

新疆加斯馬吐龙新加材料*

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自1936年我发表了新疆的加斯馬吐龙一文以后,袁复礼教授所采集的新疆的脊椎动物化石在解放前由于种种原因而遭到损坏。最近这些幸存的材料由古脊椎动物与古人类研究所保管研究。在整理这些标本中,发现了一些加斯馬吐龙的新加材料,因其代表一新的地点,而且有些骨骼部分前所未知,所以值得一记。

記 述

材料 一部分破碎的头骨部分,十五个脊椎骨分三段保存。一些肋骨和腹肋,少数较完整,两肩胛骨碎片和一较完整的锁骨(另一些碎片),一右肱骨,尺骨两端,肠骨碎片,一左股骨,一右胫骨,一腓骨末端,一些手和足的骨骼。均属于一个个体。

地点与层位 新疆吉木薩尔大龙口烧房口上部,河东紅山頂的含水龙兽层。早三迭世。野外编号600068。室内编号V.2719。袁氏加斯馬吐龙的正型标本地点为新疆阜康县烧沟。所以现在的新材料代表袁氏加斯馬吐龙的一个新地点。

因为所有的标本中,一部分和以前所记述的袁氏加斯馬吐龙是重见的,这些重见标本的大小和性质,与正型非常相近,因而可以断定,这新标本应归这一种无疑。以上所列举的标本,都只是以一个为限,很清楚地归于一个个体。

有趣的是标本呈深灰色或黑色,和正型标本的颜色和保存状况完全一样。看来虽然地点不同,可能来自同一层位。

以下的描述,可以作为以前研究的补充部分,其中有一些骨骼乃是以前未发见过的。

基枕骨部分,除了枕骨髁外,保存不很好。枕骨髁并不特别向后突伸。比南非的加斯馬吐龙为小,但和我国的袁氏加斯馬吐龙很相近。另外有五块残破的骨片,极可能属于头骨。但因为太破碎不能作可靠的鉴定。

大体上所有十五个脊椎均属于背或尾脊椎。共分三段保存。第一段有七个脊椎骨,归于背后部或腰部。第二段为三个相连的脊椎,为尾中部。第三段有五个相连脊椎,近于尾的末端。所有这些脊椎的大小和构造,均与正型的相似。第一段七个脊椎极可能代表腰部紧位于坐骨之前的脊椎。椎心的长度向后逐渐减短。椎侧已无侧突,但在横突的前下部尚微有其迹。横突是相当发育的。无论从侧面或腹侧看,后边四脊椎均夹有保存很好的较小的间脊椎体。前端必然也有,但未保存。七个脊椎总长为169毫米。最前一脊椎的前端高与宽为20和21毫米。第二段的三个脊椎已全失去其神经弧部分。所有的椎心相对拉长,总长为78毫米。显然归于尾的中段。第三段由五个脊椎组成,显然为尾的

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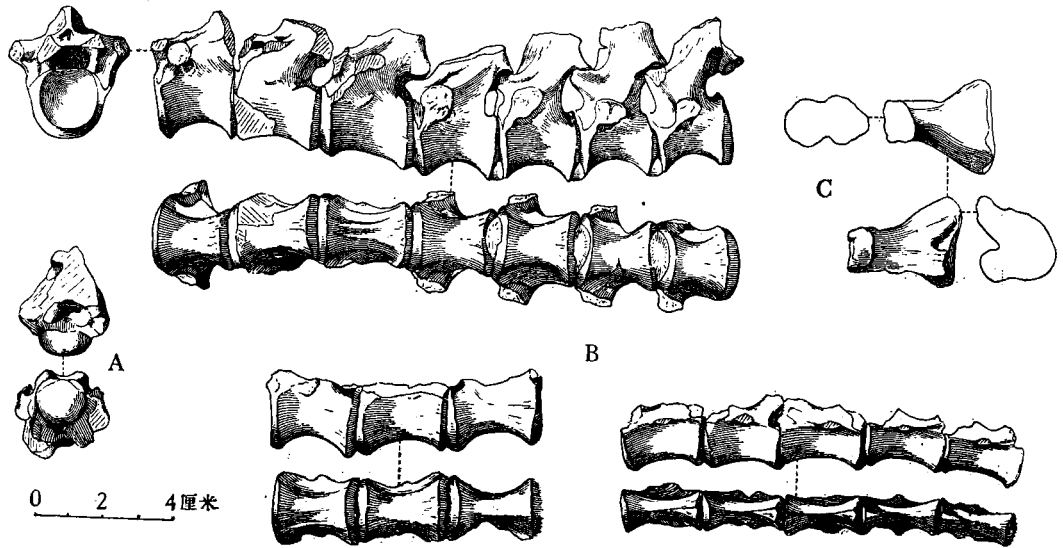


