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## MIDDLE AND UPPER CARBONIFEROUS FUSULINIDS FROM JIANGYOU DISTRICT, NORTHWESTERN SZECHUAN

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### (Abstract)

The fusulinids studied here were collected in 1961 by Mr. C. G. Shi and the writer from the Middle and Upper Carboniferous rocks exposed near Majiaoba, a town of Jiangyou district, Northwestern Szechuan. The Middle and Upper Carboniferous deposits in this region are composed almost of limestones with a total thickness about 122 meters. The details of the succession reading from the top are as follows:

Super-formation—Lower Permian Chihsia Limestone

- - - - - disconformity - - - - -

Upper Carboniferous—Chuanshan Limestone

Light grey, thick-bedded, oölitic limestones and limestones containing globular structure. The following forms of fusulinids have been found (BA1310—1319):

*Hemifusulina bella* (Chen)

*H. ovata* Chang

*H. elliptica* (Lee)

*Rugosofusulina alpina* (Schellwien)

*R. subelliptica* sp. nov.

*Schwagerina hutienensis* (Chen)

*S. sp.*

*Schubertella transitoria* Staff et Wedekind

..... 20.5 m

----- disconformity -----

Middle Carboniferous—Huanglung Limestone

Light and whitish grey, rather pure limestones and oölitic limestones interbedded with pinkish, thin-bedded carbonaceous shales, containing:

*Pseudostaffella sphaeroidea* (Ehrenberg)

*Fusiella typica* var. *extensa* Rauser

*F. praetypica* Safonova

*Fusulinella praecolaniae* Safonova

*F. bocki* Moeller

*F. majiaobensis* sp. nov.

*Profusulinella deprati* (Beede et Kniker)

*Schubertella transitoria* Staff et Wedekind

*S. majiaobensis* sp. nov.

*Fusulina* sp.

*Pseudoendothyra jiangyouensis* sp. nov.

..... 101.5 m

----- conformity -----

Sub-formation—Lower Carboniferous Zongchanggou Series

Sixteen species and one variety belonging to ten genera are described and illustrated, among which four species are new.

## DESCRIPTION OF NEW SPECIES

### Family Ozawainellidae Thompson et Forster 1937

#### Subfamily Staffellinae M.-MacIay 1949

#### Genus *Pseudoendothyra* Michailov 1939

#### *Pseudoendothyra jiangyouensis* sp. nov.

(Pl. I, figs. 8—9)

Shell small, lenticular; umbilica depressed, periphery narrowly rounded. Adult specimen of a typical form attaining 5 volutions about 0.63 mm in length and 0.93 mm in width; form ratio about 0.67:1. Axis of the first volution deviating at a large angle from that of the later volutions. Periphery of the third and fourth whorls also rounded. Widths of the second and third volutions about 0.24 and 0.43 mm, respectively. Spirotheca composed of four layers with a thick diaphanotheca. Thickness of spirotheca of the third volution about 0.03 mm. Septa unfluted. Chomata and tunnel poorly developed. Proloculus spherical, about 0.07 mm in outside diameter.

**Remarks:** This new species is characterized by its broadly rounded periphery. It differs from *Pseudoendothyra struvei* (Moeller) in having broadly rounded periphery and lower chamber of the outer volutions.

**Occurrence:** This species occurs in association with *Schubertella majiaobensis* Chang sp. nov. in the Huanglung Limestone at Majiaoba of Jiangyou. Cat. Nos. 14735 (Holotype), 14736 (Paratype).

**Family Schubertellidae Skinner 1931****Subfamily Schubertellinae Skinner 1931****Genus *Schubertella* Staff et Wedekind 1910*****Schubertella majiaobensis* sp. nov.**

(Pl. I, fig. 1)

Shell small and thickly fusiform. Middle part inflated; lateral slopes slightly concave; poles rather bluntly rounded. Whorls loosely coiled, numbering  $3\frac{1}{2}$ . The first volution involute and coiled nearly at right angle to the outer volutions. Length, 0.87 mm; width, 0.59 mm; form ratio, 1.47:1. The widths of the second and third volutions about 0.25 and 0.43 mm, respectively. Spirotheca composed of a tectum and a thicker inner tectorium. Thickness of spirotheca about 0.015 to 0.025 mm. Septa plane. Chomata rather massive in the second and third whorls, extending to the polar regions. Their height reaching about  $\frac{1}{3}$  of that of the chamber. Tunnel wide and low. Proloculus spherical, about 0.08 mm in outside diameter.

**Remarks:** Although there is only a single axial section in our material to represent this new species under consideration, its specific characters are nevertheless well displayed. This new species is characterized by its larger size, more massive chamata and larger proloculus. In the size of shell, it is closely similar to *Schubertella magna* Lee et Chen from the Huanglung Limestone of the Nanking Hills, but differs from the latter in having a larger proloculus and unfluted septa. It is also similar to *S. gracilis* Rauser, but may be distinguished from that species by the larger size, the slightly concave lateral slopes and the more massive chomata.

