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# 二叠纪新小纺锤[illegible]模式种 *Neofusulinella lantenoisi* Deprat，1913 在云南保山的发现*

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**中文提要**　*Neofusulinella* Deprat，1912 是一个有效属，但其模式标本遗失，最早发表的共模切面不正，加之手绘图影不清楚，长期未能准确地把握其属征。除原作者(Deprat，1913)首次记述的模式种(*N. lantenoisi* Deprat-Thompson，1934，p. 292 事后指定)以及 Thompson 和 Foster(1937)和 Pitakpaivan(1965)所记述的同种外，其余的有关鉴定均为误定。另外两个被广泛引用的属，即 *Leëlla* Dunbar *et* Skinner，1937 及 *Haoella* Gong，1965，却是真正的 *Neofusulinella* 属，为后者的次异名(junior synonym)。*Neofusulinella* 的系统位置并非前人所认为的舒伯特[illegible]科(Schubertellidae)，而属于纺锤[illegible]科(Fusulinidae)的史塔夫[illegible]亚科(Staffellinae)，代表该亚科中的进化类型。史塔夫[illegible]类在分布上的排它性及对围岩原岩的选择性，亦间接表明该亚科系纺锤[illegible]科在近滨局限海域里的一个特化分支。在原地埋葬的情况下，这一[illegible]类壳体及其围岩普遍受到发育于该海域海底的“淡化混合水带”的成岩期硅化或白云岩化(王尧，1990；沙庆安，1990)，因而它们的旋壁与内部构造通常被“矿化”而模糊不清，甚至造成多样化旋壁的假像。

Pitakpaivan (1965)所记述的 *Neofusulinella* cf. *lantenoisi* Deprat 采自泰国 Nakhonsawan 地区 Takli (15°18′N，100°24′E )的 Rat Buri 灰岩，其地理位置与大地构造上接近模式标本原产地老挝的 Ban-Na-Mat。泰国标本的保存与切面方向优于原来的模式标本。该[illegible]内圈明显呈对称的短轴状，具发育于隔壁基部的列孔，而非隔壁孔，为 *Neofusulinella* 的属征提供了有意义的补充。泰国标本的伴生化石被鉴定为“*Sphaerulina*”和“*Ozawainella*”，两者事实上为 *Staffella* 和 *Nankinella*。该伴生[illegible]显示了 *Neofusulinella* 与其它史塔夫[illegible]类具有共同的“排它”性质和彼此之间的亲缘关系。要明确的是，列孔和拟旋脊在史塔夫[illegible]类并非稳定地出现在同一属种中，因此该构造在这类[illegible]中不作分类特征。

我国云南保山板桥镇金鸡大凹子 *Neofusulinella lantenoisi* Deprat 的新模和近模材料的采获亦为重要发现 (插图 1)。其层位为大洼子组下部的白云质灰岩(相当于云南省区域地质志所称尖山组下段)，伴生者有 *Nankinella* 和 *Staffella*，时代属茅口期。化石与围岩均经历白云岩化，标本一如大多数史塔夫[illegible]类，保存不佳，但它们是 *Neofusulinella* 属众多化石点中除泰国 Takli 外最接近模式标本所在地点者。据李春昱等(1982)资料，云南保山与老挝的模式地点及泰国的化石点同居他们所划分的东南亚板块的西缘。据方宗杰(1994)分析，老挝 Ban-Na-Mat 与云南保山在构造上虽然分属不同的次级块体，但两者之间于茅口期并无大洋分隔，可以视为同一浅水海域。用当前材料来指定新模和补充前人对 *Neofusulinella* 属原始记述的不足是合适的。

云南保山的新材料表明，周祖仁、盛金章(1994)对 *Neofusulinella* 的定义所进行的厘定是必要的，而前人以壳形相近，内圈具内卷虫式包卷，隔壁孔又十分发育而鉴定为“*Neofusulinella*”的那些茅口期[illegible]类，则应另有归属，其中的大部分很可能应归于李家骧(1986)所建立的多孔[illegible]属(*Alviolaria*)(插图 3a，b)。

