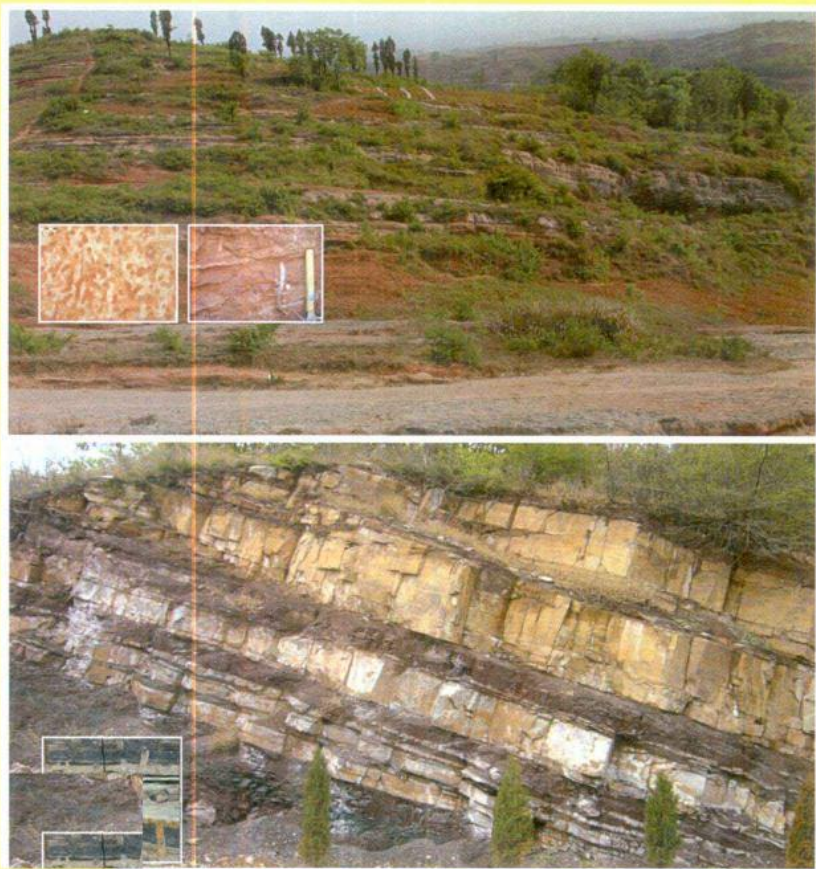


龚一鸣 胡 斌 齐永安 等 编著

PROGRESS IN ICHNOFABRIC AND ICHNOCOENOSIS

遗迹组构和遗迹群落研究新进展



煤炭工业出版社



The 10 th International Ichnofabric Workshop
Jiaozuo, China, August 25 – September 2, 2009

PROGRESS IN ICHNOFABRIC AND ICHNOCOENOSIS

--The field trip guidbook and abstracts of XIW

遗迹组构和遗迹群落研究新进展

--第十届国际遗迹组构研讨会野外考察指南
及论文摘要

Edited by:

Yiming Gong, Bin Hu, Yongan Qi, Guocheng Zhang
Deshun Zheng & Min Wang



Henan Polytechnic University
Henan 2009

图书在版编目 (CIP) 数据

遗迹结构和遗迹群落研究新进展: 第十届国际遗迹结构研讨会野外考察指南及论文摘要=Progress in Ichnofabric and Ichnocoenosis: the Field Trip Guidbook and Abstracts of XIIW: 英文/龚一鸣等编著. -- 北京: 煤炭工业出版社, 2010

ISBN 978 - 7 - 5020 - 3677 - 5

I. ①遗... II. ①龚... III. ①痕迹学-英文 IV. ①Q911.28

中国版本图书馆 CIP 数据核字(2010)第 093628 号

煤炭工业出版社 出版
(北京市朝阳区芍药居 35 号 100029)
网址: www.cciph.com.cn
石油工业出版社印刷 印刷
新华书店北京发行所 发行

*
开本 787mm×1092mm^{1/16} 印张 11^{1/2}
字数 225 千字 印数 1—5 00
2010 年 6 月第 1 版 2010 年 6 月第 1 次印刷
社内编号 6472 定价 30.00 元

版权所有 违者必究

本书如有缺页、倒页、脱页等质量问题, 本社负责调换

Institutional Organizers:

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National Science Foundation of China

Key Laboratory of Biogeology and Environmental Geology
of Ministry of Education, China University of Geosciences (Wuhan)

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The front cover photographs: outcrop of the Majiacun Fm. (Upper Cretaceous), Xixia Basin (Stop 6), and *Beaconites coronus*, *Scoyenia gracilis* (top); outcrop of the Youfangzhuang Formation (Middle Triassic), Jiyuan Basin (Stop 4) and *Skolithos linearis* (bottom).

