Beitr. Paläont., **30**:329–337, Wien 2006

The Platacanthomyine Rodent *Neocometes* SCHAUB & ZAPFE, 1953 from the Miocene of Hambach (NW Germany)

by

Thomas MÖRS[*)]

MÖRS, Th., 2006. The Platacanthomyine Rodent *Neocometes* SCHAUB & ZAPFE, 1953 from the Miocene of Hambach (NW Germany). — Beitr. Paläont., **30**:329–337, Wien.

Abstract

Molars of the fossil spiny dormouse *Neocometes* are described from the Middle Miocene Ville Formation of the Hambach lignite mine in northwestern Germany. The material from the site Hambach 6C is morphologically and metrically intermediate between the biostratigraphically older species *N. similis* and the younger species *N. brunonis*, and is therefore here referred to *Neocometes* aff. *similis*. This intermediate form predominantly occurs at localities that are correlated with mammalian Neogene unit MN 5. The new finds are of palaeobiogeographic significance for the genus *Neocometes*, since Hambach 6C represents the north-westernmost outpost of terrestrial Miocene faunas in Europe.

Key words: Rodentia, Platacanthomyinae, systematics, biostratigraphy, biogeography, Neogene

Zusammenfassung

Aus der mittelmiozänen Ville-Formation des Braunkohlen-Tagebaus Hambach in der Niederrheinischen Bucht werden Molaren des fossilen Stachelbilches *Neocometes* beschrieben. Das Material aus der Fundstelle Hambach 6C nimmt morphologisch wie auch metrisch eine Zwischenstellung ein zwischen der biostratigrafisch älteren Art *N. similis* und der jüngeren Spezies *N. brunonis*. Die Hambacher Molaren werden deshalb hier zu *Neocometes* aff. *similis* gestellt. Solche intermediären Formen kommen vor allem aus Fundstellen, die mit der neogenen Säugerzone MN 5 korreliert werden. Die Funde aus Hambach 6C sind ausserdem biogeografisch von Interesse, weil es sich um die nordwestlichste terrestrische Miozänfauna Europas handelt.

1. Introduction

Hamsters and their relatives are very common elements in Miocene small mammal faunas of Eurasia. Molars of these rodents often dominate the fossil content both in stratified localities and in fissure fillings. But even in a well-investigated area like Europe, there are rodent taxa that remain scarce and enigmatic. The remarkable discovery of a fossil European representative of the Platacanthomyinae (spiny dormice) in 1953 sheds light on such a rare rodent taxon. When SCHAUB & ZAPFE (1953) described their new genus *Neocometes* from the Middle Miocene fissure fillings of Neudorf an der March (Devínská Nová Ves) in southern Slovakia, only the two extant platacanthomyine genera *Platacanthomys* and *Typhlomys* were known from southern and southeastern Asia, with their systematic status still under discussion. Since then, *Neocometes* has been found in a number of Lower and Middle Miocene localities, extending its biogeographic range from Spain to eastern China. Additionally, Upper Miocene and Plio-Pleistocene representatives of the living genera have been described from Asia (for further references to fossil East Asian platacanthomyines, see KOWALSKI, 1993; MEIN & GINSBURG, 1997; DAXNER-HÖCK, 1998; FEJFAR & KALTHOFF, 1999). Although platacanthomyines are easy to identify by their typical molar morphology, their fossil record outside Europe is extremely poor. Additionally, there are no finds of these rodents in the earliest Miocene or Oligocene, leaving the origin of *Neocometes*, as well as the phylogeny and biogeography of the whole subfamily, unresolved.

The new specimens of *Neocometes* described in this paper were recovered in northwestern Germany, about 35 km west of Cologne, where the large Hambach open-cast lignite mine of the RWE Power AG exposes thick successions of Miocene and Pliocene strata. A well-preserved and diverse vertebrate fauna was discovered in a channel fill within the Middle Miocene Frimmersdorf seam. The channel fill, horizon 6C in the local lithostratigraphy, belongs to the Miocene Ville Formation, which contains the Rhenish Main Seam (SCHÄFER et al., 2004). Hambach 6C has produced thousands of vertebrate remains, underlining the palaeontological significance of the locality. Along with marine and freshwater fishes (HIERHOLZER & MÖRS,

---

[*)] Dr. Thomas MÖRS, Department of Palaeozoology, Swedish Museum of Natural History, P.O. Box 50007, SE-104 05 Stockholm, Sweden; thomas.moers@nrm.se.

2003), amphibians, reptiles (Klein & Mörs, 2003; Joyce et al. 2004), and birds (Dalsätt et al., 2006), more than 70 mammal species have been identified to date (Mörs et al. 2000; Mörs 2002). Among large mammals, the occurrence of the extremely rare artiodactyl *Orygotherium escheri* is of special interest (Rössner & Mörs, 2001). Among small mammals, the unusually rich material of the insectivores *Lantanotherium* aff. *sansaniense* and *Plesiosorex chantrei*, *P. germanicus* (Ziegler & Mörs, 2000), and of the rodents *Myoglis meini* (Nemetschek & Mörs, 2003), *Karydomys wigharti* (Mörs & Kalthoff, 2004), and *Anchitheriomys suevicus* (Stefen & Mörs, subm.) is a special feature of the Hambach 6C fauna.

