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REVISION OF THE MIDDLE PLEISTOCENE RHINOCEROS REMAINS FROM CONTRADA MONTICELLI (CASTELLANA, BARI, SOUTHERN ITALY)

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ABSTRACT - *Revision of the Middle Pleistocene rhinoceros remains from Contrada Monticelli (Castellana, Bari, Southern Italy)* - Il Quaternario XXX - Rhinoceros remains from Contrada Monticelli (Bari), formerly attributed to *Rhinoceros mercki*, are revisited. On the basis of the results of detailed morphological and morphometrical analyses, the rhinoceros material attests to the occurrence of *Stephanorhinus hundsheimensis* Toula, a species that has never been reported before from Apulia, and of a small-sized etruscan-like representative known to characterize the latest Villafranchian-earliest Galerian faunal turnover. However, the absence of Villafranchian faunal elements and, on the other hand, the occurrence of a full-fledged *S. hundsheimensis* and of other typical Galerian mammals from Contrada Monticelli are suggestive of a dating to the early Middle Pleistocene. This implicitly suggests that the small-sized etruscan-like rhinoceros, represented only by a right femur, is most likely a reworked element.

RIASSUNTO - *Revisione dei resti di rinoceronte medio pleistocenici di Contrada Monticelli (Castellana, Bari, Italia meridionale)* - Il Quaternario XXX - Vengono qui esaminati i resti di rinoceronte provenienti da Contrada Monticelli (Bari), precedentemente attribuiti a *Rhinoceros mercki*. Sulla base di dettagliate analisi morfologiche e morfometriche, il materiale di rinoceronte testimonia la presenza di *Stephanorhinus hundsheimensis* Toula, una specie mai riportata prima in Puglia, e di un rappresentante di piccola taglia di tipo etrusco noti per caratterizzare la rivoluzione faunistica del Villafranchiano finale-Galeriano iniziale. La presenza di *S. hundsheimensis* e di altri tipici mammiferi galeriani a Contrada Monticelli suggerisce una datazione al primo Pleistocene medio. Ciò suggerisce implicitamente che il rinoceronte di piccola taglia di tipo etrusco, rappresentato solo da un femore destro, sia molto probabilmente un elemento rimaneggiato.

Key words: Rhinocerotidae, Perissodactyla, Mammalia, Middle Pleistocene, Italy
Parole chiave: Rhinocerotidae, Perissodactyla, Mammalia, Pleistocene medio, Italia

1. INTRODUCTION

In the late '70s, the presence of fossil bones, found during building works at Contrada Monticelli, about 5 kms south-east of Putignano (Bari), near the cross-road between the Strada Statale 172 Putignano-Alberobello and the Strada Comunale Monticelli, was reported to the University of Bari. Prof. E. Luperto Sinni made a personal inspection and realized the importance of the discovery, which consisted in a rich collection of bones embedded in litified lateritic infillings of karstic cavities in the Senonian Altamura Limestone (De Juliis, 1984; 1987). The site yielded remains of elephants (*Elephas (Palaeoloxodon) antiquus*), equids (*Equus caballus*), rhinocerontids, cervids (*Cervus elaphus*, *Dama dama*), bovids (*Bos* vel *Bison*) and canids (*Canis mosbachensis*). The bones are quite badly preserved and were not found articulated.

Prof. Elena Luperto Sinni personally superintended the excavations for the recovery of the bones. The rhinoceros remains have been subject of an unpublished dissertation by Colucci (1980), supervised by Prof. Elena Luperto Sinni, and of a paper by Luperto Sinni and Colucci (1985). In both these studies the rhinoceros bones were attributed to *Rhinoceros mercki*. Recently, the writers had the opportunity to examine the fossils from Contrada Monticelli and felt the need to revisit the rhinoceros material in the light of up-to-date knowledge on these animals.

2. SPECIMENS STUDIED

The skeletal remains from Contrada Monticelli are represented by an incomplete skull, three fragmental mandibles, an atlas and a sixth or seventh cervical vertebra, three humeri, an ulna, two coxal bones, two femurs and a tibia.

