22. Comparison of the Silurian Trilobites in Japan, South China, Thailand and Malaysia

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Since Kayser had reported *Encrinurus* sp. from the southern part of the Tsinling-shan in 1883, Grabau described *Coronocephalus* and a few other trilobites from the Yangtze region in 1925. Later Grabau's species were restudied by Lu (1962). Before this Reed (1917) added some others from Yunnan. In "Chinese Trilobites" by Lu *et al.*, 1965 the known Silurian trilobites in China were only twelve species, even specifically indeterminable ones are counted. Therefore it is astonishing that the Silurian trilobites in China were so much enriched recently that their generic number exceeds forty.

So far as I am aware, the Chinese trilobites are 32, 18 and 2–3 genera respectively in the lower, middle and upper parts of the Silurian system. Thus more than a half of these genera are contained in the lower Silurian rocks. They became only a few in the upper part through the middle part.

The Chinese fauna lacks the Phacopidae. A half of the families in China are unknown in Japan. Namely they are the Aulacopleuridae, Harpidae, Raphiophoridae, Calymenidae, Homalonautidae, Dalmanitidae and Odontopleuridae. The trilobite genera occurring common between Japan and China are *Scutellum*, *Kosovopeltis*, *Latiproetus*, *Otarion*, *Coronocephalus*, *Sphaerexochus*, *Encrinurus* and *Primaspis*. However, not only *Coronocephalus*, but also the other genera of the Coronocephalinae in China are so different from *Coronocephalus kobayashii* Hamada, 1959 that Zhang (1983) has commented that "*C. kobayashii*—should not be referred to *Coronocephalus*". I think that the sporadical radiance of this subfamily is one of the most significant events in the history of the Silurian trilobites in Eastern Asia.

Of *Latiproetus* as I have discussed already in detail (1985a, b), it is one of the most distinct Asian-Pacific genera distributed from western North America to Australia through Japan and China. Incidentally, *Dalmanitina* is an important trilobite for the Ordovician-Silurian boundary problem. While *D. olini* occurs near the top of the Ashgillian in Scania, *D. malayensis* is contained near the base of the Silurian in West Malaysia (Kobayashi, 1974).

As stated above, some relation of trilobites is recognizable between Japan and Central-South China, but it is less than that between the Chichibu and Mongolian geosynclines. From Yunnan the Silurian sea was extended westerly to the Tethys and toward the south to Thailand and Malaysia. Recently Sakagami collected *Encrinurus* (personal communication) in East Thailand which probably shows the southern extension of the Namhsim fauna of the Shan plateau, Burma containing *Encrinurus konghsaensis*.

In the Langkawi Islands, West Malaysia there is the lower Llandoveryan *Dalmanitina malayensis* bed. Above it there is the *Prodontochile* bed containing *Octobronteus*, *Malayaproetus*, *Lonchodomus*, *Sphaerexochus*, *Calymene* and a few others. They total 15 species in 9 genera and 8 families. This fauna is probably middle or late Llandoveryan-early Wenlockian in age. It is quite distinct from

Trilobita													Silurian			
Family, genus (subgenus)		Yunnan	Kueichou	Szechuan	Hupei	Hunan	Kuantung	Kuansi	Chekiang	Anhui	Kiangsu	Shengsi	Kansu	Lower	Middle	Upper
I	<i>Scutellum</i>	×												●		●
	<i>Planiscutellum</i>	×	×	×										●	●	
	<i>Kosovopeltis</i>			×	×									●	●	
	<i>Leioscutellum</i>		×											●		
II	<i>Illaenus</i>								×					●		
	<i>Cekovia</i>		×											●		
	<i>Ptilillaenus</i>		×		×									●	●	
	<i>Meitanillaenus</i>		×											●		
	<i>Wuchuanella</i>		×											●		
III	<i>Latiproetus</i>		×	×	×						×			●	●	
	<i>Hypaproetus</i>		×											●		
	<i>Oidaloproetus</i>		×											●		
	<i>Neuchangella</i>		×											●		
	<i>Luojiashania</i>			×	×										●	
	<i>Chuanqianoproetus</i>		×	×											●	
	<i>Xiushuioproetus</i>							×			×				●	
<i>Zhijiangoproetus</i>								×					●			
IV	<i>Songkania</i>		×		×									●		
V	<i>Otarion</i>						×									●
VI	<i>Aristoharpes</i>				×									●		
	<i>Scotharpes</i>		×		×									●		
VII	<i>Raphiophorus</i>		×											●		
VIII	<i>Sphaerexochus</i>		×											●		
	<i>Cerauroides</i>										×				●	
	<i>Shiqiania</i>		×		×									●		
IX	<i>Encrinurus</i>												×		●	
	<i>Encrinuroides</i>	×	×	×	×				×	×	×			●	●	?
	<i>Coronocephalus</i>		×	×	×	×	×	×		×	×			●	●	
	<i>C. (Coronocephalina)</i>		×	×	×			×		×	×				●	
	<i>Senticuculus</i>		×	×	×			×		×					●	
	<i>Kailia</i>		×	×	×			×		×	×			●	●	
	<i>Kailia (Parakailia)</i>			×	×										●	
	<i>Rongxiella</i>		×	×				×		×					●	
<i>Tewonia</i>												×	●			
X	<i>Calymene</i>	×			×									●	●	

Table I (continued)

Trilobita												Silurian		
Family, genus (subgenus)		Yunnan	Kueichou	Szechuan	Hupei	Hunan	Kuantung	Kuansi	Chekiang	Anhui	Kiangsu	Shensi	Kansu	Lower Middle Upper
XI	<i>Liangshanaspis</i>								×	×		×		●
	<i>Platycorphe</i>											×		●
XII	<i>Dalmanitina</i>				×				×			×	×	●
XIII	<i>Dicranogomus</i>			×										●
	<i>Tsungilichas</i>			×										●
	<i>Acanthopyge</i>		×											●
XIV	<i>Leonaspis</i>	×	×		×									●
	<i>Gaotaia</i>	×	×		×									● ●
	<i>Primaspis</i>	×												●

I: Scutelluidae. II: Illaenidae. III: Proetidae. IV: Aulacopleuridae. V: Otariionidae. VI: Harpidae. VII: Raphiophoridae. VIII: Cheiruridae. IX: Encrinuridae. X: Calymenidae. XI: Homalonotidae. XII: Dalmanitidae. XIII: Lichidae. XIV: Odontopleuridae.

the Silurian faunas of Burma and also from the Japanese fauna, although the Burmese-Malayan geosyncline lies in the extension of the Chichibu geosyncline.

In summary the Silurian trilobites have flourished in the seas from Central China to Malaysia in the early half of the period, but in the later half in Japan and also in the Mongolian geosyncline. Therefore I presume that the age difference is the important reason for the dissimilarity of these trilobites on the two sides of the Tsinling line.

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