УДК 551.732(512)

CORRELATION OF CAMBRIAN CHRONOSTRATIGRAPHIC SUBDIVISION IN SHANDONG

Min Gao, Jiu Chuanwei, Ping Liwang

Shandong Provincial Key Laboratory of Depositional Mineralization and Sedimentary Minerals, College of Geological Sciences and Engineering, Shandong University of Science and Technology, Shandong, China;
e-mail: jcwee@126.com

Поступила в редакцию 10 июня 2013 г.

The aim of the paper is to solve many confused problems of the Cambrian chronostratigraphic subdivision in Shandong and determine the bottom boundaries of the Cambrian local stages. By analyzing domestic and foreign researches on the Cambrian, the delimitations of Shandong Cambrian stages are contrasted with the globe and South China's update Cambrian chronostratigraphic subdivisions based on the trilobite fossils. The main problems of the Cambrian chronostratigraphic subdivision in Shandong are discussed by the biostratigraphic methods. Finally, the research shows that the subdivisions of the Canglangpuian, Longwangmiaoan, Maozhuangian, Hsuchuangian, and Fengshanian stages in Shandong cannot be correlated with the subdivisions of the International Stratigraphic Chart. The lower boundary of the Zhangxian stage in Shandong corresponds to that of the global Drumian stage, the bottom boundary of the Gushanian stage is in agreement with that of the Guzhangian stage within the globe, and the lower boundary of the Furongian series of the globe is slightly lower as compared with that of the Changshanian stage in Shandong. The layer of the *Iapetognathus* conodont first appeared at the Cambrian–Ordovician boundary.

Keywords: **correlation, Cambrian, chronostratigraphic, subdivisions, trilobite, Shandong, the International Stratigraphic Chart, South China.**

INTRODUCTION

The Cambrian system in Shandong has continuous outcrops and it is most completely investigated. The researches on the Cambrian subdivision have become considerably increased since B.Willis and E.Blackwelder worked out it [12]. The Cambrian subdivisions in Shandong are summarized in table 1.

1. GLOBAL AND SOUTH CHINA CAMBRIAN CHRONOSTRATIGRAPHIC SUBDIVISION SCHEMES

The 2013 edition of the International Stratigraphic Chart officially published a four-series ten-stage division plan for the global Cambrian chronostratigraphy. Jiangshanian "Golden Spike" of the global Cambrian was established in China [7] following Paibian [8] and Guzhangian (Fig. 1). The South China slope belt is one of the places with the most developed Cambrian system and the most complete and finest biostratigraphic sequences in the world. Furthermore, the South China biostratigraphic sequence was incorporated in an official correlation table of the global Cambrian by the International Cambrian subcommission and called as the China standard by the International Stratigraphic Commission along with the Cambrian chronostratigraphic system of South China [6]. The correlation of the latest Cambrian chronostratigraphic subdivision schemes between the globe and southern slope facies is shown in Table 2.

2. CAMBRIAN DISTRIBUTION IN SHANDONG

Cambrian chronostratigraphy in Shandong is divided into eight stages (Table 2).

The Cambrian system is widely developed in the Western Shandong block, where conformable contacts between various formations, continuous deposition under the Ordovician, and standard Middle-Upper Cambrian cross sections are observed. The late Canglangpu deposits of the Early Cambrian age are not found in the Jinan-Tengzhou and Zibo-Xintai stratigraphic minor regions. Linyi-Weifang strata lie in a parallel unconformity between Wushan Formation of the Canglangpu age and Tumen Group of the Upper Proterozoic erathem [10].

In Eastern Shandong, only Precambrian deposits are developed.

North China plain strata are covered by the deposits of the Quaternary system without Cambrian outcrops.

Table 1. Evolution of views on the correlation of Cambrian subdivisions in Shandong.