2.1 -Skull

The specimen, uncatalogued, is in very poor conditions: it is dorso-ventrally crushed and the whole neurocranium is missing. The facial skeleton is massive, more than in *Stephanorhinus etruscus*. The anterior border of the orbital cavity overlies M^2. The position of the aboral border of the narial notch is unclear due to the deformation, but it apparently overlies the rear part of P^2 or the P^2/P^3 commissure. The nasal bones plunge markedly downwards in their anterior part, though without reaching the premaxillae,

and are considerably expanded (greatest breadth: 176 mm), more than in *S. etruscus*. The narial notch seems to have been quite ample and the nasal septum is ossified. The zygomatic arch is robust and plunges downward and forward with a relatively lower angle than in *S. etruscus*.

The left cheek toothrow borne by the skull includes P^3-M^3, while the right cheek toothrow includes P^4-M^3; the left P^3 and the right M^3 are fragmental. The teeth are brachyodont and extremely worn. The protolophs and metalophs are slightly inclined backwards. P^4 is anteroposteriorly compressed and broad and bears a lingual cingulum. A small pillar occurs at the outlets of the median valley of M^1 and M^2. There is no trace of cementum on the teeth.

Besides the load cracks that affect the specimen, the outer bone surface has been removed, presumably by prolonged or intense weathering, and several longitudinal fissures affect the specimen. The specimen seems to be in Behrensmeyer's (1978) weathering stage 3.

2.2 - Mandible

The sample includes a fragmental juvenile left hemimandible (n. 30600) and three incomplete adult mandibles (n. 30611 and two uncatalogued).

The front half of the juvenile hemimandible (n. 30600) is lacking, as also is the upper part of its ascending ramus. D_4 is still preserved, but it was to be replaced by the erupting P_4, which is exposed by a fracture in the medial bone wall. The toothrow preserved includes D_4, M_1 and M_2; M_3 is not yet erupted. The teeth are brachyodont, slightly worn and lack cementum. The anterior valleys are V-shaped, while the rear ones are U-shaped; both end high above the collar. No buccal or lingual cingula occur. A small pillar-like structure is present at the base of the protoconids of M_1 and M_2. The teeth are fissured, but do not appear "exploded". The outer bone wall is removed and the specimen appears coarsely rough and shows a fibrous texture. Many longitudinal cracks occur. Weathering seems more intense than in the skull (Behrensmeyer's stage 4).

One of the adult mandibles (n. 30611) is a small-sized individual. It lacks part of its incisive corpus, the rear part of its right horizontal and ascending rami and the upper part of its left ascending ramus. The left toowthrow is complete (P_2-M_3), the right lacks P_2. The horizontal ramus is slender, with a straight or slightly convex basal profile. Three mental foramina occur, one under P_2 and two under P_3. The teeth are brachyodont and fairly worn, bear a thin cementum veneer and show no evidence of buccal or lingual cingula. A network of longitudinal cracks affect the whole specimen and the outer bone surface has been removed in several places (Behrensmeyer's stage 3-4).

One of the other two adult specimens is a badly preserved fragmental right mandible (uncatalogued), which lacks all the anterior portion and the ascending ramus. The mandibular angle is still preserved. The toothrow includes fragments of M_1 and M_3, while M_2 is complete. The horizontal ramus is slender (the height under M_3 is about 92 mm). The molars are brachyodont. Both valleys of M_2 are U-shaped; the tooth shows slight traces of cementum. The outer bone surface lacks in several places and many longitudinal cracks affect the specimen (Behrensmeyer's stage 3-4).

The last adult mandible (uncatalogued) is the most complete; only the incisive corpus is not preserved. The specimen is massive, more than in *S. etruscus*. The basal profiles of the horizontal rami are slightly convex. Two mental foramina occur before P_2. The ascending rami are vertical, but comparatively shorter and somewhat more robust than in *S. etruscus*. Both toothrows lack P_2. The cheek teeth are so worn down to prevent any possible description. The outer bone wall is not preserved and the specimen appears coarsely rough and shows a fibrous texture (Behrensmeyer's stage 4).

2.3 - Atlas

The specimen (n. 30614) is fragmentary and badly preserved. The dorsal tubercle is prominent, but blunt, while the ventral one is slightly developed. The scissure connecting the intervertebralis and alaris foramina is broad and deep.

