

OSTRACODES OF THE DEVONIAN-CARBONIFEROUS TRANSITION BEDS OF SOUTH CHINA

by

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ABSTRACT

The ostracode fauna from the section at Baihupo (Dushan, Guizhou) is illustrated and briefly discussed. It includes both the last *Leperditia* and the first (possible) freshwater ostracodes in the world.

RESUME

Dans la faune de Baihupo (Dushan, Guizhou), qu'illustre et commente brièvement cette note, figurent à la fois les dernières *Leperditia* et les premiers ostracodes peut-être d'eau douce.

KEY WORDS

Ostracodes, Devonian-Carboniferous transition, Guizhou.

MOTS CLES

Ostracodes, Dévono-Carbonifère, Guizhou.

The samples studied were collected by a team composed of Eva Paproth, Raphaël Conil and Maurice StreeL under the guidance of Wu Xiang and the sponsorship of the Chinese Academy of Geological Sciences. Several localities were visited between Guilin and Guiyang, passing through Dushan and Duyun (Fig. 1). The section near Baihupo hill, 3 km northwest of Dushan, proved the most rewarding as regards ostracodes (Fig. 2).

The section starts with the Upper Devonian Yaoso Formation unit 2 of which yields *Quasiumbella* of Strunian affinities. The overlying stromatoporoid limestones of the Zhewang Formation are traditionally understood as being also equivalents of the European Strunian. It is now known, however,

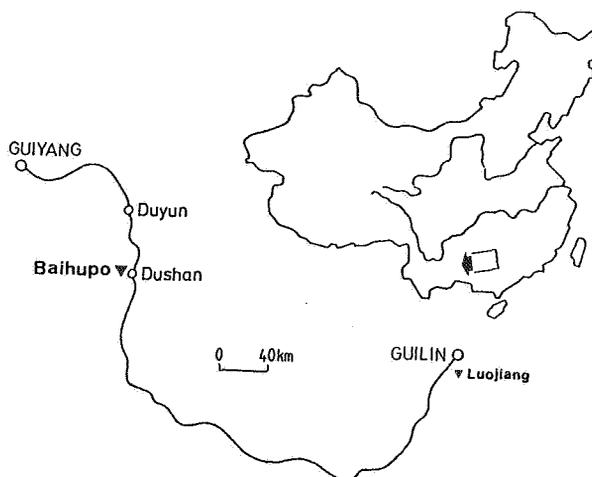


Figure 1. : Location map.

that stromatoporoids survive in the Far East as late as the Elergetkhyn and Karst suites of the Omolon succession (Shilo *et al.*, 1984, pl. 2,7). The same is true in South China where the last representatives of the order were found in unit 8 of the Gelaohe Formation. Foraminifers here parallel T(1) assemblage of the Omolon i.e. Tn1b of the Ardennes (Conil *et al.*, 1988). The Devonian-Carboniferous boundary thus roughly coincides with the Zhewang-Gelaohe transition. According to StreeL (1986, p. 88), the lowermost sample from the latter (unit 6) already contains a post-*Lepidophyta* miospore assemblage and is therefore probably of Carboniferous age. Ostracodes are distributed as follows (an asterisk marks the most common taxa) :

sample 1

- *Leperditia* (fragments)
- *Cavellina* ? *dushanensis* Shi, 1964
- *Dipinnaria semicircularis* Shi, 1964 (?)
- *Gutschickia* ? *
- *Marginia* (few juveniles)