Researchers	B.Willis and E.Blackwelder (1907)			Yanhao-Lu、Nanting-Dong (1953)		Shandong regional geology(1991)		Zengqi-Zhang et al(1996)				Proposed in the study	
area	Zhangxia Xintai			Zhangxia		Western Shandong		Western Shandong				Shandong	
Stratigraphic division	Series			Series	Formation	Series	Formation	Series	Stage	Group	Formation	Series	Stage
	Upper Cambrian	Jiulong Group	limestone of Chaomidian Formation	Upper Cambrian	Fengshan	Upper Cambrian	Fengshan	Upper Cambrian	Fengshanian	Jiulong	Sanshanzi	Upper Cambrian	Fengshanian
					Changshan		Changshan		Changshanian		Chaomidian		Changshanian
	Middle Cambrian		shale of Gushan				Gushan		Gushanian		Gushan		Gushanian
					Gushan								
			limestone of Zhangxia	Middle Cambrian	Zhangxia	Middle Cambrian	Zhangxia	Middle Cambrian	Zhangxian		Zhangxia	Middle Cambrian	Zhangxian
	Lower Cambrian	shale of Mantou			Xuzhuang		Xuzhuang		Xuzhuangian	Changqing	Mantou		Xuzhuangian
				Lower Cambrian	Maozhuang	Lower Cambrian	Maozhuang		Maozhuangian				Maozhuangian
					Mantou		Mantou	Lower Cambrian	Longwangmiaoan		Zhushadong	Lower Cambrian	Longwangmiaoan
									Canglangpuian		Liguan		Canglangpuian
	Precambrian	diamictite of Taishan		Precambrian	granite	Sinian	Tumen	Sinian				Sinian	

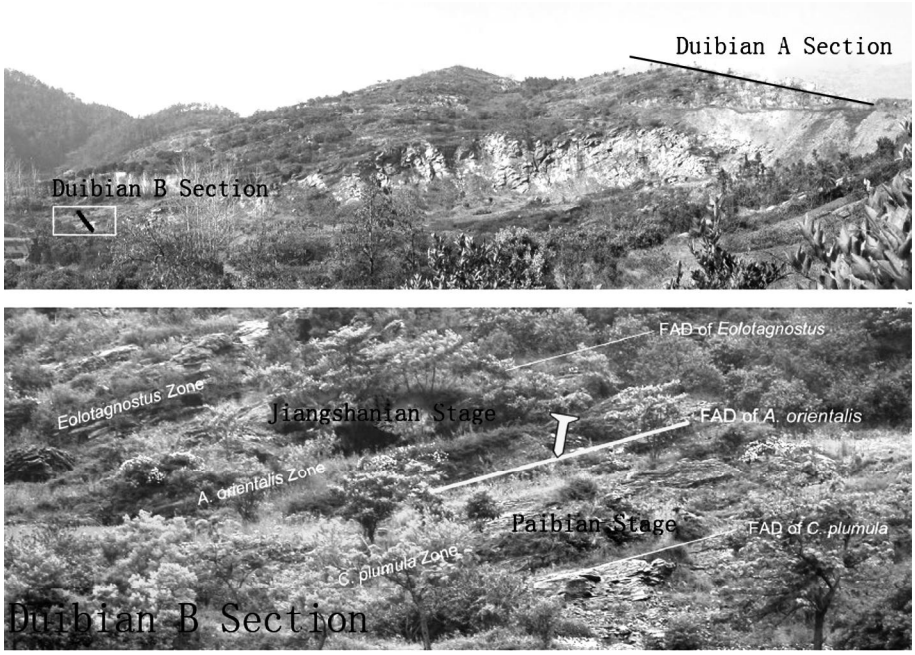

Fig. 1. Above: View of Dadoushan Hill with sections of Duibian A and Duibian B; below: Close-up view of the Duibian B section with the globe stratotype point marked by a "golden spike" (modified from [6]).

3. CORRELATION OF CHRONOSTRATIGRAPHIC BOUNDARIES OF THE CAMBRIAN SUBDIVISIONS IN SHANDONG

Most of the Cambrian stages in Shandong are still poorly defined with undefined time significance, poor contrast and disadvantageous competition to international standard stages. Besides, some stages' names were directly converted from some Cambrian formations. Therefore, the Cambrian chronostratigraphic boundary division in Shandong should be studied more comprehensively. Although the Shandong Cambrian system differs from the global and South China concerning their lithostratigraphy and biostratigraphy, it can be compared with them by the biostratigraphic method based on the trilobite fossils biozones. Biostratigraphic classification uses the consistency of the fossils contained in the formations for establishing biostratigraphic units. The corresponding relationships between the Shandong, global and South China chronostratigraphic boundaries are shown in table 2.

