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NOTA BREVE - SHORT NOTE

PROPOTAMOCHOERUS SP. (SUIDAE, MAMMALIA) FROM THE LATE MIOCENE OF GRAVITELLI (MESSINA, SICILY, ITALY) REDISCOVERED

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Abstract. This paper describes two casts of a suid from the Late Miocene of Gravitelli (Messina, Sicily), originally described by Seguenza in 1902. The entire Gravitelli faunal collection was lost in the early 1900's. The recent rediscovery of two casts in the collections of the Museo di Storia Naturale of the University of Florence represents the only available material from this locality (in addition to the original description and illustration by Seguenza). The study of these casts allows a revision of the Gravitelli suid and its attribution to the genus *Propotamochoerus*. Although a specific determination is not possible, we suggest probable affinities with the species *P. hysudricus* or *P. provincialis*.

Riassunto. Due calchi provenienti da Gravitelli appartenenti ad un suide descritto dal Seguenza nel 1902 sono stati di recente riscoperti nelle collezioni del Museo di Storia Naturale dell'Università di Firenze, e vengono qui descritti e figurati. Lo studio dei resti consente una attribuzione al genere eurasiatico *Propotamochoerus*. Anche se una determinazione certa a livello di specie rimane impossibile, gli esemplari di Gravitelli mostrano le maggiori affinità con le specie *P. hysudricus* e *P. provincialis.* Gli esemplari esaminati costituiscono l'unica testimonianza oggi disponibile della storica collezione di Gravitelli.

Introduction

L. Seguenza (1902, 1907) first described the mammal remains found in lignite layers interbedded with sandy clays near the base of the Messinian sequence in the Gravitelli area. The mammal assemblage is referred to the Messinian, late Turolian (MN 13 of the European biochronologic scheme; Rook 1992; Kotsakis et al. 1997). Unfortunately, all the fossil material was destroyed by the earthquake that razed Messina in 1908, and the locality, which has been absorbed by the town of Messina, is no longer accessible. Therefore, all of the more recent revisions, such as those of Hooijer (1946), Thomas et al. (1982), Rook et al. (1991) and Rook (1999), are based on Seguenza's photographs and descriptions. A complete faunal list is derived from Rook (1992) and Kotsakis et al. (1997) and include the following taxa: *Mesopithecus* sp., Viverridae indet., *Metailurus parvulus*, *Thalassictis hyaenoides*, *Zygolophodon borsoni*, *Z. turicensis*, *Dicerorhinus* sp., *"Ceratotherium"* cf. *pachygnathus*, *Hexaprotodon siculus*, *Parabos* sp. In addition to these species is reported the occurrence of a suid, originally referred by Seguenza (1902, tav. VI, fig. 12-16) to *Sus erymanthius* and listed by later authors as *Microstonix major erymanthius* (Kotsakis 1984; Kotsakis et al. 1997; Rook 1992).

During recent work of managing and ordering collection at the Paleontological Section of the Museo di Storia Naturale dell'Università di Firenze, two casts of the suid remains from Gravitelli (an upper M^3 and a maxillary bone fragment bearing P^4-M^1) have been unexpectedly located. The recovery of these "new" old casts (entered in the collection in 1881) allows us to redescribe the Gravitelli suid and to revise its taxonomical attribution.

Methods

Description of dental morphological characters and topographic features is based on the newly available casts and is compared to the illustrations and descriptions provided by Seguenza (1902, tav.

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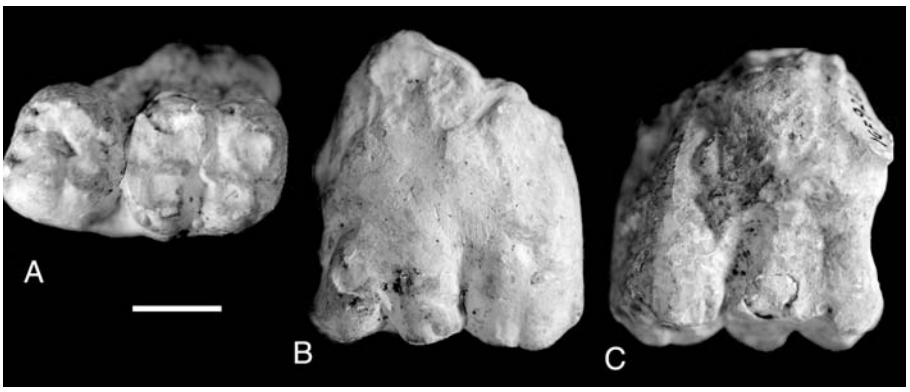

Fig. 1 - Cast of P^4-M^1 (IGF 9261V). A) Occlusal. B) Labial. C) Lingual. Scale bar 1 cm.

