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湖南零陵晚泥盆世叶虾类一新种
——*Echinocaris hunanensis* sp. nov.

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内 容 提 要

描述了湖南零陵普利桥晚泥盆世锡矿山组叶虾类一新种——*Echinocaris hunanensis* sp. nov.。晚古生代叶虾类化石较为稀少，*Echinocaris* 在亚洲是首次发现。

关键词 湖南零陵 锡矿山组 *Echinocaris hunanensis* sp. nov.

在我国，对叶虾类化石的研究还是近几年的事，见有中三叠世的扬子叶虾（*Yangzicaris*），及浙江江山奥陶系宁国组的胡桃虾（*Caryocaris*）（沈炎彬，1983、1985），但晚古生代的叶虾类，无论在中国和国外，标本都不多。湖南发现的棘虾是这一时期较稀有的代表之一。

本文所研究的湖南棘虾（*Echinocaris hunanensis* sp. nov.），采自湖南省零陵县普利桥的百里坪村（插图1）。1975年韩乃仁、李罗照曾在该地点采到1块保存不好的头胸甲；1982年韩乃仁采到了1块完整的头胸甲右瓣（TKO50）；1984年周又敏又在同一层位采到另一头胸甲的右瓣（TKO51），这两块标本都属于同一属种，个体大小十分接近（表1）。化石产于泥灰岩所夹灰色钙质页岩中，与之共生的化石有大量的腕足类：“*Productella*”*lachrymasa* var.*asiatica*

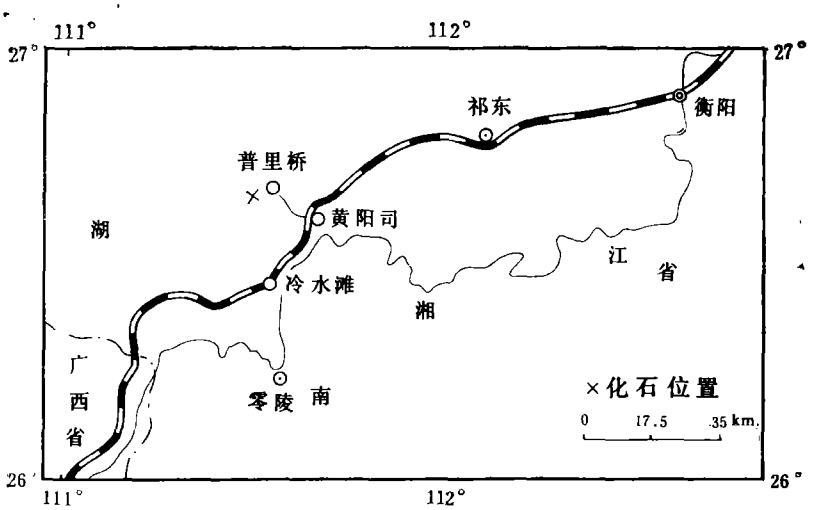

插图1 化石产地位置图
Map showing location of fossils

表 I 头胸甲的度量 (mm)

登记号 (cat.)	长 度 (L)	宽 度 (W)	绞合线长度 (Hingeline)
TKO50	34	24	25.4
TKO51	32.8	24.7	23.9

Tien, *Yunnanaellina hanburyi* (Davidson), *Yunnanellina triplicata* Grabau, *Yunnanellina obesa* Tien, *Yunnanellina unipicata* Grabau, *Cyrtospirifer pellizzorii* (Grabau), *Cyrtiopsis gradiosa* Grabau, *Cyrtiopsis davidsoni* Grabau, *Cyrtiopsis kayseri* Grabau, *Tenticospirifer tenticulum* (Verneuil)。许汉奎(1978)在讨论湖南泥盆纪的云南贝、准云南贝的动物群时，将湖南中部的上泥盆统锡矿山组分成上、中、下 3 个组合。其中最下的 1 个组合所列的化石与普利桥的腕足类化石名单基本相符，只是普利桥有更多的 *Cyrtospirifer*，少量的 *Tenticospirifer* 及 *Athyris* 等化石。所以从腕足动物组合看，含棘虾的层位属于 *Yunnanellina hanburyi-Cyrtiopsis davidsoni* 组合，即上泥盆统锡矿山组下部。

新 种 描 述

棘虾科 Echinocaridae Clarke, 1885

棘虾属 Genus *Echinocaris* Whitfield, 1880

湖南棘虾(新种) *Echinocaris hunanensis* sp. nov.

