

参 考 文 献

- [1] 王钰、卢衍豪等, 1954. 辽宁太子河流域地层(II)。地质学报, 34卷, 2期, 第89—108页。
- [2] 卢衍豪, 1959. 中国南部奥陶纪地层的分类和对比, 中国地质学基本资料专题总结论文集, 第2号, 1—114页。
- [3] 关士聪、车树政, 1955. 内蒙古伊克昭盟棹子山区域地层系统。地质学报, 35卷, 2期, 第96—108页。
- [4] 张日东, 1959. 内蒙伊克昭盟棹子山区域下奥陶纪的头足类化石。古生物学报, 7卷, 4期, 第259—283页。
- [5] 张文堂, 1959. 中国奥陶系(初稿)。全国地层会议文件。
- [6] 杨遵仪, 1959. 甘肃酒泉北祁连山白杨河区中奥陶统软体动物群。古生物学报, 7卷, 6期, 第484—498页。
- [7] 穆恩之, 1959. 中国含笔石地层。中国地质学基本资料专题总结论文集, 第3号。
- [8] Востокоба, В. А., 1955. Гастроподы Ордовика Чу-Илийских Гор. АН СССР Труды Геологического Института, Вып. 1, Стр. 169—191, Табл. 1—5.
- [9] Billings, E., 1865. Palaeozoic Fossils. Vol. 1, Geol. Surv. Canada.
- [10] Endo, E., 1932. The Canadian and Ordovician Formation and Fossils of South Manchuria. U. S. Nat. Mus. Bull. 164, pp. 50—62, pls. 28—30.
- [11] Grabau, A. W., 1922. Ordovician fossils from North China. Pal. Sinica Ser. B. Vol. 1, Fasc. 1, pp. 20—36, pls. 2—3.
- [12] Kirk, D., 1930. *Mitrospira*, a new Ordovician Gastropod genus. Proc. U. S. Nat. Mus., Vol. 76, Art. 22, p. 1—6, pls. 1—3.
- [13] Knight, J. B., 1941. Paleozoic Gastropod Genotypes, Geol. Soc. Amer. Spec. Paper, No. 32.
- [14] Koken, E., 1925. Die Gastropoden des Baltischen Untersilurs. Mem. L'Acad. Scient. Russie, VIII, Ser. Vol. 37, No. 1.
- [15] Kobayashi, T., 1930. Ordovician fossils from the Korea and Manchuria. Part II, On the Bantatsu Bed of the Ordovician age. Japan Jour. Geol. and Geogr. Vol. VII, Nos. 3—4, pp. 86—100, pls. 8—11.
- [16] Teilhard, de C. & Licent, E., 1924. On the geology of the northern, western and southern borders of the Ordos, China. Bull. Geol. Soc. China, Vol. 3, No. 1, p. 37—44.
- [17] Ulrich, E. O. and Scofield, W. H., 1897. The Lower Silurian Gastropod of Minnesota, in Geology of Minnesota, Final Rept. Vol. 3, pt. 2, p. 813—1081.
- [18] Wilson, A. E., 1924. A new genus and a new species of gastropod from the Upper Ordovician of British Columbia. Canadian Field Naturalist, Vol. 38, p. 150—151, pls. 1—2.
- [19] Yochelson, E. L., 1957. Notes on the gastropod *Palliseria robusta* Wilson. Jour. Paleont. Vol. 31, No. 3, p. 684—650.

SOME LOWER ORDOVICIAN GASTROPODS FROM ZHUOZISHAN DISTRICT, INNER MONGOLIA

YÜ WEN

(Institute of Geology and Palaeontology, Academia Sinica)

The material upon which this paper is based was collected by Messrs. S. C. Kwan and S. T. Che from the Zhuozishan limestone in southwestern part of Inner Mongolia during their field investigation in 1953. A part of specimens were procured by Messrs. Y. H. Lu, A. T. Mu and J. T. Chang from the same district in 1954.

