have been made on board, i.e. fork length, body weight, net body weight, body girth, body height, body width, the germ cells maturity, the stomach contain and fullness etc. 3,420 otoliths and 43,953 folk length data by punching hole (mark the folk length on a piece of oilpaper by punching a hole) have been collected too.

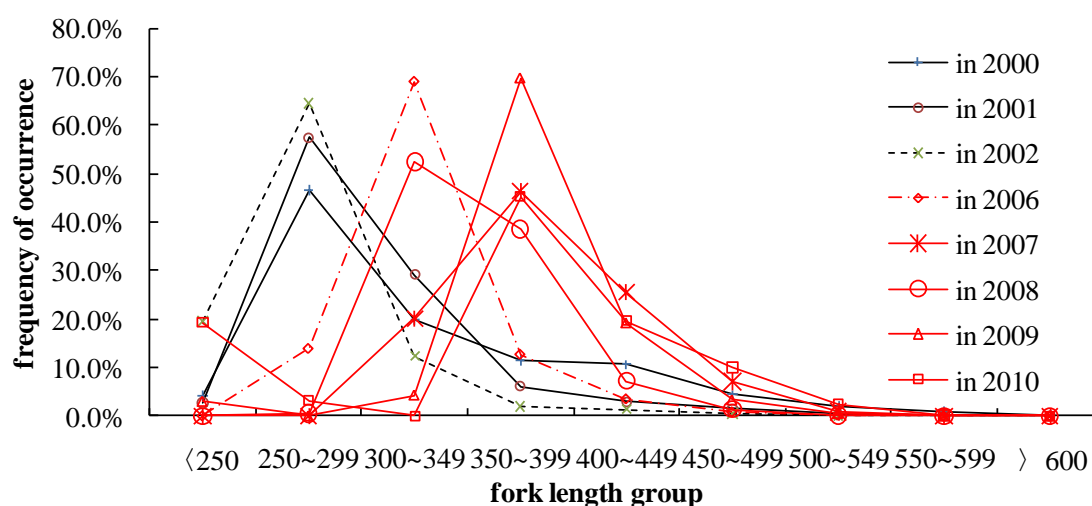


Fig7 Fork length composition of CJM

Table 3 Fork length (mm) composition of CJM

year	Min	Max	<250	250~299	300~349	350~399	400~449	450~499	500~549	550~599	> 600
2000	223	618	4.1%	46.6%	19.7%	11.5%	10.6%	4.4%	1.9%	1.0%	0.2%
2001	212	598	2.7%	57.4%	29.1%	6.1%	2.9%	1.4%	0.3%	0.1%	0.0%
2002	116	483	19.5%	64.5%	12.3%	1.9%	1.3%	0.5%	0.0%	0.0%	0.0%

2006	193	515	0.0%	13.9%	69.0%	12.7%	3.5%	0.8%	0.1%	0.0%	0.0%
2007	305	510	0.0%	0.0%	20.1%	46.4%	25.5%	7.1%	0.9%	0.0%	0.0%
2008	280	520	0.0%	0.5%	52.4%	38.5%	7.2%	1.3%	0.1%	0.0%	0.0%
2009	164	543	3.0%	0.0%	4.3%	69.7%	19.2%	3.3%	0.5%	0.0%	0.0%
2010	185	578	19.3%	3.2%	0.0%	45.3%	19.6%	10.0%	2.4%	0.1%	0.0%

Fork length composition of CJM is showed in fig6 and table 3. It indicate that the dominant fork length of CJM increase gradually in recent years and decline in 2010. We also found that there are a large number small fish occurred near 39.05°S, 101.55°W and the average fork length is 216mm (std. 14) in 2010.

The relationship between age and fork length of CJM in 2009 is showed in table4, fig.8, 9, 10.

Table 4 The relationship between age and fork length of *Trachurus murphyi* in 2009

size class (FL/mm)	age class								number
	2+	3+	4+	5+	6+	7+	8+	9+	
190-200	1								1
260-270		1							1
270-280		1							1
280-290		15	28						43
290-300		5	113						118
300-310			205						205
310-320			174	1					175
320-330			120	19					139
330-340			45	36					81
340-350			4	41					45
350-360				42					42
360-370				21	2				23
370-380				11	8				19
380-390				4	14				18
390-400					8	1			9
400-410					8	4			12
410-420					1	4			5
420-430						8			8
430-440						5			5
440-450						1	2		3
450-460							4		4
460-470							1		1
470-480							2	1	3
480-490								0	0
490-500								1	1
500-510								0	0
510-520								1	1
number	1	22	689	175	41	23	9	3	963
mean fork length	193.00	287.73	311.55	348.66	389.44	421.61	459.67	496.00	
standard deviation	0	5.93	12.33	14.62	12.61	12.36	9.55	15.12	