**Occurrence:** Same as the preceding species. Cat. No. 14728 (Holotype).

**Family Fusulinidae Moeller 1878****Subfamily Fusulinellinae Staff et Wedekind 1910****Genus *Fusulinella* Moeller 1877*****Fusulinella majiaobensis* sp. nov.**

(Pl. I, figs. 10—11)

Shell small and inflated-fusiform; median part highly inflated; poles bluntly pointed. Mature specimen possessing 4 to  $4\frac{1}{2}$  volutions. Whorls loosely coiled. The holotype consisting of  $4\frac{1}{2}$  volutions attaining a length of about 2.29 mm and a width of about 1.46 mm giving a form ratio of 1.57:1. Width of the first to fourth volution about 0.28, 0.47, 0.79 and 1.20 mm, respectively. Spirotheca thicker in the outer volutions (about 0.04 to 0.05 mm) and composed of four layers with a distinct diaphanotheca. Septa almost plane in the central part, but slightly folded at the umbilical ends. Chomata prominent, appearing as two massive spots standing in all volutions, but not extending to the polar regions. Tunnel rather high and wide in the inner volutions, but narrow in the outer ones. Proloculus large, about 0.14 mm in outer diameter.

**Remarks:** This new species is characterized by its inflated-fusiform shell, loosely coiled whorls, and its prominent chomata. This species is distinguished by its loosely coiled whorls, weaker chomata and smaller form ratio with *Fusulinella bocki* Moeller. It also

closely resembles *Aljutovella subaljutovica* Safonova. However, the difference in wall structure of these two genera is easily distinguished.

**Occurrence:** This species occurs in the Huanglung Limestones at Majiaoba. Cat. Nos. 14738 (Holotype), 14737 (Paratype).

**Family Schwagerinidae Dunbar et Henbest 1930**

**Subfamily Schwagerininae Dunbar et Henbest 1930**

**Genus *Rugosofusulina* Rauser 1937**

***Rugosofusulina subelliptica* sp. nov.**

(Pl. 2, fig. 7)

Shell of medium size, subelliptical; median part plane, poles bluntly rounded. The holotype possessing 4 volutions measuring 5.0 mm in length and 1.4 mm in width; giving a form ratio about 3.6:1. Width of the first to fourth volution about 0.28, 0.49, 0.87 and 1.40 mm, respectively. All volutions are subelliptical except the first volution. Spirotheca dimpled and composed of a tectum and a coarsely alveolar keriotheca. Septa intensely and somewhat irregularly fluted. Chomata weakly developed in the inner volutions. Proloculus about 0.16 mm in outer diameter.

**Remarks:** In general shape, the present new species resembles *Rugosofusulina elliptica* Rosovskaya, but differs from the latter in having larger form ratio, less number of volutions and less strongly fluted septa.