**关键词**　*Neofusulinella*　模式种　[illegible]类　二叠纪　云南

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# *NEOFUSULINELLA LANTENOISI* DEPRAT, 1913, TYPE SPECIES OF THE PERMIAN FUSULINID GENUS *NEOFUSULINELLA*, FROM BAOSHAN COUNTY, WEST YUNNAN, CHINA

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**Abstract** The genus *Neofusulinella* Deprat, 1913 has long been misunderstood both in its generic conception and in its phylogenetic attribution. Zhou and Sheng (1994) reviewed its definition and referred it to the subfamily Staffellinae of the family Fusulinidae. The present materials collected from Jinji, Banqiao, Baoshan County, Yunnan once again provide the supplementary evidence for the above-mentioned revision. A neotype of the type species, *N. lantenoisi* Deprat is designated.

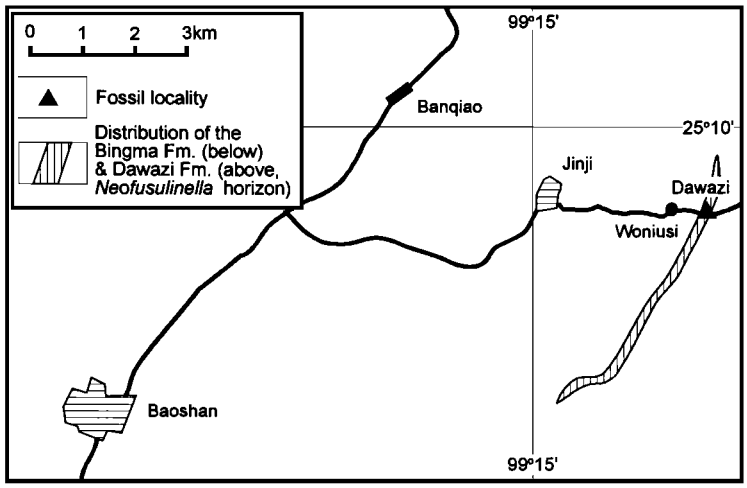
**Key words** *Neofusulinella*, Type species, Fusulinids, Permian, Yunnan

Although *Neofusulinella* Deprat, 1912 is a valid genus, its generic features have long been confusing because the syntypes of the type species were illustrated by drawings and the only axial section figured in the publication was ill-orientated. However, the major problem is that all of these type specimens have been lost (Thompson and Foster, 1937, p. 130). According to Zhou and Sheng, (1994), except a few records of the type species, *viz.*, Deprat, 1912, p. 1549; 1913, p. 41, pl. 7, figs. 23—25; Thompson and Forster, 1937, p. 131, pl. 24, figs. 1—4 and Pitakpaivan, 1965, p. 24, pl. 1, fig. 16, all the other identifications related to the genus *Neofusulinella* were thought to be incorrect. Moreover, all the species referred to the genera *Leëlla* Dunbar *et* Skinner, 1937 and *Haoella* Gong, 1966, including their type species, are the real *Neofusulinella*. In other words, both *Leëlla* and *Haoella* should be the junior synonyms of *Neofusulinella*.

In addition, Zhou and Sheng (1994) considered the genus *Neofusulinella* the most advanced member of the phylogenetic lineage of the subfamily Staffellinae in the family Fusulinidae, rather than in the family Schubertellidae as done by previous workers. Zhou and Sheng (1994) also suggested that these forms represent a specialized branch of the family that lived in a restricted littoral environment of "the zone of mixed meteoric-marine water" to explain why their shells usually were "silicified" or "dolomitized" to have indistinct structures or to form false multi-appearance structure during diagensis. This pseservation state has resulted in a general misunderstanding of the precise nature of the genus *Neofusulinella*.

