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Suidae (Artiodactyla, Mammalia) from the Miocene of Bełchatów in Poland

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Abstract: Scarce remains of suids have been found in the Miocene layers of the brown coal mine of Bełchatów in Poland. Bełchatów C, representing MN 4, yielded a tooth of *Hyotherium soemmeringi*. The uppermost layer with Miocene faunal remains, Bełchatów A, containing a fauna indicating MN 9, yielded one tooth of Suidae unsufficient for identification to species and genus.

Key words: fossil mammals, Artiodactyla, Suidae, Miocene, Poland.

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I. INTRODUCTION

The earliest data on remains of Miocene suids in the present Poland originate from the end of the 19th and beginning of the 20th century and concern the region of Opole (Oppeln) in Silesia. In 1870 RÖMER mentioned in his Geologie von Oberschlesien "*Hyotherium* sp." as represented by one premolar and fragments of a molar from Domaradz (Damratsch), a few kilometers from Opole in Silesia. STEHLIN (1899/1890) noted *H. simorrense* from "Tauenzinow" near Opole and ilustrated two teeth from that locality. The same specimens were studied by WEGNER (1908), who was of the opinion that they represent *Hyotherium soemmeringi*. The morphology and dimensions of these specimens as illustrated by STEHLIN (1899/1900, Pl. VI, Fig. 26) point rather to *Parachleuastochoerus* cf. *steinheimensis*.

ANDREAE (1904) listed from Opole 1 (Oppeln) "cf. *Choerotherium sansaniense* LART. sp. (oder *pygmaeum* DEP.)", identified by SCHLOSSER on the basis of one astragalus. WEGNER (1913) studied new material from the same locality and recognized "*Hyotherium simorrense* LARTET 1851," represented by a lower canine tooth. An upper canine was also illustrated by WEGNER and listed as probably belonging to the same species. The material as illustrated by WEGNER is insufficient to be identified as belonging to a suid.

GŁAZEK et al. (1971) described two fragmentary mandibles and several bones of the postcranial skeleton of *Hyotherium simorrense* from another Miocene locality in Silesia, called Przeworno. They were collected in one of the two localities existing in Przeworno, namely Przeworno 2. From locality Przeworno 1 in the same quarry they described one incisor as belonging to *Hyotherium*

aff. *soemmeringi* (MEYER, 1829). KUBIAK (1981) studied new materials from Przeworno and described the mandible and a few isolated teeth as belonging to *Conohyus simorrensis* (LARTET, 1851). According to him, Przeworno 1 and 2 are of the same age and the tooth identified as *Hyotherium soemmeringi* by GŁAZEK et al. (1971) belongs to *Hyotherium simorrense*. KUBIAK (1981) also identified numerous remains of the tayassuid *Taucanamo sansaniense* (LARTET, 1851) in Przeworno 1.

According to new investigations (CHEN 1984, VAN DER MADE 1900, 1994b, FORTELIUS et al. in press) three species of Suoidea are present in Przeworno: *Albanohyus* cf. *pygmaeus* (DEPERET, 1892), *Taucanamo grandaevum* (FRAAS, 1870) and *Parachleuastochoerus steinheimensis* (FRAAS, 1870).

The brown coal mine of Bełchatów in central Poland contained shells of molluscs and remains of small mammals in layers of limnic sediments intercalated between the coal seams (KOWALSKI 1994). The remains of large mammals are very rare (KOWALSKI & KUBIAK 1993). Three main horizons with animal remains have been recognized: the upper, Bełchatów A, belongs, according to its rodent fauna, to MN 9, the middle one, Bełchatów B, belongs to MN 5/6 and the lowermost, Bełchatów C, represents MN 4.

The remains of suids described in the present paper originate from Bełchatów C and Bełchatów A.

The specimens are housed in the collection of the Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, in Cracow.

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II. SYSTEMATIC PALAEONTOLOGY

Family Suidae

Subfamily Hyotheriinae

Genus *Hyotherium* MEYER, 1834

Hyotherium soemmeringi (MEYER, 1829)

L o c a l i t y. Bełchatów C.

M a t e r i a l. Right P^3 (N° MF/2166) (Fig. 1).