Based on the rich association of mammalian taxa, including about 30 rodent species (sciurids, petauristids, glirids, eomyids, cricetids, and castorids), this late Orleanian fauna can be correlated with the upper part of mammalian Neogene unit MN 5 (Mörs et al., 2000; Mörs, 2002). This means early Middle Miocene, and Langhian or Reinbekian according to the stratigraphy of the northwest German Cenozoic, and an absolute age-range of 16.0-15.2 Ma. Geologically, the Hambach mine lies within the Lower Rhine Embayment, which is a graben structure that has been active since the Oligocene and is filled with interlocking marine and terrestrial sediments (Schäfer et al., 2004). Sedimentological evidence and the various faunal and floral elements of the Hambach 6C locality indicate an estuarine environment, containing extensive coal swamps and a large fluviatile system. The climate in the Middle Miocene of northwestern Germany was humid, warm, and with distinct seasonality. Mean annual precipitation is estimated to be above 1000 mm, mean annual temperature between 16° and 18° C, cold month mean between 9° and 12° C, and warm month mean between 25° and 28° C (Utescher et al., 2000).

The purpose of this paper is to provide a description of the new *Neocometes* material and discuss its implications. The specimens add to the biogeography of the genus *Neocometes*, since Hambach 6C represents Europe's northwestern-most terrestrial Miocene fauna. Additionally it reveals biostratigraphic and palaeoecologial information for this important site.

The paper is dedicated to our colleague Gudrun Höck on the occasion of her 65th birthday. Gudrun's work has added significantly to our knowledge of Eurasian terrestrial Miocene faunas. In her volume on the "Vertebrates from the Early Miocene lignite deposits of the opencast mine Oberdorf (Western Styrian Basin, Austria)", which exemplifies how Gudrun likes to publish the faunal content of one locality, she also described the remains of *Neocometes* (Daxner-Höck, 1998).

2. Materials and methods

All fossil teeth from Hambach 6C are dark brown to black in colour, and generally well preserved. The molar material was obtained by screen washing of sediment samples that were originally collected at the site by Fritz von der Hocht and the late Heinz Tobien. The minimum sieve width was 0.5 mm. Dental morphology in the description follows Fejfar (1974, 1999) and Fejfar & Kalthoff (1999), the systematics follow McKenna & Bell (1997). In Plate 1, all right molars are figured as left ones for better comparison; they are indicated as "inverted" Comparative material of *Neocometes similis* (Plate 1, fig. 8-9) was collected by the author at the Lower Miocene (MN 4) karst fissures Petersbuch 7 (Bolliger & Rummel, 1994) and Petersbuch 38 (Fejfar, 1999) in the limestone quarry of the Schöpfel company, Bavaria. It is catalogued under the numbers NRM PZ M. 7901-7921 at the Swedish Museum of Natural History, Department of Palaeozoology. The Hambach 6C specimens described below are housed at the Institut für Paläontologie, Rheinische Friedrich-Wilhelms-Universität Bonn, with the collection acronym IPB-HaH.

3. Systematic Palaeontology

Ordo Rodentia Bowdich, 1821
Familia Muridae Illiger, 1811
Subfamilia Platacanthomyinae Alston, 1876

Genus *Neocometes* Schaub & Zapfe, 1953

***Neocometes* aff. *similis* Fahlbusch, 1966**
(Plate 1, figs. 1-7)

Material and measurements:

M1:

IPB-HaH 5468: M1 dext.	(1.60 x 1.12)
IPB-HaH 5546: M1 sin.	(1.72 x 1.16)
IPB-HaH 5547: M1 sin.	(1.92 x ?1.48)

M2:

IPB-HaH 5230: M2 dext.	(1.52 x 1.32)
IPB-HaH 5469: M2 dext.	(1.44 x 1.24)
IPB-HaH 5549: M2-fragm. sin.	

M3:

IPB-HaH 5229: M3 dext.	(1.36 x 1.20)

m1:

IPB-HaH 5231: m1 dext.	(2.04 x 1.20)

Description:

M1 (Plate 1, Figs 1-3): Three complete first upper molars are present, two of them in a medium stage of wear, and one which is more heavily worn and slightly rolled by transport (especially posterolabially). The latter specimen, as well as one of the less worn M1, has a closed syncline Ia, which is *N. similis*-morphotype sensu Fejfar (1974) and Schötz (1981). In HaH 5547, syncline Ia runs parallel to syncline I, whereas in HaH 5546 it forms an oval islet. The only right M1 (HaH 5468) has a more reduced and mesially opened syncline Ia, which is morphotype A sensu Fejfar (1974) and Schötz (1981). Synclines I, II, and III are labially open in all three specimens, whereas syncline IV is closed at least in the two less worn M1 (HaH 5468, 5546), and most probably in the third specimen, too. In HaH 5546 and 5547, the anterior transverse ridge is bent towards the anteroloph, and therefore syncline I opens in a funnel shape on the labial side. In one molar (HaH 5468), syncline II is very narrow in the center of the tooth, and it seems that the protoloph and mesoloph are slightly fused.

