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Dinocrocuta gigantea 头骨的发现

邱占祥 谢骏义
（中国科学院古脊椎动物与古人类研究所）（甘肃省博物馆）
阎德发
（中国科学院古脊椎动物与古人类研究所）

关键词 甘肃和政 晚中新世 巨鬣狗头骨

内 容 提 要

本文记述了甘肃和政县晚中新世地层中发现的一个完整的巨鬣狗头骨；讨论了它的分类地位，修正了 Schlosser 1903 年建种时的一些鉴定错误。巨鬣狗是鬣狗科中一个十分特化的成员，应代表一个独立的属。根据命名规则，我们采用 N. Schmidt-Kittler 1976 年所创的 *Dinocrocuta*。因此，这个种应订正为 *Dinocrocuta gigantea* (Schlosser, 1903)。

1903 年，M. Schlosser 依据我国一些产地不明的单个牙齿，建立了鬣狗的一个新种：*Hyaena gigantea*。正如种名所表明的，这个种的个体特别大。确实，至今它仍不失为所有已知鬣狗中个体最大者。对于这个种的建立，没人提出过异议。由于建种时依据的仅是单个牙齿，此后也一直没发现过较为完整的材料，Schlosser 的原始鉴定没得到验证，当然，就更谈不到对这个种除牙齿以外部分的认识了。1983 年，谢骏义在甘肃省和政县新庄乡大深沟的富含大唇犀和三趾马的层位中（邱占祥等，1987），发现了一个保存相当完好的鬣狗头骨。这个头骨之大，构造之特殊是目前所有已知鬣狗中所未见的。但其上裂齿（P^4）却和 Schlosser 所记述的 *Hyaena gigantea* 的几乎完全一样，这使我们相信，它正是 *Hyaena gigantea* 的头骨。这一发现，不仅使我们有可能纠正 Schlosser 原鉴定中的一些不确切之处，而且也使我们了解到这种鬣狗的真正性质。它显然代表了鬣狗科中一个极为特化的支系，应具有独立的属的分类位置。至于属名，经追索，应采用 Schmidt-Kittler 1976 年所创建的 *Dinocrocuta*。这样，*H. gigantea* 就应改称为 *Dinocrocuta gigantea* (Schlosser, 1903) 了。

这个头骨，特别是它的耳区，显然需要在更为广泛的基础上，进行深入地研究，这不是在本文的篇幅内所能完成的。本文仅就这一头骨的基本特征做一介绍，以使读者对这一稀有化石尽快地有所了解。

本文承蒙沈文龙先生绘制插图，杜治先生摄制图版，在此一并致谢。

一、标本描述

左颧弓大部缺失，右颧弓后端破损，枕顶部和腹面基蝶部及内鼻孔部也不同程度地破

损。上犬齿、第一上前臼齿和右侧第一臼齿脱落。标本保存在甘肃省博物馆，标本编号：GVH. 8302

头骨硕大粗壮，比例上相当短而高。头骨自侧面观：顶缘在眼眶前缘处形成急剧之转折；颅部高而微隆，在眶前缘明显下降；鼻上缘平直，鼻孔侧缘较垂直等构成了这一头骨最为鲜明的特征。

鼻骨十分粗壮，长达 120 毫米，其后端达眶前缘之后；前端特别宽大，其侧缘斜向下伸，使鼻骨前端近中部向后凹入；远中部很宽大，呈叶状。前面观，鼻骨中部很厚，超过 5 毫米，仅在远中叶状部分处稍稍变薄。前颌骨在鼻骨前端之下稍向后凹入，整个前颌骨的前缘都较圆钝，不呈薄片状。鼻孔自前方看很高，且宽大。眶下孔位于 P^3 前半部的上方，眶前缘则在 P^4 前缘之上方。眼眶很高，其下缘距齿槽缘约 60 毫米。面部在眶前方鼻唇提肌附着和经过处，形成相当深的沟，使眶前缘呈锐嵴状向侧方突出。眶上突不呈尖角状，而为一相当长（前、后方向）的粗隆，位于眼眶之上方。自侧面看，颧弓很宽大，其上缘的眶下突呈尖角状。颧弓的最粗壮处位于关节窝稍前。矢状嵴发育，后半部愈合为单嵴的部分短；前半部两嵴间的夹面宽大而隆起，但在接近鼻骨后端处凹下。

腭面凹入不深，在裂齿的内后角也没有容纳下裂齿的深凹。硬腭后缘已破，形状不详，约位于第一上臼齿连线的附近；前端左、右腭窝（fossa palatina）接近相互平行，较宽大，约与上犬齿长径等长。后腭孔位于 P^2 和 P^3 的交界处，其前有弱的腭沟。基蝶部，特别是关节窝和后鼻孔附近多破损。基结节发育，其后有一对凹陷，中间隔以细嵴。颅基部最突出的特点当数耳区的构造（图 1.）。听泡（B. T.）腹面不特别圆隆，仅后外方隆

