# Records on the catch of albacore in the North Pacific Ocean from the China longline fishery (2002-2011)

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## 1. Introduction

North Pacific albacore are highly migratory species and these movements are influenced by ocean conditions. Seasonal movements have been observed, especially among juvenile fish, which move into temperate waters of the eastern and western Pacific Ocean in the spring and early summer and return to the central Pacific Ocean in the late fall and winter. Adults tend to be distributed more widely than juveniles and migrate to lower latitudes to spawn. The present report analyzed the spatial pattern of albacore in the North Pacific Ocean based on the China longline fishery data from 2004 to 2011.

## 2. Data source

We obtain the monthly fishery data of Chinese fishing boats with the assistant of the Chinese Ministry of Agriculture and the Distant Water Fisheries Branch of China Fisheries Association. Data presented in this report had been submited to the WCPFC and IATTC.

## 3. Results

### 3.1 Total catch of albacore from 2002 to 2011

Total catch of albacore and the CPUE in the North Pacific Ocean from the China longline fishery from 2002 to 2011 are presented in Table 1 and Fig. 1. Catch of albacore of 2002 was 210.0 mt, varied between 453.3 and 665.3 mt from 2003 to 2006, the catch efforting was 26.0-47.3 kg/1000hooks. Much lower catch of albacore (76.6-184.9 mt) and CPUE values (3.9-18.9 kg/1000hooks) was recorded from 2007 to 2009. In 2010, the catch of albacore recovered to 906.5 mt, the CPUE values were 33.5 kg/1000hooks and 2.2 ind./1000hooks. And in 2011, significantly increased catch of albacore (2927.8 mt) and CPUE values (85.3 kg/1000hooks and 5.1 ind./1000hooks) was recorded.

### 3.2 Monthly catch of albacore at different latitude and longtitude ranges in 2010

Catch and catch efforting of albacore in the North Pacific Ocean from the China longline fishery in 2010 was presented in table 2 at four different latitude levels: N0º-5º, N5º-10º, N10º-15º, and N15º-20º. At the latitude N0º-5º, the lowest catch of albacore (31.7 mt) as well as the lowest value of CUPE (4.0 kg/1000hooks, 0.2 ind./1000hooks) was recorded; highest catch of



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albacore (501.5 mt) was recorded at the latitude N5º-10º with the highest catch efforting (17,032.1 thousand hooks), the value of CPUE was morderate (29.3 kg/1000hooks, 1.8 ind./1000hooks). Although with lower catch efforting (1,147.1 and 839.0 thousand hooks, respectively) as well as lower catch (199.2 mt and 174.1 mt, respectively), higher values of CPUE were recorded at higher latitude N10º-15º (173.6 kg/1000hooks, 11.5ind./1000hooks) and N15º-20º (207.5 kg/1000hooks, 15.8 ind. /1000hooks). There was no fishery record at the latitude higher than N20º.

Annual variations on the monthly catch of albacore from the China longline fishery in 2010 at four latitude levels in the North Pacific Ocean, N0º-5º, N5º-10º, N10º-15º, and N15º-20º, was presented in Fig.2. Obvious changes can be observed in the zones of N5º-10º and N10º-15º, the catch of albacore from June to December was higher than that from January to May. Highly increased catch (114.1 mt, 7537ind.) was recorded in December at the latitude N5º-10º. However, there was no obvious annual tendency can be observed in the zones of N0º-5º and N15º-20º.

Catch of albacore from the China longline fishery in 2010 at different longtitude ranges in the North Pacific Ocean was presented in Fig.3, the catching effort was presented in Fig.4. Catch of albacore was frequently recorded at the longtitude range between W110º-150º at the latitude N5º-15º (Fig.3, b&c). At the latitude N5º-N10º, the catch of albacore was also frequently recorded at the longtitude E155º-175º, whereas at the latitude N15º-N20º, the catch of albacore was only recorded at the longtitude E150º-165º.

