
National report of China to the SPRFMO Science Working Group (Rev 1)

1. Brief Introduction of Chinese Jack Mackerel Fishery

In the year 2000, Chinese factory trawler “KAIXIN” began its exploratory trips for Chilean Jack Mackerel (*Trachurus murphyi*) in the high seas of Southeast Pacific. The total catch was 2300 t in 41 fishing days. After that, China fishing fleets have continued their commercial fishing for Chilean Jack Mackerel in this region.

The number of fishing vessel once reached 16 and leveled off between 11 and 13 after the year of 2004. After 2006, the Chinese fishing fleet has make reconstruction their fleet, 5 vessels are replaced by larger vessels which GRT is greater than 4000 ton around 7847 ton, so that all together 7 vessels are greater than 4000 ton and 4 vessels are remained as before.

The annual yield of Chilean Jack Mackerel fluctuated between 130,000 and 160,000 t from the year 2004 to 2008. The average monthly CPUE fluctuated between 2 and 11 t/hour (12-41 t/tow) form Jan. to Dec. in these years. The peak presented during June and July which is about 10-11 t/h or 41 t/tow.

Chilean Jack Mackerel is the main target species in the catch. Japanese mackerel (*Scomber japonicus*) as by-catch was found in catch, however, was less than 10-20% in the total catch. There are a few of other spices, such as pacific scad (*Scomberomorus sierra*), yellowtail (*Seriola laland*), lantrenfishes (*Myctophidae*) etc to be found in the catch. Jumbo flying squid (*Dosidicus gigas*) has been caught by trawls since 2006, which is about 5-10% in the catch.

Table 1 5°×5° catches of Chilean Jack Mackerel by Chinese fishing fleet in Southeast Pacific Ocean (FAO Area 87) between the years of 2004 and 2008 in tones

| Fishing area by 5°×5° | Year | | | | |
|-----------------------|--------|--------|--------|--------|--------|
| | 2004 | 2005 | 2006 | 2007 | 2008 |
| 70°-75°W;25°-30°S | - | - | - | - | 1323 |
| 75°-80°W;25°-30°S | - | - | - | - | 408 |
| 75°-80°W; 35°-40°S | - | 1222 | - | 3393 | - |
| 75°-80°W; 40°-45°S | - | 1834 | 5767 | 3044 | - |
| 80°-85°W; 30°-35°S | 3470 | - | - | - | - |
| 80°-85°W; 35°-40°S | 21754 | 10910 | 17598 | 25943 | 9900 |
| 80°-85°W; 40°-45°S | 31640 | 21921 | 43963 | 46697 | 7436 |
| 80°-85°W; 45°-50°S | - | - | - | 263 | 3435 |
| 85°-90°W; 30°-35°S | 27399 | 30140 | 37998 | 17623 | 10480 |
| 85°-90°W; 35°-40°S | 5434 | 19902 | 5005 | 4236 | 20975 |
| 85°-90°W; 40°-45°S | 6967 | 846 | 8867 | 8162 | 21797 |
| 85°-90°W;45°-50°S | - | - | - | 969 | 1551 |
| 90°-95°W; 30°-35°S | 11749 | 21131 | 16324 | 14340 | 19914 |
| 90°-95°W; 35°-40°S | 7242 | 21614 | 10008 | 3149 | 12820 |
| 90°-95°W; 40°-45°S | 652 | - | 111 | - | 17925 |
| 90°-95°W;45°-50°S | - | - | - | - | 51 |
| 95°-100°W; 30°-35°S | - | 464 | 4100 | 1700 | 356 |
| 95°-100°W; 35°-40°S | 14337 | 9937 | 9618 | 4320 | 14755 |
| 95°-100°W; 40°-45°S | 376 | 2884 | 641 | - | - |
| 100°-105°W; 30°-35°S | - | - | - | 5659 | - |
| 100°-105°W; 35°-40°S | - | 195 | - | - | 56 |
| 105°-110°W;30°-35°S | - | - | - | 149 | - |
| 110°-115°W;30°-35°S | - | - | - | 935 | - |
| Total | 131020 | 143000 | 160000 | 140582 | 143182 |