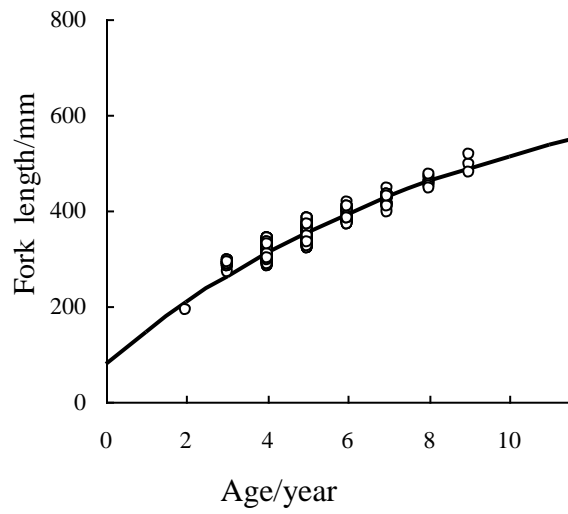


Fig. 8 The predicted von Bertalanffy growth curve and observed length-at-age for *Trachurus murphyi* in 2009, $L_t = 738.9[1 - \exp(-0.108(t + 1.08))]$ $R^2=0.81$

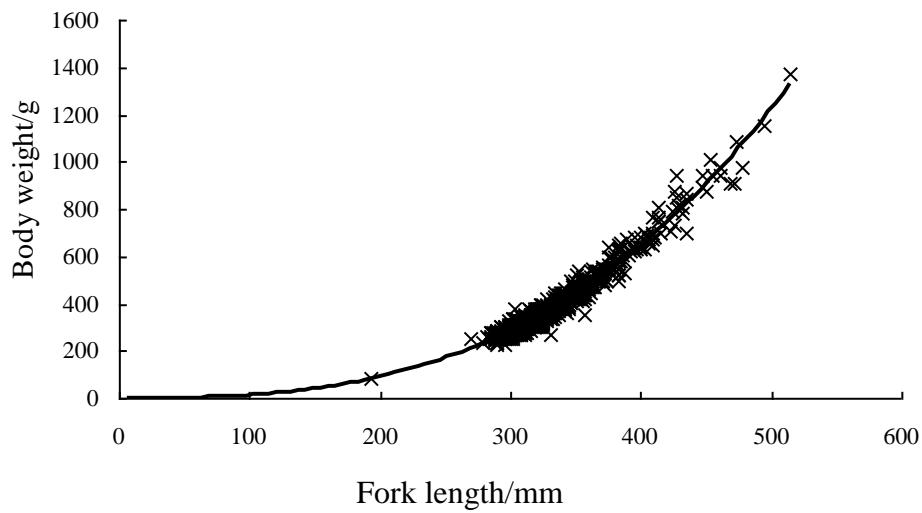


Fig.8 Fork length-weight relationship for *Trachurus murphyi* in 2009,
 $W=2.5293 \times 10^{-5} L^{2.8472}$ $R^2=0.95$

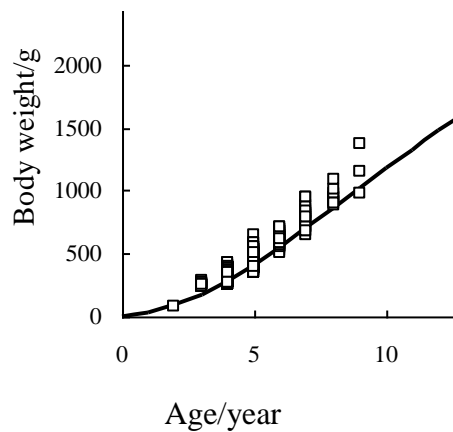


Fig.10 The von Bertalanffy growth curve in terms of weight and observed weight-at-age for *Trachurus murphyi* in 2009, $W_t = 3974.04[1 - \exp(-0.108(t + 1.08))]^{2.9}$ $R^2=0.82$

4. Fishery Scientific Observer Program

In order to implement “Standards for the collection, reporting, verification and exchange of data” of SPRFMO, China fishery Authority and CFA accredit SHOU for the observers training, selection and dispatch, etc. SHOU also responds for the data evaluation and debug, and related studies. The FSOP has been already under way since 2007. 2 or 3 of Chinese fishing vessels were dispatched the observers on board each year, namely “Kai Xin”, “Kai Fu”, “Kaili” and “Fu Xing Hai”. The coverage rate of observers is 25-30%. So far the observers are still on board in 2011.