Study on the difference characteristics of spring and autumn in Tie Bay ecosystem

LUO Minbo [1], LI Tianxiang[1,2]， WANG Yunlong[1] ， JIANG Mei[1]

(1. East China Sea Fisheries Research Institute, Chinese Academy of Fishery Sciences, Shanghai 200090, China;
2. College of Marine sciences, Shanghai Ocean University, Shanghai 201306, China)

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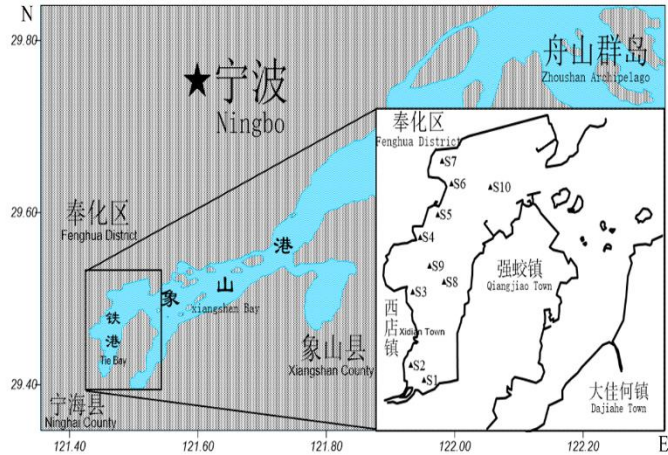
1、 Research methods -
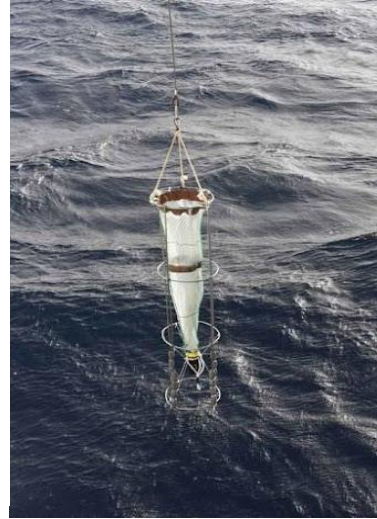

Fig.1 Distribution of sample sites of Tie Bay

Fig.2 Survey methods

According to *specifications for oceanographic survey*

Model Application:
Ecopath model was applied to divide the biological communities of the ecosystem into different functional groups according to different niches.

Data analysis

$$B_i \left(\frac{P}{B}\right)_i EE_i = \sum_{j=0}^{n} B_j \left(\frac{Q}{B}\right) DC_{ji} + EX_i$$

In formula, B is biomass; P is the production; Q is consumption; EE is the conversion efficiency of ecological nutrition; DC_{ji} is a food composition matrix, which indicates the proportion of prey i in the food composition of predator j; EX_i is output.
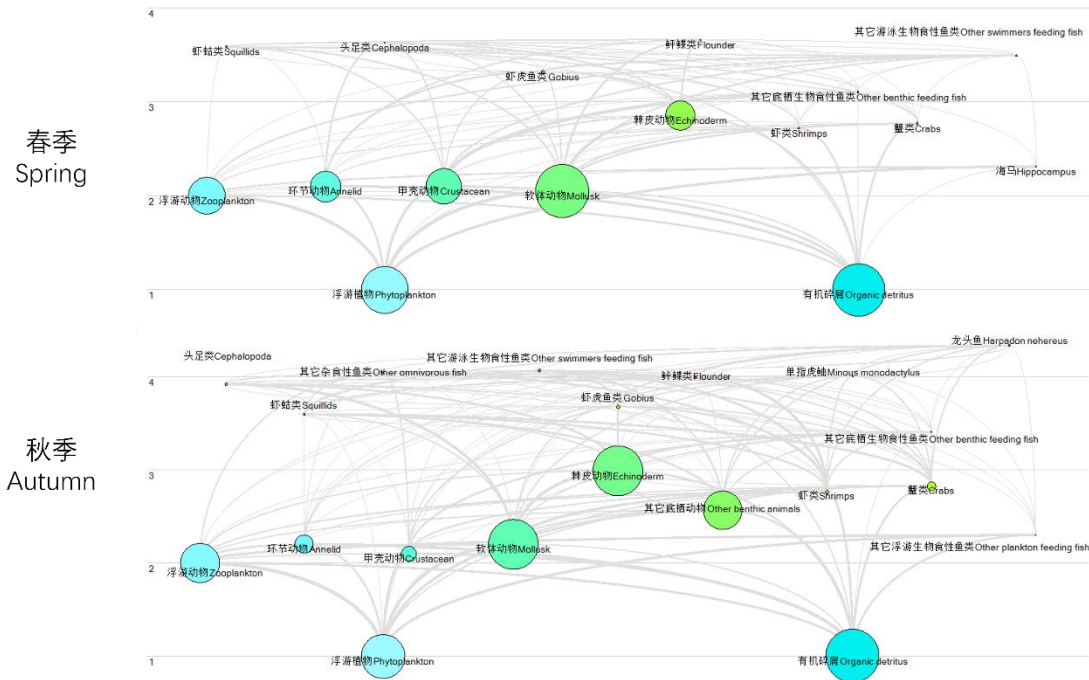
2.1 Food Web of Tie Bay Ecosystem

