

***Permianella* (Brachiopoda) from the Upper Permian of Transcaucasia**

Shuzhong SHEN* and Guangrong SHI**

Abstract

A species of *Permianella* He and Zhu, *Permianella grunti* n. sp., is described for the first time from the *Araxoceras* Bed of the Dzhulfa Formation in the Dorasham II section, Transcaucasia. This record shows the westernmost distribution of permianellids. The new species is characterized by a short median septum on the central platform of ventral valve, thin shell, thin cavity, and an inconspicuous lateral marginal brim.

Key-words : *Permianella*, Brachiopoda, Dzhulfa Formation, Upper Permian, Transcaucasia

Introduction

Permianellids have been reported from many localities of South China (He and Zhu, 1979; Liang, 1982, 1990; Yang, 1984; Mou and Liu, 1989; Zhu, 1990; Wang and Jin, 1991; Shen *et al.*, 1994, 1996). Elsewhere, this brachiopod group has also been recorded from Thailand (Grant, 1976; Yanagida *et al.*, 1988), Japan (Tazawa, 1987, 1991), Russia (Likharew and Kotlyer, 1978) and Northeast China (Wang and Jin, 1991). These data indicate that permianellids generally characterize the eastern Tethyan Province.

In July 1995, the senior author visited the Palaeontological Institute of the Russian Academy of Science in Moscow and accidentally discovered a permianellid specimen from the collections from the *Araxoceras* Bed (bed 6) of the Dorasham II section, Dzhulfa area (Figs. 1, 2). It is the first specimen of permianellids to be recorded from Transcaucasia and represents the westernmost distribution of permianellids. The Dzhulfa specimen is so finely preserved that the authors feel confident that it

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Fig.1. Map showing the fossil locality.

Dorasham II

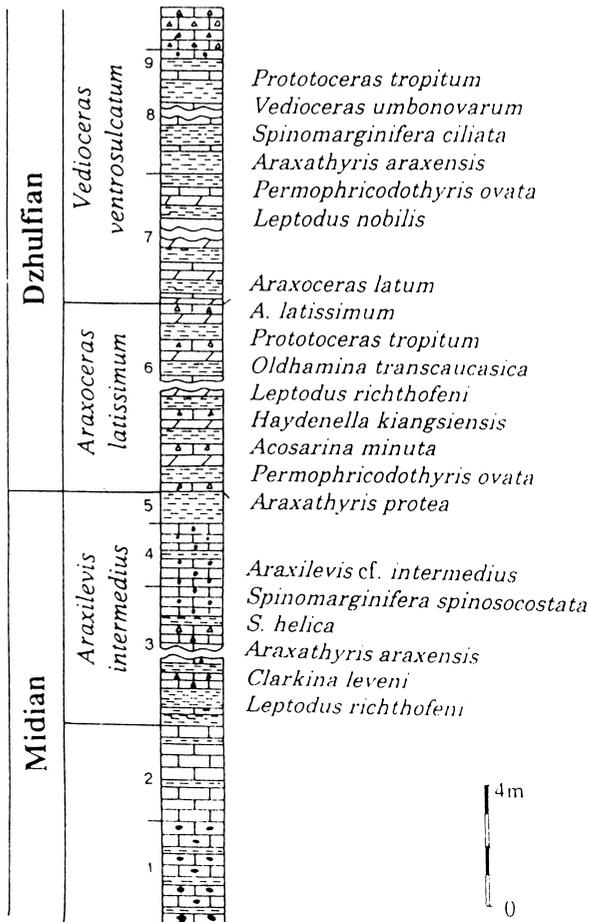


Fig. 2. Columnar section of Dorasham II and major fossils from the section. Data from Ruzhentsev and Sarytcheva, 1965 and Kotljars *et al.*, 1983. *Permianella grunti* n. sp. from bed 6.

undoubtedly belongs to a new species of *Permianella* He and Zhu.

The Permian System in Transcaucasia has been studied extensively, notably by Ruzhentsev and Sarytcheva (1965) and Kotljar *et al.* (1983, 1989). Marine invertebrate fossils are very abundant in the Permian sequence, among which araxoceratid ammonites are particularly rich, including *Araxoceras*, *Vedioceras*, *Uratoceras*, and *Aushoceras*. Fusulinids and brachiopods are also common, with fusulinids being dominated by *Codonofusiella* and *Reichelina* species.