Because the syntypes described by Deprat (1912, 1913) are not available for review, any discovery of the plesiotypes close to the original locality, Ban-Na-Mat, Luang Phrabang, Laos in the southeast Asia is significant. One specimen described by Pitakpaivan (1956) as *Neofusulinella* cf. *lantenoise* Deprat was reported from the Rat Buri limestone of Takli (15°18'N, 100°24'E), Nakhonsawan, Thailand. The single specimen has better preservation and orientation than those of the syntypes. It was located in an adjacent locality within the same tectonic block. The specimen suggested that the genus *Neofusulinella* should have inner volutions with short axis and may have foramina rather than septal pores. The associated genera "*Sphaerulina*" and "*Ozawainella*" at Takli are actually the representatives of *Staffella* and *Nankinella* respectively. This close phylogenetic association also suggested the exclusion of staffellins from non-staffellins ecologically.

The neotype and plesiotypes of *Neofusulinella lantenoisi* Deprat studied herein were collected from the Dawazi Formation at Dawazi, Jinji, near Banqiao, about 11 km N60°E to the Baoshan City (Textfig. 1). Dawazi Formation is equivalent to the horizon of the lower member of the Jianshan Formation. The latter, as used in the Geological Memoirs of Yunnan, ser. 1, no. 21, has a Maokouan age. All the staffellins here, including the associated *Nankinella* and *Staffella*, are poorly preserved as a




Text-fig. 1　Locality of *Neofusulinella lantenoisi* Deprat in Baoshan, Yunnan

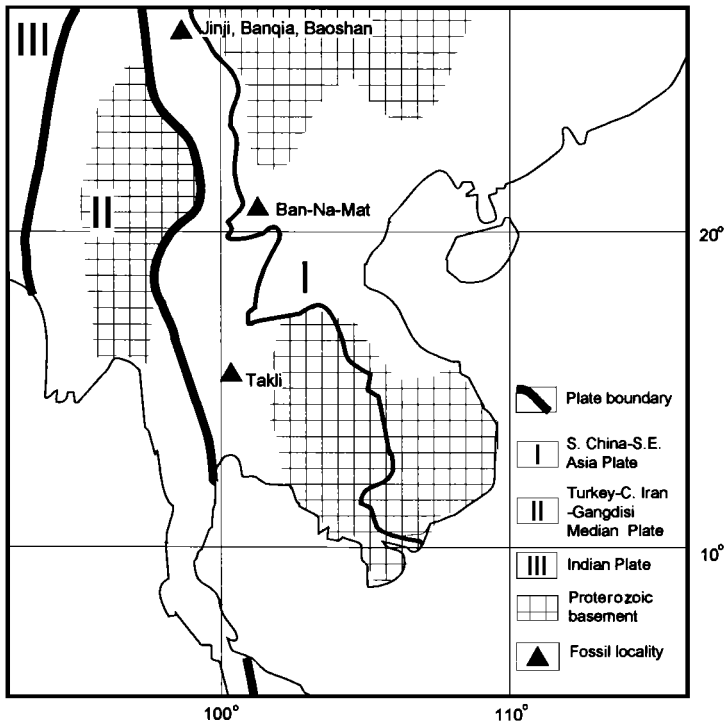
result of dolomitization.

Tectonic data indicate that Baoshan in Yunnan, Ban-Na-Mat in Laos, and Takli in Thailand are located along the west margin of the South China - Southeast Asia Block (Li *et al*., 1982). According to Fang (1994), Baoshan and the type-locality Ban-Na-Mat, although assigned to different second-ranked blocks, are considered to lie within the same shallow sea basin, were not separated from each other by a deep ocean during Maokouan (Text-fig. 2). Therefore, it is desirable to designate a neotype and to supplement the diagnosis of the genus *Neofusulinella* on the basis of the current materials.