M2 (Plate 1, Figs 4-5): The two complete second upper molars are as heavily worn as HaH 5547, and one of them (HaH 5469) is anterolabially slightly damaged. HaH 5469 is shorter than HaH 5230, partly due to the strongly eroded anterior and posterior walls. The fragment represents the anterior part of a left M2, with the labial wall missing. The two complete molars are nearly identical in morphology with synclines I, II, and III labially open, syncline IV closed, and a very small, closed syncline Ia. The fragment also has a small, closed syncline Ia.

M3 (Plate 1, Fig. 6): The single complete third upper molar is medium worn, and in this stage of wear exhibits a closed lingual wall. Therefore, syncline II does not divide the tooth into an anterior and a posterior part, as in M1 and M2. The mesoloph is the only loph that does not reach the lingual wall. Synclines Ia – IV are all labially open, with a fused opening of synclines Ia and I. Therefore, the anterior transverse ridge is (labially) shorter than the other ridges.

m1 (Plate 1, Fig. 7): The lower dentition is documented by only one complete first lower molar, showing a medium stage of wear. This m1 represents morphotype A sensu FEJFAR (1974), where the metaconid/paraconid ridge is labially connected with the anteroconid. Therefore, syncline I is closed on the labial side. Syncline Ia is very long and opens to syncline I. The mesial and lingual sides of the anterior part of the tooth are somewhat separated into stylids, which allow two weak lingual openings for syncline Ia/I at this stage of wear. At a slightly more worn stage there would be no opening at all for synclines Ia and I. Synclines II and III are open both on the labial and lingual sides, with syncline III running almost transversely. Syncline IV is only lingually open.

Comparisons: The dimensions of the *Neocometes* teeth from Hambach 6C vary considerably. Some of them (HaH 5468, 5546) fit well with *N. similis* from Erkertshofen 2 (MN 4) (FAHLBUSCH, 1966), some of them (HaH 5229, 5231) fit well with *N. brunonis* from Neudorf (MN 6) (FEJFAR, 1974), and one molar (HaH 5230) is intermediate between the size ranges of these two populations. The upper first molars from Hambach 6C also vary more than those from Maßendorf (MN 5) (SCHÖTZ, 1981), which is the third-richest locality and of approximately the same age as Hambach 6C. Unfortunately, the record from Franzensbad (MN 5) (FEJFAR, 1974) is so poor that it is not possible to compare with this intermediate population of *N.* aff. *similis* (see discussion below).

The intermediate evolutionary stage in size is mirrored in the morphology of the Hambach molars. Two of the M1 show a morphotype that is characteristic of *N. orientalis*, *N. similis*, and *N.* aff. *similis*, and one (HaH 5468) represents morphotype A of a modification that occurs only in *N. brunonis* according to FEJFAR (1999) and FEJFAR & KALTHOFF (1999). In this respect, the Hambach population seems somewhat more modern than the one from Maßendorf, where all M1 have the *N. similis*-morphotype. I might add here, that there is some confusion in the definition of M1 morphotypes in *Neocometes*: FEJFAR (1974) and SCHÖTZ (1981) use three morphotypes: *N. similis*-morphotype with a closed syncline Ia (100 % in Erkertshofen, 0 % in Neudorf), morphotype A with a mesially open syncline Ia (0 % in Erkertshofen, 84 % in Neudorf), and morphotype B with syncline Ia lost (0 % in Erkertshofen, 16 % in Neudorf). On the other hand, FEJFAR (1999) and FEJFAR & KALTHOFF (1999) use only two morphotypes: morphotype A with two modifications (closed and mesially open syncline Ia) and morphotype B in the same way as above. Another feature in the only slightly worn M1 from Hambach (HaH 5468, 5546) is the labially closed syncline IV, which according to FEJFAR (1999) and FEJFAR & KALTHOFF (1999:200) is characteristic of the oldest species, *N. orientalis* and the recent *Platacanthomys*, although it occurs in the M1 of *N. similis* from Erkertshofen 2 and Maßendorf, as well as in *N. brunonis* from Anwil (ENGESSER, 1972). The M2 show no unusual features, the labially closed syncline IV may occur in *N. similis* from Erkertshofen 2 (FAHLBUSCH, 1966) as well as in *N. brunonis* from Neudorf (FEJFAR, 1974). The single M3 from Hambach 6C morphologically resembles a specimen of *N. brunonis* (FEJFAR, 1974: fig. 33.2). The single m1, on the other hand, resembles a specimen of *N. similis* from Maßendorf (SCHÖTZ, 1981:fig. 2.3; FEJFAR, 1999:fig. 36.1; FEJFAR & KALTHOFF, 1999:fig. 4.10), which only appears to be a little more worn. The tooth represents morphotype A, which makes up 100 % in the m1 of *N. similis* from Erkertshofen, but is still present in 40 % of *N. brunonis* from Neudorf (FEJFAR, 1974; SCHÖTZ, 1981). The separation of the anterolophid into stylids is more characteristic of *N. brunonis* (FEJFAR, 1999; FEJFAR & KALTHOFF, 1999).