The back cover photograph: *Zoophycos villae* in the Carbonate of the Lower Permian Taiyuan Formation, Jiaozuo (Stop 2).

Field Trip Leaders: Guocheng Zhang, Bin Hu, Yongan Qi & Yiming Gong

Editorial work, typography and layout elaboration by
Min Wang, Yiming Gong & Deshun Zheng

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PREFACE

Progress in Ichnofabric and Ichnocoenosis is a fitting theme for the 10th International Ichnofabric Workshop. The contribution to this highlight new and exciting discoveries, as well as theoretical and methodological advances that have taken place in ichnology research in the two years since the 9th IIW in Calgary, Canada. This workshop is intended to bring together ichnological researchers to share developing ideas, processes and innovations in the area of ichnofabric research. It has attracted many ichnologists, researchers and students of related disciplines from worldwide. It is the first time that the International Ichnofabric Workshop was held in Asia and developing countries.

The researchers and students from ichnology research group of Henan Polytechnic University have successfully organized about 9 mid- and post-workshop field trips, providing an opportunity for international participants to examine some of the most exciting trace fossil sites in China, including the fantastically well preserved Neoproterozoic microbially induced sedimentary structures and Palaeozoic, Mesozoic trace fossils and dinosaur egg fossils in central and southwest China. A total of 37 abstracts, submitted by participants from over 9 countries, are presented in this book.

We would like to thank our colleagues and graduate students for their organizational and collaborative work. There is no doubt that the tenth IIW will greatly facilitate academic exchange among participants from different countries, promote research collaborations internationally, and provide an opportunity for worldwide ichnologists to better know the ichnological research progress in China.

Ichnology Research Group
Henan Polytechnic University, China
25th September, 2009

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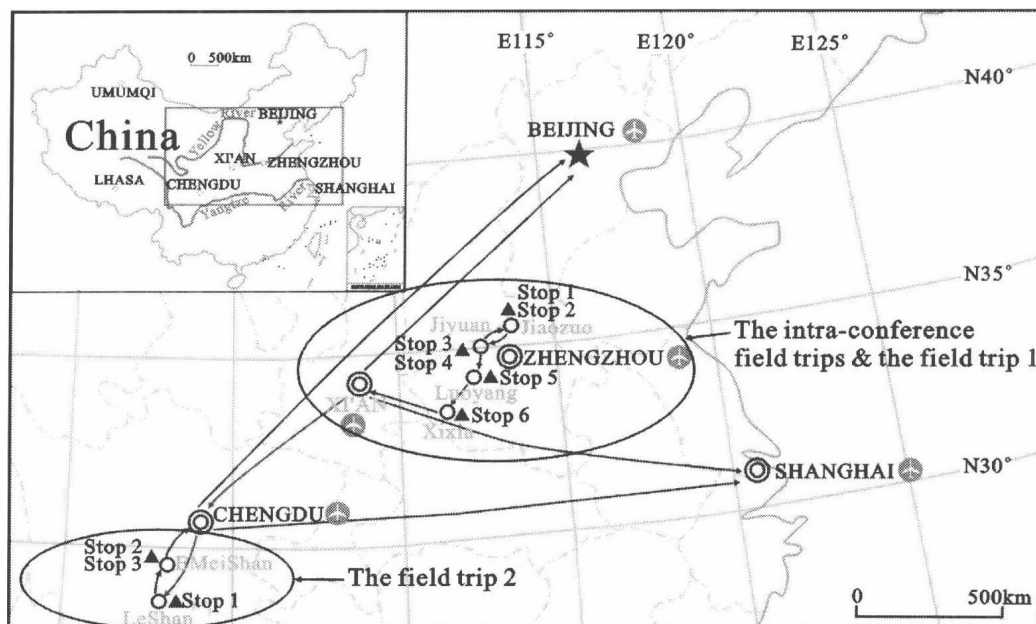
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THE FIELD TRIPS