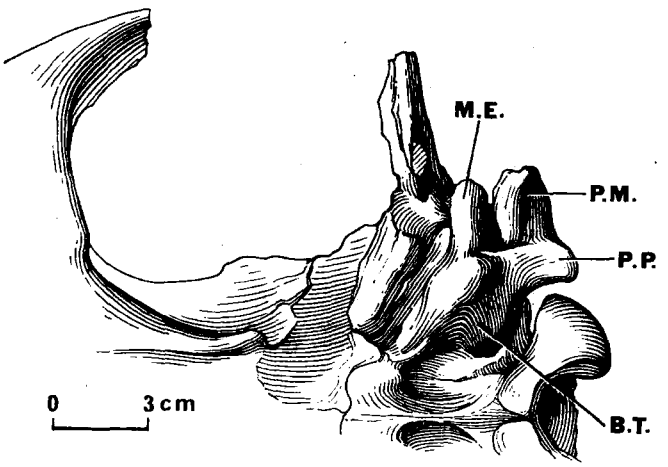

图 1　*Dinocrocuta gigantea*（GVH. 8302）耳区腹面图

Fig. 1　Ventral view of the ear region of *D. gigantea*

起，前方反而变凹，使听泡前端边缘（欧氏管处）稍稍翘起。外耳道（M. E.）管状，极长，与听泡宽度相等，自听泡最隆处向外平伸。外耳道外端与很向外伸的颞嵴还有一段距离，因此，颞嵴自上方将外耳道完全掩盖。外耳道后方为乳突（P. M.），自腹面看，比外耳道还长、大；侧面看，它从后侧将外耳道完全封闭，乳突和外耳道之间留有空隙，其内端为茎乳孔。副枕突（P. P.）则相反，很小，退至听泡之基部，不形成突状；自后面看，不低于枕

髁之下缘。

枕面近钟形，基部宽大。顶面上中嵴发育。乳突和副枕突位置都很高，听泡为腹面之最突处。

表 1 头骨测量表(单位：毫米)

Measurements of skull in mm.

1. 基长 (Basal length)	321
2. 顶长 (Maximum L)	380
3. 腭长 (Prosthion-posterior boder of palate)	178
4. 鼻骨长×前端宽 (Nasals L×W)	123.4×65
5. 鼻孔高×宽 (Nostril H×W)	45.5×50.7
6. 眶上突处宽 (W at postorbital processes)	132
7. P^4 后端齿缘处宽 (W at P^4)	170
8. 枕部高×宽 (Occipital H×W)	150×152
9. 颧弓在眼眶下宽 (H of zygoma under orbit)	59

牙齿皆已磨蚀较深，门齿和裂齿尤甚。I^1 舌侧基部没有中纵沟，I^2 的中纵沟很微弱，这表明它们舌侧的一对附尖不甚发育。I^3 不特别粗大，尚保留微弱的舌侧齿带。I^3 和C的齿槽相距仅 5 毫米左右。C已脱落，齿槽很大，断面为 32 × 26 毫米。P^1 也脱落，齿槽近圆形，断面径长约 11 毫米，它和C及 P^2 的齿隙都很小，不足 5 毫米。

P^2 和 P^3 的形态较接近。自冠面看，它们的形状近一长方形，舌侧缘中央稍稍凹入，主尖稍斜向后方，因此，其前缘斜度大于后缘；双根，由于牙齿斜置，前齿根总是向舌侧伸延强。P^2 明显比 P^3 小而低。前嵴向舌侧偏转程度弱，它和后嵴间的夹角约为 130°；前嵴基部没有明显的附尖；后附尖低小；齿带几乎环绕整个牙齿，后外方最为发育，从侧面看，此处齿带斜向后上方；前内角齿带也较明显，其它部位仅隐约可见。P^3 的前内角更突出，前嵴较明显，它和后嵴间的夹角仅为 110°，表明它更偏向舌侧；后附尖显著高大，侧扁，它和主尖在舌、唇侧皆以沟相分隔；齿带仅发育于前内角和后外角，在后外角齿带形成一接近垂直的隆起，和后附尖的分界不明显，但它不达后附尖的高度即行消失。P^3 除了近水平方向的磨蚀面外，还有两个接近垂直方向的磨蚀面：一个位于前内角前嵴的前方，该磨蚀面横向长；另一个位于后内角，此磨蚀面稍小。P^4 外嵴由三尖组成：前附尖最小，在其前缘偏外有一嵴；前尖比前附尖稍大，外壁隆；后附尖最长。三个尖在外壁上以沟相隔，其内面有两个接近垂直的磨蚀面，后面的一个很大，占据了前尖和后附尖的大部分，仅在后附尖的后部和前尖的前四分之一处没有磨蚀；前附尖上的磨蚀面，不如上述磨蚀面那样陡。这两个磨蚀面都已磨至齿冠之基部。原尖处的珐琅质已磨蚀贻尽，它亦由两个面组成，一个面向内方，一个面向后方，它们好象是上述两个面在原尖上的延续，因此原尖上的磨蚀面是位于外脊内面两个磨蚀面的上方（近根方向）。估计原尖并不形成单独的尖，而是和齿根一起组成一个向舌侧的突出物。原尖处的齿槽和外脊处的齿槽在高度上有很大的差