The lower Ordovician strata of the Zhuozishan region was divided by Messrs. S. C. Kwan and S. T. Che (1955, Acta Geological Sinica, vol. 35, no. 2, p. 98—101) into three parts, namely: the Sandaokan formation in the lower part, the Zhuozishan limestone in the middle part and the Klimli limestones in the upper part. The gastropods are largely procured from the Zhuozishan limestone. This limestone series consists mainly of greyish blue, massive limestones intercalated with thin-bedded brown limestones, containing rich cephalopods. The cephalopods have been studied by Mr. J. T. Chang (1959, Acta Palaeont. Sinica, vol. VII, no. 4, p. 259—284)

as *Polydesmia zueezshanensis* Chang, *Armenoceras* cf. *tani* (Grabau), *Wutinoceras lui* Chang and *Ormoceras* spp.

The gastropods described and illustrated in this paper contain 10 species in 4 genera, including 1 new genus and 6 new forms. They are listed as follows:

- Lophospira sinensis* (sp. nov.)
Lophospira subcylindrica (sp. nov.)
Hormotoma ordosensis (sp. nov.)
Maclurites magnus Lesueur
Maclurites cf. *acuminatus* (Billings)
M. orientalis (sp. nov.)
M. zhuozishanensis (sp. nov.)
M. sp. A.
M. sp. B.
Zhuozishanospira zhuozishanensis (gen. et sp. nov.)

Among the above listed gastropods the genus *Maclurites* is a world-wide spread form ranging from Lower to Upper Ordovician. It occurs in the Ordovician formations of U. S. S. R., in the Quebec group of Newfoundland, in the Ordovician beds of North America, in the Cape Calhou bed of Greenland and in the Unkaku bed of Chosen etc. There are 10 species of this genus of the Ordovician formations hitherto known in China; namely: *Maclurites neritoides* (Eichwald) and *Maclurites meitanensis* Yü from the basal part of the Neichiashan Series, Southern China; *Maclurites niuhsin'aiensis* (Kobayashi), *M. tofangoensis* (Kobayashi), *M. kotoi* (Kobayashi) and *M. bigsbyi* (Hall) from the Machiakou Limestone of Northeastern China; *M. crassus* (Ulrich and Seofield) and *M. sin'kiangensis* Yu from the Saergan Series and *M.* sp. from the Quilitagh Series of Kepin district, Western Sinkiang. The occurrence of abundant *Maclurites* from the Zhuozishan limestone is of special interest, not only for it furnishes us evidence on the geological age of that formation, but also for the geological distribution of this genus.

The writer wishes to express his deep thanks to Prof. K. K. Chao for his valuable suggestions and critical reading the manuscript.

DESCRIPTION OF SPECIES

Superfamily Pleurotomariacea

Family Pleurotomariidae D'Orbigny

Subfamily Lophospirinae

Genus *Lophospira* Whitfield, 1886

Genotype: *Murchisonia bicincta* Hall, 1847

Lophospira sinensis Yü (sp. nov.)

(Pl. IV, fig. 5)

This form is represented by a single well preserved internal mould.

Shell of usual size, high spired, consisting of six to seven angulated volutions, which embrace to the lower carina and separated by the deeply impressed sutures. The last whorl is marked by three strong carinae and with gently concave sections between.

The upper carina is rather sharply prominent, situated near the suture and the second carina is stronger and more carinate than the upper one and forms the prominent peripheral shoulder of the shell. Interspace between them is gently concave. The lower carina, located on the base of the shell is also strong and prominent, with a rather wide and concave band at the periphery.

Aperture is not well preserved, but its elliptical outline is shown. Outer lip is broken off, columellar lip is reflected over the narrow umbilicus.

MEASUREMENTS:

Height of shell	18 mm.
Greatest width of the last whorl	9 mm.
Apical angle	42°

Remarks: This species bears a considerable resemblance to *Lophospira turruliformis* Endo from the Machiakou Limestone (Kangyao Formation) of Liaoning and *L. acuta* Grabau from the Machiakou Limestone of Kaiping basin of Hopei. It differs from the former in the narrower apical angle, in the more concave peripheral band and in the narrow umbilicus which is absent in Endo's species. It differs from the latter in the presence of an upper carina and in the narrower apical angle.

In some respects, it is closely allied to *Lophospira pulchella* Ulrich and Scofield from the Richmond Group of Minnesota, but differs from the American species in the more slender spire, in the more prominent lower carina and in the deeper suture.

Horizon and Locality: Lower Ordovician. At Yilehaituo of the western Lashizhong Ortuokgi, Yikezhaomeng. Inner Mongolia.

Field No. CD. 74, Holotype: Cat. No. 9941.