(1) Terreneuvian Series

Luxi exists in obvious lack of strata at the bottom of the Cambrian system, without Meishucunian and Jinningian stages relative to South China. So Luxi misses the deposits of the Terreneuvian series.

(2) Canglangpuian stage

There have been few researches on the boundary of the Canglangpuian stage in Shandong since Baoxiang-Niu [5] determined the bottom of the Canglangpuian stage to be the *Megapalaeolenus* trilobite fossil zone. However, by now there is no clear division of it. The deposits of the Canglangpuian stage in Shandong are limited in distribution and occur only in the Linyi-Weifang strata where fossils are not very rich and difficult to be collected. Moreover, this zone is not correlated with the international fossils, so it is difficult to identify the bottom boundary of this stage by biozones. The boundary of the global stage 3 is not only unproven but the level of its drawing is not yet chosen. So the lower boundary of the Canglangpuian stage cannot be correlated with the lower boundary of the 3-rd stage of the International Stratigraphic Chart.

Isotope age determination and magnetic stratigraphic correlation methods must be the important research tools for determination of the bottom boundary of the Canglangpuian stage in Shandong.

(3) Longwangmiaoan Stage

The trilobite *Redlichia chinensis* was defined as the bottom trilobite fossil zone of the Longwangmiaoan stage by Niu B.X. [5]. Zhang W. et al. [19] found *Redlichia* fossils, among which *R. chinensis* Walcott was the most common in the 10th layer of the Mantou Formation in Shandong Boshan (44 m from Precambrian). The 9-th layer of this section is yellow and yellow-green gray shale, and the bottom of the Longwangmiaoan stage is generally marked by yellow-green calcareous shale. Therefore, the first appearance of *Redlichia chin-*

Table 2. Correlation of Cambrian chronostratigraphic boundaries between Shandong, Globe and South China.

Aera	Globe			South China			Shandong		
System	Series	Stage	strtigraphic boundary	Series	Stage	strtigraphic boundary	Series	Stage	strtigraphic boundary
Cambrian	Furongian	Cambrian Stage 10	Trilobite FAD of Lotagnostus americanus. An internal substage division might be FAD of Codylodus adesei conodont	Furongian	Niuchehean	FAD of Lotagnostus americanus	Upper Cambrian	Fengshanian	The bottom boundary of Fengshanian is undefined.
		Jiangsha-nian	FAD of agnostd trilobite Agnostotes orientalis(GSSP) and the FO of polymerid trilobite Irvingella angustilimbata		Taoyuanian	FAD of Agnostotes orientalis(GSSP)			
		Paibian	Trilobite FAD of Glyptagnostus reticulatus (GSSP)		Paibian	FAD of Glyptagnostus reticulatus (GSSP)		Changsha-nian	The bottom boundary of Changshanian Stage corresponds to the interior of Paibian Stage, with uncertain specific location .
	Cambrian series 3	Guzhangian	Trilobite FAD of Lejopyge laevigata (GSSP)	Wulin-gian	Guzhangian	FAD of Lejopyge laevigata (GSSP)		Gushanian	The bottom boundary of Gushanian Stage corresponds to the interior of Guzhangian Stage, with uncertain specific location.
		Drumian	Trilobite FAD of Ptychagnostus atavus (GSSP)		Wangcunian	FAD of Ptychagnostus atavus (GSSP)	Middle Cambrian	Zhangxian	The bottom boundary of Hsuchuangian, Maozhuangian, Longwangmiaoan and Canglangpuian is undefined.
		Cambrian Stage 5	Trilobite, potentially FAD of Oryctocepholus indicus		Taijiangian	FAD of Oryctocepholus indicus		Hsuchuan-gian	
								Maozhuan-gian	
	Cambrian series 2	Cambrian Stage 4	Trilobite FAD of Olenellus or Redlichia	Qiandon-gian	Duyunian	FAD of Agnostotes duyunensis	Lower Cambrian	Longwang-miaoan	
		Cambrian Stage 3	Trilobites--their FAD		Nanaoan	FAD of trilobites		Canglang-puian	
	Terreneu-vian	Cambrian Stage 2	Small Shelly Fossils, or Archaeocyathid species	Diandon-gian	Meishucu-nian	FAD of Paragloborilus subglobusus	Deficiency		