距，所以原尖深深地插向腭部。M^1 横向扁长，其外后缘已破损，前尖和后尖是否单独存在不得而知；三角座U形，U形凹内有细弱的纹饰。从后面至少可以看到内、外两个齿根，在前外角，齿冠已被一接近垂直的磨蚀面所取代，这一磨蚀面与 P^4 后端内壁的磨蚀面位于同一水平。

这件标本上所有牙齿（M^1 除外）的齿冠，都远高出齿槽缘，露出相当长的齿根。看来，这不是偶然的，至少 P^4 是这样，否则它的原尖就会仍然被埋在齿槽之内；再则，P^3，P^4 和 M^1 的齿冠还明显地不处于同一水平：P^4 伸出齿槽最多，P^3 齿冠基部就比 P^4 者伸出齿槽的部分少，它的后齿带向齿冠方向伸得最远的地方，才与 P^4 的齿冠基部处于同一水平；另一方面，M^1 则又深深插入腭部之内，它实际上和 P^4 的原尖处于同一水平，亦即 M^1 和 P^4 外壁至少相差 20 毫米。

二、与 Schlosser 建种材料的比较

在 Schlosser 的建种材料中，属于上牙的共九件：两枚 I^3、一枚 P^1、一枚半 P^2，半枚 P^3 和三枚不完整的 P^4。I^3 至 P^4（共五枚）皆有测量；P^3 和 P^4 有照片（Schlosser, 1903, Taf. 11, fig. 1. 2. 3.）。他的描述与测量及照片不完全吻合：文中未曾提及完整的 P^3，却提供了 P^3 的测量和照片。Howell 和 Petter (1985)已注意到，开始他们认为，测量和照片上的 P^3，实际上是 Schlosser 在文章中提到的 P^2。但他们通过对这颗牙齿形态的分析，认为它还应是 P^3，而不是 P^2。我们把这颗牙齿与和政的标本对比后发现，它与和政的 P^2，P^3 都有明显的区别。和政的 P^2 虽然在长度上和它一样，但冠面的构造差异很大：和政者冠面为长方形，前外角为牙齿的最突处，前嵴和后嵴间的夹角小，约 130°，亦即前嵴更向舌侧偏转；几乎没有前附尖，后附尖也很小且低，与主尖分隔得很弱。Schlosser 的这颗牙齿的冠面则近半圆形，即外缘中部最凸隆；前、后嵴间的夹角大，约为 150°，前、后附尖都很发育，并和主尖分开。这颗牙齿与和政标本上的 P^3 差别更为显著：前者明显地小于后者，齿冠也低；和政标本的前、后嵴间的夹角更小，只有 110°，几乎没有前附尖，而后附尖却极高。总之，Schlosser 的这颗牙齿根本就不能归入这个种。我们发现它和中更新世习见的“*Hyaena*” *sinensis* 的 P^3，无论在大小，还是在形态上倒很接近。在 Schlosser 保存的标本中，有不少第四纪的化石，因此，这并不是不可能的。

另外，Schlosser 作为 P_3 记述、测量和照相的一件标本（Schlosser, 1903, Taf. 11, fig. 8），倒与和政标本上的 P^2 完全一致。其实，只要仔细观察一下这颗牙齿，就会发现它的前嵴向舌侧强烈偏转，这种特征只能出现在上牙，因此，这颗被 Schlosser 视为 P_3 的下牙，倒确确实实是这个种的上牙——P^2。

Schlosser 关于 P^4 的鉴定是正确的，但他提供的该牙的长度（44 毫米）却又是有疑问的。本文前一作者 1983 年在墨尼黑大学曾对这件标本做过观察和测量，它是由两个断块合在一起的（该标本编号为 501 和 506），但确实为同一牙齿，其长度约 54 毫米（后端稍破损）。我们估计，44 毫米可能是 54 毫米的印刷之误。Howell 和 Petter 也曾指出过这点，他们所测的长度是 52 毫米。