(图版 I,图 1,2;插图 2)

材料 两块头胸甲右瓣。

描述 头胸甲呈卵形。铰合线平直。约为头胸甲长度的 2/3。头胸甲前区有两排纵向的瘤(插图 2)。靠近背部的一排有 3 个瘤，每个瘤的顶端都有 1 个棘状突起(已断)。背前瘤小而尖；背中瘤最小，且靠近背方，背后瘤大，横向拉长且窄凸。腹瘤的排列方向与铰合线呈锐角，有 4 个瘤，腹前下瘤较大，腹前上瘤较小，介于腹排与背排之间；腹中瘤小而尖，末端成刺；腹后瘤缓凸，浑圆，未见瘤刺。头胸甲后部大瘤宽缓隆凸，约占头胸甲的 1/2，腹部边缘不清，背部具有 3 个瘤刺，其中两个与铰合线平行，另一个位于壳瓣的后边缘上，这 3 个瘤刺都是纵向扁平末端呈尖刺。头胸甲的腹方有一略成 S 形弯曲的腹脊，脊的断面呈尖棱状凸起，约占头胸甲长度的 3/5。腹脊(或称腹突)与腹边缘之间的壳面光滑或具极细网纹沿腹边缘有一条完整的边缘脊，边缘脊内有明显的边缘沟。

比较 从头胸甲形态构造看，新种与产于加拿大西部上泥盆统 Alexo 组的 *Echinocaris castorensis* Copeland, 1960 接近，但后者前背区有 6 个瘤，分成两排，每排 3 个瘤，腹排前瘤为 1 个；头胸甲后叶中部及背部各有 1 条由几个小瘤组成的短脊，与铰合线近平行；弯曲的呈 S 形的腹脊末端形成结瘤状；沿壳瓣的后边缘还有 6 个小刺。因此与新种易于区别。新种与 *Echinocaris beecheri* Copeland, 1960 的区别，除后者的前瘤数目及排列方式不同外，壳面还布满了瘤点。新种与 *Echinocaris consanguina* Eller (Copeland, 1960) 头胸甲的形状有些近似，只是后者前瘤及腹脊的形状与新种不同。新种与 *Echinocaris punctata* (Hall) (Крестовников, 1960) 的区别是后者全壳具斑状瘤点不具棘刺，头胸甲前部的瘤不甚发育，腹脊形状也不同。*Echinocaris randallii* Beecher, 1902 与新种的区别是它的壳瓣最大宽度位于前

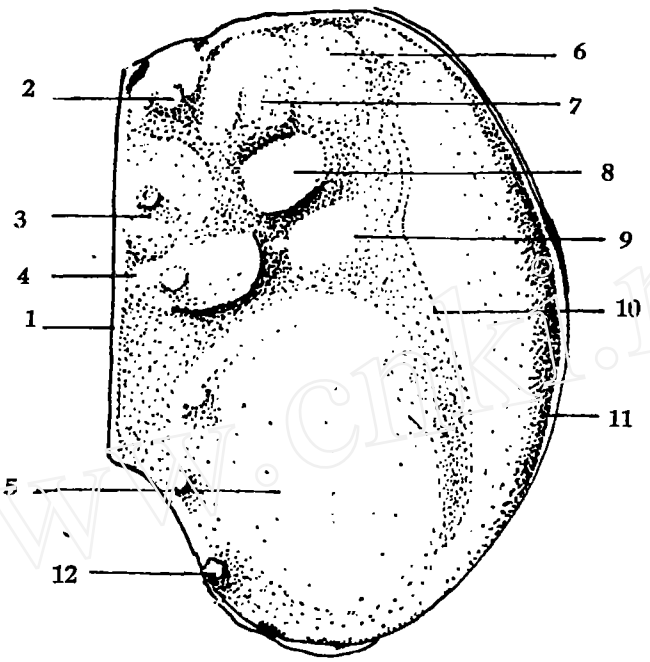

插图 2　湖南棘虾头胸甲构造图

Structure of carapace of *Echinocaris hunanensis* sp. nov.