The evolutionary stage of *Neocometes* from Hambach 6C is comparable to material from other localities correlated with MN 5. *Neocometes* aff. *similis* from Hambach is definitely more derived than *N. similis* from MN 4 localities like Erkertshofen 2 and Oberdorf. On the other hand, the Hambach material is more primitive than *N. brunonis* from the MN 6 locality Neudorf, or from the MN 7/8 locality Anwil (ENGESSER, 1972). Thus, the *Neocometes* specimens support the correlation of the Hambach 6C site with MN 5. If compared with the material from Maßendorf, which is the locality that has produced the best record in MN 5, *N.* aff. *similis* from Hambach seems more derived, which might indicate a somewhat younger stratigraphic position for Hambach 6C.

4. Discussion and conclusions

Intermediate forms of the two species *Neocometes similis* and *N. brunonis* were attributed to *N.* cf. *similis* by FEJFAR (1999) and FEJFAR & KALTHOFF (1999); according to them the geographic distribution is limited to Central Europe and biostratigraphically *N.* cf. *similis* is restricted to MN 5. It should be clarified here, that a "cf." designation denotes that the material is unsufficient to allow for attribution to a specific species-level taxon, which is actually the case for most of the MN 5 localities (see Table 1). However, at least in some sites (Bełchatów B, Hambach 6C, Maßendorf) the material is apparently sufficient to recognise it as an intermediate form. In this case the "aff." determination should be used. In the present paper, *Neocometes* aff. *similis* is used as a distinguishable form, as proposed by Fejfar (1999) and Fejfar & Kalthoff (1999). Following these authors, *N.* aff. *similis* has been recognized from the Cheb Basin in the western Czech Republic, from the Upper Freshwater Molasse and their equivalents in Bavaria and in Baden-Württemberg, southern Germany, from the Upper Freshwater Molasse of Switzerland, and now from the Lower Rhine Basin in northwestern Germany (for localities and sites, references, and material see Table 1).

Fejfar (1999) and Fejfar & Kalthoff (1999) presented a rather schematic chronospecies-model for the evolution of *Neocometes* in the European Miocene: *Neocometes similis* is restricted to MN 4 faunal associations, *N.* aff. *similis* only documented in MN 5 (see above), and *N. brunonis* occurs in MN 6 and MN 7/8. Although there is a general consensus about the evolutionary trends in the lineage *N. orientalis – N. similis – N.* aff. *similis – N. brunonis* (Fahlbusch, 1966; Schötz, 1981; Kowalski, 1993; Daxner-Höck, 1998; Mörs, this paper), Daxner-Höck (1998) argued that there is at least not a continuous increase in size: The molars from Oberdorf (MN 4) perfectly match the morphology of *N. similis* from Erkertshofen 2, but their size, already in this Lower Miocene locality, ranges from upper values of *N. similis* to middle values of *N. brunonis*. Large *Neocometes* teeth were also reported by Aguilar et al. (1997) from Ste. Catherine 2 and 9 (MN 3). Fejfar (1999) and Fejfar & Kalthoff (1999) assigned the material from Bełchatów B to *N. similis* (as originally described by Kowalski, 1993), but this does not fit their stratigraphic scheme, as it ignores the assignment of this site to MN 5-6 (Kowalski, 1993, 1997) or MN 5 (Mein, 1999). I would like to emphasize that only the populations of the type localities, Erkertshofen 2 for *N. similis*, and Neudorf with *N. brunonis*, are sufficient to estimate variation in size and morphology (Table 1). Otherwise, *Neocometes* is a very rare element in European Miocene faunas, when it is present at all. In fact, for MN 5 there is no adequate population known, which allows any statement about variation in the dentition of *Neocometes* to be made and Maßendorf is so far the only MN 5 locality from which at least all molar positions are documented (Table 1).

Outside of Europe, there are only four molars known from the Lower Miocene (MN 4) of Li Mae Long in Thailand, described as the third and most primitive *Neocometes* species, *N. orientalis* (Mein & Ginsburg, 1997). Recently, a single molar of *Neocometes* was reported from the Shanwangian (Early Miocene) of Sihong (MN 4) in eastern China (Qiu & Li, 2003). The first record of a platacanthomyine molar from the early Middle Miocene Lower Siwaliks of the Potwar Plateau, Pakistan (Flynn, 2003:fig. 1A-B), cannot in my opinion be assigned to *Neocometes*. In contrast to the Sihong specimen, which shows the characteristic *Neocometes* morphology, the simple molar pattern with only three lophs might even argue against an affiliation of the Siwalik specimen to the Platacanthomyinae at all.

The rarity of *Neocometes* in the fossil record might be explained by a similar ecology to that of extant spiny dormice, which live as arboreal, frugivorous animals in moist habitats in subtropical and tropical forests of southern and south-eastern Asia (Kowalski, 1993; Daxner-Höck, 1998; Flynn 2003).

Although *Neocometes* is generally a rare faunal element in the European Miocene, several localities with at least some teeth have been reported since the first description of the genus by Schaub & Zapfe (1953). It is obvious, that *Neocometes similis* / aff. *similis* was widely distributed in MN 4 to MN 5 (Table 1). The oldest record of *Neocometes* in Europe comes from the fissure filling Petersbuch 28 (MN 3) in southern Germany according Fejfar & Kalthoff (1999). An MN 3 age is also discussed for the fissure fillings in the Roussillon area in southern France (Aguilar et al., 1997). The only Spanish locality, Rubielos de Mora (De Bruijn & Moltzer, 1974) is also correlated with MN 3 (Montoya et al., 1996). *N. brunonis*, on the other hand, is only known from three localities, one in MN 6, Neudorf in Slovakia, and two in MN 7/8, Anwil in Switzerland and La Grive M in southern France. Additionally, this species might be present in Vracevici, Serbia (Markovic, 2003).

