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Biradiolites from the Yigeziya Formation of the Southwestern Tarim Basin

Xin Rao

State Key Laboratory of Palaeobiology and Stratigraphy, Nanjing Institute of Geology and Palaeontology and the Center for Excellence in Life and Paleoenvironment, Chinese Academy of Sciences, Nanjing, China
Email: xinrao@nigpas.ac.cn

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Abstract

Two *Biradiolites* species described from the Yigeziya Formation of the southwestern Tarim Basin are revised. The Maastrichtian *Biradiolites boldjuanensis* is small and pipe-like species that is usually preserved as clusters or bouquets. Although it was considered to be endemic to Central Asia, similar specimens are abundant in Maastrichtian of other Tethyan regions. *Biradiolites minor* specimens have no relationship with the genus *Biradiolites* because their ventral and posterior bands are protruding ridges and interband is depressed broad groove. This species is comparable with the Campanian-Maastrichtian eastern Arabian species *Glabrobournonia arabica*, by the character of smooth outer shell layer in right valve, and simple radial bands and ridges on margin of each shell flank, but it differs from the latter species in size and the shape of left valve. This study will be a supportive tool for the establishment and reconstruction of the palaeogeographic connection between Central Asia and other Tethyan regions.

Keywords

Tarim Basin, Cretaceous, Rudist, *Biradiolites*

1. Introduction

Biradiolites d'Orbigny 1850 is radiolitid which is characterized by the protruding interband and relatively depressed ventral and posterior bands, as well as the absence of the ligament infolding and central tooth in right valve. It has a cosmopolitan distribution with the age ranging from Turonian to Maastrichtian. Two *Biradiolites* species, *Biradiolites boldjuanensis* Bobkova 1960 and *Biradiolites minor* Pojarkova 1955, had been described by Lan and Wei (1995) from the Yigeziya Formation of the southwestern Tarim Basin. Both of them were

considered as endemic species that are restricted to the southeast Central Asia including Tajik, Fergana and Tarim Basin. As similar specimens have been recorded from other Tethyan regions like eastern Arabia [1], the taxonomic position and distribution of these two species need to be revised.

2. Geological Setting

The SW Tarim Basin in Xinjiang Ugur Autonomous Region is one of the main areas in China where the marine Cretaceous is well developed [2]. The Upper Cretaceous deposits crop out as a narrow belt along the southwest border of this basin and are represented mainly by sediments of littoral, near-shore neritic and estuarine facies divided in ascending order into the Kukebai, Wuyitake, Yigeziya and Tuyiluoke formations [3]. Ygeziya Formation distributed as a narrow NNW belt encompassing Kashgar, Wuqia, Aketo, Yengisar, Kargant and Yecheng counties, with its thickness thins gradually from west to east, changing from 125 m to 10 m [4].

3. Revision of *Biradiolites* Species from the Yigeziya Formation

Biradiolites boldjuanensis was recorded in the upper part of the Yigeziya Formation. Lan and Wei' specimens are small in size, with the commissural diameter ranging from 3 mm to 7 mm, and mostly preserved as clusters or bouquets. The right valve is elongate cylindrical, has about 6 to 10 radial ribs. As the dental and myophoral structures are not preserved, it is difficult to identify the position of the radial bands. Lan and Wei [4] defined the most protruding rib as the interband. The outer shell layer develops coarse cellular structure. This species is abundant in the Maastrichtian of Southeast Central Asia including SW Tarim Basin, east Tajik Basin and SW Darwasi [5]. Although it was considered as an endemic species that restricted to Central Asia, similar specimens that usually preserved as clusters are abundant in Maastrichtian of other Tethyan regions [6], detailed study on the relationship of *B. boldjuanensis* with other contemporaneous *Biradiolites* species like *B. mooretownensis* need to be carried out in the future.

Biradiolites minor was described from the middle part of the Yigeziya Formation. Most Tarim specimens were preserved as small individuals, the height of right valve ranging from 20 mm to 35 mm. Left valve is operculiform, right valve is conical, with four acute ridges on the margin of dorsal, posterior, ventral and anterior flanks. The ridge located on the anterior margin of the ventral flank is ventral band, and the adjacent one on the posterior margin is posterior band. The outer shell layer of right valve is thin and smooth, without longitudinal ornamentations on the surface. Except for Tarim Basin, it has also been reported from the Campanian-Maastrichtian of Fergana Basin and Alai. This species has no relationship with the genus *Biradiolites* because their ventral and posterior bands are protruding ridges and the interband is depressed broad groove. They

show typical characteristics of the genus *Glabrobournonia* Morris and Skelton, 1995, including the smooth outer shell layer of right valve, simple radial bands and ridges on the margin of each flank, but differ from the eastern Arabian type species *G. arabica* in size and the shape of the left valve.

4. Conclusion

Biradiolites boldjuanensis is small radiolitid which is usually preserved as clusters or bouquets. Although it was considered to be endemic to Central Asia, similar specimens are abundant in Maastrichtian of other Tethyan regions. *Biradiolites minor* specimens from the SW Tarim Basin have no relationship with the genus *Biradiolites* because their ventral and posterior bands are protruding ridges and interband is depressed broad groove. This species is comparable with the Campanian-Maastrichtian eastern Arabian species *G. arabica*, but differs from the latter in size and the shape of left valve. The rudist taxa discussed herein, probably have a relatively cosmopolitan Tethyan distribution; this finding could be a supportive tool for the reconstruction of the palaeogeographic connection between Central Asia and other Tethyan regions.

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Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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