**3.3 Monthly catch of albacore at different latitude and longtitude ranges in 2011**

Catch and catch efforting of albacore in the North Pacific Ocean from the China longline fishery in 2011 was presented in table 3 at four different latitude levels: N0º-5º, N5º-10º, N10º-15º, and N15º-35º. At the latitude N0º-5º and N5º-10º, higher catch efforting (12,591,903 and 18,298,433 hooks, respectively) as well as higher catch (825.8 mt and 1420.2 mt, respectively) was recorded, the CPUE values varied at 65.6-77.6 kg/1000hooks and 3.5-4.8ind. /1000hooks. At the higher latitude N10º-15º and N15º-35º, lower catch efforting (3,264,790 and 151,300 hooks, respectively) as well as lower catch (567.9 mt and 113.9 mt, respectively) was recorded,



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however, the CPUE values were much higher, varied at 173.9-752.8 kg/1000hooks and 11.5-39.9ind. /1000hooks.

Annual variations on the monthly catch of albacore from the China longline fishery in 2011 at four latitude levels in the North Pacific Ocean, N0º-5º, N5º-10º, N10º-15º, and N15º-35º, was presented in Fig.5. Highly increased catch was recorded in February at the latitude N10º-15º (320.7mt, 21472ind.), in May at the latitude N0º-5º (228.9 mt, 11315ind.), and in December at the latitude N5º-10º (288.2, 18458ind.). However, there is no obvious annual tendency can be observed at all the latitude levels.

Catch of albacore from the China longline fishery in 2011 at different longtitude ranges in the North Pacific Ocean was presented in Fig.6, the catching effort was presented in Fig.7. At the latitude N0$^{o}$-10$^{o}$, catch of albacore was recorded at almost all the longtitude zones in the North Pacific Ocean, (Fig.5, c&d). A suddenly increased catch of albacore (320.6 mt) was observed at the longtitude W170$^{o}$-175$^{o}$, latitude N10$^{o}$-15$^{o}$ from a single month (Fig.5, b).



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**Tab. 1** Total catch of albacore and the CPUE in the North Pacific Ocean from the China longline fishery from 2004 to 2011.

| Year | Hooks (x1000) | Weight (mt) | Number | CPUE | |
|---|---|---|---|---|---|
| | | | | kg/1000hooks | ind./1000hooks |
| **2002** | 13,357.4 | 210.0 | - | 15.7 | - |
| **2003** | 21,682.4 | 643.1 | - | 29.7 | - |
| **2004** | 19,362.0 | 504.2 | - | 26.0 | - |
| **2005** | 9,764.5 | 453.3 | - | 46.4 | - |
| **2006** | 14,054.5 | 665.3 | - | 47.3 | - |
| **2007** | 7,043.3 | 132.8 | - | 18.9 | - |
| **2008** | 12,143.8 | 184.9 | 8,701 | 15.2 | 0.7 |
| **2009** | 19,325.4 | 76.6 | 5,167 | 4.0 | 0.3 |
| **2010** | 27,047.6 | 906.5 | 58,675 | 33.5 | 2.2 |
| **2011** | 34,306.4 | 2927.8 | 175,925 | 85.3 | 5.1 |

**Tab. 2** Catch of albacore and the CPUE at different latitude in the North Pacific Ocean from the China longline fishery in 2010.

| Latitude | Hooks (x1000) | Weight (Mt) | Number | CPUE | |
|---|---|---|---|---|---|
| | | | | kg/1000hooks | ind./1000hooks |
| **N0º-5º** | 7,951.4 | 31.7 | 1,814 | 4.0 | 0.2 |
| **N5º-10º** | 17,032.1 | 501.5 | 30,354 | 29.3 | 1.8 |
| **N10º-15º** | 1,147.1 | 199.2 | 13,235 | 173.6 | 11.5 |
| **N15º-20º** | 839.0 | 174.1 | 13,272 | 207.5 | 15.8 |

