Shanghai Ocean University

College of Marine Science

China's Squid Fishing Technology Group

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Age, growth and population structure of purple-back flying squid (*Sthenoteuthis oualaniensis*) in the Xisha Islands Waters of the South China Sea by beak microstructure

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Background

- 1). Purple-back flying squid (*S. oualaniensis*) is widely inhabited into warmer waters in equatorial Indo-Pacific Ocean with abundant resources.
- 2). Beak is one of the important hard structures for cephalopod with favorable ability of information storage for fishery biology and ecology.
- 3). Fishery biology, ecology and life history of *S. oualaniensis* were conducted from previously fundamental studies in other areas, except for the South China Sea of Western Pacific Ocean.

Objective

- 1). We should explore the age, growth pattern and life history of *S. oualaniensis* in the South China Sea of Western Pacific Ocean.

Sampling

Sampling Areas

1). May-Aug, 2017 (12-18° N, 110-115° E)
May-Aug, 2018 (11-17° N, 114-117° E)

2). **1180** squid samples were randomly caught and collected in the survey by Chinese lighting falling-net vessels.

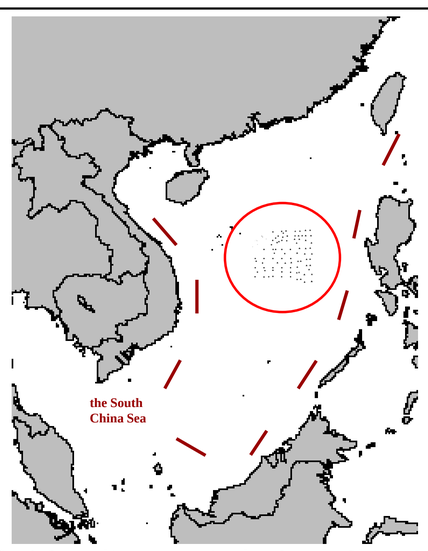


Fig.1 Sampling areas in the South China Sea

Fig.2 *Sthenoteuthis oualaniensis*

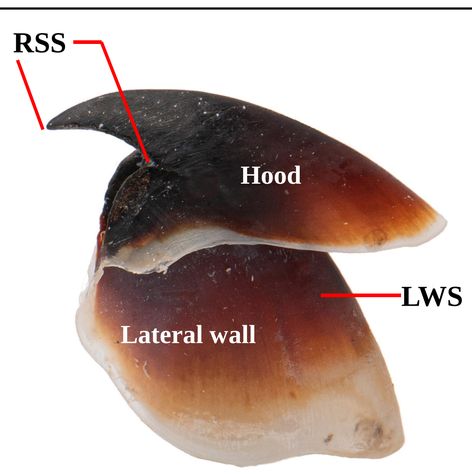


Fig.3 Rostrum sagittal section (RSS)

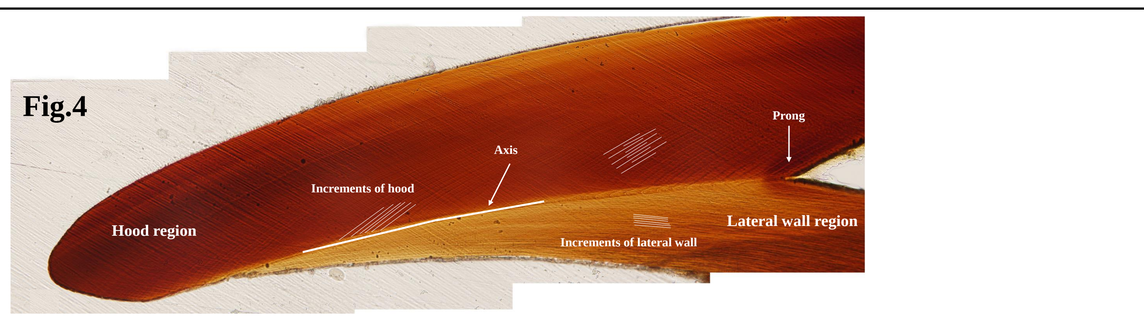
Materials & methods

Beak microstructure

1). The microstructure characteristics of rostrum sagittal section (RSS) was demonstrated.(Fig.4)

2). Many distinguishing increments called "check", were easily divided from the other common increments.(Fig.5)

3). Several paler sub-day increments were found in each internal of daily increments. (Fig.6)