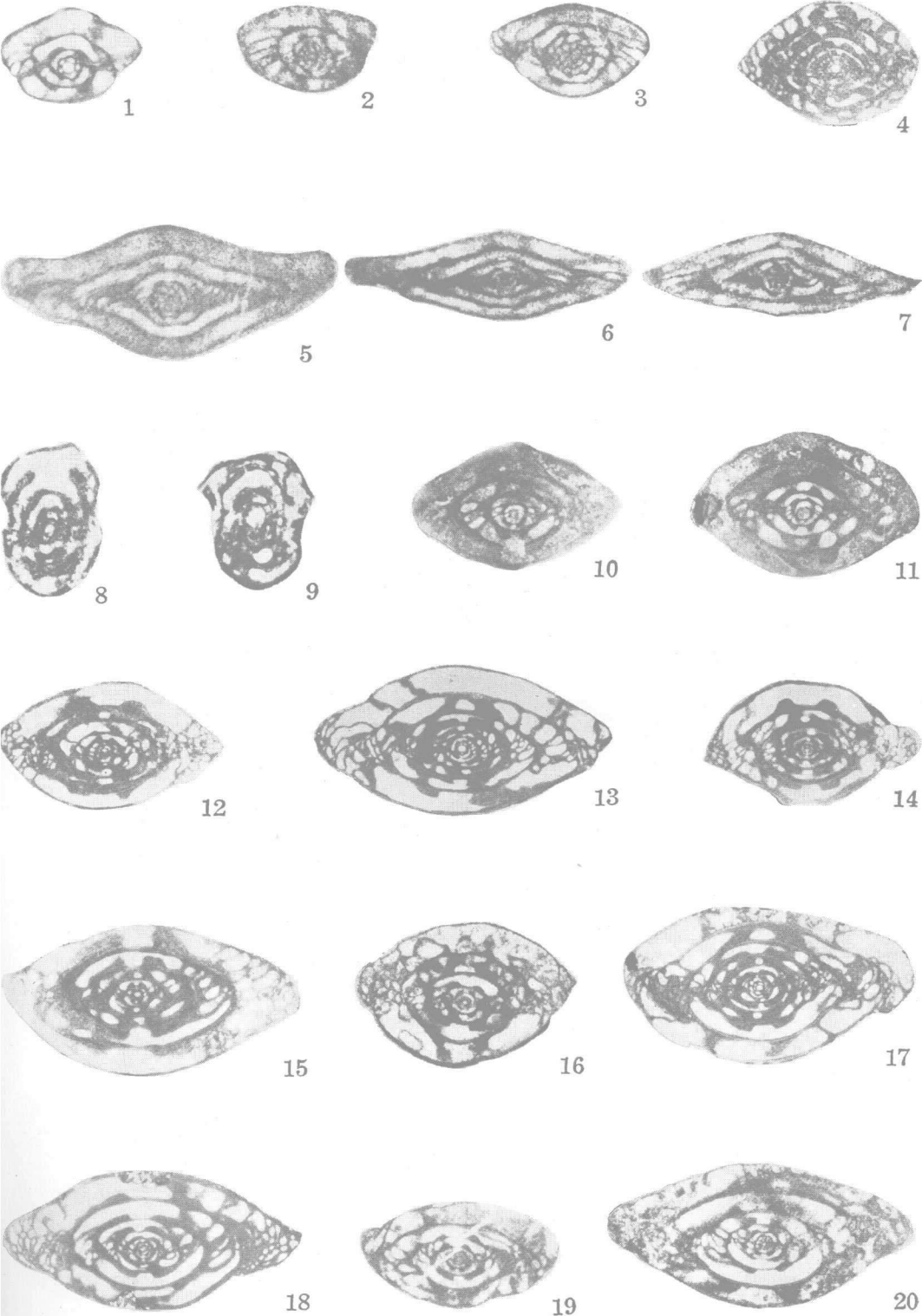
**Occurrence:** This new form occurs in the Chuanshan Limestone at Majiaoba. Cat. No. 14754 (Holotype).