According to Kowalski (1993:264) the contemporaneous occurrence of platacanthomyines in the Miocene of Europe and south-east Asia could indicate a continuous distribution of tropical forests. This might be the case in MN 4 to MN 5, but less optimal climatic conditions later on might be the reason for the very few younger records of *Neocometes*. The fauna of Hambach 6C includes a number of tropical elements, such as a chamaeleonid, a carettochelyine turtle, an anhinga, and the primate *Pliopithecus* (Mörs et al., 2000; Mörs, 2002; Joyce et al., 2004; Dalsätt et al., 2006.). The presence of *Neocometes* in Hambach, thus far the north-westernmost record of the genus, fits well with the record of those tropical taxa.

5. Acknowledgements

I would like to thank the RWE Power AG mining company (Cologne) for the permission to conduct field work in the Hambach mine, as well as the former employees Fritz von der Hocht (Kerpen) and Bertram Wutzler (Bornheim) for assistance in the field. Thanks to the editors, Lars van den Hoek Ostende (Leiden) and Doris Nagel (Vienna), for the invitation to contribute to this festschrift. I acknowledge the review comments of Lars van den Hoek Ostende, which improved the paper. Many thanks to Georg Oleschinski (IPB) for the splendid SEM pictures, and to Magnus Hellbom (NRM) for preparing the plate. I am grateful to Lars Werdelin (NRM) for improving the English language of the manuscript. The mate-

Species	Locality	MN	References	Upper dentition	Lower dentition	N
Neocometes	Ste Catherine 2, 9, France	3	Aguilar et al. (1997)	1 M2, 1 M3	1 m1	3
N. aff. *similis*	Petersbuch 28, Germany	3	Fejfar (1999)	?	?	?
N. similis	Rubielos de Mora, Spain	3	Bruijn & Moltzer (1974)	1 M2	1 m2	2
N. similis	Bełchatów C, Poland	4	Kowalski (1993)	2 M2, 1 M3	2 m1, 2 m2	7
N. similis	Bézian, France	4	Ginsburg & Bulot (2000)	?	?	?
N. similis	Dolnice 1-3, Czech Republic	4	Fejfar (1974)	1 M1, 2 M2	3 m1, 4 m2	10
N. similis	Echzell, Germany	4	Tobien (1955), Fejfar (1999)	?	?	?
N. similis	**Erkertshofen 2, Germany**	4	Fahlbusch (1966)	52 M1, 20 M2, 30 M3	29 m1, 32 m2, 17 m3	180
N. similis	Oberdorf, Austria	4	Daxner-Höck (1998)	1 M1, 1 M3	3 m1	5
N. similis	Petersbuch 2-5, 7-8, 11, Germany	4	Bolliger & Rummel (1994) Fejfar & Kalthoff (1999)	?	?	45
N. similis	Petersbuch 7, 38	4	Mörs (this paper)	5 M1, 3 M2, 4 M3	5 m1, 2 m2, 2 m3	21
N. similis	Sérido, France	4	Ginsburg & Bulot (2000)	?	?	?
N. similis	Vieux-Collonges, France	4/5	Mein & Freudenthal (1981)	1 M3	1 m1, 1 m2	3
Neocometes	Isle-d'Abeau, France	5	Mein & Freudenthal (1981) Mein (1984)	? ?	? ?	? ?
N. similis	Bełchatów B, Poland	5	Kowalski (1993)	1 M1, 1 M2, 1 M3	1 m2, 2 m3	6
N. similis	Betlinshausen, Germany	5	Boon (1991)	1 M1, 1 M2	no lower molars	2
N. similis	Bubenhausen, Germany	5	Boon (1991)	no upper molars	1m1	1
N. cf. *similis*	Franzensbad, Czech Republic	5	Fejfar (1974)	2 M1, 1 M2	1 m2, 1 m3	5
N. aff. *similis*	Hambach 6C, Germany	5	Mörs (this paper)	3 M1, 3 M2, 1 M3	1 m1	8
N. similis	Martinsbrünneli, Switzerland	5	Hünermann (1984)	no upper molars	1 m2	1
N. similis	Maßendorf, Germany	5	Schötz (1981)	5 M1, 4 M2, 2 M3	7 m1, 4 m2, 2 m3	24
Neocometes sp.	Puttenhausen, Germany	5	Wu (1982)	1 M3	no lower molars	1
N. aff. *brunonis*	Schellenfeld 2, Germany	5	Ziegler (1995)	no upper molars	1 m1, 1 m2	2
N. similis seu *brunonis*	Schellenfeld 3, Germany	5	Ziegler (1995)	1 M2	no lower molars	1
N. similis	Schönenberg, Germany	5	Schötz (1981)	no upper molars	1 m1, 1 m2	2
N. cf. *similis*	Tobel Hombrachtikon, CH	5	Bolliger (1992a, b)	2 M3	1 m1	3
N. similis	Undorf, Germany	5	Schötz (1981)	no upper molars	1 m3	1
N. brunonis	**Neudorf Spalte 1, Slovakia**	6	Schaub & Zapfe (1953) Fejfar (1974)	8 M1, 7 M2, 5 M3	5 m1, 6 m2, 4 m3	35
N. brunonis	Neudorf Spalte 2, Slovakia	6	Schaub & Zapfe (1953) Fejfar (1974)	24 M1, 23 M2, 9 M3	20 m1, 20 m2, 8 m3	96
N. brunonis	Neudorf Bonanza, Slovakia	6	Sabol & Holec (2002)	?	?	?
N. brunonis	Anwil, Switzerland	7/8	Engesser (1972)	2 M1, 2 M3	1 m1	5
N. brunonis	La Grive M, France	7/8	Mein (1999)	?	?	?
Neocometes sp.	Vracevici, Serbia	7/8	Markovic (2003)	?	?	?