**Tab. 3** Catch of albacore and the CPUE at different latitude in the North Pacific Ocean from the China longline fishery in 2011.

| Latitude | Hooks | Weight (Mt) | Number | CPUE | |
|---|---|---|---|---|---|
| | | | | kg/1000hooks | ind./1000hooks |
| **N0º-5º** | 12,591,903 | 825.8 | 43,746 | 65.6 | 3.5 |
| **N5º-10º** | 18,298,433 | 1420.2 | 88,558 | 77.6 | 4.8 |
| **N10º-15º** | 3,264,790 | 567.9 | 37,589 | 173.9 | 11.5 |
| **N15º-35º** | 151,300 | 113.9 | 6,032 | 752.8 | 39.9 |



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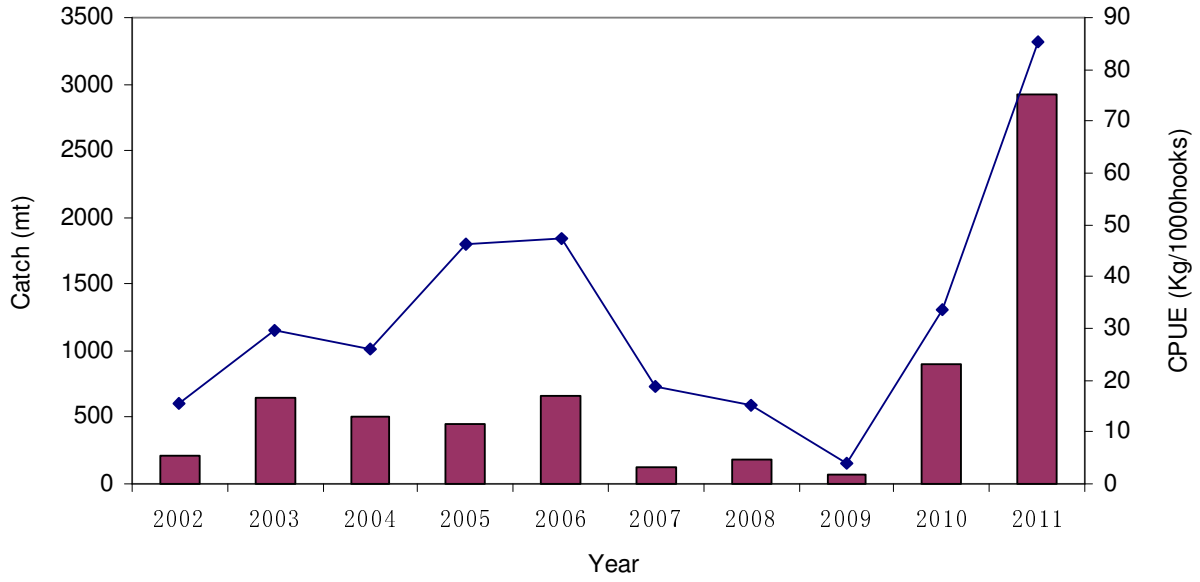