Table 2 monthly total catches of Chilean Jack Mackerel by Chinese fishing fleet in Southeast Pacific Ocean (FAO Area 87) between the years of 2004 and 2008 in tones

| month | catch | month | catch |
|-------|----------|-------|----------|
| 1 | 7602.157 | 7 | 119038.9 |
| 2 | 6700.727 | 8 | 97476.05 |
| 3 | 11901.91 | 9 | 93924.72 |
| 4 | 46808.1 | 10 | 78684.45 |
| 5 | 80488.49 | 11 | 45004 |
| 6 | 102240.9 | 12 | 27913.61 |
| total | 717784 | | |

Table 3 Chinese Chilean Jack Mackerel fishing fleet composition between the years of 2004 and 2008

| year | number of the fishing vessel | Registered tonnage, GRT | | gear type |
|------|------------------------------|-------------------------|-------|---------------|
| | | <4000 | ≥4000 | |
| 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 |

Table 4 the average monthly CPUE of Chilean Jack Mackerel by Chinese fishing fleet in Southeast Pacific Ocean (FAO Area 87) between the years of 2004 and 2008

| month | CPUE(t/h) | CPUE(t/tow) |
|-----------|-----------|-------------|
| 1 | 2 | 12 |
| 2 | 2 | 13 |
| 3 | 2 | 15 |
| 4 | 5 | 26 |
| 5 | 9 | 35 |
| 6 | 10 | 41 |
| 7 | 11 | 41 |
| 8 | 8 | 35 |
| 9 | 7 | 35 |
| 10 | 6 | 31 |
| 11 | 4 | 23 |
| 12 | 3 | 17 |

Table 5 the average yearly CPUE of Chilean Jack Mackerel by Chinese fishing fleet in Southeast Pacific Ocean (FAO Area 87) between the years of 2000 and 2008

| year | CPUE(t/hour) | CPUE(t/tow) |
|-------------|--------------|-------------|
| 2000 | 5.7 | 25.5 |
| 2001 | 3.9 | 21.1 |
| 2002 | 5.1 | 23.0 |
| 2003 | 5.4 | 23.8 |
| 2004 | 5.2 | 25.7 |
| 2005 | 6.0 | 28.4 |
| 2006 | 7.5 | 41.2 |
| 2007 | 6.5 | 33.1 |
| 2008 | 8.2 | 41.0 |

