Available online at www.sciencedirect.com

ScienceDirect

Palaeoworld 23 (2014) 143–154

Palaeoworld

www.elsevier.com/locate/palwor

Early Triassic bivalves from the Feixianguan Formation in Xingyi, Guizhou and the Ximatang Formation in Qiubei, Yunnan (southern China)

Yan Hong Pan [a,*], Shi Xue Hu [b], Jin Geng Sha [a], Qi Yue Zhang [b], Ya Qiong Wang [a], Chang Yong Zhou [b], Wen Wen [b], Jin Yuan Huang [b], Tao Xie [b]

[a] *State Key Laboratory of Palaeobiology and Stratigraphy, Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, No. 39 East Beijing Road, Nanjing 210008, China*

[b] *Chengdu Center of China Geological Survey, No. 2, N-3 Section, First Ring Road, Chengdu 610081, China*

Received 15 April 2013; received in revised form 18 September 2013; accepted 13 November 2013
Available online 23 November 2013

Abstract

Based on newly collected materials from the Lower Triassic Feixianguan Formation of Xiongwu section in Xingyi, Guizhou and the Ximatang Formation of Ximatang section in Qiubei, Yunnan, southern China, nine species belonging to seven genera are described. Two bivalve assemblages are recognized and regionally correlated in South China. The bivalve assemblage from the Feixianguan Formation of Xiongwu exhibits a higher diversity including seven species belonging to seven genera: *Claraia griesbachi*, *Leptochondria virgalensis*, *Entolium* (*Entolium*) *microtis*, *Towapteria scythicum*, *Bakevillia exporrecta*, *Bositra* sp., and *Unionites*? *fassaensis*. In contrast, the bivalve assemblage from the Ximatang Formation of Ximatang has a much lower diversity, consisting of only two species, i.e., *Claraia griesbachi* and *Claraia radialis*. Additionally, *C. griesbachi* and *C. radialis*, as the most common species of *Claraia* in the Early Triassic, are revised.
© 2013 Elsevier B.V. and Nanjing Institute of Geology and Palaeontology, CAS. All rights reserved.

Keywords: Bivalves; Early Triassic; Southwest China

1. Introduction

The greatest extinction event at the end-Permian strongly affected marine ecosystems (Erwin, 1993, 1994, 2006; Benton, 2006). After the mass extinction, during the Early Triassic the benthic shelly fauna experienced a transition towards dominance of the bivalves (Hallam and Wignall, 1997; Wagner et al., 2006; Fraiser and Bottjer, 2007). Accurate taxonomic knowledge of the marine benthic faunas in the Lower Triassic is critical for understanding the rate and pattern of biological recovery that followed the mass extinction (Erwin, 1998). However, only a few Early Triassic bivalve faunas have been described systematically (e.g., Krystyn et al., 2003; He et al., 2007; Gao et al., 2009; Kumagae and Nakazawa, 2009; Hautmann et al., 2011, 2013; Wasmer et al., 2012). This lack of systematic studies might have led to the perception of an extremely low diversity after the end-Permian mass extinction that might have persisted through the entire Early Triassic (e.g., Pruss et al., 2006; Fraiser and Bottjer, 2007, 2009), which could be overestimated as the combined results of inadequate sampling and poor preservational conditions (Hautmann and Nützel, 2005; Hautmann et al., 2011, 2013).

South China as a key locality for the study of marine invertebrates during the transition from the Palaeozoic to the Mesozoic, yielding abundant well-preserved bivalve fossils in the Early Triassic strata, which has been largely ignored before, and few persuasive taxonomic works are available (e.g., Yin, 1985; He et al., 2007; Hautmann et al., 2011).

Abundant bivalve fossils have been collected in the Lower Triassic strata of southern China during the last few years. In this paper, we document the bivalves from the Feixianguan Formation of Xiongwu section in Xingyi, Guizhou and the Ximatang Formation in Qiubei, Yunnan. Eight species belonging to seven genera are described. Two bivalve assemblages are recognized and regionally correlated in South China. The present paper intends to provide a taxonomic basis for further palaeoecological and palaeobiogeographic studies during the allegedly prolonged

* Corresponding author. Tel.: +86 25 83282181.
E-mail address: yhpan@nigpas.ac.cn (Y.H. Pan).