1.铰合线 (hingeline), 2.头胸甲背前瘤(antero-dorsal node), 3.头胸甲背中瘤 (median dorsal node), 4.头胸甲背后瘤 (postero-dorsal node), 5.头胸甲后部大瘤 (large posterior node of cara-pace), 6.头胸甲腹前下瘤(lower antero-ventral node), 7.头胸甲腹前上瘤(upper antero-ventral node), 8.头胸甲腹中瘤 (median ventral node), 9.头胸甲腹后瘤 (postero-ventral node), 10.腹脊(ventral carina), 11.边缘脊(marginal ridge), 12.扁平瘤刺(flated node-spine)

方，头胸甲前区的瘤上无刺，壳面具小斑点。新种与 *Echinocaris socialis* Beecher, 1902 区别较大，后者头胸甲前部有 1 个大瘤，它与铰合线之间有 3 个发育良好的小瘤。头胸甲的后叶是 1 个被背脊与腹脊包围的大瘤，且背脊与腹脊上都有许多小瘤点。产于美国 Ohio 上泥盆统(法门阶) Chagrin 页岩的 *Echinocaris multinodosa* Whitfield, 1880, *E. ohioensis* Sturgeon Hlavin et Kesling, 1964 和 *Echinocaris sublevis* Whitfield, 1880 (Weidner and Feldmann, 1985) 与新种的区别在于这 3 个种整个头胸甲上没有明显的刺，边缘脊普遍加厚，腹脊不延伸到前部，其中 *Echinocaris multinodosa* 具有很深的腹中沟。

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A NEW SPECIES OF *ECHINOCARIS* (PHYLLOCARIDA) IN LATE DEVONIAN FROM LINGLING, HUNAN

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Key words: *Echinocaris hunanensis* sp. nov., Late Devonian, Hunan

Summary

Echinocaris hunanensis sp. nov. was found from the Bailiping village of Puliqiao, Lingling county, Hunan. The two fossil specimens were collected from the marl with grey calcareous shale, belonging to the same genus and species, and closely associated with *"Productella" lachrymasa* var. *asiatica* Tien, *Yunnanellina hanburyi* (Davidson), *Y. triplicata* Grabau, *Y. obesa* Tien, *Y. unipicata Grabau, Cyrtospirifer pellizzarii* (Grabau), *Cyrtiopsis graciosa* Grabau, *C. davidsoni* Grabau, *C. kayseri* Grabau, and *Tenticospirifer tenticulum* (Verneuil). While discussing the Upper Devonian *Yunnanella-Yunnanellina* (Brachiopoda) Fauna from Hunan, Xu Hankui (1978) divided the brachiopods of Xikuangshan into 3 fossil assemblages, among which the lowest assemblage contains brachiopods which are similar to those listed in the brachiopod assemblage of Puliqiao, but it contains a large number of *Cyrtospirifer* and a small number of *Tenticospirifer* and *Athyris*. Therefore, based on the brachiopod assemblages, the strata bearing *Echinocaris hunanensis* sp. nov. are corresponding to those yielding the *Yunnanellina hanburyi—Cyrtiopsis davidsoni* assemblages, that is, below the Xikuangshan Formation of Upper Devonian.

DESCRIPTION OF NEW SPECIES

Family Echinocaridae Clarke, 1885

Genus *Echinocaris* Whitfield, 1880

Echinocaris hunanensis sp, nov.