VI, fig. 12-16). The comparative sample used for the study of Gravitelli material consists of Late Miocene suids from Eurasia and Africa. Dental terminology used here is according Pickford (1988), wear stage classification is according Armour-Chelu et al. (2003). All measures are in millimeters. The abbreviations used in the text are as follows:

DAP: maximum length; DTa: width of the first pillar pair; DTp: width of the second pillar pair; DTpp: width of the talon/talonid; HLa: height of the first labial cusp; HLp: height of the second labial cusp; HLpp: height of the talon/talonid, taken on the labial side; Hla: height of the first lobe, taken on the lingual side; Hlp: height of the second lobe, taken on the lingual side; Hlpp: height of the third lobe, taken on the lingual side.

Description

IGF 9261V - Right maxillary bone fragment bearing P^4-M^1.

The fourth upper premolar (Fig. 1A-C) is squared in outline, with rounded lingual side. A cingulum is present both anteriorly and posteriorly, the posterior one being more strongly marked. The tooth bears three main cusps: paracone and metacone on the labial side, protocone on the lingual side. From both paracone and metacone, take origin two accessory cusps, elongated towards the sagittal valley, that is almost completely filled by the latter accessory cusps. Measurements: DAP= 13.88 mm; DTa= 16.02 mm; DTp= 15.12 mm; HLa= 9.72 mm; HLp= 10.26 mm; Hl= 7.74 mm.

The first upper molar (Fig. 1A-C) has a rectangular outline and exhibits a relatively advanced stage of wear. It bears four main cusps. In between the anterior pair of cusps and the posterior one, an accessory cusplet is present, just in the middle of the tooth crown. The anterior cingulum, albeit present, is very weak. Measurements: DAP= 18.18 mm; DTa= 15.93 mm; DTp= 15.45 mm; HLa= 6.20 mm; HLp= 6.30 mm; Hla= not measaurable; Hlp= 6.34 mm.

IGF 9262V - Isolated right upper third molar.

The tooth shows a sub-triangular outline (Fig. 2A). It is at a slightly advanced stage of wear. A well developed anterior cingulum bears, in central position, an accessory cusp. A second accessory cusp is situated in between the first and second couple of main occlusal cusps. Talon is simple, made up by a main cusp and by two small accessory cusps on its labial side. The cast also preserves the roots (Fig. 2-B). Five main roots are recognizable, two in correspondence of the anterior cusps, two in correspondence of the posterior cusps, and a fifth on below the talon. An additional small root occurs on the anterior margin, just below the central additional cusp on the anterior cingulum. The wear of the occlusal surface ("wear stage" 4 sensu Armour-Chelu et al. 2003) reveals the enamel thickness. The latter, measured on the lingual side of main cusps has the following values: 2.35 mm (at paracone), 2.97 mm (at protocone), 2.58 mm (at metacone), and 3.34 mm (at hypocone). Measurements: DAP= 30.45 mm; DTa= 22.79 mm; DTp= 20.00 mm; DTpp= 12.34 mm; HLa= 10.21 mm; HLp= 9.63 mm; HLpp= 7.53 mm; Hla= 8.73 mm; Hlp= 8.30 mm; Hlpp= 7.82 mm.