综上所述，Schlosser 的材料中，属于上牙的只有 P^2 和 P^4，它们的大小应分别为 28 × 19 毫米和 54 × 25 毫米。这两颗牙与和政头骨上的 P^2 和 P^4，在大小和形态上完全

一致。我们毫不怀疑，和政发现的头骨，正是 Schlosser 建立的 "*Hyaena*" *gigantea* 的头骨。

三、关于属名的讨论

Schlosser 定种时，使用的是鬣狗广义的属名——*Hyaena*。 1957 年 B. Kurtén 把这个种归入了 *Crocuta* 属的 *Percrocuta* 亚属中。关于 *Percrocuta* 属的含义，邱占祥等已在另一文中作过介绍(邱占祥等，1988)，这里仅就与本文有关的 *Dinocrocuta* 进行讨论。

Dinocrocuta 是 Schmidt-Kittler 1976 年创建的一个 *Percrocuta* 的亚属，它包括一些中至大型，主要生存于晚中新世的种。 Schlosser 的 "*H.*" *gigantea* 也被归入这个亚属，因此这个种应被称做 *Percrocuta* (*Dinocrocuta*) *gigantea*。 *Dinocrocuta* 亚属的属型种，被指定为 *P.* (*D.*) *algerensis* (阿尔及利亚，Arambourg, 1958)。归入这个亚属的还有 *P.* (*D.*) *senyürek*i (土耳其，Ozensony, 1957)、*P.* (*D.*) *minor* (土耳其， Ozansony, 1965) 和 *P.* (*D*) *salonicae*。由于材料的限制，Schmidt-Kittler 这两个亚属的划分，主要依据的是下牙。*Percrocuta* 亚属的特征是 M_1 长于 P_4，P_2 短宽，远小于 P_3；而 *Dinocrocuta* 亚属的特征是 M_1 不长于 P_4，P_2 大。

和政头骨的发现，使我们有可能对这些种的上牙也做一些比较。 我们发现和政的标本与 *P.* (*D.*) *senyürek*i 最为接近，它们在大小和形态上也基本一致，只是后者 P^3 的前附尖特别大，或许这就是这个种的特点； *P.* (*D.*) *grandis*的 P^3、P^4 的形态与和政者相似，但个体稍小。*P.* (*D.*) *algerensis* 的个体更小些，但它的 P^2 和 P^3 与和政者也很相似。*P.* (*D.*) *salonicae* 同样也具有类似的 P^2 和 P^3。上述这些种的共同特征是：前嵴特别向舌侧偏转，它和后嵴的夹角一般都小于 130°，甚至接近 90°；它们的前外角都很向外突出；牙齿的前半部宽于后半部， P^3 的后附尖特别高，但相当窄，和主尖以沟相隔；后齿带近于垂直，且很高。这些特征易与其它鬣狗相区别。看来 Schmidt-Kittler 把它们归入同一类群是不无道理的。*P.* (*D.*) *minor* 因为只有下牙，无从与和政的材料进行对比。

在过去发现的材料中，因无保存较好的头骨，我们无法对这些种的头骨进行对比， *P.* (*D.*) *algerensis* 仅保存了头骨的前半部，也因 Arambourg 的描述过于简单，图版不清，难于判定它与和政标本的关系。*P.* (*D.*) *algerensis* 的鼻骨相当宽大，其宽度达 47 毫米，比一般鬣狗的鼻骨都宽。这与和政头骨的特征相吻合。如果我们根据上述这些种上、下牙齿上的相似性而假定它们的头骨也是比较一致的，而以和政的头骨做为这一类鬣狗代表的话，那么和政的头骨上所显示的一系列独特的性状：如高而短的头骨；鼻部在眶前急剧下降；宽大厚实的鼻骨；不强烈隆起的听泡；极长的外耳道；极大的乳突；退化的副枕突等，都使我们相信，这类鬣狗，无疑已是相当特化的一类，它应代表一个独立的属，而不应作为 *Percrocuta* 的一个亚属。实际上，我们现在已经了解了一些属于 *Percrocuta* 亚属的种的头骨如： *P.* (*P.*) *tungurensis*、*P.* (*P.*) *abessalomi* (高加索， Gabunia, 1973) 和最近发现的 *P.* (*P.*) *primordialis* (宁夏同心，邱占祥等，1988)都与和政的头骨有很大的区别，而和一般鬣狗的头骨相近。