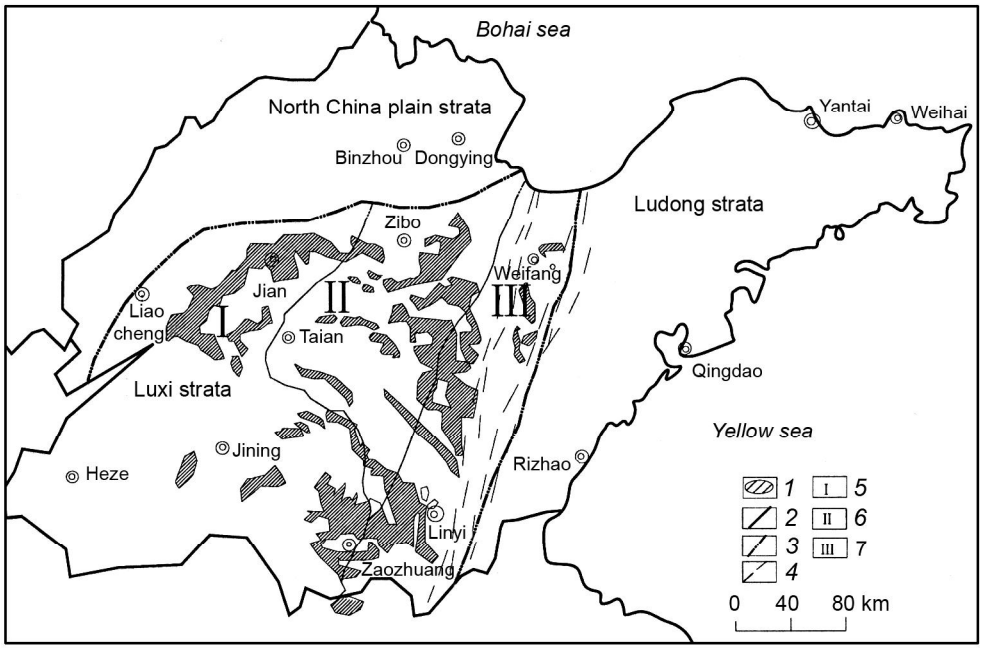

Fig. 2. Division and distribution of Cambrian outcrops in Shandong (modified from [10, 9]).

1 – outcrops; *2* – provincial boundary; *3* – stratigraphic minor region's boundary; *4* – faults; *5* – Jinan –Tengzhou stratigraphic minor region; *6* – Zibo-Xintai stratigraphic minor region; *7* – Weifang-Linyi stratigraphic minor region.

ensis trilobite fossil zone can be regarded as the bottom boundary of this stage.

But at present the boundary of the global stage 4 is not only undefined but the level of its drawing is not yet chosen. As for now, there are two suggestions concerning this boundary: the first appearance of trilobites *Olenellus* or *Redlichia*. Therefore, the correlation between the Longwangmiaoan stage and the 4-th stage of the International Stratigraphic Chart can be changed depending upon the level at which the lower boundary of the global stage 4 will be defined.

(4) Maozhuangian Stage

The bottom boundary of the Maozhuangian stage also marks the boundary between the middle and lower Cambrian. The Maozhuangian stage of Shandong is characterized by the disappearance of *Redlichia* and the mass propagation of *Oryctocephalus indicus* [17] thus indicating that the bottom boundary of this stage corresponds to the first appearance of *Oryctocephalus indicus*.

In South China, it is only 0.85 m from the layer where *Oryctocephalus indicus* FAD molecules firstly appeared to the lower Cambrian layer where *Redlichia* became extinct, which means that localities of the *Oryctocephalus indicus* first appearance and *Redlichia* extinction are thought to be basically the same place. The trilobite *Oryctocephalus indicus* was considered as the boundary between the Wulingian and Qianjiangian series and also the bottom boundary of the Taijiangian stage of South China.

But at present, the lower boundary of the 5-th stage of the International Stratigraphic Chart is not only unconfirmed but the level of its drawing is still not understood. Its inferred sections are Wuliu-Zengjiayan (eastern Guizhou, China) and Split Mountain (Nevada, USA). As for now, its correlation event is trilobite, potentially FAD of *Oryctocephalus indicus*. As a result, the lower boundary of the Maozhuangian stage of Shandong cannot be correlated with the undefined lower boundary of the 5-th stage of International Stratigraphic Chart and the lower boundary of the Taijiangian stage of South China.