The Outline of the Intra- and Post-conference Field Trips



The outline of the intra- and post-conference field trips

The intra-conference field trips (Tuesday-Wednesday, August 25-26, 2009)

Stop 1-Microbially induced sedimentary structures (MISS) in sandstones from the Neoproterozoic Yunmengshan Formation, Red Stone Gorge, Jiaozuo city, Henan

Stop 2 - *Zoophycos* and others ichnofabrics in carbonates from the Upper Carboniferous-Lower Permian Taiyuan Formation, Xizhangzhuang village, Jiaozuo city, Henan

The post-conference field trip 1 (Thursday -Monday, August 27-31, 2009)

Stop 3-*Vagorichnus*, *Neonereites* and other ichnofabrics in lacustrine turbidites from the Lower Jurassic Anyao Formation, Sanhuang village, Jiyuan city, Henan

Stop 4-*Skolithos* and *Beaconites* ichnofabrics in fluvial deposits from the Middle Triassic Youfangzhuang Formation, Nanshan Forest Park, Jiyuan city, Henan

Stop 5-*Palaeophycus* and *Thalassinoides* ichnofabrics in marine carbonates from the Middle and Upper Cambrian Zhangxia and Gushan Fms., Longmen Grottoes, Luoyang city, Henan

Stop 6-*Beaconites*, *Scopyenia* and dinosaur eggs ichnofabrics in fluvial and extremely shallow lacustrine deposits from the Upper Cretaceous, Zhaoying village, Xixia town of Nanyang city, Henan

The post-conference field trip 2 (Tuesday-Thursday, September 1-3, 2009)

Stop 1-*Rhizocorallium* and other ichnofabrics in carbonate pavement stones from the Lower Triassic Jialingjiang Formation, Giant Buddha Park, Leshan city, Sichuan

Stop 2-*Pylonichnus*, *Rhizocorallium* and other ichnofabrics in terrigenous clastic rocks and carbonates from the Lower Triassic Jialingjiang Formation, Lizhuang village (the Longmendong section), Mount Emeishan, Sichuan

Stop 3-*Planolites* and other ichnofabrics in carbonates from the Lower Triassic Jialingjiang Formation, Shawan quarry, Mount Emeishan, Sichuan

The Intra-conference Field Trips

Outline of the Yuntaishan World Geopark, Jiaozuo city, Henan

Yongan Qi, Yuyang Yuan, Zhifeng Xing, Wei Zheng

1 Introduction of Yuntaishan World Geopark

The Yuntaishan World Geopark is located in the southern foothills of the Taihang Range, north of Jiaozuo City in Henan Province (Fig.0-1). With a total area of 556 km², the geopark is characterized by its rifting structures, spectacular landscapes, in combination with its natural ecological and cultural relic scenery.