图 1. 袁氏加斯馬吐龙 A. 枕髁骨的下視与后視。B. 脊椎骨的側視与腹視。C. 可能为荐骨肋骨 I, 背視与腹視及两端輪廓。V. 2719。

Fig. 1. *Chasmatosaurus yuani* Young. A. Basioccipital in ventral and posterior views. B. Vertebrae in three segments in side and ventral views with first vertebra in anterior view. C. ?sacral rib I in dorsal and ventral views with the outline of both ends. V. 2719.

近末端,其上端虽有些殘破,但一般情况还能辨别,已无背棘可寻。这些脊椎和以前脊椎一样,也是双凹式的。在腹側可以看出腹棘的接触面。总长 112 毫米。这里所描述的脊椎骨和以前已研究者在构造上、大小上均相同。

肋骨和腹肋虽然不少,但很破碎,只有一个腹肋是完整的。这些材料也和以前所描述的相同,完整腹肋两端間的直距为 148 毫米。另外一骨,很有兴趣,似代表第一个荐肋。这个骨小的一端,可能为与脊椎接触的一端和其他假鱷类第一荐骨肋骨很象,而大的一端作三角形輪廓,但这一端和以前描述过的腸骨內側的和肋骨相接的粗糙面很符合。横寬为 30 毫米。

肩胛骨和鎖骨为以前所未知的骨骼。有两肩胛骨的远端,其一較薄也較破,究竟是否为肩胛骨尚有疑問,可能为一年幼个体。大的一个保存較好,远端极完全保存,寬約为 50 毫米。鎖骨保存完好,只两端少有殘破,一般形状很象武氏鱷的鎖骨。近端較扩展。保存的长度为 79 毫米。近端 22, 末端 8 毫米。

肱骨以前也未見过。为一完整的右肱骨。两端显著扭曲,几近九十度。三角稜发育不厉害,无內側孔,总长 103 毫米,近端 50 毫米,末端 50 毫米,中部寬 14 毫米。这个肱骨和二齿兽的肱骨区别很大,不易混淆(尽管經常一起发見)。保存的尺骨两端和以前描述过的正型完全相同。

