

## *Allohyaena sarmatica* (Carnivora, Mammalia) – a new hyaenid species from the late Miocene of the Ukraine

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Abstract: A new species of hyaenids is described on the basis of the materials from cave deposits of middle Sarmatian (early Vallesian) age found at Gritsev, in the Ukraine. *Allohyaena sarmatica* sp. nov. is the least specialized member of the subgenus *Allohyaena* KRETZOI, 1938. Its premolars are narrower, the talonid of its M<sub>1</sub> longer and the metaconid of M<sub>1</sub> less reduced than in the type species *A. (A.) kadici* KRETZOI, 1938 from the late Vallesian of Hungary and *A. (A.) minor* (OZANSOI, 1965) from the late? Astaracian of Turkey.

Key words: systematics, Mammalia, Carnivora, Hyaenidae, *Allohyaena*, late Miocene, Ukraine.

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### I. INTRODUCTION

A revision of the "percrocutoid" hyaenids by HOWELL & PETTER (1985) and our new finds from the middle Sarmatian locality at Gritsev in the Ukraine made it possible to revise the taxonomic status of two hyaenids, previously attributed (SEMENOV in KOROTKEVICH et. al., 1985) to the genus *Percrocuta* KRETZOI, 1938. It appears, that both species from Gritsev belong to the genus *Allohyaena* KRETZOI, 1938. One of them undoubtedly belongs to the subgenus *Dinocrocuta* SCHMIDT-KITTLER, 1976. In the present paper this species is left out of account, since the scanty remains have allowed me to determine it only as *Allohyaena* (*Dinocrocuta*) sp. The other hyaenid, which belongs to the new species of the nominate subgenus, is described below. To facilitate its comparison with two other species of the subgenus *Allohyaena*, I adopted the methods, dimensions, indices and their designations used by HOWELL & PETTER (1985), adding some other parameters.

The type and other materials are stored in the Department of Vertebrate Palaeozoology & Palaeontological Museum, Institute of Zoology, Ukrainian Academy of Sciences, Kiev (IZAN).

## II. SYSTEMATIC PART

Family *Hyaenidae* GRAY, 1869Genus *Allohyaena* KRETZOI, 1938*Allohyaena (Allohyaena) sarmatica* sp. nov.

**H o l o t y p e :** IZAN, No 22-1814, right mandibular ramus with I<sub>1</sub>-C<sub>1</sub> and P<sub>2</sub>-M<sub>1</sub> (Fig. 1 a-b).

**E t y m o l o g y :** After the Paratethis stage of the Sarmatian.

**T y p e l o c a l i t y :** Gritsev, Shepetovsky district of the Khmel'nitsky region, the Ukraine; cave deposits in a limestone quarry on the right bank of the river Khomora, 3 km W of the village.

**A g e :** Middle Sarmatian (early Vallesian, MN zone 9).

**D i a g n o s i s :** *Allohyaena* species, about the size of *A. minor*. Crowns of upper and lower premolars narrow. P<sup>1</sup> small or absent. P<sup>3</sup> two-rooted. M<sub>1</sub> with well developed metaconid, relatively short blade and long talonid.

**M a t e r i a l :** IZAN, collection No 22; right mandibular ramus with all teeth preserved (22-1814, holotype); left P<sup>3</sup> (22-1817) and fragmentary right maxilla with canine, P<sup>2</sup>, fragment of P<sup>3</sup> and P<sup>4</sup> (22-1839), probably belonging to the same individual as the holotype; left mandibular ramus broken behind M<sub>1</sub> and lacking incisors and canine (22-1840); fragment of right mandibular ramus with P<sub>3</sub> (22-9); isolated teeth of upper and lower jaws; the remains listed belong to at least eight adult individuals. They were collected by the author in 1983-1992. Besides, there are deciduous teeth, limb bones and other remains, which are not included in the description.