Table 1: The fossil record of *Neocometes* in Europe. Specific assignment according the original descriptions, with the exception of Echzell, where originally only the genus was reported. Type localities in bold face.

rial described in this paper was obtained while working at the Collaborative Research Centre SFB 350 (Bonn University), financed by the Deutsche Forschungsgemeinschaft (DFG).

6. References

AGUILAR, J.-P., ESCARGUEL, G. & MICHAUX, J., 1997. Biochronologie du Miocène inférieur et moyen du Sud de la France à partir des faunes karstiques. Le problème du genre *Neocometes*. — BiochroM'97, Montpellier, Résumés/Abstracts, p. 14, Montpellier.

BOLLIGER, Th., 1992a. Kleinsäugerstratigraphie in der lithologischen Abfolge der miozänen Hörnlischüttung (Ostschweiz) von MN3 bis MN7. — Eclogae Geologicae Helvetiae, **85**:961–1000, Basel.

BOLLIGER, Th., 1992b. Kleinsäugerstratigraphie in der miozänen Hörnlischüttung (Ostschweiz). — Documenta naturae, **75**:1–296, München.

BOLLIGER, Th. & RUMMEL, M., 1994. Säugetierfunde aus Karstspalten. Die komplexe Genese am Beispiel eines Steinbruches bei Petersbuch, Südliche Frankalb (Bayern). — Mitteilungen der Bayerischen Staatssammlung für Paläontologie und historische Geologie, **34**: 239–264 München.

BOON, E., 1991. Die Cricetiden und Sciuriden der Oberen Süsswassermolasse von Bayerisch-Schwaben und ihre stratigraphische Bedeutung. — Dissertation, Universität München, 157 pp., München.

BRUIJN, H. DE & MOLTZER, J.G., 1974. The rodents from Rubielos de Mora; the first evidence of the existence of different biotopes in the Early Miocene of Eastern Spain. — Proceedings of the Koninklijke Nederlandse Akademie van Wetenschapen, B, **77**: 129–145, Amsterdam.

DALSÄTT, J., MÖRS, Th. & ERICSON, P.G.P., 2006. Fossil birds from the Miocene and Pliocene of Hambach (NW Germany). — Palaeontographica, A: Stuttgart.

DAXNER-HÖCK, G., 1998. Wirbeltiere aus dem Unter-Miozän des Lignit-Tagebaues Oberdorf (Weststeirisches Becken, Österreich). 7. Rodentia 2 und Lagomorpha (Mammalia). — Annalen des Naturhistorischen Museums Wien, **99A**: 139–162, Wien.

ENGESSER, B., 1972. Die obermiozäne Säugetierfauna von Anwil (Baselland). — Tätigkeitsberichte der Naturforschenden Gesellschaft Baselland, **28**:37–363, Liestal.

FAHLBUSCH, V., 1966. Cricetidae (Rodentia, Mamm.) aus der mittelmiocänen Spaltenfüllung Erkertshofen bei Eichstätt. — Mitteilungen der Bayerischen Staatssammlung für Paläontologie und historische Geologie, **6**:109–131, München.

FEJFAR, O., 1974. Die Eomyiden und Cricetiden (Rodentia, Mammalia) des Miozäns der Tschechoslowakei. — Palaeontographica, A, **146**:100–180, Stuttgart.

FEJFAR, O., 1999. Subfamily Platacanthomyinae. — [in:] RÖSSNER, G.E. & HEISSIG, K. (eds), The Miocene Land Mammals of Europe: 389-394, (Verlag Dr. Friedrich Pfeil), München.

FEJFAR, O. & KALTHOFF, D.C., 1999. Aberrant cricetids (Platacanthomyines, Rodentia, Mammalia) from the Miocene of Eurasia. — Berliner geowissenschaftliche Abhandlungen, E, **30**:191–206, Berlin.

FLYNN, L.J., 2003. Small mammal indicators of forest paleoenvironment in the Siwalik deposits of the Potwar Plateau, Pakistan. — [in:] REUMER, J.W.F. & WESSELS, W. (eds). Distribution and Migration of Tertiary Mammals in Eurasia. A Volume in Honour of Hans de Bruijn. — Deinsea, **10**:183–196, Rotterdam.

HIERHOLZER, E. & MÖRS, Th., 2003. Cypriniden-Schlundzähne (Osteichthyes: Teleostei) aus dem Tertiär von Hambach (Niederrheinische Bucht, NW-Deutschland). — Palaeontographica, A, **269**:1–38, Stuttgart.

