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CHAROPHYTES OF NANXIONG BASIN, GUANGDONG AND ITS CRETACEOUS-TERTIARY BOUNDARY

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Summary

The present paper makes a second study on the fossil oogonia of the Charophyta from the Nanxiong Basin, Guangdong. The first study (Huang Ren-jin, 1979) concerned the charophyte fossil of Late Cretaceous and Paleogene from the same basin, while the present one contains Cretaceous-Tertiary boundary and charophytes of this basin.

The Late Cretaceous and Paleogene charophytes described in this paper were obtained from the sections of Yangmeikeng-Nilongkeng (about 2 km. WS of Datang) and Fengmenao (about 4 km. WS of Nanxiong town), Nanxiong. They consist of 19 genera, 46 species (including 8 new species), with their occurrences shown in Tables. I—II.

The stratigraphic sequence and fossils of the Late Cretaceous to Paleocene section from Yangmeikeng to Nilongkeng in the Datang district are recognized in descending order as follows:

Paleocene Shanghu Formation 272.67 m

20. Brown or yellowish-brown silt mudstones, with brownish-red or greyish-green sandstones (10—30 cm) in the top part, rich in such charophytes (fossils No. ND-320, 324) as *Peckichara varians, P. zhijiangensis, Neochara sinuolata, Stephanochara huangjiancnsis S. micrococa, S. hukouensis, S. wanzhuangensis* and

Rhabdochara jiangduensis. 37.89 m

19. Brown or dark-purple silt mudstone and clayey siltstone, with thin-bedded greyish-green sandstones, yielding the charophytes (ND-297, 298, 299, 301, 302, 304, 305, 306, 307, 309, 311, 312, 313) *Charites sadleri, C. styliovalis* sp. nov., *C. oblonga* sp. nov., *Nemegtichara prima, Mesochara datangensis* sp. nov., *Peckichara varians, P. longa, P. zhijiangensis, Neochara huananensis, Stephanochara huangjianensis, S. kiangsuensis, S. funingensis, S. micrococca, S. hukouensis, S. wanzhuangensis, Rhabdochara jiangduensis* 290, 294) *Mesochara datangensis* 39.68 m
18. Brown silt mudstones, rich in calcareous nodules, yielding the charophyte (ND-273, 275, 278, 279, 288, 290, 294) *Mesochara datangensis* 39.68 m
17. Brown clayey siltstones and silt mudstone, intercalated with thin sandstones, with a layer of purplish-grey thick sandstones in the basal part, yielding the charophytes (ND-245, 256, 257, 258, 261, 263, 271) *Nemegtichara prima, Mesochara datangensis, Peckichara longa, Latochara curtula* and *L. cylindrica.* 38.97 m
16. Purplish-red silt mudstones, rich in calcareous nodules, yielding the charophytes (ND-221, 228, 232, 234, 235, 237) *Sphaerochara parvula, Nemegtichara prima, Mesochara datangensis, Grovesichara changzhouensis and Croftiella* cf. *stenoformis.* 50.32 m
15. Dark red clayey siltstones, with 2 layers of yellowish-grey thick sandstones in the upper and basal parts separately, rich in such charophytes (ND-207, 209, 210, 211, 213, 214, 215, 216, 217, 218, 219) as *Charites oblonga, Nemegtichara prima, Mesochara datangensis, Sphaerochara parvula, Grovesichara changzhouensis, Croftiella* cf. *stenoformis, Stephanochara breviovalis, Latochara curtula* and *L. cylindrica.* 32.24 m
14. Purplish-red or yellowish-brown silt mudstones, yielding the charophyte (ND-194) *Sphaerchara parvula.* 31.00 m
13. Interbedding of purplish-red clayey siltstones and sandstones, yielding, the charophytes (ND-187, 191) *Stephanochara cuneiformis* and *S. micrococca.* 3.14 m
12. Purplish-red silt mudstones, yielding the charophyte (ND-184) *Gobichara deserta.* 5.80 m
11. Yellowish-grey thick-bedded sandy conglomerates with purplish-red mudstones and thick sandstones in the basal part, yielding the charophytes (ND-168, 172, 176, 178, 179, 180) *Hornichara paralagenalis, Grovesichara changzhouensis, Stephanochara cuneiformis, S. breviovalis* and *S. micrococca.* 0.40—1.00 m