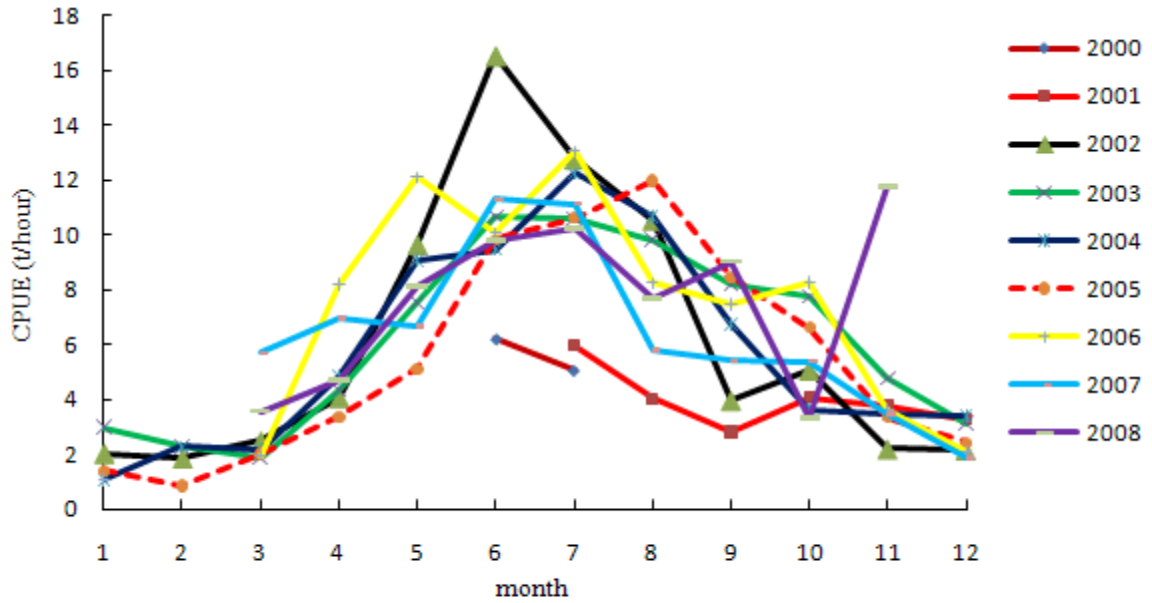


Fig 1 the average monthly CPUE (t/hour) of CJM by Chinese fishing fleet in Southeast Pacific (FAO Area 87) between the years of 2000 and 2008

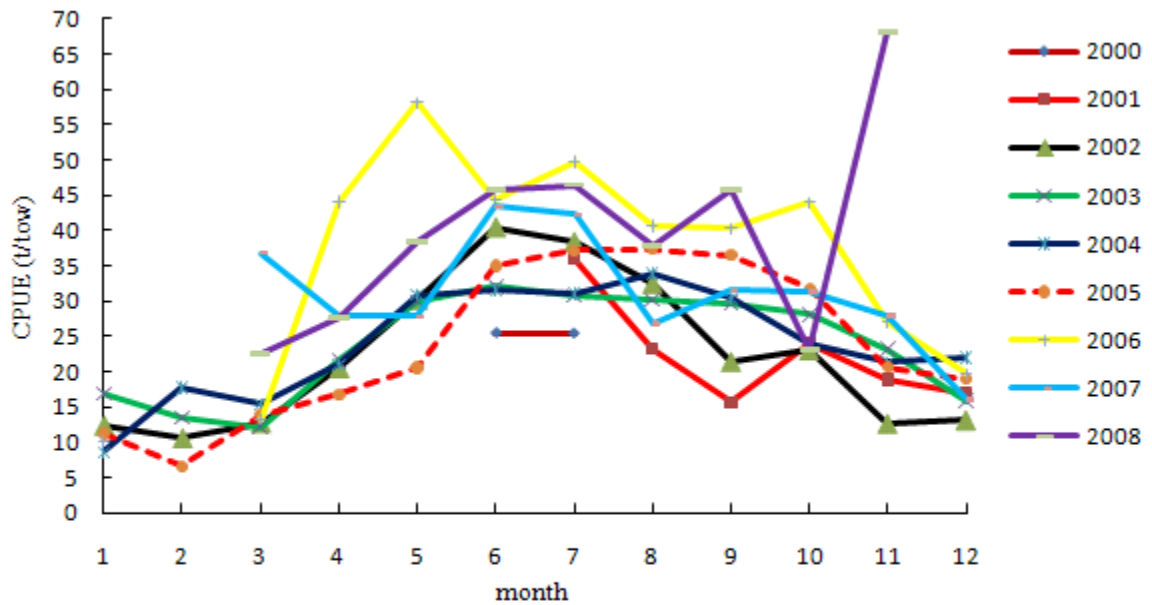


Fig 2 the average monthly CPUE (t/tow) of CJM by Chinese fishing fleet in Southeast Pacific (FAO Area 87) between the years of 2000 and 2008