The original diagnosis of *Neofusulinella* made by Deprat (1913, p. 40) is very brief and leaves much uncertainty, "Conch small, long-fusiformis, coiling around axis, with 5 at least and $6\frac{3}{4}$ at most volutions. Septa are straight, while slightly folding and getting close each other near the poles. Proloculus small and tunnel single." Deprat (1913) did not mention the structure of the spirotheca and septal pores at all. The concept of the genus was gradually completed by consequent works in an incorrect way and the critical features based on the type species *N. lantenoisi* Deprat had been altered step by step. Dunbar and Skinner (1937) and Thompson (1948) thought that the spirotheca of *Neofusulinella* consisted of two layers, *i. e*., tectum and diaphanotheca. Leven (1967) added that the inner volutions of the genus were coiling asymmetrically, with an "endothyroid juvenarium". Torivama, Kanmera and Ingvat (1969), besides the features mentioned-above, emphasized "septal perforation prominent and pores circular and large". Since then, the synthetic diagnosis of the genus could be summed up in "the taxon developed in Maokouan (Guadalupian) limestone, with two layer spirotheca and endothyra-like inner volutions, and characterized by well developed septal pores".

However, Zhou and Sheng (1994) did not think that the endothyroid inner volutions was the critical character of the genus. In normal cases, axes of the inner and outer volutions in *Neofusulinella* were coincident with each other and shells were symmetric for both sides. Additionally, they supposed that the spirotheca of *Neofusulinella* was of four layers like that in the genus *Fusulinella*, but usually the vague image of tectum with very fine "keriotheca" could be seen in the thin-sections, due to the diagenesis by silicization or dolomization. They also considered that *Neofusulinella* may have foramen and parachomata (but not necessarily), whereas it does not have "obvious septal pores", as usually thought.

Based on materials from Baoshan, it could be concluded that the genus *Neofusulinella* may have distinct foramen. As is well known, septal pores are distributed on the whole septa randomly, whereas foramina are only present along the bottom of septa. Also, septal pores are much smaller in diameter than foramen. The former is only approximately one third of the latter, *i. e*., 0.012—0.018 mm *vs*. 0.036—0.060 mm (compare Text-figs. 3a, b with 3c, d). Essentially, the difference between both structures




Text-fig. 2 Localities of *Neofusulinella lantenoisi* Deprat in Southeast Asia (boundary of plates modified from Li *et al*., 1982)