------disconformity ?------

Upper Cretaceous Nanxiong Formation

Upper member 160.99 m

10. Purplish-red silt mudstones and clayey siltstones in the upper part; and grey-purple sandy conglomerates in the lower part, yielding oöliths and the charophytes (ND-164) *Mesochara datangensis* and *Grovesichara changzhouensis.* 9.29 m
9. Interbedding of purplish red silt mudstones, clayey mudstones and grey-purple sandy conglomerates, yielding oöliths. 55.54 m
8. Interbedding of grey-purple thick sandstones and clayey siltstones, yielding oöloths and the charophyte (ND-120) *Maedlerisphaera sanshuiensis.* 28.52 m
7. Greyish-purple or purplish-red sandstones and thick sandstones, yielding the charophyte (ND-106); *Grovesichara changzhouensis.* 67.64 m

Middle member 229.36 m

6. Purplish-red silt mudstones. 44.22 m
5. Purplish-red silt mudstones. 41.48 m
4. Purplish-red silt mudstones, with many layers of greyish-green, greyish-purple sandstones conglomerates, yielding the charophytes (ND-78) *Sphaerochara parvula, Nemegtichara prima* and *Maedlerisphaera sanshuiensis.* 57.00 m
3. Purplish-red silt mudstones and clayey siltstone, intercalated with a number of greyish-green sandstones and thin sandstones, in which had been found footprints of Dinosauria, rich in such charophytes (ND-34, 35, 39, 42, 51, 52, 54, 59, 62, 63, 69, 70, 73) as *Amblyochara longiconica, A.* sp., *Nemegtichara prima, Sphaerochara parvula, Obtusochara paracylindrica* sp. nov., *Gyrogona xindianensis, Pseudolatochara jianghanensis, Maedlerisphaera sanshuiensis, Peckichara paomagangenis, Latocurtulacurtula, L. cylindrica* and *L. guangdongensis.* 41.86 m
2. Purplish-red silt mudstones, rich in such charophytes (ND-16, 20, 23, 24, 26, 27) as *Charites tenuis, Amblyochara longiconica, A. breviconica* sp. nov., *Nemegtichara prima, N yoshanensis* sp. nov., *Mesochara datangensis, Obtusochara columna* sp. nov., *Pseudolatochara jianghanensis, Latochara curtula, L. cylindrica* and *L. guangdongensis.* 28.17 m
1. Purplish-red silt mudstones, intercalated with greyish-green thin sandstones, rich in such charophytes as (ND-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,): *Charites tenuis, C. styliovalis, Amblyochara longiconica, A. breviconica, Nemegtichara prima, N. youshanensis, Mesochara datangensis, Sphaerochara parvula, Grambastichara yuntaishanensis, Gyrogona xindianensis, Croftiella* cf. *stenoformis, Latochara curtula, L. cylindrica* and *L. guangdongensis.* 16.93 m

The stratigraphic sequence and fossils of the Late Cretaceous to Paleocene section from Fengmenao are recognized in descending order as follows:

Paleocene Shanghu Formation 64.12 m

9. Brown clayey sandstones, rich in calcareous nodules yielding the charophyte (NF-57) *Latochara curtula.* 16.97 m
8. Brown clayey sandstones, intercalated with thick sandstones in the basal part, yielding the charophytes

(NF-40, 41, 42, 44, 45) *Nemegtichara prima, Mesochara datangensis, Hornichara paralagenalis, Gobichara deserta, G. rubra, Grovesichara changzhouensis* and *G. changdeensis* 20.72 m