**D e s c r i p t i o n :** Hyaenid of medium size. Skull unknown. Enamel of unworn teeth slightly wrinkled. I<sup>1</sup> and I<sub>1</sub> moderately enlarged. Upper and lower canines long, slender, with antero-lingual and posterior crests; the basal cross-sections of their crowns are oval. In old individuals both crowns and roots of incisors and canines worn. Upper premolars relatively low and narrow. P<sup>1</sup> small, one-rooted; in specimen No 22-1839 this tooth was apparently absent originally. P<sup>2</sup> and P<sup>3</sup> (Fig. 2a) two-rooted, with a feeble anterior cusp on the lingual surface of the crown and a large posterior cusp. P<sup>4</sup> (Fig. 2b,c) with a well-developed, narrow protocone, slightly posterior to the anterior margin of the parastyle; its metastyle forms about 36% of the crown length, while the preparastyle is a small vertical crest in shape. This tooth is three-rooted, but a small tubercle on the external surface of the crown base indicates that *A. sarmatica* sp. nov. may have a fourth root on the upper carnassial, sometimes present in other hyaenids including the recent *Hyaena hyaena* (L.). M<sub>2</sub> (Fig. 2d) relatively large, three-rooted, with strongly developed protocone and prominent crest between paracone and metacone. In the present paper the definitions of measurements of M<sup>2</sup> follow those given by SEMENOV (1989) and WERDELIN & SOLOUNIAS (1991).

Mandibular ramus (Fig. 1b) relatively robust, with slightly concave (in holotype) or straight (in No 22-1840) lower border, deep masseteric fossa and two mental foramina situated under P<sub>2</sub> and P<sub>3</sub>. The length of the mandible from the anterior border to the

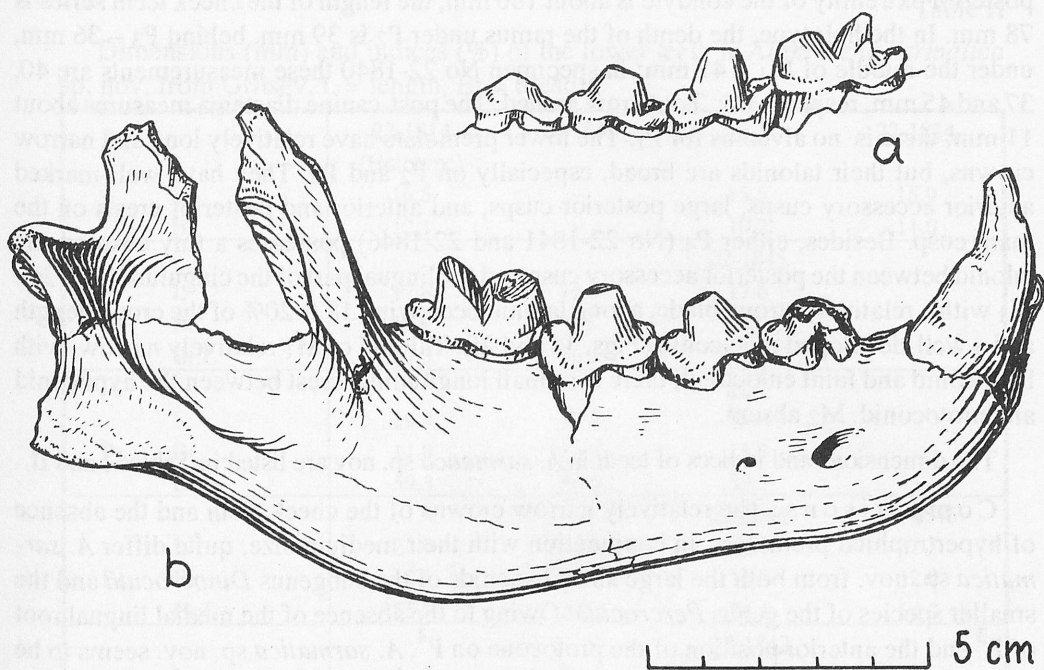


Fig. 1. *Allohyaena sarmatica* sp. nov. from Gritsev, right mandibular ramus (IZAN 22-1814; holotype): a) lingual view of cheek teeth series; b) buccal view of the ramus.