D e s c r i p t i o n a n d d i m e n s i o n s. The paracone is large and conical. There is no clear and individual metacone. The protocone is small and low. It is a simple structure and there is no lingual cingulum on the protocone. A pattern like this is found in D^2, P^2 and P^3 of the Suoidea. The dimensions of the tooth are: Antero-posterior diameter = 15.5; anterior transverse diameter = 9.6; posterior transverse diameter = 12.1.

C o m p a r i s o n. The known European Suoidea are listed by VAN DER MADE (1990). The dimensions of our specimen were compared with P^3 and P^2 of a number of European Miocene species of the suids (Fig. 2). The very small suids can be disregarded, as well as some of the very large ones. It is apparent that the P^2 is usually a much narrower tooth than the P^3: the index I = 100 antero-posterior diameter/transverse diameter is greater than 150 in most P^2, whereas it is smaller in the P^3. The only exception are the listriodonts, where the premolars are "molarized". The D^2 is narrow, even in listriodonts. Listriodont P^2 and P^3 have lingual cingula that are always more or less separate from the protocone: the tooth from Bełchatów is a P^3 and does not belong to a listriodont.

Propotamochoerus palaeochoerus (KAUP, 1833) has a metacone that is close to, but well separated from the paracone. Other European species of *Propotamochoerus* PILGRIM, 1925 or *Microstonyx* PILGRIM, 1926 are larger than *P. palaeochoerus* and thus much too large for the tooth

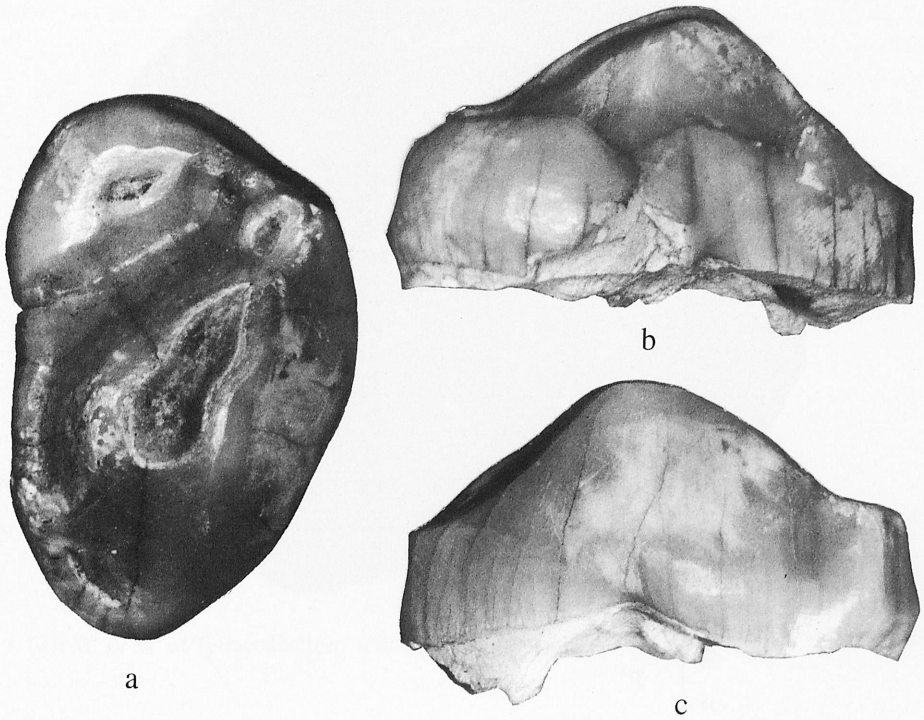

Fig. 1. Right P^3 of *Hyotherium soemmeringi* from Bełchatów C. a – occlusal, b – buccal, c – lingual.

in question. The P^3 of *Conohyus* PILGRIM, 1925 and *Parachleuastochoerus steinheimensis* (FRAAS, 1870) are larger while that of *Parachleuastochoerus huenermanni* (HEISSIG, 1989) is smaller. *Parachleuastocherus crusafonti* GOLPE, 1972 is still smaller. In size and morphology the tooth from Bełchatów is close to that of *Hyotherium soemmeringi*, the largest species of this genus.