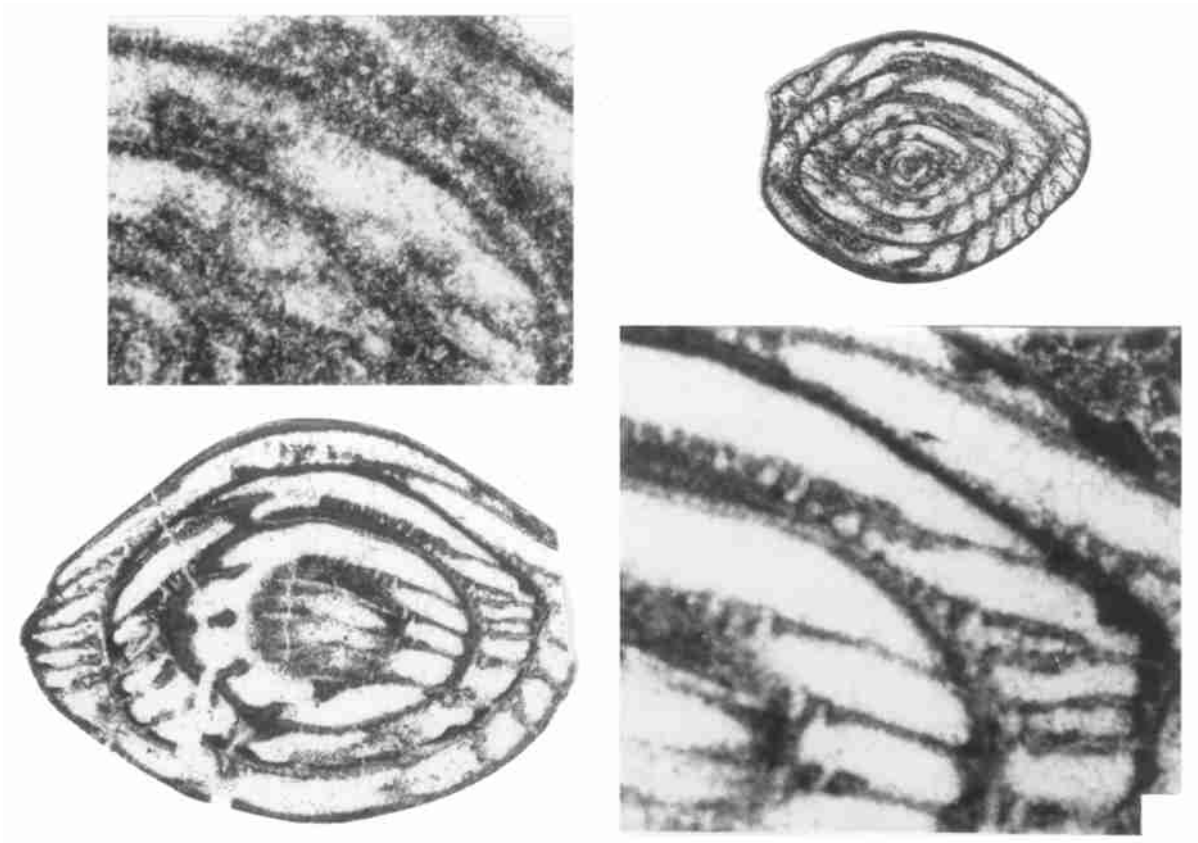
lies on origin and function. Septal pores are part of the antetheca and allow plasma exchange inside and outside of the shell. When the antetheca passes into the septa the septal pores close and lose their communication function. In most cases, these abandoned pores in septa can not be observed in the thin-section (Dunbar and Henbest, 1942, p. 45). Foramen, on the other hand, serve as tunnels to connect the plasma between chambers in the shell, that is, they are internal structures. Pores and foramen are structures that evidently have different physiological function. They could also be distinguished as the primary and secondary structures. The former includes septal pores and the latter includes both foramen and parachomata. The pictures of Jinji, Banqiao, Baoshan materials (Pl. I, figs. 1—11; Text-figs. 3c,d) obviously show the latter, *i.e.*, foramen and discontinuous parachomata. The strong ridge-like items appeared in the mediate volutions of the syntype *Neofusulinella lantenoisi* Deprat might be simply the exaggerated parachomata (Deprat, 1913, pl. 7, fig. 23). As discussed above, the "developed septal pores" is not the real character of the genus *Neofusulinella*.

It should be emphasized here that both foramina and parachomata in staffellins are not consistently developed or always developed to the same extent in all the genera, hence these two structures are not considered as taxonomic characters in them.

Although the thin-sections of the present materials are not good enough for us to observe the shape of the inner volutions and the structure inside perfectly, the evolutionary process from the symmetric lenticular shape of inner volutions *via* the spherical shape of middle volutions to the matured thick fusiform of outer volutions is well recognized. Combining observations made on specimen 168 in Pitakpaivan (1965), we may conclude that the axes of the inner and outer volutions in the genus *Neofusulinella* are variable only in relative length compared with width (*i.e.*, in form ratio), but the direction of axes of the inner and outer volutions are coincident with each other. In normal cases, there are no endothyra-like inner volutions in the genus.

To sum up, *Neofusulinella* is the advanced representative of staffellins in Permian, with a thick, four-layered spirotheca, well-developed chomata, and straight septa. Shape changes in ontogeny, from lenticular juvenility through spherical transition, then to fusiform adult. It may have foramina and discon-

tinuous parachomata. The consistent association of *Neofusulinella* with *Staffella* and *Nankinella* (Pl. I, figs. 12 and 13) could be thought as the ecological and taphonomical similarity among them. It also could be thought as the phylogenetic epitome at the same time level. However, the usual Maokouan "*Neofusulinella*" forms with endothyra-like juvenile and well-developed septal pores should be reassigned to other genus. Most of them may be referred to the genus *Alviolaria* Li, 1986 (Text-figs. 3a,b).