The rocks of the bed 6 consist mainly of grayish green shale interbedded with limestone (Ruzhentsev and Sarytcheva, 1965). And the present specimen was collected from a slightly weathered purple biocalcarenite with abundant crinoid fragments. The associated brachiopods are *Acosarina minuta* (Abich), *A. dorashamensis* (Sokolskaja), *Orthothenina dzhulfensis* (Sokolskaja), *O. peregrina* (Abich), *Spinomarginifera spinocostata* (Abich), *S. helica* (Abich), *S. ciliata* (Abich), *Compressoproductus djulfensis* (Stoyanov), *Haydenella kiangsiensis* (Kayser), *Leptodus richthofeni* Kayser, *Oldhamina transcaucasica* (Stoyanov), *Poikilosakos dzhulfensis* Sarytcheva, *Wellerella arthaber* (Tschernyschew), *W. dorashamensis* Sokolskaja, *W. globosa* Koczyrkevich, *Permophricodothyris ovata* Pavlova, *Crenispirifer dzhulfensis* Ivanova, *Araxathyris protea* (Abich), *A. quadrilobata* (Abich), *A. araxensis* Grunt, *A. lata* Grunt and *Notothyris djoulfensis* (Abich). Among them, *Acosarina minuta*, *A. dorashamensis*, *Haydenella kiangsiensis*, *Leptodus richthofeni* and *Araxathyris araxensis* are all common species of the Upper Permian of South China, indicating a strong affinity to those of the Cathaysian Province. The flourishing of the araxoceratid ammonites and the occurrence of the conodont species, *Clarkina leveni* (Kozur, Mostler and Pjatakova), show that the *Araxoceras* Bed (bed 6) approximately corresponds to the lower Wuchiaping Stage in South China.

The specimen is kept in the Department of Geology, China University of Mining and Technology, Xuzhou, Jiangsu 221008, P.R. China.

Systematic descriptions

Suborder Strophalosiidina Waagen, 1883

Superfamily Lyttonioidea Waagen, 1883

Family Permianellidae He and Zhu, 1979

Genus *Permianella* He and Zhu, 1979

Permianella He and Zhu, 1979, p.132, 137; Wang and Jin, 1991, p.495-496.

Type-species.-*Permianella typica* He and Zhu, 1979

Diagnosis.-Shell medium to large, elongately bilobate in outline, concavo-convex or plano-convex; with sulcus, fold and incision; anterior incision very deep, attaining more than half of shell length; irregular marginal brim well developed along the lateral sides of ventral valve. Ventral inte-

rior with teeth and central platform; median septum developed on central platform. Dorsal interior with cardinal process and long brachial ridges. Shell pseudopunctate.

Stratigraphical range and geographical distribution.-Middle and Upper Permian; South China, Thailand, Northeast Japan and Transcaucasia.

Permianella grunti n. sp.

Pl.1, figs.1-7

Etymology.-This species is named in honor of Dr. Tatjana Grunt, a respected colleague and well-known brachiopodologist at the Palaeontological Institute of the Russian Academy of Sciences, who generously provided this permianellid specimen for this study.

Material.-One specimen (CUMT90342, holotype). The ventral valve is not preserved, but the central platform and the dorsal valve are well preserved.

Description.- Shell of medium size for genus, elongately bilobate in outline, greatest width near anterior commissure; length 38.0mm, width 14.0mm, thickness 2.1mm, hinge width 4.6mm, length of incision 27.0mm, width of incision 2.2mm at midlength; posterolateral sides slightly bending and converging posteriorly at an umbonal angle about 45° , anterolateral sides nearly parallel; cavity thin. Ventral valve flat in lateral profile, moderately convex in anterior profile, but slightly concave along midline, forming a conspicuous sulcus occupying about 1/4 of shell width; sulcal bottom flat; beak inconspicuous; ventral ear not developed; attachment ring present on the posterior part of ventral valve; lateral marginal brim not seen, probably stripped with ventral valve, but vaguely observed in posterior transverse section (pl.1, fig.4); internal surface of shell slightly preserved, almost completely smooth. Dorsal valve also flat longitudinally, slightly convex along midline, forming a broad and low fold, each lobe concave in anterior profile; umbonal region with a conical process; hinge straight in dorsal view, much shorter than shell width; ears very small, acute, demarcated by a concave auricular sulcus from visceral portion.

Shell fairly thin, about 0.08mm at 6.35mm anterior to hinge line (pl.1, fig.7); both valves strongly thickened along lateral sides, well articulated; shell consisting of two layers, outer layer pseudopunctate (pl.1, fig.3) and inner layer laminar; pseudopunctae about 0.04mm in diameter, laminar fibres bending along pseudopunctae.