**Fig. 1** Total catch and CPUE of albacore in the North Pacific Ocean from the China longline fishery (2002-2011)

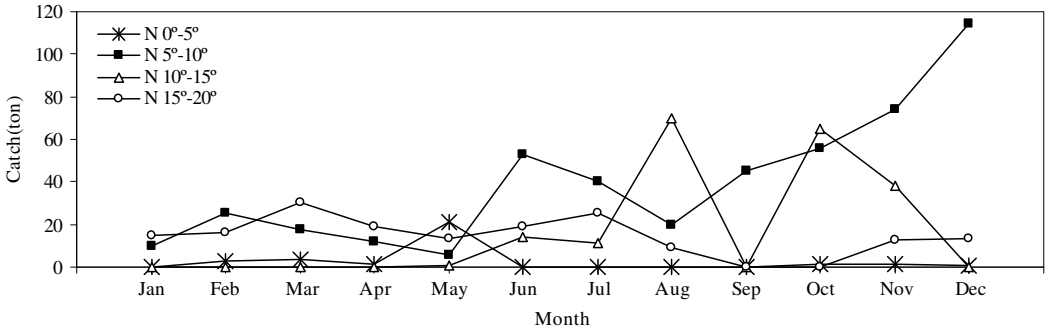


**Fig. 2** Annual variations on the monthly catch of albacore from the China longline fishery in 2010 at four latitude levels in the North Pacific Ocean.



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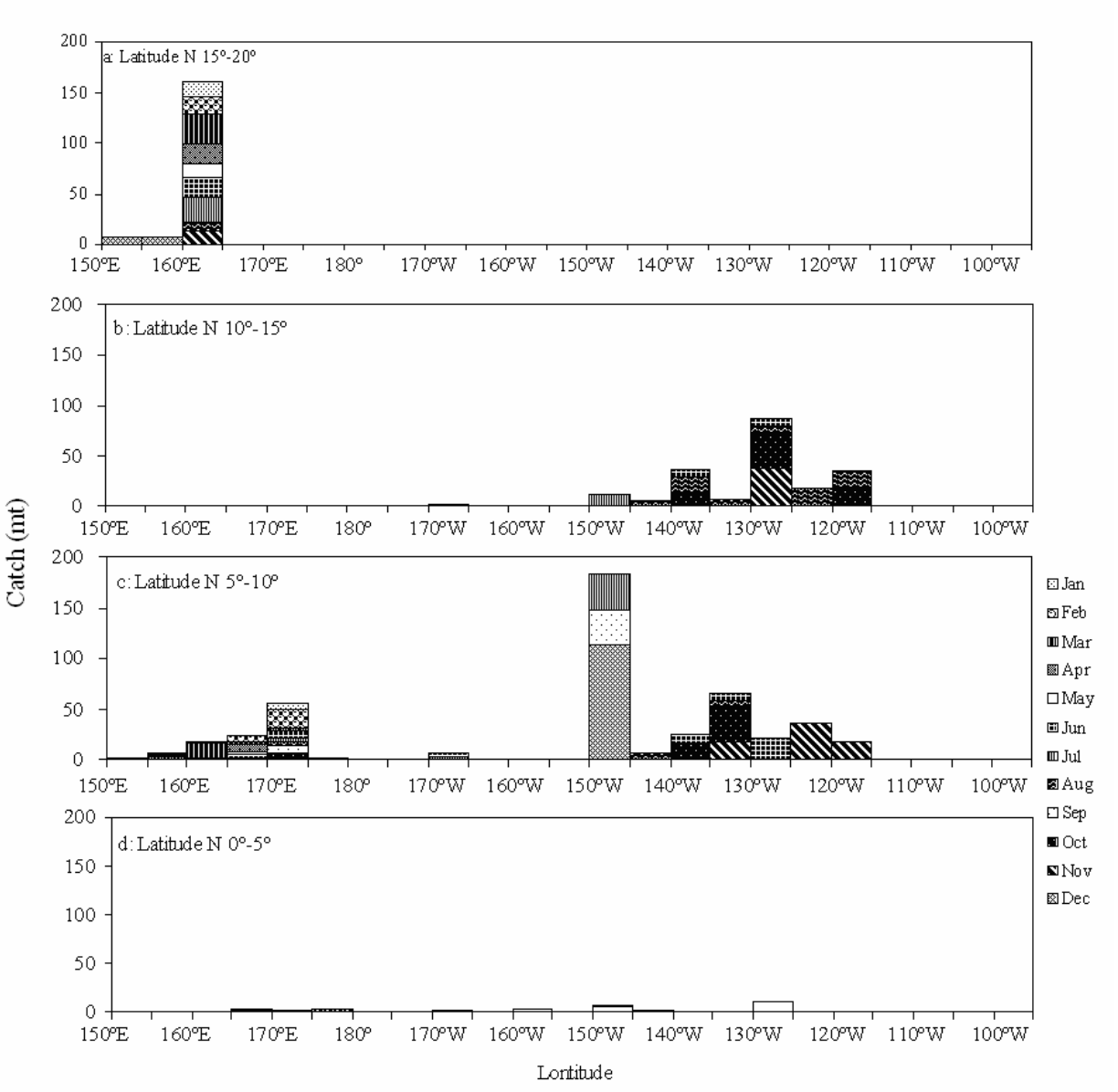