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sample 7a

- *Bairdia* *
- *Kloedenellitina*
- *Cavellina* (subordinate)

sample 7c

- *Marginia* *
- *Bairdia*
- *Kloedenellitina*

sample 7d

- *Sansabella* **
- with still a few *Kloedenellitina*

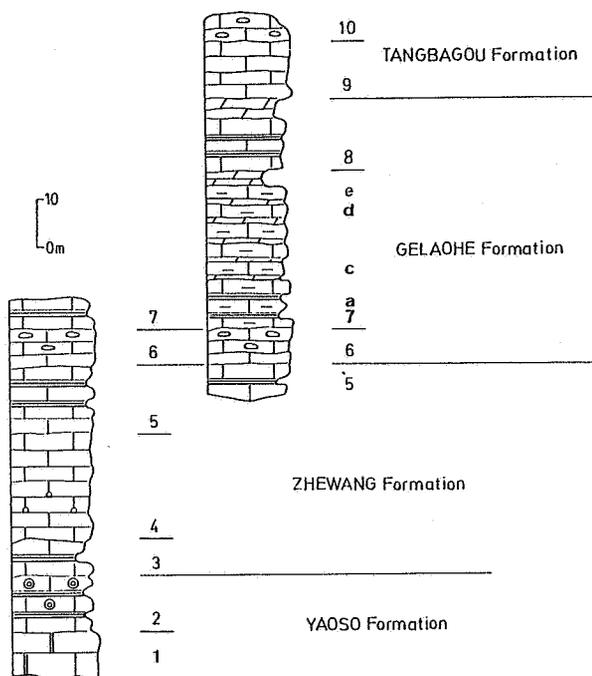


Figure 2. : Log of the section at Baihupo (after Wu 1985); ostracode samples bold-faced.

The occurrence of *Leperditia* in sample 1 is indicative of a lagoonal environment. The specimens labelled *Gutschickia* ? have indeed the outline of the Pennsylvanian freshwater *Gutschickia* (Sohn, 1977). The central muscle scar is different but compares with that of some other freshwater forms such as *Gerdalia* (Gramm, 1984, fig. 11/4,5). Low salinity because of freshwater influx is therefore probable. Higher in the succession (sample 7a) the entry of *Bairdia* attests to the progress of the transgression. However, it is not until level 7de that foraminifers and crinoids become significant components. This, together with the rich but poorly diversified ostracode assemblage, suggests rather special, possibly unstable conditions that only a few euryhaline

organisms could tolerate. Professor Lees, who examined the microfacies in thin sections, agrees with such an interpretation. *Sansabella* as well (sample 7d) is usually considered to be a near-shore indicator.

Upper Devonian *Leperditia* of the Yaoso Formation are most probably the latest in the world (Shi, 1964, p. 36). If confirmed, the attendant occurrence of freshwater forms would prove very early. The ostracode fauna from the Gelaoh Formation is quite remarkable, too. It deserves further comment.

The shells of *Marginia* readily exfoliate. Mature females thus clearly demonstrate the egg-receptacles. In fully developed specimens (Pl. 1, fig. 7) these are set out like illustrated by Gramm & Egorov (1972) from *Cavellina lovatika*. Prior to the last moulting, they are less numerous (Pl. 1, fig. 5 to be compared with Lundin & Visintainer, 1987, text-fig. 1b = 146/5).

Bairdia divides into two types: an elongated, slender form (Pl. 2, fig. 2) and a higher, more inflated one (Pl. 2, fig. 3). Both share the same, peculiar, markedly triangular outline in end-view. Both left valves exhibit the same kind of dorsal crest. There seems to be no doubt we are dealing with the same species. Further examples of dimorphism can be found in Lethiers (1981)², Coen *et al.* (1988)³ and Bolz (1971) who explicitly related it to sex, stating (p. 240): "Sexualdimorphism wird in L/H-Diagrammen häufig erkennbar". Males of *Bairdia ploechingeri*, for instance, are said to be "kürzer und schlanker"; females of *B. acerta* to be "grösser und gedrungener". Kollmann (1960) was less assertive when he wrote (p. 92, 94): "Gedrungene und schlankere Individuen bei *Parabairdia ploechingeri* könnten ebensogut in dem Streubereich der Art gehören, wie verschiedene Geschlechtsformen darstellen. Ob Geschlechtsdimorphismus vorliegt, ist erst auf Grund reichener Populationen zu entscheiden". The same holds true at Baihupo. The existence of possible bairdiid dimorphism is nevertheless worth noticing, and attention should be directed to similar cases.