(5) Hsuchuangian Stage

Lu Y.H. et al. [4] found *Ruichengella triangularis* and *Hsuchuangia hsuchuangensis* trilobite fossils in the 20th layer and in the 18th layer of the Mantou formation section in Changqing, Shandon, respectively. The 19th layer is only 0.5 m thick, without a mixing event of these two trilobites. Hence, these trilobites cannot constitute a limited interval of mixed distribution and are identified as *Hsuchuangia-Ruichengella* trilobite assemblage zone [4]. This zone is considered as the bottom zone of the Hsuchuangian stage in Changqing, Shandong.

(6) Zhangxian Stage

Zhang W. et al.(2003) defined the *Crepicephalina* zone as the bottom zone of the Zhangxian stage. The genus *Crepicephalina* firstly appeared in the 5th layer of the stratotype section of the Zhangxian stage, which is 30 m higher than the bottom boundary of this stage, so the bottom boundary of this stage cannot be determined to allocate at which part of this genus range zone. Jinliang–Yuan et al. [16] renamed the Zhangxian stage as the Changqingian stage and considered the first appearance of *Inouyella peiensis* as the bottom boundary of Changqingian stage in Shandong. The first occurrence of *Ptychagnostus punctuosus* trilobita fossils is regarded to be the bottom

boundary of the Drumian stage by the globe and that of the Wangcunian stage by South China. The *Inouyella peiensis Peishania convexa* zone of the Zhangxian stage in Shandong corresponds to the *Ptychagnostus atavus* zone of the slope facies in South China. So the bottom boundary of the Zhangxian stage in Shandong is in line with that of the Drumian stage in the globe.

(7) Gushanian Stage

Currently, there exist several divisions of the bottom boundary of the Gushanian stage in Shandong, but none of them has standard fossils in wild sections for determining the bottom. Zhu Z.L. et al. [20] classified the appearance of Damesellid class trilobite as the beginning of the Gushanian stage. Du S.X. et al. [2] considered the first appearance of *Damesella paronai* the bottom of the Gushanian stage and the top of the Zhangxian stage. Later on, Yuan J.L. et al. [16] renamed the Gushanian stage as the Jinanian stage and proposed the first appearance of *Damesella paronai* to be the bottom boundary of the Jinanian stage. Yang X.F. [14] considered the boundary between the *Cyclolorenzella rotundate* and *Cyclolorenzella acalle* zones as the boundary between the Gushanian and Zhangxian stages. At the same time, he found *Parablackwelderia* at the bottom of the Gushanian formation which was in Panchegou sections of Laiwu-Xintai strata in Shandong. He assumed that *Parablackwelderia* was a new genus, not the junior synonym of *Blackwelderia*. Therefore he considered the Gushanian stage's bottom boundary should be drawn higher than the Gushanian formation.

The first appearance of *Lejopyge laevigata* is regarded as the bottom boundary of the Guzhangian stage by the globe and South China. Yuan J.L. [15] compared trilobites of the Zhangxian stage in Shandong with those from the transition zone of South China, and came to conclusion that the *Lejopyge laevigata* zone corresponds to the interior of *Liopeishania*, namely the bottom of *Yabeia R.Z.* and *Yabeia R.Z.* appeared at the top of the Zhangxian stage in Shandong. So the authors believe that the bottom of international Guzhangian stage is consistent with the upper part of the Zhangxian stage in Shandong and the bottom of the Gushanian stage is related to the interior of the international Guzhangian stage.

(8) Changshanian Stage

Both Niu B.X. [5] and Du S.X. et al. [2] interpreted *Chuangia* the bottom trilobite fossil zone of the Changshanian stage. Zhang W. (2003) suggested the *Prochuangia-Paracoosia* assemblage zone to be the bottom trilobite fossil zone of the Changshanian stage. The division of Changshanian stage in Shandong should be the subject of further research.

The bottom boundary of the international Furongian series, which is also of the Paibian stage, is delimited in the interior of Huaqiao formation in Huayuan Paibi section that is 369.03 m away from the formation bottom. The *Chuangia* member appeared in the *Glyptagnostus reticulatus* zone of this section and can be compared with *Chuangia* zone of Western Shandong block. Therefore the bottom boundary of the international Furongian stage is slightly lower than that of the Changshanian stage in North China.