Fig.3 Food Web of Tie Bay Ecosystem in Spring and Autumn 2021
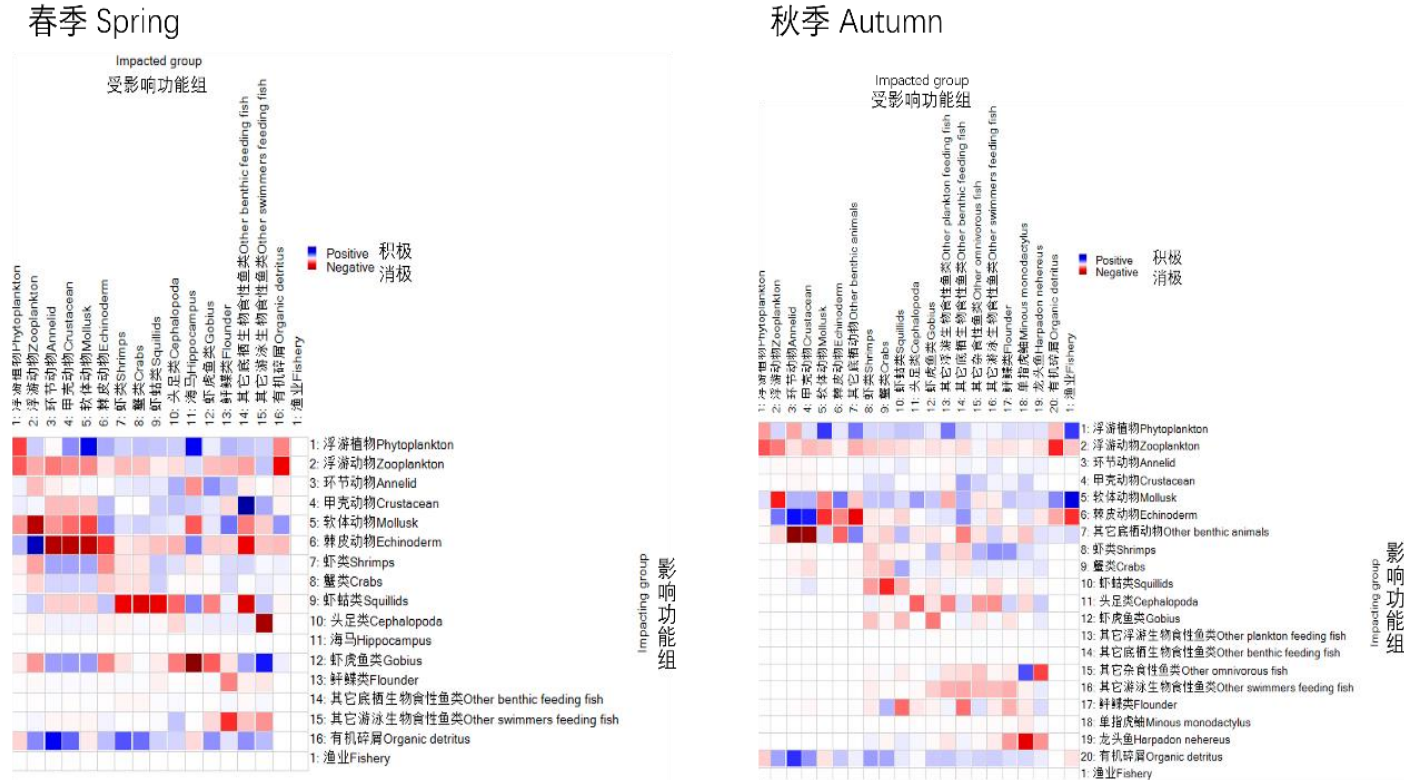
2.2 Effects of mixed nutrition in the Tie Bay ecosystem

Fig.4 Effects of mixed nutrition on the Tie Bay ecosystem in Spring and Autumn 2021

3.Conclusion

3.1 There Were 16 functional groups in spring and 20 functional groups in autumn, covering the whole process of energy flow in the Tie Bay ecosystem. The results showed that the energy conversion efficiency in autumn was much higher than that in spring, and the nutrient level and nutrient conversion efficiency of all functional groups in autumn were higher than that in spring.

3.2 The total energy flow of the ecosystem in spring and autumn was 11419.57 $t\cdot km^{-2}\cdot a^{-1}$ and 7314.99 $t\cdot km^{-2}\cdot a^{-1}$, respectively, and the trophic levels of each functional group were 1.00~3.66 and 1.00~4.34, respectively. The grazing food chain was the main energy flow channel.

3.3 The average trophic level of the fishery resource components in autumn was between II and III. Organisms such as phytoplankton and most benthic organisms, which were in key positions of energy flow, played an active role in most functional groups. The energy utilization rate of the Tie Bay ecosystem in spring and autumn was low and there was a lot of surplus production that was not fully utilized. The Tie Bay ecosystem was in the immature development stage.