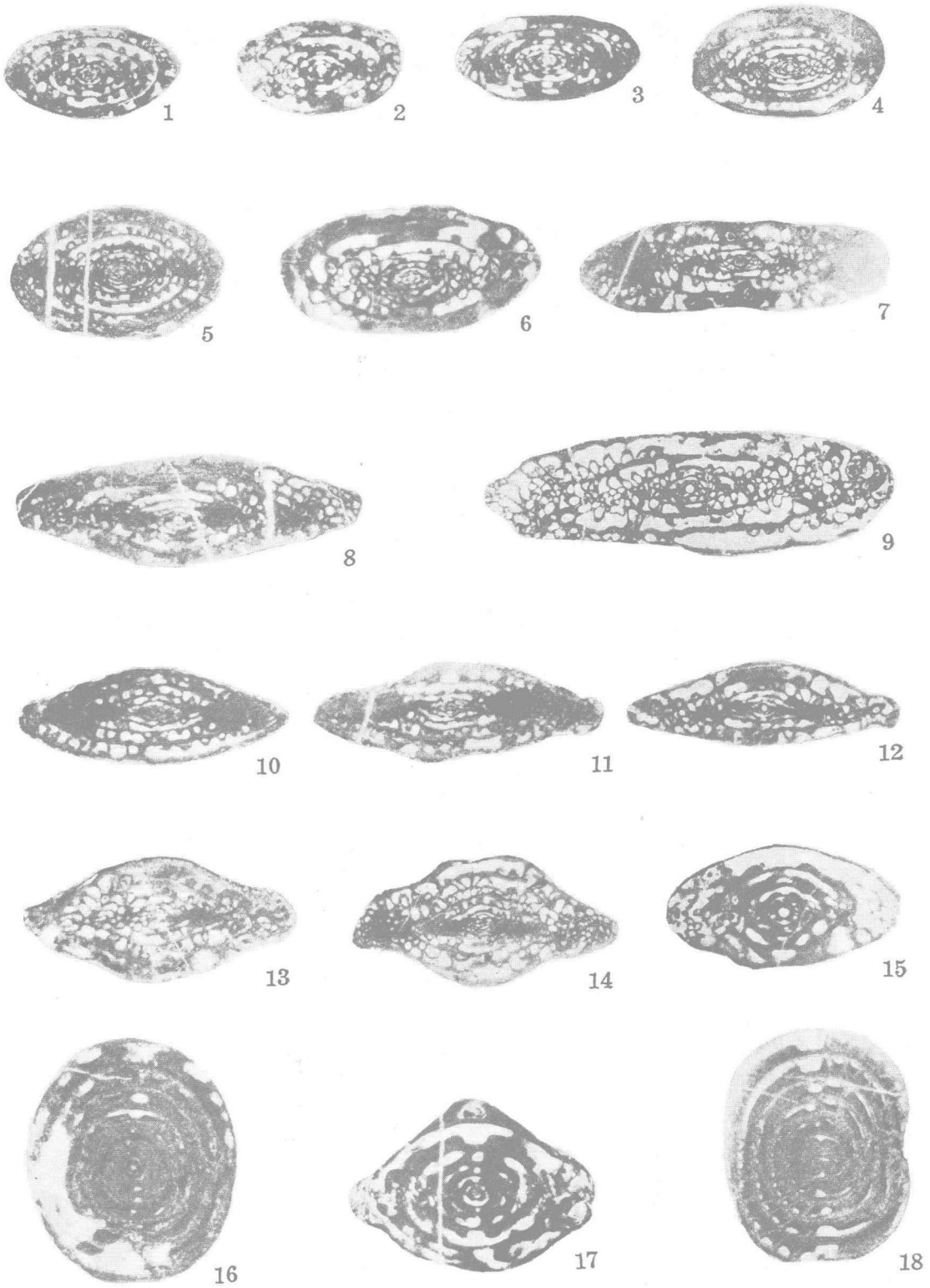
## 图 版 說 明

所有薄本都保存在中国科学院地质古生物研究所, 本所磨片室制片。全部图影未加任何潤飾, 我所照相組摄影。

### 图 版 I

- 图 1. *Schubertella majiaobensis* sp. nov.  
軸切面, 正型标本 ( $\times 25$ )。登記号: 14728。
- 图 2—3. *Schubertella transitoria* Staff et Wedekind  
二个軸切面, 近型标本 ( $\times 40$ )。登記号: 14729—14730。
- 图 4. *Fusulina* sp.  
一个不甚完整的軸切面 ( $\times 15$ )。登記号: 14731。
- 图 5. *Fusiella praetypica* Safonova  
軸切面, 近型标本 ( $\times 40$ )。登記号: 14732。
- 图 6—7. *Fusiella typica* var. *extensa* Rauser  
二个軸切面, 近型标本 ( $\times 40$ )。登記号: 14733—14734。
- 图 8—9. *Pseudoendothyra jiangyouensis* sp. nov.  
8. 軸切面, 正型标本 ( $\times 25$ )。登記号: 14735。  
9. 軸切面, 副型标本 ( $\times 25$ )。登記号: 14736。
- 图 10—11. *Fusulinella majiaobensis* sp. nov.  
10. 近乎軸切面, 副型标本 ( $\times 15$ )。登記号: 14737。  
11. 軸切面, 正型标本 ( $\times 15$ )。登記号: 14738。
- 图 12—15, 17—18. *Fusulinella bocki* Moeller  
六个軸切面, 近型标本 ( $\times 15$ )。登記号: 14739—14742, 14744—14745。
- 图 16, 19. *Profusulinella deprati* (Beede et Kniker)  
二个軸切面, 近型标本 ( $\times 15$ )。登記号: 14743, 14746。
- 图 20. *Fusulinella praecolaniae* Safonova  
軸切面, 近型标本 ( $\times 15$ )。登記号: 14747。





## 图 版 II

- 图 1—3. *Hemifusulina bella* (Chen)  
三个轴切面,近型标本( $\times 15$ )。登记号: 14748—14750。
- 图 4—5. *Hemifusulina ovata* Chang  
二个轴切面,近型标本( $\times 10$ )。登记号: 14751—14752。
- 图 6. *Hemifusulina elliptica* (Lee)  
轴切面,近型标本( $\times 15$ )。登记号: 14753。
- 图 7. *Rugosofusulina subelliptica* sp. nov.  
轴切面,正型标本( $\times 10$ )。登记号: 14754。
- 图 8、10—12. *Schwagerina hutienensis* (Chen)  
四个轴切面,近型标本( $\times 15$ )。登记号: 14755, 14757—14759。
- 图 9. *Rugosofusulina alpina* (Schellwien)  
轴切面,近型标本( $\times 10$ )。登记号: 14756。
- 图 13—14. *Schwagerina* sp.  
二个近乎轴切面( $\times 15$  及  $\times 10$ )。登记号: 14760—14761。
- 图 15、17. *Fusulinella bocki* Moeller  
二个轴切面,近型标本( $\times 15$ )。登记号: 14762, 14764。
- 图 16、18. *Pseudostaffella sphaeroidea* (Ehrenberg)  
16. 轴切面,近型标本( $\times 25$ )。登记号: 14763。  
18. 弦切面,近型标本( $\times 25$ )。登记号: 14765。