Text-fig. 3　Differences between the septal pores in *Alviolaria* and the foraminen with parachomata in *Neofusulinella*

a,b. *Alviolaria* sp. Close to axial section, specimen for short training-course, of the Maokouan age, locality unknown. a. ×25, b. partial enlargement of the same specimen, ×100, to show the septal pores distributed over all the septa.

c,d. *Neofusulinella tantenoisi* Deprat, tangential section of plesiotype NIGP 129425, Maokouan Stage, Dawazi, Jinji, Banqiao, Baoshan County, Yunnan. c. ×15, d. partial enlargement of the penultimate two volutions of the same specimen, ×60, showing foramina being limited at the base of septa and the discontinuous parachomata between septa. The specimen is housed in the Repository of Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, Nanjing 210008, P. R. China.

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## SYSTEMATIC DESCRIPTION

**Superfamily Fusulinacea Möller, 1878 (nom. correct. Loeblich *et* Tappan, 1961, pro Superfamily Fusulinidea Ciry in Piveteau, 1952)**

**Family Fusulinidae Möller, 1878**

**Subfamily Staffellinae Miklukho-Maklay, 1949**

### Genus *Neofusulinella* Deprat, 1912

*Neofusulinella* Deprat, 1912, p. 1549; 1913, p. 40 (part); Dunbar and Skinner, 1937, p. 564 (part); Thompson, 1948, p. 36 (part); 1964, p. C406 (part); Thompson and Forster, 1938, p. 130 (part); Pitakpaivan, 1965, p. 24; Miklukho-Maklay, Rauser-Chernousova and Rozovskaya, 1959, p. 211 (part); Rozovskaya, 1975, p. 56 (part); Sheng, Zhang and Wang, 1988, p. 62 (part); Zhou and Sheng, 1994, p. 61. Above-marked "part" actually means only the type species, *N. lantenoisi* Deprat is included.

*Leëlla* Dunbar *et* Skinner, 1937, p. 604; Thompson, 1948, p. 31; 1964, p. C396; Miklukho-Maklay, Rauser-Chernousova and Rozovskaya, 1959, p. 207; Rozovskaya, 1975, p. 115; Gong,

1966, p. 87; Yang, 1978, p. 93; Liu, Dong and Xiao, 1978, p. 76; Wang, Wang and others, 1982, p. 92; Chen, 1984, p. 38; Lin, 1984, p. 177; Sheng, Zhang and Wang, 1988, p. 133.

*Haoella* Gong, 1966, p. 86; Rozovskaya, 1975, p. 118; Lin, 1977, p. 18; Rauser-Chernousova , 1985, p. 18; Sheng, Zhang and Wang, 1988, p. 181.

*Sphaerulina* Kochansky-Devidé, 1966, p. 89 (part).

*Caspiella* Gibsman *et* Sipko, 1985, p. 27 (part).

**Type species** *Neofusulinella lantenoisi* Deprat, 1913, p. 41, pl. VII, figs. 23—25 (= *Neofusulinella* sp., Deprat, 1912), Maokouan Stage, Ban-Na-Mat, Luang Phrabang, Laos.

**Definition** Shell medium size, thick fusiform with bluntly pointed poles in adult. A series of shape changes occur in ontogeny, from a lenticular juvenile through spherical transition, then to fusiform adult. Spirotheca thicker, composed of tectum, diaphanotheca and inner and outer tectoria, in most cases with various pseudomorphs of spirothecal structures owing to diagenetic replacement. Septa straight; some specimens with well-developed foramina and discontinuous parachomata; median tunnel with small tunnel angle; chomata well developed.

**Discussion** The major characters of the genus are a series of shape changes occurring in ontogeny, from lenticular to fusiform, but both sides being symmetrical throughout the shell, four layer spirotheca and well developed chomata and medial tunnel, in addition, shells usually have diagenetic replacement with relation to environment where they lived and were buried. Foramina may be found in some individuals, depending on their living environment.