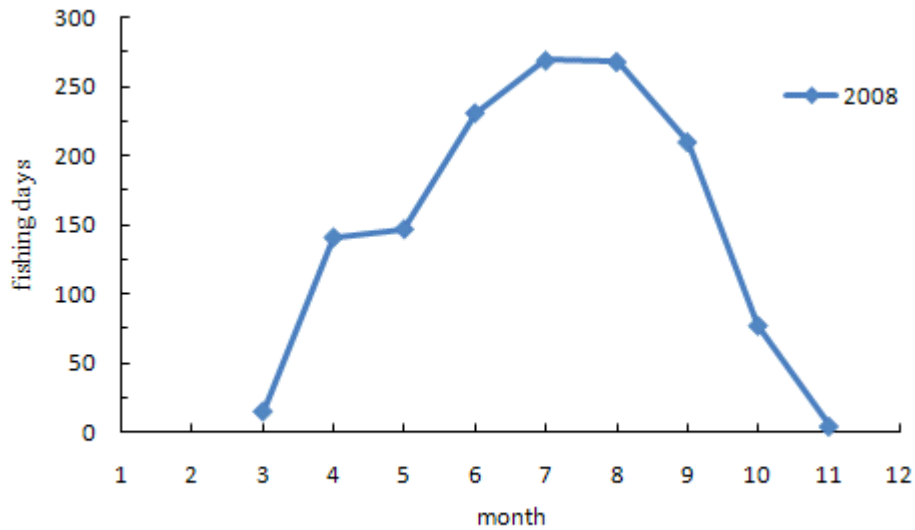


Fig 3 fishing days of Chinese fishing fleet per month

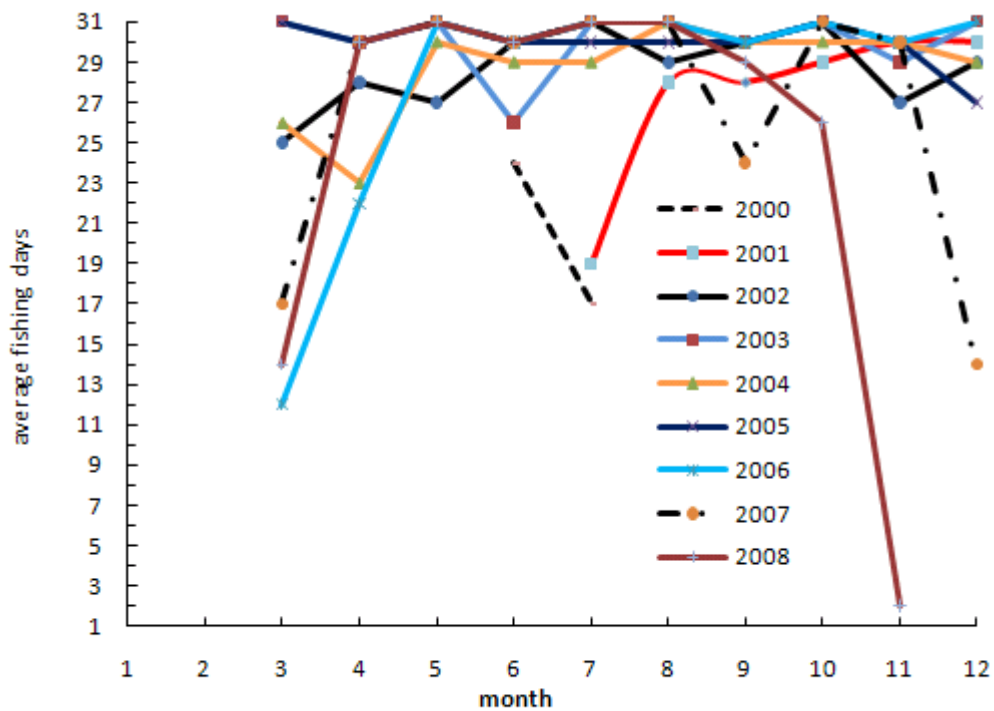


Fig 4 fishing days composition of CJM per vessel in average

2 Fisheries Data Collection and Research Activities

China Fisheries Association (CFA) and Shanghai Ocean University (SHOU) jointly take charge of the Jack Mackerel fisheries data collection and research activities. The fisheries data collection was carried out by Chinese fishing fleet cooperating with the Chinese fishery scientific observers program. And a full log books collection program have been carried out in 2009 and delivered to SHOU for research study purpose.