**Fig. 3** Catch of albacore from the China longline fishery in 2010 at different longtitude ranges in the North Pacific Ocean, a) catch at latitude N15-20$^{o}$; b) catch at latitude N10-15$^{o}$; c) catch at latitude N5$^{o}$-10$^{o}$; d) catch at latitude N0-5$^{o}$.



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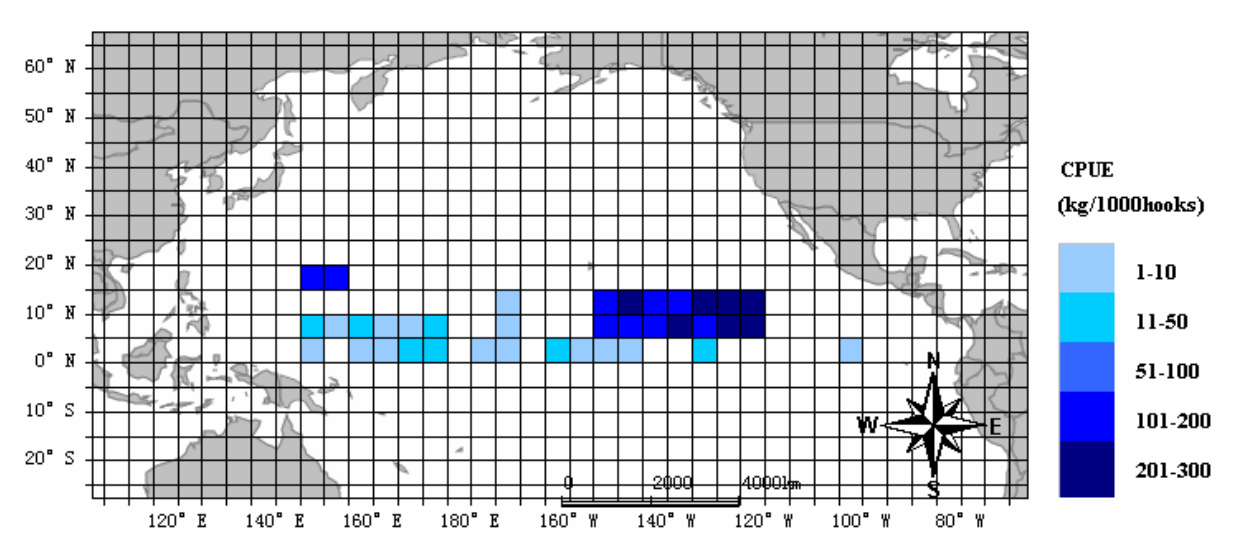