***Lophospira subcylindrica* Yü (sp. nov.)**

(Pl. IV, fig. 6)

Shell of medium size, consisting of four to five volutions. The first two whorls are not well preserved, the last three are strongly angulated. The last whorl is rather high, about one-half the total height of the shell and is covered by two prominent carinae, of which the peripheral one is much stronger and more carinate than the lower carina and is marked off by a rather wide and gently concave band. The shoulder is flat or slightly concave and the base is slightly convex. Aperture and umbilicus unknown.

MEASUREMENTS:

Height of shell preserved	11 mm.
Greatest width of the last whorl	about 8 mm.
Apical angle	40°

Remarks: This species can be distinguished from *Lophospira aoji* Endo by its more flat shoulder, by its narrower apical angle and by its larger and longer spire.

Horizon and Locality: Same as the preceding species.

Field No. CD. 74, Holotype: Cat. No. 9942.

Genus *Hormotoma* Salter, 1895**Genotype: *Murchisonia gracilis* Hall*****Hormotoma ordosensis* Yü (sp. nov.)**

(Pl. I, fig. 3)

Shell medium in size, high spired, with an apical angle of about 30 degrees. Volutions seven to eight in number, which are expanded gradually and separated by deeply impressed sutures. The profile of the whorls is rather rounded; with the upper side of the last two whorls more or less flattened.

The ornamentation of the shell is very poorly preserved, seemingly with a feeble angulation suggesting a selenizone. Aperture enclosed by the matrix.

MEASUREMENTS:

Height of shell preserved	23 mm.
Width of shell at last whorl	12 mm.
Apical angle	about 30°

Remarks: This species is similar to *Hormotoma simulatrix* (Billings) from the Quebec group of Newfoundland (Billings, 1865 p. 232, fig. 218), but differs from that form in the more convex whorls, in the larger apical angle and in the smaller size.

Horizon and Locality: Same as the preceding species.

Field No. CD. 74, Holotype: Cat. No. 9943.

Superfamily Euomphalacea**Family Macluritidae Koken****Genus *Maclurites* Lesueur, 1818****Genotype: *Maclurites magnus* Lesueur, 1818*****Maclurites magnus* Lesueur**

(Pl. I, fig. 5; Pl. II, figs. 1—2)

1847. *Maclurea magna*; Hall, Palaeontology of New York, vol. 1, p. 26, pl. 5, figs. 1a—1d, pl. 5, (bis.) figs. 1a—1c.
1902. *Maclurea magna*; Raymond, Bull. Amer. Pal., vol. 3, p. 305, pl. 18, fig. 10.
1908. *Maclurites magnus*; Raymond, Ann. Carnegie Mus., 4, p. 199, pl. 50, figs. 1—2, pl. 51, figs. 1—2, pl. 52, figs. 1—4.
1909. *Maclurea magna*; Grabau and Shimer, North American Index Fossils, p. 664, fig. 918a.
1915. *Maclurites magnus*; Basseler, U. S. Nat. Mus., Bull. 92, vol. 2, p. 779.
1919. *Maclurites magnus*; Basseler, Maryland Geological Survey vol. 1, p. 297, pl. 39, figs. 12—15.
1941. *Maclurites magnus*; Knight, Geol. Soc. Amer. Spec. Paper, no. 32, p. 184, pl. 64, figs. 1—10.
1944. *Maclurites magnus*; Shimer and Shrock, Index Fossils of North America, p. 467, pl. 190, figs. 1—6.

This form is represented by two well-preserved specimens in the collection.

Shell of large size, sinistral and discoidal, width about two times the height. It consists of four to five regularly increasing volutions. The upper side is flat, while the outer margin is obtusely angular. The outer side slopes gradually toward the umbilicus with gentle convexity. The umbilicus is broad and deep, being less than one-half of the diameter.

The surface is marked with coarse lines of growth. The suture is slightly impressed but not deep. The aperture is not well preserved in our form.

MEASUREMENTS:

Height of shell	about 35 mm.
Diameter of shell	80 mm.
Width of umbilicus	30 mm.

Remarks: The form described above agrees in general characters with those described by former authors, expect that in our specimens the outer side is more convex.

Horizon and Locality: Lower Ordovician: At Pingdingshan, south of Lashizhong, Ortuokqi, yikezhaomeng, Inner Mongolia.