7. Brown or purple silt mudstones, intercalated with sandy conglomerates, calcareous nodules and 2 layers of yellowish-green clay rock (2—3 cm), rich in such charophytes (NF-18, 21, 22, 26, 29, 31, 32, 33, 34, 35, 37, 39) as *Charites longiovata* (J. F. Zhang) comb. nov., *Hornichara lagenalis, Gobichara deserta, G. subglobosa, Grovesichara changzhouensis, G. changdeensis, G.* sp. and *Stephanochara cuneiformis.* 26.43 m

Upper Cretaceous Nanxiong Formation

Upper member 120.24 m

6. Purplish-red clayey mudstones, intercalated with brown thin sandstones and thick sandstones, yielding oöliths and the charophytes (NF-11, 12) *Hornichara lagenalis* and *Grovesichara changzhouensis.* 11.62 m

5. Purplish-red thick sandstones and sandy conglomerates. 12.62 m

4. Purplish-red thick sandstones, intercalated with greyish-green thin sandstone. 16.98 m

3. Purple thick sandstones, sandy conglomerates. 31.82 m

2. Interbedding of purple thick sandstones and greyish-purple sandy conglomerates. 27.77 m

1. Greyish-yellow thick sandstones and sandy conglomerates. 19.89 m

Nanxiong Formation

In this formation, the charophytes occur in the 1st—10th beds of the Yangmeikeng to Nilongkeng section and in the 1st—6th beds of the Fengmenao section (see Tables I—II), including *Charites tenuis, Amblyochara longiconica, Nemegtichara prima, Hornichara lagenalis, Grambastichara yuntaishanensis, Gobichara deserta, Gyrogona xindianensis, Grovesichara changzhouensis, Pseudolatochara jianghanensis, Latochara curtula, L. cylindrica* and *L. guangdongensis.* Among them, *Charites tenuis, Grambastichara yuntaishanensis, Gyrogona xindianensis, Pseudolatochara jianghanensis, Latochara curtula* and *L. cylindrica* were found in the Upper Cretaceous Paomagang Formation of Hubei, and the Upper Cretaceous Taizhou Formation of Jiangsu, China, with fossil egg shells of dinosaurs yielding in the formation, thus suggesting that it might be assigned to the Maastrichtian of the Late Cretaceous in age.

Shanghu Formation

The charophytes from the 11th—20th bods of the Yangmeikeng to Nilongkeng section and the 7th—9th beds of the Fengmenao section (see Tables I—II) contain 34 species in 14 genera, namely, *Charites oblonga, Gobichara deserta, Grovesichara changzhouensis, Neochara sinuolata, N. hunanensis, Peckichara varians, P. longa, P. zhijiangensis, Stephanochara kiangsuensis, S. breviovalis S. cuneiformis, S. huangjianensis, S. funingensis, S. micrococca, S. hukouensis, S. wanzhuangensis, Rhabdochara jiangduensis, Latochara,* etc. Among them, *Gobichara deserta* was found in the Paleocene to Early Eocene of North America, Mongolia and Upper Cretaceous to Eocene of Jiangsu, Hunan, Hubei ,Yunnan, Guangdong and the Bohai Coastal Region of China; and it is very rich in the Paleocene of China. *Peckichara varians* was found in the Sparnacian of France and Paleocene of China; *P. longa* and *P. zhijiangensis* were found in the Paleocene to Eocene of Hubei and Jiangsu in China; while *Grovesichara changzhouensis, Stephanochara kiangsuensis, S. funingensis, S. breviovalis* and *S. huangjiangensis* are the common species in Paleocene or Eocene of China. It is believed that the Shanghu Formation which contains the outstanding mammalian fauna characterized by *Bemalambda,* belongs to the Middle Paleocene of America. In short, this formation belongs to the Danian of the Paleocene in age. Therefore, the Cretaceous-Tertiary boundary in this basin is drawn between the Nanxiong Formation and the Shanghu Formation.

Descsription of new species

Charites styliovalis sp. nov.