HÜNERMANN, K.A., 1984. Der erste Nachweis von *Neocometes similis* FAHLBUSCH 1966 (Mammalia, Rodentia, Cricetidae) in der Schweiz. — Eclogae Geologicae Helvetiae, **77**:721–727, Basel.

JOYCE, W.G., KLEIN, N. & MÖRS, Th., 2004. Carettochelyine turtle from the Neogene of Europe. — Copeia, **2004**:406–411.

KLEIN, N. & MÖRS, Th., 2003. Die Schildkröten (Reptilia: Testudines) aus dem Mittel-Miozän von Hambach (Niederrheinische Bucht, NW-Deutschland). — Palaeontographica, A, **268**:1–48, Stuttgart.

KOWALSKI, K., 1993. *Neocometes* SCHAUB and ZAPFE, 1953 (Rodentia, Mammalia) from the Miocene of Bełchatów (Poland). — Acta zoologica cracoviensia, **36**:259–265, Kraców.

KOWALSKI, K., 1997. Rodents of the Miocene locality in Poland. — [in:] AGUILAR, J.-P., LEGENDRE, S. & MICHAUX, J., (eds). Actes du Congres BiochroM'97. — Mémoirs et Traveaux de l'Institut Montpellier, **21**:698–703, Montpellier.

MARKOVIC, Z., 2003. The Miocene small mammals of Serbia, a review. — [in:] REUMER, J.W.F. & WESSELS, W. (eds). Distribution and Migration of Tertiary Mammals in Eurasia. A Volume in Honour of Hans de Bruijn. — Deinsea, **10**:393–398, Rotterdam.

MCKENNA, M.C. & BELL, S., 1997. Classification of mammals above the species level. — 631 pp., (Columbia University Press), New York.

MEIN, P., 1984. Composition quantitative des faunes de mammifères du Miocène moyen et supérieur de la région lyonnaise. — Paléobiologie continentale, **14**:339–346, Montpellier.

MEIN, P., 1999. European Miocene mammal biochronology. — [in:] RÖSSNER, G.E. & HEISSIG, K. (eds). The Miocene Land Mammals of Europe:25-38, (Verlag Dr. Friedrich Pfeil), München.

MEIN, P. & FREUDENTHAL, M., 1981. Les Cricetidae (Mammalia, Rodentia) du Néogène Moyen de Vieux-Collonges. Partie 2: Cricetodontinae incertae sedis, Melissiodontinae, Platacanthomyinae, et Anomalomyinae. — Scripta Geologica, **60**:1–11, Leiden.

MEIN, P. & GINSBURG, L., 1997. Les mammifères du gisement miocène inférieur de Li Mae Long, Thailande: systematique, biostratigraphie et paléoenvironnement.

— Geodiversitas, **19**:783–844, Paris.

MONTOYA, P., PEÑALVER, E., RUIZ-SÁNCHEZ, J., SANTISTEBAN, C. DE, ALCALÁ, L., BELINCHON, M. & LACOMBA, J.I., 1996. Los yaciemientos paleontológicos de la cuence terciaria continental de Rubielos de Mora (Aragón). — Revista Española de Paleontología, Vol. Extr.:215–224, Madrid.

MÖRS, Th., 2002. Biostratigraphy and palaeoecology of continental Tertiary vertebrate faunas in the Lower Rhine Embayment (NW-Germany). — Netherlands Journal of Geosciences / Geologie en Mijnbouw, **81**:177–183, Utrecht.

MÖRS, Th., HOCHT, F. VON DER & WUTZLER, B., 2000. Die erste Wirbeltierfauna aus der miozänen Braunkohle der Niederrheinischen Bucht (Ville-Schichten, Tagebau Hambach). — Paläontologische Zeitschrift, **74**:145–170, Stuttgart.

MÖRS, Th. & KALTHOFF, D.C., 2004. A new species of *Karydomys* (Rodentia, Mammalia) and a systematic re-evaluation of this rare Eurasian Miocene hamster. — Palaeontology, **47**:1387–1405, London.

NEMETSCHEK, A. & MÖRS, Th., 2003. *Myoglis meini* (de BRUIJN, 1965 [1966]) (Mammalia: Gliridae) aus dem Miozän von Hambach 6C (NW-Deutschland). — Paläontologische Zeitschrift, **77**:401–416, Stuttgart.

QIU Z.-D. & LI, C.-K., 2003. Rodents from the Chinese Neogene: Biogeographic relationships with Europe and North America. — [in:] FLYNN, L. (ed.). Vertebrate Fossils and their Context. Contributions in Honor of Richard Tedford. — Bulletins of the American Museum of Natural History, **279**: 586–602, New York.

RÖSSNER, G.E. & MÖRS, Th., 2001. A new record of the enigmatic Eurasian Miocene ruminant artiodactyl *Orygotherium.* — Journal of Vertebrate Paleontology, **21**:591–595, Lawrence.

SABOL, M. & HOLEC, P., 2002. Temporal and spatial distribution of Miocene mammals in the western Carpathians (Slovakia). — Geologica Carpathica, **53**:269–279, Bratislava.

SCHÄFER, A., UTESCHER, T. & MÖRS, Th., 2004. Stratigraphy of the Cenozoic Lower Rhine Basin, northwestern Germany. — Newsletter on Stratigraphy, **40**:73–110, Berlin, Stuttgart.