Subfamily Tetraconodontinae or Suinae

Genus and species indet.

L o c a l i t y. Bełchatów A.

M a t e r i a l. Left M^1 or M^2 (N° MF/2167) (Fig. 3).

D e s c r i p t i o n a n d d i m e n s i o n s. The tooth is bunodont with four main cusps, as is common in Suoidea, and it is slightly longer than wide (antero-posterior diameter = 21.6; anterior transverse diameter = 20.3; posterior transverse diameter = 19.3). The protoconule is fused to the cingulum. The posterior cingulum has a cusp in the middle and is not connected to the metaconule.

C o m p a r i s o n. The tooth does not belong to a listriodont, since the European species are lophodont or sublophodont, nor to the Old World "Tayassuidae", which have the protoconule connected to the protocone (VAN DER MADE 1994a). The size of the tooth is greater than that of the M^2 of *Hyotherium soemmeringi* (AZANZA et al. 1993, fig. 3), the largest species of this genus, and all *Aureliachoerus* GINSBURG, 1974 (VAN DER MADE 1994a). It is comparable in size to the M^2 of *Xenohyus venitor* GINSBURG, 1980, but *Xenohyus* GINSBURG, 1980 has M^2 that are wider

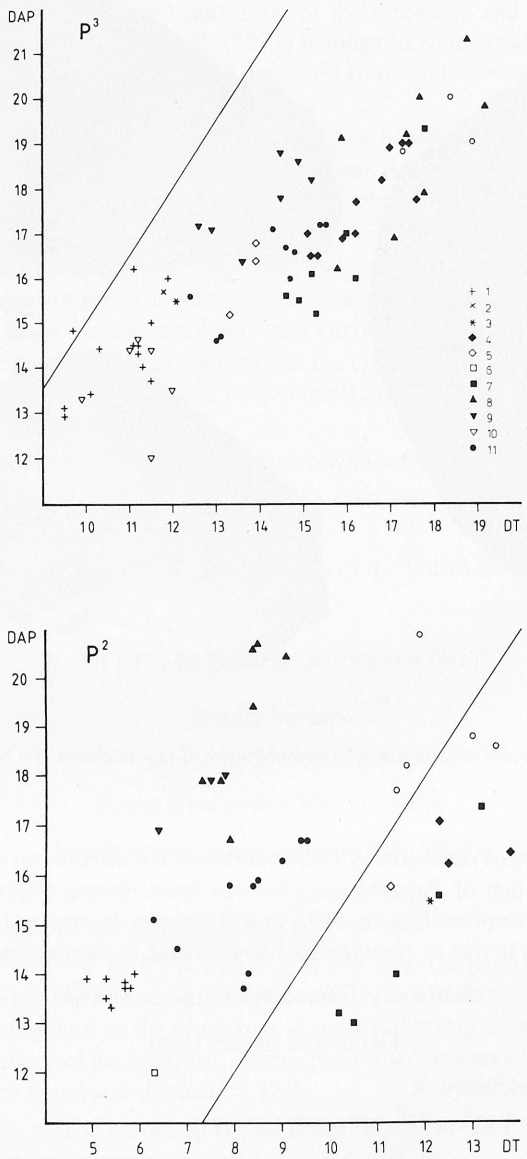

Fig. 2. Antero-posterior diameter (DAP) and posterior transverse diameter (DTp) of the P^3 of *Hyotherium soemmeringi* from Bełchatów compared to D^2, P^2 and P^3 of other species. 1 – *Hyotherium soemmeringi* from Sandelzhausen (Bayerische Staatssammlung für Paläontologie und historische Geologie in München); 2 – *H. soemmeringi* from type locality Georgensgmünd (Naturhistorisches Museum, Basel); 3 – P^3 of *H. soemmeringi* from Bełchatów (Institute of Systematics and Evolution of Animals, Cracow); 4 – *Bunolistriodon lockharti* (POMEL, 1848) from various localities; 5 – *Bunolistriodon* aff. *latidens* (BIEDERMANN, 1873) from various localities; 6 – D^2 in the diagram for P^2 of *Bunolistriodon lockharti*; 7 – *Listriodon splendens* MEYER, 1846 from La Grive (Muséum Guimet, Lyon – MGL; Université Claude Bernard, Lyon – UCBL; Instituto di Geologia, Firenze – IGF); 8 – *Conohyus simorrensis* from Göriach (Landesmuseum Joanneum, Graz); 9 – *Parachleuastochoerus steinheimensis* from La Grive (MGL, UCLB and IGF); 10 – *Parachleuastochoerus huenermanni* from various localities; 11 – *Propotamochoerus palaeochoerus* from various European localities. The line represents the relation: antero-posterior diameter = 1.5 transverse diameter.