如果将来的发现证实 *P.* (*D.*) *algerensis* 的头骨与和政发现的头骨差别很大的话，鉴于 *P.* (*D.*) *algerensis* 是 *Dinocrocuta* 亚属的属型种，那么 "*H.*" *gigantea* 就该另创新的属名，目前，在头骨材料还不多的情况下，依然采用 *Dinocrocuta* 的属名为好。

近来，Howell 和 Petter 根据下牙的相似性，把 *Dinocrocuta* 以亚属归入了 *Allohyaena* 属。由于 *Allohyaena* 所有的材料都是下牙，我们无法进一步探讨 *Dinocrocuta* 和它的关系。

四、中国的 *Dinocrocuta* 化石

Dinocrocuta 显然是一类个体数量较少的鬣狗。从 1903 年到现在的八十多年中，在我国只有很少的几次发现。

解放前，除了 *Schlosser* 记述的材料外，见于记载的只有 G. H. R. von Koenigswald 从我国药铺获得的几颗牙齿，以及大英博物馆获得的一、两颗牙齿。Kurten 把它们都归入了 *Dinocrocuta gigantea* 这个种。

解放后发现的，能归入这个种的，大概只有郑绍华 1982 年记述的，采自甘肃天祝松山的一段下颌。这件标本的 P_4，在大小和形态上与 *Schlosser* 1903 年记述的标本几乎完全一样，看来，把它们归入同种问题不大。

解放后另一重要的发现，当推陕西蓝田的一件右上颌。这件标本 1978 年经刘东生、李传夔和翟人杰的研究，建立了一个新种：*Crocuta* (*Percrocuta*) *macrodonta*。现在看来，把它归入 *Dinocrocuta* 问题不大，它的基本形态与和政者非常接近，但又有以下的区别：1. 个体稍小(见表 1)；2. M^1 已高度退化，与和政的大而横向的M^1差别很大；P^4 上的前尖相对较粗大，而原尖更退缩。刘东生等在建种时曾指出，它的 P^4 比 Schlosser 记述的 P^4 还大；蓝田标本的 P^4 与 P^2+P^3 相比也更大些…这都是由于 Schlosser 关于 P^3 及 P^4 的鉴定和测量有误所致。我们把蓝田的材料与和政的标本进行了对比，在这方面两者并无多大区别。Howell 和 Petter 把蓝田的这件标本也归入 *gigantea* 这个种内。基于上述之分析，我们认为它仍不失为一个独立的种，不过应归入到 *Dinocrocuta* 属中，即：*D. macrodonta*。

1980 年郑绍华还记述了一件西藏比如的下颌，他建了一个新的亚种：*Crocuta gigantea xizangensis*。这件标本显然要比天祝者小得多，齿冠也低。Howell 和 Petter 曾建议将其归入印度的 *grandis* 种，实际上我们对 *grandis* 这个种了解得并不多，下牙中只有一个 P_4 比较清楚可靠。虽然它们的 P_4 比较接近，但要把它归入同种还为时尚早。

Howell 和 Petter 曾指出 *Dinocrocuta* 化石主要发现于晚中新世早期，亦即相当于欧洲的 Vallesian 期或 MN9—10。我国发现的材料也显示了这种倾向。在保德期的地层中 *Adcrocuta* 和 *Ictitherium* 类鬣狗化石十分丰富，但没发现一件可以肯定的产于该层位的 *Dinocrocuta* 化石。天祝发现的材料，虽然郑绍华把它归入保德期，但由于标本来源于药材收购站，地点不明，层位不清，其时代尚需进一步核定。其它三件标本(蓝田灞河的上颌；西藏比如的下颌及甘肃和政的头骨)，根据现在的认识，都产于比保德期稍早的地层中，看来 *Dinocrocuta* 化石在我国具有较高的时代鉴定意义。

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DISCOVERY OF THE SKULL OF *DINOCROCUTA GIGANTEA*

Qiu Zhanxiang

(*Institute of Vertebrate Paleontology and Paleoanthropology, Academia Sinica*)

Xie Junyi

(*The Provincial Museum of Gansu*)

Yan Defa

(*Institute of Vertebrate Paleontology and Papeoanthropology, Academia Sinica*)

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Summary

Based on isolated teeth of unknown provenance, M. Schlosser erected a new hyaenid species: *Hyaena gigantea* in 1903. The mere gigantism of that species dispelled and doubt as to whether it is a valid species. However, the lack of any important additional specimens renders it extremely difficult to verify Schlosser's original identification and his conclusion concerning its affinity. In 1983 one of the prresent authors (Xie) discovered a well preserved hyaenid skull from the deposits rich in chilotheres and hipparions in Hezheng County, Gansu. The most characteristic teeth, especially P^4, of the skull are almost identical with those described by Schlosser in 1903. There is no room to doubt that the skull belongs namely to Schlosser's "*Hyaena*" *gigantea*. The skull provided us with the possibility to touch upon the issue regarding the affinity of the species.

