

广西下泥盆统大瑶山群盔甲鱼类的新发现¹⁾

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广西象州县大乐乡泥盆系剖面是华南象州型(底栖相)泥盆系的标准剖面(侯鸿飞、王士涛,1988),其下部大瑶山群为一套厚达上千米的石英砂岩夹粉砂岩沉积,底部以一层约2 m厚的砾岩与下伏的前泥盆系呈角度不整合接触(白顺良等,1982)。大瑶山群岩性单一,化石稀少且保存不佳,生物地层学研究程度较低。根据沉积特征和区域地质对比,白顺良等(1982)和侯鸿飞、王士涛(1988)认为,大瑶山群的沉积时代大致与广西六景地区莲花山组 and 那高岭组的时代相当,为早泥盆世洛霍考夫期。钟铿等(1992)认为其上部大致相当于那高岭组,中下部可与莲花山组对比。本文记述的材料为无颌类盔甲鱼亚纲的一新属、新种,采自大乐大瑶山群的中部,代表了该群早期脊椎动物化石的首次记述,也为区域地层的对比提供了古鱼类学依据。

盔甲鱼亚纲 Galeaspida Tarlo, 1967

目、科未定 Order and Family Incertae sedis

双沟鱼属(新属) *Diploholcaspis* gen. nov.

词源 Diplo (Gr.), 双,成对;holc (Gr.), 沟;aspis (Gr.) 盾甲。

属型种 大乐双沟鱼(新种) *Diploholcaspis daleensis* sp. nov.。

属征 个体较大的盔甲鱼类。头甲呈梯形;中背孔大,呈横向的椭圆形,宽约为其长的4倍,洞穿背甲,近头甲前缘;眶孔较小,侧位,位于中背孔后缘之后;角较小,向侧后方延伸;感觉管系统不甚发育,除一对侧横管外,未见其他感觉管;侧横管直,前端在两眶孔后缘联线之后,然后向后外侧方延伸,径直伸达头甲后外侧缘;纹饰为大的瘤点,其上还有更小的突起。

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比较 从中背孔的形状与位置、头甲的形状及其纹饰看,新属与汉阳鱼科(*Hanyangaspidae* P'an & Liu, 1975)的现有属比较相像。目前汉阳鱼科共包括 4 个属(朱敏、盖志琨,2006),即 *Hanyangaspis* (潘江等,1975;王士涛等,1980;王念忠,1986)、*Konocaraspis* (Pan, 1992)、*Kalpinolepis* (王俊卿等,1996)和 *Nanjiangaspis* (王俊卿等,2002)。在眶孔小而侧位、中背孔为横置的椭圆形等特征方面,新属与 *Hanyangaspis* 相近,但在感觉管系统方面,新属则十分特殊,头甲上仅有一对呈“八”字分布的侧横管,其他感觉管如眶上管、眶下管、侧背管以及联结两侧侧背管的中横联络枝等均观察不到。新属在头甲形状、纹饰等方面与 *Konocaraspis*、*Kalpinolepis*、*Nanjiangaspis* 接近,但它们之间在眶孔位置上明显不同,新属眶孔侧位,而 *Konocaraspis* 等眶孔背位。*Kalpinolepis* 和 *Nanjiangaspis* 的中背孔呈横置的肾形,即前缘凸后缘凹,这一点也与新属明显不同。

在头甲形状、眶孔侧位和中背孔的位置与形状等方面,新属与多鳃鱼科(*Polybranchiaspididae* Liu, 1965)的某些属种,如 *Cyclodiscaspis ctenus* (刘玉海,1975)也有些相似。但新属感觉管的分布与构成特殊,个体也比较大,很容易与后者区别开。

基于以上比较,笔者认为新材料不能归到盔甲鱼亚纲已有各属,应代表一新属。但囿于现有材料的不完整,新属在盔甲鱼亚纲中的分类位置尚不能确定。

大乐双沟鱼(新种) *Diploholcaspis daleensis* sp. nov.

(图 1-2)

词源 dale, 化石产地“大乐”的汉语拼音。

正型标本 一件不完整的头甲(背视)及其外模。中科院古脊椎所标本登记号 IVPP V 13763a, b。

产地与层位 广西象州大乐;大瑶山群,早泥盆世洛霍考夫期。

种征 同属征(惟一的种)。

描述 大乐双沟鱼属个体较大的盔甲鱼类。新材料仅保存头甲左侧的大部,左侧缘保存完整,而其前缘和后缘则保存不全;左侧眶孔保存完整,中背孔左侧的大部分被保存下来。标本的保存长度(从吻缘到角之间的长度)为 12.3 cm,保存宽度为 9 cm。头甲实际宽度估计可达 18 cm,宽约为长的 1.6 倍。