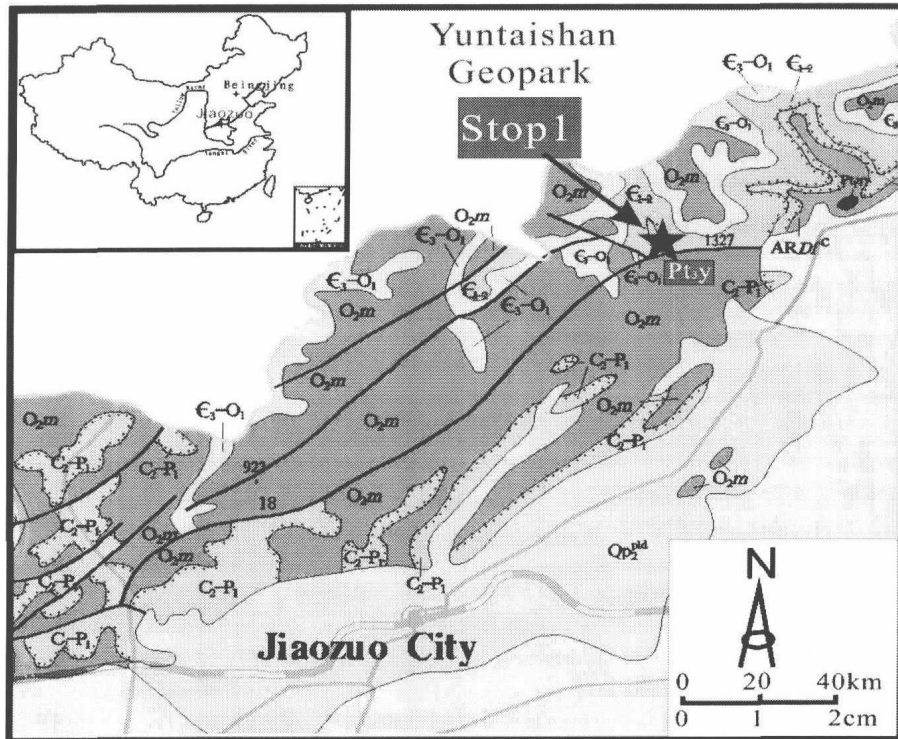


Fig.0-1 Geological map of Yuntaishan World Geopark near Jiaozuo City with the location.

The Geopark tectonically lies in the southern margin of North China block and the intersection between North China rift zone and Taihangshan uplift zone. It develops Neoproterozoic and Palaeozoic marine strata that overlie the Archean crystalline basement. As the uplift of North China block on the end of the Palaeozoic Era, the seawater eventually withdrew from the geopark area. Along with Pacific Plate subducting westward in the end of the Mesozoic Era, the peri-Pacific active

continental margin and the grand East Asian rift system formed. Under the influence of this neotectonics, most of Palaeozoic sediments were eroded, long time weathering, corrosion, scouring, riving and disintegration to the remaining Cambrian and Ordovician rocks, the unique “Yuntai Landform” is formed in Yuntaishan geopark area.

The “Yuntai Landform”, developed on the background of this old massif, is a new member of the family in Chinese landscapes. The unique topographic landforms of the geopark have the combination of monadnock, plateau surface, broken scrap, shoulder terrace, long wall, broad valley, enclosed valley, gully, gorge, lane valley, Urn-shaped valley, peak cluster in valley, peak wall, peak forest, erosion and sedimentary terraces, as well as the adorning karst cave, travertine, hanging spring, waterfall, cascade, etc (Fig.0-2), exhibiting the combination of the grand panorama of the north and the exquisite beauty of the south.

2 Stratigraphy of Yuntaishan World Geopark

The main strata in Yuntaishan Geopark include the Neoproterozoic Yunmengshan Formation, Cambrian carbonate rocks and mudstones and Middle Ordovician Majiagou Formation (Fig. 0-3, 4).

2.1 The Yunmengshan Formation (Neoproterozoic)

The Yunmengshan Formation, located in Red Stone Gorge of Yuntaishan Geopark, is the first set of capping beds and the earliest sedimentary rocks preserved in this area, representing a initial transgression. This Formation is dominated by thick siliciclastic units. Many sedimentary structures, such as planar cross bedding, herringbone cross bedding, wedge-shaped cross bedding, swash cross bedding, parallel bedding, and nearly all kinds of ripples with different size and shapes are widely developed in the strata (Wang et al., 2007).

2.2 Strata developed in Cambrian

The Cambrian Outcrops are distributed in the middle and northern part of the Geopark, and constitute the body of Yuntai mountain. They disconformably overlie on the Neoproterozoic Yunmengshan Formation or unconformably overlie on Archean rocks. The Cambrian succession is relatively complete. Breaks in the stratigraphic record are marked by disconformities on its bottom contact with the Yunmengshan Formation and its top disconformably contact with the Middle Ordovician Majiagou Formation. It can be divided into the Xinji Formation, Zhushadong Formation (Lower Cambrian), Mantou Formation (Lower-Middle Cambrian), Zhangxia Formation (Middle Cambrian), Gushan Formation, Chaomidian Formation and Sanshanzi Formation (Upper Cambrian). They have recorded the whole Cambrian history of epicontinental evolution.

2.2.1 The Xinji Formation

It is the production of the first transgression in Cambrian, and overlies disconformable on the Yunmengshan Formation, 5-8 m in thickness, and includes basal conglomerate exposed in the bottom, middle-coarse phosphoric quartz sandstones (lower part), and alternating layers of black arenaceous shales and spherulitic calcareous dolomites in the upper part, with planar cross beddings, mud cracks structures. It was formed in subtidal lagoon environment.