有一腸骨的后端,为左側,比原型稍大一些。

一左股骨,也是以前所未描述过的一骨。这个骨非常完整。近端的关节部分并未完全分化。沒有清楚的第四轉軸。远端两关节相当清楚。整个骨較直。仅比脛骨稍长一

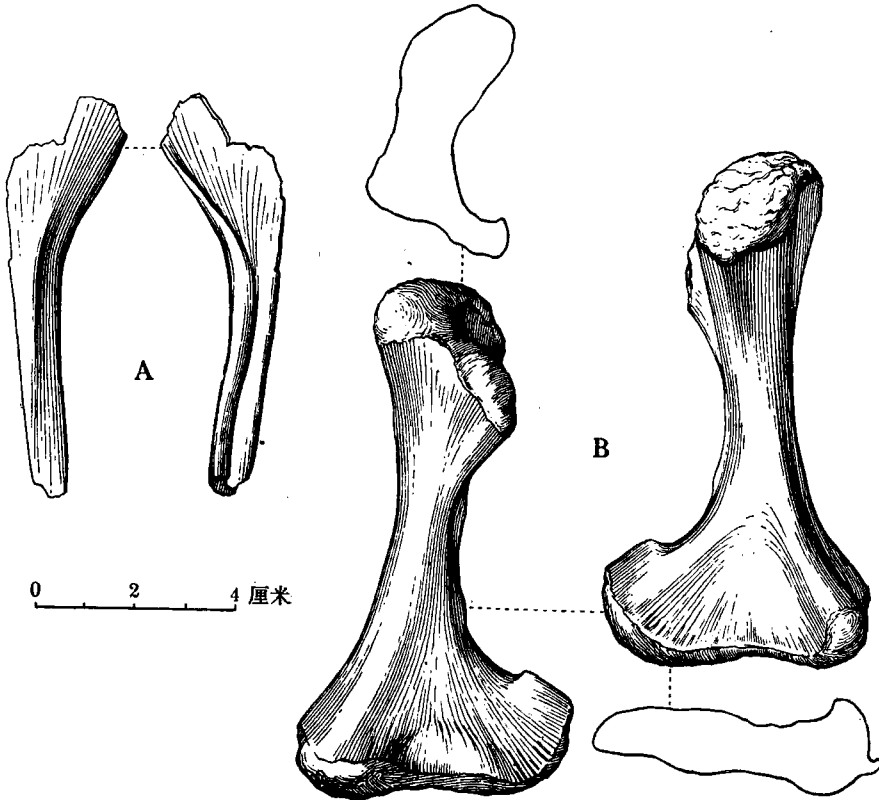


图 2. 袁氏加斯馬吐龙 A. 鎖骨的前視与后視。B. 右肱骨的背視与腹視及两端輪廓。V. 2719.

Fig. 2. *Chasmatosaurus yuani* Young. A. Clavicle in anterior view and posterior views. B. Right humerus in dorsal and ventral views with the outline of both ends. V. 2719.

些。总长 152 毫米,近端寬 53 毫米,末端寬 47 毫米,中部橫寬 19 毫米。

右脛骨和以前描述的脛骨完全一样。只是稍小一些。总长 136 毫米,近端寬 36 毫米,末端寬 22 毫米,中間寬 14 毫米。

一腓骨末端寬 18 毫米,比原型者也稍小。

所有手骨和足骨,如手掌、足掌、趾骨等都是零散发見的,和原型的一样,一般性質与之相同,不再重述。

除了以上所記述的 600068 地点的材料以外,另有一些更破碎,但显然也属于袁氏加斯馬吐龙的材料,可以简单地加以叙述。这些材料的野外号碼为 600061,但标籤上只写着“大龙口”,别无詳細地点。可以断定它和以上材料来自同一区域,但是地点不同。这些化石的顏色不一,有的发黑和前一地点的标本一样,有的顏色較浅。可能来自不同层位或地点,清楚地不代表同一个体。

这些化石經鉴定为: 19 个大体上完全的脊椎骨。多数是尾脊椎,只有一个为荐骨前脊椎。一左肱骨的近端部分,另一右肱骨的远端部分。比 600068 地点的肱骨稍大一些,其他完全相同。一左股骨的远端,也比 600068 的稍大,橫寬为 49 毫米。一些手和足的骨