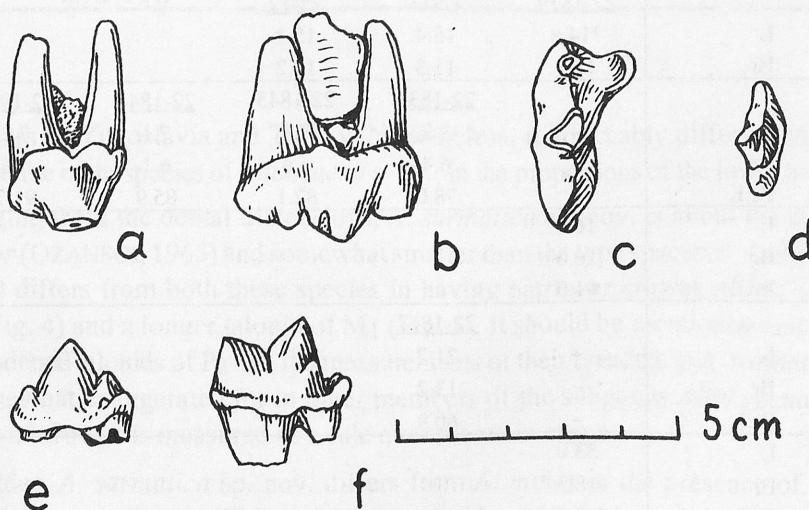


Fig. 2. *Allohyaena sarmatica* sp. nov. from Gritsev: a) left P<sup>3</sup> (IZAN 22-1817), lingual view; b) right P<sup>4</sup> (IZAN 22-1839), buccal view; c) the same, occlusal view; d) right M<sup>1</sup> (IZAN 22-1947), occlusal view; e) right P<sub>4</sub> (IZAN 22-1841), lingual view; f) right M<sub>1</sub> (IZAN, 22-1842), lingual view.



posterior extremity of the condyle is about 180 mm, the length of the cheek teeth series is 78 mm. In the holotype, the depth of the ramus under P<sub>2</sub> is 39 mm, behind P<sub>3</sub> – 36 mm, under the middle of M<sub>1</sub> – 47 mm; in specimen No 22-1840 these measurements are 40, 37 and 45 mm, respectively. Tooth row arched. The post-canine diastema measures about 11 mm; there is no alveolus for P<sub>1</sub>. The lower premolars have relatively long and narrow crowns, but their talonids are broad, especially on P<sub>2</sub> and P<sub>3</sub>. They have well-marked anterior accessory cusps, large posterior cusps, and anterior and posterior crests on the main cusp. Besides, either P<sub>4</sub> (No 22-1841 and 22-1846) possesses a tiny cusp on the talonid between the posterior accessory cusp and the lingual part of the cingulum (Fig. 2e). M<sub>1</sub> with a relatively strong blade, a long talonid occupying 18.8-20% of the crown length and a well-developed metaconid (Figs. 1a and 2f). Talonid of M<sub>1</sub> relatively narrow, with hypoconid and faint entoconid; there is a small longitudinal crest between the hypoconid and protoconid. M<sub>2</sub> absent.

The dimensions and indices of teeth in *A. sarmatica* sp. nov are listed in Tables I and II.

Comparisons: The relatively narrow crowns of the cheek teeth and the absence of hypertrophied premolars, in conjunction with their medium size, quite differ *A. sarmatica* sp. nov. from both the large sized hyaenids of the subgenus *Dinocrocuta* and the smaller species of the genus *Percrocuta*. Owing to the absence of the medial lingual root of P<sup>3</sup> and the anterior position of the protocone on P<sup>4</sup>, *A. sarmatica* sp. nov. seems to be somewhat similar to *Percrocuta miocenica* PAVLOVIC & THENIUS, 1965 from the lower

Table I

Dimensions (mm) and indices (%) of the upper teeth in *Allohyaena sarmatica* sp. nov. from Gritsev. L = length, Br = breadth