Cavellina sp. (Pl. 2, fig. 10) develops a blunt protrusion of the right valve that is responsible for the pointed posterior end.

In *Sansabella* (Pl. 2, fig. 11) there is a faint suggestion of a sulcus. Taking this to be anterior, the smaller valve is the left one. It bears a row of 5-6 very small posterior tubercles together with a much stronger ventral knob presumably acting as a stop-structure. Besides overlapping it all along the free margin, the right valve extends over the left at both ends of the hinge line.

Kloedenellitina is represented by at least two species: *K. triceratina* Tschigova, 1960, the attri-

² See *Bairdia* (*R.*) *confragosaeformis*, *B. superba* - *Bairdia* (*C.*) *strangulata*, *B. turbinata* as well as *Acratia* (*C.*) *rootensis*.

³ *Bairdia kalugaensis*, *Acratia* aff. *peremnis*.

bution of which is fairly sound, and *K. cf. binodosa* Samoilova & Smirnova, 1960 which is much less certain. Originally described as a variety of *K. sigmaeformis* (Batalina 1941), *K. binodosa* was said to be smooth. No male had been encountered. Tschigova (1967) illustrated male, female and juvenile carapaces all together. Presence or lack of reticulation is possibly only a matter of preservation or could be related to some kind of polymorphism. The female illustrated in Pl. 2, fig. 9 would then agree reasonably well with the Russian illustrations. Presence of ventral posterior constriction in a juvenile (Pl. 2, fig. 8) is more difficult to accept. As for the presumed male (Pl. 1, fig. 8) it could equally well be transferred to another genus e.g. *Permiana*. The material available is insufficient to allow those questions to be solved.

Two small samples were also prepared from the Upper Tournaisian at Luojiang. They yielded few specimens, but two fine ones are illustrated in Pl. 2, fig. 4, 5. Again it would be worthwhile studying larger samples.

ACKNOWLEDGEMENTS

Sincere thanks are extended to Professor A. Lees for discussing the sedimentological matter and improving the English. Hou Hong-fei kindly agreed with the publication of Chinese material. The author is pleased to think this is a way of honoring a common friend.

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PLATE 1 (X 60)

Fig. 1, 2 - *Gutschickia* ? sp. (Baihupo 1)

1ab dorsal and right lateral views.
1c same view as 1b, using visible light.
2ab left lateral and ventral views.

Fig. 3, 4 - *Cavellina* ? *dushanensis* Shi, 1964 (Baihupo 1).

Fig. 5, 7 - *Marginia* sp. (Baihupo 7c)

5 partly exfoliated pre-adult female, left lateral view.
6 right valve.
7 steinkern of fully developed female as seen from the right side.

Fig. 8 - *Kloedenellitina* cf. *binodosa* Samoilova & Smirnova, 1960 : presumed male carapace, left lateral view (Baihupo 7c).