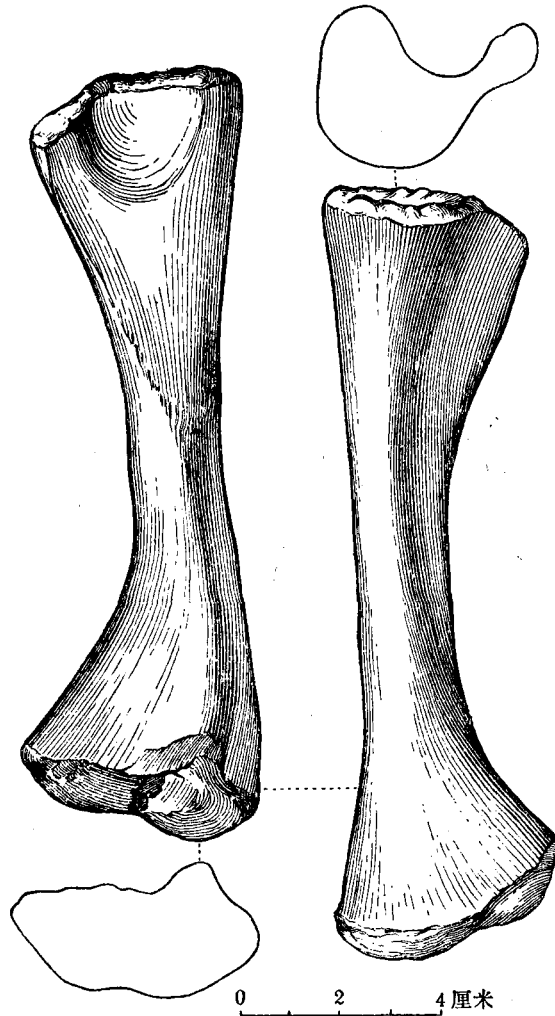


图 3. 袁氏加斯马吐龙 左股骨的背视与腹视与两端轮廓。V. 2719.

Fig. 3. *Chasmatosaurus yuani* Young. Left femur in dorsal and ventral views with the outline of both ends. V. 2719.

相当破碎,有些是保留地归入此种的。室内号码 V. 2720。

关于加斯马吐龙的若干比例 因为在 V. 2719 的材料中肱骨和股骨都为以前所未记录,因而有可能得出一些有关的比例。虽然有些不是出于一个个体,但由于大小差别不大,还是可以当作有些参考价值的。

1. $\frac{\text{桡骨} \times 100}{\text{肱骨}} = \frac{9300}{103} = 90$ (非同一个体)
2. $\frac{\text{脛骨} \times 100}{\text{股骨}} = \frac{13600}{152} = 83$ (同一个体)
3. $\frac{\text{前肢}}{\text{后肢}} = \frac{93 + 103 \times 100}{152 + 136} = \frac{19600}{288} = 68$ (非同一个体)

結 論

虽然沒有很好的头骨和牙齿，但現有材料之应当定作袁氏加斯馬吐龙，还是很明显的。許多骨骼正型的和現有的都有，可以直接作比較。

另外一些重要的骨骼，以前未发見。現在的研究增加了我們对于这一种的一些知識。上述的几个比例表明，加斯馬吐龙的前肢已相当的短。看来白劳里和施罗特所作关于南非加斯馬吐龙的复原图（1934，图版 V）有一些改正的必要。加斯馬吐龙当然还是四脚动物，用前后肢行走，但后肢已足够担负身体的主要重量。

目下的研究也增加了这一动物的分布面积。加斯馬吐龙是新疆水龙兽层最常見的动物之一。依野外的記錄（楊，1939），加斯馬吐龙經常和二齿兽和水龙兽等属共生。但是关于地层問題的进一步了解，还是要等到正在新疆进行的工作告一段落时，才能决定。

在 600068 地点和袁氏加斯馬吐龙共生的还有一小的动物，为一破下顎，但代表动物羣中的一新种，当另文叙述。

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ADDITIONAL REMAINS OF *CHASMATOSAURUS YUANI* YOUNG FROM SINKIANG, CHINA

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Since my publication on the *Chasmatosaurus* remains from Sinkiang 1936, the collection of the vertebrate fossils made by Professor P. L. Yuan had suffered very much from the war and other reasons. Recently the collection survived was under the care of the Institute of Vertebrate Palaeontology and Palaeoanthropology. By the sorting of those fossils, a few additional materials of *Chasmatosaurus yuani* have been recognized. Since they represent two new localities and many of materials are here to unknown before, it is necessary to make a short note on the new remains.