(Pl. I; Text-fig. 2)

Description Carapace valve ovate. Hingeline plain and straight, occupying two-thirds the length of carapace. Antero-dorsal area bearing two rows of nodes. Dorsal row near hingeline, carrying three nodes, with the top of each bearing a spine (broken); anterior node small and sharp, median node the smallest and closed to dorsum, while posterior node large and convex, extending transversally. Ventral row of nodes forming an approximately acute angle with hingeline, consisting of four nodes: lower anterior ventral node large, upper one situated between ventral and dorsal rows; median ventral node small and sharp, changing to a spine at extremity; posterior ventral node circular and slightly convex, without a spine. Large posterior node of carapace broad and convex, occupying about half the length of whole carapace. Ventral edge indistinct. Dorsal edge bearing three nodular spines, with two of them parallel to hingeline, and the rest one situated on posterior margin of valve; all nodular spines longitudinally flat, forming sharp tips at extermity. Ventral side of carapace bearing a sigmoidal sagittal carina, which is sharp and highly convex in section, nearly extending for three-fifths the length of carapace. Surface of shell smooth or with rather thin reticulate lines between ventral carina and ventral mar in of valve. Marginal ridge along free margin of valve complete. Marginal furrow apparent on the internal side of marginal ridge.

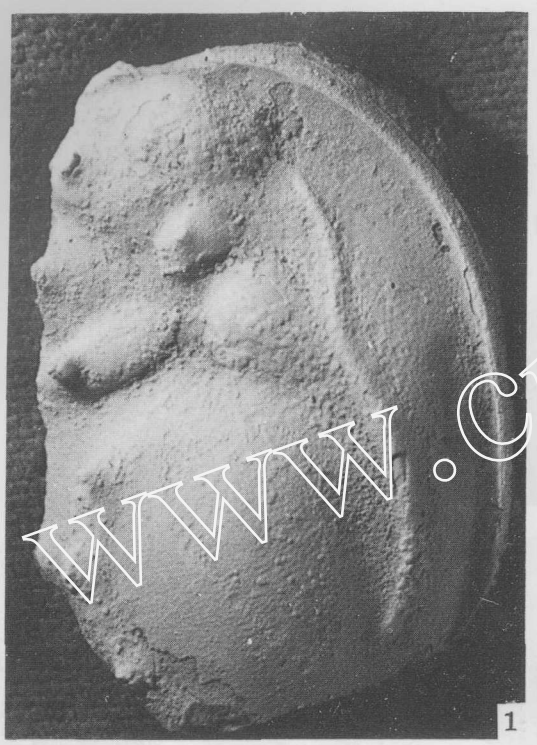
Comparison　In structure and the form f carapace, the new species is similar to *Echinocaris castorensis* Copeland from the Upper Devonian Alexo Formation of Western Canada, but in the latter, the antero-dorsal area bears six nodes in two rows (with three in one row); ventral row contains only one anterior node; dorsal and median posterior lobes of carapace all possess a short carina consisting of several tubercles, extending parallel to hingeline; ventral carina sigmoidal, tuberculate at posterior end, and the posterior margin of valve bears six small posterior spines. Therefore, it can be easily distinguished from the new species. The new species differs from *Echinocaris beecheri* Copeland in which the shell surface is ornamented with a lot of scattered tubercles, only the number of anterior nodes and the ways of their arrangement are different. This species somewhat resembles *Echinocaris consanguina* Eller in the shape of valve, but in the latter, the anterior node and ventral carina are different in shape from the new species. The new species differs from *Echinocaris punctata* (Hall), in which the whole shell bears spotted tubercles whithout any spine; the anterior node of carapace is developed, and the ventral carina is different in shape. *Echinocaris randallii* Beecher differs from this species which is widest in the front of valve, without any spine on anterior nodes of carapace, but with the shell surface bearing tubercle. By comparing the new species with *Echinocaris socialis* Beecher, there are great differences between them: the latter bears a large node in the anterior area of carapace, with three well-developed smaller nodes between large node and hingeline, and the posterior lobe of carapace encircled by ventral carina and dorsal carina with many tubercles. The new-species also differs from *Echinocaris multinodosa* whitefield, *E. ohioensis* Sturgeon, Hlavin and Kesling, and *E. sublevis* Whitefield collected from the Chagrin shale of Upper Devonian (Famennian), northeastern Ohio, America, in which the carapace bears no tvident spines, the marginal ridges are generally thickened, and the ventral carina does not extend to the anterior lobe of carapace; especially in *E. multinodosa* Whitefield, the carapace bears a deep centroventral sulcus.