头甲左侧后缘仅有部分被保存。保存部分向前凹,表明头甲后缘两侧向前凹(图 2)。头甲前缘虽然保存不全,但大致能判断其稍向前凸。从总体轮廓来看,头甲略呈梯形。

头甲稍向背上方凸起,但在中背孔后面有一明显的下凹区,大致呈长椭圆形;在下凹区两侧和后面,头甲部分则明显突起。角较小,向侧后方延伸。内角情况不明。

中背孔呈横椭圆形,宽 43 mm,长 11 mm,宽几乎为长的 4 倍。眶孔小,侧位,位于中背孔后缘连线的后方。松果孔观察不到。

新材料的感觉管系统十分特殊。左侧的侧横管保存完整,在内、外模标本上呈一沟痕。而其他感觉管如眶上管、眶下管、侧背管以及中横联络枝等不发育。侧横管非常直,大致从距中背孔后缘约 35 mm 处径直向头甲后侧缘伸出,并伸达头甲的侧缘。左右两侧的侧横管在头甲背面呈“八”字型分布。

头甲表面具有大的瘤点纹饰。瘤点大小不等,大者分布在头甲的边缘,而相对较小者

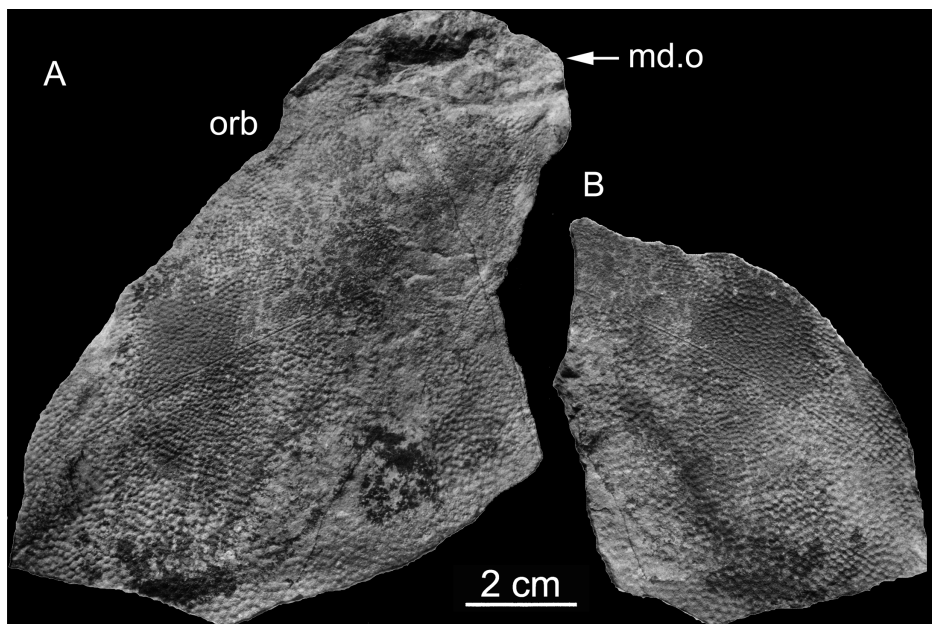


图1 大乐双沟鱼(新属、新种)头甲内模(A, V 13763a)与外模(B, V 13763b), 正型标本
Fig.1 Internal (A, V 13763a) and external (B, V 13763b) moulds of an incomplete head-shield
of *Diploholcaspis daleensis* gen. et sp. nov., holotype

简字说明 Abbreviations: md. o. median dorsal opening 中背孔; orb. orbital opening 眶孔

多分布于中背孔后面的下凹区内。在瘤点的表面上还有更小的突起。

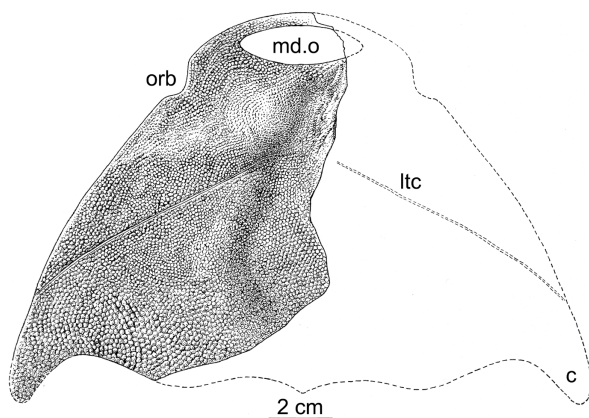


图2 大乐双沟鱼(新属、新种)头甲复原,背视
Fig.2 Restoration of the head-shield of *Diploholcaspis*
daleensis gen. et sp. nov. in dorsal view

简字说明 Abbreviations: c. corner 角; ltc. lateral
transverse canal 侧横管; md. o. median dorsal opening
中背孔; orb. orbital opening 眶孔