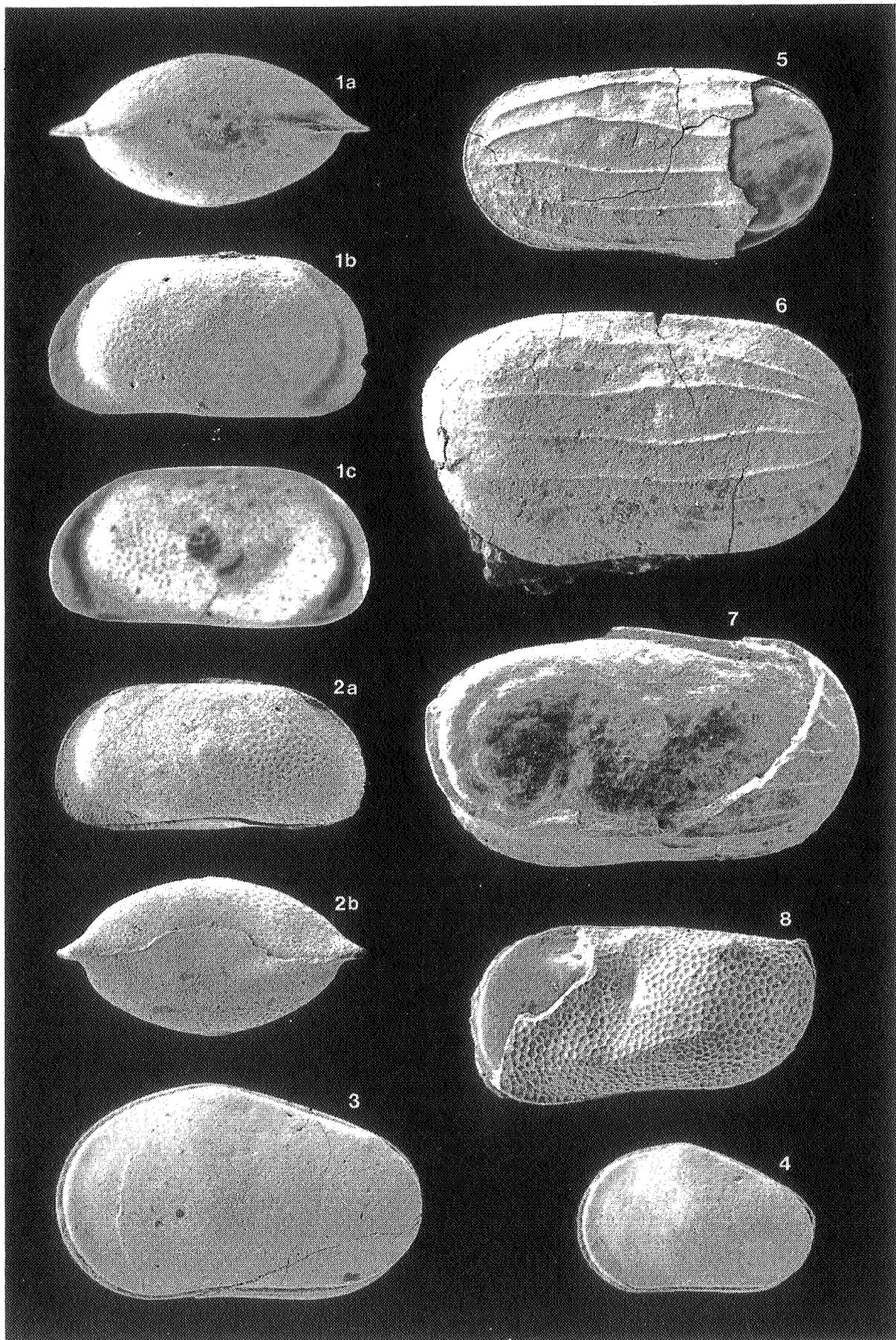


PLATE 2 (X 60)

- Fig. 1 - *Kloedenellitina triceratina* Tschigova, 1960
dorsal (a) and left lateral (b) views (Baihupo 7a).
- Fig. 2, 3 - *Bairdia* sp.
2 elongated form, dorsal (a) and right lateral (b) views (Baihupo 7c).
3 higher form, dorsal (a), right lateral (b) and anterior (c) views (Baihupo 7a).
- Fig. 4 - *Ampulloides* sp. (Luojiang 23a)
dorsal (a) and right lateral (b) views.
- Fig. 5 - *Acratia* sp. (Luojiang 27a)
right lateral view.
- Fig. 6, 7 - *Dipinnaria semicircularis* Shi, 1964 (?)
6 right lateral view (Baihupo 1).
7 left lateral view (id.).
- Fig. 8, 9 - *Kloedenellitina* cf. *binodosa* Samoilova & Smirnova, 1960
8 juvenile ? carapace (Baihupo 7a, could also be related to *K. triceratina*).
9 female carapace, left lateral view (Baihupo 7c).
- Fig. 10 - *Cavellina* sp. (Baihupo 7a)
left lateral view.
- Fig. 11 - *Sansabella* sp. (Baihupo 7d)
left lateral view.