**Component of species** more than 10 species, including *N. lantenoisi* Deprat, 1913; *N. bellula* (Dunbar and Skinner), 1937; *N. brevica* (Li), 1989; *N. compacta* (Li), 1989; *N. ellipsoidalis* (Kokhanska-Devidé), 1966 (Zhou and Sheng, 1994, p. 64 was wrongly writing as the species *Sphaerulina croatica*); *N. fountaini* (Dunbar and Skinner), 1937; *N. guangxiensis* (Lin), 1977; *N. kalmykovae* (Gibsman and Sipko), 1985; *N. kueichowensis* (Gong), 1966; *N. sinensis* (Gong), 1966; and ? *N. sphaeroidea* (Li), 1989.

**Age and distribution** Middle to Late Permian; South China, Indo-China Peninsula, Dzhulfa area, Croatia, Russian and North America.

### *Neofusulinella lantenoisi* Deprat, 1913

(Pl. I, figs. 1—11, Text-figs. 3c, d)

1912 *Neofusulinella* sp., Deprat, p. 1549.

1913 *Neofusulinella lantenoisi* Deprat, p. 41, pl. 7, figs. 23—25.

1937 *Neofusulinella lantenoisi*, Thompson and Forster, p. 131, pl. 24, figs. 1—4.

1937 *Ozawainella* sp., Thompson and Forster, p. 132, pl. 24, figs. 6, 8.

1965 *Neofusulinella lantenoisi*, Pitakpaivan, p. 24, pl. 1, fig. 16.

? 1984 *Leëlla hubeiensis* Chen, p. 38, pl. 16, figs. 12—14.

? 1994 *Neofusulinella hubeiensis*, Zhou and Sheng, 1994, pl. 4, figs. 1—7.

**Materials** Twelve thin-sections, some of them poorly oriented, fossils and matrix were dolomitized.

**Description** Shell medium, thick fusiform with bluntly pointed poles and flat or slightly convex slopes in matured stage. Adult individuals are of 7—10 volutions, with 3.67—5.85 mm in length, 2.65—4.22 mm in width, and form ratio at 1.38—1.41. The first one or two volutions are of a symmetric lenticular to spherical shape with form ratio less than one. Size of proloculus is unclear for all specimens since sections did not centered well enough. Spirotheca structure can not be recognized owing to dolomitization. Spirotheca looks thick compared with shell size, in the last volution the thickness may reach 0.108 mm. Septa straight, with well developed basal foramina. Parachomata discontinuous, along the base of chambers. Diameter of foramina may reach 0.036—0.060 mm. Chomata well developed, with steep tunnel side, present in both inner and outer volutions. Tunnel narrow, in a crescent form with half height of the chamber.

**Comparison** At the pre-maturely ontogenetic stage with 5—7 volutions, the present specimens are very similar to the figures and coincident with the brief description of the conspecific syntypes of Deprat (1913). The nearly centered axial section of the syntypes was of merely 5—6 volution, at 2.96 mm length and 2.00 mm width, about 1.48 in form ratio. It is quite close to the smaller specimens in Baoshan materials. These smaller specimens are very close to the plesiotypes of *N. lantenoisi* Deprat, described by Thompson and Forster (1937) from Sichuan, South China and Pitakapaivan (1965) from Takli, Thailand in shell form, size, thickness of spirotheca, chomata and tunnel and planispiral coiling with a series of shape changes in ontogeny. Two

Tab. 1　Measurements of *Neofusulinella lantenoisi* Deprat

| Catalogue No. | Figure | Length | Width | F.R. | D.P. | Radius vector | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| NIGP 129414 | pl.1.fig.1 | 5.85 | 4.22 | 1.39 | — | 0.12 | 0.18 | 0.26 | 0.44 | 0.65 | 0.88 | 1.16 | 1.50 | 1.84 |
| NIGP 129415 | pl.1.fig.2 | 5.17 | 3.67 | 1.41 | — | 0.08 | 0.17 | 0.26 | 0.38 | 0.66 | 0.80 | 1.02 | 1.36 | 1.6 |
| NIGP 129416 | pl.1.fig.3 | 3.67 | 2.65 | 1.38 | — | 0.09 | 0.18 | 0.26 | 0.38 | 0.58 | 0.8 | 1.09 | | |