SCHAUB, S. & ZAPFE, H., 1953. Die Fauna der mittelmiozänen Spaltenfüllung von Neudorf an der March (CSSR). Simplicidentata. — Sitzberichte der österreichischen Akademie der Wissenschaften, mathematisch-naturwissenschaftliche Klasse, Abteilung 1, **162**:181–215, Wien.

SCHÖTZ, M., 1981. Erste Funde von *Neocometes* (Rodentia, Mammalia) aus der Molasse Bayerns. — Mitteilungen der Bayerischen Staatssammlung für Paläontologie und historische Geologie, **21**:97–114, München.

STEFEN, C. & MÖRS, Th., subm. The beaver *Anchitheriomys* from the Miocene of Central Europe. — Journal of Paleontology.

TOBIEN, H., 1955. Eine miozäne Säugerfauna aus vulkanischen Tuffen des Vogelsberges (Vortragsbericht). — Zeitschrift der deutschen geologischen Gesellschaft, **105**:588, Hannover.

UTESCHER, T., MOSBRUGGER, V. & ASHRAF, A.R., 2000. Terrestrial climate evolution in northwest Germany over the last 25 million years. — Palaios, **15**:430–449.

WU, W.-Y., 1982. Die Cricetiden (Mammalia, Rodentia) aus der Oberen Süßwasser-Molasse von Puttenhausen (Niederbayern). — Zitteliana, **9**:37–80, München.

ZIEGLER, R., 1995. Die untermiozänen Kleinsäugerfaunen aus den Süßwasserkalken von Engelswies und Schellenfeld bei Sigmaringen (Baden-Württemberg). — Stuttgarter Beiträge zur Naturkunde, B, **228**:1–53, Stuttgart.

ZIEGLER, R. & MÖRS, Th., 2000. Marsupialia, Lipotyphla und Chiroptera (Mammalia) aus dem Miozän des Braunkohlentagebaus Hambach (Niederrheinische Bucht, NW-Deutschland). — Palaeontographica, A, **257**:1–26, Stuttgart.

PLATE 1

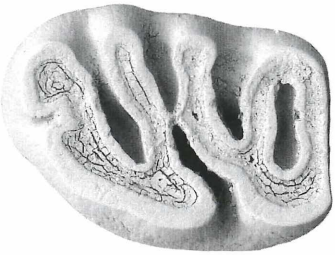
Figs 1-7: Molars of *Neocometes* aff. *similis* from Hambach 6C

Fig. 1	M1 dext. (inverted), a. occlusal view, b. oblique view from posterior (IPB-HaH 5468)
Fig. 2	M1 sin., occlusal view (IPB-HaH 5546)
Fig. 3	M1 sin., occlusal view (IPB-HaH 5547)
Fig. 4	M2 dext. (inverted), occlusal view (IPB-HaH 5230)
Fig. 5	M2 dext. (inverted), occlusal view (IPB-HaH 5469)
Fig. 6	M3 dext. (inverted), occlusal view (IPB-HaH 5229)
Fig. 7	m1 dext. (inverted), a. occlusal view, b. oblique view from posterior (IPB-HaH 5231)

Figs 8-9: Molars of *Neocometes similis* from Petersbuch 7

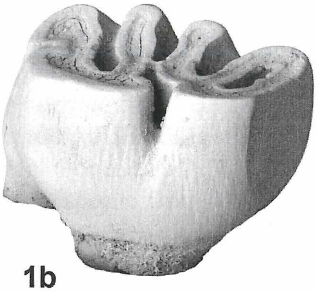
Fig. 8	M3 sin., occlusal view (NRM PZ M. 7902)
Fig. 9	m1 sin., occlusal view (NRM PZ M. 7901)

PLATE 1


1a


2

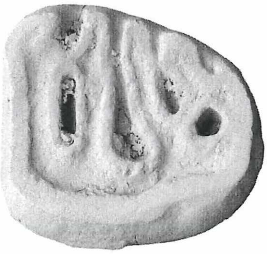

3

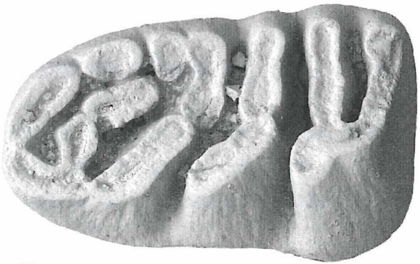

1b

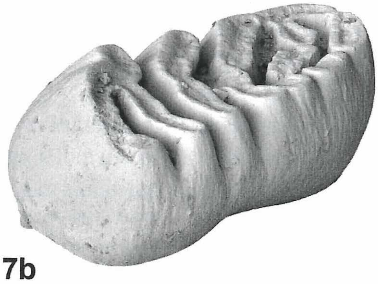

4


5


6


8


7a


7b


9

Zeitschrift/Journal: Beiträge zur Paläontologie

Jahr/Year: 2006

Band/Volume: 30

Autor(en)/Author(s): Mörs Thomas

Artikel/Article: The Platacanthomyine Rodent Neocometes Schaub & Zapfe, 1953 from the Miocene of Hambach (NW Germany) 329-337