(Pl. I, figs. 3—5)

Description: Gyrogonites cylindrical-ovate, ranging from 725 to 750 μm in length and from 425 to 450 μm in width. Apical part broady conical and basal tip round. Spiral cells convex, slightly thinner at the summit than those on the equator, with 10—11 convolutions in lateral view. Spirals at equator 75 μm in width, with an equ-

atorial angle of about 18°—20°. Cellular spirals slightly narrow and flat at apical periphery. Basal pore small, pentagonal, with outer opening about 25 μm in diameter.

Horizon and Locality: Nanxiong Formation of Upper Cretaceous and Shanghu Formation of Paleocene, Datang, Nanxiong Basin, Guangdong.

Charites longiovata (J. F. Zhang) comb. nov.

(Pl. 1, figs. 6, 7)

1988 *Horichara longiovata*, J. F. Zhang et al, p. 333, pl. 89. figs. 3, 4.

Description: Gyrogonites elongated ovate, 525—550 μm long and 327—337 μm wide. Apex narrowly rounded and basal forming a stalk-like projection. Cellular spirals concave, narrow at apical periphery. becoming distinctly wider at apical center, and continuing onto summit without changing their thickness to join with each other along a short irregular line. Cellular furrows shallow-broad; inter-cellular ridges lower-narrow; 9—10 convolutions visible in lateral view; spirals at equator 66 μm in width with an equatorial angle of about 20—22°. But basal pore pentagonal, with outer opening about 50 μm in diameter.

Horizon and Locality: Shanghu Formation of Paleocene, Datang and Fengmenao, Nanxiong Basin, Guangdong.

Charites oblonga sp. nov.

(Pl. I, figs. 8, 9)

Description: Gyrogonites subcylindrical, ranging from 525 to 587 μm in length and from 250 to 300 μm in width, with the greatest diameter at mid-height. Apex broadly conical or round and flatly based. Spiral cells slightly convex, with 10—11 convolution in lateral view. Spirals at equator 66 μm in width, with an equatorial angle of about 28°—30°. Spiral cells slightly narrow at apical periphery, but slightly broadened and meeting each other along a short zigzag line at apical center. Basal pore pentagonal, about 50 μm in diameter.

Horizon and Locality: Shanghu Formation of Paleocene, Datang, Nanxiong Basin, Guangdong.

Amblyochara breviconica sp. nov.

(Pl. I, figs. 12, 13)

Description: Gyrogonites broadly oval, about 640—650 μm in length and 550—570 μm in width, with the greatest diameter a little above mid-height. Apex broadly rounded and basal slightly rounded. Spiral cells convex, with 9—10 convolutions visible in lateral view. Spirals at equator 66 μm in width, with an equatorial angle of about 15°. Spiral cells slightly narrowing at apical periphery, but slightly broadened and meeting each other along a short irregular line at apical center. Outer opening of basal pore pentagonal, about 60 μm in diameter.

Horizon and Locality: Nanxiong Formation of Upper Cretaceous, Datang, Nanxiong Basin, Guangdong.

Nemegtichara youshanensis sp. nov.

(Pl. I, figs. 14, 15; Pl. II, fig. 3)

Description: Gyrogonites cylindrical or subcylindrical, generally consisting of five (rarely six) sinistral spiral cells, 542—550 μm long and 375—387 μm wide, with the maximum diameter at mid-height; Summits broadly rounded or broadly conical; bases rounded or narrowly round. Spiral cells concave or slightly convex, with 8—9 convolutions visible in lateral view. Spirals at equator 58—66 μm wide, with an equatorial angle of about 11°—20°. Spiral cells slightly concave at apical part, but joining with each other at one point at apical center without changing their width. Basal pore pentagonal, about 40μm in diameter. Basal plug unknown.

Horizon and Locality: Shanghu Formation of Paleocene, Datang, Nanxiong Basin, Guangdong.

Mesochara datangensis sp. nov.