| Form ration | | | | | | | | | Thickness of spirotheca | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0.50 | 0.87 | 1.11 | 1.23 | 1.29 | 1.53 | 1.53 | 1.45 | 1.40 | — | — | — | 0.048 | 0.060 | 0.072 | 0.078 | 0.084 | 0.108 |
| 0.71 | 0.86 | 1.00 | 1.28 | 1.3 | 1.35 | 1.41 | 1.22 | 1.21 | — | — | — | — | 0.048 | 0.060 | — | — | — |
| 0.51 | 0.90 | 1.38 | 1.42 | 1.65 | 1.51 | 1.43 | | | — | — | 0.036 | 0.036 | 0.048 | 0.048 | 0.060 | | |

F.R.: Form ratio; D.P.: Diameter of proloculus not available for Baoshan materials

more volutions, *i.e.*, the 8th to 9th and a half in most of the present specimens are thought to be the result of the full-growth in the same species.

The specimen shown in Pitakpaivan (1965, p. 24, pl. 1, fig. 6) has well developed foramina and discontinuous parachomata, but was not mentioned by that author. It is interesting that these features are the same as in the current specimens.

According to the fossil association, the present material is also quite similar to those noted by Thompson and Foster (1937) and Pitakpaivan (1965). Both the "dark-gray to black, slightly cherty limestone" of Sichuan, South China and "brownish limestone" in Takli, Nakhonsawan, Thailand have abundant *Nankinella* (= *Ozawainella* in Thompson and Foster, 1937 and Pitakpaivan, 1965) and *Staffella* (= *Eoverbeekina* in Thompson and Foster, 1937; = *Sphaerulina* in Pitakpaivan, 1965). As further evidence, the association of fossils which usually existed in the silicified or dolomitized matrix indicates that all these genera should be phylogenetically related to each other.

Since there are many differences in the form and structure of the shell, we do not include the specimens which were identified as *N. lantenoisi* Deprat by Miklukho-Maklay (1957) into the present species.

**Locality and horizon**　Dawazi, Jinji, Banqiao, Baoshan County, Yunnan; Maokouan Dawazi Formation. The present horizon is the same as the Sichuan materials of Thompson and Foster (1937). The Artinskian assignment of Pitakpaivan of Takli's materials probably resulted from misunderstanding.

**Catalogue number**　NIGP 129414 (neotype); 129415—129425 (plesiotypes).

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## EXPLANATION OF PLATES

Specimen shown in the plates were collected from Dawazi, Jinji, Banqiao, Baoshan County, Yunnan, at horizon of the Maokouan Dawazi Formation (=lower Jianshan Formation), Permian. All ×15. Specimens with catalogue-numbers NIGP 129414—129425, $129425^{-1}$ and $129425^{-2}$ are housed in the Repository of Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, Nanjing 210008, P. R. China. (NIGP 129425 showing in Text-figs. 3c,d).

**Plate I**

1—11. *Neofusulinella lantenoisi* Deprat

1—3. Axial sections nearly centered. 1, neotype, NIGP 129414; 2, 3, plesiotypes, NIGP 129415 and 129416 respectively.

4—10, Close to axial sections, all plesiotypes, NIGP 129417—129423, respectively.

11, Oblique, close to sagital section, plesiotype, NIGP 129424.

12. *Nankinella* sp.

Oblique, close to axial section, in association with *N. lantenoisi* Deprat, indicating a restricted living and burying environment, NIGP $129425^{-1}$.

13. *Staffella* sp.

Nearly axial section, in association with *N. lantenoisi* Deprat, indicating a restricted living and burying environment, NIGP$129425^{-2}$.

*Neofusulinella lantenoisi* Deprat, 1913, Type Species of the Permian Fusulinid Genus *Neofusulinella*, from Baoshan County, West Yunnan, China

Plate I