Ventral interior with well developed central platform, hollow and trapezoid in transverse sections, median septum only developed near cardinal region and on the most posterior part of central platform, completely absent from the rest of the central platform (Fig.3); median septum distorted, knife-edged on the front (pl.1, fig.3) and thick-crested posteriorly (pl.1, fig.4). Brachial interior with fairly short but well developed brachial processes (Fig.3: 0.5, 0.65), brachial ridges placed along midline of each lobe (pl.1, figs.4, 7).

Comparison and remarks.-Although only one specimen is available for study, the specimen is distinctive enough to warrant a new name. This form is unmistakably a species of *Permianella* He and Zhu, as evidenced by the deep incision and the distinctive median septum on the central plat-

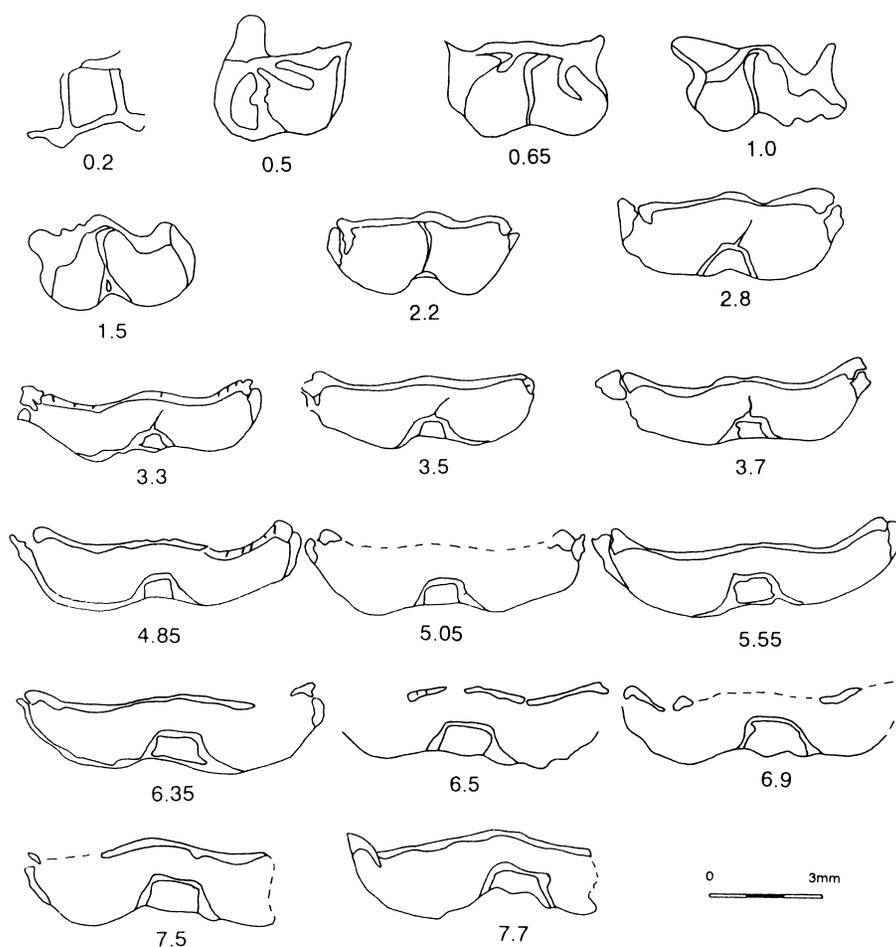
Permianella (Brachiopoda) from the Upper Permian of Transcaucasia

Fig. 3. Serial sections of *Permianella grunti* n. sp.. The Arabic numerals show the distance in mm from the section to hinge line.

form. However, the inconspicuous marginal brim, very short median septum, thin shell and thin cavity show that it is quite different from those of the type species of *Permianella*, which usually possesses wide, well-developed marginal brims along the lateral commissure of ventral valve and a long median septum on its central platform (He and Zhu, 1979, p.133, text-fig.1). Some specimens from South China described by Liang (1990) have a similar shape to the present form, but they usually have two lateral septa on the central platform as stated by Liang (1990), indicating that they probably belong to *Dicystoconcha* Termier *et al.*. The specimens described as *Loczyella? parvulia* Licharew by Licharew and Kotljar (1978, pl. 31, figs. 3-4) have a broad outline and a slightly curved profile although they nearly share the same size as the present species. The generic status of this species cannot be determined between *Permianella* or *Dicystoconcha* because of its unknown internal structure.