**Fig. 4** Catching effort of albacore from the China longline fishery in 2010 in the North Pacific Ocean.

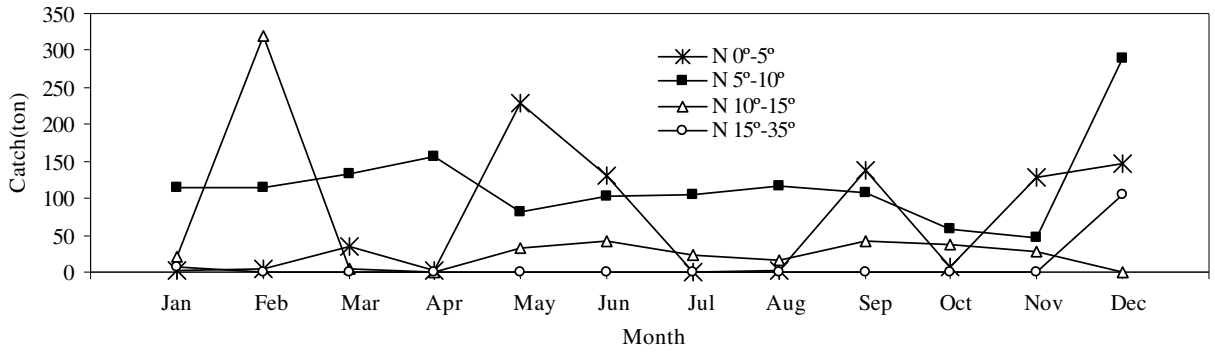


**Fig. 5** Annual variations on the monthly catch of albacore from the China longline fishery in 2011 at four latitude levels in the North Pacific Ocean.



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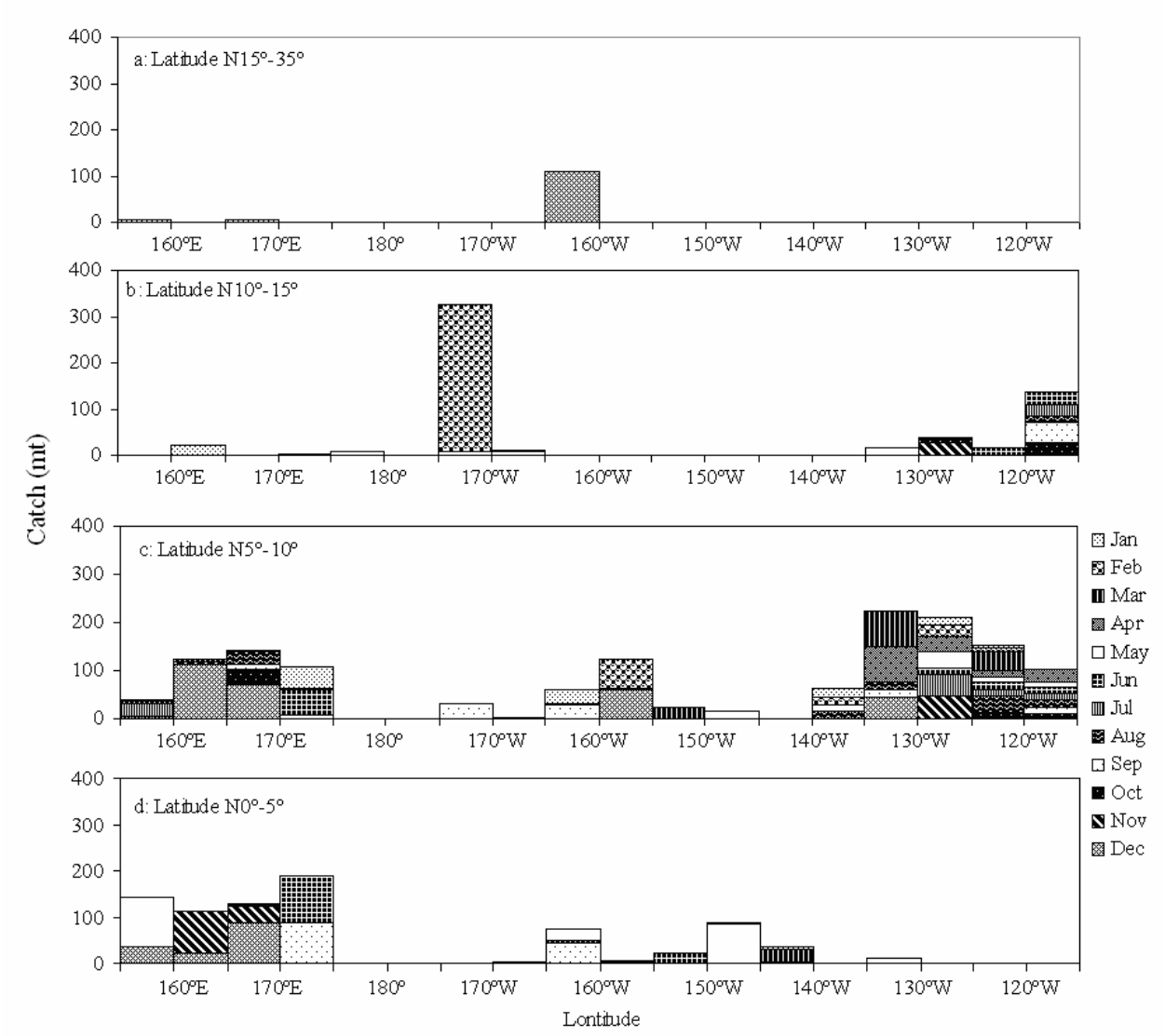