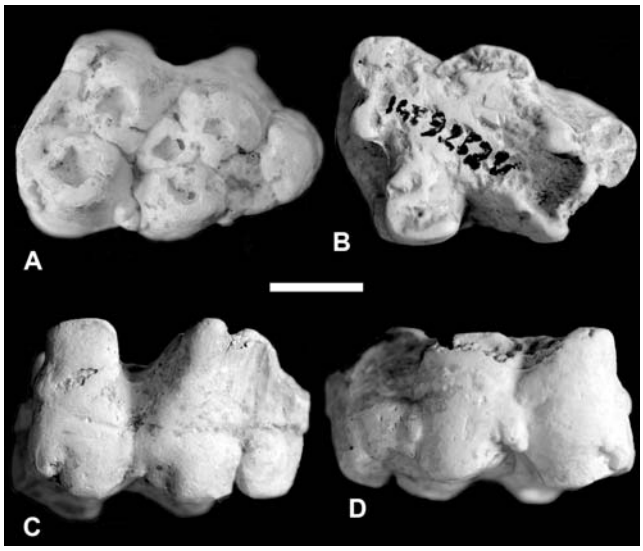

Fig. 2 - Cast of M^3 (IGF 9262V).A) Occlusal. B) Inferior. C) Labial. D) Lingual. Scale bar 1 cm.

Discussion

Old World suid fossil record during the Late Miocene (in a time span encompassing European mammal units MN12 and MN13) is made up by representatives of the subfamilies Suinae in Eurasia and Tetraco-

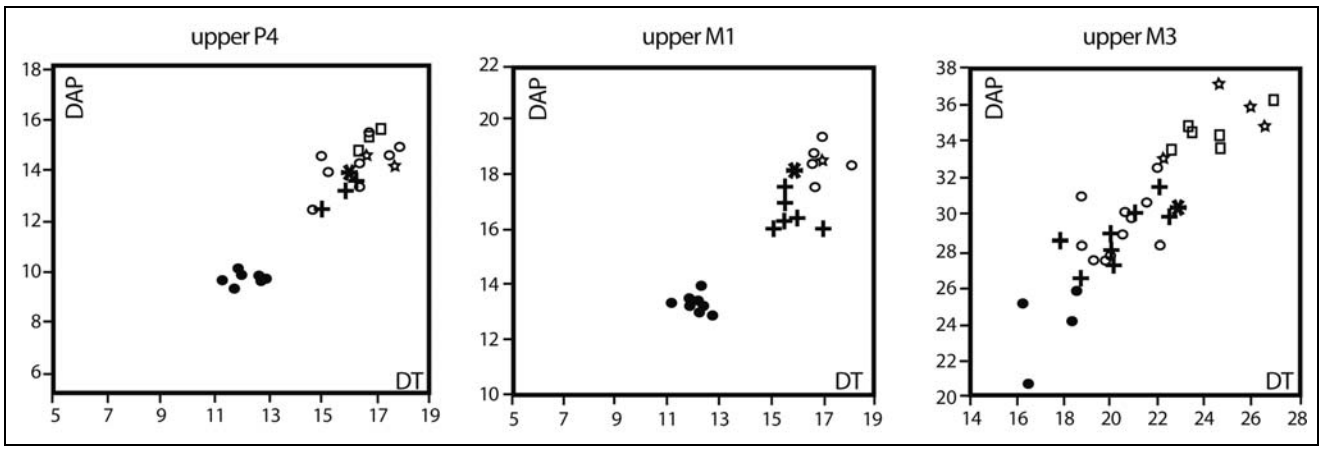

Fig. 3 - Scatter diagram of DAP vs DT plotting Gravitelli specimens and other *Propotamochoerus* species. Asterisk: *Propotamochoerus* sp. from Gravitelli; Open star: *P. provincialis*; Open square: *P. hyoterioides*; Cross: *P. hysudricus*; Solid circle: *P. wui*; Open circle: *P. paleochoerus*. Data from Hunermann (1968), van der Made et al. (1999), van der Made & Defen (1994), Pickford (1998), Pickford & Liu (2001) and G.G. unpublished data.

nodontinae in Africa (Pickford 1993). Since an apomorphy of family Suinae (Pickford 1988) is the P^4 sagittal valley closed by the accessory cusps at paracone and metacone, the Gravitelli specimens are referred to the Suinae. In addition, the Gravitelli specimens does not fit the Tetraconodontinae pattern, where P^4 is significantly more inflated and the paracone and metacone are fused.