2.2.2 The Zhushadong Formation

It, up to 29 m in thickness, is characteristic of light-gray laminated marlites, interbedded with gypsum breccias in the middle-upper part and gypsum pseudocrystals in the upper part. The dominant sedimentary structures are mud cracks, small caverns and tepee structures. Above features show that this Formation is deposited in evaporated lagoon environment under arid climate.

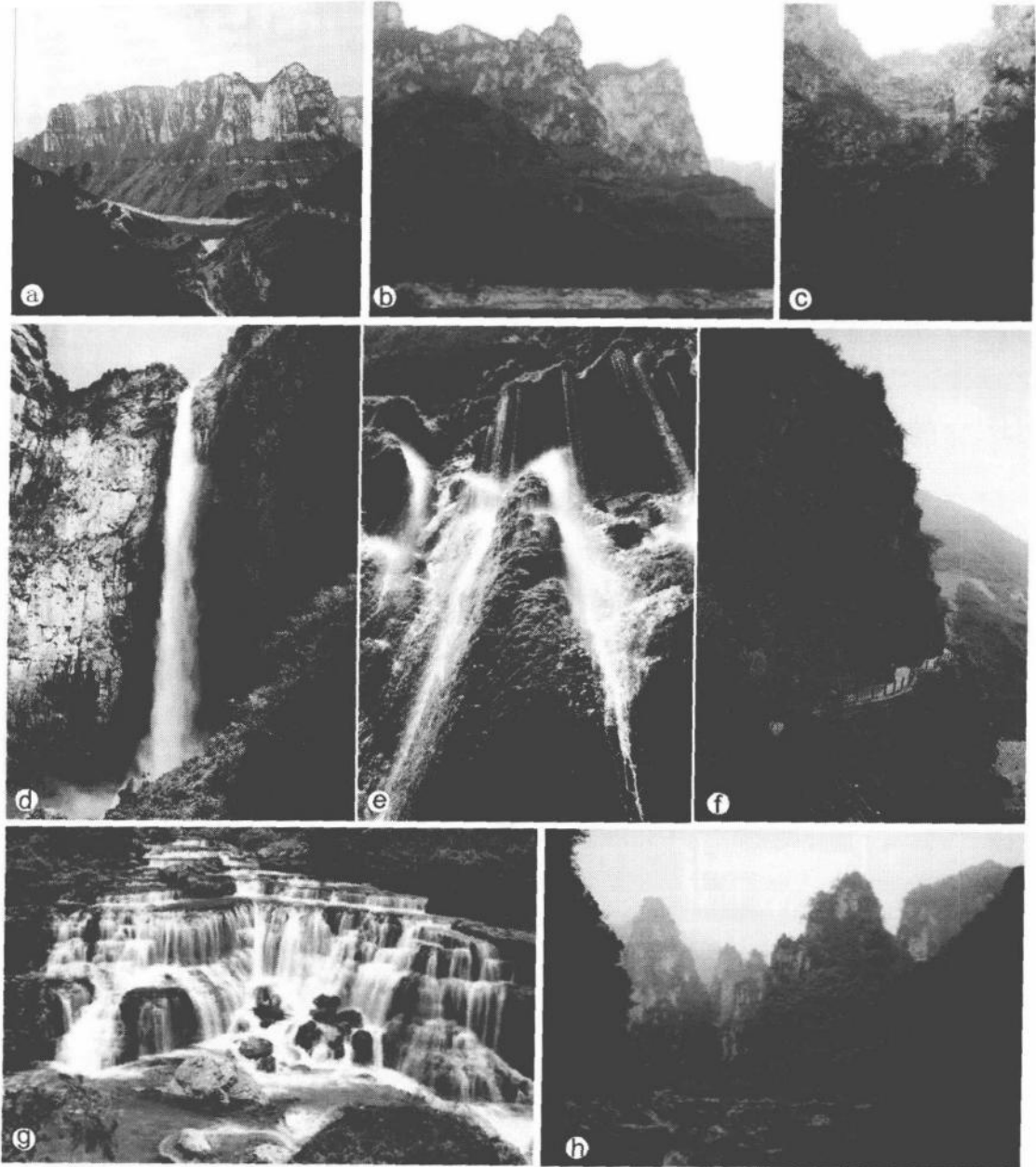


Fig.0-2 Geomorphologic Landscape of Yuntai Landform.a-Long stone wall; b-Sedimentary terraces; c-Urn-shaped valley; d-Yuntai Waterfall; e-Travertin waterfall; f- Cliff walls; g-Waterfall cluster; h-Peak forest.