Horizon and Locality.-Araxoceras Bed (bed 6) of the Dzhulfa Formation; Dorasham II, Dzhulfa, Nakhichevan.

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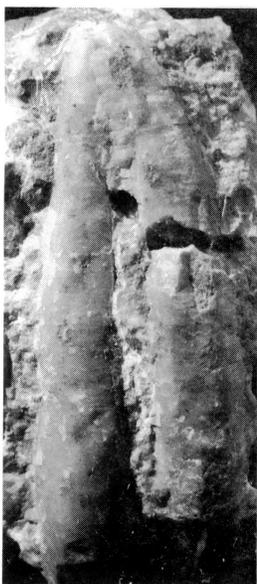
Explanation of Plate

Plate 1

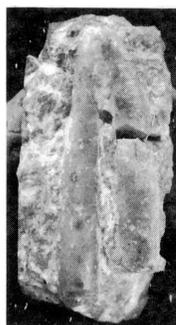
1-7. *Permianella grunti* n. sp., CUMT90342, holotype

1. ventral view $\times 2$
2. ventral view $\times 1$
3. section at 3.3mm anterior to hinge line showing central platform and thin distorted median septum $\times 28$
4. section at 1.5mm anterior to hinge line, showing the top-thickened median septum, pseudopunctate shell, transverse profile and lateral marginal brim of ventral valve $\times 18$
5. showing shell fabric of dorsal valve, the right is pseudopunctate layer and the left layer is laminar layer $\times 56$
6. transverse section of central platform $\times 50$
7. section at 6.35mm anterior to hinge line showing the anterior profile and thin cavity $\times 23$

Plate 1



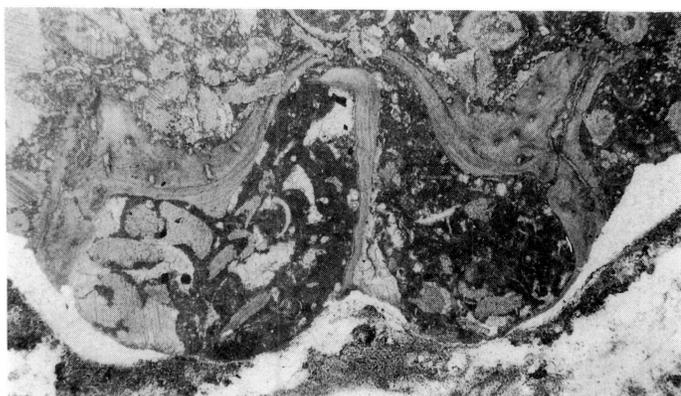
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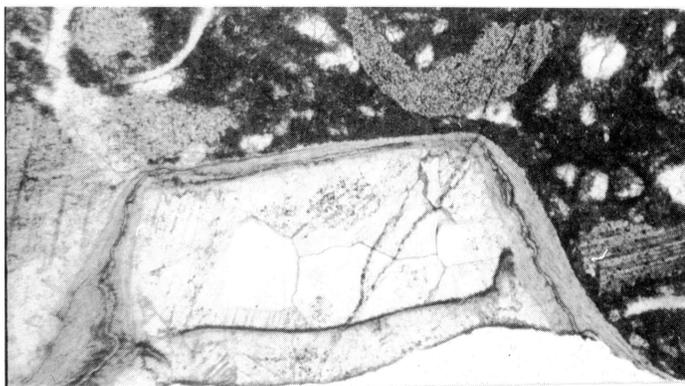
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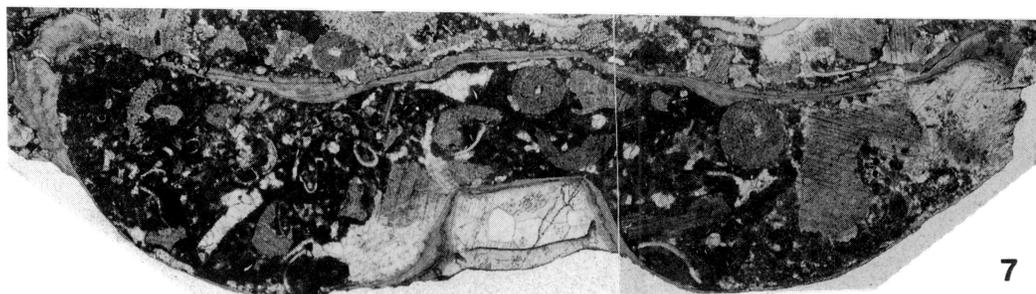
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