图　版　说　明

标本保存于桂林冶金地质学院古生物实验室，产于湖南零陵普利桥百里坪村上泥盆统锡矿山组。

图　版　I

1,2. *Echinocaris hunanensis* sp. nov.
1.头胸甲右瓣，×2.7 (Holotype)。登记号：TKO50；2.头胸甲右瓣，×2.7。登记号：TKO51。
3—5. *Yunnanellina triplicata* Grabau
3.背视；4.前视；5.侧视，均×1.5。登记号：KBO10。
7—9. *Tenticospirifer tenticulum* (Vernruil)
7.背视；8.前视；9.侧视，均×1.5。登记号：KBO12。
6,10. *Yunnanellina hanburgi* (Davidson)
6.前视，10.侧视，均×1.5。登记号：KBO11。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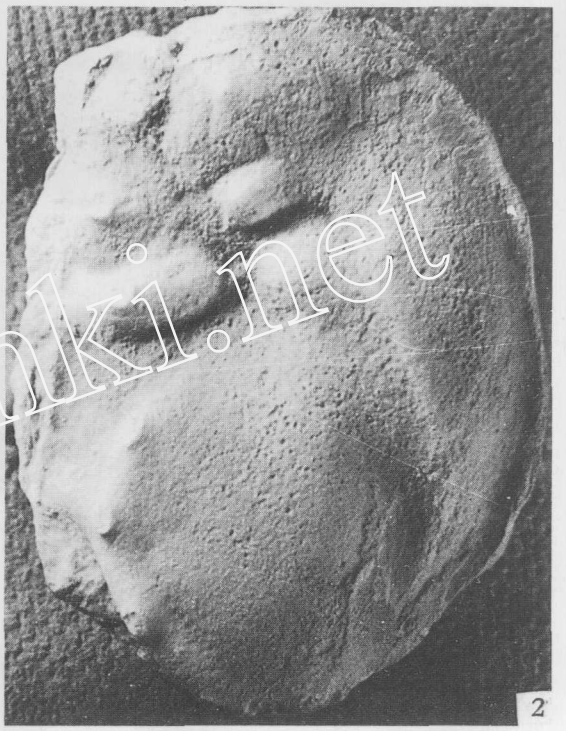
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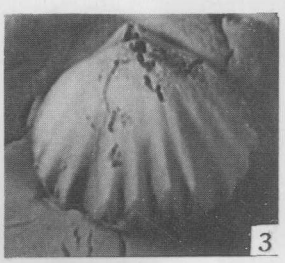
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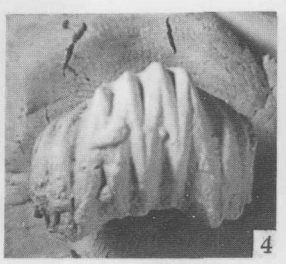
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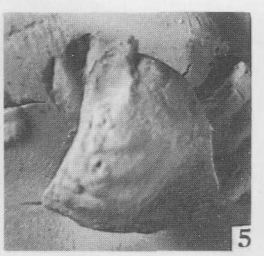
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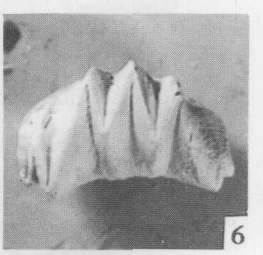
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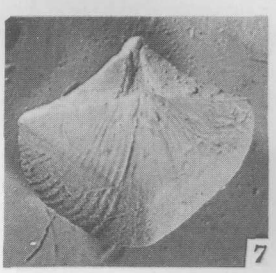
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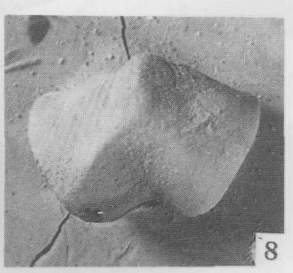
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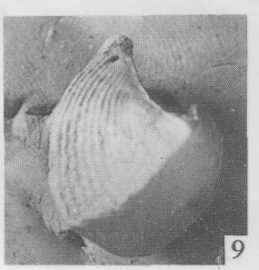
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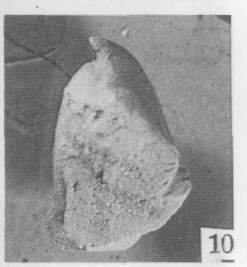
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