(Pl. II, figs. 1, 2, 4)

Description: Gyrogonites cylindrical-oval,

or elongated-oval, ranging from 400 to 450 μm in length and from 275 to 325 μm in width, with the maximum diameter at mid-height, possessed of rounded summites and rounded or pointed rounded bases. Spiral cells concave, with 8—9 convolutions in lateral view, meeting at a point or along a short irregular line without changing their width and thickness. At apical part, basal pore pentagonal, about 40—45 μm in diameter.

Horizon and Locality: Nanxiong Formation of Upper Cretaceous, Datang and Shanghu Formation of Paleocene, Fengmenao, Nanxiong Basin, Guangdong.

Obtusochara columna sp. nov.

(Pl. II, figs. 11, 12)

Description: Gyrogonites cylindrical, ranging from 400 to 420 μm in length and from 250 to 295 μm in width, with the maximum diameter above mid-height, possessed of broadly rounded or flattened summits and broadly flattened bases. Spiral cells flat or slightly convex, with 7—8 convolutions visible in lateral view. Spirals on equator 66 μm wide. Equatorial angle about 17°—20°. Cellular spirals reaching the summit without change in width but conspicuously with a smaller thickness, and contacting each other along a short irregular line at apical center. Basal pore pentagonal, about 40 μm in diameter.

Horizon and Locality: Nanxiong Formation of Upper Cretaceous, Datang, Nanxiong Basin, Guangdong.

Obtusochara paracylindrica sp. nov.

(Pl. II, figs 13, 14)

Description: Gyrogonites subcylindrical or cylindrical-ovoid, 475—500 μm long, and 350—375 μm wide, with the maximum diameter at mid-height; apex broadly rounded and base rounded. Spiral cells concave to slightly convex, with 7—8 convolutions in lateral view. Spirals at equator 66 μm wide. Equatorial angle about 20°. Cellular spirals reaching the summit without change in width and obviously becoming thinner. Ends of cellular spirals slightly protruding, and contacting each other at one point. Basal pore pentagonal, about 40 μm in diameter.

Horizon and Locality: Nanxiong Formation of Upper Cretaceous, Datang, Nanxiong Basin, Guangdong.

Gobichara subglobosa sp. nov.

(Pl. III, figs. 2, 3)

Description: Gyrogonites subglobose, 325—350 μm long, and 300—325 μm wide, with the maximum diameter at mid-height, apex rounded and base conical. Spiral cells slightly concave; intercellular ridges narrow. Secondary ridges mostly the same as or slightly narrower and lower than intercellular ridges. Spirals at equator 40 μm wide. Equatorial angle about 10°. Cellular spirals reaching the summit without changing their width and thickness, and joining with each other along a short irregular line. Secondary ridges disappearing on apical periphery while comma-shaped tubercles appearing at apical center at slightly extended ends of cellular spirals. Basal pore small, pentagonal, about 25 μm in diameter.

Horizon and Locality: Shanghu Formation of Paleocene, Fengmenao, Nanxiong Basin, Guangdong.

图 版 说 明

标本保存于中国科学院南京地质古生物研究所，除注明者外，所有标本均放大 60 倍。

图 版 I

1. *Charites sadleri* (Unger) Horn af Rantzien
   1.侧视。南雄县大塘杨梅坑—逆龙坑剖面；上湖组。登记号 PB14056。
2. *Charites tenuis* Z. Wang
   2.侧视。南雄县大塘杨梅坑—逆龙坑剖面；南雄组。登记号 PB14057。
3—5. *Charites styliovalis* sp. nov.
   3a—c. 正模 (Holotype)，顶、侧、底视。南雄县大塘杨梅坑—逆龙坑剖面；南雄组。登记号 PB14058。
   4.侧视。产地层位同上。登记号 PB14059。
   5.侧视。南雄县大塘杨梅坑—逆龙坑剖面；上湖组。登记。

号 PB14060。

6,7. *Charites longiovata* (J. F. Zhang) comb. nov.

6a—c. 顶、侧、底视。产地层位同上。登记号 PB14061。

7.侧视。产地层位同上。登记号 PB14062。

8,9. *Charites oblonga* sp. nov.