2.4 - Humerus

The three specimens, two left ones (n. 30602 and 30604) and a right one (n. 30603) are sturdy and more massive than those of *S. etruscus*. The lesser and greater tubercles are not well preserved, or not preserved at all, in the three bones. The intertuberal groove is ample and deep. The deltoid tuberosity is very protruding. The teres major is shifted quite more distally than in *S. etruscus*. The epicondyle is very salient, more than in *S. etruscus*. The olecranic fossa is wider than in *S. etruscus*. The distal epiphyses are proportionally broader than in *S. etruscus*. The three specimens show a thick network of longitudinal cracks and the outer bone surfaces is not preserved in several places (Behrensmeyer's stage 4). The humerus n. 30604 has its distal epiphysis dissected by a deep longitudinal fault.

2.5 - Ulna

The specimen (n. 30623) has a shorter and more massive olecranon than *S. etruscus*. The anconeal process is elongated and projects straight forwards, while in *S. etruscus* it is less prominent and more arcuated. Longitudinal cracks (Behrensmeyer's stage 3) and several recent transversal fractures occur.

2.6 - Os coxae

The two specimens are an almost complete right os coxae (n. 30617), which lacks the caudal branch of the pubis and part of the ischiatic tuberosity, and a left one (n. 30620), far more incomplete, represented only by the acetabulum and part of the ischiatic tuberosity. The tuber coxae is pointed, whereas the sacral

tuber is broad and salient. The acetabulum is subcircular, deep and much wider than in *S. etruscus*. The iliac border of the acetabulum is less salient and embracing than in *S. etruscus* and the articulation as a whole is faced more laterally than in the latter species.

2.7 - Femur

The sample includes two right specimens (n. 30605 and 30606). One of the two bones (n. 30605) is incomplete: it lacks the greater trochanter, part of the third trochanter and the distal epiphysis. The other bone (n. 30606) is complete, but it is very small-sized, smaller than the femurs of *S. etruscus* from the Upper Valdarno.

The former specimen is massive, with a very broad, roundish head, a sturdy neck, a well developed, prominent lesser trochanter and a powerful third trochanter shifted more distally than in *S. etruscus*. The other specimen is quite slender, with a triangular-shaped greater trochanter, a relatively smaller head, a thinner neck and a more slender diaphysis. Both femurs show a thick network of longitudinal cracks (Behrensmeyer's stage 3).

2.8 - Tibia

A sturdy left tibia (n. 30608) has broad epiphyses. The outer bone wall is extensively lacking and the specimen appears coarsely rough and shows a fibrous texture. Many longitudinal cracks occur. The bone seems to have been exposed to intense weathering (Behrensmeyer's stage 4).

3 - DISCUSSION

The ratio diagrams included here show that the humeri, the large-sized femur and the tibia (Figs. 1-3) are suggestive, in size and proportions, of a reference to *S. hundsheimensis*, while the small-sized femur (n. 30606) is very similar to the specimens from Pirro (Fig. 2). Also one of the adult mandibles (n. 30611) recalls a small-sized etruscan rhinoceros and may therefore be associated with the small-sized femur. Two different rhinoceroses are therefore documented in the sample from Contrada Monticelli: a larger-sized form, with morphological characters and proportions suggestive of a full-fledged *Stephanorhinus hundsheimensis* Toula, and a quite smaller-sized one, with *etruscus*-like affinities.

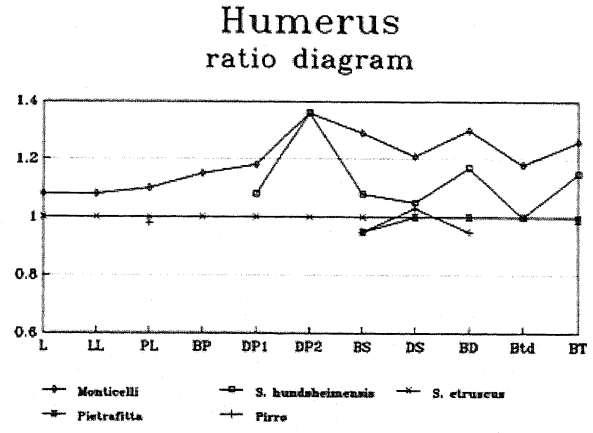

Fig. 1 - ratio diagram of the humeri (standard *S. etruscus*).