		<u>22-1839</u>	22-11	<u>22-12</u>		
C <sup>1</sup>	L	?14.8	15.4	15.1		
	Br	11.7	11.3	10.2		
			<u>22-1836</u>	22-1843	<u>22-1844</u>	<u>22-1946</u>
P <sup>1</sup>	L	—	8.2	7.8	7.1	7.2
	Br	—	6.4	6.4	6.1	6.6
	Br:L	—	78.0	82.1	85.9	91.7
P <sup>2</sup>	L	16.4				
	Br	10.0				
	Br:L	61.0				
			<u>22-1817</u>			
P <sup>3</sup>	L	—	21.7			
	Br	—	13.2			
	Br:L	—	60.8			
P <sup>4</sup>	L	33.0				
	Br	18.3				
	Br:L	55.4				
			<u>22-1947</u>			
M <sup>1</sup>	L	—	11.8			
	Br	—	20.0			
	Br:L	—	169.5			

Table II

Dimensions (mm) and indices (%) of the lower teeth in *Allohyaena sarmatica* sp. nov. from Gritsev. L = length, Br = breadth

		<u>22-1814</u> (Holotype)	22-1840	<u>22-2</u>	<u>22-1834</u>
C <sub>1</sub>	L	16.5	—	15.5	15.9
	Br	12.1	—	10.2	11.0
P <sub>2</sub>	L	17.8	16.8	<u>22-1845</u> 17.6	
	Br	10.2	9.5	9.3	
	Br:L	57.3	56.5	52.8	
P <sub>3</sub>	L	19.9	19.8	<u>22-9</u> 18.9	
	Br	11.8	11.7	11.2	
	Br:L	59.3	59.1	59.3	
P <sub>4</sub>	L	22.0	22.8	<u>22-1841</u> 21.8	22-1846 22.1
	Br	12.1	12.1	11.8	12.0
	Br:L	55.0	53.1	54.1	54.3
M <sub>1</sub>	L	24.8	24.6	<u>22-1842</u> 25.0	
	Br	11.2	11.3	11.9	
	Bl l	19.7	19.5	20.3	
	Ta l	5.1	5.1	4.7	
	Bl l:L	79.4	79.3	81.2	
	Ta l:L	20.6	20.7	18.8	
M1L : P <sub>4</sub> L		112.7	107.9		

Astaracian of Yugoslavia and Turkey. Nonetheless, it noticeably differs from the latter, and from the other species of *Allohyaena* s. str., in the proportions of the lower teeth (Fig. 3).

Judging from the dental dimensions, *A. sarmatica* sp. nov. is about the same size as *A. minor* (OZANSOI, 1965) and somewhat smaller than the type species *A. kadici* KRETZOI, 1938. It differs from both these species in having narrower crowns of the lower cheek teeth (Fig. 4) and a longer talonid of M<sub>1</sub> (Fig. 5). It should be mentioned that because of the broadened talonids of P<sub>2</sub> - P<sub>4</sub> the measurements of their breadths in *A. sarmatica* sp. nov. are somewhat exaggerated for in other members of the subgenus *Allohyaena*, the major breadth of crowns is measured as a rule over the main cusps.

Besides, *A. sarmatica* sp. nov. differs from *A. minor* in the presence of the second mental foramen in the mandible and the metaconid on M<sub>1</sub> and from *A. kadici* in the absence of the median lingual root of P<sup>3</sup> and in the less reduced metaconid of M<sub>1</sub>. And whether the attribution of the materials described by SORIA (1980) from the mid-Turolian locality at Concud in Spain to *A. minor* is confirmed or not, *A. sarmatica* sp. nov. differs from this species in having a considerably more reduced P<sup>1</sup>.