1871-174X/$ – see front matter © 2013 Elsevier B.V. and Nanjing Institute of Geology and Palaeontology, CAS. All rights reserved.
http://dx.doi.org/10.1016/j.palwor.2013.11.003

Fig. 1. Location of the two fossil localities, southwestern China.

lag phases of Early Triassic after the end-Permian mass extinction, when well-preserved fossil material is notoriously scarce.

2. Geological setting

The Ximatang section is situated about 6 km west of Ximatang town, Qiubei County, Yunnan Province, South China (Fig. 1). The detailed description of the section and a list of the fossils from this section have been provided by Chen et al. (1961), and the systematic work on the mollusks was only partly published by Chen et al. (1974), while most described material has been lost. The described material in this paper was collected from the yellowish green mudstone and silty-mudstone of the lower Ximatang Formation.

The Xiongwu section is close to the Xiongwu town, Xingyi County, Guizhou Province (Fig. 1). The precise measuring work on this section has not been carried out yet. Almost all the fossils are collected from one greenish to brownish siltstone and mudstone layer. Based on the lithographic features, it belongs to the lower part of the Feixianguan Formation (Biostratigraphy Working Group of Guizhou Province, 1977).

The observable physical lithologic features of the rocks are apparently different between these two Formations. However, according to the biostratigraphic correlation, both of them are within the range of the *Claraia griesbachi* zone (Induian) (e.g., Yin, 1985; Gao et al., 2009), and regarded as simultaneously formed heterogenous phases.

3. Materials

The present paper deals with the specimens collected from the Feixianguan Formation of the Xiongwu section and the Ximatang Formation of the Ximatang section (Fig. 1) during the general survey in Southwest China (2009–2011). The materials are preserved as either internal moulds or composite moulds, whereas shell preservation is rare.

4. Systematic palaeontology

The generic classification mainly follows the Treatise on Invertebrate Paleontology (Cox et al., 1969) or more recent amendments (e.g., Newell and Boyd, 1995; Carter et al., 2011; Hautmann et al., 2011), as indicated. Synonymies generally refer to type specimens and list bibliographic references to material from Southwest China and adjacent areas. All specimens described in this paper are deposited in the Chengdu Center of China Geological Survey.

Family Bakevelliidae King, 1850
Genus *Bakevellia* King, 1848
Type species: *Avicula antiqua* von Münster in Goldfuss, 1836

Bakevillia exporrecta (Lepsius, 1878)
(Fig. 5I, J)

1878 *Gervillia exporrecta* – Lepsius, p. 352, pl. 1, fig. 6a–c.
1908a *Gervillia exporrecta* Lepsius – von Wittenburg, p. 279, pl. 39, fig. 10.
1909 *Gervillia exporrecta* Lepsius – von Wittenburg, p. 12, pl. 2, fig. 2a, b.
1935 *Gervillia exporrecta* Lepsius – Leonardi, p. 25, pl. 2, figs. 10, 11.
1948 *Gervillia exporrecta* Lepsius – Gu, p. 249, pl. 1, figs. 18, 19.
1965 *Gervillia exporrecta* Lepsius – Vu et al., p. 26, pl. 2, fig. 13.
1976 *Gervillia exporrecta* Lepsius – Gu et al., p. 138, pl. 27, fig. 30.
?1982 *Gervillia exporrecta* Lepsius – Shi, p. 25, pl. 11, fig. 9.
1982 *Bakevellia exporrecta* (Lepsius) – Chen, p. 213, pl. 3, figs. 13, 16–18.
1983 *Bakevellia exporrecta* (Lepsius) – Yin and Yin, p. 137, pl. 13, figs. 15, 16.
1995 *Bakevellia exporrecta* (Lepsius) – Sha, p. 89, pl. 25, fig. 7.
1996 *Bakevellia exporrecta* (Lepsius) – Sha and Grant-Mackie, fig. 3g.

Material. Two incomplete composite moulds (XW-12-2, XW-12-3).

Download English Version:

https://daneshyari.com/en/article/4749809

Download Persian Version:

https://daneshyari.com/article/4749809

Daneshyari.com