Brief description

The skull is exceptionally robust, high and short in propotion. Probably the most distinctive feature of the skull in its lateral view is the sharp bending of its roof in front of the orbits. The nasal bones are long and thick, considerably widened anteriorly, forming a pair of lateral blades, which stretch laterally and downward. Like the nasal bones, the premaxillae are also rather thick. The nasal opening is high and wide. The preorbital foramen lies above the anterior half of the P^3, while the anterior margin of the orbit lies at the level of the anterior border of the P^4. The orbit is situated high up, forming a distance of 60 mm between its lower border and the alveolar border. Where the muscle levator naso-labialis is supposed to pass is deeply excavated. Because of that excavation the anterior border of the orbita assumes the from of a narrow ridge. The supraorbital process is long and robust, while the postorbital process on the jugal bone is hook-like. The thickest part of the zygomatic arch is the part just before the glenoid fossa.

The posterior border of the palate is broken, but it lies apparently at the level of the M^1. The fossa palatina is rather wide and oval in form. Its long axis is almost parallel to the longitudinal axis of the skull. The foramen palatinum lies at the level between the P^2 and P^3. The ear region is particularly interesting. The bulla tympanica is less so inflated than

in recent hyaenas, and perhaps the majority of the fossil forms. It is inflated only posteriorly, a little concave anteriorly. The meatus acusticus externius is particularly long. Its length equals approximately the width of the bulla. The processus mastoideus, seen from below, is even larger than the meatus. Seen from lateral side, it encloses the meatus completely from behind, leaving only a slit representing the foramen stylomastoideum. On the contrary, the processus paroccipitalis is rather small.

The teeth are all heavily worn, especially the incisors and the carnassials. The paired cingular cusplets on the lingual sides of I^1 and I^2, which are usually well developed in recent forms, are not clearly shown. I^3 is not particularly enlarged in comparison with the two median ones. C is not preserved, but must be very robust, judged by its alveolus. P^1 is not preserved either. The diastemas between the C and I^3 and P^1 are both very short, no more than 5 mm.

P^2 and P^3 are alike morphologically. They are rectangular in form, seen from below, with a slight central concavity on each of their lingual sides. The main cusps slant slightly backward, seen from the lateral side. P^2 is much smaller than P^3 in size, with hardly discernible anterior cusplet. The angle formed by the anterior and postrior ridges is about 130°. Cingulum is well developed, especially at the postero-labial angle, where the cingulum stretches more downward than the rest of the cingulum. P^3 has a more pronounced antero-lingual bulge supported by the anterior root. The anterior ridge deflects more lingually, forming an angle of about 110° with its posterior counterpart. The postrior cusplet is well developed, clearly separated from the main cusp by labial and lingual grooves. In addtion to the usual horizontal wear surface, there are other two wear facets: one is in front of the anterior ridge; the other is at the postero-lingual corner, which is smaller than the first one. Both are almost vertical in orientation. The P^4 consists of three laterally compressed labial cusps and a reduced and much lower situated protocone, which is supported by a separated root. The inner surface of the paracone and metastyle is strongly scooped, while the protocone is deprived of the enamel coating owing to heavy wearing. The M^1 remains still considerably large, much wider than long, with U-shaped trigon. The cheek teeth are all well out of their sockets, the P^4 is particularly so. It seems closely correlated with the exceptionally low position of the P^4's protocone, otherwise the protocone would inevitably fall beneath the palate and well into the choana.

Comparison with the originally described material

There were altogether nine specimens described by Schlosser in 1903: Two I^3, one P^1, one and a half P^2, a half P^3 and three incomplete P^4. Among them 5 were measured and P^3 and P^4 were figured (Schlosser, 1903, Taf. 11, fig. 1—3.). Unfortunately, there are some discrepancies between Schlosser's description, measurements and figures. For example, no complete P^3 was ever mentioned in his description, but it was given in his measurements and figured. Howell and Petter (1985) noticed it already. According to them, the figured P^3 is the same tooth that Schlosser designated as P^2 in his description and this tooth should be a P^3, not P^2. Our close comparison between that specimen and the teeth of the new skull reveals that the above discussed tooth does not belong to *"Hyaena" gigantea* at all, but should be attributed to *"Hyaena" sinensis*. On the other hand, the tooth described, measured and figured by Schlosser as P_3 is almost identical to the P^2 of our new skull. Therefore, we have no doubt that there should

be a P^2, rather than P_3, of *"Hyaena" gigantea.*

Schlosser's identification of the P^4 is doubtless correct, but the length he gave in his measurements was erroneus. The senior author of the present paper studied the original specimens kept in Munich himself. The length of the P^4 he measured is 54 mm instead of 44 mm given by Schlosser in 1903.