Fig. 3. Left M^1 or M^2 of Tetracodontinae or Suinae sp. indet. from Bełchatów A.

than long and tend to have the posterior cingulum connected to the metaconule (GINSBURG et al. 1988, Table 2, Plate 1, figs. 13, 14, 16). *Albanohyus* GINSBURG, 1974 is a very small suid the affinities of which are not yet well known (VAN DER MADE 1994b). This leaves the Tetraconodontinae and Suinae as possibilities.

There are two European genera of Tetraconodontinae: *Parachleuastochoeus* GOLPE, 1972 and *Conohyus*. Of the former, *P. steinheimensis* of MN 8 and 9 has a size comparable to this tooth (FORTELIUS et al. in press), though earlier representatives of the species tend to be smaller. Of the latter genus, *C. ebroensis* AZANZA, 1986 may have a M^2 of this size, though at present no upper molars are known of this species (VAN DER MADE 1989). European mainland Suinae include *Propotamochoerus*, *Microstonyx* and *Sus* LINNAEUS, 1758 (VAN DER MADE & MOYÁ-SOLÁ 1989). The tooth might be a M^1 or M^2 of species of any of those genera (data on size given by: HÜNERMANN 1968; VAN DER MADE et al. 1992; VAN DER MADE & HAN 1994).

Bearing in mind the probable age of this tooth and the species that were abundant at that time, it is possible that the tooth belonged to *Propotamochoeus palaeochoerus*, but it might have belonged to at least 6 other species [*Propotamochoeus steinheimenis*, *Conohyus ebroensis*, *Propotamochoerus provincialis* (GERVAIS, 1859), *Microstonyx antiquus* (KAUP, 1833), *M. major* (GERVAIS, 1848/1852), *M. erymanthius* (ROTH & WAGNER, 1854)]. The first *Sus*, *S. arvernensis* CROIZET & JOBERT, 1828, is much younger (first known occurrence in MN 14).

III. DISCUSSION

Hyotherium soemmeringi was a common species in Europe, with a possible first occurrence in MN 3, but certainly in MN 4 to 6 (VAN DER MADE 1990). This fits the age of Bełchatów C (MN 4) well. The material extends the geographical range of the species to the northeast.

The molar from Bełchatów A cannot be determined to species, nor even to genus, but it belongs to a taxon of an evolutionary stage indicative of MN 8 or later. This is in accordance with the age of Bełchatów A (MN 9).

Hyotherium soemmeringi is well known from lignite deposits and is usually considered to be indicative of more humid conditions (THENIUS 1956). Bełchatów is another case where *Hyotherium* is found associated with lignite and strengthens the correlation between the species and its supposed preferred environment.

REFERENCES

ANDREAE A. 1904. Dritter Beitrag zur Binnekonchylienfauna des Miocäns von Oppeln in Schlesien. Mitteilungen der Roemer-Museum, Hildsheim, **20**: 1-22.

AZANZA B., CERDEO E., GINSBURG L., MADE J. VAN DER, MORALES J., TASSY P. 1993. La faune des grands mammifères du Miocène Inférieur (MN 4, zone C de l'Aragonien) d'Artesilla Villafeliche (Saragosse), Bassin de Catalayud-Teruel (Espagne). Bulletin du Museum national dHistoire naturelle, Paris, 4e sér.,section C, **15**: 105-153.

CHEN G. 1984. *Suidae* and *Tayassuidae* (*Artiodactyla, Mammalia*) from the Miocene of Steinheim a. A. (Germany). Palaeontographica, Abt. A, **184**: 79-93.