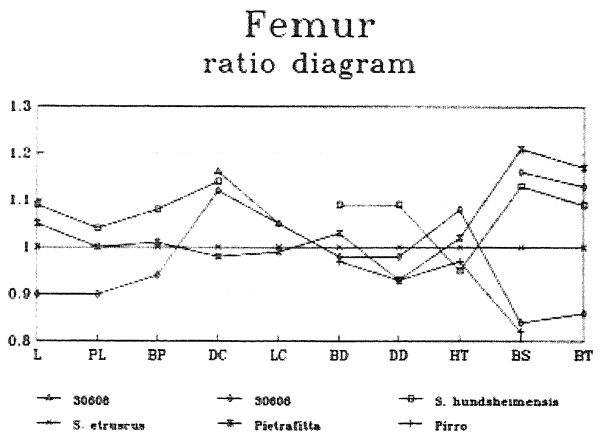

Fig. 2 - ratio diagram of the femurs (standard *S. etruscus*).

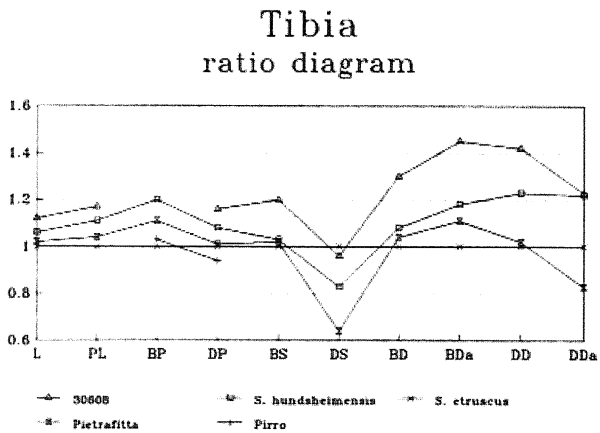

Fig. 3 - ratio diagram of the tibiae (standard *S. etruscus*).

Mazza *et al.* (1993) have recently reported the occurrence of small-sized etruscan-like rhinoceroses from a number of latest Villafranchian-early Galerian sites of Italy and of Central Europe, namely Pietrafitta (Perugia, Central Italy), Colle Curti (Macerata, Central Italy), Pirro (Gargano, Southern Italy), Loreto (Venosa, Southern Italy), Westerhoven (Brabant, The Netherlands) and Wissel power plant (Kalkar, Germany).

The finds from Contrada Monticelli are particularly significant because they represent the first ascertained occurrence of *S. hundsheimensis* in Apulia. The absence of Villafranchian faunal elements and, on the other hand, the occurrence of a full-fledged *S. hundsheimensis* and of other typical Galerian mammals suggest that the fauna may be referred to a moment of the early Middle Pleistocene, which however cannot be precised exactly given the absence of a sure stratigraphic provenance.