Field No. K-318, Cat. No. 9944—9945.

***Maclurites cf. acuminatus* (Billings)**

(Pl. I, figs. 1—2)

1865. *Maclurea acuminata*; Billings, Pal. Foss. 1, Geol. Surv. Canada, p. 240, fig. 225.

1903. *Maclurea acuminata*; Sardson, Jour. Geol. 11, p. 479, figs. 10—12.

This species is represented only by one specimen.

Shell medium in size, composed of three to four volutions, which increase gradually. The upper side of the whorls is very flat, while the outer margin is thin, much more acute. The base is depressed hemispherical and the umbilicus is very narrow. Aperture and ornamentation are not well preserved.

MEASUREMENTS:

Height of the last whorl near the aperture	22 mm.
Diameter of shell	50 mm.

Remarks: This form appears to be closely related to *M. acuminatus* (Billings) in the more acute outer margin, in the flattened upper side and in its smaller umbilicus. It differs from the Newfoundland species in the absence of striae.

Horizon and Locality: Lower Ordovician. At Deyanggouzhangzi, Zhuozishan, Inner Mongolia.

Field No. K-223, Cat. No. 9946.

***Maclurites orientalis* Yü (sp. nov.)**

(Pl. III, figs. 1—2; Pl. IV, fig. 1)

This species is represented by a quite large specimen, about 140 mm. wide across the flat spire in adult. It consists of three and a half volutions. They increase gradually at first, then becomes rapidly in the last whorl. The upper surface is evenly rounded and convex, while the

outer margin is rounded. The outer side slopes gradually toward the umbilicus with a gentle convexity. The umbilicus is very wide and abrupt, being less than two-thirds of the diameter of the shell and with a subangular umbilical edge; umbilical wall high and steeply inclined.

The ornamentation is very poorly preserved in this form. The upper suture is linear and the umbilical suture is sharp, but not deep. The aperture is not well preserved but the general form can be observed.

MEASUREMENTS:

Height of shell	50 mm.
Diameter of shell	140 mm.
Width of umbilicus	95 mm.

Remarks: This species somewhat resembles *M. magnus* Lesueur from the Ordovician formation of many places of the world, but it differs from the latter in the very rapidly increasing last whorl, in the wider umbilicus and in the rounded outer margin.

Horizon and Locality: Lower Ordovician. At eastern Changkekgou, Zhuozishan, Inner Mongolia.

Field No. OFD. 71, Cat. No. 9947.

***Maclurites zhuozishanensis* Yü (sp. nov.)**

(Pl. I, figs. 4—7)

This species is represented by two individuals including a young form.

Shell rather large for the genus, sinistral and discoidal with a subrounded cross-section. It consists of about four or five slender volutions and separated by rather impressed sutures. The upper side is evenly rounded and convex, while the outer margin is rounded. The outer side is well broadly rounded and the umbilicus is very large and shallow, being more than two-thirds of the diameter and with a rounded umbilical edge. Ornamentation is not well preserved in our specimens.

MEASUREMENTS:

Height of shell	20 mm.
Diameter of shell	70 mm.

Remarks: *Maclurites zhuozishanensis* is similar to *Maclurites affinis* (Billings) in apical view, but it differs from the latter species in the subrounded cross-section and in the wider umbilicus. The umbilical edge is rounded instead of acute.

In some respects, it also resembles *M. crassus* (Ulrich and Scofield) but differs in the wider umbilicus and in the aperture which is not expanded.

Horizon and Locality: Lower Ordovician. At Yilehaituoshan of the western Lashizhong, Ortuokqi, Yikezhaomeng, Inner Mongolia.

Field No. CD. 74, Cat. No. 9948—9949. Holotype: 9948.

***Maclurites* sp. A**

(Pl. IV, figs. 2—4)

Shell of medium size, consisting of three to four gradually increasing volutions. The upper

side of the whorls is somewhat narrowly rounded, while the outer margin is subangular. The lateral side is broadly convex and gently sloping simultaneously toward the umbilicus. The umbilicus is narrow and abrupt, being about less than one-half of the diameter; umbilical wall steeply inclined and with a sub-angular umbilical edge. Ornamentation and aperture unknown.