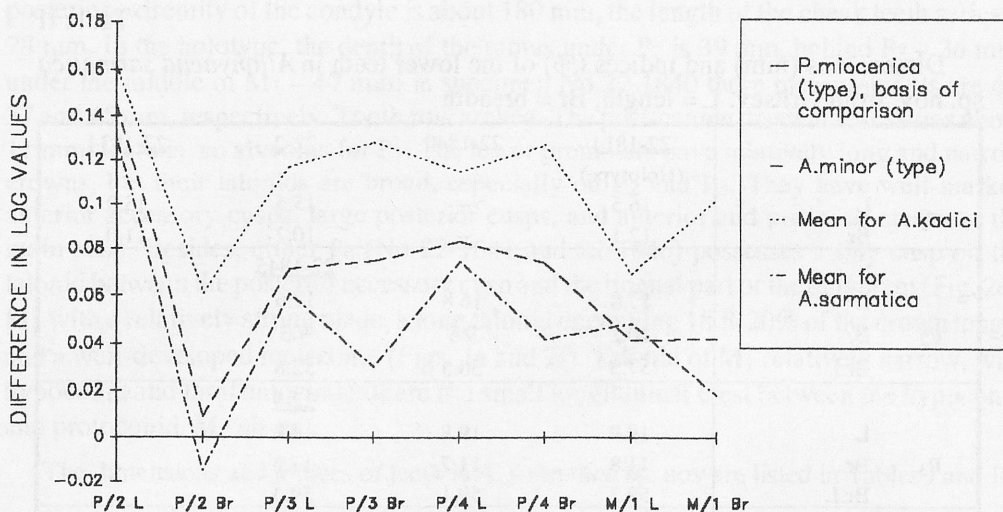


Fig. 3. Comparison of length and breadth of the lower teeth (P<sub>2</sub> to M<sub>1</sub>) in *Percrocuta miocenica*, *Allohyaena kadici*, *A. minor* (data after HOWELL & PETTER 1985) and *A. sarmatica* sp. nov.

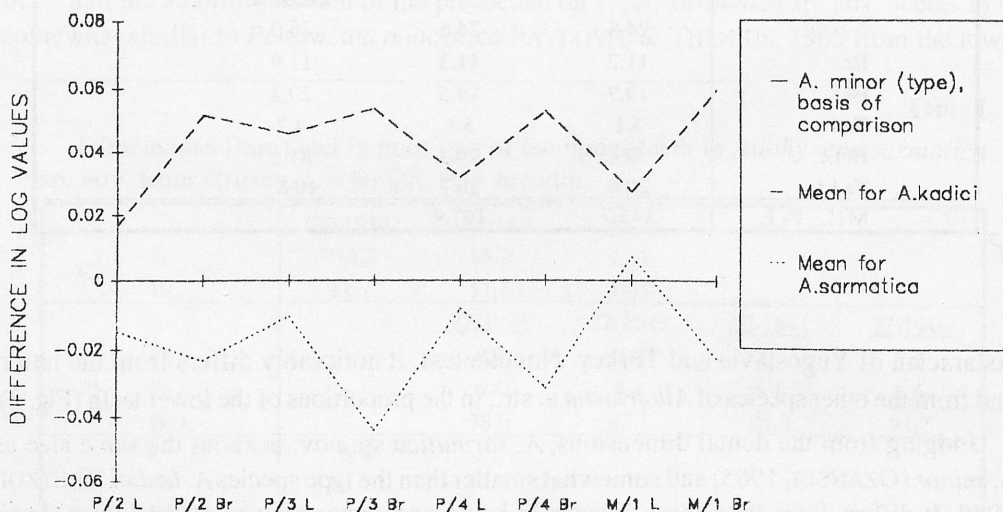


Fig. 4. Comparison of length and breadth of the lower teeth (P<sub>2</sub> to M<sub>1</sub>) in *A. minor*, *A. kadici* (data after HOWELL & PETTER 1985) and *A. sarmatica* sp. nov.