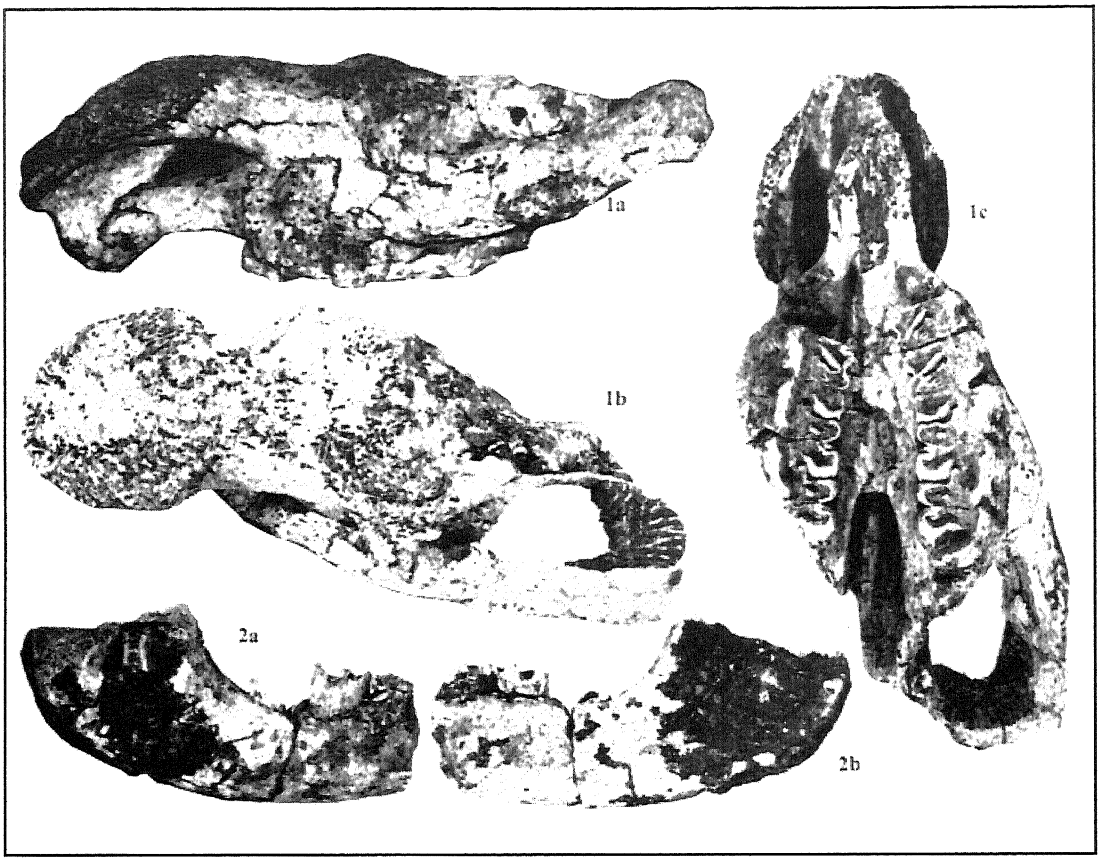

Plate 1 - *Stephanorhinus hundsheimensis* - fragmental skull – uncatalogued.
1a - left lateral view; 1b - dorsal view; 1c - ventral view. About x 6.6.

Stephanorhinus hundsheimensis - fragmental right mandible – uncatalogued.
2a - right lateral view; 2b - left lateral view. About x 6.6.