Therefore, while describing his new species, Schlosser possessed only P^2 and P^4 of that species. Their size and morphology are identical with those of the newly found skull, and this has led us to believe that the above mentioned skull represents nothing else, but the long sought skull of *"Hyaena" gigantea.*

About the generic name

Schlosser used the all-embracing generic name *Hyaena* for his new species in 1903. In 1957 B. Kurtén revived the name *Percrocuta* created by Kretzoi in 1938 for the Indian form, *"Hyaena" carnifex,* but Kurten lowered its rank as a subgenus of the genus *Crocuta. Percrocuta* soon won recognition as a separate valid genus and became a "waste-paper basket" for the prematurely highly specialized species. N. Schmidt-Kittler made a thorough investigation into the classification of the percrocutas in 1976. First of all, he expelled *Adcrocuta* from that group. Then, he subdivided the group into two subgenera: *Percrocuta* and *Dinocrocuta.* The latter was based on *"Hyaena" algerensis* (type species of the subgenus), and all the large-si zed percrocutas were here included: *"H." senyüreki, "H." minor, "H." gigantea* and *"H." salonicae.* Unfortunately, Schmidt-Kittler based his distinction between the two subgenera solely on the lower teeth: *Dinocrocuta* has a short M_1, not longer than P_4, and large P_2; while *Percrocuta* has a long M_1, always longer than P_4, and proportionally small P_2.

The discovery of the present skull renders it possible for us to touch upon the true affinity of the dinocrocutas. The skull we presented shows a series of features different from any other known forms of the hyaenids. The most remarkable among them are: the general short and high proportion, the sharp bending of the skull roof, the thick and much widened nasal bones, the exceptionally long meatus acusticus, the enlarged processus mastoideus, the reduced processus paroccipitalis and so on. These remarkable distinctions seem convincing enough to warrant the skull an independent genus status. It is a pity that no species so far attributable to the dinocrocuta group has any more or less well preserved skull. *"H." algerensis* is the best represented among them. Even here, there is only an anterior half of skull. Provided the above described skull which we attribute to *"H." gigantea* is fully representative for the whole dinocrocuta group, we would call it *Dinocrocuta,* a valid, independent genus. In case Schmidt-Kittler's type species of the subgenus *Dinocrocuta, "H." algerensis,* possesses skull generically different from that of *"H." gigantea,* a new genus name should be given to *"H." gigantea.* At present, the first of the two alternatives is most likely to be expected, so we will call Schlosser's species *Dinocrocuta gigantea* (Schlosser, 1903).

The Chinese *Dinocrocuta* fossils

Fossils of *Dinocrocuta* are rare in general. Before the liberation of China in 1949 only isolated teeth of unknown provenance were reported by G. H. R. von Koenigswald. After liberation, the only specimens which could be more or less safely attributed to *Dinocrocuta gigantea* are those from Songshan, Gansu, described by Zheng Shaohua in 1982.

The most important finding was that of an upper jaw from Lantian, Shaanxi, described by Liu et al. as a new species, *Crocuta (Percrocuta) macrodonta,* in 1978. Howell and Petter doubted (1985) its validity as a separate species, considered it as belonging to *Dinocrocuta gigantea.* A close comparison reveals some differences between the two: 1) *D. macrodonta* is evidently smaller in size (see table); 2) Its M^1 is reduced to a small peg; 3) The paracone of the P^4 is more robust, while the protocone is more reduced than their counterparts in *D. gigantea.* The other differences pointed out by Liu et al., concerning the size and proportion of the P^4 and P^{2+3}, were based on erroneus data given by Schlosser. They proved untrue after close observations. This notwithstanding, the Lantian form should represent another species, different form the preceding one, and should be called *Dinocrocuta macrodonta* (Liu et al., 1978).

In 1980 Zheng Shaohua described a lower jew from Tibet under the name of *Crocuta gigantea xizangensis.* Howell and Petter (1985) considered it synoym of *Dinocrocuta grandis,* based mainly on size. The problem could unlikely be properly solved unless more material is discovered.

Howell and Petter (1985) pointed out that *Dinocrocuta* fossils have been so far mainly discovered from the deposits of the Vallesian age. The present material, though very poor, tends to substantiate their viewpoint. It is noteworthy that *Dinocrocuta* has never been reported from Baode (Paote) area, Shanxi, where the richest *Hipparion* fauna of Turolian age was amply reported and thoroughly studied. Except the specimen from Tianzhu, Gansu, the age of which can not be considered fully certain owing to the fact that the specimen was purchased from local people, the other *Dinocrocuta* fossils were really found mainly from the deposits suposedly a little earlier than the typical Baode age. This holds true for those from Lantian, from Hezheng, and probably from Biru, Tibet, as well.