MEASUREMENTS:

Height of shell	28 mm.
Diameter of shell	50 mm.
Width of umbilicus	25 mm.

Remarks: This species is represented by a single, poorly preserved internal mould. It seems to be related to *M. rotundata* (Billings) from the Quebec group of Newfoundland, but it can be distinguished from the mentioned form in its narrowly rounded upper side, in its sub-angular outer margin and the inner whorls are nearly flat instead of slightly elevated. The species appears to constitute a new species but the better course would be to defer naming the specimen, because it is too imperfectly preserved.

Horizon and Locality: Lower ordovician. At Bulesitaimiao, Zhuozishan, Inner Mongolia.

Field No. K-310, Cat. No. 9950.

***Maclurites* sp. B**

(Pl. 11, figs. 3—4)

Shell medium in size, about 32 mm. in width, consisting of three or three and a half volutions, which increase gradually in the inner whorls, then becoming rapidly in the last one. The upper side is nearly flat while the outer margin is sharply angular. The lateral side is nearly vertical or somewhat regularly convex. Umbilicus is narrow, less than one-third the diameter of the shell. Ornamentation unknown, except the moderately impressed sutures.

Horizon and Locality: Same as the preceding species.

Field No. K-428, Cat. No. 9951.

Genus *Zhuozishanospira* Yü (gen. nov.)

Genotype: *Zhuozishanospira zhuozishanensis* Yü (gen. et sp. nov.)

Diagnosis: Shell medium sized, subglobose, and sinistral, consisting of five to six volutions. Whorls increase rapidly, with a greatly depressed spire. Aperture sub-reniform. Umbilicus moderately wide, surrounded by a angular carina on the umbilical edge. Surface sculptured by regular, spiral costae. Sutures linear.

Remarks: This new genus is more or less similar to *Palliseria* Wilson 1924 from the late Early Ordovician age of North America, but differs from that genus in the rounded outline of the shell, in the linear sutures and in the larger, sub-reniform aperture. The most important distinguished feature of the shell is characterized by the regular, spiral costae. The surface of *Palliseria* is marked by several carinae and cross striations.

In some aspects, this genus resembles *Maclurina* Ulrich and Scofield 1897, but differs from the latter in its depressed low conical spire and in its larger sub-reniform aperture.

***Zhuozishanospira zhuozishanensis* Yü (gen. et sp. nov.)**

(Pl. V, figs. 1—3)

This new species is represented by a single well-preserved specimen.

The shell is medium in size, subglobose and sinistral. It consists of about five to six rapidly increasing volutions. The spire is greatly depressed with an apical angle of about 140 degrees. The last whorl is highly inflated and embracing the preceding whorl to a little above the periphery. The upper side of the whorl is gently convex, while the outer side is well rounded and becoming more or less flattened on the basal side. The umbilicus is open and deep, being more than one-third of the diameter and is surrounded by a prominent, angular carina on the umbilical edge.

The surface of the shell is covered by numerous, regular spiral costæ. On the last whorl there are twenty five regular spiral costæ below the periphery, while on the upper part they become very obscure. The upper suture is linear and no growth lines are seen.

The aperture is more or less sub-reniform in shape. The outer lip is rather high and sharp. The inner lip unknown.

MEASUREMENTS:

Height of shell	36 mm.
Diameter of shell	42 mm.
Width of umbilicus	16 mm.

Horizon and Locality: Lower Ordovician. At eastern Changkekgou, Zhuozishan, Inner Mongolia.

Field No. OFD 39. Holotype: Cat. No. 9952.

图版说明

本文内所描述的标本均保存在中国科学院地质古生物研究所。摄影者为庞茂芳同志。

图版 I

- 图 1—2. *Maclurites* cf. *acuminatus* (Billings)
1. 顶视, 原大。
2. 口视, 原大。
登记号码: 9946。
- 图 3. *Hormotoma ordosensis* Yü (新种)
3. 侧视, 放大 2 倍。
正型标本, 登记号码: 9943。
- 图 4—7. *Maclurites zhuozishanensis* Yü (新种)
4—5. 正型标本的顶视及口视。原大。
登记号码: 9948。
6—7. 一块幼年期壳的顶视及口视。原大。
登记号码: 9949。
- 图 8. *Maclurites magnus* Lesueur
8. 顶视, 原大。示粗的生长线。
登记号码: 9945。

EXPLANATION OF PLATES

The specimens described in this paper are all kept in the Institute of Geology and Palaeontology, Academia Sinica. Photo. by Mr. M. F. Pan.