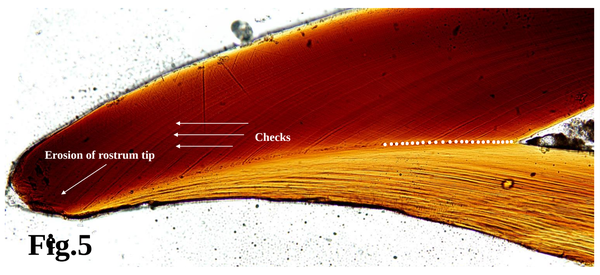


Fig.5

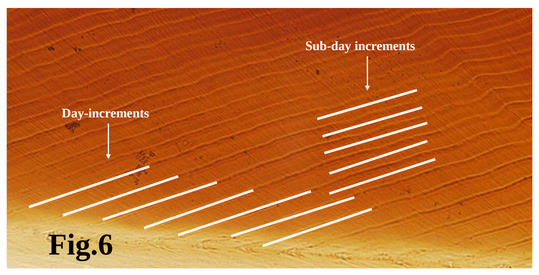


Fig.6

Methods

1). 4 models were established to quantify the relationships between mantle length, body weight and age.

2). The smallest Akaike information criterion (AIC) was used to compare the 4 types models and filtrated the optimal model.

3). Absolute daily growth rate (AGR, mm/d or g/d) and instantaneous growth rate (IGR, %/d) between mantle length, body weight were estimated for each 30-day interval.

