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The Holocene Transgression, Foraminiferal
Faunas and Sealevel Changes in China

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(Summary)

Over past ten years, the author has carried out many researches into the Holocene stratigraphy of the Chinese seaboard areas, now we choose 15 typical drill holes from 5 provinces and one city, they are Liaoning, Hebei, Zhejiang, Fujian, Guangdong province and Shanghai city, for outlining study on the Holocene transgression, Foraminiferal faunas and sealevel changes in the Chinese seaboard areas.

During the Holocene, the transgression took place in the Chinese seaboard areas that is widespread (Fig.1, Table 1). The maximum thickness of the transgression stratum is 30 metres about, but in different area or in the different part of geomorphic and tectonic unit, its thickness and its distribution in time are not the same, they may be distinguished several types as follows:

1. Early Holocene (EH) type: Only the Early Holocene stratum is the transgression stratum. During the Middle to Late Holocene the sea water withdrew from there and the sedimentary facies changed from marine facies into continental facies, such as in the area of the Nanpi county, Hebei province.

2. Early-Middle Holocene (EMH) type: The Early-Middle Holocene stratum is the transgression stratum, but during the Late Holocene the sea water started to withdraw from there, the sedimentary facies changed from marine facies into transitional facies to continental facies, such as the area of the Dawa county, Liaoning province.

China		Europe
N. China	S. China	Flandrian transgression
Tianjin transgression	Changle transgression	

Table 1, Comparison of transgression strata.

3. Middle Holocene (MH) type: The Middle Holocene stratum is the transgression stratum only, but during the Early Holocene and Late Holocene, the sedimentary facies are all the continental facies, such as the area of Donggou county, Liaoning province.

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4, Holocene(H) type: Whole Holocene stratum is all the transgression stratum, such as the area of the Huanghua county, Hebei province and the Baoshan county, Shanghai city.

There are very abundant foraminiferal fossils in the Holocene transgression stratum, according to the research of foraminiferal faunas, that can be fallen into five regional assemblages of foraminifera (Table 2). Based on the ecological features of foraminiferal assemblages, the five regional assemblages of foraminifera can be broken down into two categories:

1. Littoral-Inner neritic assemblage type: The main foraminifera in this assemblage type are as follows Pseudononionella variabilis, Ammonia tepida, Quinqueloculina akneriana rotunda, Elphidium hispidulum, Nonion spp. etc., they are all the shallow water species, the depth of water are 0-20 metres about. This assemblage type distribute mainly in Early Holocene, Late Holocene and some Middle Holocene transgression strata.

2. Inner-Middle neritic assemblage: The main species of this assemblage type are also composed by shallow water species, but the percentages of the foraminifera of the deep water categories such as Bulimina spp., Lagena spp., Trifarina spp. and planktonic foraminifera it go up outstanding, it shows that the depth of water may be over 20-30 metres, and the environments extend from inner neritic to middle neritic. This assemblage type distribute mainly in Middle Holocene, such as Paleo-Taiwan Strats region.

From the research of the Holocene transgression strata and foraminiferal faunas in China that have been mentioned above, we can find out the sketch of the sealevel changes in Chinese seaboard areas during the Holocene (Fig.2).

At the begining of Holocene (10,000 ys. BP), the sealevel went up to 22 metres below present sealevel, in the begning of Middle Holocene (8,000 ys. BP) it rose to 14 metres below the present sealevel, on that time from Middle Holocene into Late Holocene (5,000 ys. BP), the sealevel ascended to 7 metres below the present sealevel, then it was rising slowly to the present sealevel.

From the Fig.2, we can find out that the sealevel changes in the Chinese seaboard areas are the slow rising course. The curve of the sealevel changes in the Chinese seaboard areas that have been drawn by us, it is similar with K.O. Emery's curve. But from the climatic curve which was drawn by author, we can imagine that the sealevel of the Paleo-China Sea took place at least three times bigger fluctuations during the Holocene, and there was several times second-class fluctuations following during the every bigger fluctuations.

Locality Epoch	The north margin of Paleo-Yellow Sea	Paleo-Bohai	Paleo-East China Sea	Paleo-Taiwan Strats	Paleo-South China Sea
Late Holocene		<u>Ammonia tepida</u> <u>Monion</u> spp. <u>Cribrononion</u> spp.	<u>Ammonia tepida</u> <u>Epistominella</u> <u>naraensis</u> <u>Monion glabrum</u>	<u>Ammonia tepida</u> <u>Elphidium</u> <u>hispidulum</u> <u>Pseudorotalia</u> <u>schroeteriana</u>	<u>Triloculina</u> <u>trigonula</u> <u>Cribrononion</u> spp. <u>Elphidium</u> spp.
Middle Holocene	<u>Ammonia</u> spp. <u>Arenoparrella</u> <u>Mexicana</u> <u>Trochammina</u> <u>inflata</u>	<u>Ammonia tepida</u> <u>Ammonia</u> <u>annectens</u> <u>Monion</u> spp.	<u>Globigerina</u> <u>falconensis</u> <u>Ammonia tepida</u> <u>Florilus</u> <u>decorus</u>	<u>Bulimina</u> spp. <u>Lagena</u> spp. <u>Fissurina</u> spp.	<u>Triloculina</u> <u>trigonula</u> <u>Spiroloculina</u> <u>laevigata</u> <u>Pararotalia</u> <u>inermis</u>
Early Holocene		<u>Ammonia tepida</u> <u>Pseudononionella</u> <u>variabilis</u> <u>Protelohidium</u> spp.	<u>Ammonia tepida</u> <u>Elphidium</u> <u>magellanicum</u> <u>Pseudononionella</u> <u>variabilis</u>	<u>Cribrononion</u> <u>incertum</u> <u>Ammonia tepida</u> <u>Elphidium</u> <u>hispidulum</u>	<u>Quinqueloculina</u> <u>akneriana</u> ro- tunda <u>Ammonia tepida</u> <u>Elphidium</u> <u>hispidulum</u>

Table 2, Comparison of foraminiferal assemblages.