Latest Miocene Suinae are represented by two tribes, Propotamochoerini and Hippohyini (Pickford 1988). Hippohyini morphologies (highly specialised forms, with very hypsodont molars) are not characterising Gravitelli specimens, while they actually fit the general morphology of tribe Propotamochoerini. The latter tribe includes six genera (Pickford 1988; 2004): *Propotamochoerus*, *Eumaiochoerus, Hippopotamodon*, *Microstonyx*, *Chleuastochoerus*, *Molarochoerus*. Because of the small size, Gravitelli specimens are excluded from the large-sized genera *Microstonyx* and *Hippopotamodon*. The genus *Chleuastochoerus* is a small sized taxon much smaller than Gravitelli specimens. Gravitelli specimens also differs from *Molarochoerus*, a genus characterised by fully molarised P^4. *Eumaiochoerus* is a genus endemic to the latest Miocene of the Tusco-Sardinian paleobioprovince (OZF in Bernor et al. 2001). The Gravitelli specimens are closely comparable to this genus, but the M^3 morphology (with labial side much convergent towards the sagittal plane) is different. Finally, the Gravitelli specimens compare closely in both size and morphology to the genus *Propotamochoerus* and we refer them to this genus.

Propotamochoerus exhibits a wide geographic range in the Late Miocene of Eurasia. It has been named by Pilgrim (1926) on material from Siwaliks. The genus has been then synonimized with genus *Korynochoerus* Smidth-Kittler, 1971 (cfr. Ginsburg 1980; Pickford 1988; van der Made & Moya-Solà 1989). *Propotamochoerus* includes six recognized species: *Propotamochoerus palaeochoerus*, *Propotamochoerus wui*, *Propotamochoerus hysudricus*, *Propotamochoerus hyotherioides*, *Propotamochoerus parvulus*, and *Propotamochoerus provincialis*. In a recent paper Pickford & Liu (2001) demonstrated as synonymous *P. wui* and *P. parvulus*. Specific differentiation within the genus *Propotamochoerus* is based on cranial anatomy, size and morphology of incisors and canines, as well as on relative proportions of molars. For our sample we only can base our analysis on the molar size and proportions, being dental morphology of P^4, M^1 and M^3 relatively uniform within the genus. Graphs in figures (Fig. 3) show the position of Gravitelli specimens within the range of variability of *Propotamochoerus* species. By size and proportions of M^3 and P^4, Gravitelli specimens are close to *P. hysudricus* and *P. paleochoerus*. Concerning M^1 it is clear that *P. wui* is markedly smaller in size than other species, but also in general this tooth is relatively uniform and not very informative. It is also clear that only by size it is impossible to derive a specific separation, because of the great overlap in dimensions. For this reason it is impossible to determine the Gravitelli sample at a specific level.

Paleogeography and biochronology of genus *Propotamochoerus*

As noted by Bernor & Fessaha (2000) if we accept the synonymy *Propotamochoerus* - *Korynochoerus*, the genus would have a very wide distribution from 12 MA to 5 MA in Eurasia and Arabia. *Propotamochoerus paleochoerus* is known in Eurasia beginning with MN8, it is abundant in the MN9, and has its last occurrence in MN10. Its geographic range is wide, from Spain (van der Made 1997) to Ukraine (van der Made et al. 1999). *Propotamochoerus provincialis* is well known from sites

in France and Spain beginning with the Late Miocene (MN13) and becomes extinct during the Pliocene, in the MN15 (Faure & Guerin 1982; van der Made et al. 1999). *Propotamochoerus wui* (=*P. parvulus*) and *Propotamochoerus hyotherioides* are taxa from the Late Miocene of China (MN 9 – MN 11; correlative with the Nagri Formation in Pakistan; van der Made & Defen 1994; Pickford & Liu 2001). *Propotamochoerus hysudricus* is known from Arabia (Bishop & Hill 1999) and from the Indian subcontinent (middle Siwaliks). Its chronologic range is from 10 to 6 MA (Pickford 1988), corresponding to European MN 11 - MN 13 biochrons.

Conclusions

Casts of a Late Miocene suid from Gravitelli have been located. These represents the only known direct evidence of this important fauna that was destroyed in the early 1900s. These casts are important because allow a secure taxonomic revision and because represent an historical documentation of a lost fauna. On the basis of general morphology and dimensions, the Gravitelli suid is referred to the genus *Propotamochoerus*. Although a specific determination is not possible, within the known *Propotamochoerus* species we suggest (on the basis of morphology and biochronology) probable affinities with the species *Propotamochoerus hysudricus* or *Propotamochoerus provincialis*.

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