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First Report of Middle-Late Ordovician Fish-Like Exoskeletal Fragments from the Tarim Basin, Xinjiang, China

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Abstract: The earliest known vertebrates are soft-bodied remains from the Lower Cambrian Chengjiang fossil-Lagerstätte (about 520 million years ago). The typical exoskeletal vertebrate, 'Ostracoderm' didn't boom until the early Silurian times (about 435 million years ago) after the glaciation at the end of the Ordovician period. The undoubted Ordovician vertebrates are very rare expect for *Arandaspis*, *Porophoraspis* from Australia, *Sacabambaspis* from Bolivia, *Astraspis*, *Eriptychius* from North America. These Ordovician vertebrates are very simple in shape, with a fusiform head covered with large bony plates ornamented with tubercles. Here, we describe some fish-like skeletal fragments from the Middle–Upper Ordovician of Tarim Basin in Bachu County, South Xinjiang, China. The fish-like exoskeletal fragments were found in asscociation with the Late Ordovician conodonts *Baltoniodus alobatus*. The surface of fragments is ornamented with tiny and densely set round tubercles, which is quite comparable to the exoskeleton of vertebrates from the Harding Sandstone of North America. Further histological

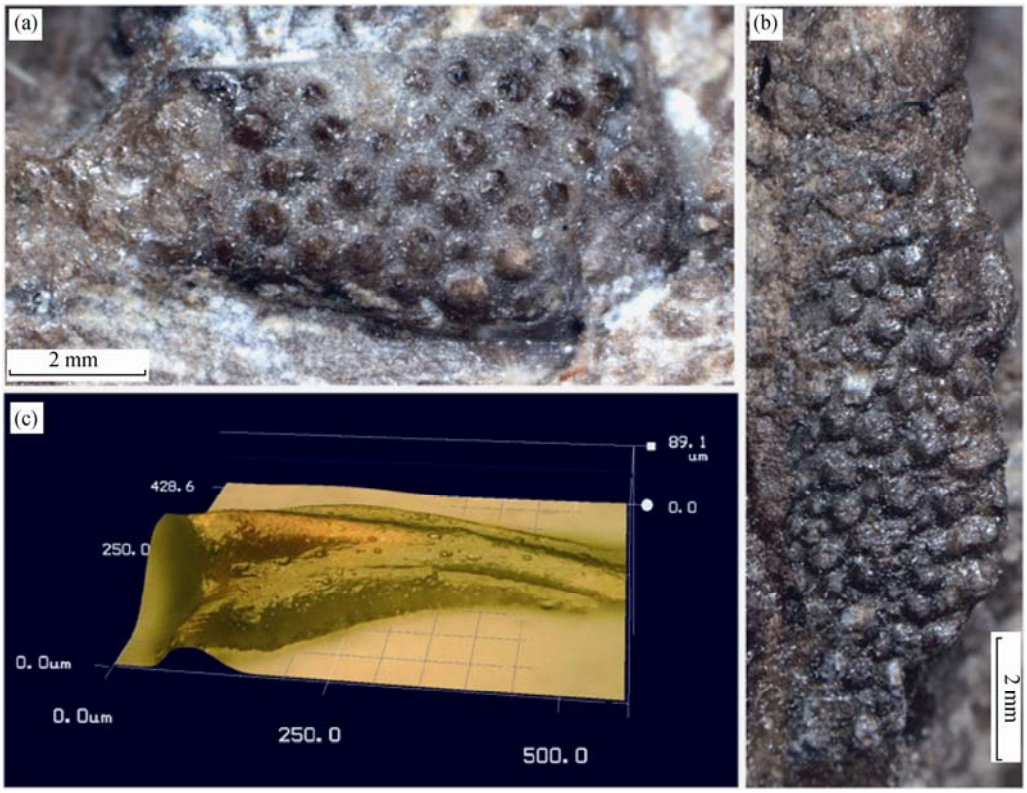

Fig. 1. Fish-like exoskeletal fragments from the Middle–Upper Ordovician of the Tarim Basin, Xinjiang, China.
(a) A spine-like exoskeletal fragments with tiny and densely set round tubercles; (b) An exoskeletal fragment with tiny and densely set round tubercles striking similar to the exoskeleton of vertebrates from the Harding Sandstone of North America; (3) A conodont remains from the same locality and horizon.

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investigation on these fragments and more field excursion for the articulated specimen will clarify the nature of the fragments.

Key words: Ordovician, Tarim basin, vertebrate, exoskeleton

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