Three of Chinese fishing vessels (3/11, 27.3%) were dispatched the fishery scientific observers on board, namely “Kai Xin”, “Kai Fu” and “Fu Xing Hai”.

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 collected 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.

Biological items measured on board by the random sampling are fork length, body height, width and girth, body weight and net weight without organs, sex, germ cells maturity, contents 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 contents 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 Chilean Jack Mackerel taken by Chinese scientists were mainly in the fields of biological characteristics, distribution of stocks and population, fishing ground, oceanic environment, DNA, etc.. The major research activities in the future will be Chilean Jack Mackerel resource survey, stock assessment, DNA tests and so on.

3. Biological Sampling and Length / Age Composition of Chilean Jack Mackerel

Altogether 12,320 Chilean Jack Mackerel 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 contents and fullness etc. 2550 otoliths and 37972 fork length data by punching hole (mark the fork length on a piece of oilpaper by punching a hole) have been collected too. The results are shown in table 6, 7 and fig. 3.

Table 6 fork length (mm) composition of Chilean Jack Mackerel

| 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% |

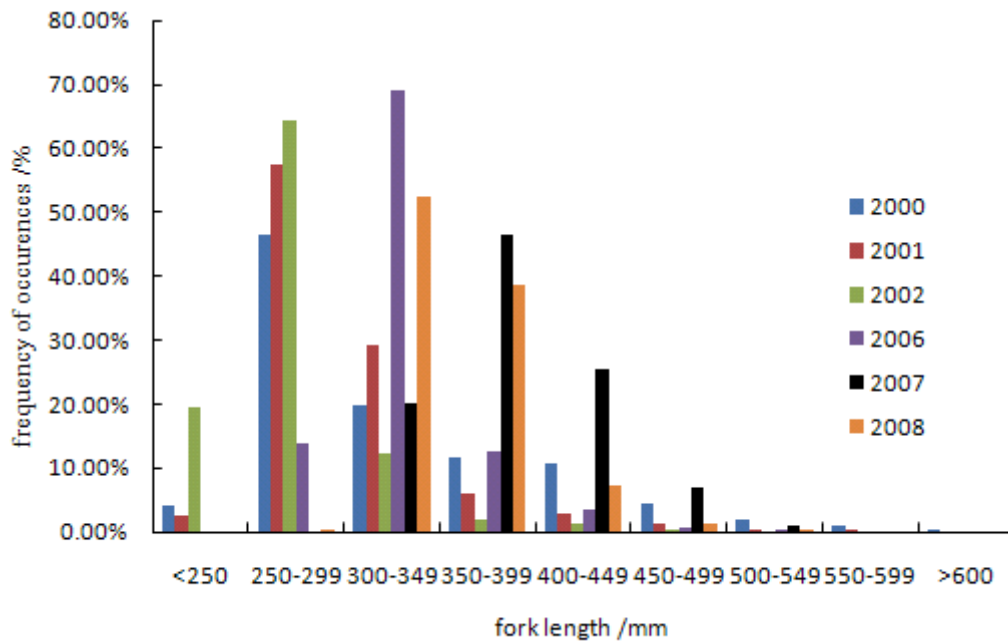


Fig.5 fork length (mm) composition of Chilean Jack Mackerel

Table 7 the relationship between age and fork length of *Trachurus murphyi* in 2006

| size class (FL/mm) | age class | | | | | | | | tail 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 |
| tail 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 | |

4. Fishery Scientific Observer Programmers

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, and SHOU also responds for the data evaluation and debug, carrying the scientific research and so on. The FSOP has been already under way since 2007.