Lithostratigraphic columns of the Gushanian and Changshanian stages in Zhangxia-Gushan are shown in Fig. 3.

(9) Fengshanian Stage

By now there are few researches on the Fengshanian stage in Shandong. Since Niu B.X. [5] determined *Tsinania-Ptychaspos* trilobite zone as the bottom trilobite fossil zone of the Fengshanian stage, this program has been used by most of the researchers till now. Fossils in wild sections are the basis for delimiting the boundary of the Fengshanian stage, and isotope age determination and magnetic stratigraphic correlation are also important methods.

(10) Division of the Cambrian–Ordovician boundary

The division of the Cambrian–Ordovician boundary is widely debated. Zhang H.D. et al. [18] proposed that the Cambrian–Ordovician boundary in Qingzhou was located between the *Cordylodus proavus* zone and the *Utahconus beimadaoensis-Moncostadus sevierensisu* zone. Wu G.C. et al. [13] firstly reported *Cordylodus lindstromi-Iapetognathus* zone in Yaowangshan sections of Qingzhou and considered the bottom of this zone as the Cambrian-Ordovician boundary. Du S.X. et al. [2] found *Cordylodus lindstromi* conodont fossils in the Cambrian standard sections of the Zhangxia-Gushan strata and treated the first appearance of *Cordylodus lindstromi* as the Cambrian-Ordovician boundary.

From the above, both *Cordylodus lindstromi* conodonts and *Iapetognathus* trilobites appeared at the bottom of the Ordovician system. Both Globe and South China regarded the first appearance of *Iapetognathus fluctivagus* as the bottom boundary of the Cambrian system. *Iapetognathus fluctivagus* conodonts belong to the *Iapetognathus* genus. So the first appearance of *Iapetognathus* is the bottom boundary of the Cambrian–Ordovician boundary in Shandong. This division is in good agreement with the international stratotype and rock stratigraphy.

(1) The researches on the fossils found in wild sections of the Canglangpuian, Longwangmiaoan,

4. CONCLUSIONS

Maozhuangian, Hsuchuangian, and Fengshanian stages in Shandong are limited in distribution and hence some fossils zones cannot be correlated with the glob-