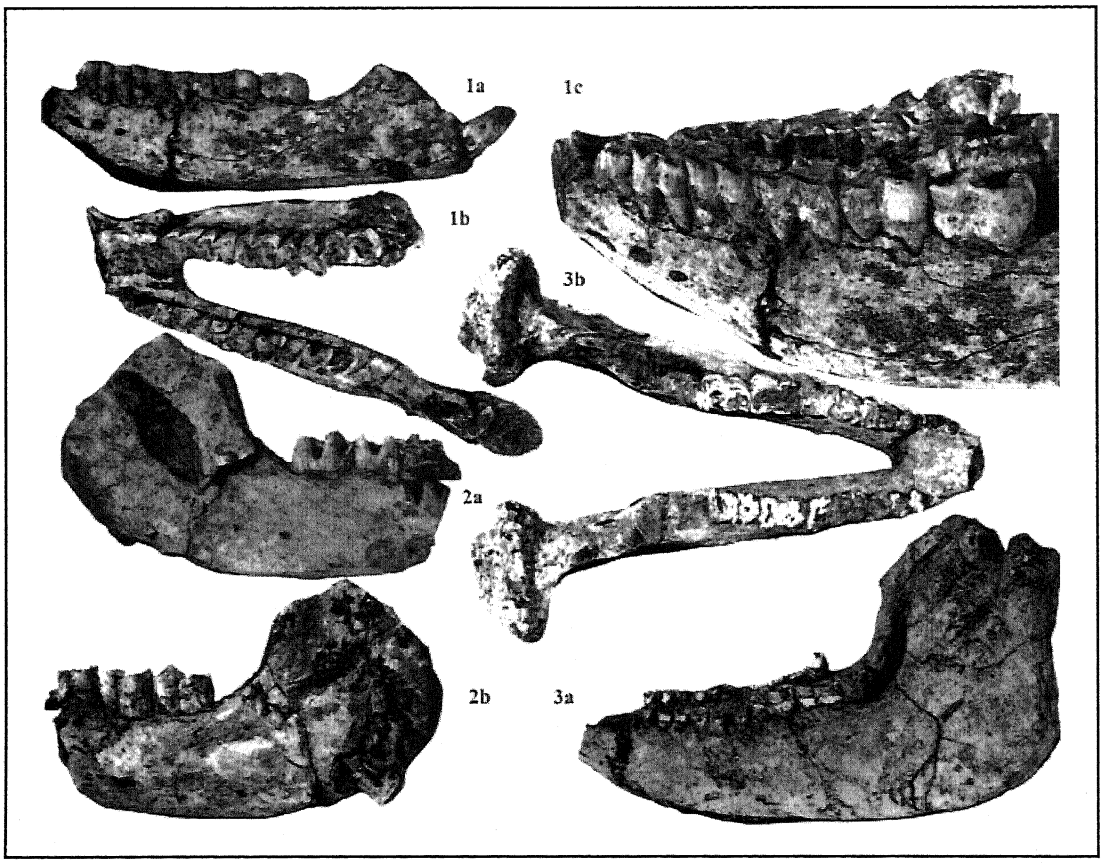

Plate 2 - *Stephanorhinus hundsheimensis* - fragmental adult mandible - n. 30611.
1a - left lateral view; 1b - dorsal view; about x 6.6; 1c - particular of the left toothrow; about x 3.3.

Stephanorhinus hundsheimensis - fragmental juvenile left hemimandible - n. 30600.
2a - right lateral view; 2b - left lateral view; about x 6.6.

Stephanorhinus hundsheimensis - fragmental adult mandible – uncatalogued.
3a - left lateral view; 3b - dorsal view; about x 6.6.