8a—c. 正模 (Holotype), 顶、侧、底视。产地层位同上。登记号 PB14063。

9.侧视。产地层位同上。登记号 PB14064。

10. *Grambastichara yuntaishanensis* Z. Wang

10.侧视。南雄县大塘杨梅坑—逆龙坑剖面;南雄组。登记号 PB14065。

11. *Amblyochara longiconica* Huang

11.侧视。产地层位同上。登记号 PB14066。

12,13. *Amblyochara breviconica* sp. nov.

12a—c. 正模 (Holotype), 顶、侧、底视。产地层位同上。登记号 PB14067。

13.侧视。产地层位同上。登记号 PB14068。

14,15. *Nemegtichara youshanensis* sp. nov.

14a—c. 正模 (Holotype), 顶、侧、底视。产地层位同上。登记号 PB14069。

15.侧视。产地层位同上。登记号 PB14070。

16. *Nemegtichara prima* Karczewska et Ziembinska

16.侧视。产地层位同上。登记号 PB14071。

图　版　II

1,2,4. *Mesochara datangensis* sp. nov.

1a—c. 正模 (Holotype) 顶、侧、底视。南雄县大塘杨梅坑—逆龙坑剖面;上湖组。登记号 Pb14072。

2a—c. 顶、侧、底视。产地层位同上。登记号 PB14073。

4a—c. 顶、侧、底视。南雄县大塘杨梅坑—逆龙坑剖面;南雄组。登记号 PB14074。

3. *Nemegtichara youshanensis* sp. nov.

3a—c. 顶、侧、底视。产地层位同上。登记号 PB14075。

5. *Sphaerochara parvula* (Reid et Groves) Horn af Rantzien

5.侧视。南雄县大塘杨梅坑—逆龙坑剖面;上湖组。登记号 PB14076。

6. *Pseudolatochara jianghanensis* Z. Wang

6.侧视。南雄县大塘杨梅坑—逆龙坑剖面;南雄组。登记号 PB14077。

7. *Hornichara paralagenalis* Huang et Xu

7.侧视。产地层位同上。登记号: PB14078。

8,9. *Hornichara lagenalis* (Straub) Huang et Xu

8.侧视。南雄县城西南角风门坳剖面;上湖组。登记号 PB14079。

9.侧视。产地层位同上。登记号 PB14080。

10. *Amblyochara* sp.

10a—c. 顶、侧、底视。南雄县大塘杨梅坑—逆龙坑剖面;南雄组。登记号 PB14081。

11,12. *Obtusochara columna* sp. nov.

11a—c. 正模 (Holotype), 顶、侧、底视。产地层位同上。登记号 PB14082。

12.侧视。产地层位同上。登记号 PB14083。

13,14. *Obtusochara paracylindrica* sp. nov.

13a—c. 正模 (Holotype), 顶、侧、底视。产地层位同上。登记号 PB14084。

14.侧视。产地层位同上。登记号 PB14085。

15. *Obtusochara* sp.

15a—c. 顶、侧、底视。产地层位同上。登记号 PB14086。

16,17. *Maedlerisphaera sanshuiensis* J. F. Zhang

16a—c. 顶、侧、底视。产地层位同上。登记号 PB14087。

17.侧视。产地层位同上。登记号 PB14088。

18. *Cyrogona xindianensis* Z. Wang

18a—c. 顶、侧、底视。产地层位同上。登记号 PB14089。

图　版　III

1. *Gobichara deserta* Karczewska et Ziembinska

1.侧视。南雄县城西南角风门坳剖面; 上湖组。登记号 PB14090。

2,3. *Gobichara subglobosa* sp. nov.