Plate I

- Figs. 1—2. *Maclurites* cf. *acuminatus* (Billings)
1. Apical view, Nat. size.
2. Apertural view, Nat. size.
Cat. No. 9946.
- Fig. 3. *Hormotoma ordosensis* Yü (sp. nov.)
3. Lateral view, $\times 2$.
Holotype: Cat. No. 9943.
- Figs. 4—7. *Maclurites zhuozishanensis* Yü (sp. nov.)
4. Apical and apertural views of holotype. Nat. size.
Cat. No. 9948.
5. Apical and apertural views of a young specimen. Nat. size.
Cat. No. 9949.
- Fig. 8. *Maclurites magnus* Lesueur
8. Apical view, showing the coarse lines of growth.
Cat. No. 9945.

图版 II

图 1—2. *Maclurites magnus* Lesueur

1. 頂視, 原大。

2. 口視, 原大。

登記號碼: 9944。

图 3—4. *Maclurites* sp. B.

3. 底視, 放大 2 倍。

4. 頂視, 放大 2 倍。

登記號碼: 9951。

Plate II

Figs. 1—2. *Maclurites magnus* Lesueur

1. Apical view of another specimen. Nat. size.

2. Apertural view of the same. Nat. size.

Cat. No. 9944.

Figs. 3—4. *Maclurites* sp. B.

3. Basal view, $\times 2$.

4. Apical view, $\times 2$.

Cat. No. 9951.

图 版 III

图 1—2. *Maclurites orientalis* Yü (新种)

1. 頂視, 原大。示螺壳的頂部。
 2. 口視, 原大。示壳口的形状。
- 正型标本, 登記号碼: 9947。

Plate III

Figs. 1—2. *Maclurites orientalis* Yü (sp. nov.)

1. Apical view, showing the upper side of shell. Nat. size.
 2. Apertural view, showing the form of aperture. Nat. size.
- Holotype: Cat.-No. 9947.

图版 IV

- 图 1. *Maclurites orientalis* Yü (新种)
1. 底視, 原大。示寬大的臍孔及尖銳的臍緣。
正型标本, 登記號碼: 9947。
- 图 2—4. *Maclurites* sp. A.
2. 口視, 原大。
3. 底視, 原大。
4. 頂視, 原大。
登記號碼: 9950。
- 图 5. *Lophospira sinensis* Yü (新种)
5. 口視, 示壳口及旋稜。放大 2 倍。
正型标本, 登記號碼: 9941。
- 图 6. *Lophospira subcylindrica* Yü (新种)
6. 口視, 放大 2 倍。
正型标本, 登記號碼: 9942。

Plate IV

- Fig. 1. *Maclurites orientalis* Yü (sp. nov.)
1. Basal view, showing the wider umbilicus and acute umbilical edge. Nat. size.
Holotype: Cat. No. 9947.
- Figs. 2—4. *Maclurites* sp. A.
2. Apertural view. Nat. size.
3. Basal view. Nat. size.
4. Apical view. Nat. size.
Cat. No. 9950.
- Fig. 5. *Lophospira sinensis* Yü (sp. nov.)
5. Apertural view, showing the form of aperture and carinae. $\times 2$.
Holotype: Cat. No. 9941.
- Fig. 6. *Lophospira subcylindrica* Yü (sp. nov.)
6. Apertural view of the holotype. $\times 2$. Cat. No. 9942.

图版 V

图 1—3. *Zhuozishanospira zhuozishanensis* Yü (新属新种)

1. 頂視, 放大 2 倍。示螺塔。
 2. 口視, 放大 2 倍。示壳口的形状。
 3. 底視, 放大 2 倍。示臍孔及旋紋。
- 正型标本, 登記号碼: 9952。

Plate V

Figs. 1—3. *Zhuozishanospira zhuozishanensis* Yü (gen. et sp. nov.)

1. Apical view, showing the greatly depressed spire. $\times 2$.
 2. Apertural view, showing the form of aperture. $\times 2$.
 3. Basal view, showing the wider umbilicus and acute umbilical edge. $\times 2$.
- Holotype: Cat. No. 9952.