讨论 广西象州大乐地区泥盆系出露较全,从下泥盆统的大瑶山群到上泥盆统的融县组均有出露。除大瑶山群化石稀少外,其他各组所含化石均很丰富。这一地区发现的早泥盆世鱼化石包括小山组的盔甲鱼类 *Tridenaspis* (刘时藩,1986)与胴甲鱼类 *Liujiangolepis* (王士涛,1987),大乐组六回段的肺鱼类 *Sorbitorhynchus* (Wang et al., 1993)。在大乐附近早泥盆世二塘组中还发现丰富的脊椎动物微体化石,包括棘鱼类、辐鳍鱼类和肉鳍鱼类(王念忠,1992)。上述发现说明,该地区下泥盆统中不仅有丰富的无脊椎动物化石,也有门类较齐全的脊椎动物化石,是开展早期脊椎动物研究的理想地区

之一。

广西是盔甲鱼类化石较多的地区,迄今已记述 6 个属,其产出层位分别是下泥盆统莲花山组 (*Eugaleaspis* Liu, 1986, *Asiaspis* P'an, 1975)、那高岭组 (*Antiquisagittaspis* Liu, 1985)、郁江组 (*Tridenaspis* Liu, 1986)、贺县组 (*Lopadaspis* Wang et al., 2001, 2002) 和中泥盆统信都组 (*Clarorbis* Pan & Ji, 1993)。大瑶山群被认为与六景地区的莲花山组和那高岭组相当,然而一直没有可靠的化石资料予以佐证。钟铿等 (1992) 曾指出,在该区大瑶山群内“仅见有少量鱼类 *Polybranchiaspis*, 腕足类 *Lingula*, 植物 *Taeniocrada*。上部偶见腕足类 *Orientospirifer wangi*”。文章中虽然有 *Polybranchiaspis* 的报道,但是并没见到任何描述、插图或图版,因此其可信度尚有待检验。尽管如此,它还是为在大瑶山群中寻找盔甲鱼类化石提供了线索。大乐双沟鱼的详细记述,不仅填补了大瑶山群在早期脊椎动物化石方面的空白,也为地层划分与对比提供了新的依据。

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A NEW GALEASPID AGNATHAN FROM LOWER DEVONIAN OF GUANGXI, CHINA

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Key words Xiangzhou, Guangxi; Early Devonian; Galeaspida, Agnatha

Summary

A new galeaspid agnathan, *Diploholcaspis daleensis* gen. et sp. nov., was collected from the middle part of the Dayaoshan Group of Dale, Xiangzhou County, Guangxi, China. The Dayaoshan Group is more than one thousand meters in thickness, but yields rare fossils. It is unconformable with pre-Devonian deposits whose age is likely to be the Cambrian (Bai et al., 1982). Based on the depositional sequence and the age of the overlying strata, the Dayaoshan Group was referred to the Lochkovian (Early Devonian) in age (Bai et al., 1982; Hou and Wang, 1988). *Diploholcaspis daleensis* represents the first finding of early vertebrates in the Dayaoshan Group, and provides new data for the regional stratigraphic correlation of Guangxi.

Subclass Galeaspida Tarlo, 1967

Order and Family Incertae sedis

Genus *Diploholcaspis* gen. nov.

Etymology Diplo (Gr), dual; holc (Gr), groove; aspis (Gr), a shield.

Type species *Diploholcaspis daleensis* sp. nov.

Diagnosis Large-sized Galeaspida. Head-shield trapezoid in shape, broader than long; large median dorsal opening transversally oval-shaped and subterminal; orbital opening laterally situated; sensory canal system poorly developed with only one pair of lateral transverse canals, which extend posterolaterally from the middle part of head-shield to the posterolateral margin of head-shield; ornament with large rounded tubercles, on which secondary fine tubercles are present.

Remarks The new form resembles the Hanyangaspidae with respect to the trapezoid head-shield, the shape of subterminal median dorsal opening and the ornamentation. Considering the laterally-set orbital openings, the new form is more suggestive of *Hanyangaspis* of the Hanyangaspidae. However, they differ in the unique sensory canal system of the new form. Regarding the shape of median dorsal opening and the position of orbital openings, the new form also resembles *Cyclodiscaspis* of the Polybranchiaspididae. They differ in the general shape of head-shield, and the sensory canal system. Based on these differences, a new genus *Diploholcaspis* is erected. However, its phylogenetic position among the Galeaspida could not be resolved due to few available data.

***Diploholcaspis daleensis* sp. nov.**

(Figs. 1–2)

Etymology After the fossil site (Dale) in Xiangzhou County, Guangxi.

Holotype IVPP V 13763a, b, the internal and external moulds of an incomplete head-shield.

Horizon and locality Dayaoshan Group, Lochkovian, Early Devonian; Dale, Xiangzhou County, Guangxi, China.

Diagnosis As for the genus (the only species).

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