DESCRIPTION

Material: Some fragments of the skull including one piece with the part surrounding the basioccipital, fifteen vertebrae in three segments, many pieces of ribs and gastralia with one is complete and one sacral rib I, fragments of two scapulae, ones clavicle and many fragments of apparently the same part, a complete right humerus, both ends of a ulna, fragment of a ilium, a left femur, a right tibia and distal part of a fibula, and a number of hand and foot bones. All apparently the same individual.

Horizon and Locality: From the *lystrosaurus* beds (Lower Triassic) of Hungshanting, Hotung, upper part of Shoufangkou, Talungkou, Jimusar (formerly Füyuan), Sinkiang. Field number 600068. Cat. number V.2719. The type of *Chasmatosaurus yuani* is from Shoukou Fukanghsien, Sinkiang. It is therefore that the present material represents a new locality of *Chasmatosaurus yuani*.

Since the duplicated specimens at disposal show nearly the same size and features as already described in the previous description, it is quite certain that the present fossils are to be determined as the same species. The above enumerated fossils are clearly belonging to one individual as there is no duplicated bone found in the collection.

It is interesting to note that all the bones are dark grey to black in coloration exactly the same as those of the type. Although different in localities, they may derived from the same general level.

The following notes may be made of various part of the preserved bones as the complementary part of the previous description.

The part of the *basioccipital* is rather poorly preserved. The well formed condyle looks less projected. (Fig. 1.A) It is much smaller than that of *Chasmatosaurus van hoepeni* described by Broili and Schroeder, but rather fit with the skull of the type of the Chinese form. The other five pieces of the skull remains are too fragmentary for a precise determination.

Probably all the fifteen vertebrae are the dorsal and caudal ones. (Fig. 1.B) The first segment composed of seven consecutive posterior dorsal vertebrae. The second segment with three consecutive vertebrae represents the middle part of the tail and the third

segment with five consecutive vertebrae the part not very far from the end of the tail. All are fit in size and structure with those of the type. The first segment represents evidently the posterior part of the dorsal perhaps immediately before the sacrum. The centrum decreases in length somewhat posteriorly. There is no more true parapophysis but trace of it can be seen just below and anterior to the rather big diapophysis. In ventral view and side view three intercentrums are well presented in the last four vertebrae, it was certainly present between the other dorsal vertebrae. Total length of the seven vertebrae 169 mm. Height and breadth of the first preserved vertebra 20 and 21 mm respectively. The second segment has lost their neural arch completely. All the centrums are much elongated. Total length, 78 mm. They belong to the middle part of the tail. The third segment with five vertebrae situated apparently much posteriorly of the tail. The upper part is somewhat damaged but on the whole they are tolerably preserved and without trace of the spina dorsalis. They are also amphicoelous just as those of the previous ones. In the ventral side facet for attachment of chevrons bones are recognizable. Total length, 112 mm. The here described vertebrae are exactly the same in structure and almost same sized as those we have described previously.

The **ribs** and the **gastralia** are rather fragmentary. There is one gastralia in complete condition and fit well with that of the type. Point to point distance, 148 mm. There is one bone of rather particular interesting, because it seems to represent the first sacral rib. (Fig. 1.C) The outline of small end, supposed in connection with the vertebra is very similar to that of other pseudosuchians, but the other bigger end is triangular in outline. It is however fit well with the rough surface for the contact with the sacral rib. (Young, 1936, p. 304, fig. 10.) Transversal breadth, 30 mm.

The **scapula** and the **clavicle** are not recorded before. The two scapulae are only represented by the distal ends and not necessary for a detailed description. The small one is so poorly preserved that it may either represent a young individual or not belong to scapula at all. The larger one has the distal border nearly completely preserved, breadth estimated about 50 mm. The clavicle is well preserved, only the both ends being partly broken. (Fig. 2.A) It looks very the same structure as that of *Vjushkovia*. The proximal end is rather expanded. Preserved length, 79 mm, breadth of the proximal part 22 mm distal, 8 mm.