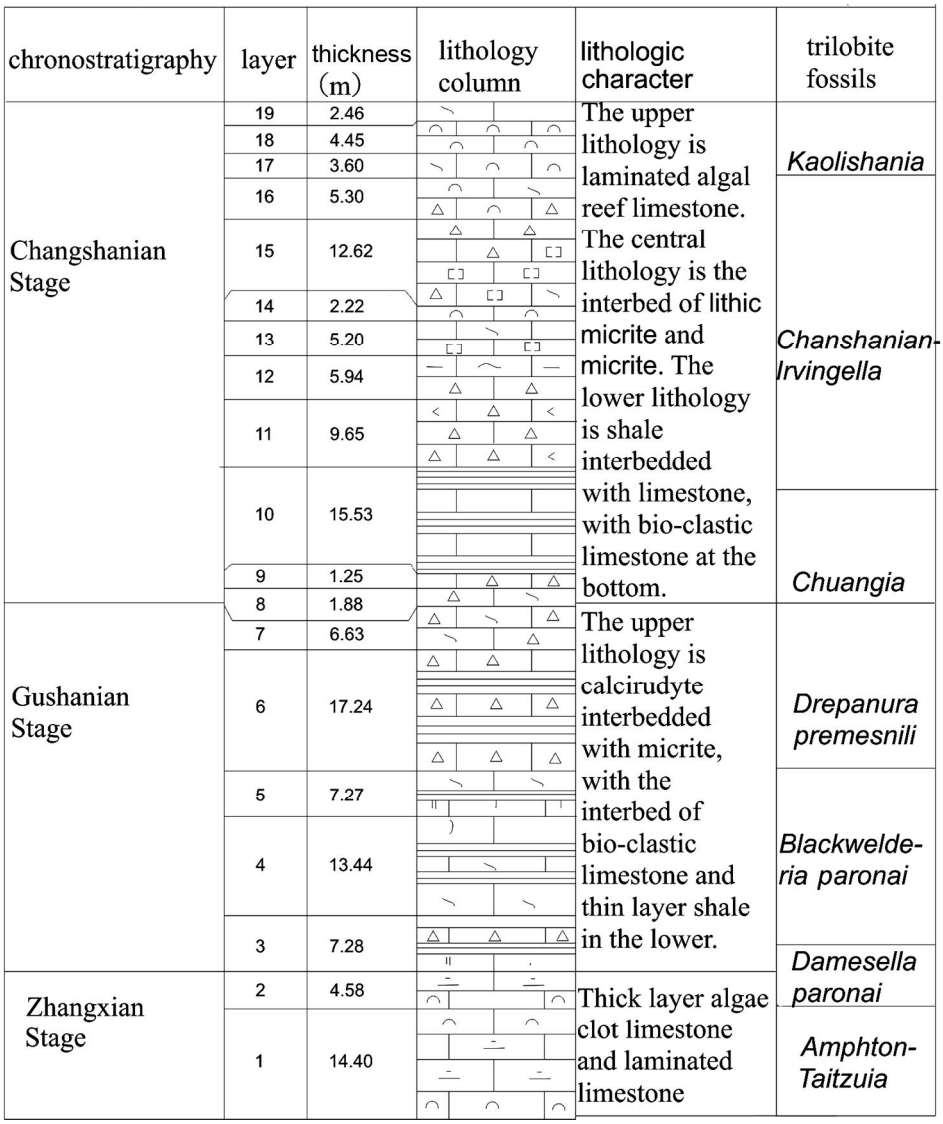

Fig. 3. Lithostratigraphic column of the Gushanian and Changshanian stages in Zhangxia-Gushan (modified from [2]).

al system. Therefore it is difficult to delimit the bottom boundaries of these five stages by fossils.

At present, the boundaries between the 2-nd, 3-rd, 4-th, 5-th, and 10-th stages of the global system still remain unproven and the level of their drawing is not yet established. Therefore, the correlation between these five stages of Shandong and those of the International Stratigraphic Chart can be changed depending on the level at which the lower boundaries of the global stages will be defined.

The future researches on the isotope age determination and magnetic stratigraphic correlation methods will be focused on determining the bottom boundary of these stages in Shandong and making good chronostratigraphic comparison.

(2) The layers with *Lejopyge laevigata* of Guzhangian stage of the globe and South China are observed under *Yabeia R.Z.* appearing at the top of the Zhangxian stage in Shandong, which suggests that the bottom boundary of the Gushanian stage in Shandong corresponds to the interior of the international Guzhangian stage. The *Chuangia* member of North China appeared at the interior of the *Glyptagnostus reticulatus* zone at the bottom of the international Furongian series and can be compared with the *Chuangia* zone of the Western Shandong block, which shows that the bottom boundary of the international Furongian series is located slightly lower than that of the Changshanian Stage in Shandong.

(3) By the comparison between fossils of Shandong and international standard fossils, we have concluded that the bottom boundary of the Zhangxian stage in Shandong corresponds to that of the international Drumian stage, the layer *Iapetognathus* conodont

first appeared at the stands for Cambrian–Ordovician boundary in Shandong.