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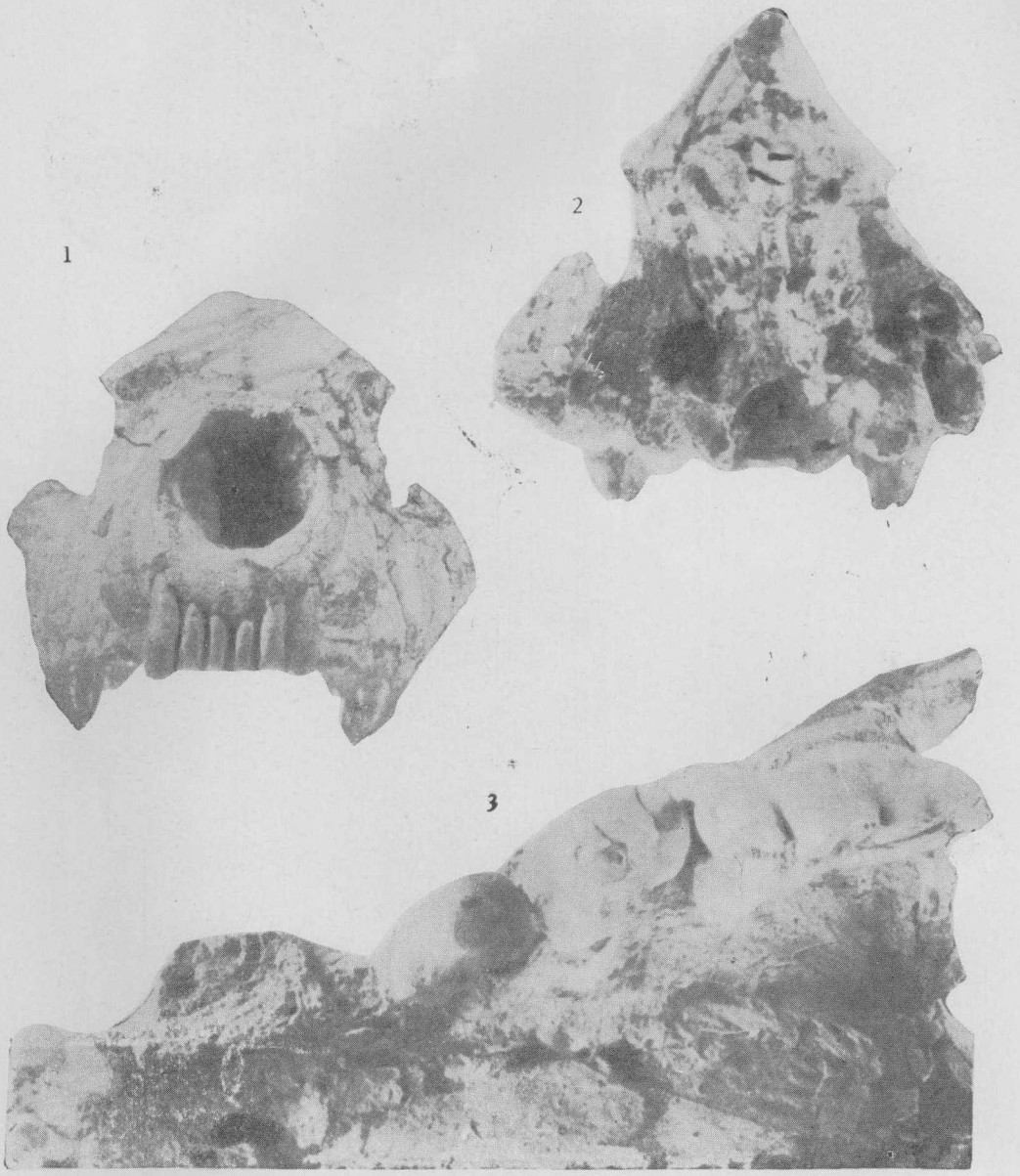
Dinocrocuta gigantea GVH. 8302×1/3
1. 顶面观 (dorsal view)　2. 左侧观 (left lateral view)
3. 腹面观 (ventral view)



Dinocrocuta gigantea GVH. 8302

1．吻部前面观 (anterior view of snout) ×1/3

2．枕部后面观 (posterior view of occiput) ×1/3

3．左齿列嚼面观 ×3/4(dorsal view)