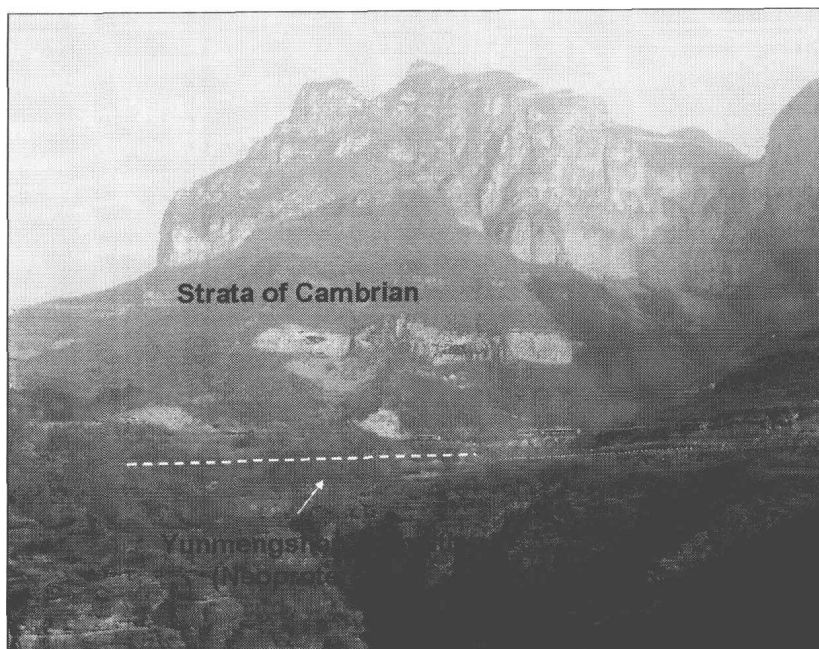


Fig.0-3 Stratigraphic succession of Yuntaishan World Geopark

2.2.3 The Mantou Formation

The Mantou Formation differs from the underlying Zhushadong Formation by the occurrence of purple shale layers in the bottom. Based on lithology, the Formation here has been subdivided into three Members.

The Lower Member: Purple dolomitic mudstones alternating with grayish yellow dolomitic mudstones occur in the middle and lower part; argillaceous dolomitic limestones develop in the upper part. The trilobite *Redilichia* sp. can be found in the lower part of this Member.

The Middle Member: Sedimentary rocks are characterized by the alternations of marly dolomites, oolitic limestones and bioclastic limestones. Limestone beds were bioturbated and accompanied by trilobite: *Eosoptychoparia*.

The Upper Member: The strata are typified by purple shales interbedded with glauconite quartz sandstones, bioclastic limestones and allochemical limestones. Rich body fossils have been observed in this Member, mainly including trilobites and brachiopods: *Kailiella* sp., *Poriagraulos nanum* (Dames), *Bailiella lantenoisi*, *Bailiella tyasversa* Zhang et Wang, *Honanaspis honanensis* Chang, *Honanaspis* cf. *transversus* Wu et Lin, *Proasaphiscus* sp., *Gangdeeria* sp., *Daopingia* sp., *Zhongtiaoshanaspis* sp., *Proasaphiscina* sp., *Obolus* sp. etc.

All mentioned above are characteristic of mudstones intercalated with limestones. Mudstone is easily to form gentle slope, platform or small groove by erosion, but limestone often leaves scarp or convex, which result in ladder macro-topography or peak walls, or overlapping waterfalls. Mudstone layer is an important waterproof layer, which is favorable for the formation of springs, suspended springs, and usually constitutes the base for long walls, enclosed valleys and Urn-shaped Valleys.