The **humerus** is also not recorded before. (Fig. 2.B) It is of the right side and complete. The both ends twisted in about 90 degrees. The deltoid pectoral crest is weakly developed. No entepicondylar foramen is present. Total length, 103 mm, proximal breadth, 50 mm, distal breadth 56 mm. Breadth at the middle, 14 mm. The humerus differs widely from that of dicynodonts and can be easily distinguished from those forms. The preserved ulna fragments are the same as those of the type.

A fragment represents the posterior end of the **ilium** border. It is of the left side. It is slightly larger than that of the type.

The left **femur** is also not recorded before and complete. The proximal condyle is not well differentiated and no clear fourth trochanter. (Fig. 3) The distal end is well separated. It is a rather straight bone and only slightly longer than the length of the tibia. Length, 152 mm; breadth of the proximal ends, 53 mm, that of the distal end, 47 mm; transversal breadth at the middle, 19 mm.

The right tibia duplicates in all essential features those of the type, being only a

little smaller, total length, 136 mm; Proximal breadth, 30 mm. Distal breadth, 22 mm; minimum breadth, 14 mm.

The distal part of the fibula is also somewhat smaller. Breadth, 18 mm.

All the **hand** and **foot bones**, such as the metacarpalia, metatarsalia, phalanges are all in isolated condition and less well represented as those of the type. The essential features are exactly the same, so that it is not necessary to give a detailed description.

Besides the above described material from 600068, there are a number of much fragmentary bones mostly belong to the present species and may be briefly noted here. The locality number is 600061. The etiquette shows only "Talungkou" without far the information. So, they are apparently derived from the same general area as that described above but certainly from different locality. Some of the bones are black as those from other locality, but some are in light coloration. They may from different level or locality, certainly more than one individual is represented.

Those bones at disposal are: nineteen more less complete vertebrae, mostly distal caudals, only one is certainly presacral vertebra. A proximal part of a left humerus and distal part of the right one. They are slightly larger than the humerus of 600068, otherwise the same. The distal part of a left femur. It is also larger. Transversal breadth 49 mm. A few hand or foot bones, very fragmentary. Some of them are doubtfully referred here. Cat. No. V.2720.

A few ratios of *Chasmatosaurus*: Since the humerus and femur are completely represented in V.2719, it is possible to give a few ratios of various limb-bones. Although they are from the same individual but the result is nevertheless suggestive, since the size of difference is by far not so wide.

1. Length of radius $\times 100$ / length of humerus..9300/103 90
2. Length of tibia $\times 100$ / length of femur..13600/152 (same individual) 83
3. Anterior limb/posterior limb..93 + 103 $\times 100$ / 152 + 136 = 19600/288 68

DISCUSSION

Although no good skull part is present in the present material, the identification of those fossils as *Chasmatosaurus yuani* is obvious. Many bones, such as the vertebrae and other limb-bones, are in common.

There are some important bones which are not known before. The present study increases our knowledge of this species considerably. The proportion of the limbs shows that the anterior leg is start to shorten considerably. The reconstruction given for *Chasmatosaurus van hoepeni* is certainly incorrect concerning this consideration. (Broili and Schroeder, 1919. 34 Tafel V.) It is still quadrupedal but the posterior legs are possible to carry the main weight of the animal.

The present study increases also the geographical distribution of the animal. It is one of the commonest animal in the *Lystrosaurus*-beds of Sinkiang. According to the field record (Young 1939) *Chasmatosaurus yuani* are in association with both the genera *Dicynodon* and *Lystrosaurus*. The final settlement of the stratigraphical problem is, however, has to wait on the new finds now are making in those area by the Institute of Vertebrate Palaeontology and Palaeoanthropology.

In association with the *Chasmatosaurus yuani* from the locality 600068, there is a small lower jaw fragment which represents a new form of the fauna. This will be described separately.