Results

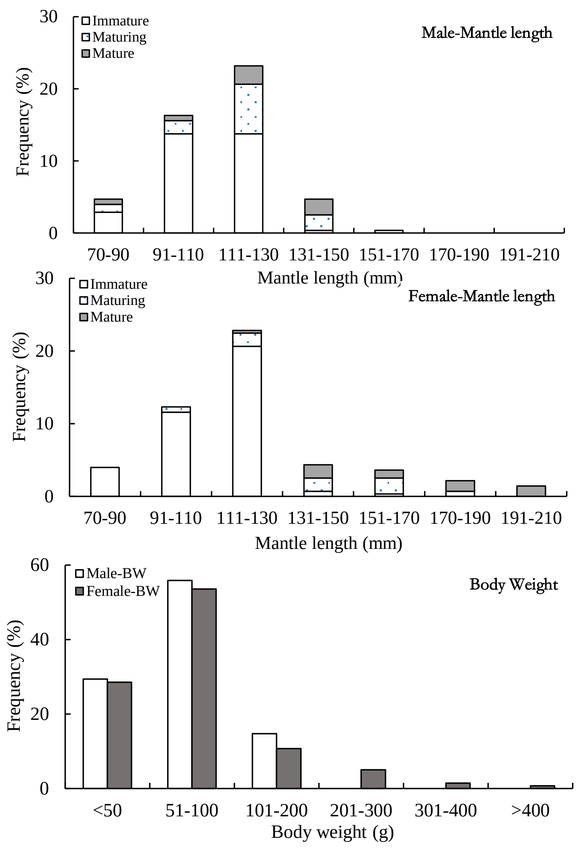


Fig.7 Distribution of mantle length and body weight

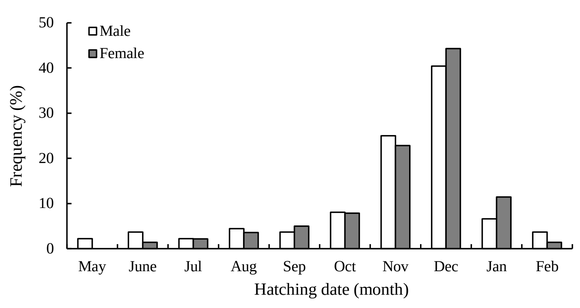


Fig.8 Distribution of body weight and hatching date

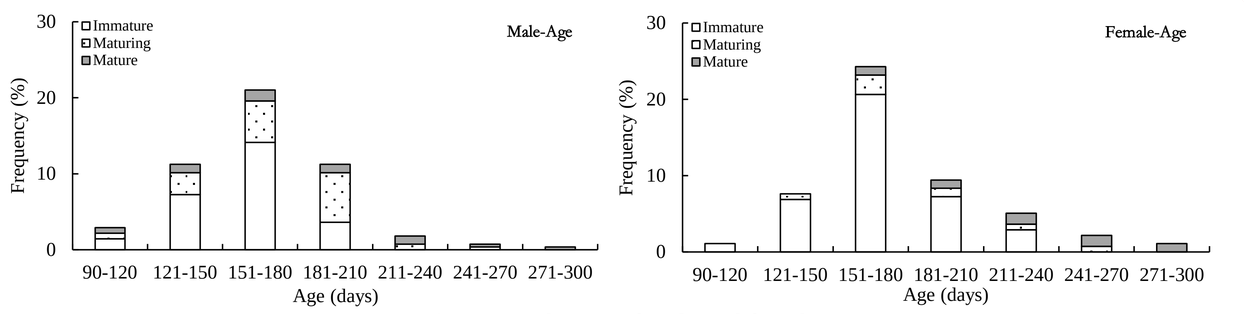


Fig.9 Distribution of male and female age

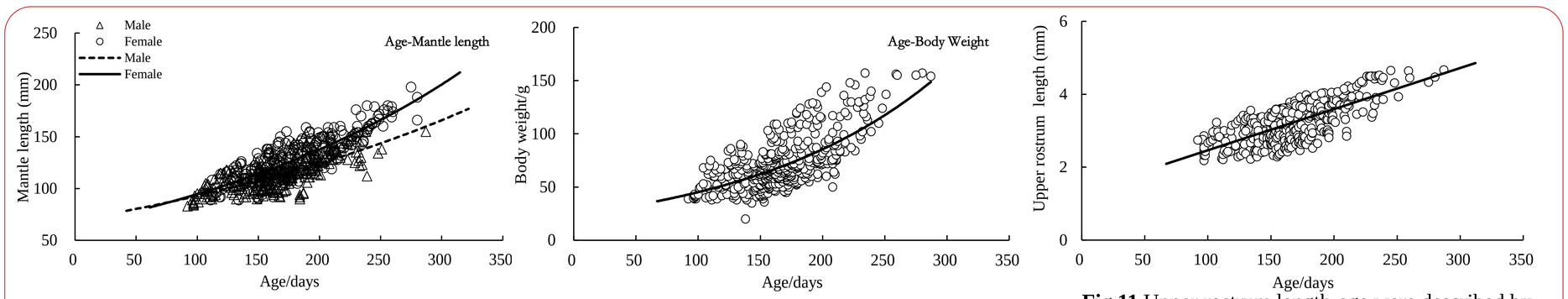


Fig.10 Mantle length/Body weight-age were described by exponential growth model

Fig.11 Upper rostrum length-age were described by linear growth model

Conclusions

1). Our result was indicated that the squids belong to Autumn-Winter hatching groups, and most of the age distribution was at 4-7 months.

2). From the relationship of mantle length-age, we can observe the nearly synchronous growth rate pattern between males and females about 130 days ago.

3). From our result, we found and confirmed that the purple-back flying squids in Xisha Islands waters of South China Sea have reached at mature stage about 210 days (7 Months), and spawning season would sustain for 1-3 months (210-300 days).

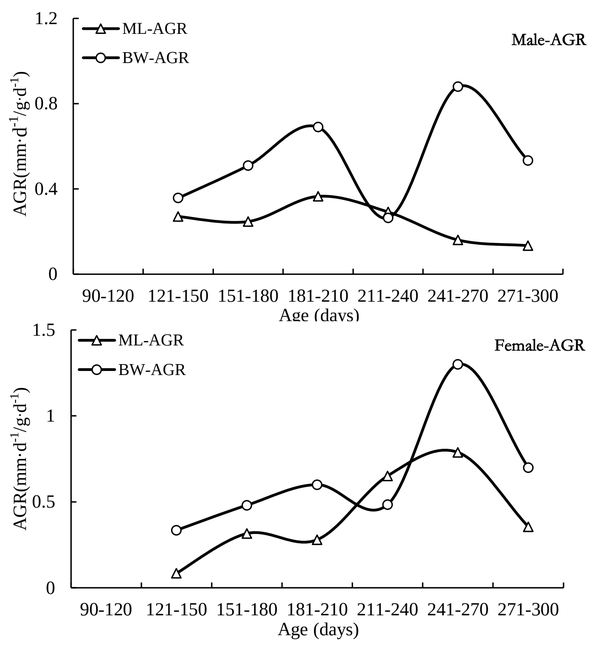


Fig.12 Distribution of absolute daily growth rate

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2). Thanks for China's Squid Fishing Technology Group.

3). Thanks for this presentation could be displayed in CIAC 2022.