2.2.4 The Zhangxia Formation

The strata are subdivided into two members, which are conformable contact with each other. Middle-thin bedded muddy limestones, oolitic limestones, dolomitic oolitic limestones developed in the lower part of the Formation. Sediments in its upper part include dolomitic oolitic limestones and grey laminated muddy limestones.

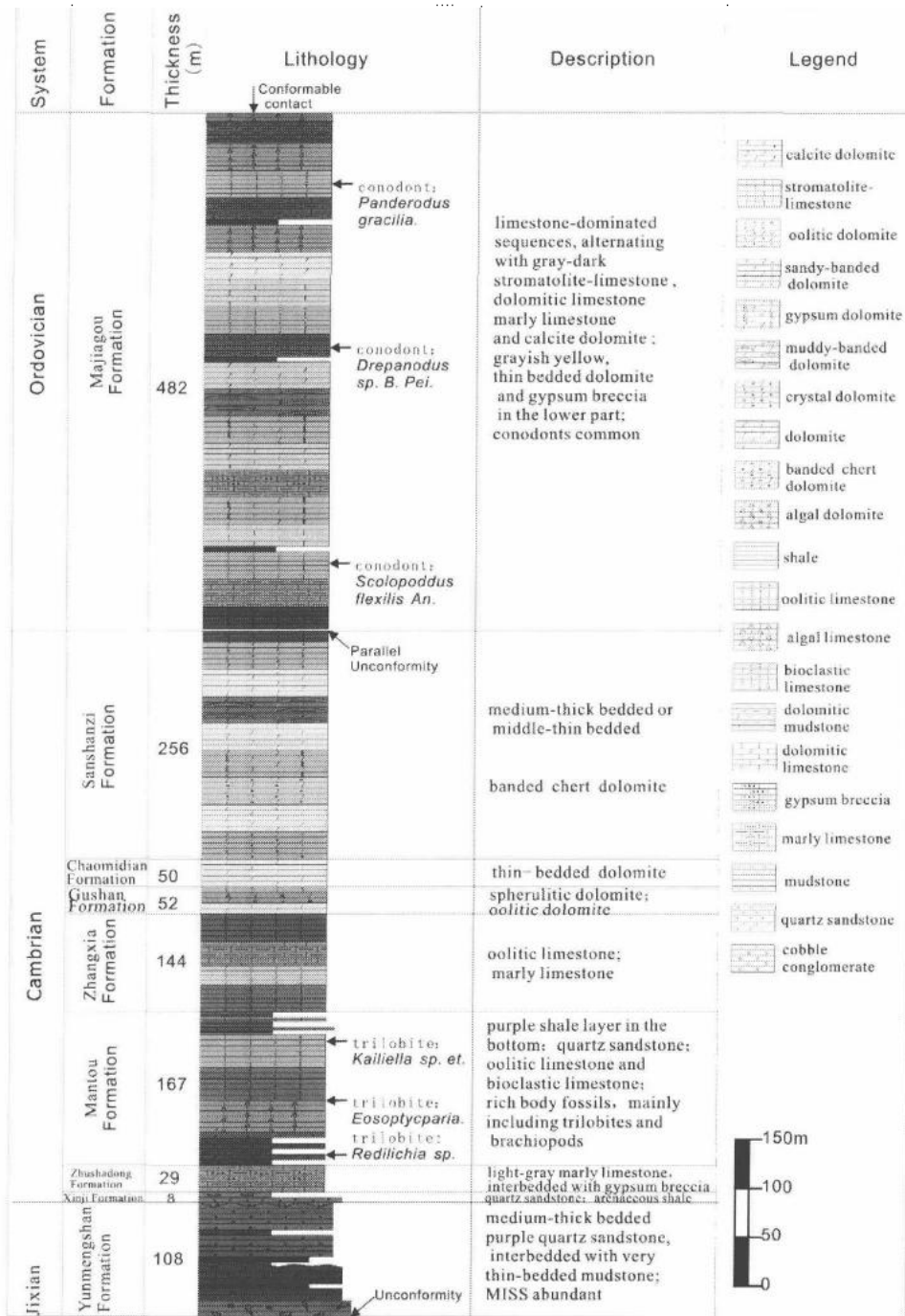


Fig. 0-4 Lithological column of exposed strata in Yuntaishan Geopark