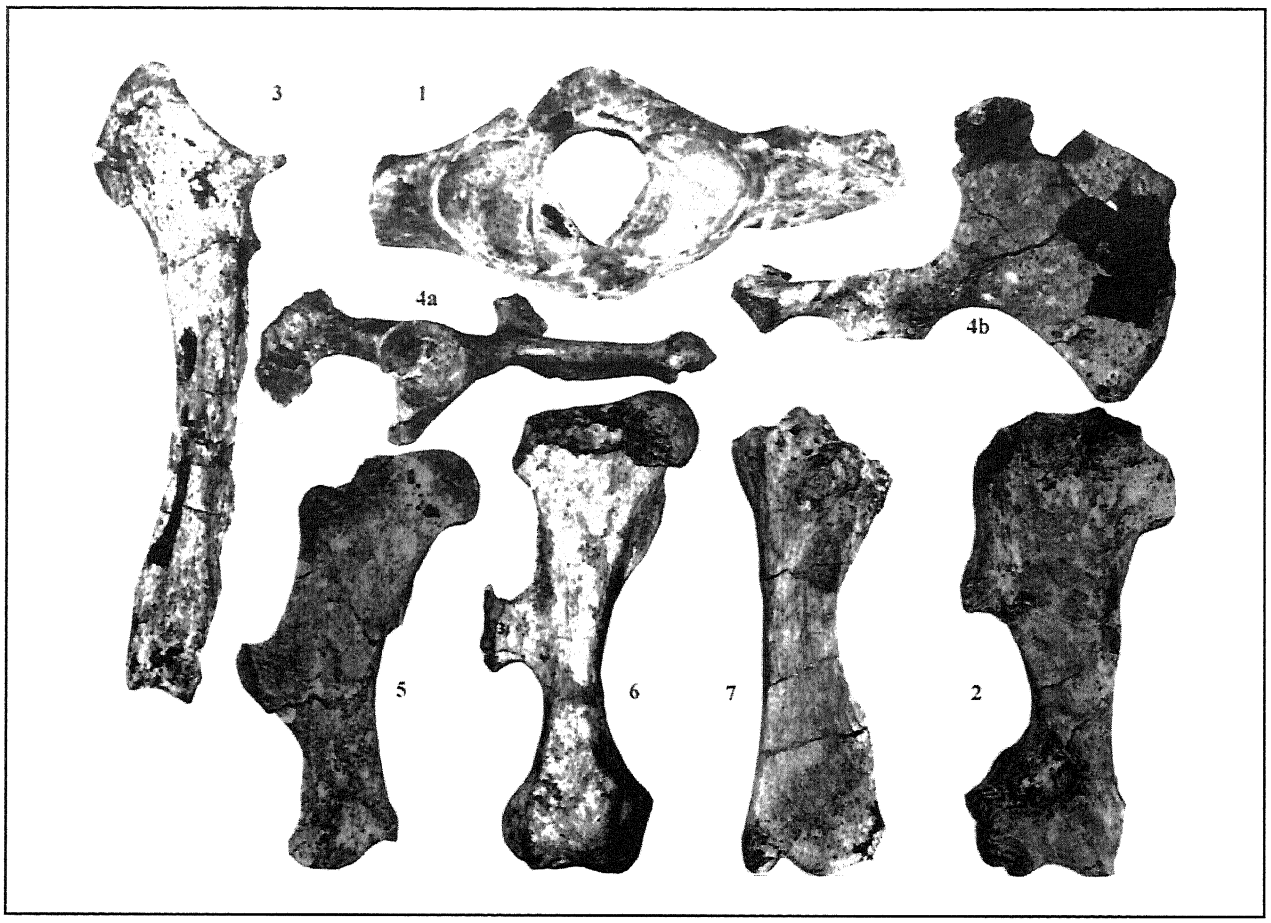

Plate 3 - *Stephanorhinus hundsheimensis* - atlas - n. 30623.
1 - Cranial view; about x 3.

Stephanorhinus hundsheimensis - right humerus - n. 30603.
2 - cranial view; about x 6.

Stephanorhinus hundsheimensis - ulna – 30614.
3 - right lateral view; about x 6.

Stephanorhinus hundsheimensis - right os coxae - n. 30617.
4a - right lateral view; 4b - dorsal view; about x 9.

Stephanorhinus hundsheimensis - fragmental right femur - n. 30605.
5 - cranial view; about x 6.

Stephanorhinus cf. *etruscus* - right femur - n. 30606.
6 - cranial view; about x 6.

Stephanorhinus hundsheimensis - left tibia – 30608.
7 - dorsal view; about x 6.

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CAPTIONS - DIDASCALIE

HUMERUS

L - greatest length; **LL** - lateral length; **PL** - physiologic length; **BP** - proximal breadth; **DP1** - proximal depth, from the caput humeri to the greater tubercle; **DP2** - proximal depth, from the caput humeri to the lesser tubercle; **BS** - smallest breadth of the shaft; **DS** - smallest depth of the shaft; **BD** - distal breadth; **Btd** - greatest breadth at the deltoid tuberosity; **BT** - breadth of the trochlea.

OMERO

L – lunghezza massima; **LL** – lunghezza laterale; **PL** – lunghezza fisiologica; **BP** – larghezza prossimale; **DP1** – spessore prossimale, dal caput humeri al trochitere; **DP2** – spessore prossimale, dal caput humeri al trochine; **BS** – larghezza minima della diafisi; **DS** – spessore minimo della diafisi; **BD** – larghezza distale; **Btd** – larghezza massima alla tuberosità deltoidea; **BT** – larghezza della troclea.

FEMUR

L - greatest length; **PL** - physiologic length; **BP** - proximal breadth; **DC** - depth of the caput femoris; **LC** - length of the caput femoris; **BD** - distal breadth; **DD** - greatest depth of the medial portion of the distal epiphysis; **HT** - depth of the shaft at the third trochanter; **BS** - smallest breadth of the shaft; **BT** - breadth of the shaft at the third trochater.

FEMORE

L – lunghezza totale; **PL** – lunghezza fisiologica; **BP** – larghezza prossimale; **DC** – spessore del caput femoris; **LC** – lunghezza del caput femoris; **BD** – larghezza distale; **DD** – spessore massimo della porzione mediale dell'epifisi distale; **HT** – spessore della diafisi al terzo trocantere; **BS** – minima larghezza della diafisi; **BT** – larghezza della diafisi al terzo trocantere.

TIBIA

L - greatest length of the tibia; **PL** - physiologic length; **BP** - proximal breadth of the tibia; **DP** - proximal depth of the tibia; **BS** - smallest breadth of the shaft of the tibia; **DS** - smallest depth of the shaft of the tibia; **BD** - distal breadth of the tibia; **BDa** - breadth of the distal articular surface of the tibia; **DD** - distal depth of the tibia; **DDa** - depth of the distal articular surface of the tibia.

TIBIA

L – lunghezza massima della tibia; **PL** – lunghezza fisiologica; **BP** – larghezza prossimale della tibia; **DP** – spessore prossimale della tibia; **BS** – larghezza minima della diafisi della tibia; **DS** – spessore minimo della diafisi della tibia; **BD** – larghezza distale della tibia; **BDa** – larghezza della superficie articolare distale della tibia; **DD** – spessore distale della tibia; **DDa** – spessore della superficie articolare distale della tibia.

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