### III. DISCUSSION

It is hard to regard the genus *Allohyaena* as well known, however, its nominate subgenus is undoubtedly the least-known group of the fossil hyaenids. The currently available data on this taxon are extremely scarce. And so, *A. kadici* and *Xenohyaena*



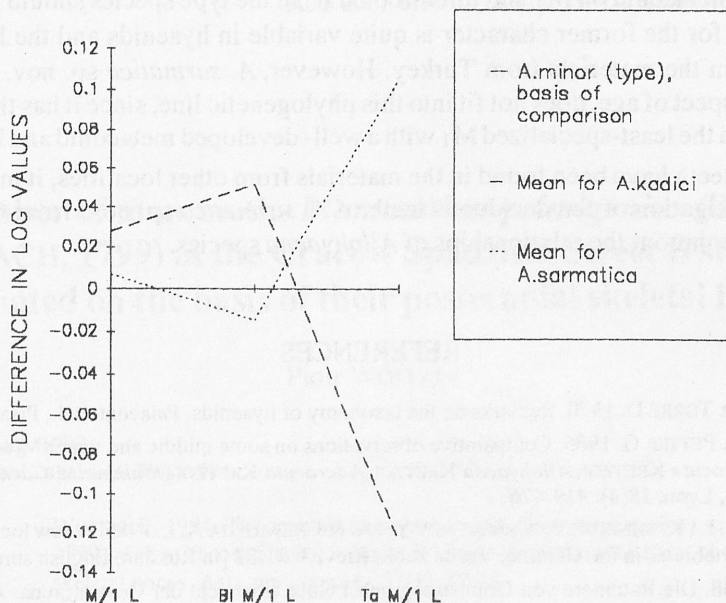


Fig. 5. Comparison of relative lengths of the blade (BI M<sub>1</sub> L) and of the talonid (Ta M<sub>1</sub> L) of M<sub>1</sub> in *A. minor*, *A. kadici* (data after HOWELL & PETTER 1985) and *A. sarmatica* sp. nov.

*csakvarensis* from Csakvar (KRETZOI, 1938), as well as *Hyaena minor* from Yassiören (OZANSOY, 1965) were described without specifying any measurements, practically solely from three incomplete mandibles; short descriptions of P<sup>3</sup> and P<sup>4</sup> were published only for the former species. The later revisions by FICCARELLI & TORRE (1970), SCHMIDT-KITTLER (1976) and HOWELL & PETTER (1985) were almost as brief as the original descriptions, sometimes contradicting one another in dental dimensions while some indications of morphological peculiarities given in them are doubtful. This last refers in particular to the presence of M<sub>2</sub> in *A. kadici* (FICCARELLI & TORRE, 1970) and to the identification of the Turolian hyaenid from Concud with *A. minor* (SORIA, 1980). Furthermore, if the unification of *A. kadici* with *X. csakvarensis* and the subdivision of *Allohyaena* and *Percrocuta* into two genera is quite reasonable, the reduction of the taxonomic status of *Allohyaena* s. str. to subgenus and its integration with *Dinocrocuta* into one genus are not sufficiently well justified, especially considering the lack of data on skull morphology and the different nature of teeth specialization in these subgenera.

Such a situation adversely affects the systematics of the group and phylogenetic conclusions. Unfortunately, in this aspect *A. sarmatica* sp. nov. even complicates the situation. Thus, *A. minor* from the late Astaracian of Turkey is the most ancient species in the subgenus. It has therefore relatively massive premolars and a lower carnassial with a moderately long talonid and no metaconid. It might be supposed that this phylogenetic line is continued by the late Vallesian species *A. kadici*, which has more massive premolars and more specialized M<sub>1</sub> with a short talonid. Such primitive properties as the presence

of a reduced metaconid on  $M_1$  and three-rooted  $P^3$  in the type species should not be taken into account, for the former character is quite variable in hyaenids and the latter cannot be observed in the materials from Turkey. However, *A. sarmatica* sp. nov. being intermediate in respect of age, does not fit into this phylogenetic line, since it has the narrowest premolars and the least-specialized  $M_1$  with a well-developed metaconid and long talonid.

If similar teeth have been found in the materials from other localities, it may be hoped that the investigation of the deciduous teeth of *A. sarmatica* sp. nov. from Gritsev, will permit us to point out the relationships of *Allohyaena* species.

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