FORTELIUS M., MADE J. VAN DER, BERNOR R. L. (in press). Middle and Late Miocene Suoidea of Central Europe and the Eastern Mediterranean: evolution, biogeography and paleontology. [In:] R. L. BERNOR, V. FAHLBUSCH, S. RIETSCHEL (eds.) – Later Neogene European biotic evolution and stratigraphic correlation. Columbia University Press.

GINSBURG L., HUIN J., LOCHER J.-P. 1988. Les Suidae (Artiodactyla, Mammalia) du Miocène inférieur des Beilleaux à Savigné-sur-Lathan (Indre-et-Loire). Bulletin du Museum national d'Histoire naturelle, Paris, 4 série, 10, sec. C, **2**: 197-207.

GŁAZEK J., OBERC J., SULIMSKI A. 1971. Miocene vertebrate faunas from Przeworno (Lower Silesia) and their geological setting. Acta geologica polonica, **21**: 473-516.

HÜNERMANN K. A. 1968. Die Suidae (Mammalia, Artiodactyla) aus den Dinotheriensanden (Unterpliozän = Pont) Rheinhessens (Südwestdeutschlands). Schweizerische palaeontologische Abhandlungen, **86**: 1-96.

KOWALSKI K. 1994. Evolution of *Anomalomys* GAILLARD, 1900 (*Rodentia, Mammalia*) in the Miocene of Poland. Acta zoologica cracoviensia, **37**: 163-176.

KOWALSKI K., KUBIAK H. 1993. *Gomphotherium angustidens* (CUVIER, 1806) (Proboscidea, Mammalia) from the Miocene of Bełchatów and the Proboscidean Datum in Poland. Acta zoologica cracoviensia, **36**: 275-280.

KUBIAK H. 1981. Suidae and Tayassuidae (Artiodactyla, Mammalia) from the Miocene of Przeworno in Lower Silesia. Acta geologica polonica, **31**: 59-70.

MADE J. VAN DER 1989. A *Conohyus* – lineage (Suidae, Artiodactyla) from the Miocene of Europe. Revista Española de paleontologia, **4**: 19-28.

MADE J. VAN DER 1990. A range chart for European Suidae and Tayassuidae. Paleontologia i Evolució, **23**: 99-104.

MADE J. VAN DER 1994a. Suoidea from the Lower Miocene of Cetina de Aragón, Spain. Revista Española de paleontologia, **9**: 1-23.

MADE J. VAN DER 1994b. *Albanohyus*, a small pig (Suidae) of the Middle Miocene. Neogene and Quaternary mammals of the Palaearctic, Kraków, 17/5-21/5/1994. Abstracts, 77-78.

MADE J. VAN DER, HAN D. 1994. Suoidea from the Late Miocene hominoid locality Lufeng, Yunnan province, China. Proceedings, Koninklijke Nederlandse Akademie van Wetenschappen **97**: 27-82.

MADE J. VAN DER, MONTOYA P., ALCALÁ L. 1992. *Microstonyx* (Suidae, Mammalia) from the Upper Miocene of Spain. Geobios, **25**: 395-413.

MADE J. VAN DER, MOYÁ-SOLÁ S. 1989. European Suinae (Artiodactyla) from the Late Miocene onwards. Bollettino della Societa de Paleontologia Italiana, **28**: 329-339.

RÖMER F. 1870. Geologie von Oberschlesien. Breslau, XIV+587+XXII pp., Atlas of 50 tabls., 14 maps and profiles.

STEHLIN H. G. 1899/1900. Ueber die Geschichte des Suiden-Gebisses. Abhandlungen der Schweizerischen paläontologischen Gesellschaft, **26-27**: 1-527.

THENIUS E. 1956. Die Suiden and Tayassuiden der Steirischen Tertiärs VIII. Sitzungsberichte der Akademie der Wissenschaften in Wien, s. 1, **165**: 337-382.

WEGNER R. N. 1908. Zur Kenntnis der Säugetierfauna des Obermiocäns bei Oppeln (Oberschlesien). Verhandlungen der K. K. geologische Reichsanstalt, **1908 (5-6)**: 11-117.

WEGNER R. N. 1913. Tertiär und umgelagerte Kreide bei Oppeln (Oberschlesien). Palaeontographica, **60**: 175-274.