REFERENCES

1. China biostratigraphy. Beijing: Science Press, 2003. P. 55–119.
2. Du S.X., Zhang R.H., Zhang G.L., Zhang J.B., Chen X.M. New development of study on lower part of Cambrian standard profile in Zhangxia-Gushan area in Shandong province // Land and resources in Shandong Province. 2007. V. 23, N10. P. 1–6.
3. Lu Y.H., Dong N.T. New observations about sections of Cambrian system in Shandong // Acta Geologica Sinica. 1953. V. 32, N 3. P.166–180.
4. Lu Y.H., Zhu Z.L. Trilobites from the middle Cambrian Hsuchuangian of Zhangxia, Changqing county, Shandong Province // Acta Palaeontologica Sinica. 2001. V. 40, N 3. P. 279–293.
5. Niu B.X. Division of Paleozoic biostratigraphy in Shandong Province // Shandong Geology. 1998. V.14, N.3. P. 6–12.
6. Peng S.C. The newly-developed Cambrian biostratigraphic succession and chronostratigraphic scheme for South China // Chinese Sci. Bull. 2009. V. 54, N 18. P. 2691–2698.
7. Peng S.C. Jiangshanian stage (Cambrian, Furongian) and the GSSP for the base of the stage established formally // Journ. Stratigraphy. 2011. V. 35, N 4. P. 393–396.
8. Peng S.C., Zhu X.J., Lin H.L. The first global standard stratotype section and point of Cambrian system for Paibian stage and Furongian series in China // Journ. Stratigraphy. 2004. V. 28, N 1. P. 92–94.
9. Rock stratum of Shandong province // Shandong Bureau of Geological and Mineral Resources. Beijing: Geol. Publ. House, 1996. P. 109–166.
10. Shandong regional geology. Beijing: Geol. Publ. House, 1991. P. 78–105.
11. Shandong rock formations. Wuhan: China Univ. Geosci. Press, 1996.
12. Willis B., Blackwelder E. Stratigraphy of western Chi-li and Central Shansi // Descriptive Topography and Geology. 1907. N 2. P. 99–152.
13. Wu G.C., Yao J.X., Ji Z.S., Liu S.C. Latest biostratigraphic advances of Cambrian-Ordovician boundary in Qingzhou area, Shandong // Acta Palaeontologica Sinica. 2005. V. 44, N 1. P. 106–116.
14. Yang X. F. The first record of *Parablackwelderia* from Laiwu and Xintai, Shandong, and its stratigraphic significance // Journ. Stratigr. 2011. V. 35, N 2. P. 209–218.
15. Yuan J.L., Li Y., Mu X.N., Fu Q.L. Biosratigraphy of trilobites from Changhia stage (Late/ middle Cambrian) in Shandong // Journ. Stratigr. 2000. V. 24, N 2. P. 136–143.
16. Yuan J.L., Li Y., Mu X.N., Zhu X.J. Cambrian trilobite belt and diachronism of Zhangxia Group in Shandong and its adjacent area // XI National Congress of China Paleontologic Society: 25th Annual meeting abstract sets. 2009.
17. Zhang B. Study on the division and correlation of Cambrian in Luxi Block. Shandong Univ. Sci. & Technol.: Master's degree thesis. Shandong, 2010. P. 2–12.
18. Zhang H.D., Liu H.K., Liu S.C. Conodont associations in the upper part of Chaomidian Formation and contact line determination of Cambrian and Ordovician in Qingzhou, Shandong Province // Shandong Geol. 2000. V. 16, N 4. P. 11–25.
19. Zhang W.T. Preliminary note on the lower and middle Cambrian stratigraphy of Poshan, central Shandong // Acta Palaeontologica Sinica. 1957. V. 5, N 1. P. 13–31.
20. Zhu Z.L., Xiang L.W., Zhang G.S., Liu S.C., Luo K.L., Du S.X., Liang Z.W. New advance in the study of the upper Cambrian Gushanian Stage of North China // Journ. Stratigr.. Suppl. Issue. 2005. V 29. P. 462-466.

Рекомендована к печати Л.И. Попеко

Минь Гао, Цзю Чуаньвэй, Пин Ливан

Корреляция хроностратиграфических подразделений кембрия в Шаньдуне

Целью данной статьи является решение сложных проблем хроностратиграфического деления кембрия в Шаньдуне и определение нижних границ кембрийских местных ярусов. На основе анализа отечественных и зарубежных исследований проведение границ ярусов кембрия в Шаньдуне сопоставляется с глобальными и модернизированными хроностратиграфическими подразделениями кембрия Южного Китая, основанными на ископаемых трилобитах. Обсуждаются основные проблемы хроностратиграфического деления в Шаньдуне с помощью биостратиграфических методов. Исследования показывают, что Цанланпуяньский, Лунванмяояньский, Маочжуаньянский, Хсучуанянский и Фэншаньаньский ярусы Шаньдуна не коррелируются с подразделениями Международной стратиграфической шкалы. Нижняя граница Чжансяньского яруса Шаньдуна соответствует Друминскому ярусу глобальной шкалы, нижняя граница Гушаньянского яруса согласуется с нижней границей Гучжаньянского яруса, а нижняя граница Фужуньянского яруса глобальной шкалы располагается несколько ниже границы Чаншаньянского яруса Шаньдуна. Слой с конодонтами *Iapetognathus* впервые появился на границе кембрия и ордовика.

Ключевые слова: **корреляция, кембрий, хроностратиграфический, трилобиты, Шаньдун, Международная стратиграфическая шкала, Южный Китай.**