**Fig. 6** Monthly catch of albacore from the China longline fishery in 2011 at different longtitude ranges, a) catch at latitude N15-35$^{o}$ ; b) catch at latitude N10-15$^{o}$ ; c) catch at latitude N5-10$^{o}$ ; d) catch at latitude N0-5$^{o}$ .



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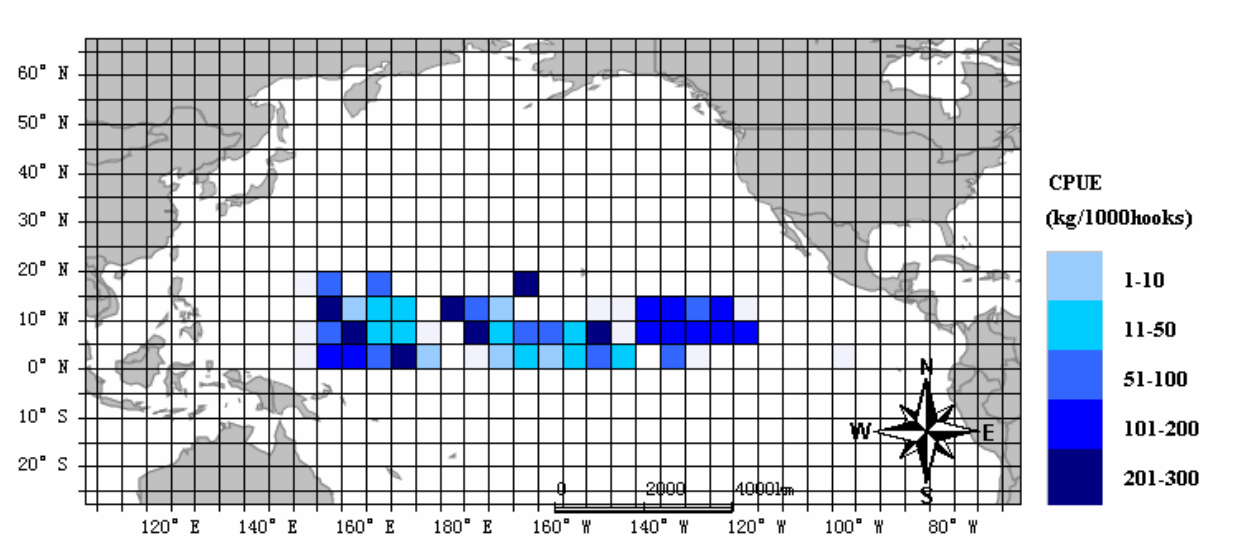


**Fig. 7** Catching effort of albacore from the China longline fishery in 2010 in the North Pacific Ocean.



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