2a—c. 正模 (Holotype), 顶、侧、底视。产地层位同上。登记号 PB14091。

3a—c. 顶、侧、底视。产地层位同上。登记号 PB14092。

4. *Gobichara rubra* Karczewska et Ziembinska

4.侧视。产地层位同上。登记号 PB14093。

5,6. *Grovesichara changzhouensis* Huang et S. Wang

5.侧视, ×40。南雄县大塘杨梅坑—逆龙坑剖面; 上湖组。登记号 PB14094。

6.侧视, ×40。南雄县大塘杨梅坑—逆龙坑剖面; 南雄组。登记号 PB14095。

7. *Grovesichara changdeensis* Hu et Zeng

7.侧视, ×40。南雄县城西南角风门坳剖面;南雄组。登记号 PB14096。

8. *Grovesichara* sp.

8.侧视, ×40。南雄县城西南角风门坳剖面;上湖组。登记号 PB14097。

9,10. *Peckichara varians* L. Grambast

9a—c. 顶、侧、底视, ×40。南雄县大塘杨梅坑—逆龙坑剖面;上湖组登记号 PB14098。

10.侧视, ×40。产地层位同上。登记号 PB14099。

11. *Peckichara longa* Lin et Z. Wang

11.侧视, ×40。产地层位同上。登记号 PB14100。

12. *Peckichara paomagangensis* Z. Wang

12.侧视, ×40。南雄县大塘杨梅坑—逆龙坑剖面; 南雄组。登记号 PB14101。

13,14. *Peckichara zhijiangensis* Z. Wang

13.侧视, ×40。南雄县大塘杨梅坑—逆龙坑剖面;上湖组。登记号 PB14102。

14.侧视, ×40。产地层位同上。登记号 PB14103。

15,16. *Croftiella* cf. *stenoformis* Lin et Z. Wang

15a—c. 顶、侧、底视, ×40。南雄县大塘杨梅坑—逆龙坑剖面;南雄组。登记号 PB14104。

16.侧视, ×40。南雄县大塘杨梅坑—逆龙坑剖面; 上湖组。登记号 PB14105。

图　版　IV

1. *Croftiella* cf. *stenoformis* Lin et Z. Wang

1a—c. 顶、侧、底视, ×40。南雄县大塘杨梅坑—逆龙坑剖面;南雄组。登记号 PB14106。

2. *Neochara sinuolata* Z. Wang et Lin

2.侧视, ×40。南雄县大塘杨梅坑—逆龙坑剖面; 上湖组。登记号 PB14107。

3. *Neochara huananensis* Z. Wang et Lin

3.侧视，×40。产地层位同上。登记号 PB14108。

4. *Stephanochara huangjianensis* Xu et Huang
4.侧视，×40。产地层位同上。登记号 PB14109。

5. *Stephanochara kiangsuensis* (S. Wang) Z. Wang et Lin
5.侧视，×40。产地层位同上。登记号 PB14110。

6. *Stephanochara cuneiformis* Z. Wang et Lin
6.侧视，×40。产地层位同上。登记号 PB14111。

7. *Stephanochara brèviovalis* Lin et Huang
7.侧视，×40。产地层位同上。登记号 PB14112。

8. *Stephanochara funingensis* (S. Wang) Z. Wang et Lin
8.侧视，×40。产地层位同上。登记号 PB14113。

9. *Stephanochara micrococca* Z. Wang et Lin
9.侧视，产地层位同上。登记号 PB14114。

10. *Stephanochara hukouensis* Huang
10.侧视，×40。产地层位同上。登记号 PB14115。

11—13. *Stephanochara wanzhuangensis* Xinlun
11.侧视，×40。产地层位同上。登记号 PB14116。
12.侧视，×40。产地层位同上。登记号 PB14117。
13.侧视，×40。产地层位同上。登记号 PB14118。

14. *Rhabdochara jiangduensis* Xu et Huang
14.侧视，×40。产地层位同上。登记号 PB14119。

15. *Latochara curtula* Z. Wang
15a—c. 顶、侧、底视。南雄县大塘杨梅坑—逆龙坑剖面；南雄组。登记号 PB14120。

16. *Latochara cylindrica* Z. Wang
16a—c. 顶、侧、底视。产地层位同上。登记号 PB14121。

17. *Latochara guangdongensis* Huang
17a—c. 顶、侧、底视。产地层位同上。登记号 PB14122。